PRODUCT CATALOG

NEW *PRODUCTS INSIDE*

2023

NIVELCO

40 YEARS

ADVANCED 80 GHz RADAR

LEVEL TRANSMITTERS

PiloTREK W–200 series

NIVELCO

TRANSCEND YOUR CHALLENGES

SUBSIDIARY & DISTRIBUTION NETWORK

To find a local NIVELCO representation, please check distribution page on NIVELCO website!

CONTACT NIVELCO

To contact NIVELCO, please use contact page on NIVELCO website!

SALES AND APPLICATION SUPPORT

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NIVELCO.COM

*5 years warranty for the majority of NIVELCO products. Detailed information on page 250 and product price sheets.

Table of Contents 2023

NIVELCO is one of the leading manufacturers of precision engineered level measurement instruments, with more than a million units sold worldwide. We are represented on three continents by numerous subsidiaries and distributors, and our products are used in a vast array of industrial applications.

We are committed to building long-lasting and successful business relations with our partners. We aim to provide the best quality and unmatched reliability both in our services and our products. We aim to reduce your costs, streamline manufacturing, and to improve productivity.

Our quality indicators have been showing excellent results and steady development for decades due to our strict quality policy.
In 2010, we extended our 2-year warranty period to 3 years for our products, and from 2018, most of our instruments come with a 5-year full warranty, which is unprecedented in the industry.

We are further inspired by all the positive feedback from our clients and partners to continue striving to provide the highest quality services and products.

Tamás Szőllős

THE STORY OF A FAMILY VENTURE

Endre Szőllős

Tamás Szőllős and András Szőllős

After training as an engineer at the "ITT Standard" telephone company, Endre Szőllős started his own business in 1939, designing and producing telephone systems. Even during the troubled times of World War II, business was growing, and it provided an excellent training opportunity for Endre's sons. After obtaining their university degrees in electrical engineering and economics respectively, and the untimely death of their father in 1969, Tamás and András Szőllős took over the company. By 1982, the production of a series of industrial controllers had led to a developing specialization in level measurement and control, and NIVELCO was founded. By the time free international trade reached Hungary in 1989, NIVELCO had a full range of level control products and immense production capabilities, backed by impressive in-house manufacturing and engineering facilities. In 1989 NIVELCO developed the world's first "compact" ultrasonic level transmitter, offering a combined sensor/transmitter in one unit. It had a major impact and secured a leading position for the company in the world market.

NIVELCO took the opportunity offered by the newly available markets and established trade relations with various notable foreign distributors and sales agents. Building on the already existing channels into neighboring countries, NIVELCO invested in its own sales organizations and offices in Austria and Poland, then later in the Czech Republic, Romania, India, the USA, Croatia and Greece. The company's success in these ventures demonstrates that by maintaining business principles, continually improving expertise and skills, it can compete with the top suppliers successfully by

- manufacturing a wide range of products to suit all applications,
- investing in advanced technology, expertise, and product development,
- enforcing strict quality management guidelines and control systems,
- developing worldwide marketing, sales and service support,
- providing fast and flexible in-house production and customer order logistics,
- making use of a company-wide IT system for full product design and production data,
- maintaining fair and modest pricing, ensuring the capital for future customer support and development,
- continually investing in employees and work relations.

Even though today's globalized world economy favors multinational giants, among the ranks of medium-sized companies, NIVELCO pursues the highest level of customer satisfaction and manufactures products with high added intellectual value. NIVELCO proves that flexible, medium-sized, customer-led companies can find their place in the market and successfully maintain their independence.

NIVELCO PROCESS CONTROL CO.
Hungary – 1982

- **NIVELCO Messtechnik GmbH**
  Austria – 1991
- **NIVELCO-Poland Sp. z.o.o.**
  Poland – 1995
- **NIVELCO Bohemia s.r.o**
  Czech Republic – 2004
- **SC NIVELCO Tehnica Masurarii SRL.**
  Romania – 2005
- **NIVELCO Instruments India Pvt. Ltd.**
  India – 2007
- **NIVELCO USA LLC**
  USA – 2008
- **NIVELCO Mjerna Tehnika d.o.o.**
  Croatia – 2012
- **NIVELCO Greece LLC.**
  Greece – 2020

1982	▪ NIVELCO is founded ▪ NIVOSONAR – the first Ultrasonic level transmitter
1984	▪ NIVOCONT – Vibrating rod level switch
1986	▪ NIVOCAP – Capacitive level transmitter
1989	▪ NIVOSONAR – Compact Ultrasonic level transmitter: A WORLD FIRST!
1991	▪ NIVELCO Messtechnik (Austria) is established
1992	▪ New factory is opened in Budapest
1994	▪ NIVOPOINT – Float level switch ▪ NIVOMAG – Magnetic coupling level switch
1995	▪ NIVELCO becomes ISO 9001 certified ▪ NIVELCO Poland is founded
1996	▪ NIVELCO Trade Center ▪ NIVOSWITCH – Vibrating fork level switch
1999	▪ NIVOPRESS – Hydrostatic level transmitter
2000	▪ Budapest Factory expansion
2001	▪ NIVOTRACK – Magnetostrictive level transmitter
2002	▪ Standardized mechanical and electronic construction ▪ HART® – Digital Communication in transmitters
2003	▪ ATEX Hazardous Area Certificates
2004	▪ MultiCONT – The new system concept ▪ NIVELCO Bohemia (Czech Republic) is founded
2005	▪ MicroTREK – Radar-based level transmitter ▪ NIVELCO T.M. Company in Romania
2007	▪ NIVELCO Instruments (India) is created
2008	▪ NIVELCO USA is established
2009	▪ AnaCONT – pH, ORP & conductivity transmitter
2010	▪ AnaCONT – Dissolved oxygen transmitter ▪ The first SIL product certification
2012	▪ PiloTREK – Non-contact radar level transmitter ▪ NIVELCO Mjerna Tehnika d.o.o. (Croatia)
2013	▪ NIVOCAP CK – RF-capacitive level switch
2016	▪ The first FM certificate
2017	▪ EasyTREK SP–500 ▪ UNICOMM HART®-USB / Bluetooth® modem
2018	▪ NIPRESS – product family is expanded
2019	▪ Planar antenna version of PiloTREK
2020	▪ NIVOTRACK – Magnetostrictive integrated level transmitter
2021	▪ Redesigned aluminum housings ▪ Introduction of ISO 14001 Environmental Management System ▪ MicroTREK HT–700
2022	▪ PiloTREK W–200 non-contact, 80 GHz (W-band) radar ▪ NIVOFLIP MAK–200 level switch ▪ EasyTREK SP–500 Pro level transmitter

TIMELINE

Efficient industrial production depends on the information provided by high-tech sensors and instrumentation. In the 1980s, the entire sensor manufacturing industry was radically changed by developments in microprocessors and electronics. **NIVELCO** acquired a significant market share, which it maintains by utilizing these developments.
Recognizing the growth in market demand, **NIVELCO** earned recognition primarily with its level transmitters and gained substantial global market share due to its pragmatic business practices and continuous investment in new technologies.
For years, **NIVELCO** has been producing every 20th ultrasonic transmitter sold globally, every 50th vibrating level switch, and every 100th radar level transmitter.
NIVELCO has established and maintained a respectable position in the world market, and has sold more than 1 million units of level measuring and control instrumentation so far: **NIVELCO** is now one of the largest producers of ultrasonic level transmitters in the world.

HEADQUARTERS

From cramped beginnings in 1982, with only 15 employees occupying 150 m^2 in Budapest, **NIVELCO** has invested in extensive facilities capable of total control of production requirements. In the year 2000, further expansion to a new building complex of 10,000 m^2 provided ample space for future development, currently allocated for the **NIVELCO** Trade Center and associated activities. Air-conditioned offices, excellent working conditions, and a relaxed environment ensure exceptional productivity and harmonious coexistence on the premises. Unused office space in the **NIVELCO** Trade Center is leased to various other companies. While the engineering and production departments are located in Hungary, **NIVELCO**'s foreign subsidiaries handle sales and marketing activities, consulting, installation, and maintenance in their respective areas.

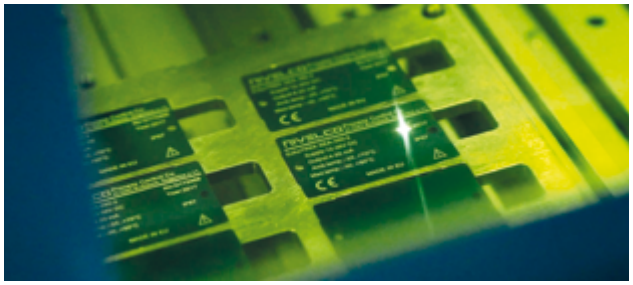


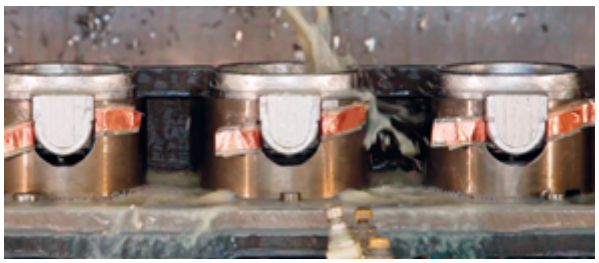
ADVANCED MANUFACTURING PROCESSES

NIVELCO devotes significant energy and cost to the continuous development of production technology. The production of high-tech instruments is supported by production preparation, and logistics is aided by a self-developed IT system. Quantitative and qualitative requirements are satisfied by a cutting-edge CNC plant and surface-mounted electronic technology. The reliability of the manufactured devices is guaranteed by climatic treatment and testing, computer control, the ISO 9001 quality control system *(1995)*, and the complementary quality model, TQM / EFQM, implemented a few years ago. Moreover, our environmental management program fully complies with the directives of ISO 14001 *(2021)*. The products are delivered to the customers traceably and only after a 100% count.

ISO CERTIFIED 9001 & 14001





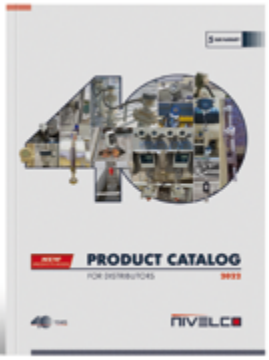


SALES & SUPPORT

Providing exemplary technical and sales support to customers, contractors, and distributors has always been an essential part of NIVELCO's approach. The application of knowledge and experience amassed by the sales team is one of the company's strongest suits. Input from the Hungarian sales team, NIVELCO's subsidiaries in Poland, the Czech Republic, Romania, India, the USA, Croatia, and Greece, as well as from export distributors and sales agents, is treated as a valuable resource to be shared and to guide product planning and development. The company publishes numerous articles, application stories, reference site information on the website, and twice a year in NIVELCO Magazine to share this experience with sales agents and distributors. In addition, frequent training courses in the Budapest training center provide customers, installers, and distributors with hands-on experience.

MARKETING

The marketing team at headquarters in Hungary creates all marketing materials such as brochures, advertisements, and presentations for subsidiaries to represent the unified **NIVELCO** corporate image. They update all information on **NIVELCO**'s website and are also responsible for updating all downloadable color brochures and technical documentation. Our product videos *(uploaded to YouTube)* and the **NIVELCO** movie were produced by **NIVELCO**'s own crew to present our product portfolio, manufacturing capabilities, and the wide range of application possibilities. The team is also responsible for managing our online and social channels *(web, Facebook, LinkedIn, Instagram, YouTube, NewsLine, Selector),* participation in exhibitions, and organizing conferences and training courses for clients, distributors, and other professionals.



EXPORT

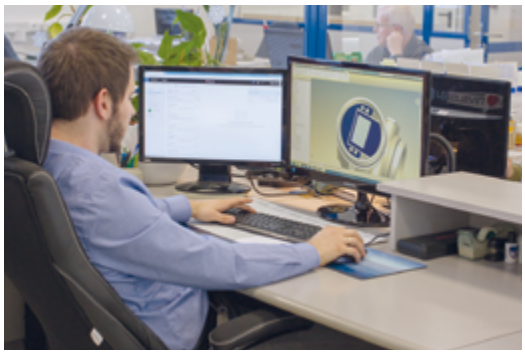
During the 80s, when the company was established, export was limited to the Warsaw Pact countries. After the fall of communism in 1990, **NIVELCO** finally had the opportunity to explore Western markets, and the time of successful multinational expansion has begun for the company. Twenty years later, 85% of the company's products were exported. These days, our products are sold in over 80 countries through subsidiaries and distributors worldwide. **NIVELCO** holds regular technical training events and annual sales meetings to enhance knowledge, spread information, and exchange ideas. Our dealers that participate in international exhibitions are provided with operational models, exhibition accessories, and expert advice. Emboldened by the success of our non-European subsidiaries (USA and India), the company is firmly determined to establish further subsidiaries in the near future.

RESEARCH & DEVELOPMENT

The general objective of **NIVELCO**'s Research and Development department is the continual improvement of all products and technologies, including mechanics, hardware, and software, and to design new products that meet the requirements of our customers. R&D is also tasked with devising new ways to continuously modernize and optimize our entire product line, to improve the quality and elegance of designs.

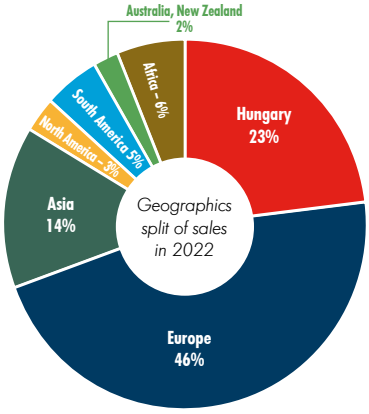
To create an incomparably versatile product portfolio that provides suitable solutions for even the most peculiar industrial problems, the team has to face the most rigorous approval procedures, such as ATEX or PED, and emerge victoriously from measurement accuracy and performance certificates like OIML, GOST, or SIL. In these procedures, close co-operation has been established between NIVELCO and international certification institutions like BKI, TÜV, DNV, BV, and OMH.

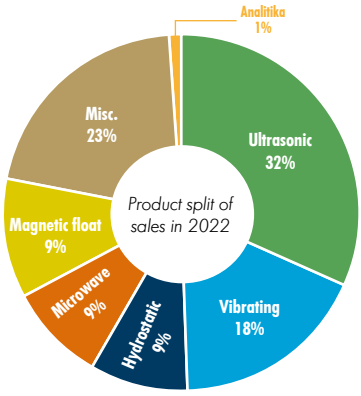
We aim to create sophisticated devices that are thoroughly tested, operate according to specifications, and are sold at competitive prices. **NIVELCO** maintains close ties with academia and suppliers to utilize the most advanced developments available. Strong work relations have been established with Budapest University of Technology and Economics, with Óbuda University, and other academic institutions, which led to recruiting numerous young and well-trained engineers.

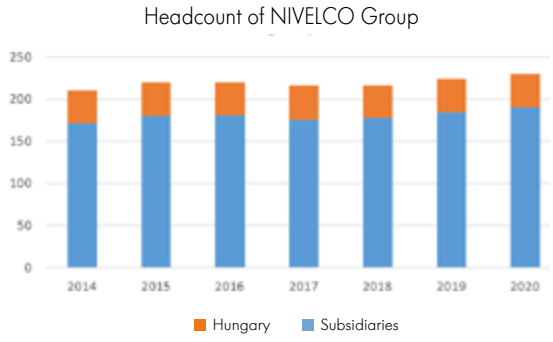


STATISTICS

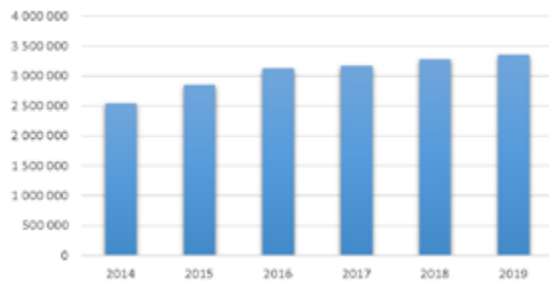
NIVELCO has been growing steadily since its inception and has seen a consistent increase in output, sales revenue, company value, and the number of employees. Over the last five years, investment in technological and infrastructural development exceeded two and a half million Euros, covered entirely from the net profit, and the company's equity ratio has been maintained above 72%.
The proportion of equity at **NIVELCO** Process Control Co. is 72% on the liability side of the balance sheet. 23% of our products sold in the domestic market in 2022, while our overseas sales result has been also continuously improving. Our entering the global market in 1990 was due to ultrasonic level transmitters. Ever since then, our systematic and market-focused product development resulted in a broad range of state of the art products, represented more and more in our sales.



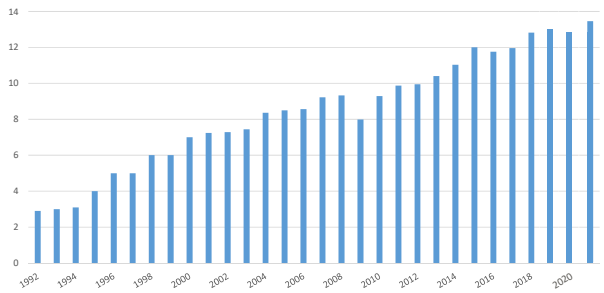




NIVELCO entered the global market with ultrasonic level transmitters in 1990. Since then, systematic, market-focused product development brought forth numerous highly sophisticated devices. Almost 70% of our products were sold within Europe in 2022, and our overseas presence is steadily increasing.



Equity of NIVELCO Hungary in kHUF



NIVELCO Group sales revenue in m€

REFERENCES

IN NEARLY ALL INDUSTRIES AND ALMOST EVERYWHERE IN THE WORLD

Our devices are used extensively in nearly all industries that involve level measurement and control, including the manufacture and processing of industrial machinery, raw materials, oil, cement, sand, food and beverages, pharmaceuticals, chemicals, clean water, and sewage. There is a virtually endless number of possible applications. Please read about our successful applications sorted by industries, devices, and operation principles on our website.


Biofuel production – Sweden


Tyre manufacturing – USA


Pharmaceutical industry – Hungary


Grain elevator – Poland


Dairy industry – Belgium


Paving stone and cement production – Poland

LEVEL TRANSMITTERS

Since its foundation, NIVELCO has been manufacturing industrial measuring devices. Our primary focus remained the same, and the company developed a plethora of instruments of various operating principles over the decades. Our range of ultrasonic level transmitters is one of the widest on the market, offering a remarkable number of integrated, compact, 2 and 4-wire transmitters for liquids and solids.

Most of our transmitters are available in PFA-coated versions for aggressive mediums; all transmitter families have explosion-proof models for hazardous environments.

PiloTREK
NON-CONTACT MICROWAVE

NEW

page 15

- 80 GHz (W-band) or 25 GHz (K-band)
- 2-wire compact and integrated transmitters
- Accuracy up to ±2 mm
- Measuring distance up to 30 m
- Up to 25 bar and +180 °C
- 4…20 mA + HART® communication
- ε_r > 1.9
- IP67 or IP68
- Explosion-proof variants

MicroTREK
GUIDED MICROWAVE

NEW

page 32

- 2-wire compact transmitter
- TDR principle
- ±5 mm or ±20 mm accuracy
- ε_r > 1.4
- Measuring range up to 30 m
- 4…20 mA + HART® communication
- Up to 40 bar and +200 °C
- Rod or cable probe
- Plug-in graphic display module
- Explosion-proof variants

NIVOCAP
CAPACITIVE

page 42

- 2-wire compact transmitter
- Rod or cable probe up to 20 m
- ε_r > 1.5
- Partially or fully insulated probe
- 32-point linearization
- High sensitivity
- 4…20 mA + HART® communication
- Explosion-proof variants

NIVOPRESS D
HYDROSTATIC

page 47

- 2-wire compact level transmitter
- 0…400 bar
- High overload capability
- Accuracy: 0.25%
- Stainless steel diaphragm
- Plug-in display module
- 4…20 mA + HART® communication
- Explosion-proof variants

NIVOPRESS N
SUBMERSIBLE HYDROSTATIC

page 50

- 2 or 3-wire submersible transmitter
- Stainless steel or fully plastic body
- Up to 350 m measuring range
- 4…20 mA + HART® communication
- Linearity error: 0.25%
- Integrated Pt100 temperature sensor
- Venting tube in cable
- IP68
- Explosion-proof variants

NIVOTRACK
MAGNETOSTRICTIVE INTEGRATED

page 56

- 1 mm resolution
- Distance and level measurement
- Normal and mini rigid guide tube versions
- Stainless steel or titanium floats
- IP65
- HART® communication
- Chemicals, solvents, hydrocarbons
- Tank level monitoring
- Interface measurement

NIVOTRACK
MAGNETOSTRICTIVE COMPACT

page 61

- 2-wire compact or mini compact transmitter
- 0.1 mm or 1 mm resolution
- Maximum 15 m measuring range
- For liquids with min. 0.4 kg/dm^3 density
- Distance, level and volume measurement
- Rigid or flexible probe
- OIML R 85 certificate
- Explosion-proof variants

NIVOFLIP
BYPASS LEVEL INDICATORS

NEW

page 67

- Operation without power supply
- 500…5500 mm measuring range
- ±10 mm accuracy
- Stainless steel or titanium float
- Optional strap-on level switches
- Maximum 100 bar process pressure
- DIN and ANSI flanges
- High-temp. version up to +250 °C
- PED certified
- Explosion-proof

EasyTREK for liquids
ULTRASONIC INTEGRATED

NEW

page 75

- For liquid level measurement
- 2-wire integrated transmitter
- Narrow, 5° beam angle
- Maximum 25 m measuring range
- PP, PVDF, PTFE transducers
- 32-point linearization
- 4…20 mA + HART® communication
- Open-channel flow metering
- IP68
- Explosion-proof variants

EchoTREK for liquids
ULTRASONIC COMPACT

NEW

page 86

- For liquid level measurement
- 2 and 4-wire compact transmitter
- Narrow, 5° beam angle
- Maximum 25 m measuring range
- PP, PVDF, PTFE and SS transducers
- 32-point linearization
- Plug-in display module
- 4…20 mA + HART® communication
- IP67
- Explosion-proof variants

EasyTREK for solids
ULTRASONIC INTEGRATED

page 95

- For free-flowing solids
- 4-wire integrated transmitter
- Narrow, 5° beam angle
- Maximum 60 m measuring range
- PP or aluminum sensor
- Joystick aiming device
- 4…20 mA + HART® communication
- IP65
- Explosion-proof variants

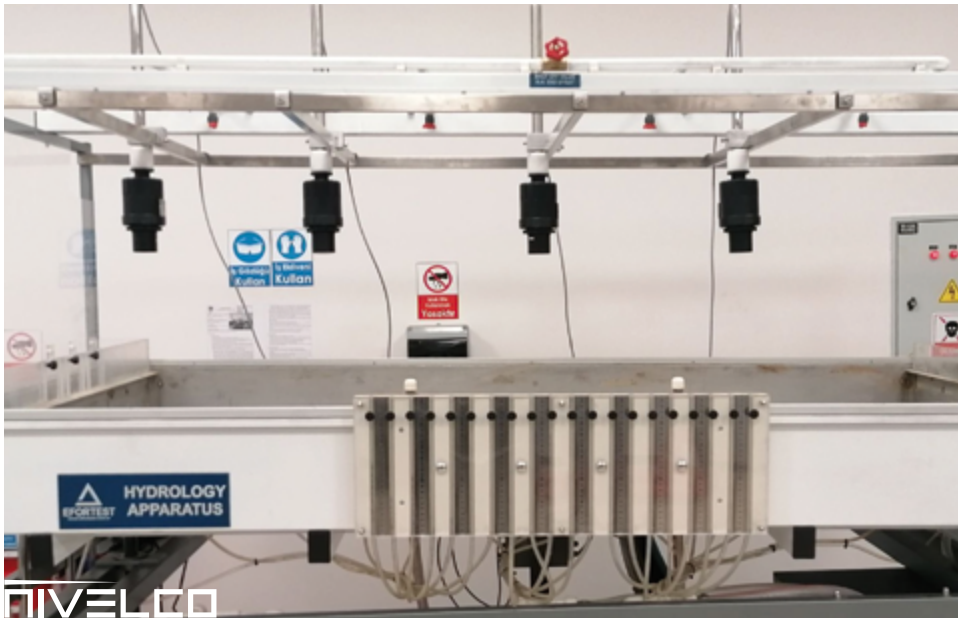
EchoTREK for solids
ULTRASONIC COMPACT

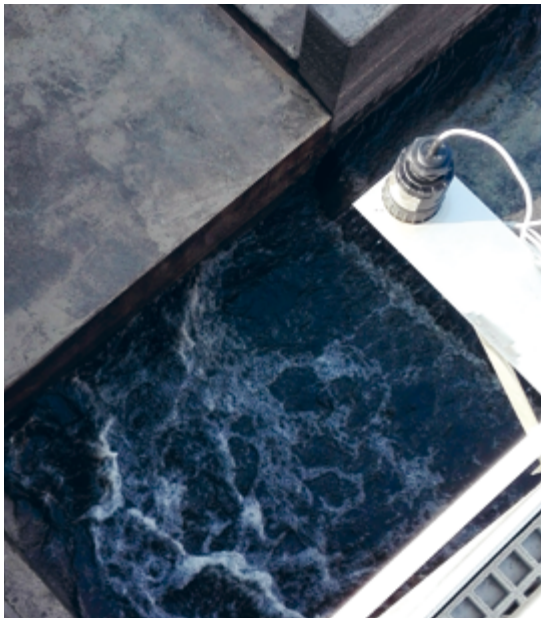
page 98

- For free-flowing solids
- 4-wire compact transmitter
- Narrow, 5° beam angle
- Maximum 60 m measuring range
- PP or aluminum sensor
- Joystick aiming device
- Plug-in display module
- 4…20 mA + HART® communication
- IP65
- Explosion-proof variants


02
BENZO

APPLICATIONS





WPP–210–4

FEATURES

- 2-wire 80 GHz *(W-band)* radar
- Measuring range up to 30 m for liquids
- Accuracy of ±2 mm
- Easy to install due to small antenna diameter
- 1", 1½" encapsulated horn antenna
- Integrated design with IP68 protection
- User-friendly threshold management
- Ex variant *(pending)*
- For material prone to vapor formation
- For measuring liquids with a gas blanket
- It can also be used in a vacuum
- Open-channel flow measurement

APPLICATIONS

- For measuring the level of liquids, emulsions, and other media up to 30 m
- For large-particle bulk solids
- Storage tanks, chemical tanks, open pits, sumps, wells
- Measurement through a plastic tank roof

AREAS OF APPLICATION

- Water and wastewater industry
- Energy industry / Plant utilities
- Food & Beverage
- Pharmaceutical industry
- Chemical industry
- Marine applications
- Agriculture
- Construction materials
- Heavy industry
- Packaging industry

The new **PiloTREK W–200** non-contact radar level transmitters use the most advanced industrial measurement technology, the 80 GHz FMCW radar. The most fundamental advantage of 80 GHz radars compared to lower frequencies (5…12 GHz and 25 GHz) is the smaller antenna size, better focusability, and narrow beam angle.
It uses the latest technology for measuring liquids, masses, emulsions, and other chemicals widely used in, for example, the water industry, food industry, energy industry, pharmaceutical industry, and chemical industry, which provides measurement results with millimeter accuracy.
It is also excellent for measuring substances prone to vapor formation and liquids with gas blanket. In addition to the level, volume, and weight measurement functions, this product family also inherits the open-channel flow measurement functions and the threshold functions to eliminate false and interfering echoes introduced in connection with ultrasonic devices. Since no medium is required for millimeter waves to propagate, it can also be used in a vacuum.
The device can also be operated with HART® compliant **NIVELCO EView2**, **MultiCONT** universal process controller, and PACT*ware* software.

OPERATING PRINCIPLE

The reflection of the millimeter-waves is highly dependent on the dielectric constant of the medium. Therefore, the measured medium's dielectric constant (ε_r) must be over 1.9 for millimeter-wave level measurement. The measurement principle of a level transmitter with a millimeter-waves signal is based on measuring the reflection's time of flight.
The speed of propagation of millimeter-waves signals in the air, gases, and vacuum is almost constant regardless of temperature and medium pressure, so the measured distance does not depend on the physical parameters of the intermediate medium.

The **PiloTREK W–200** level transmitter is a continuous-wave frequency modulated radar *(FMCW)* operating at 80 GHz *(W-band)*. The most obvious advantages of 80 GHz radars over lower frequency *(5…12 & 25 GHz)* radars are smaller antenna size, better focus, and smaller beam angle. A portion of the millimeter-wave continuous wave energy radiated by the level transmitter antenna is reflected from the measured surface, depending on the material to be measured. The distance of the reflecting surface is calculated with high accuracy by the electronics from the frequency shift of the reflected signal and converted into a distance, level, or volume signal by the electronics.

Informative Er values			
Butane	1.4	Grain	3…5
Cement	1.5…10	Cooking oil	3.9
LPG	1.6…1.9	Limestone	6.1…9.1
Kerosene	1.8…2.1	Acetone	21
Crude oil	2.1	Ethanol	24
Diesel	2.1	Methanol	33.1
Gasoline	2.3	Glycol	37
Asphalt	2.6	Nitrobenzene	40
Clinker	2.7	Water	80
Resin	2.4…3.6	Sulphuric acid (T = 20 °C)	84

TECHNICAL DATA

WP□–2□□–□		
Measured values		Distance; calculated values: level, volume, mass, flow
Signal frequency		77…81 GHz (W-band)
Measuring range*		0…30 m
Minimum beam angle*		7°
Lowest ε_r of medium		1.9
Resolution		1 mm
Supply voltage		12…36 V DC
Output	Analog	4…20 mA (3.9…20.5 mA); $R_{tmax} = (U_s - 12\ V) / 0.02\ A$
	Digital	HART® interface, loop resistance ≥250 Ω
	Relay *(optional)*	SPDT 30 V / 1 A DC; 48 V / 0.5 A AC
	Service interface	SAT–504–3 compatible; galvanically isolated; 3.3 V LVDS; max. 100 mA
Measuring frequency		~1 s
Antenna diameter*		1" (25.4 mm), 1½" (38.1 mm)
Antenna material*		PP / PVDF / PTFE
Process temperature		–40…+80 °C
Ambient temperature		
Process pressure		–1…3 bar
Process connection		1", 1½" BSP / NPT
Ingress protection		IP68
Electrical connection		4 x 0.5 mm² shielded Ø6 mm cable x 5 m (up to 30 m); For relay option: 7 x 0.5 mm² shielded cable
Electrical protection		Overvoltage Class 1; (Class III [SELV])
Housing material*		Plastic (PP / PVDF)

**depending on order code*

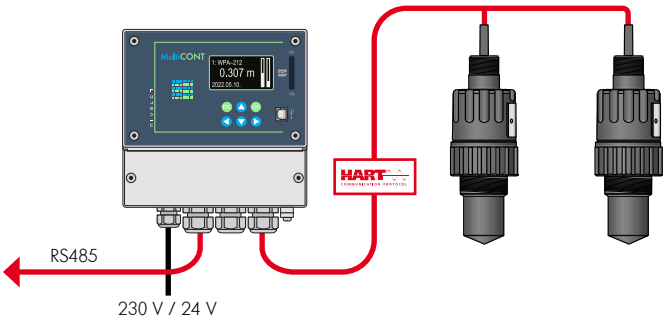
TYPE-DEPENDENT DATA

	WP□–212–□ WP□–213–□	WP□–214–□ WP□–215–□	WP□–224–□ WP□–225–□
Dead zone[1]	0 m		
Maximum measuring range[2]	10 m		20 m
Accuracy[3]	±5 mm		±2 mm
Beam angle *(–3 dB)*	12°	7°	
Antenna insertion length[4]	56 mm	70 mm	
Lower process connection	1" BSP / NPT	1½" BSP / NPT	
Upper process connection	1" BSP		

[1] *Measured from the tip of the antenna.*
[2] *May be limited in the case of low dielectric constant or non-perpendicular or non-planar media.*
[3] *In the case of an ideal reflecting surface.*
[4] *Measured from the sealing plane of the process connection.*

HART® MULTIDROP LOOP

MultiCONT multichannel process controllers process and display measurement data supplied by NIVELCO's HART® equipped transmitters in a Multidrop loop. Connected transmitters can be programmed through **MultiCONT**, and it can also perform data logging tasks. Processed data may be sent to a computer via RS485 and displayed in **NIVISON**. **MultiCONT** provides the means to optimize and configure measurements and display the echo maps of the particular installations.



PiloTREK WP-200 — 5 years

2-wire integrated pulse burst radar level transmitter with PP or PVDF sensor, ingress protection: IP68

Version

W□■ – 2 ■■ – ■		
P		Integrated transmitter

Antenna / Housing

W P □ – 2 ■■ – ■		
A		PP / PP
B	*	PVDF / PVDF
T		PTFE / PVDF

Measurement range

W P ■ – 2 □■ – ■		
1		10 m
2		20 m
3	*	30 m

Process connection lower / upper

W P ■ – 2 ■□ – ■		
2		1" BSP / 1" BSP (only for 10 m measuring range)
3		1" NPT / 1" BSP (only for 10 m measuring range)
4		1½" BSP / 1" BSP (only for 10 m or 20 m measuring range)
5		1½" NPT / 1" BSP (only for 10 m or 20 m measuring range)
6	*	2" BSP / 1" BSP (only for 20 m measuring range)
7	*	2" NPT / 1" BSP (only for 20 m measuring range)
8	*	Ø75 mm / 1" BSP (only for 30 m measuring range)

Output / Certificates

W P ■ – 2 ■■ – □		
4		4...20 mA + HART®
8	*	4...20 mA + HART® / Ex ia G
H		4...20 mA + HART® + relay

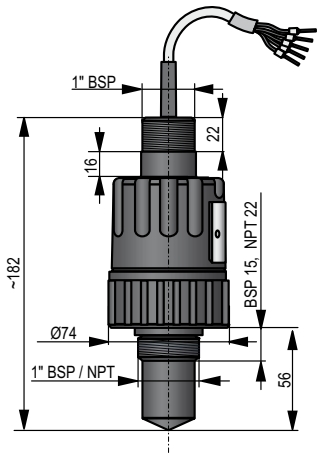
* Under development

Cable

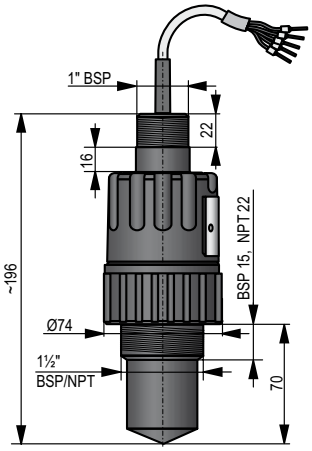
Maximum length 30 m; sold by the meter over the standard 5 m

Accessories sold separately; see relevant page for details

S F A – 3 ■■ – 0	Flanges
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G
S A A – 1 0 ■ – ■	Mounting brackets



WP□–212–□, WP□–213–□



WP□–2□4–□, WP□–2□5–□

NIV24
WPA–212–4
WPA–214–4
WPA–224–4

NEW

Non-Contact Microwave Compact Level Transmitters

WES–212–4

WES–214–4

FEATURES

- 2-wire 80 GHz *(W-band)* radar
- Measuring range up to 30 m for liquids
- Accuracy of ±2 mm
- Easy to install due to small antenna diameter
- Plug-in graphic display module
- Horn and plastic encapsulated antennas
- IP67 protection
- User-friendly threshold management
- Ex variant *(pending)*

APPLICATIONS

- For measuring the level of liquids, emulsions, and other media
- For large-particle bulk solids
- Storage tanks, chemical tanks, open pits, sumps, wells
- Measurement through a plastic tank roof
- For material prone to vapor formation
- For measuring liquids with a gas blanket
- It can also be used in a vacuum
- Open-channel flow measurement

AREAS OF APPLICATION

- Water and wastewater industry
- Energy industry / Plant utilities
- Food & Beverage
- Chemical & pharmaceutical industry
- Marine applications
- Agriculture
- Construction materials
- Heavy industry
- Packaging industry

COMING SOON

The new **PiloTREK W–200** non-contact radar level transmitters use the most advanced industrial measurement technology, the 80 GHz FMCW radar. The most fundamental advantage of 80 GHz radars compared to lower frequencies *(5…12 GHz and 25 GHz)* is the smaller antenna size, better focus and narrow beam angle.
It uses the latest technology for measuring in liquids, masses, mud, and other chemicals widely used in, for example, the water industry, food industry, energy industry, pharmaceutical industry, and chemical industry, which provides measurement results with millimeter accuracy.
It is also excellent for measuring substances prone to vapor formation and liquids with gas blanket. In addition to the level, volume, and weight measurement functions, this product family also inherits the open-channel flow measurement functions and the threshold functions to eliminate false and interfering echoes introduced in connection with ultrasonic devices. Since no medium is required for millimeter waves to propagate, it can also be used in a vacuum.
The device can also be operated with HART® compliant **NIVELCO EView2**, **MultiCONT** universal process controller, and PACT*ware* software.

OPERATING PRINCIPLE

The reflection of the millimeter-waves is highly dependent on the dielectric constant of the medium. Therefore, the measured medium's dielectric constant (ε_r) must be over 1.9 for millimeter-wave level measurement. The measurement principle of a level transmitter with a millimeter-waves signal is based on measuring the reflection's time of flight.
The speed of propagation of millimeter-waves signals in the air, gases, and vacuum is almost constant regardless of temperature and medium pressure, so the measured distance does not depend on the physical parameters of the intermediate medium.

The **PiloTREK W–200** level transmitter is a continuous-wave frequency modulated radar *(FMCW)* operating at 80 GHz *(W-band)*. The most obvious advantages of 80 GHz radars over lower frequency *(5…12 & 25 GHz)* radars are smaller antenna size, better focus, and smaller beam angle. A portion of the millimeter-wave continuous wave energy radiated by the level transmitter antenna is reflected from the measured surface, depending on the material to be measured. The distance of the reflecting surface is calculated with high accuracy by the electronics from the frequency shift of the reflected signal and converted into a distance, level, or volume signal by the electronics.

Informative Er values			
Butane	1.4	Grain	3…5
Cement	1.5…10	Cooking oil	3.9
LPG	1.6…1.9	Limestone	6.1…9.1
Kerosene	1.8…2.1	Acetone	21
Crude oil	2.1	Ethanol	24
Diesel	2.1	Methanol	33.1
Gasoline	2.3	Glycol	37
Asphalt	2.6	Nitrobenzene	40
Clinker	2.7	Water	80
Resin	2.4…3.6	Sulphuric acid (T = 20 °C)	84

TECHNICAL DATA

		WE□–2□□–□	
		Plastic housing	Metal housing
Measured values		Distance; calculated values: level, volume, mass, flow	
Signal frequency		77…81 GHz (W-band)	
Measuring range*		0…30 m	
Minimum beam angle*		7°	
Lowest ε_r of medium		1.9	
Resolution		1 mm	
Supply voltage		12…36 V DC	
Output	Analog	4…20 mA (3.9…20.5 mA); $R_{tmax} = (U_s - 12\ V) / 0.02\ A$	
	Digital	HART® interface, loop resistance ≥250 Ω	
	Relay *(optional)*	SPDT 30 V / 1 A DC; 48 V / 0,5 A AC	
	Service interface	SAT–506–0 compatible	
	Display	SAP–300 graphic display unit	
Measuring frequency		~1 s	
Antenna diameter*		1" (25.4 mm); 1½" (38.1 mm)	
Antenna material*		1.4571 stainless steel, or plastic antenna enclosure (PP / PVDF / PTFE)	
Process temperature		–40…+80 °C	
Ambient temperature			
Process pressure		PP, PVDF, PTFE antennas: –1…3 bar (–0.1…0.3 MPa); Stainless steel antennas: –1…40 bar (–0.1…4.0 MPa)	
Process connection		1", [illegible]	
Ingress protection		[illegible]	
Electrical connection		2× M20×1.5 plastic cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø7…13 mm, wire cross section: maximum 1.5 mm²	
Electrical protection		Overvoltage Class 1; (Class III [SELV])	
Housing material*		Plastic (PBT)	Painted aluminum or stainless steel
Weight		1…1.6 kg	Aluminum: 2…2.6 kg; stainless steel: 3.3…3.9 kg

*Depending on order code

TYPE-DEPENDENT DATA

	WE□–212–□ WE□–213–□	WE□–214–□ WE□–215–□	WE□–224–□ WE□–225–□
Dead zone[1]	0 m		
Maximum measuring range[2]	10 m		20 m
Accuracy[3]	±5 mm		±2 mm
Beam angle *(–3 dB)*	12°	7°	
Antenna insertion length[4]	80 mm	92 mm	
Process connection	1" BSP / NPT	1½" BSP / NPT	

[1] *Measured from the tip of the antenna.*
[2] May be limited in the case of low dielectric constant or non-perpendicular or non-planar media.
[3] *In the case of an ideal reflecting surface.*
[4] *Measured from the sealing plane of the process connection.*

PiloTREK WE-200 — 5 years

2-wire compact radar level transmitter with stainless steel horn antenna or plastic encapsulated antenna

Version

W ☐■ – 2 ■■ – ■

E	Transmitter
G	Transmitter with LCD display

Antenna / Housing

W ■☐ – 2 ■■ – ■

P	PP / Plastic, PBT, fiberglass-reinforced
M	1.4571 / Plastic, PBT, fiberglass-reinforced
S	1.4571 / Aluminum (powder-coated)
V	PVDF / Plastic, fiberglass reinforced
F	PTFE / Plastic, fiberglass reinforced (up to 20 m measuring range)

Antenna type

W ■■ – ☐■■ – ■

2	Horn

Measurement range

W ■■ – 2 ☐■ – ■

1	10 m
2	20 m
3	30 m

Process connection

W ■■ – 2 ■☐ – ■

2	1" BSP (only for 10 m measuring range)
3	1" NPT (only for 10 m measuring range)
4	1½" BSP (only for 10 m or 20 m measuring range)
5	1½" NPT (only for 10 m or 20 m measuring range)
8	Ø75 mm (3") prepared for flange (only 30 m and encapsulated types)

Output / Certificates

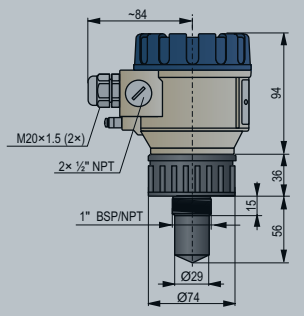
W ■■ – 2 ■■ – ☐

4	4...20 mA / HART®
5	4...20 mA + HART® / Ex ia D
8	4...20 mA + HART® / Ex ia
H	4...20 mA + HART® + relay
F	4...20 mA + HART® + relay / Ex ta D

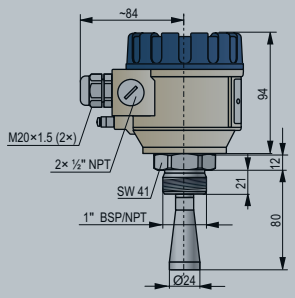
Need of IEC Ex is to be specified in the text part of the order

Accessories sold separately; see relevant page for details

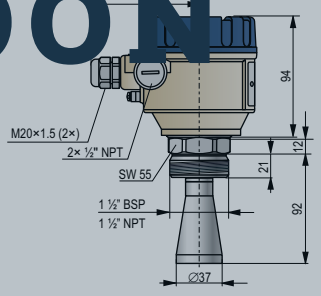
SAP–300–0	Graphic plug-in display module
SAT–304–0	HART®-USB modem
SAT–504–■	
SAK–305–2	HART®-USB/RS485 modem
SAK–305–6	HART®-USB/RS485 modem / Ex ia G



WEP–212–☐, WEP–213–☐



WEM–212–☐, WEM–213–☐



WES–214–☐, WES–215–☐

ADVANCED 80 GHz RADAR

LEVEL TRANSMITTERS

PiloTREK W-200 series

NIVELCO

TRANSCEND YOUR CHALLENGES

The 25 GHz *(K-band)* **PiloTREK W–100** Pulse Radar is regarded as one of the most progressive non-contact level transmitters in industrial process automation. It is superbly accurate, and its small antennas make installation simple and cost-effective. **NIVELCO**'s K-band radar features ±3 mm accuracy and short dead band; its versatile casing is available in plastic, aluminum, or stainless steel. The choice of antennas includes stainless steel parabolic and stainless steel horn with an optional plastic tube enclosure. Antennas can be replaced safely in the enclosure without removing the enclosure itself, thus preventing any leaks. A plug-in display module aids the local programming of PiloTREK. If on-site reading is not required, the unit may be ordered without a display module, further reducing the cost. The signal processing algorithm of PiloTREK is the product of **NIVELCO's** 40 years of experience in non-contact level measurement, making it an excellent choice for simple and complex applications.

FEATURES

- 2-wire K-band Pulse Burst Radar
- 25 GHz frequency
- Maximum 23 m measuring range for liquids and slurries
- ±3 mm accuracy
- Easy installation due to small antennas
- Parabolic, horn and enclosed antennas
- IP68 rated integrated variant
- Sanitary versions for strict hygiene requirements
- High-temperature version
- Plug-in graphic display module
- Explosion-proof version

WPP–110–4

WGS–150–C Ex

INDUSTRY SEGMENTS

- Water, wastewater
- Power generation
- Food and beverage
- Pharmaceuticals
- Chemicals

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d [ia] G)
- IEC Ex (Ex ia G)
- IEC Ex (Ex d [ia] G)
- INMETRO (Ex ia G)

APPLICATION

- Liquids and slurries in general

WGK–150

WGS–140

OPERATION

The operation of non-contact microwave level transmitters is based on measuring the travel time of electromagnetic waves. The speed of electromagnetic waves is practically unchanged within the applicable ranges of temperature and pressure; therefore, measurement data is also unaffected by these factors. Level transmitters emit microwave impulses for nanoseconds from the antenna, and the measured surface reflects part of the signal. Measuring the level of a specific medium depends on the reflected signal's strength, which depends heavily on the measured distance, the relative dielectric constant (ε_r) of the measured medium, and the waviness of its surface. The relative dielectric constant of mediums must exceed 1.4 when using units equipped with parabolic antennas, and 1.9 with horn antennas.

ANTENNAS

Antenna	Antenna diameter							
	DN40			DN50	DN80	DN150	48 mm	148 mm
	Process connection							
	1½" BSP / NPT	2" TriClamp	DN50 MILCH	2" BSP / NPT	DN80, DN150 flanges		2" BSP / NPT	1" BSP
Stainless steel (1.4571 / 316Ti) horn	■	–	–	■	■	–	–	–
Plastic (PP) enclosure	■	–	–	■	–	–	–	–
Plastic (PTFE) enclosure	■	■	■	■	–	–	–	–
Stainless steel (1.4571 / 316Ti) parabolic	–	–	–	–	–	■	–	–
Plastic (PP) enclosed parabolic	–	–	–	–	–	–	–	■

TECHNICAL DATA

		Integrated	Compact		
			Plastic housing	Metal housing	High-temperature version
Measured values / Calculated values		Level, Distance / Volume, Weight			
Signal frequency		~25 GHz (K-band)			
Measuring range		0.2…23 m (depending on antenna type – see Antenna Properties)			
Linearity error		< 0.5 m: ±25 mm; 0.5…1 m: ±15 mm; 1…1.5 m: ±10 mm; 1.5…8 m: ±3 mm; > 8 m: ±0.04% of the measured distance			
Minimum beam angle		6° (depending on antenna type)	6° (depending on antenna type; see Antenna Properties)		
Minimum ε_r of the medium		1.6 (depending on meas. range)	1.4…2 (depending on antenna type and meas. range; see Max. measuring range vs. ε_r diagram)		
Resolution		1 mm			
Temperature error (as per EN 61298-3)		0.05% FSK / 10 °C (–20…+60 °C)			
Supply voltage		20…36 V DC, Ex ia: 20…30 V DC, Ex d[ia]: 24…36 V DC			
Output	Communication	4…20 mA + HART®			
	Display	–	SAP–300 graphic display unit		
Measuring frequency		10…60 s, as per application settings			
Antenna diameter		38 mm (1½"), 48 mm (2"), 75 mm (3"), 148 mm (6")			
Antenna material		Horn: 1.4571 (316Ti) stainless steel; enclosure: PP, PTFE; encapsulated parabolic: PP	Horn, Parabolic: 1.4571 (316Ti) stainless steel; enclosure: PP, PTFE		Horn, Parabolic: 1.4571 (316Ti); enclosure: PTFE
Process temperature[2]		–30…+100 °C, (up to +120 °C for up to 2 minutes) with PP antenna enclosure: maximum +80 °C			–30…+180 °C
Highest process pressure		25 bar at 120 °C; with plastic antenna enclosure: 3 bar at +25 °C			
Ambient temperature		–20…+60 °C			
Process connection		Threaded, flanged or sanitary connections (as per order code)			
Ingress protection		IP68	IP67		
Electrical connection		LiYCY type. 2× 0.5 mm² shielded Ø6 mm cable; standard cable length: 5 m (available up to 30 m)	2× M20×1.5 cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø7…Ø13 mm, wire cross section: max. 1.5 mm²		
Electrical protection		Class III			
Housing material		Plastic (PP)	Plastic (PBT)	Painted aluminum or Stainless Steel	
Seal		Viton®, EPDM			
Communication certificates		R&TTE, FCC			
Weight		0.7…1.6 kg		Aluminum: 2…2.6 kg Stainless steel: 3.3…3.9 kg	Aluminum: 2.7…3.3 kg Stainless steel: 4…4.6 kg

[1] *Under reference reflection conditions and constant temperature.*
[2] *In the case of integrated transmitters, if the enclosure may come in direct contact with the measured medium, the medium's temperature may not exceed the ambient temperature.*

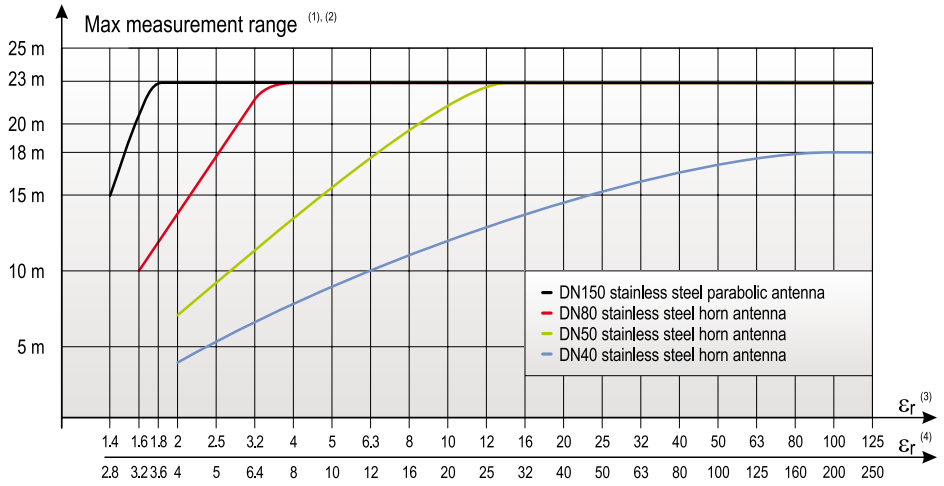
Ex INFORMATION

		Plastic housing		Metal housing	
		WPM–1□□–□ (integrated)	W□M–1□□–□ (compact)	W□S–, W□K–1□□–□	WH□–, WJ□–1□□–□ (high-temperature version)
Ex marking	IEC Ex	Ex ia IIB T6 … T5 Ga	Ex ia IIB T6 … T5 Ga/Gb	Ex ia IIB T6…T4 Ga	Ex ia IIB T6…T3 Ga
				Ex ia IIIC T85°C…T110°C Da/Db	Ex ia IIIC T85°C…T180°C Da/Db
				Ex ta/tb IIIC T85°C…T110°C Da/Db	Ex ta/tb IIIC T85°C…T180°C Da/Db
				Ex db [ia Ga] IIB T6…T4 Ga/Gb	Ex db [ia Ga] IIB T6…T3 Ga/Gb
	ATEX	⟨Ex⟩ II 1 G Ex ia IIB T6 … T5 Ga	⟨Ex⟩ II 1/2 G Ex ia IIB T6 … T5 Ga/Gb	⟨Ex⟩ II 1G Ex ia IIB T6…T4 Ga	⟨Ex⟩ II 1G Ex ia IIB T6…T3 Ga
				⟨Ex⟩ II 1/2 D Ex ia IIIC T85°C…T110°C Da/Db	⟨Ex⟩ II 1/2 D Ex ia IIIC T85°C…T180°C Da/Db
				⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C… T110°C Da/Db	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C…T180°C Da/Db
				⟨Ex⟩ II 1/2 G Ex db [ia Ga] IIB T6…T4 Ga/Gb	⟨Ex⟩ II 1/2 G Ex db [ia Ga] IIB T6…T3 Ga/Gb
Intrinsic safety data		U_i = 30 V, I_i = 140 mA, P_i = 1 W, C_i = 30 nF, L_i = 200 µH	U_i = 30 V, I_i = 140 mA, P_i = 1 W, C_i = 16 nF, L_i = 200 µH	U_i = 30 V, I_i = 140 mA, P_i = 1 W, C_i = 16 nF, L_i = 200 µH "Ex db [ia Ga]": U_t = 24…36 V DC, U_m = 250 V	

ANTENNA PROPERTIES

	W□M / W□S / W□K–14□	W□M / W□S / W□K–15□	W□M / W□S / W□K–18□	W□M / W□S / W□K–11□	WPP–110
Name	DN40 (1½") stainless steel horn antenna	DN50 (2") stainless steel horn antenna	DN80 (3") stainless steel horn antenna with flange	DN150 (6") stainless steel parabolic antenna	PP encapsulated DN150 (6") parabolic antenna
Process connection	1½" BSP / NPT	2" BSP / NPT	DN80…DN150 flanges	DN150 flange	1" BSP (upper)
Material of wetted parts	1.4571 (316Ti), PTFE; WPM: 1.4571 (316Ti), PTFE, PP			1.4571, PTFE	PP
Beam angle	19°	16°	11°	6°	
Closest measuring distance	0.2 m			0.3 m	0.4 m

	W□P–14□	W□P–15□	W□M–, W□S–, W□K–14□ + WAT–14T–0	W□M–, W□S–, W□K–14□ + WAT–14R–0
Name	DN40 (1½") PP or PTFE encapsulated antenna	DN50 (2") PP or PTFE encapsulated antenna	Sanitary variant DN40 (1½") horn antenna with PTFE antenna enclosure	
Housing	Plastic		Plastic / Painted aluminum / Stainless steel	
Process connection	1½" BSP / NPT	2" BSP / NPT	2" TriClamp	DN50 MILCH
Material of wetted parts	PP or PTFE		1.4571 (316Ti), PTFE	
Closest measuring distance	0.3 m			



(1) *Under reference reflection conditions (as per EN 61298-3, in an interference-free environment, from a minimum 10 m² target surface) and constant temperature. Plastic antenna enclosures decrease the maximal measuring range by 10% (PTFE) or 20% (PP).*

(2) *Certain factors (e. g. disturbing reflections, steam or gas condensation, EMC noises) might decrease the maximal measurement by 50%.*

(3) *Dielectric constant (εr) of liquids at rest.*

(4) *Dielectric constant (εr) of liquids used in process tanks or where the liquid's surface is not at rest.*

POLARIZATION

PiloTREK non-contact level transmitters emit linearly polarized microwave impulses. The polarization plane of the emitted impulses can be rotated fully in the case of W□S, W□M and the W□K types. Rotating the polarization plane can minimize false reflections from interfering objects or the tank wall. The orientation of the polarization plane coincides with the line drawn between the cable glands.

BACKGROUND MAPPING

Background mapping provides an excellent remedy for unwanted reflections from *(stationary)* interfering objects. The device takes a snapshot of the empty tank, and creates a reference image of its surface. This snapshot enables the measurement evaluation software of PiloTREK to recognize and ignore any false reflections automatically.

TEMPERATURE DATA FOR Ex CERTIFIED MODELS

Thermal properties	Hazardous gas atmospheres							Explosive dust atmospheres			
	Plastic housing		Metal housing								
	W□M–, W□P– –1□□–□		W□S–, W□K– –1□□–□			High-temperature [WH□–, WJ□– –1□□–□]		W□S–, W□K– –1□□–□			High-temperature [WH□–, WJ□– –1□□–□]
	Ex ia IIB		Ex ia IIB, Ex db [ia Ga] IIB					Ex ia IIIC, Ex ta/tb IIIC			
Highest process temperature	+80 °C	+95 °C	+80 °C	+95 °C	+100 °C	+130 °C	+180 °C	+80 °C	+95 °C	+100 °C	+180 °C
Highest ambient temperature	+60 °C										
Highest surface temperature	+80 °C	+95 °C	+80 °C	+95 °C	+100 °C	+130 °C	+133 °C	+80 °C	+95 °C	+100 °C	+133 °C
Temperature class	T6	T5	T6	T5	T4	T4	T3	T85°C	T100°C	T110°C	T180°C

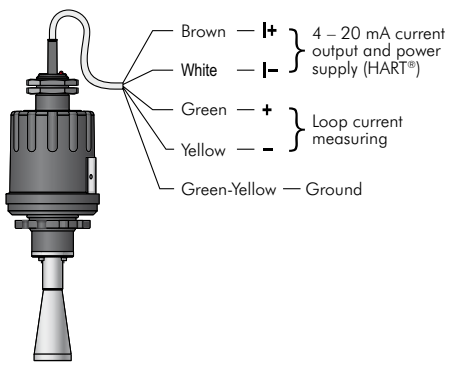
INMETRO CERTIFICATE NO.: DNV 15.0065 X/2

	Plastic housing	Metal housing	
	Compact version [W□M–1□□–□]	W□S–, W□K–1□□–□	High-temperature version [WH□–, WJ□–1□□–□]
Ex marking (INMETRO)	Ex ia IIB T6…T5 Ga/Gb	Ex ia IIB T6…T3 Ga	
		Ex ia IIIC T85°C…T110°C Da/Db	Ex ia IIIC T85°C…T180°C Da/Db
		Ex ta IIIC T85°C…T110°C Da/Db	Ex ta IIIC T85°C…T180°C Da/Db
Ex supply voltage and intrinsic safety data	L_i: 200 µH, C_i: 16 nF, U_i: 30 V, I_i: 140 mA, P_i: 1 W		

TEMPERATURE LIMIT DATA FOR INMETRO APPROVED MODELS

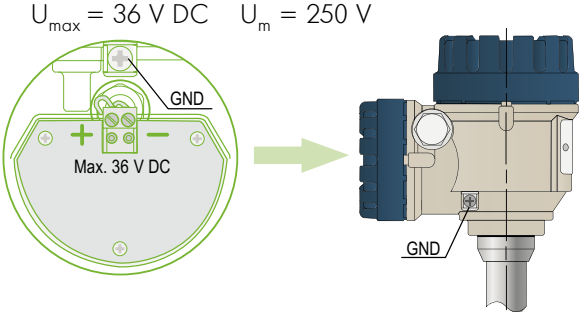
Temperature data	Hazardous gas atmospheres						Explosive dust atmospheres			
	Plastic housing		Metal housing							
	W□M–, W□P– –1□□–□		W□S–, W□K– –1□□–□			High-temperature [WH□–, WJ□– –1□□–□]	W□S–, W□K– –1□□–□			High-temperature [WH□–, WJ□– –1□□–□]
	Ex ia IIB						Ex ia IIIC, Ex ta IIIC			
Highest process temperature	+80 °C		+90 °C	+100 °C		+180 °C	+80 °C	+90 °C	+100 °C	+180 °C
Highest ambient temperature	+60 °C									
Highest surface temperature	+75 °C	+80 °C	+75 °C	+90 °C	+100 °C	+175 °C	+75 °C	+90 °C	+100 °C	+175 °C
Temperature class	T6	T5	T6	T5	T4	T3	T85°C	T100°C	T110°C	T180°C

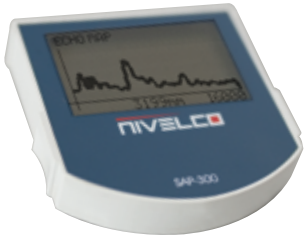
WIRING



WIRING FOR DUAL COMPARTMENT (Ex db [ia Ga] RATED DEVICES

Highest allowed input voltage:
U_{max} = 36 V DC U_m = 250 V





PROGRAMMING, ECHO MAP

All parameters can be programmed via the SAP–300 plug-in display; measurement and output parameters can be adjusted in a text-based menu system.

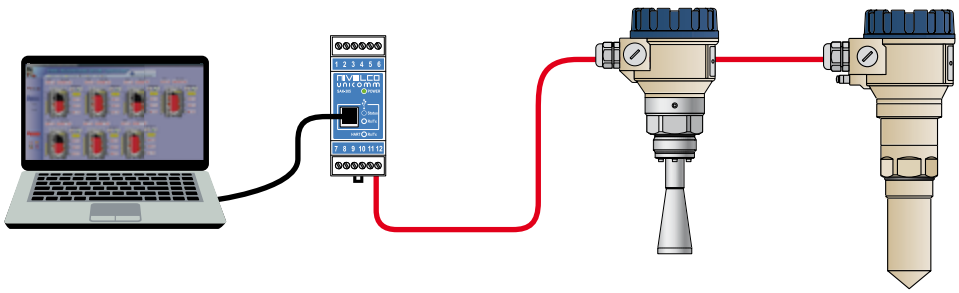
Measured values are displayed in numbers and bar-graphs on the dot-matrix screen. Echo Map helps to detect false reflections and optimizes measurement configuration.

MOUNTING

The device must not be mounted in the middle of the tank or the inlet's proximity or the tank's outlet to avoid unwanted multiple reflections. The ideal position for the **PiloTREK** is on the r = (0.3…0.5) R in a cylindrical tank. The distance between the sensor and the tank walls must be at least 200 mm. The device must be mounted far as possible from interfering objects inside the tank and sources of interference, such as waves, vortex or strong vibrations. The antenna cover must be parallel to the measured surface within ±2…3°. The instrument must be protected from direct sunlight to avoid overheating.

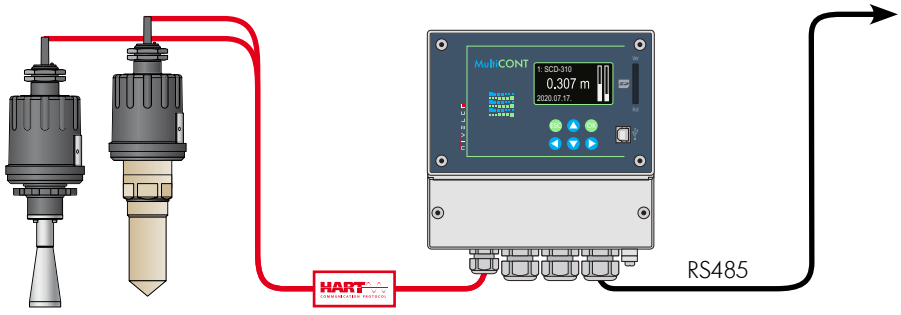
PC CONNECTION

HART® output devices and a **UNICOMM** SAK–305 HART®–USB modems can be connected to a PC via a wire, while using a **UNICOMM** SAT–504 HART®–USB/Bluetooth® modem, the transmitters can be connected via Bluetooth®. All measured values can be visualized on the PC screen and the instruments can be programmed remotely via HART® modem. Up to 15 *(non-Ex)* instruments can be connected to a single HART® loop. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.



PiloTREK TRANSMITTERS IN HART® MULTIDROP LOOP

The MultiCONT can handle digital data coming from HART® capable NIVELCO transmitters *(e.g. level, temperature, pressure, pH, dissolved oxygen, etc.)*. The digital *(HART®)* information is processed, displayed and transmitted via RS485 communication line to a PC when needed. Remote programming of the transmitters is also possible. Visualisation on PC can be accomplished with **NIVISION** process visualisation software.



PiloTREK WP-100 — 5 years

2-wire integrated pulse burst radar level transmitter for liquids
with DN40, DN50 stainless steel horn antenna or plastic encapsulated antenna

Version

W □■ – 1 ■■ – ■

P	Integrated transmitter

Antenna / Housing

W P □ – 1 ■■ – ■

P	PP / PP
M	1.4571 / PP

Antenna / Connection size

W P ■ – 1 □■ – ■

1	Parabola DN150 / 1" BSP
4	Horn DN40 / 1½" and 1" BSP
5	Horn DN50 / 2" and 1" BSP

Process connection

W P ■ – 1 ■□ – ■

0	BSP
N	NPT (cannot be combined with antenna enclosure)

Output / Certificates

W P ■ – 1 ■■ – □

4	4...20 mA + HART®
8	4...20 mA + HART® / Ex ia G

Cable

Maximum length 30 m; sold by the meter over the standard 5 m

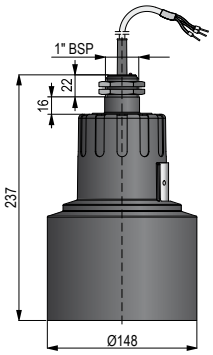
Accessories sold separately; see relevant page for details

S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

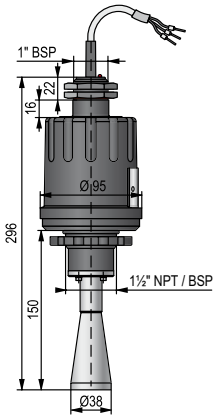
Antenna enclosures

W A P – 1 4 0 – 0	****	PP enclosure with 1½" BSP process connection for DN40 antenna
W A P – 1 4 N – 0	****	PP enclosure with 1½" NPT process connection for DN40 antenna
W A T – 1 4 0 – 0	****	PTFE enclosure with 1½" BSP process connection for DN40 antenna
W A T – 1 4 N – 0	****	PTFE enclosure with 1½" NPT process connection for DN40 antenna
W A P – 1 5 0 – 0	****	PP enclosure with 2" BSP process connection for DN50 antenna
W A P – 1 5 N – 0	****	PP enclosure with 2" NPT process connection for DN50 antenna
W A T – 1 5 0 – 0	****	PTFE enclosure with 2" BSP process connection for DN50 antenna
W A T – 1 5 N – 0	****	PTFE enclosure with 2" NPT process connection for DN50 antenna
W A T – 1 4 T – 0	****	PTFE enclosure with 2" TriClamp 1.4571 process connection for DN40 antenna
W A T – 1 4 R – 0	****	PTFE enclosure with DN50 Pipe coupling 1.4571 process connection for DN40 antenna
W A T – 1 5 S – 0	****	PTFE enclosure with 3" TriClamp 1.4571 process connection for DN50 antenna
W A P – 1 4 0 – 8	****	PP enclosure with 1½" BSP process connection for DN40 antenna / Ex ia G
W A P – 1 4 N – 8	****	PP enclosure with 1½" NPT process connection for DN40 antenna / Ex ia G
W A P – 1 5 0 – 8	****	PP enclosure with 2" BSP process connection for DN50 antenna / Ex ia G
W A P – 1 5 N – 8	****	PP enclosure with 2" NPT process connection for DN50 antenna / Ex ia G

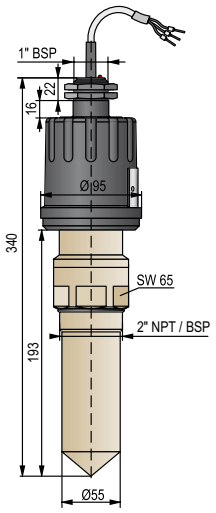
**** Suitable only for transmitters with BSP process connection; should be ordered together with the transmitter.



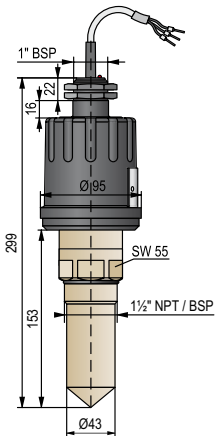
WPP–110



WPM–140 / 14N



WPP–150 / 15N



WPP–140 / 14N

PiloTREK WP-100 — 5 years

2-wire integrated pulse burst radar level transmitter for liquids
with DN80 stainless steel horn antenna

Version

W ☐ M – 1 8 ■ – ■

P	Integrated transmitter

Antenna / Housing

W P ☐ – 1 8 ■ – ■

M	1.4571 / PP

Antenna / Connection size

W P M – 1 ☐ ■ – ■

8	Horn DN80 / Flange

Process connection

W P M – 1 8 ☐ – ■

2	DN80 PN25 1.4571 flange
3	DN100 PN25 1.4571 flange
6	DN80 PP flange, PN25
7	DN100 PP flange, PN25
A	3" RF 150 psi 1.4571 flange
B	4" RF 150 psi 1.4571 flange
E	3" FF PP flange, 150 psi
F	4" FF PP flange, 150 psi
J	JIS 10K 80A 1.4571 flange
K	JIS 10K 100A 1.4571 flange
P	JIS 80A PP flange, 10K
R	JIS 100A PP flange, 10K

Output / Certificates

W P M – 1 8 ■ – ☐

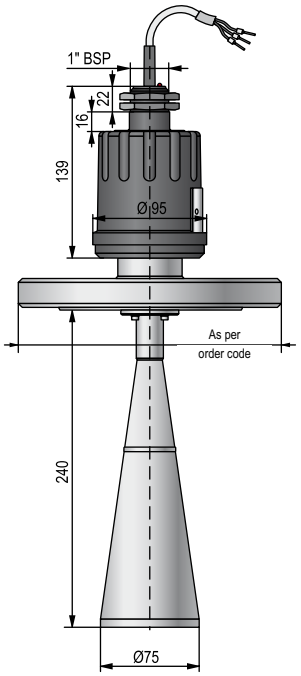
4	4…20 mA + HART®
8	4…20 mA + HART® / Ex ia G

Cable

Maximum length 30 m; sold by the meter over the standard 5 m

Accessories sold separately; see relevant page for details

S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



WPM-18☐

PiloTREK W-100 — 5 years

2-wire compact radar level transmitter for liquids
with DN40, DN50 stainless steel horn antenna or plastic encapsulated antenna

Version

W □■ – 1 ■■ – ■

E		Transmitter
G		Transmitter with LCD display
H	*	High-temperature transmitter (max. +180 °C)
J	*	High-temperature transmitter with LCD display (max. +180 °C)

* High temperature version can be ordered only with aluminum housing

Antenna / Housing

W ■□ – 1 ■■ – ■

P	PP / Plastic, PBT, fiberglass-reinforced
M	1.4571 / Plastic, PBT, fiberglass-reinforced
S	1.4571 / Painted aluminum
K	1.4571 / Stainless steel

Antenna / Connection size

W ■■ – 1 □■ – ■

4	Horn DN40 / 1½"
5	Horn DN50 / 2"

Process connection

W ■■ – 1 ■□ – ■

0	BSP
N	NPT (cannot be combined with antenna enclosure)

Output / Certificates / El. connection

W ■■ – 1 ■■ – □

4		4...20 mA + HART®
5	**	4...20 mA + HART® / Ex ia D
6	**	4...20 mA + HART® / Ex ta/tb D
8		4...20 mA + HART® / Ex ia G
C	***	4...20 mA + HART® / Ex db [ia] G / M20x1.5 (dual compartment)

** Only with metal housing
*** Only with aluminum housing

Need of IEC Ex is to be specified in the text part of the order

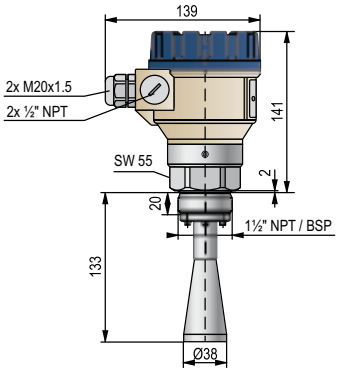
Accessories sold separately; see relevant page for details

SAP – 3 0 0 – 0	Graphic plug-in display module
SAT – 3 0 4 – 0	HART®-USB modem
SAT – 5 0 4 – ■	
SAK – 3 0 5 – 2	HART®-USB/RS485 modem
SAK – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

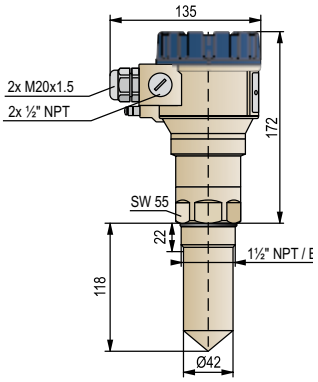
Antenna enclosures

WAP – 1 4 0 – 0	****	PP enclosure with 1½" BSP process connection for DN40 antenna
WAP – 1 4 N – 0	****	PP enclosure with 1½" NPT process connection for DN40 antenna
WAT – 1 4 0 – 0	****	PTFE enclosure with 1½" BSP process connection for DN40 antenna
WAT – 1 4 N – 0	****	PTFE enclosure with 1½" NPT process connection for DN40 antenna
WAP – 1 5 0 – 0	****	PP enclosure with 2" BSP process connection for DN50 antenna
WAP – 1 5 N – 0	****	PP enclosure with 2" NPT process connection for DN50 antenna
WAT – 1 5 0 – 0	****	PTFE enclosure with 2" BSP process connection for DN50 antenna
WAT – 1 5 N – 0	****	PTFE enclosure with 2" NPT process connection for DN50 antenna
WAT – 1 4 T – 0	****	PTFE enclosure with 2" TriClamp 1.4571 process connection for DN40 antenna
WAT – 1 4 R – 0	****	PTFE enclosure with DN50 Pipe coupling 1.4571 process connection for DN40 antenna
WAT – 1 5 S – 0	****	PTFE enclosure with 3" TriClamp 1.4571 process connection for DN50 antenna
WAP – 1 4 0 – 8	****	PP enclosure with 1½" BSP process connection for DN40 antenna / Ex ia G
WAP – 1 4 N – 8	****	PP enclosure with 1½" NPT process connection for DN40 antenna / Ex ia G
WAP – 1 5 0 – 8	****	PP enclosure with 2" BSP process connection for DN50 antenna / Ex ia G
WAP – 1 5 N – 8	****	PP enclosure with 2" NPT process connection for DN50 antenna / Ex ia G

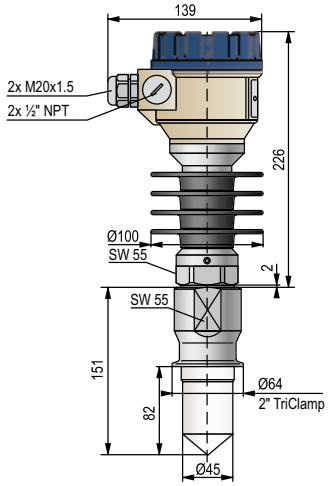
**** Suitable only for transmitters with BSP process connection; should be ordered together with the transmitter.



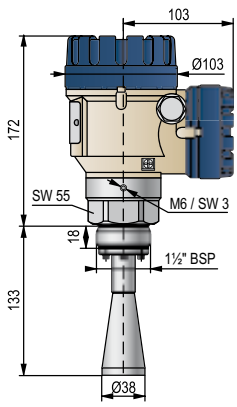
WES-140/14N



WEP-140/14N



WHS-140 + WAT-14T



WES-140-C, WGS-140-C
WES-14N-C, WGS-14N-C

PiloTREK W-100 — 5 years

2-wire compact radar level transmitter for liquids
with DN80 stainless steel horn antenna

Version

W ☐■ – 1 8 ■ – ■

E		Transmitter
G		Transmitter with LCD display
H	*	High-temperature transmitter (max. +180 °C)
J	*	High-temperature transmitter with LCD display (max. +180 °C)

* High-temperature version can be ordered only with aluminum housing

Antenna / Housing

W ■☐ – 1 8 ■ – ■

M	1.4571 / Plastic, PBT, fiberglass-reinforced
S	1.4571 / Painted aluminum
K	1.4571 / Stainless steel

Antenna / Connection size

W ■■ – 1 ☐■ – ■

8	Horn DN80 / Flange

Process connection

W ■■ – 1 8 ☐ – ■

2	DN80 PN25 1.4571 flange
3	DN100 PN25 1.4571 flange
5	DN150 PN25 1.4571 flange
6	DN80 PP flange, PN25
7	DN100 PP flange, PN25
A	3" RF 150 psi 1.4571 flange
B	4" RF 150 psi 1.4571 flange
E	3" FF PP flange, 150 psi
F	4" FF PP flange, 150 psi
J	JIS 10K 80A 1.4571 flange
K	JIS 10K 100A 1.4571 flange
P	JIS 80A PP flange, 10K
R	JIS 100A PP flange, 10K

Output / Certificates / El. connection

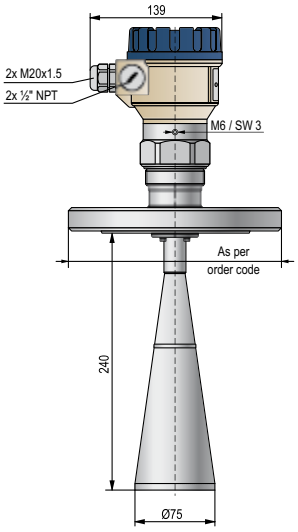
W ■■ – 1 8 ■ – ☐

4		4…20 mA + HART®
5	**	4…20 mA + HART® / Ex ia D
6	**	4…20 mA + HART® / Ex ta/tb D
8		4…20 mA + HART® / Ex ia G
C	***	4…20 mA + HART® / Ex db ia G / M20x1.5 (dual compartment)

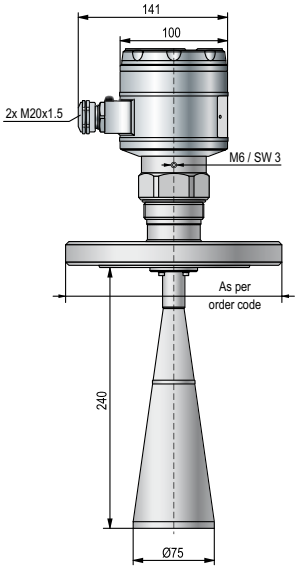
** Only with metal housing
*** Only with aluminum housing

Accessories sold separately; see relevant page for details)

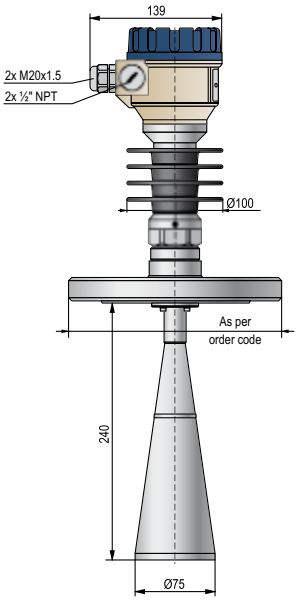
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



WES-18☐



WEK-18☐



WHS-18☐

PiloTREK W-100 with parabolic antenna — 5 years

2-wire compact radar level transmitter for liquids
with stainless steel parabolic antenna

Version

W ☐■ – 1 1 ■ – ■

E		Transmitter
G		Transmitter with LCD display
H	*	High-temperature transmitter (max. +180 °C)
J	*	High-temperature transmitter with LCD display (max. +180 °C)

* High-temperature version can be ordered with metal housing and metal flange only

Antenna / Housing

W ■☐ – 1 1 ■ – ■

M	1.4571 / Plastic, PBT, fiberglass-reinforced
S	1.4571 / Painted aluminum
K	1.4571 / Stainless steel

Antenna / Connection size

W ■■ – 1 ☐■ – ■

1	Parabolic DN150 / with flange

Process connection

W ■■ – 1 1 ☐ – ■

5	DN150 PN25 1.4571 flange
9	DN150 PP flange, PN25
D	6" RF 150 psi 1.4571 flange
H	6" FF PP flange, 150 psi
M	JIS 10K 150A 1.4571 flange
T	JIS 150A PP flange, 10K

Output / Certificates / El. connection

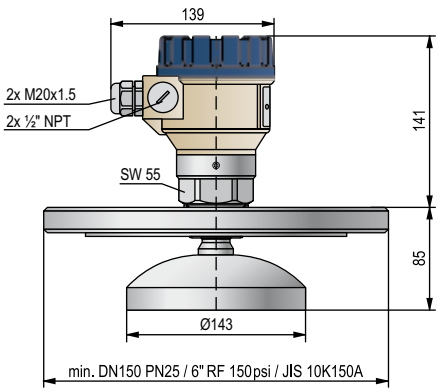
W ■■ – 1 1 ■ – ☐

4		4...20 mA + HART®
5	**	4...20 mA + HART® / Ex ia D
6	**	4...20 mA + HART® / Ex ta/tb D
8		4...20 mA + HART® / Ex ia G
C	***	4...20 mA + HART® / Ex db [ia] G / M20x1.5 (dual compartment)

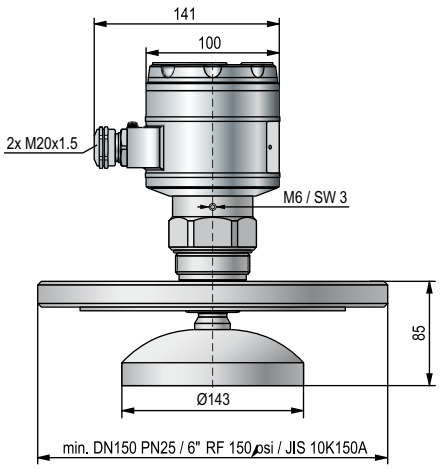
** Only with metal housing
*** Only with aluminum housing

Accessories sold separately; see relevant page for details)

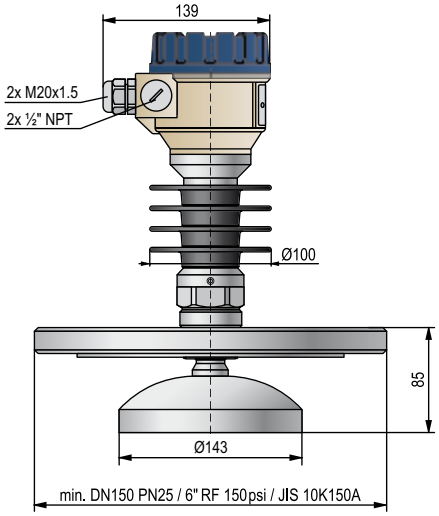
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



WES-115



WEK-115



WHS-115

NEW

Guided Microwave Level Transmitters

Our newly developed **MicroTREK HT–700** guided microwave level transmitter is designed for the continuous level measurement of conductive and non-conductive liquids, pulps, and solids. The measuring speed of the new **MicroTREK HT–700** is almost ten times that of its predecessor, the HT–700's measuring dead zone is significantly smaller, and its maximum measuring distance is longer! Furthermore, the supply voltage range of the device has been expanded. Its level gauge operates based on measuring the travel time of impulse reflections *(TDR – Time Domain Reflectometry)*. The electronic module generates microwave impulses in the sensor, which travel at the speed of light.
Part of the impulse energy is reflected from the surface depending on the material. The reflected signal's travel time is measured and processed by the module's electronics, and then it is converted to a volume- and level-proportional signal. Reflections depend heavily on the medium's dielectric constant (ε_r), which must be at least 1.4 for successful measurement. The propagation speed of microwave impulses in a vacuum, air, and other gases is virtually the same; distance measurement is therefore independent of the medium within the given limits.

FEATURES

- Measuring range up to 30 m
- Tracking speed: 900 m/h *(= 25 cm/s)*
- Accuracy: ±5 mm
- Measurement is independent of medium's dielectric constant, temperature, pressure and density
- Rod, cable, or coaxial probe
- Segmented rod probe version
- Lowest $\varepsilon_r \geq 1.4$
- Interface measurement *(coming soon)*
- Graphic display
- Advanced threshold management
- False echo suppression
- Probe Correction Table *(SCT)*
- 4…20 mA + HART® output + relay *(optional)*
- Process temperature range: –30… +200 °C
- Highest process pressure: 40 bar
- IP67
- 5 years warranty

SAP–300 display

HTD–730

HPK–707

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex ia D)
- ATEX (Ex ta/tb D)
- IEC Ex (Ex ia G)
- IEC Ex (Ex ia D)
- INMETRO (Ex ia G)
- INMETRO (Ex ia D)
- UKCA Ex (Ex ia G)
- UKCA Ex (Ex ia D)
- UKCA Ex (Ex ta/tb D)

APPLICATIONS

Mono cable / Mono rod Mono segmented rod	Twin cable	Twin rod	Coaxial pipe
▪ Cement, limestone, fly ash, alumina, soot ▪ All high-viscosity liquids ▪ Mineral powders ▪ Clean and contaminated liquids ▪ For stilling wells (calibration required) ▪ With plastic-coated probe for aggressive substances ▪ Slightly conductive foams ▪ High-temperature applications ▪ Bypass applications	▪ Tank parks with solvents, oil and fuels ▪ Water storage tanks ▪ Plastic granules ▪ For products with low dielectric constant (ε_r > 1.8) ▪ For any liquids, light granules ▪ For narrow tanks ▪ Where minimum dead zone is needed ▪ Mounting close to tank wall is possible	▪ Plastic granules ▪ Coated tanks ▪ Clean and contaminated liquids ▪ Fine powders ▪ Where minimum dead zone is needed ▪ For narrow tanks ▪ For mediums with low dielectric constant and slightly moving products	▪ Small vessels and tanks up to 6 m tall ▪ Solvents, liquefied gases ▪ LPG, LNG ▪ For clean liquids with low dielectric constant ▪ Agitated or flowing liquids – the probe acts as a stilling well ▪ Liquid or vapor spray near the probe ▪ Can be heated ▪ Contact possible with metallic object or tank wall ▪ Where no dead zone allowed

TECHNICAL DATA

Version		Plastic housing	Aluminum housing	Stainless steel housing
Measured values / calculated values		Distance, level; / Volume, Weight		
Measuring range		Depending on probe version and dielectric constant (Ɛr) of the medium		
Probe versions		Mono cable, twin cable, mono rod, twin rod, coaxial pipe, segmented coaxial pipe and segmented rod		
Accuracy	Linearity error[1]	For liquids: ±5 mm, if probe length ≥ 10 m: ±0.05% of the probe length. For solids: ±20 mm, if probe length ≥ 10 m: ±0.2% of the probe length		
	Resolution	1 mm		
Lowest ε_r of medium		1.4 (depending on probe version)		
Supply voltage		12[3]…36 V DC, nominal 24 V DC, Ex version: 12[3]…30 V DC, transient overvoltage protection		
Output	Communication	4…20 mA + HART®		
	Display (optional)	SAP–300 graphic display unit		
	Relay (optional)	SPDT 30 V / 1 A DC; 48 V / 0.5 A AC		
Process temperature		–30…+90 °C; high-temperature version: –30…+200 °C		
		For plastic-coated probes, coated: see "Probe Properties"		
Highest process pressure		40 bar (4 MPa); with plastic lined flange: maximum 25 bar (2.5 MPa); with coaxial pipe probe: maximum 16 bar (1.6 MPa)		
Ambient temperature		–30…+65 °C, with display: –20…+65 °C		
Process connection		Threaded, flanged or sanitary connections (as per order code)		
Ingress protection		IP67		
Electrical connection		2× M20×1.5 cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø6…Ø12 mm, wire cross section: maximum 1.5 mm²		
Electrical protection		Class III		
Housing material		Plastic (PBT)	Painted aluminum	Stainless steel (KO35)
Seal		FPM (Viton®), optional: FFKM (Kalrez®), EPDM		
Explosion protection		–	See "Ex Information"	
Weight (head unit)		1.3 kg	2.2 kg	3.9 kg

[1] Under reference conditions and constant temperature. *[2] The use of SAP–300 graphic displays is limited in hazardous environment. For further information, see "Ex Information".*
[3] In an industrial environment, reliable operation can be guaranteed with a terminal voltage >13 V.

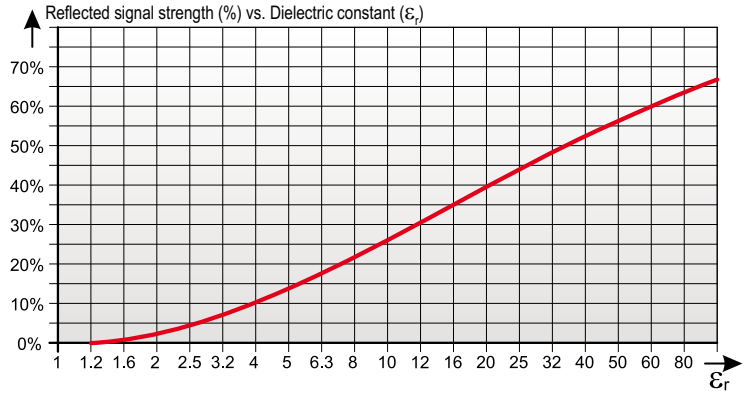
Ex INFORMATION

		H□□–7□□–8 Ex / H□□–9□□–8 Ex		H□□–7□□–6 Ex H□□–9□□–6 Ex	H□□–7□□–5 Ex H□□–9□□–5 Ex	H□□–7□□–9 Ex H□□–9□□–9 Ex
		Probe without coating	Coated probe			
Protection		Ex ia G		Ex ia D	Ex ta/tb D	Ex ta D
Ex marking [4]	ATEX	⟨Ex⟩ II 1 G Ex ia IIC T6…T3 Ga	⟨Ex⟩ II 1 G Ex ia IIB T6…T3 Ga	⟨Ex⟩ II 1 D Ex ia IIIC T85°C…T180°C Da	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C… T180°C Da/Db	⟨Ex⟩ II 1D Ex ta IIIC T105°C Da
	IEC Ex[5]	Ex ia IIC T6…T3 Ga	Ex ia IIB T6…T3 Ga	Ex ia IIIC T85°C…T180°C Da	Ex ta/tb IIIC T85°C…T180°C Da/Db	Ex ta IIIC T105°C Da
Ex supply voltage and intrinsic safety data		C_i ≤ 10 nF, L_i ≤ 10 µH, U_i ≤ 30 V, I_i ≤ 100 mA, P_i ≤ 0.75 W	C_i ≤ 10 nF, L_i ≤ 10 µH, U_i ≤ 30 V, I_i ≤ 140 mA, P_i ≤ 1 W		U_i = 30 V DC, I_i = 1 A	
Supply voltage		12[6]…30 V DC				
Electrical connection		2× M20×1.5 metal cable glands, cable outer diameter: Ø6…Ø12 mm, wire cross section: maximum 1.5 mm²				
Ambient temperature		–30…+65 °C, with display: –20…+65 °C				

[4] In IIC environment SAP–300 graphic display must not be used!
[5] IEC Ex compliance is optional; must be requested in the order.
[6] In an industrial environment, reliable operation can be guaranteed with a terminal voltage >13 V.

MEASURABILITY OF THE MEDIUM

The measurability of the medium and the reflected signal strength depends on the relative dielectric constant of the medium.



Informative ε_r values			
Butane	1.4	Grain	3…5
Cement	1.5…10	Cooking oil	3.9
LPG	1.6…1.9	Limestone	6.1…9.1
Kerosene	1.8…2.1	Acetone	21
Crude oil	2.1	Ethanol	24
Diesel oil	2.1	Methanol	33.1
Gasoline	2.3	Glycol	37
Asphalt	2.6	Nitrobenzene	40
Clinker	2.7	Water	80
Resin	2.4…3.6	Sulphuric acid (T = 20 °C)	84

PROBES

Reliable measurement with microwaves depends on selecting the appropriate probes and taking the medium's properties and other vessel conditions into consideration.

Probe	Max. measuring range	Dead zone[1]		Process connection	ε_r min.
		Upper (t) / lower (b) ε_r = 80	Upper (t) / lower (b) ε_r = 2.4		
Mono cable Ø4 mm	30 m	250 mm / 20 mm	350 mm / 100 mm	1"; 1½"	2.1
Mono cable Ø8 mm				1½"	
Mono rod Ø8 mm	3 m			1"	
Mono / segmented rod Ø14 mm	6 m			1½"	
Twin cable Ø4 mm	30 m	150 mm / 20 mm	300 mm / 100 mm		1.8
Twin rod Ø8 mm	3 m				
Coaxial pipe Ø28 mm	6 m	0 / 10 mm	0 / 100 mm	1"; 1½"	1.4
Segmented coaxial pipe Ø14 mm				1½"	1.6
Coated cable Ø6 mm	30 m	250 mm / 20 mm	350 mm / 100 mm	1"; 1½" TriClamp; DN40 MILCH, DN50	2.4
Coated rod Ø12 / Ø16 mm	3 m			DN50	

[1] The unmeasurable upper and lower part of the tank, the lower dead zone is extended with the length of the counterweight (cable versions only)

PROBE PROPERTIES

Type	H□K, H□L H□V, H□W	H□R, H□P	H□S, H□Z	H□N, H□J	H□T, H□U	H□D, H□E	H□A, H□B H□C, H□H
Probe	Ø4 mm cable	Rod	Rod / segmented rod	Ø8 mm cable	Ø4 mm twin cable	Twin rod	Coaxial
Maximum measuring distance	30 m	3 m	6 m	30 m		3 m	6 m
Min. meas. dist. (ε_r = 80 / ε_r = 2.4)	250 mm / 350 mm				150 mm / 300 mm		0 m
Lowest ε_r of medium	2.1				1.8		1.4
Sensing space around the probe	Ø600 mm				Ø200 mm		0 mm
Process connection	1" BSP / NPT	1" BSP	1½" BSP				1" BSP / NPT
	1½" BSP / NPT	1" NPT	1½" NPT				1½" BSP / NPT
Probe material	1.4401	1.4571		1.4401		1.4571	
Probe nominal Ø	4 mm	8 mm	14 mm	8 mm	4 mm	8 mm	28 mm
Weight	0.12 kg/m	0.4 kg/m	1.2 kg/m	0.4 kg/m	0.24 kg/m	0.8 kg/m	1.3 kg/m
Separator material[2]	–				PFA, welded onto the cable	PTFE-GF25	PTFE
Weight dimensions	Ø25 × 100 mm	–		Ø40 × 260 mm	Ø40 × 80 mm	–	
Weight material	1.4571	–		1.4571		–	

[2] *There is no separator below 1.5 m length*

COATED PROBE PROPERTIES

Type	H□F, H□G	H□X	H□Y	H□M	H□Q	H□O	H□I
Probe	Ø4 mm FEP-coated cable			Ø4 mm fully FEP/PFA-coated cable	Fully PFA-coated rod		Fully PP-coated rod
Maximum measuring distance	30 m				3 m		
Min. meas. dist. (ε_r = 80 / ε_r = 2.4)	250 mm / 350 mm						
Lowest ε_r of medium	2.1						
Minimal sensory distance from sensor	Ø600 mm						
Process connection	1" BSP / NPT	1½" TriClamp	DN40 MILCH	DN50 PN25 flange		1½" TriClamp	DN50 PN25
Highest process temperature	+200 °C			+150 °C			+60 °C
Probe material	1.4401				1.4571		
Probe coating	FEP				PFA		PP
Probe nominal Ø	6 mm				12 mm		16 mm
Fillet coating	–			FEP / PFA	PFA		PP
Weight material	1.4571			1.4571 + PFA-coating	–		
Weight dimensions	Ø25 × 100 mm				–		
Weight	0.16 kg/m				0.5 kg/m		0.6 kg/m

MicroTREK H-700/H-800/H-900 with cable probe — 5 years

2-wire compact TDR level transmitter for liquids and free-flowing solids
with stainless steel mono or twin cable probe with or without plastic coating

Version / Temperature

H □■ – ■■■ – ■

T	Transmitter / Flange temperature max. +90 °C
H	High-temperature transmitter / Flange temp. max. +200 °C (M type only up to +150 °C)
B	Transmitter with local LCD display / Flange temperature max. +90 °C
P	High-temperature transmitter with local LCD display / Flange temp. max. +200 °C (M type only up to +150 °C)

Probe / Process connection

H ■□ – ■■■ – ■

K		Mono cable, Ø4 mm, 1.4401 / 1" BSP / max. 30 m
L		Mono cable, Ø4 mm, 1.4401 / 1" NPT / max. 30 m
V		Mono cable, Ø4 mm, 1.4401 / 1½" BSP / max. 30 m
W		Mono cable, Ø4 mm, 1.4401 / 1½" NPT / max. 30 m
1		Mono cable, Ø4 mm, 1.4401 / 1½" TriClamp / max. 30 m
2		Mono cable, Ø4 mm, 1.4401 / 2" TriClamp / max. 30 m
N		Mono cable, Ø8 mm, 1.4401 / 1½" BSP / max. 30 m
J		Mono cable, Ø8 mm, 1.4401 / 1½" NPT / max. 30 m
T		Twin cable, 2x Ø4 mm, 1.4401 / 1½" BSP / max. 30 m
U		Twin cable, 2x Ø4 mm, 1.4401 / 1½" NPT / max. 30 m
F	*	Mono cable, Ø4 mm, + FEP-coated / 1" BSP / max. 30 m
G	*	Mono cable, Ø4 mm, + FEP-coated / 1" NPT / max. 30 m
X	*	Mono cable, Ø4 mm, + FEP-coated / TriClamp 1½" / max. 30 m
Y	*	Mono cable, Ø4 mm, + FEP-coated / Sanitary DN40 / max. 30 m
M		Mono cable, Ø4 mm, + PFA/FEP fully coated / DN50, PN25, 1.4571 + PFA/FEP lining

* Only the cable probe is coated

Housing

H ■■ – □■■ – ■

7	Painted aluminum
8	Plastic, PBT, fiberglass-reinforced (Ex version not available)
9	Stainless steel

Probe length / Material

H ■■ – ■□□ – ■

n n	1.0…30.0 m (sold by the meter), for mono cable, Ø4 mm / 1.4401
n n	1.0…30.0 m (sold by the meter), for mono cable, Ø8 mm / 1.4401
n n	1.0…30.0 m (sold by the meter), for twin cable / 1.4401
n n	1.0…30.0 m (sold by the meter), for mono cable, Ø4 mm / 1.4401 + FEP

nn = 01…30 : 1.0…30.0 m

Output / Certificates

H ■■ – ■■■ – □

4	4…20 mA + HART®
5	4…20 mA + HART® / Ex ta/tb D (only for uncoated probe versions)
6	4…20 mA + HART® / Ex ia D (only for uncoated probe versions)
8	4…20 mA + HART® / Ex ia G (plastic-coated probes Ex ia IIB only)
9	4…20 mA + HART® / Ex ta D (only for uncoated probe versions)
H	4…20 mA + HART® + Relay

Need of IEC Ex is to be specified in the text part of the order

Available on request (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

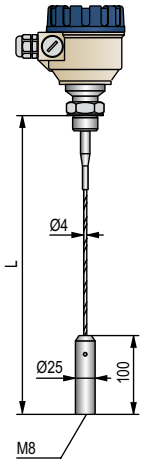
Process connections (price information on request)

- DIN and ANSI flanges
- DN40 Pipe coupling (DIN 11851)

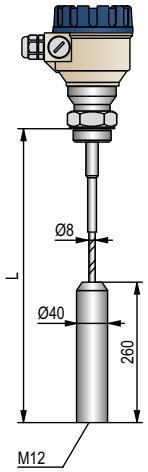
Special seals

- EPDM
- FFKM

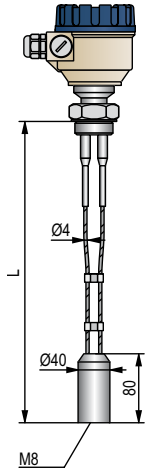
The above process connections and special seals are ordered separately and must be specified in the text part of the order



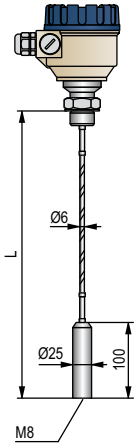
H□K / H□L / H□V / H□W–700 / 800



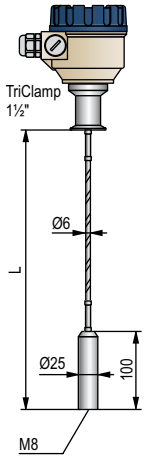
H□N / H□J–700 / 800



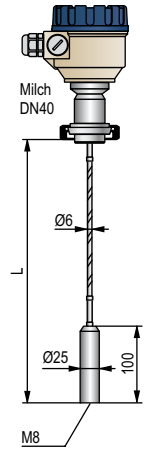
H□T / H□U–700 / 800



H□F / H□G–700 / 800



H□X–700 / 800



H□Y–700 / 800

MicroTREK H-700/H-800/H-900 with rod probe — 5 years

2-wire compact TDR level transmitter for liquids and free-flowing solids
with stainless steel mono or twin rod probe with or without plastic coating

Version / Temperature

H □■ – ■■■ – ■

T	Transmitter / Flange temperature max. +90 °C
H	High-temperature transmitter / Flange temp. max. +200 °C (up to +150°C with plastic-coated probes)
B	Transmitter with local LCD display / Flange temperature max. +90 °C
P	High-temperature transmitter with local LCD display / Flange temp. max. +200 °C (up to +150°C with plastic-coated probes)

Probe / Process connection

H ■□ – ■■■ – ■

R	Mono rod, Ø8 mm, 1.4571 / 1" BSP / max. 3 m
P	Mono rod, Ø8 mm, 1.4571 / 1" NPT / max. 3 m
3	Mono rod, Ø8 mm, 1.4571 / 1½" TriClamp / max. 3 m
D	Twin rod, 1.4571 / 1½" BSP / max. 3 m
E	Twin rod, 1.4571 / 1½" NPT / max. 3 m
Q	Mono rod + PFA-coated / DN50, PN25, 1.4571 + PFA lining
I	Mono rod + PP-coated / DN50, PN25, 1.4571 + PP lining (up to a maximum flange temperature of +60 °C)
O	Mono rod + PFA-coated / 1½" TriClamp PFA-coated
7	Mono rod + PFA-coated / 2" TriClamp PFA-coated

Housing

H ■■ – □■■■ – ■

7	Painted aluminum
8	Plastic, PBT, fiberglass-reinforced (Ex version not available)
9	Stainless steel

Probe length / Material

H ■■ – ■□□ – ■

n n	1.0…3.0 m (each 0.1 m), for mono rod / 1.4571
n n	1.0…3.0 m (each 0.1 m), for mono rod / 1.4571, PP-coated
n n	1.0…3.0 m (each 0.1 m), for mono rod / 1.4571, PFA-coated
n n	1.0…3.0 m (each 0.1 m), for twin rod / 1.4571

nn = 10…30 : 1.0…3.0 m

Output / Certificates

H ■■ – ■■■ – □

4	4…20 mA + HART®
5	4…20 mA + HART® / Ex ta/tb D (only for uncoated probe versions)
6	4…20 mA + HART® / Ex ia D (only for uncoated probe versions)
8	4…20 mA + HART® / Ex ia G (in the case of plastic-coated probes, only Ex ia IIB)
9	4…20 mA + HART® / Ex ta D (only for uncoated probe versions)
H	4…20 mA + HART® + Relay

Need of IEC Ex is to be specified in the text part of the order

Available on request (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

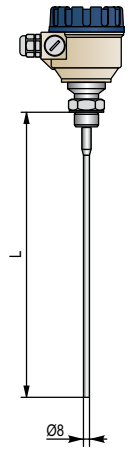
Process connections (price information on request)

- DIN and ANSI flanges
- DN40 Pipe coupling (DIN 11851)

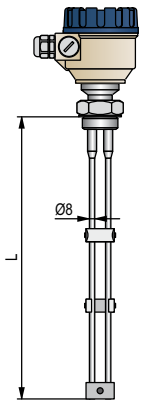
Special seals

- EPDM
- FFKM

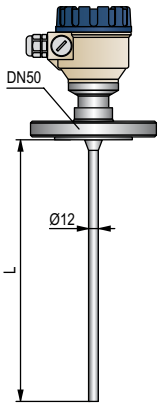
The above process connections and seals are ordered separately and must be specified in the text of the order.



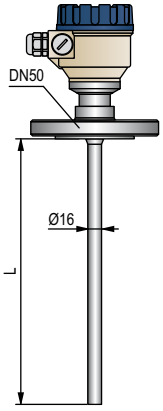
H□R / H□P–
700 / 800



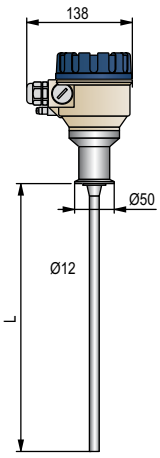
H□D / H□E–
700 / 800



H□Q–700 / 800



H□I–700 / 800



H□O–700 / 800

MicroTREK H-700/H-800/H-900 with rod or coaxial probe — 5 years

2-wire compact TDR level transmitter for liquids and free-flowing solids
with stainless steel Ø14 mm rod or coaxial probe

Version / Temperature

H □■ – ■■■ – ■

T	Transmitter / Flange temperature max. +90 °C
H	High-temperature transmitter / Flange temp. max. +200 °C
B	Transmitter with local LCD display / Flange temperature max. +90 °C
P	High-temperature transmitter with local LCD display / Flange temp. max. +200 °C

Probe / Process connection

H ■□ – ■■■ – ■

S	*	Mono rod, Ø14 mm, 1.4571 / 1½" BSP / max. 6 m
Z	*	Mono rod, Ø14 mm, 1.4571 / 1½" NPT / max. 6 m
4		Mono rod, Ø14 mm, 1.4571 / 2" TriClamp / max. 6 m
A		Coaxial, 1.4571 / 1" BSP / max. 6 m
B		Coaxial, 1.4571 / 1" NPT / max. 6 m
C	*	Coaxial, 1.4571 / 1½" BSP / max. 6 m
H	*	Coaxial, 1.4571 / 1½" NPT / max. 6 m
5		Coaxial, 1.4571 / 1½" TriClamp / max. 6 m
6		Coaxial, 1.4571 / 2" TriClamp / max. 6 m

* Can be ordered with segmented probe which must be specified in the text of the order. The lenght of a probe section is 1 m.

Housing

H ■■ – □■■ – ■

7	Painted aluminum
8	Plastic, PBT, fiberglass-reinforced (Ex version not available)
9	Stainless steel

Probe length / Material

H ■■ – ■□□ – ■

n n	1.0…6.0 m (each 0.1 m), for mono rod / 1.4571
n n	1.0…6.0 m (each 0.1 m), for coaxial / 1.4571
n n	1.0…6.0 m (each 0.1 m), for segmented mono rod / 1.4571
n n	1.0…6.0 m (each 0.1 m), for segmented coaxial / 1.4571

nn = 10…60 : 1.0…6.0 m

Output / Certificates

H ■■ – ■■■ – □

4	4…20 mA + HART®
5	4…20 mA + HART® / Ex ta/tb D
6	4…20 mA + HART® / Ex ia D
8	4…20 mA + HART® / Ex ia G
9	4…20 mA + HART® / Ex ta D
H	4…20 mA + HART® + Relay

Need of IEC Ex is to be specified in the text part of the order

Available on request (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

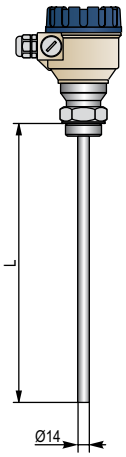
Process connections (price information on request)

- DIN and ANSI flanges
- DN40 Pipe coupling (DIN 11851)

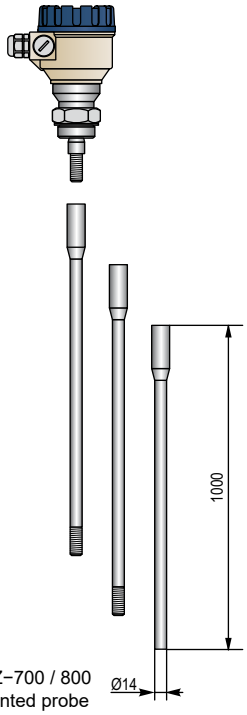
Special seals

- EPDM
- FFKM

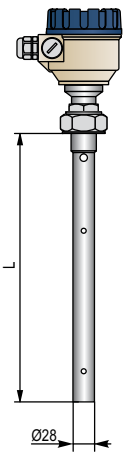
The above process connections and seals are ordered separately and must be specified in the text part of the order.



H□S / H□Z–700 / 800



H□S / H□Z–700 / 800
with segmented probe

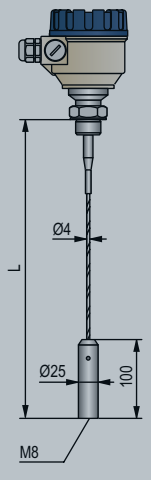


H□A / H□B / H□C / H□H–
700 / 800

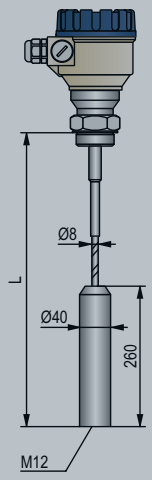
Defy *the* WAVES *with* MicroTREK

» Advanced threshold management
» False echo exclusion
» Probe Correction Table (SCT)
» High temperature range
» Rod, cable, or coaxial probe versions
» Extremely small deadband
» Plastic, aluminum or stainless steel housing
» Rod, cable, or coaxial probe versions
» Plug-in graphic display module
» Interface measurement *(coming soon)*
» Explosion-proof variants
» 5 years warranty

Level transmitter for liquids & solids.

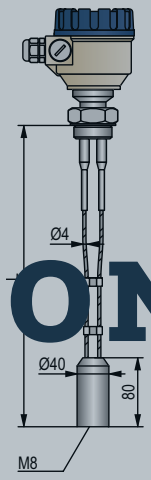


H□K / H□L / H□V / H□W–700 / 800

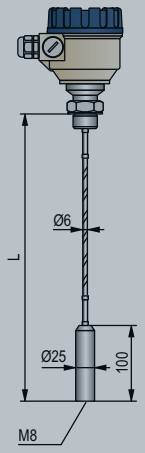


H□N / H□J–700 / 800

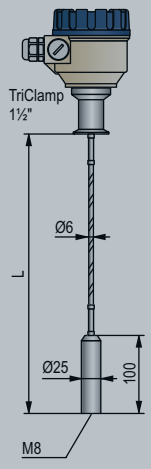
COMING SOON



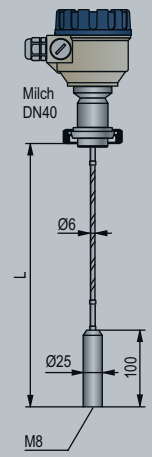
H□T / H□U–700 / 800



H□F / H□G–700 / 800

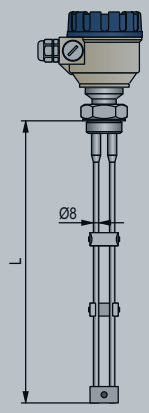


H□X–700 / 800



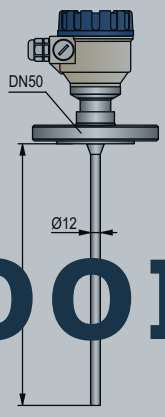
H□Y–700 / 800

H□R / H□P–
700 / 800

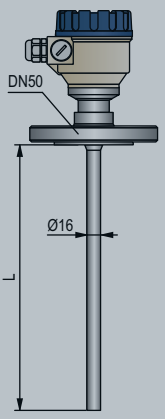


H□D / H□E–
700 / 800

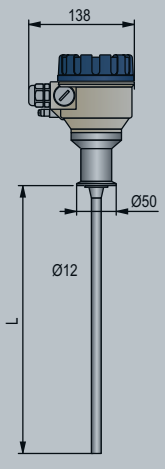
COMING SOON



H□Q–700 / 800



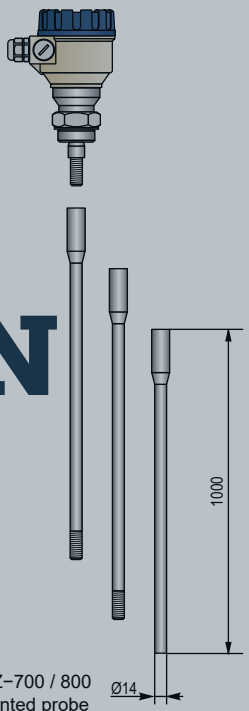
H□I–700 / 800



H□O–700 / 800

H□S / H□Z-700 / 800

COMING SOON



H□S / H□Z-700 / 800
with segmented probe

H□A / H□B / H□C / H□H-
700 / 800

Capacitive Level Transmitters

NIVOCAP

NIVOCAP 2-wire capacitive level transmitters are an ideal solution for level measurement of conductive and non-conductive liquids. The instrument's probe and the reference probe *(which can be either the metal wall of the tank or a separate probe)* operate as opposing plates of a capacitor. Between the plates of this capacitor, the air is replaced by a medium with a higher dielectric constant, changing the capacitance proportionally to the material's level. The incorporated electronic circuitry measures the capacitance difference and converts it to an output signal.

FEATURES

- Maximum 20 m measuring range
- Vertical mounting
- Rod or cable probe versions
- −30…+200 °C process temperature
- Up to 40 bar process pressure
- 32-point linearization table
- Indirect assignment of 0% and 100%
- 4…20 mA + HART® output
- Ex version
- IP67

APPLICATIONS

- Level and volume measurement
- Level measurement of conductive and non-conductive materials
- Level measurement of liquids
- For high pressures and high-temperature mediums

CERTIFICATES

- ATEX (Ex ia G)

SAP–202
(display)

CHR–200

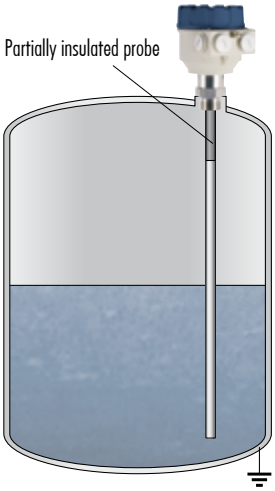
CAF–110

CFR–100

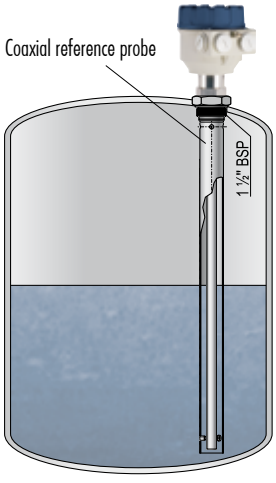
CBC–203–6 Ex

CTK–200

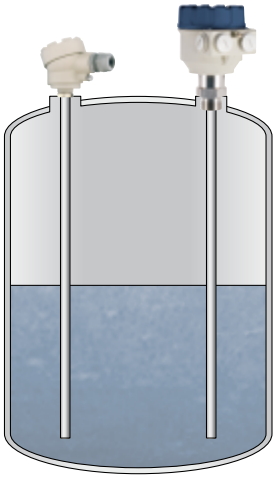
ARRANGEMENTS



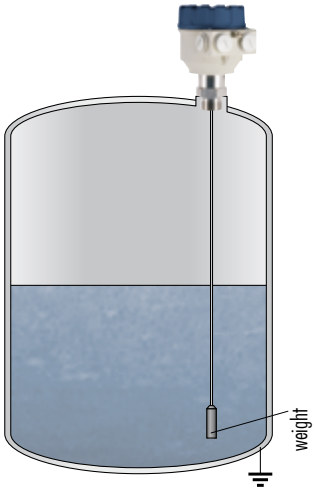
Rod probe
Metal tank and non-conductive medium. The rod probe is partially insulated at the process connection.



Rod probe
With coaxial tube reference probe



Rod probe
With reference rod probe



Cable probe with weight
Metal tank

TECHNICAL DATA

	Version	Rod probe	High-temperature rod probe	Cable probe
Measuring range (Ln)		0.2…3 m		1…20 m
Capacitance range		0 pF…5 nF		
Min. capacitance change		Max. (I_{out}) SPAN: 10 pF or 10% FS		
Saturation capacitance of the insulated probe		~600 pF/m		~200 pF/m
Relative dielectric constant		ε_r min. 1.5		
Process connection		As per order code		
Material of wetted parts	Threaded part	1.4571 Stainless steel		
	Probe	Fully or partially PFA-coated 1.4301 stainless steel		Fully or partially FEP-coated steel cable
Housing material		Plastic (PBT), painted aluminum or stainless steel		
Process temperature		–30…+130 °C	–30…+200 °C	–30…+130 °C
Ambient temperature		–25…+70 °C		
Medium pressure		Maximum 40 bar (4 MPa)		Maximum 16 bar (1.6 MPa)
Supply voltage / consumption		12…36 V DC / maximum 800 mW, transient overvoltage protection		
Output properties	Output signals	Analog: 4…20 mA (3.9…20.5 mA) $R_{max} = (U_t – 11.4\ V)/0.02\ A$ Error indication: 3.8 mA or 22 mA		
		Digital communication: HART®		
		Display module: SAP–202, 6-digit LCD, dimensions, bargraph		
		Current loop test: 10 mV / 1 mA via resistor in series		
	Damping time	0, 3, 6…300 s (selectable)		
	Linearity error	±0.3% FS		
	Temperature error	±0.02% / °C FS		
Electrical connection		2x M20×1.5 cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø6…Ø12 mm, wire cross section: maximum 1.5 mm²		
Electrical protection		Class III		
Ingress protection		Probe: IP68. Housing: IP67		
Weight		~2.5 kg with 0.5 m probe	~3 kg with 0.5 m probe	~2 kg with 3 m probe

Ex INFORMATION

C□□–2□□–□ Ex / C□□–3□□–□ Ex		
Protection		Intrinsic safety
Ex marking		⟨Ex⟩ II 1 G Ex ia IIB T6…T3 Ga
Intrinsic safety data		$C_i \leq 15$ nF, $L_i \leq 200$ µH, Ui ≤ 30 V, $I_i \leq 140$ mA, $P_i \leq 1.0$ W
Temperature classification	T6…T4 temperature class	$T_{ambient}$: –25…+70 °C; T_{medium}: maximum +80…+120 °C
	T3 temperature class	$T_{ambient}$: –25…+45 °C; T_{medium}: maximum +190 °C

SELECTING THE APPROPRIATE PROBE

The device uses the capacitive operating principle; therefore, if the dielectric constant of the measured material changes or it is too low, or the wrong probes are selected for the job, measurement accuracy will suffer.

	Material				Reference probe		
	Conductive	Non-conductive			Rod	Tube	Tank wall
		$\varepsilon_r > 2$	$2 > \varepsilon_r > 1.5$				
Insulated probe, reference probe	■	■	–	Conductive tank	■	■	■
Partially insulated probe, reference probe	–	■	■	Non-conductive tank	■	■	–

NIVOCAP C-200/C-300 with rod probe — 5 years

2-wire compact capacitive level transmitter for conductive and non-conductive liquids
with partially or fully plastic-coated stainless steel rod probe

Version / Max. temperature

C □■ – ■■■ – ■

T		Transmitter / +130 °C
B		Transmitter with local LCD display / +130 °C
H		Transmitter / +200 °C
P		Transmitter with local LCD display / +200 °C

Process connection size / Insulation

C ■□ – ■■■ – ■

M		¾" BSP / Fully PFA-insulated stainless steel
Z		¾" NPT / Fully PFA-insulated stainless steel
R		1" BSP / Fully PFA-insulated stainless steel
P		1" BSP / Partially PFA-insulated stainless steel
A		1" NPT / Fully PFA-insulated stainless steel
C		1" NPT / Partially PFA-insulated stainless steel
S		1½" BSP / Fully PFA-insulated stainless steel
T		1½" BSP / Partially PFA-insulated stainless steel
B		1½" NPT / Fully PFA-insulated stainless steel
D		1½" NPT / Partially PFA-insulated stainless steel
1	*	1" TriClamp / Fully PFA-insulated steel
2	*	1½" TriClamp / Fully PFA-insulated steel
3	*	2" TriClamp / Fully PFA-insulated steel

Housing

C ■■ – □■■ – ■

2		Painted aluminum
3		Plastic, PBT, fiberglass-reinforced
4	*	Stainless steel

* Ex version under approval

Probe length

C ■■ – ■□□ – ■

Fully PFA-insulated	
0 2	0.2 m
n n	0.3…3 m; sold by the 100 mm
Partially PFA insulated	
0 2	0.2 m
n n	0.3…3 m; sold by the 100 mm
nn = 03…30 : 0.3…3 m	

Output / Certificates

C ■■ – ■■■ – □

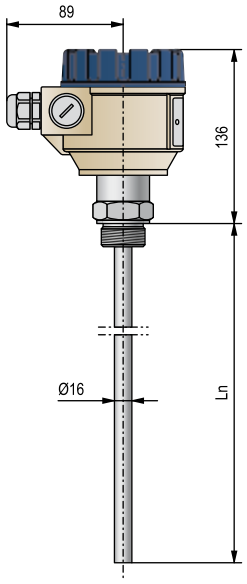
2	4…20 mA
4	4…20 mA + HART®
6	4…20 mA / Ex ia G
8	4…20 mA+ HART® / Ex ia G

Available on request: special process connections (should be given in the text of the order)

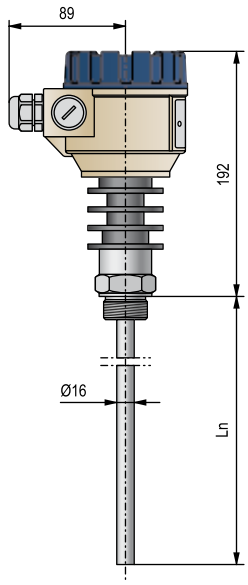
X12	DN40 Pipe coupling (DIN 11851)
X12	DN50 Pipe coupling (DIN 11851)

Accessories sold separately; see relevant page for details

CBR-205-2M-900-01	Adapter 1" BSP / ¾" NPT (1.4571)
CBR-205-2M-900-02	Adapter 1" BSP / 2" BSP (1.4571)
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



CTR-200/300



CHR-200/300

NIVOCAP C coaxial reference probe — 5 years

For use with NIVOCAP rod probe capacitive level transmitters
Internal process connection for NIVOCAP: 1" BSP, process connection: 1½" BSP/NPT

Connection type

C □ F – 1 ■■ – 0

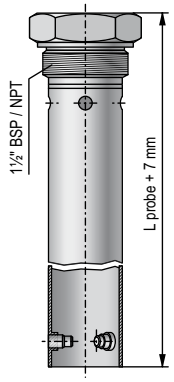
A	BSP
D	NPT

Probe length

C ■ F – 1 □□ – 0

0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m

nn = 03…30 : 0.3…3 m



CAF-100

NIVOCAP C reference rod probe — 5 years

Reference rod probes for NIVOCAP rod probe type capacitance level transmitters
Process connection 1" BSP/NPT

Connection type

C □■ – 1 ■■ – 0

F	BSP thread
E	NPT thread

Connection size / Insulation

C ■□ – 1 ■■ – 0

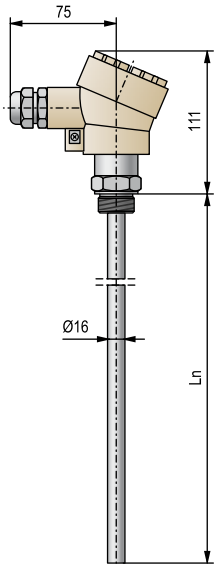
R	1" / Fully PFA-insulated stainless steel
P	1" / Partially-PFA insulated stainless steel

Probe length

C ■■ – 1 □□ – 0

Fully PFA-insulated	
0 2	0.2 m
n n	0.3…3 m; sold by the 100 mm
Partially PFA-insulated	
0 2	0.2 m
n n	0.3…3 m; sold by the 100 mm

nn = 03…30 : 0.3…3 m



CFR-100

NIVOCAP C-200/C-300 with cable probe — 5 years

2-wire compact capacitive level transmitter for conductive and non-conductive liquids
with partially of fully plastic-coated stainless steel cable probe

Version / Max. temperature

C □■ – ■■■ – ■

T		Transmitter / +130 °C
B		Transmitter with local LCD display / +130 °C

Process connection / Cable type

C ■□ – ■■■ – ■

K		1" BSP / Fully FEP-insulated steel
V		1½" BSP / Fully FEP-insulated steel
E		1" NPT / Fully FEP-insulated steel
F		1½" NPT / Fully FEP-insulated steel
4	*	1" TriClamp / Fully FEP-insulated steel
5	*	1½" TriClamp / Fully FEP-insulated steel
6	*	2" TriClamp / Fully FEP-insulated steel

Housing

C ■■ – □■■ – ■

2		Painted aluminum
3		Plastic, PBT, fiberglass-reinforced
4	*	Stainless steel

* Ex version under approval

Probe length

C ■■ – ■□□ – ■

Fully FEP-insulated	
0 1	1 m
n n	2…20 m; sold by the meter
Partially FEP-insulated	
0 1	1 m
n n	2…20 m; sold by the meter

nn = 02…20 : 2…20 m

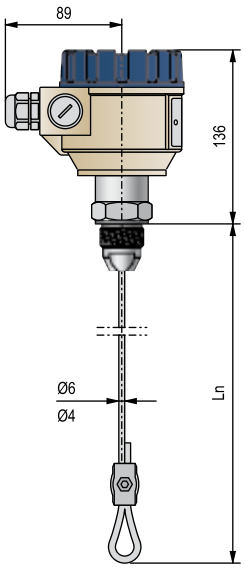
Output / Certificates

C ■■ – ■■■ – □

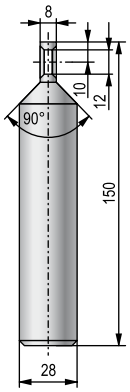
2	4…20 mA
4	4…20 mA + HART®
6	4…20 mA / Ex ia G
8	4…20 mA + HART® / Ex ia G

Accessories sold separately; see relevant page for details

CTK-103-0M-400-01	stainless steel counterweight Ø28 x 150 mm
CBR-205-2M-900-01	Adapter 1" BSP / ¾" NPT (1.4571)
CBR-205-2M-900-02	Adapter 1" BSP / 2" BSP (1.4571)
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



CTK-200 / 300



CTK-103-0M-400-01

NIVOPRESS D level transmitters operate in 2-wire systems that convert the relative pressure *(input signal)* into a direct current signal *(output signal)*. The silicone oil *(cooking oil on request)* transmission fluid transmits the pressure value from the stainless steel diaphragm to the piezoresistive sensor of the transmitter — smart elect onics and HART® communication feature local and remote programming. The transmitters are available in standard and non-sparking *(Ex ia)* versions.

Due to their design, the NIVOPRESS D front diaphragm level transmitters are particularly suitable for level measuring tasks by measuring pressure at the bottom of the tank. The same design makes it an excellent instrument for food applications *(milk, pastes)*. The smooth membrane surface and the maximum permissible process temperature of +125 °C ensure hygienic cleaning in technologies that require regular cleaning and eliminate the risk of clogging. The device can be used for all level measurement tasks with atmospheric pressure above the liquid column.

FEATURES

- 0.25% accuracy
- Gauge or absolute pressure transmitter
- Piezoresistive sensor with stainless steel flush diaphragm
- Wide pressure range
- Temperature compensation
- HART® communication
- Plug-in display
- Wide variety of process connections
- IP65
- Ex version
- 5 years warranty

APPLICATIONS

- Liquids in tanks and vessels
- Chemicals with dense vapor or gas layers above the surface
- Foaming liquids
- Highly viscous and corrosive substances

CERTIFICATES

- ATEX (Ex ia G)

SAP–203 display

DT–500

OPERATION

Hydrostatic level measurement principle

Provided the density is constant, the level depends on the pressure head.

$$P_{hydr} = 10^{-5} \rho \cdot g \cdot h$$

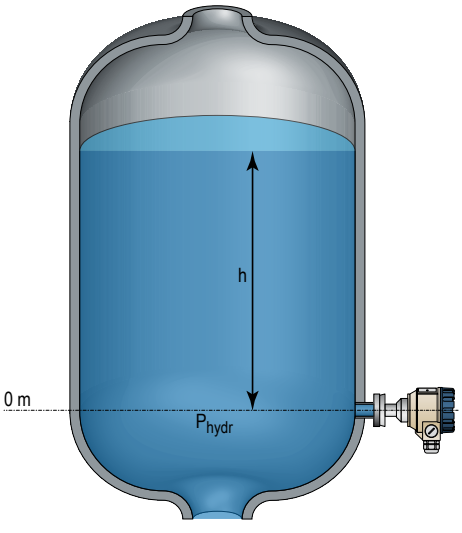
$$\downarrow$$

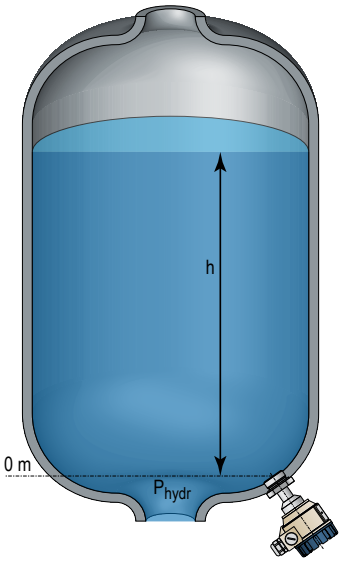
$$h = 10^{5} \frac{P_{hydr}}{\rho \cdot g}$$

$$\downarrow$$

Maximum possible value of **"h"**: $h_{max} = 10^{5} \frac{P_{hydr.max}}{\rho \cdot g}$

P_{hydr} [bar] = hydrostatic pressure
ρ [kg/m³] = density of the medium
g [m/s²] = gravitational acceleration
h [m] = distance between the middle of the diaphragm and the level of the material
$P_{hydr.max}$ = highest pressure limit





TECHNICAL DATA

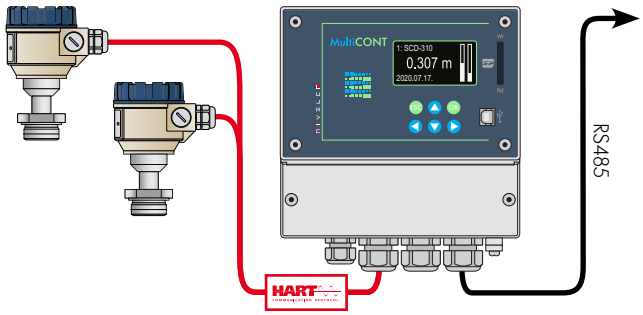
		D–500 / D–700	D–600
Measured Process Value		Level, pressure	
Sensor		Piezoresistive silicium sensor, with stainless steel flush diaphragm	
System		2-wire	
Supply Voltage		10…36 V DC	
Measuring Range		0…400 bar (as per order code)	
Overpressure		0.5…600 bar (as per order code)	
Downscale Rate		~1:2	
Zero Point Offset		50% of the measuring range	
Accuracy (Linearity Error)		P > 0.4 bar: ±0.25%; p ≤ 0.4 bar: ±0.5%	
Output	Analog	4…20 mA	
	Display	6-digit plug-in LCD display (SAP–203)	
	Digital Communication	HART®	
Ambient Temperature		–40…+70 °C, with display: –25…+70 °C	–30…+70 °C, with display: –25… +70 °C,
		Ex variant: see "Ex Information"	
Range of Temperature Compensation		p < 100 bar: 0…+70 °C p ≤ 0.4 bar: 0…+50 °C	
Process Temperature		–25…+125 °C	
Material of Wetted Parts	Protective Diaphragm	1.4435 (316L) stainless steel	
	Process Connection		
	Seal	p < 100 bar: Viton®; p > 100 bar: NBR; EPDM is ordered separately	
Pressure Transmitting Medium		Silicone oil; food industry compatible oil is ordered separately	
Housing Material		Painted aluminum or stainless steel	Plastic (PBT)
Process Connection		As per order code	
Electrical Connection		2× M20×1.5 plastic cable glands, for 6…12 mm cable diameter + 2× internally threaded ½" NPT connection for protective pipes for 0.5…1.5 mm² wire cross section	
Electrical Protection		Class III	
Ingress Protection		IP65	
Weight		~2 kg	~1.6 kg

Ex INFORMATION

D□□–5□□–□ Ex / D□□–6□□–□ Ex	
Protection	Intrinsic safety
Ex marking	II 1 G Ex ia IIC T6 … T4 Ga
Intrinsic safety data	U_i ≤ 30 V; I_i ≤ 100 mA; P_i ≤ 0.75 W; C_i ≤ 14 nF; L_i ≤ 180 µH
Process temperature range	Without display: –40…+70 °C; With display: –25…+70 °C

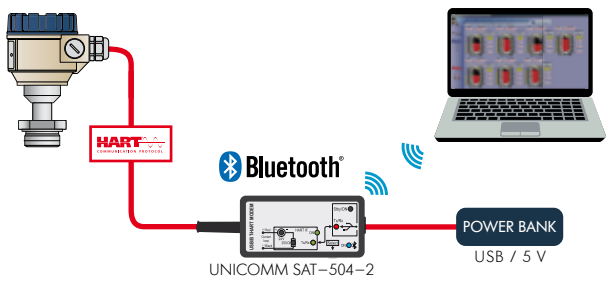
HART® MULTIDROP LOOP

MultiCONT multichannel process controller can handle up to 15 normal HART® or up to 4 Ex-proof HART® capable **NIVELCO** transmitters. Digital *(HART®)* information is processed, displayed, and if necessary, transmitted via RS485 to a computer. Remote programming of the transmitters is also possible. Processes can be visualized on computers by using **NIVISION**.



COMPUTER CONNECTION

HART® output devices and a **UNICOMM** SAK–305 HART–USB modems can be connected to a PC wired, while using a **UNICOMM** SAT–504 HART–USB/Bluetooth® modem, the transmitters can be connected via Bluetooth®. All data measured by the **NIVOPRESS D** can be displayed on the PC, and the devices can be reprogrammed if required. For a HART® modem, a maximum of 15 standard transmitters can be connected. In addition, the **EView2** configuration or **NIVISION** process visualization software can also be used.



NIVOPRESS D-500/D-600 — 5 years

2-wire compact hydrostatic level transmitter for liquids
with stainless steel flush diaphragm piezoresistive sensor

Version

D □■ – ■■ 1 – ■

T	Transmitter
B	Transmitter with local LCD display

Process connection

D ■□ – ■■ 1 – ■

C	½" BSP (p > 2.5 bar) (Ex version not available)
E	1" BSP
S	1" NPT
F	1½" BSP
T	1½" NPT
L	1" TriClamp (ISO 2852, 0,25...16 bar)
M	1½" TriClamp (ISO 2852, p ≤ 16 bar)
N	2" TriClamp (ISO 2852, p ≤ 16 bar)
O	DN25 Pipe coupling (DIN 11851, 0.25...40 bar)
P	DN40 Pipe coupling (DIN 11851, 0.25...40 bar)
R	DN50 Pipe coupling (DIN 11851, 0.25...25 bar)

Housing

D ■■ – □■ 1 – ■

5		Painted aluminum
6		Plastic, PBT, fiberglass-reinforced
7	*	Stainless steel

* Ex version under approval

Range (gauge) / Overpressure

D ■■ – ■□ 1 – ■

1	0...0.16 bar / 0.5 bar (with min. 1" process connection)
2	0...0.25 bar / 1 bar (with min. 1" process connection)
3	0...0.4 bar / 1 bar (with min. 1" process connection)
4	0...0.6 bar / 3 bar (with min. 1" process connection)
5	0...1 bar / 3 bar (with min. 1" process connection)
6	0...1.6 bar / 6 bar (with min. 1" process connection)
7	0...2.5 bar / 6 bar
8	0...4 bar / 20 bar
9	0...6 bar / 20 bar
A	0...10 bar / 20 bar
B	0...16 bar / 60 bar
C	0...25 bar / 60 bar
D	0...40 bar / 100 bar
E	0...60 bar / 120 bar
F	0...100 bar / 250 bar
G	0...160 bar / 500 bar
H	0...250 bar / 500 bar
J	0...400 bar / 600 bar

Output / Certificates

D ■■ – ■■ 1 – □

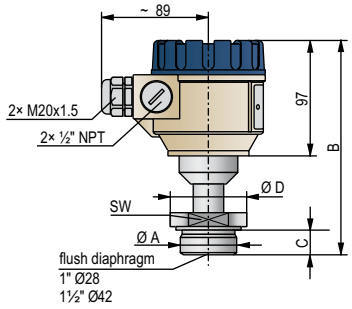
2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA + HART® / Ex ia G

Available on request (should be given in the text of the order)

Customised 4...20 mA output calibration for ranges other than above
Filled with food compatible oil

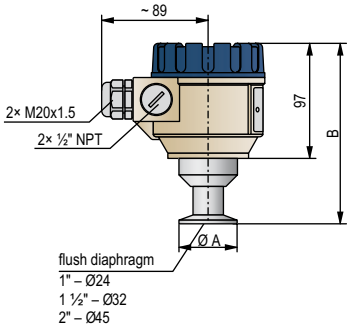
Accessories sold separately; see relevant page for details

SAP – 203 – 0	Plug-in display module
SAT – 304 – 0	HART®-USB modem
SAT – 504 – ■	
SAK – 305 – 2	HART®-USB/RS485 modem
SAK – 305 – 6	HART®-USB/RS485 modem / Ex ia G
EAA – 604 – 0	½" BSP / ½" NPT (1.4571)
NAZ – 104 – 0	1" BSP / ½" BSP (1.4571)
NAZ – 107 – 0	½" BSP / 1" BSP (1.4571)



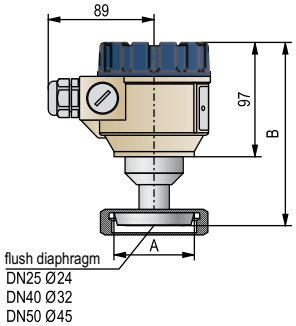
DTC / DTE / DTS / DTF / DTT
-500 / 600

	DTC	DTE	DTS	DTF	DTT
A	½" BSP	1" BSP	1" NPT	1½" BSP	1½" NPT
B	190	193	197	185	189
C	15	19	26	22	27
D	30	50	52	65	70
SW	27	44	40	55	55



DTL / DTM / DTN-500 / 600

Type	DTL	DTM	DTN
TriClamp	1"	1½"	2"
A	50.5		64
B	183		167



DTO / DTP / DTR-500 / 600

Type	DTO	DTP	DTR
MILCH	DN25	DN40	DN50
A	44	56	68.5
B	186	170	166

Submersible Hydrostatic Level Transmitters

NIVOPRESS N submersible hydrostatic level transmitters are designed to measure the level of clean and contaminated liquids. The pressure sensor at the end of the probe measures the sum of the hydrostatic pressure (P_{hydr}) of the liquid column above and the atmospheric pressure (P_{atm}). Atmospheric pressure is channeled to the sensor through a breathing capillary equipped with a moisture filter that prevents moisture from damaging the electronics. The atmospheric pressure is subtracted from the overall measured pressure to get the hydrostatic pressure, which is proportional to the height of the liquid column *(h)*, then the sensor's signal is converted into an output signal. If both the level and the temperature of the liquid needs to be measured, a combined *(level & temperature)* transmitters are available. There is a wide variety of accessories for the transmitters.

A sewage adapter operating on the diving bell principle can be snapped into the protective cap's place to avoid the direct contact between the sensor and the measured contaminated liquid. A mechanical filter is built into NZ type transmitters as a measure of extra protection. N–500 devices can be used in hazardous environments. NZ screw-in type transmitters are recommended for applications where there is a risk of flooding. NB/NG plastic housing types are designed for those applications where aggressive mediums *(e. g. saline solutions or seawater)* may corrode stainless steel.

FEATURES

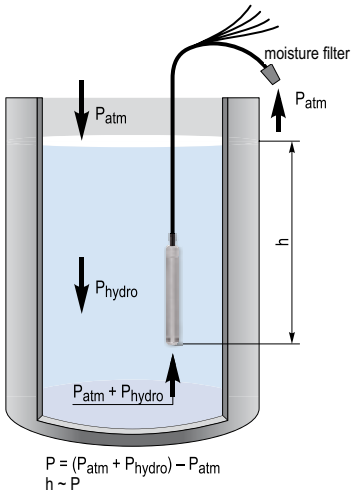
- Measuring range up to 350 m
- Remotely programmable
- IP68
- Submersible or screw-in versions
- Ø22 / Ø24 mm tube
- HART® communication
- 2 or 3-wire versions
- Ex versions
- 2× 4…20 mA output *(level + temperature)*
- Built-in Pt100 temperature sensor
- Overvoltage and inverse polarity protection
- Wide range of accessories
- Approved for potable water
- Available with capacitance ceramic, piezorezistive stainless steel or ceramic sensor
- 5 yeras warranty

APPLICATIONS

- Level and temperature measurement of potable water wells, tanks, pools
- Submersible pump control
- Screw-in submersible version with IP68 protection for applications with risk of flooding
- Clean or slightly polluted, contaminated liquids
- Sewage
- Draw-down protection
- Sewage lift station control
- Saline solutions, seawater

CERTIFICATES

- ATEX (Ex ia G)
- UKCA Ex (Ex ia G)



NB

NB + NAW–107 sewage adapter

NP / NK

NZ / ND

NZ / ND + NAZ–103 sewage adapter

NC

NP / NK + NAW–104 sewage adapter

OVP–32 / 33 overvoltage protection unit

NAA–101 / NAA–102 cable terminal box

NAA–105 cable-holding sliding sleeve

OVP–22 / 33 over-voltage protection unit

NAA–209 cable mounting unit

TECHNICAL DATA

		2-wire				3-wire
		NB, NG	NK, NN, ND, NH	NC, NT	NP, NF, NZ, NR	NPH, NFH, NZH, NRH
Sensor	Principle	Piezoresistive		Capacitive	Piezoresistive	
	Material	Ceramic			Stainless steel	
Housing		Plastic	Stainless steel			
Measuring range[1]		0…200 mH_2O		0…20 mH_2O	0…350 mH_2O	0…200 mH_2O
		As per order code; current output can be customized within 2…130% pressure range; remotely programmable				
Overload allowed (versus range)		3× (≤ 20 mH_2O) 2× (> 20 mH_2O)		20× (≤ 3 mH_2O) 10× (> 3 mH_2O)	3×	
Output		4…20 mA + HART®		4…20 mA	4…20 mA + HART®	0…10 V (0 V ≤ 80 mV) measured to the negative supply voltage
Supply voltage		12…30 V DC				18…30 V DC / 6 mA
Temperature measurement		NPD, NFD, NZD, NRD types: 2-wire 4…20 mA output (s. voltage: 12…30 V DC); 0…+60 °C, acc.: ±3 °C N☐P types: 4-wire Pt100 "B" temperature sensor; Other types with HART® output: temperature can be queried as HART® Secondary Value, acc.: ±3 °C				–
Linearity error (level)		±0.45%		±0.25%		
Temperature error		≤ ±0.1% / 10 K				≤ ±0.2% / 10 K
Process temperature[2]		–30…+60 °C, for FEP cable devices, where the output code is N☐K or N☐P: –40…+80 °C				
Process connection		NAA–209 cable mounting wedge clamp, NZ, NR, ND, NH types: ¾" BSP thread				
Ingress protection		IP68				
Electrical protection		Class III				
Electrical connection		Shielded cable with breathing capillary				
Cable		Ø7 mm; 0.34 mm^2				
Cable length[3]		0…300 m			0…450 m	
Dimensions		Ø24 × 212 mm	NK, NN: Ø22 × 173 mm ND, NH: Ø38 × 174 mm	Ø40 × 146 mm	NP, NF: Ø22 × 173 mm NZ, NR: Ø38 × 174 mm	
Weight		Probe: 200 g	NK, NN: Probe: 200 g ND, NH: Probe: 300 g	Probe: 0.4 kg	NP, NF: Probe: 200 g NZ, NR: Probe: 300 g	
Material of wetted parts	Sensor	Al_2O_3			1.4404 (316L) or (1.4571 [316Ti] and 1.4435 [316L]	
	Housing	POM	1.4571 (316Ti)			
	Cable coating	Polyurethane (PUR) or FEP				
	Seals	Viton® (FKM)				
	Protective cap	POM	1.4571 (316Ti)	–	1.4571 (316Ti)	

[1] mH_2O means: 1 metre of water column, 1 mH_2O ~0.1 bar *[2] High-temperature (+75 °C) variant on request.* *[3] As order code.*

Ex INFORMATION

NP / NF / NZ / NR / NK / NN / ND / NH☐–5☐☐–☐ Ex	
Protection	Intrinsic safety
Ex marking	Up to 100 m cable length: ⟨Ex⟩ II 1G Ex ia IIC T6 Ga, between 100 m and 300 m cable length: ⟨Ex⟩ II 1G Ex ia IIB T6 Ga
Intrinsic safety data	U_i = 30 V, I_i = 100 mA, P_i = 0.8 W for IIC gas group: C_i ≤ 52 nF, L_i ≤ 1.4 mH (calculated with 100 m integrated cable), for IIB gas group: C_i ≤ 132 nF, L_i ≤ 1.6 mH
Supply voltage	14…30 V DC
Operation temperature range	–30…+60 °C

TECHNICAL PROPERTIES OF ACCESSORIES

NAA–101 – Cable terminal box	
Dimensions	93 × 93 × 55 mm
Ingress protection	IP65
Process temperature range	–40…+70 °C
Material	Polystyrene
Cable gland	M20×1.5 (cable outer diameter: Ø5…Ø10 mm)
Electrical connection	Terminal block (for max. 2.5 mm^2 wire cross section)
NAA–102 – Cable terminal box with overvoltage protection	
Data	See NAA-101
Electrical Properties	See OVP

[1] High-temperature (up to +75 °C) version is ordered separately
[2] Applicable only for one 2-wire 4…20 mA (HART®) device!

NAA–209 – Cable mounting wedge clamp		
Max. mechanical load	300 m cable	
Material	Polyamide, stainless steel wedge clamp	
Process temperature range	–20… + 60 °C	
	Overvoltage protection	
	OVP–22 / 33[2]	OVP–32 / 33[2]
Version	Field use	Rail-mountable (EN 60715)
Dimensions	72 × 42 × 19 mm	62 × 65 × 18 mm
Ingress protection	IP54	IP20
Breakdown voltage	33 V	
Absorbed energy	600 W / 1 ms	
Serial resistance	13 Ω	
Leakage current	≤ 10 µA	

NIVOPRESS N-200 — 5 years

2-wire submersible hydrostatic level transmitter for liquids
with capacitive ceramic sensor; humidity filter: fixed to breathing cable

Type / Cable

N □■ – 2 ■■ – ■

C	Capacitive ceramic sensor / PUR
T	Capacitive ceramic sensor / FEP

Output

N ■□ – 2 ■■ – ■

K	2-wire, 4…20 mA output
P	Level: 4…20 mA + Temperature: Pt100 sensor

Version

N ■■ – □■■ – ■

2	Standard

Range

N ■■ – 2 □■ – ■

1	0…1 mH_2O (0…100 mbar)
2	0…2 mH_2O (0…200 mbar)
3	0…5 mH_2O (0…500 mbar)
4	0…10 mH_2O (0…1000 mbar)
5	0…20 mH_2O (0…2000 mbar)

Breathing cable length

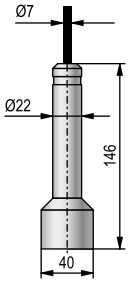
N ■■ – 2 ■□ – □

PUR cable		
n	n	1…99 m; sold by the meter
o	o	100…190 m; sold by the meter
p	p	200…290 m; sold by the meter
C	0	300 m; sold by the meter
FEP cable		
n	n	1…99 m; each started 1 m
o	o	100…190 m; each started 1 m
p	p	200…290 m; each started 1 m
C	0	300 m; each started 1 m

nn = 01…99 : 1…99 m
oo = A0…A9 : 100…190 m
pp = B0…B9 : 200…290 m

Available on request (must be specified in the text of the order)

High-temperature (up to +75 °C) version
Custom 4…20 mA output calibration



NC□ / NT□-200

NIVOPRESS N-400/N-500 — 5 years

2 or 3-wire submersible hydrostatic level transmitter for liquids
with stainless steel piezoresistive sensor; humidity filter: fixed to breathing cable

Type

N □■ – ■■■ – ■

P	Piezoresistive stainless steel sensor / PUR
F	Piezoresistive stainless steel sensor / FEP
Z	Piezoresistive stainless steel sensor, ¾" BSP process connection / PUR
R	Piezoresistive stainless steel sensor, ¾" BSP process connection / FEP

Output

N ■□ – ■■■ – ■

K		2-wire, 4…20 mA + HART
H	*	3-wire, 0…10 V DC output (up to 200 mH2O)
D	*	Level: 4…20 mA + HART + Temperature: 4…20 mA (electronic temp. sensor)
P		Level: 4…20 mA + HART + Temperature: Pt100 sensor

* Ex version not available

Version

N ■■ – □■■ – ■

4	Standard
5	Ex ia G

Range

N ■■ – ■□■ – ■

1	0...1 mH_2O (0...100 mbar)
2	0...2 mH_2O (0...200 mbar)
3	0...5 mH_2O (0...500 mbar)
4	0...10 mH_2O (0...1 000 mbar)
5	0...20 mH_2O (0...2 000 mbar)
6	0...50 mH_2O (0...5000 mbar)
7	0...100 mH_2O (0...10000 mbar)
8	0...200 mH_2O (0...20000 mbar)
9	0...350 mH_2O (0...35000 mbar)

Breathing cable length

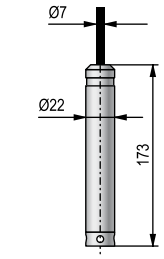
N ■■ – ■■□ – □

PUR cable		
n	n	1...99 m; sold by the meter
o	o	100...190 m; sold by the meter
p	p	200...290 m; sold by the meter
r	r	300...390 m; sold by the meter
s	s	400...450 m; sold by the meter
FEP cable		
n	n	1...99 m; sold by the meter
o	o	100...190 m; sold by the meter
p	p	200...290 m; sold by the meter
r	r	300...390 m; sold by the meter
s	s	400...450 m; sold by the meter

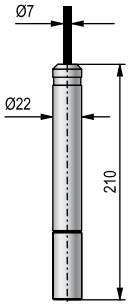
nn = 01...99 : 1...99 m
oo = A0...A9 : 100...190 m
pp = B0...B9 : 200...290 m
rr = C0...C9 : 300...390 m
ss = D0...D5 : 400...450 m

Available on request (must be specified in the text of the order)

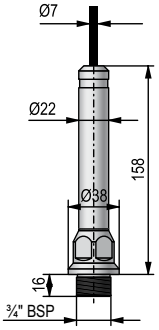
High temperature (up to +75 °C) version (Ex version not available)
Custom 4...20 mA output calibration



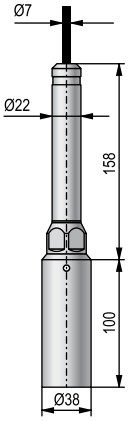
NP□ / NF□–400 / 500



NP□ / NF□–400 / 500
+ NAW–104



NZ□ / NR□–400
/ 500



NZ□ / NR□–400 / 500
+ NAZ–103

NIVOPRESS N-400 — 5 years

2-wire submersible hydrostatic level transmitter for liquids
with piezoresistive ceramic sensor; humidity filter: fixed to breathing cable

Type

N ☐■ – ■■■ – ■

K		Piezoresistive ceramic sensor / PUR / 1.4571
N		Piezoresistive ceramic sensor / FEP / 1.4571
B	*	Piezoresistive ceramic sensor / PUR / POM
G	*	Piezoresistive ceramic sensor / FEP / POM
D		Piezoresistive ceramic sensor, ¾" BSP process connection / PUR / 1.4571
H		Piezoresistive ceramic sensor, ¾" BSP process connection / FEP / 1.4571

* Ex version not available

Output

N ■☐ – ■■■ – ■

K	2-wire, 4…20 mA + HART
P	Level: 4…20 mA + HART + Temperature: Pt100 sensor

Version

N ■■ – ☐■■ – ■

4	Standard
5	Ex ia G

Range

N ■■ – ■☐■ – ■

1	0…1 mH_2O (0…100 mbar)
2	0…2 mH_2O (0…200 mbar)
3	0…5 mH_2O (0…500 mbar)
4	0…10 mH_2O (0…1 000 mbar)
5	0…20 mH_2O (0…2 000 mbar)
6	0…50 mH_2O (0…5000 mbar)
7	0…100 mH_2O (0…10000 mbar)
8	0…200 mH_2O (0…20000 mbar)

Breathing cable length

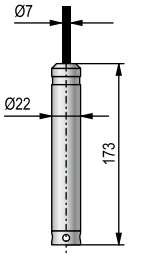
N ■■ – ■■☐ – ☐

PUR cable		
n	n	1…99 m; each started 1 m
o	o	100…190 m; sold by the meter
p	p	200…290 m; sold by the meter
C	0	300 m; sold by the meter
FEP cable		
n	n	1…99 m; sold by the meter
o	o	100…190 m; sold by the meter
p	p	200…290 m; sold by the meter
C	0	300 m; sold by the meter

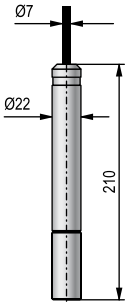
nn = 01…99 : 1…99 m
oo = A0…A9 : 100…190 m
pp = B0…B9 : 200…290 m

Available on request (must be specified in the text of the order)

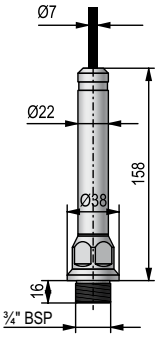
High temperature (up to +75 °C) version
Custom 4…20 mA output calibration



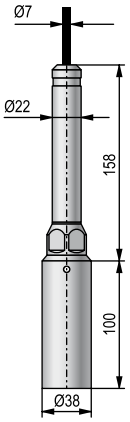
NK☐ / NN☐–400



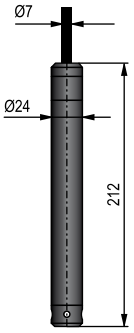
NK☐ / NN☐–400
+ NAW–104



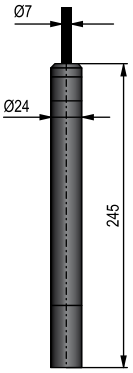
ND☐ / NH☐–400



ND☐ / NH☐–400
+ NAZ–103



NB☐ / NG☐–400

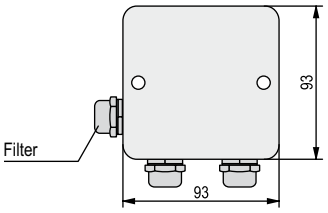


NB☐ / NG☐–400
+ NAW–107

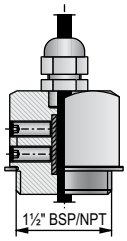
NIV24
NPK-431-0
NPK-441-0

NIVOPRESS N accessories (sold separately) — 5 years

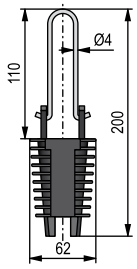
Type	
□ A A – 1 0 ■ – 0	
N	Terminal box
Terminal boxes and cable mounting units	
N A A – 1 0 □ – 0	
1	Terminal box with filter without OVP
2	Terminal box with filter with OVP-12/33 (only for N_K versions)
5	Sliding sleeve 1½" BSP
6	Sliding sleeve 1½" NPT
N A A – 2 0 9 – 0	Cable mounting wedge clamp
Overvoltage protection units	
O V P – □ 2 S – L	
2	OVP-22/33, outdoor, IP54
3	OVP-32/33, IP20, DIN rail mounting
Sewage adapters	
N A W – 1 0 □ – 0	
4	Can be mounted in the place of the protective cap / 1.4571
7	Can be mounted in the place of the protective cap / POM (applicable when there is no risk of tilting)
N A Z – 1 0 3 – 0	Sewage adapter (for ¾" threaded process connection) / 1.4571
Adapters	
N A Z – 1 0 1 – 0	¾" BSP / ½" BSP (1.4571)
N A Z – 1 0 2 – 0	¾" BSP / M20x1.5 (1.4571)
N A Z – 1 0 5 – 0	¾" BSP / 1" NPT (1.4571)
N A Z – 1 0 6 – 0	¾" BSP / 1" BSP (1.4571)
N A Z – 1 0 7 – 0	½" BSP / 1" BSP (1.4571)
Accessories (sold separately; see relevant page for details)	
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



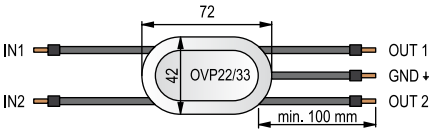
NAA-101 / 102



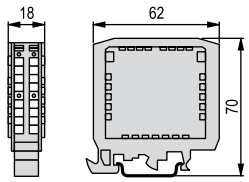
NAA–105/106



NAA–209



OVP-22 / 33



OVP-32 / 33

NIV24
NAA-209-0
OVP-22 / 33
OVP-32 / 33
NAA-101-0

NIVOTRACK MI□–, MX□–, MY□–5□□ magnetostrictive level transmitters are an ideal solution for high-accuracy measurement of clean fluids. Integrating the transmitter into a process control system is easy due to the intelligent signal processing and communication software and the wide range of accessories offered.

MIA–513

OPERATING PRINCIPLE

The float, containing a magnetic disc, moves along the stem with a magnetostrictive wire in it. A pulse generated by the electronics travels along the magnetostrictive wire. When the pulse reaches the float's magnetic field, torsion develops. Reflected from the torsion point, the pulse creates an acoustic wave, which travels back along the wire. The transmitter's 4…20 mA output is proportional to the time between the excitation and detection.

FEATURES

- 2-wire integrated transmitter
- 1 mm resolution
- Distance and level measurement
- Standard and mini versions
- Stainless steel or Titanium floats
- IP65
- HART® communication
- Level monitoring of tanks
- Interface measurement
- 5 years warranty

APPLICATIONS

- Level measurement of liquids, with min. 0.4 kg/dm^3 density
- Chemical industry
- Power plants
- Oil industry
- Water industry
- Chemicals, solvents, hydrocarbons

TECHNICAL DATA

		Rigid probe version		
		Standard (MI□)	Mini (MY□)	Plastic-coated (MX□)
Measured process value		Liquid level, distance		
Nominal length (L)		0.3…3.5 m	0.3…1.5 m	0.5…3 m
Material of the tube		1.4571 (316Ti) stainless steel		
Highest process pressure[1]		25 bar (2.5 MPa)	16 bar (1.6 MPa)	3 bar (0.3 MPa)
Process temperature[1]		–40…+90 °C		
Standard float diameter / material[1]		Ø54 × 60 mm cylindrical / 1.4404	Ø28 × 29 mm / 1.4404	Ø76 × 87 mm cylindrical / PVDF or PP
Medium density		See "Floats"		
Material of wetted parts		Stainless Steel: 1.4571, 1.4404		PFA, PVDF, PP
Ambient temperature		–40…+70 °C		
Output	Analog	4…20 mA (limit values: 3.9…20.5 mA)		
	Digital communication	HART® (lowest loop resistance: 250 Ω)		
Error indication		Output signal = 22 mA / 3.8 mA		
Output load		$R_L = (U_S – 12.5\ V) / 0.02\ A$, U_S = supply voltage		
Supply voltage		12.5…36 V DC		
Electrical protection		Class III		
Ingress protection		IP65		
Process connection		As per order code		
Electric connection (M□□–5□□–M types)		Hirschmann EN 175 301-803-A (DIN 43650)		
Weight		2.9 kg + measuring probe (0.6 kg/m)	2.9 kg + measuring probe (0.3 kg/m)	2.9 kg + measuring probe (0.7 kg/m)

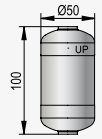
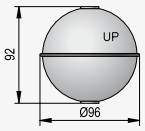
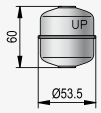
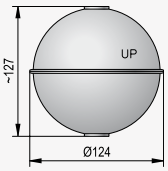
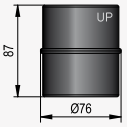
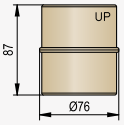
[1] *Properties of non-standard floats can be found in "Floats."*

MEASUREMENT DATA

M□□–5□□–□	
Resolution (on HART® transmitted value)	1 mm
Nonlinearity (on HART® transmitted value)	±2 mm or ±0.085% F.S. whichever is greater
Hysteresis (under reference conditions)	±0.25 mm
Zero span (in LEVEL mode)	Anywhere within the active range
Measuring Range (reducing)*	Minimal distance: 32 mm; Maximum distance: see "Dimensions"
Temperature error	0.04 mm / 10 °C (between –25…+50 °C)
Current output resolution	0.4 µA
Current output accuracy	33 µA
Current output temperature error	6 ppm / °C

** Accuracy data is only valid with factory default settings!*

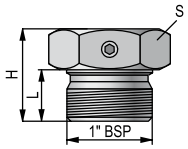
FLOATS

	MBA–505–2M–600–00[1]	MBK–530–2M–400–00[2]	MBA–505–2M–800–00[1]	MBA–505–2M–200–00[1]	MBA–505–2M–900–00[2]	MGU–505–2M–200–00	MGU–506–1M–200–00	4w34bs–16yyyyy[3]
Type	MI□					MX□		MY□
Dimensions								
Medium density (min.)	0.45 kg/dm³	0.55 kg/dm³	0.55 kg/dm³	0.8 kg/dm³	0.4 kg/dm³	0.7 kg/dm³	0.4 kg/dm³	0.8 kg/dm³
Material	Titanium	1.4435	Titanium	1.4404	1.4435	PVDF	PP	1.4404
Medium pressure	16 bar (1.6 MPa)		25 bar (2.5 MPa)			3 bar (0.3 MPa)		10 bar (1 MPa)

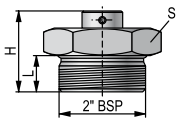
[1]*Designed for min. 2" process connection, order only with rigid probe.* [2]*Flange is ordered separately.* [3]*Designed for min. 1" process connection, order only with mini version.*

ACCESSORIES

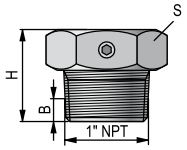
Threaded sliding sleeve					
Type	Process connection	S (mm)	H (mm)	L (mm)	B (mm)
MBH-105-2M-300-00	1" BSP	41	36	20	–
MBK-105-2M-300-00	2" BSP	60	55	24	–
MBL-105-2M-300-00	1" NPT	41	37	–	~10
MBN-105-2M-300-00	2" NPT	60	44.5	–	~11



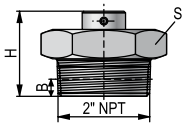
MBH-105-2M-300-00



MBK-105-2M-300-00



MBL-105-2M-300-00



MBN-105-2M-300-00

NIVOTRACK M-500 with rigid probe — 5 years

2-wire integrated magnetostrictive level transmitter for liquids
with stainless steel rod probe with 1 mm resolution

Version

M ☐■ – 5 ■■ – ■

I		Transmitter

Process connection

M I ☐ – 5 ■■ – ■

A		1" BSP
B		1" BSP, lower connection
C		2" BSP
F		2" BSP, lower connection
D		1" NPT
E		1" NPT, lower connection
G		2" NPT
H		2" NPT, lower connection
O		2½" TriClamp
S		2½" TriClamp, lower connection
P		3" TriClamp
R		4" TriClamp
U		Without process connection for sliding sleeve
L	*	Without float, for NIVOFLIP (max. 3.5 m, max. +90 °C)
T	*	Without float, for NIVOFLIP (max. 3.5 m, max. +200 °C)

* Probe length = center to center of NIVOFLIP +400 mm as per float version and pressure rating

Housing

M I ■ – ☐■■ – ■

5	Stainless steel

Probe length**

M I ■ – 5 ☐☐ – ■

n n	0.5…1 m
o o	1.1…3 m; sold by the 0.1 m

nn = 05…10 : 0.5…1 m
oo = 11…30 : 1.1…3 m, ** 3…3.5 m as per special offer

Output / Resolution / Certificates / El. connection

M I ■ – 5 ■■ – ☐

K	***	4…20 mA + HART® / 1 mm / cable
L	***	4…20 mA + HART® / 1 mm / Ex ia G / cable
M		4…20 mA + HART® / 1 mm / DIN connector
N	***	4…20 mA + HART® / 1 mm / Ex ia G / DIN connector
O	***	4…20 mA + HART® / 1 mm / M12x1 connector
P	***	4…20 mA + HART® / 1 mm / Ex ia G / M12x1 connector

*** Under development

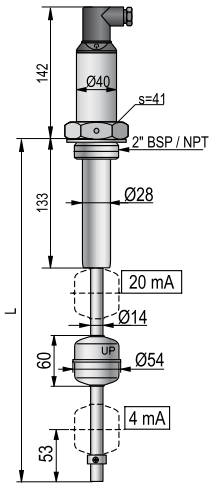
Need of IEC Ex is to be specified in the text part of the order.

Available on request (must be specified in the text of the order)

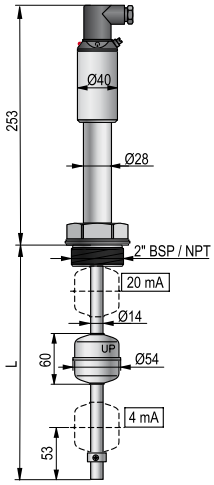
Ø96 mm stainless steel (1.4404) ball float (for min. 0.55 kg/dm³ liquids)
Ø124 mm stainless steel (1.4401) ball float (for min. 0.4 kg/dm³ liquids)
Ø53.5 mm titanium float (for min. 0.55 kg/dm³ liquids)
Ø50x100 mm titanium float (min. 0.45 kg/dm³)

Accessories sold separately; see relevant page for details

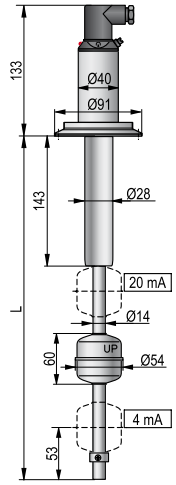
MBH-105-2M-300-00	Sliding sleeve, 1.4571, 1" BSP
MBK-105-2M-300-00	Sliding sleeve, 1.4571, 2" BSP
MBL-105-2M-300-00	Sliding sleeve, 1.4571, 1" NPT
MBN-105-2M-300-00	Sliding sleeve, 1.4571, 2" NPT
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



MIC / MIG-5☐☐-M



MIF / MIH-5☐☐-M



MIP-5☐☐-M

NIVOTRACK M-500 mini version with rigid probe — 5 years

2-wire integrated magnetostrictive level transmitter for liquids
mini version with stainless steel rod probe with 1 mm resolution

Version

M □■ – 5 ■■ – ■

Y	Transmitter mini

Process connection

M Y □ – 5 ■■ – ■

A	1" BSP
B	1" BSP, lower connection
C	2" BSP
F	2" BSP, lower connection
D	1" NPT
E	1" NPT, lower connection
G	2" NPT
H	2" NPT, lower connection
J	1½" TriClamp
K	1½" TriClamp, lower connection
M	2" TriClamp
N	2" TriClamp, lower connection
O	2½" TriClamp
S	2½" TriClamp, lower connection
P	3" TriClamp
R	4" TriClamp

Housing

M Y ■ – □■■ – ■

5	Stainless steel

Probe length

M Y ■ – 5 □□ – ■

n n	0.5…1 m
o o	1.1…1.5 m; sold by the 0.1 m

nn = 05…10 : 0.5…1 m
oo = 11…15 : 1.1…1.5 m

Output / Resolution / Certificates / El. connection

M Y ■ – 5 ■■ – □

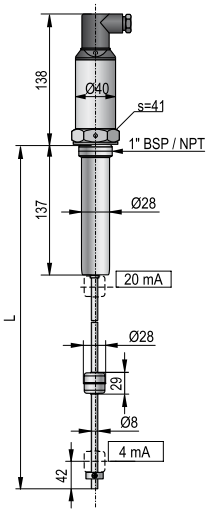
K	*	4…20 mA + HART® / 1 mm / cable
L	*	4…20 mA + HART® / 1 mm / Ex ia G / cable
M		4…20 mA + HART® / 1 mm / DIN connector
N	*	4…20 mA + HART® / 1 mm / Ex ia G / DIN connector
O	*	4…20 mA + HART / 1 mm / M12x1 connector
P	*	4…20 mA + HART® / 1 mm / Ex ia G / M12x1 connector

* Under development

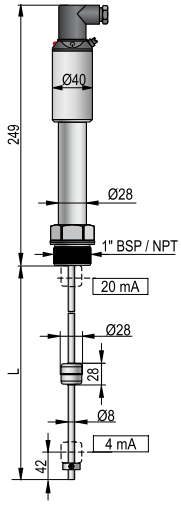
IEC Ex compliance is optional; it must be specified in the order.

Accessories sold separately; see relevant page for details

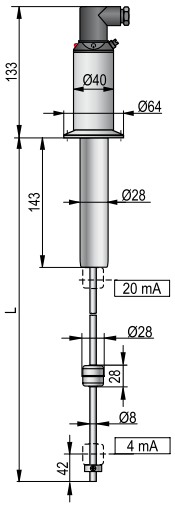
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



MYA / MYD-5□□-M



MYB / MYE-5□□-M



MYM-5□□-M

NIVOTRACK M-500 with plastic-coated rigid probe — 5 years

2-wire integrated magnetostrictive level transmitter for liquids
with plastic-coated stainless steel rod probe with 1 mm resolution

Version

M □ U – 5 ■ ■ – ■

X	Transmitter

Process connection

M X □ – 5 ■ ■ – ■

U	Without process connection for sliding sleeve

Housing

M X U – □ ■ ■ – ■

5	Stainless steel

Probe length

M X U – 5 □ □ – ■

n n	0.5…1 m
o o	1.1…3 m; sold by the 0.1 m

nn = 05…10 : 0.5…1 m
oo = 11…30 : 1.1…3 m

Output / Resolution / Certificates / El. connection

M X U – 5 ■ ■ – □

K	*	4…20 mA + HART® / 1 mm / cable
L	*	4…20 mA + HART® / 1 mm / Ex ia G / cable
M		4…20 mA + HART® / 1 mm / DIN connector
N	*	4…20 mA + HART® / 1 mm / Ex ia G / DIN connector
O	*	4…20 mA + HART® / 1 mm / M12x1 connector
P	*	4…20 mA + HART® / 1 mm / Ex ia G / M12x1 connector

* Under development

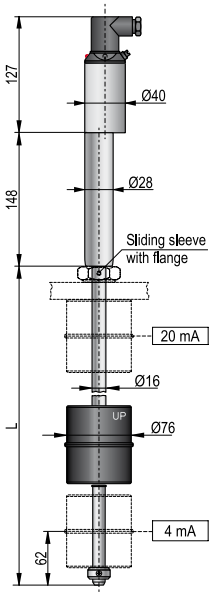
The material of the float (PVDF or PP) should be given in text of the order. The standard float material is PVDF.

Process connection

MGH-105-2M-300-00	Sliding sleeve: 1" BSP, PVDF
MGL-105-2M-300-00	Sliding sleeve: 1" NPT, PVDF
M F T – 3 2 1 – 2	PP flange DN80, PN16 + 1" BSP sliding sleeve must be ordered
M F T – 3 3 1 – 2	PP flange DN100, PN16 + 1" BSP sliding sleeve must be ordered

Accessories sold separately; see relevant page for details)

S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



MXU–5□□

NIVOTRACK magnetostrictive level transmitters are an ideal solution for high-accuracy measurement of clean fluids. Their level of precision makes them an excellent choice for the custody transfer measurement of liquids such as fuels, solvents, and alcohol derivatives. Flexible tube units make accurate measurements possible in tanks as high as 15 meters. Models with plastic coating can be used with aggressive materials. Integrating the transmitter into a process control system is easy due to the intelligent signal processing and communication software and the wide range of accessories offered.

FEATURES

- 0.1 mm or 1 mm resolution
- Insertion length up to 15 m
- Compact model
- Rigid or flexible guide tube
- Plastic-coated version for chemicals
- 4…20 mA and HART® output
- Graphic display
- 99 point linearization table
- Measurement optimization
- Volume measurement
- ATEX certified variants
- IP67 (IP68)
- 5 yeras warranty

APPLICATIONS

- Custody transfer measurement
- Oil, gas and chemical industry *(ATG – Automatic Tanking Gauge)*
- Fuels and gasoline products
- Pharmaceutical industry
- Alcohols and beverages, food industry
- Installation in bypass tubes possible
- Supplementary level transmitter for **NIVOFLIP** magnetic flip indicator

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d G)
- ATEX (Ex d ia G)
- OIML R 85
- IEC Ex (Ex ia G)
- IEC Ex (Ex d G)
- IEC Ex (Ex d ia G)

MCA–500
mini version

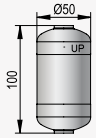
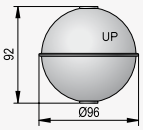
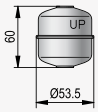
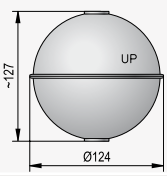
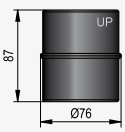
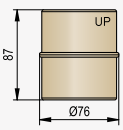
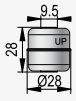
MTA–500
rigid probe

MG□–500
plastic-coated
version

SAP–300
graphic display

MTK–500
flexible probe
version

FLOATS

	MBA–505–2M–600–00[1]	MBK–530–2M–400–00	MBA–505–2M–800–00[1]	MBA–505–2M–200–00[1]	MBA–505–2M–900–00	MGU–505–2M–200-00	MGU–506–1M–200-00	4w34bs–16yyyyy[2]
Dimensions								
Medium density (min.)	0.45 kg/dm³	0.55 kg/dm³	0.55 kg/dm³	0.8 kg/dm³	0.4 kg/dm³	0.7 kg/dm³	0.4 kg/dm³	0.8 kg/dm³
Material	Titanium	1.4435	Titanium	1.4404	1.4401	PVDF	PP	1.4404
Medium pressure	16 bar (1.6 MPa)		25 bar (2.5 MPa)			3 bar (0.3 MPa)		10 bar (1 MPa)

[1] Designed for min. 2" process connection

[2] Designed for min. 1" process connection, only order with mini version

TECHNICAL DATA

		Rigid probe	Flexible probe	Plastic-coated rigid probe	Mini version with rigid probe
Measured process value		Liquid level, distance, volume			
Nominal length (L)		0.5…4.5 m	2…15 m	0.5…3 m	0.5…1.5 m
Material of the tube		1.4571 (316Ti) stainless steel		PFA-coated stainless steel	1.4571 stainless steel
Highest process pressure [1]		25 bar (2.5 MPa)	16 bar (1.6 MPa)	3 bar (0.3 MPa)	10 bar (1 MPa)
Process temperature		−40…+90 °C, see temperature diagram			
Standard float diameter / material [2]		Ø53.5 × 60 mm cylindrical / 1.4404 (316L)	Ø96 mm ball / 1.4435 (316L)	Ø76 × 87 mm cylindrical / PVDF / PP	Ø28 × 28 mm cylindrical 1.4404 (316L)
Medium density		See "Floats"			
Material of wetted parts		Stainless steel: 1.4571, 1.4404 (316Ti, 316 L)		PFA, PVDF, PP	Stainless steel: 1.4571, 1.4404
Ambient temperature		−40…+70 °C, plastic housing: −25…+70 °C, with display: −25…+70 °C, Ex variant: see temperature diagram in the user's manual			
Output	Analog	4…20 mA (limit values: 3.9…20.5 mA)			
	Digital	HART® (lowest loop resistance: 250 Ω)			
	Display	Graphic display (SAP–300)			
Damping time		Adjustable 0…99 s			
Error indication		22 mA or 3.8 mA or holding			
Output load		$R_L = (U_s - 12.5\ V)/0.02\ A$, U_s = supply voltage			
Supply voltage		12.5…36 V DC			
Electrical protection		Class III			
Ingress protection		IP67, IP68 for M□□–5/7□□–9 types (IP68 specification: 4 m water column for 4 hours)			
Process connection		As per order code			
Electric connection		2× M20×1.5 plastic cable glands for Ø6…Ø12 mm cable + 2× internally threaded ½" NPT connection for protective pipes for 0.5…1.5 mm² wire cross section, IP68 protection: up to 20 m, LiY-CY 6×0.5 mm, fitted with 500 V cable			
Housing		Plastic (PBT) or painted aluminum or stainless steel			
Weight		1.7 kg + m. probe: 0.6 kg/m	2.9 kg + m. probe: 0.3 kg/m + counterweight 3.5 kg	1.7 kg + m. probe: 0.7 kg/m	1.7 kg + m. probe: 0.6 kg/m

[1] Depends on selected float, with sliding sleeve connection the highest process pressure is 3 bar (0.3 MPa)

[2] Requested float version must be specified in the order

MEASUREMENT DATA

	M□□–□□□–2/4/6/8	M□□–□□□–1/3/5/7, M□□–□□□–A/B/C/D
Resolution [3]	1 mm	0.1 mm
Nonlinearity [3] [4] (up to 10 m order length)	±2 mm or ±0.02% F.S. whichever is greater	±1 mm or ±0.01% F.S. whichever is greater
Nonlinearity [3] [4] (above 10 m order length)	±3 mm or ±0.02% F.S. whichever is greater	
Hysteresis [5]	±1 mm	±0.25 mm (up to 10 m length)
		±1 mm (above 10 m length)
Zero span (in LEVEL mode)	Anywhere within the active range	
Measuring Range (reducing)	Minimum distance: 200 mm; maximum distance: as per probe length	
Temperature error	0.04 mm / 10 °C between (−25…+50 °C)	
Current Output Properties	Resolution: 2 µA, accuracy: 10 µA, temperature error: 200 ppm/ °C	

[3] For displayed and HART® transmitted values

[4] Under reference conditions

[5] In case of a different factory setting the accuracy data is not valid!

Ex INFORMATION

	M□□–5/7□□–9 Ex [6]	M□□–5/7□□– –5 Ex, 6 Ex, 7 Ex, 8 Ex	M□□–5/7□□– –C Ex, D Ex	M□□–5/7□□– –A Ex, B Ex
Ex marking (ATEX)	⟨Ex⟩ II 1 G Ex ia IIB T6…T5 Ga		⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T5 Ga/Gb	⟨Ex⟩ II 2 G Ex d IIB T6…T5 Gb
Ex marking (IECEx)	Ex ia IIB T6…T5 Ga		Ex db ia IIB T6 Ga/Gb	Ex db IIB T6…T5 Gb
Nominal lenght (L)	0.5…15 m		0.5…10 m	
Cable entry	–	M20×1.5 cable gland	Metal M20×1.5 cable gland Ex d certification	
Cable outer diameter	–	Ø7…Ø13 mm	Ø9…Ø11 mm	
Stock cable	max. 20 m; LiY-CY 6x0.5 mm; 500 V C < 9 nF; L < 10 µH	–		
Ex supply voltage, Intrinsically safety data	U_i = 30 V I_i = 140 mA P_i = 1 W	U_i = 30 V I_i = 140 mA P_i = 1 W C_i < 15 nF L_i < 200 µH		U_i: 12.5…36 V DC I_i = 140 mA
	ATEX: C_i < 25 nF, L_i < 210 µH			
	IECEx: C_i < 15 nF, L_i < 200 µH			

[6] Caution! The M□□–5□□–9 Ex is rated IP68. The cover, the cable gland, the cable, and the cover plug are glued in place and cannot be opened!

NIVOTRACK M-500/M-600 with rigid probe — 5 years

2-wire compact magnetostrictive level transmitter for liquids
with stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M □■ – ■■■ – ■

T		Transmitter
B		Transmitter with local LCD display

Process connection

M ■□ – ■■■ – ■

A		1" BSP
C		2" BSP
D		1" NPT
G		2" NPT
O		2½" TriClamp
P		3" TriClamp
R		4" TriClamp
U		Without process connection for sliding sleeve
L	*	Without float, for NIVOFLIP (max. 5.8 m, max. +90 °C)
T	*	Without float, for NIVOFLIP (max. 5,8 m, max. +200 °C)

* Probe length = center to center of NIVOFLIP +400 mm as per float version and pressure rating

Housing

M ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced(Ex version not available)
7	Stainless steel

Probe length**

M ■■ – ■□□ – ■

n n	0.5...1 m
o o	1.1...3 m; sold by the 100 mm

nn = 05...10 : 0.5...1 m
oo = 11...30 : 1.1...3 m, ** 3...4.5 m as per special offer

Output / Resolution / Certificates / El. connection

M ■■ – ■■■ – □

1	4...20 mA / 0,1 mm
2	4...20 mA / 1 mm
3	4...20 mA + HART® / 0,1 mm
4	4...20 mA + HART® / 1 mm
5	4...20 mA / 0,1 mm / Ex ia G
6	4...20 mA / 1 mm / Ex ia G
7	4...20 mA + HART® / 0,1 mm / Ex ia G
8	4...20 mA + HART® / 1 mm / Ex ia G
A	4...20 mA / 0.1 mm / Ex d G
B	4...20 mA + HART® / 0,1 mm / Ex d G
C	4...20 mA / 0,1 mm / Ex d ia G
D	4...20 mA + HART® / 0,1 mm / Ex d ia G

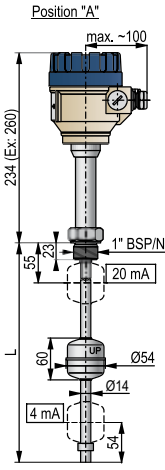
For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length.
Need of IEC Ex is to be specified in the text part of the order.

Available on request (must be specified in the text of the order)

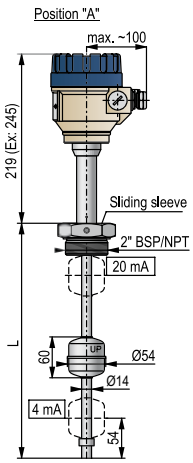
Ø96 mm stainless steel (1.4404) ball float (for min. 0.55 kg/dm³ liquids)
Ø124 mm stainless steel (1.4401) ball float (for min. 0.4 kg/dm³ liquids)
Ø53.5 mm titanium float (for min. 0.55 kg/dm³ liquids)
Ø50x100 mm titanium float (min. 0.45 kg/dm³)
Side viewed "B" head position model

Accessories sold separately; see relevant page for details

MBH-105-2M-300-00	Sliding sleeve, 1.4571, 1" BSP
MBK-105-2M-300-00	Sliding sleeve, 1.4571, 2" BSP
MBL-105-2M-300-00	Sliding sleeve, 1.4571, 1" NPT
MBN-105-2M-300-00	Sliding sleeve, 1.4571, 2" NPT
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



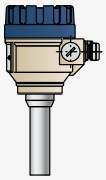
MTA / MTD-500 / 600



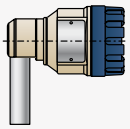
MTU-500 / 600

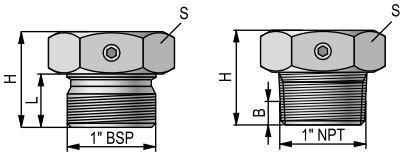
Housing position

Position "A"

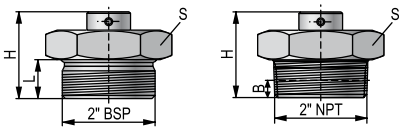


Position "B"





MBH / MBL-105-2M-300-000



MBK / MBN-105-2M-300-000

Type	Material	Proc. conn.	Dimensions S (mm)	H (mm)	L (mm)	B (mm)
MBH-105-2M-300-00	1.4571	1" BSP	41	36	20	–
MBK-105-2M-300-00	1.4571	2" BSP	60	55	24	–
MBL-105-2M-300-00	1.4571	1" NPT	41	37	–	10
MBN-105-2M-300-00	1.4571	2" NPT	60	44.5	–	11

NIVOTRACK M-500/M-600 with flexible probe — 5 years

2-wire compact magnetostrictive level transmitter for liquids
with stainless steel cable probe and weight with 0.1 mm or 1 mm resolution

Version

M □■ – ■■■ – ■

T	Transmitter
B	Transmitter with local LCD display

Process connection

M ■□ – ■■■ – ■

K	2" BSP
N	2" NPT

Housing

M ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■■ – ■□□ – ■

n n	2…3 m
o o	3.1…15 m; sold by the 100 mm

nn = 20…30 : 2…3 m
oo = 31…F0 : 3.1…15 m

Output / Resolution / Certificates

M ■■ – ■■■ – □

1	4…20 mA / 0.1 mm
2	4…20 mA / 1 mm
3	4…20 mA + HART® / 0.1 mm
4	4…20 mA + HART® / 1 mm
5	4…20 mA / 0.1 mm / Ex ia G
6	4…20 mA / 1 mm / Ex ia G
7	4…20 mA + HART® / 0.1 mm / Ex ia G
8	4…20 mA + HART® / 1 mm / Ex ia G
A	4…20 mA / 0.1 mm / Ex d G (up to 10 m)
B	4…20 mA + HART® / 0.1 mm / Ex d G (up to 10 m)
C	4…20 mA / 0.1 mm / Ex d ia G (up to 10 m)
D	4…20 mA + HART® / 0.1 mm / Ex d ia G (up to 10 m)

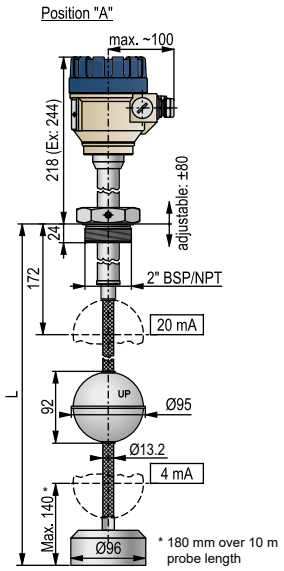
For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length.
Need of IEC Ex is to be specified in the text part of the order.

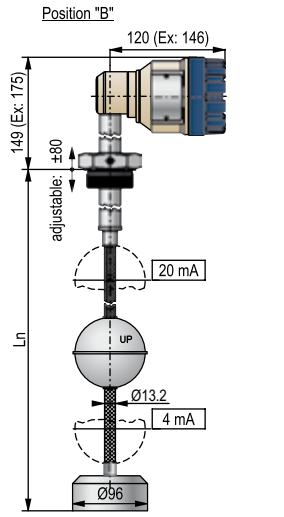
Available on request (must be specified in the text of the order)

Ø124 mm ball float (for min. 0.4 kg/dm³ liquids)
Side viewed "B" head position model

Accessories sold separately; seerelevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G





MTK / MTN-500 / 600

NIVOTRACK M-500/M-600 with plastic-coated rigid probe — 5 years

2-wire compact magnetostrictive level transmitter for liquids
with plastic-coated stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M □ U – ■■■ – ■

E	Transmitter
G	Transmitter with local LCD display

Process connection

M ■□ – ■■■ – ■

U	Without process connection for sliding sleeve

Housing

M ■ U – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■ U – ■□□ – ■

n n	0,5...1 m
o o	1.1...3 m; sold by the 100 mm

nn = 05...10 : 0.5...1 m
oo = 11...30 : 1.1...3 m

Output / Resolution / Certificates

M ■ U – ■■■ – □

1	4...20 mA / 0,1 mm
2	4...20 mA / 1 mm
3	4...20 mA + HART® / 0,1 mm
4	4...20 mA + HART® / 1 mm
5	4...20 mA / 0,1 mm / Ex ia G
6	4...20 mA / 1 mm / Ex ia G
7	4...20 mA + HART® / 0,1 mm / Ex ia G
8	4...20 mA + HART® / 1 mm / Ex ia G
A	4...20 mA / 0,1 mm / Ex d G
B	4...20 mA + HART® / 0,1 mm / Ex d G
C	4...20 mA / 0,1 mm / Ex d ia G
D	4...20 mA + HART® / 0,1 mm / Ex d ia G

For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length.
Need of IEC Ex is to be specified in the text part of the order.
The material of the float (PVDF or PP) must be specified in text of the order. The standard float material is PVDF.

Available on request (must be specified in the text of the order)

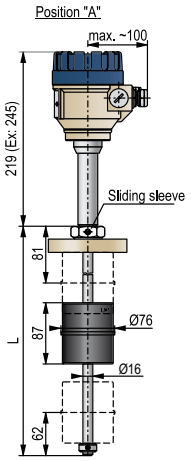
Side viewed "B" head position model

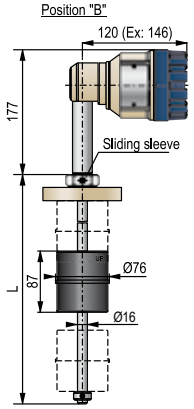
Process connection

MGH-105-2M-300-00	Sliding sleeve: 1" BSP
MGL-105-2M-300-00	Sliding sleeve: 1" NPT
M F T – 3 2 1 – 2	PP flange DN80, PN16 + 1" BSP sliding sleeve must be ordered
M F T – 3 3 1 – 2	PP flange DN100, PN16 + 1" BSP sliding sleeve must be ordered

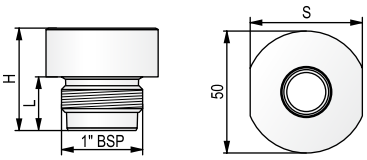
Accessories sold separately; see relevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G





MEU-500 / 600



MGH-105-2M-300-000

	Material	Proc. conn.	Dimensions S (mm)	H (mm)	L (mm)
MGH-105-2M-300-00	PVDF	1" BSP	46	42	22
MGL-105-2M-300-00		1" NPT			25

NIVOTRACK M-500/M-600 mini version with rigid probe — 5 years

2-wire compact magnetostrictive level transmitter for liquids
mini version with stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M ☐■ – ■■■ – ■

M	Transmitter
C	Transmitter with local LCD display

Process connection

M ■☐ – ■■■ – ■

A	1" BSP
D	1" NPT
J	1½" TriClamp
M	2" TriClamp
O	2½" TriClamp
P	3" TriClamp
R	4" TriClamp

Housing

M ■■ – ☐■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■■ – ■☐☐ – ■

n n	0,5...1 m
o o	1.1...1.5 m; sold by the 100 mm

nn = 05...10 : 0.5...1 m
oo = 11...15 : 1.1...1.5 m

Output / Resolution / Certificates

M ■■ – ■■■ – ☐

1	4...20 mA / 0.1 mm
2	4...20 mA / 1 mm
3	4...20 mA + HART® / 0.1 mm
4	4...20 mA + HART® / 1 mm
5	4...20 mA / 0.1 mm / Ex ia G
6	4...20 mA / 1 mm / Ex ia G
7	4...20 mA + HART® / 0.1 mm / Ex ia G
8	4...20 mA + HART® / 1 mm / Ex ia G

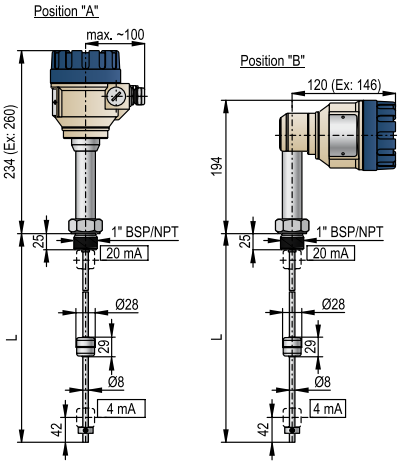
Need of IEC Ex is to be specified in the text part of the order

Available on request must be specified in the text of the order)

Side viewed "B" head position model

Accessories sold separately; see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



MMA / MMD-500 / 600

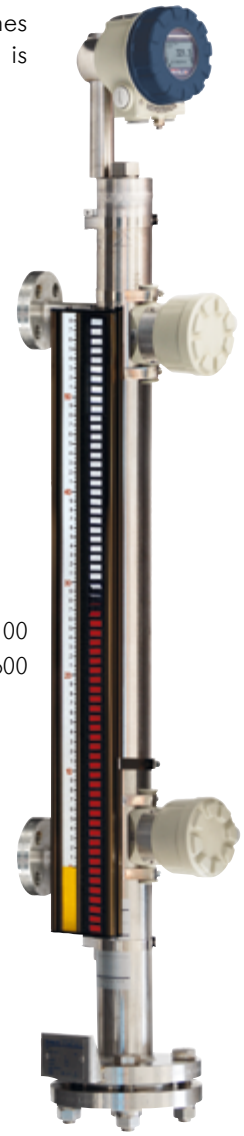
NIVOFLIP is a bypass level indicator for pressurized vessels with up to 5.5 m flange distance containing liquids. The device has the international PED *(Pressure Equipment Directive)* certificate, so it can be used for level indication of pressurized vessels up to 100 bar process pressure. The high-temperature versions are applicable up to +250 °C process temperature. **NIVOFLIP** can be equipped with optional limit switches or with **NIVELCO**'s **NIVOTRACK** high-precision magnetostrictive level transmitter if level transmission is needed.

FEATURES

- Clearly visible display
- Measuring range: 500…5500 mm
- ±10 mm accuracy
- Up to 100 bar process pressure
- High-temperature version
- Aluminum or stainless steel indicator housing
- Optional level switches
- Optional magnetostrictive level transmitter
- Explosion-proof
- 5 years warranty

APPLICATIONS

- Oil & Gas
- Chemical industry
- Power generation
- Boilers
- Pressurized vessels
- Tanks



NIVOFLIP ML□–100 + MAK–100
+ NIVOTRACK M□L–500/600

CERTIFICATES

- PED certificate
- ATEX (Ex d e m Gb): MAK–100 level switches
- ATEX (Ex h Ga/Gb): ML–100 bypass level indicator

OPERATION

The fluid level in the bypass chamber is the same as in the tank. The welded bypass chamber and the tank form one pressurized system, so the float containing a magnet rises and descends with the fluid level. The properly polarized magnet in the float topples the two-toned plates with the colored magnetic caps through the stainless steel tube's wall, indicating the fluid level. The plates with different color codes on the 100 mm under the lower stem provide a visual error message when fluid levels drop below the instrument's lower connecting point.

NIVOFLIP LEVEL INDICATING SYSTEM

NIVOFLIP bypass liquid level indicator can be equipped with positionable MAK–100/200 external level switches to provide level limit switching. For MAK–100 level switches, the minimal liquid density must exceed the default value specified in the datasheet by 0.1 kg/dm^3. For jobs requiring more accuracy than that of the magnetic flaps, high-precision **NIVOTRACK M–500** magnetostrictive level transmitters are recommended to use. Equipped with OIML R 85 certified **NIVOTRACK**, the measurement system is suitable for custody transfer measurements. The floatless rigid probe magnetostrictive transmitter can be mounted externally to the bypass chamber with clamps. All optional units are operated via magnetic coupling, there is no direct contact with the measured material.

PROPERTIES

NIVOFLIP	Standard version	High-temperature version
Titanium float	■	■
PED certificate	■	■
Maximum 100 bar process pressure	■	–
Maximum +250 °C process temperature	–	■
Optional level switch	■	■
Optional level transmitter	■	■

TECHNICAL DATA

		Standard version	High-temperature version
Display type		Two-toned magnetic flaps	
Display	scale	cm / inch	
	accuracy	±10 mm	
	resolution	5 mm	
	error indication	Lower 100 mm, inversely polarized flaps	
Tube diameter		Ø60.3 mm	
Flange distance (center to center)		500…5500 mm (as per order code)	
Process connection		DIN, ANSI flanges (as per order code)	
Vent connection		M20×1.5	
Process pressure		Max. 100 bar	Max. 88 bar
Process temperature		−60…+130 °C	−60…+250 °C
Ambient temperature		−60…+60 °C	
Min. medium density [1]		0.6 kg/dm³	
Level switch		Optional, freely adjustable MAK–100/200 level switches [2]	
PED (2014/68/EU) certificate		Category I–III, Module B + C2	
Level transmitter		Optional NIVOTRACK M□L–500 / 600 / 700 magnetostrictive level transmitter [2]	
Weight		About 25 kg for 1 m center to center distance	

[1] *In case of MAK–100 level switches, the minimal medium density must exceed the default value by 0.1 kg/dm³. The minimum media density is influenced by the type of float!*
[2] *For NIVOTRACK level transmitters and MAK level switches, the highest temperature values are shown in the diagram below.*

Ex INFORMATION

ATEX certificate	ML□–□□□–□ Ex, MH□–□□□–□ Ex	Ex marking: ⟨Ex⟩ II 1/2 G Ex h IIC T6…T2 Ga/Gb

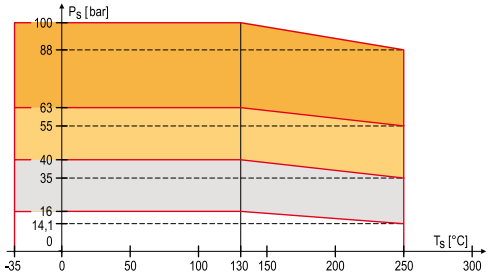
Temperature data for Ex certified models	Hazardous gas atmospheres			
	Standard [ML□–□□□–□ Ex]			High-temperature [MH□–□□□–□ Ex]
Highest process temperature	+80 °C	+95 °C	+130 °C	+250 °C
Highest ambient temperature	+60 °C			
Highest surface temperature	+80 °C	+95 °C	+130 °C	+250 °C
Temperature class	**T6**	**T5**	**T4**	**T2**

Lowest ambient and process temperature: −60 °C

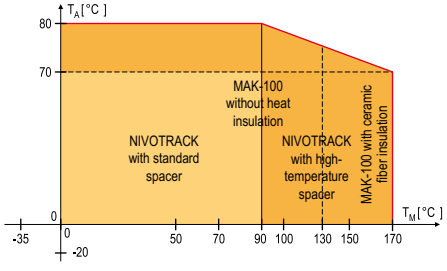
Highest process pressure		Highest process temperature	
Process connection	Bypass tube / Flange rating	T_{max} = 130 °C	T_{max} = 250 °C
		Standard version	High-temperature version
		Maximum process pressure	
DIN flanges DN15 – DN50	Ø60 mm / PN16	16 bar	14.1 bar
	Ø60 mm / PN40	40 bar	35 bar
	Ø60 mm / PN63	63 bar	55 bar
	Ø60 mm / PN100	100 bar	88 bar
ANSI flanges ½" – 1"	Ø2.35" / 150 Class	232 psi	204 psi
	Ø2.35" / 400 Class	580 psi	500 psi
	Ø2.35" / 600 Class	930 psi	800 psi
	Ø2.35" / 900 Class	1440 psi	1275 psi

TEMPERATURE DIAGRAM

Temperature (T_S) – Pressure (P_S) diagram



Process temperature (T_M) – Ambient temperature (T_A) diagram when NIVOTRACK level transmitter or MAK–100/MAK–200 level switch is mounted on NIVOFLIP



MAK–100/200 MAGNETIC LEVEL SWITCHES

The **MAK** magnetic level switches are optional accessories for **NIVOFLIP** bypass level indicators. The float in the stainless steel bypass tube follows the level of the measured liquid. The float *(permanent magnet)* operates the positionable MAK–100/200 level switch via magnetic coupling and provides a non-contact signal transfer to the switch. There must be at least 100 mm distance for MAK–100 and 60 mm distance for MAK–200 between two switching points.

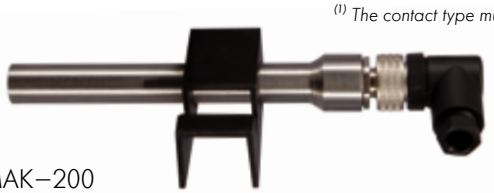
TECHNICAL DATA

	MAK–100–0	MAK–100–7 Ex	MAK–100–6 Ex	NEW MAK–2□0–□
Process temperature	up to +130 °C	See temperature classes table		up to +130 °C
Ambient temperature	–20…+80 °C			–25…+90 °C
Material of the switch-housing	Painted aluminum			Stainless steel (DIN 1.4571)
Bracket material	–			Aluminum
Switch	1 microswitch, with NO, NC contacts			1 bistable reed switch, with NO, NC contacts[1]
Switching data	250 V 2.5 A AC12, 220 V 0.3 A DC13		Only Ex ia certified and approved contact isolator should be used for supply	120 W / VA, 250 V AC/DC, 3 A
Switching hysteresis	up to Δ 35 mm			up to Δ 20 mm
Electrical connection	M20×1.5 cable gland, terminal for max. 2.5 mm² wire cross section			M12 cable gland: cable diameter: Ø4…6 mm, max 0.75 mm² wire cross section
Ingress protection	IP65			
Electrical protection	Class I			Class II
Overvoltage protection	–			Class II (degree of pollution: 2)
Ex marking	–	Ex II 2 G Ex db eb mb IIC T6…T4	Ex II 1 G	–
Weight	1.5 kg			~0.15 kg

[1] *The contact type must be specified in the order code.*

MAK–100

MAK–200

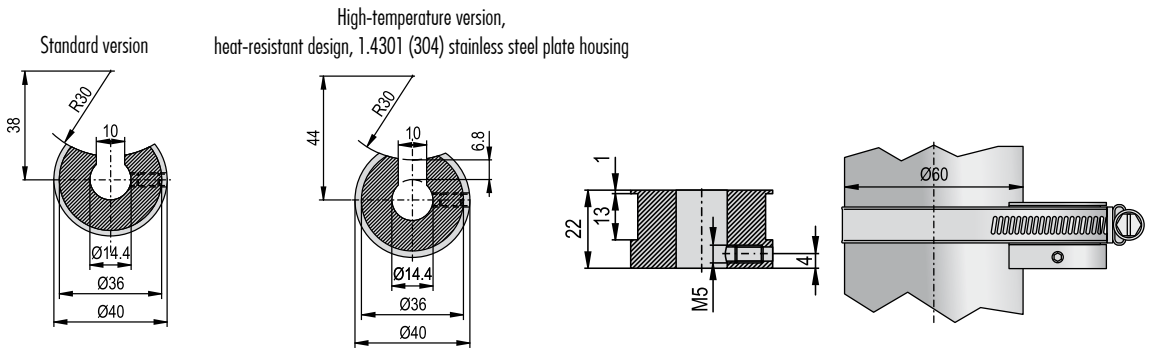


TEMPERATURE DATA FOR Ex CERTIFIED MODELS

Temperature classes		
Classes	Max. process temperature	Ambient temperature
T6	+70 °C	–20…+60 °C
T5	+85 °C	–20…+70 °C
T4	+120 °C	–20…+80 °C

NIVOTRACK MOUNTED ON NIVOFLIP

The length of the magnetostrictive level transmitter's probe must be 400 mm longer than the center to center distance of the bypass tube, depending on float version. The level transmitter is placed onto the bypass tube so that the top of the magnetostrictive probe is at the same height as the bypass tube's top. The end of the probe must extend 20 mm / 40 mm farter than the error indication flaps.
The aluminum spacers that come with the level transmitter are held to the probe stem by grub screws, and the assembly is clamped onto the bypass tube. High-temperature versions have ceramic fiber insulator fabric between the bypass tube and the probe of the level transmitter.



NIVOFLIP ML — 5 years

Bypass level indicator with optical display and magnetic float for liquids with titanium float and for max. 16 or 40 bar process pressure

Version

M □■ – ■■■ – ■

L	Standard version, max. +130 °C
H	High-temperature version, max. +250 °C, as per pressure diagram

Process connection

M ■□ – ■■■ – ■

A	DN15 (B form)
B	DN20 (B form)
C	DN25 (B form)
D	DN40 (B form)
E	DN50 (B form)
F	ANSI ½" RF
G	ANSI ¾" RF
H	ANSI 1" RF
J	ANSI 1½" RF
K	ANSI 2" RF
X	¾" BSPT
Y	¾" NPT
1	1" BSPT
2	1" NPT

Bypass tube / Pressure / Lamella housing material

M ■■ – □■■ – ■

5	60.3 mm tube diameter / PN16; 150 Class / Aluminum
1	60.3 mm tube diameter / PN40; 400 Class / Aluminum
9	60.3 mm tube diameter / PN16; 150 Class / Stainless steel
6	60.3 mm tube diameter / PN40; 400 Class / Stainless steel

Measuring range (center to center)

M ■■ – ■□□ – ■

For aluminum housing	
0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m
For stainless steel housing	
0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m
nn = 06…55 : 0.6…5.5 m	

Float material / Scale

M ■■ – ■■■ – □

1	Titanium / mm scale
3	Titanium / Feet/inch scale

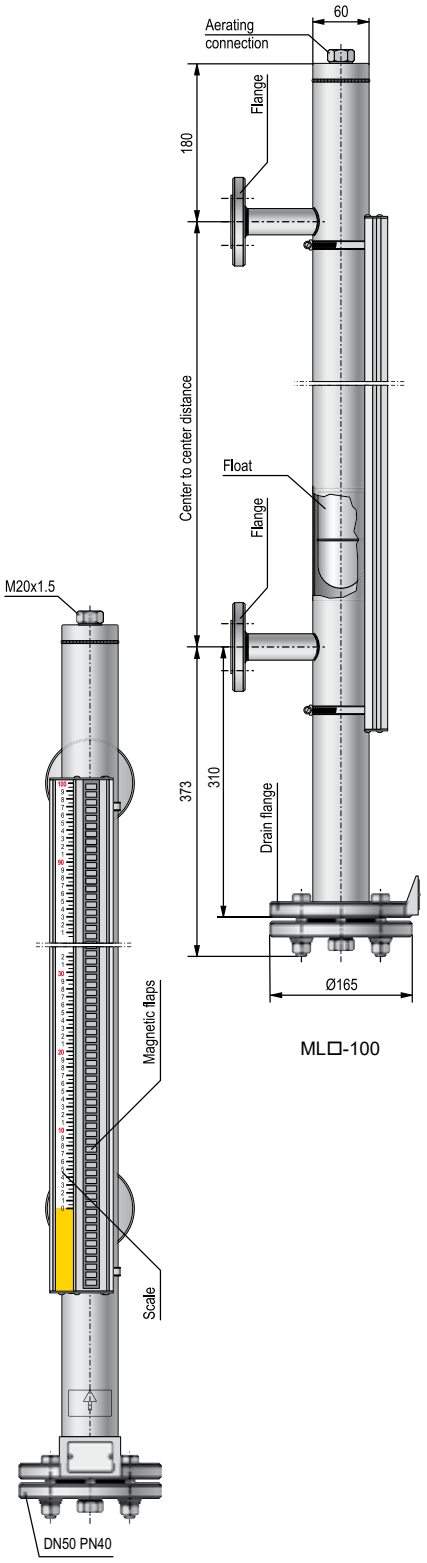
The instrument can be equipped with high-resolution NIVOTRACK M_L-500 and M_T-500 magnetostrictive level transmitter up to +90 °C / +200 °C process temperature! (Center to center distance +400 mm).

Available on request (must be specified in the text of the order)

Drain/vent plug M20x1.5 / ½" BSP inner thread
Drain/vent plug M20x1.5 / ½" NPT inner thread
Drain/vent plug M20x1.5 / ¾" BSP inner thread
Drain/vent plug M20x1.5 / ¾" NPT inner thread
Drain/vent plug M20x1.5 / ½" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ½" NPT inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temperature version

Accessories sold separately

MLD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread
MLD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread
MLD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread
MLD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread
MHD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread, high temp. version
MHD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread, high temp. version
MHD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temp. version
MHD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temp. version
MLD-105-0M-711-00	Ball valve ½" BSP MF 63 bar / 914 psi (max. +180 °C)
MLD-105-0M-721-00	Ball valve ½" NPT MF 63 bar / 914 psi (max. +180 °C)



ML□-100

NIVOFLIP ML — 5 years

Bypass level indicator with optical display and magnetic float for liquids
with titanium float and for max. 63 or 100 bar process pressure

Version

M □■ – ■■■ – ■

L	Standard version, max. +130 °C
H	High-temperature version, max. +250 °C, as per pressure diagram

Process connection

M ■□ – ■■■ – ■

A	DN15 (B form)
B	DN20 (B form)
C	DN25 (B form)
D	DN40 (B form)
E	DN50 (B form)
F	ANSI ½" RF
G	ANSI ¾" RF
H	ANSI 1" RF
J	ANSI 1½" RF
K	ANSI 2" RF

Bypass tube / Pressure / Lamella housing material

M ■■ – □■■ – ■

3	60.3 mm tube diameter / PN63; 600 Class / Aluminum
4	60.3 mm tube diameter / PN100; 900 Class / Aluminum
7	60.3 mm tube diameter / PN63; 600 Class / Stainless steel
8	60.3 mm tube diameter / PN100; 900 Class / Stainless steel

Measuring range (center to center)

M ■■ – ■□□ – ■

For aluminum housing	
0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m
For stainless steel housing	
0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m
nn = 06…55 : 0.6…5.5 m	

Float material / Scale

M ■■ – ■■■ – □

1	Titanium / mm scale
3	Titanium / Feet/inch scale

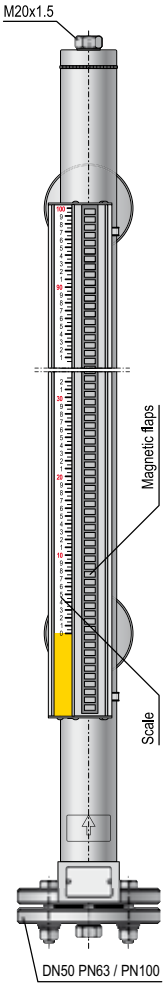
The instrument can be equipped with high resolution NIVOTRACK M_L-500 and M_T-500 magnetostrictive level transmitter up to +90 °C / +200 °C process temperature! (Center to center distance +400 mm).

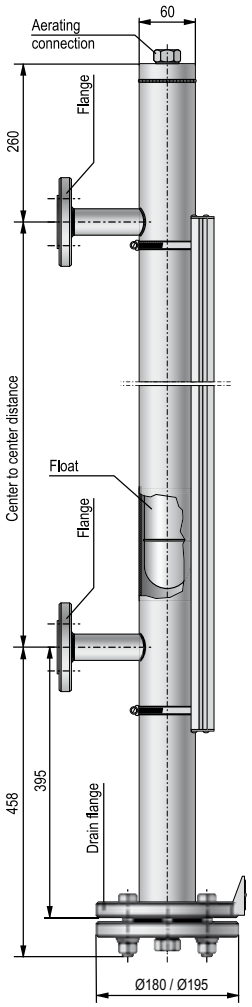
Available on request (must be specified in the text of the order)

Drain/vent plug M20x1.5 / ½" BSP inner thread
Drain/vent plug M20x1.5 / ½" NPT inner thread
Drain/vent plug M20x1.5 / ¾" BSP inner thread
Drain/vent plug M20x1.5 / ¾" NPT inner thread
Drain/vent plug M20x1.5 / ½" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ½" NPT inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temperature version

Accessories sold separately

MLD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread
MLD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread
MLD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread
MLD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread
MHD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread, high temp. version
MHD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread, high temp. version
MHD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temp. version
MHD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temp. version
MLD-105-0M-711-00	Ball valve ½" BSP MF 63 bar / 914 psi (max. +180 °C)
MLD-105-0M-721-00	Ball valve ½" NPT MF 63 bar / 914 psi (max. +180 °C)





MLD-300 / 400

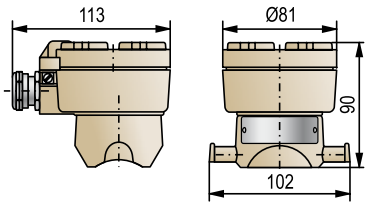
NIVOFLIP MAK-100 — 5 years

Magnetic coupling limit switch for NIVOFLIP ML bypass level indicator
with contact output, factory positioned at intervals specified in the order

Ex certificate

M A K – 1 0 0 – ☐

0		None
6		Ex ia
7		Ex d e m Gb



MAK–100

NIVOFLIP MAK-200 — 5 years

Magnetic coupling limit switch for NIVOFLIP ML bypass level indicator
with contact output, factory positioned at intervals specified in the order

Output%%TAB

M A K – 2 ☐ 0 – ■

0		1 bistable reed, NO
1		1 bistable reed, NC

Electrical connection%%TAB

M A K – 2 ■ ☐ – ■

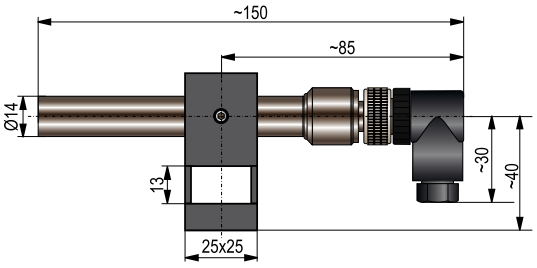
0		M12x1 connector

Ex certificate%%TAB

M A K – 2 ■ 0 – ☐

0		None
6	*	Ex ia

* Under development



MAK–200

NIVOFLIP ML — 5 years

Bypass measuring chamber for liquid level measurement or level switching, stainless steel, 16 or 40 bar

Prices on request

Version

M □■ – ■■■ – ■

L	Standard version, max. +130 °C
H	High-temperature version, max. +250 °C, as per pressure diagram

Process connection

M ■□ – ■■■ – ■

A	DN15 (B form)
B	DN20 (B form)
C	DN25 (B form)
D	DN40 (B form)
E	DN50 (B form)
F	ANSI ½" RF
G	ANSI ¾" RF
H	ANSI 1" RF
J	ANSI 1½" RF
K	ANSI 2" RF
X	¾" BSPT
Y	¾" NPT
1	1" BSPT
2	1" NPT

Bypass tube / Pressure

M ■■ – □■■ – ■

5	60.3 mm tube diameter / PN16; 150 Class
1	60.3 mm tube diameter / PN40; 400 Class

Measuring range (center to center)

M ■■ – ■□□ – ■

0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m

nn = 06…55 : 0.6…5.5 m

Instrument connection

M ■■ – ■■■ – □

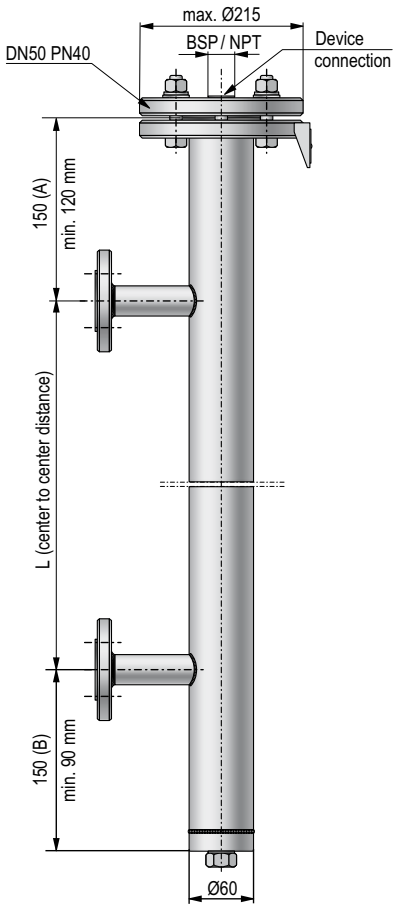
A	¾" BSP
B	¾" NPT
C	1" BSP
D	1" NPT
E	1½" BSP
F	1½" NPT
G	2" BSP
H	2" NPT

Available on request (must be specified in the text of the order)

Drain/vent plug M20x1.5 / ½" BSP inner thread
Drain/vent plug M20x1.5 / ½" NPT inner thread
Drain/vent plug M20x1.5 / ¾" BSP inner thread
Drain/vent plug M20x1.5 / ¾" NPT inner thread
Drain/vent plug M20x1.5 / ½" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ½" NPT inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temperature version

Accessories sold separately

MLD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread
MLD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread
MLD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread
MLD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread
MHD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread, high temp. version
MHD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread, high temp. version
MHD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temp. version
MHD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temp. version
MLD-105-0M-711-00	Ball valve ½" BSP MF 63 bar / 914 psi (max. +180 °C)
MLD-105-0M-721-00	Ball valve ½" NPT MF 63 bar / 914 psi (max. +180 °C)



ML□–100 / 500,
MH□–100 / 500

NIVOFLIP ML — 5 years

Bypass measuring chamber for liquid level measurement or level switching, stainless steel, 63 or 100 bar

Prices on request

Version

M □■ – ■■■ – ■

L	Standard version, max. +130 °C
H	High-temperature version, max. +250 °C, as per pressure diagram

Process connection

M ■□ – ■■■ – ■

A	DN15 (B form)
B	DN20 (B form)
C	DN25 (B form)
D	DN40 (B form)
E	DN50 (B form)
F	ANSI ½" RF
G	ANSI ¾" RF
H	ANSI 1" RF
J	ANSI 1½" RF
K	ANSI 2" RF

Bypass tube / Pressure

M ■■ – □■■ – ■

3	60.3 mm tube diameter / PN63; 600 Class
4	60.3 mm tube diameter / PN100; 900 Class

Measuring range (center to center)

M ■■ – ■□□ – ■

0 5	0.5 m
n n	0.6…5.5 m; sold by the 0.1 m

nn = 06…55 : 0.6…5.5 m

Instrument connection

M ■■ – ■■■ – □

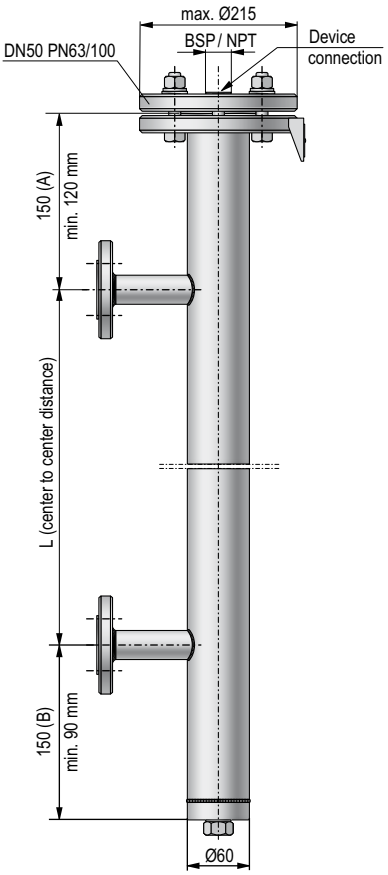
A	¾" BSP
B	¾" NPT
C	1" BSP
D	1" NPT
E	1½" BSP
F	1½" NPT
G	2" BSP
H	2" NPT

Available on request (must be specified in the text of the order)

Drain/vent plug M20x1.5 / ½" BSP inner thread
Drain/vent plug M20x1.5 / ½" NPT inner thread
Drain/vent plug M20x1.5 / ¾" BSP inner thread
Drain/vent plug M20x1.5 / ¾" NPT inner thread
Drain/vent plug M20x1.5 / ½" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ½" NPT inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temperature version
Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temperature version

Accessories sold separately

MLD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread
MLD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread
MLD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread
MLD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread
MHD-105-0M-611-00	Drain/vent plug M20x1.5 / ½" BSP inner thread, high temp. version
MHD-105-0M-621-00	Drain/vent plug M20x1.5 / ½" NPT inner thread, high temp. version
MHD-105-0M-631-00	Drain/vent plug M20x1.5 / ¾" BSP inner thread, high temp. version
MHD-105-0M-641-00	Drain/vent plug M20x1.5 / ¾" NPT inner thread, high temp. version
MLD-105-0M-711-00	Ball valve ½" BSP MF 63 bar / 914 psi (max. +180 °C)
MLD-105-0M-721-00	Ball valve ½" NPT MF 63 bar / 914 psi (max. +180 °C)



ML□–300 / 400,
MH□–300 / 400

The **EasyTREK SP–500 Pro** series level transmitters embody four decades of NIVELCO's experience in ultrasonic level measurement. **EasyTREK** devices are IP68 rated, their transducer and processing electronics are incorporated into a single unit. **EasyTREK** transmitters utilize HART® 7 communication, they can be used in multidrop systems connected to **MultiCONT** process controller/display, or a PC via a **UNICOMM** HART®–USB modem or similar. Transmitters can be programmed remotely with Handheld Field Communicator as well; they can be connected wirelessly to a computer via an **SAT–504** Bluetooth® HART® modem. The EasyTREK SP–500 Pro devices are smaller in size, their maximum measuring range has been extended, and their minimum measuring range decreased.

FEATURES

- 2-wire integrated transmitter
- Non-contact level measurement
- Can be powered by a 12 V battery
- Maximum 18 m measuring range
- Narrow (5°) beam angle
- Temperature compensation
- HART® 7
- Handheld compatibility
- Advanced threshold management
- Quick start mode
- Faster measurement cycle
- IP68 protection
- PP, PVDF, PTFE transducer
- Service Interface
- Ex version *(pending)*
- 5 years warranty

CERTIFICATES

- ATEX (Ex ia G) *(pending)*

TECHNICAL DATA

EasyTREK SP–500 Pro		
System		2-wire
Supply voltage		12…36 V DC
Accuracy[1]		± (0.1% of measured distance +0.025% of range) or ± (0.05% of range), whichever is greater
Resolution		Depending on measured distance: < 2 m: 1 mm, 2…5 m: 2 mm, 5…10 m: 5 mm, >10 m: 10 mm
Output	Analog	4…20 mA
	Relay	SPDT, 30 V DC, 1 A DC
	Digital communication	HART® 7
Ambient temperature		–30…+80 °C
Process temperature		PP, PVDF transducers –30…+90 °C
Pressure (absolute)		0.5…3 bar
Housing		PP or PVDF same as the transducer material
Electrical connection		4 × 0.5 mm² (relay version: 7 × 0.5 mm²) shielded Ø6 mm cable; standard cable length: 5 m (available up to 30 m)
Electrical protection		Class III
Ingress protection		IP68
Seal		PP transducers: EPDM; all other transducers: FPM (Viton®)

[1] *Under optimal conditions and constant transducer temperature.*

APPLICATIONS

- For liquid level measurement, open-channel flow metering
- Wide application area from wastewater to aggressive chemicals
- Level measurement in basins, wells, sumps, lift-stations
- Measuring of hydrocarbons, acids, water-based liquids

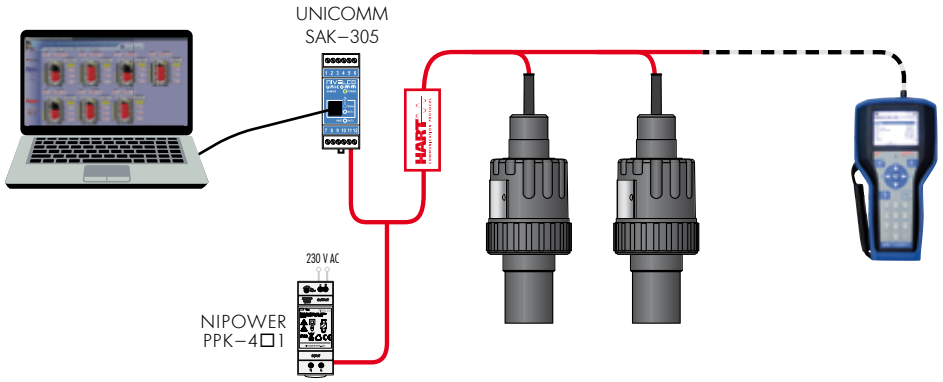
TRANSDUCER DETAILS

	SP□–					
	5A□–□	59□–□	58□–□	57□–□	56□–□	54□–□
Beam angle	5°	6°	5°	7°	5°	5°
Transducer material	PP, PVDF					
Upper process connection	1" BSP					
Lower process connection	1" BSP / NPT	1½" BSP / NPT	2" BSP / NPT		–	
Maximum measuring range[1]	3 m	5 m	8 m	10 m	12 m	18 m
Minimum measuring range[1]	0.15 m	0.18 m	0.2 m	0.25 m	0.25 m	0.35 m

[1] *Under optimal conditions and constant transducer temperature.*

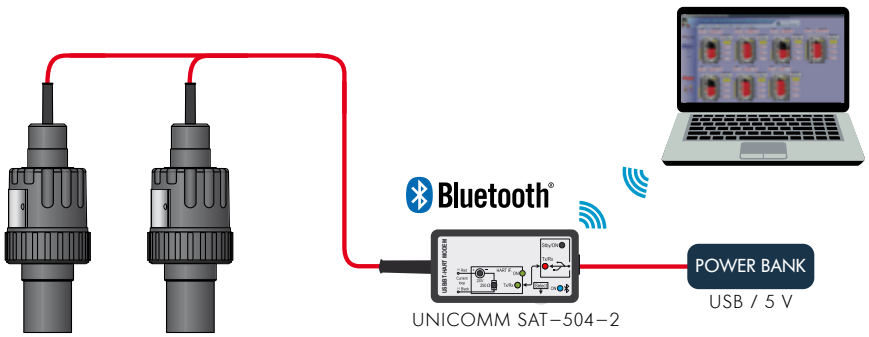
SPA–590

PC CONNECTION



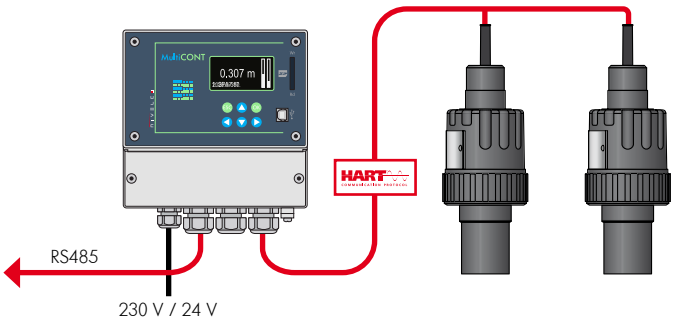
Instruments with HART® connectivity can be linked to a PC using a **UNICOMM** SAK–305 HART®–USB modem. All measured values of **EasyTREK** level transmitters can be visualized, and the instruments can be remotely programmed via HART®. Applicable software for PC: **EView2** configuration tool or **NIVISION** process visualization program.

Bluetooth® CONNECTIVITY



Instruments with HART® connectivity can be linked to a PC via Bluetooth® using a **UNICOMM** HART®–USB/Bluetooth® modem (SAT–504). The USB power bank connected to the **UNICOMM** modem can power the entire setup.

HART® MULTIDROP LOOP



MultiCONT Multichannel Process Controllers process and display measurement data supplied by **NIVELCO**'s HART® compatible transmitters in a Multidrop loop. Connected transmitters can be programmed through **MultiCONT**, and it can also perform data logging tasks. Processed data may be sent to a computer via RS485 and displayed in **NIVISON**.

EasyTREK SP-5A/59/58/57/56/54 Pro — 5 years

2-wire integrated ultrasonic level transmitters for liquids
with PP, PVDF or PTFE transducer; Ingress protection: IP68

Range / Frequency

S P ■ – 5 □ ■ – ■

A		0.15…3 m / 120 kHz (only for 1" process connection)
9		0.18…5 m / 80 kHz (only for 1" or 1½" process connection)
8		0.2…8 m / 80 kHz (only for 1" or 2" process connection)
7		0.25…10 m / 60 kHz (only for 1" or 2" process connection)
6		0.25…12 m / 60 kHz (only for 1" process connection)
4		0.35…18 m / 40 kHz (only for 1" process connection)

Transducer material

S P □ – 5 ■ ■ – ■

A		PP
B		PVDF
T	*	PTFE (only for SP-5A)

Process connection

S P ■ – 5 ■ □ – ■

0		BSP thread
N		1", 1½", 2" NPT and 1" BSP (only for SP-5A/59/58/57)

Output / Certificates

S P ■ – 5 ■ ■ – □

4		4…20 mA + HART®
8	*	4…20 mA + HART® / Ex ia G
H		4…20 mA + HART® + Relay

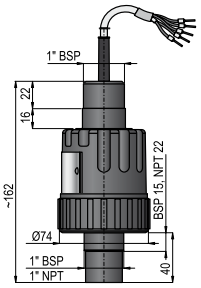
* Under development

Cable

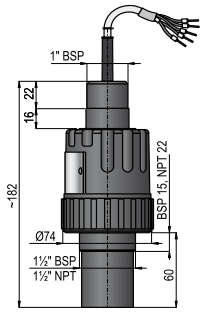
Maximum length 30 m; sold by the meter over the standard 5 m

Accessories sold separately; see relevant page for details

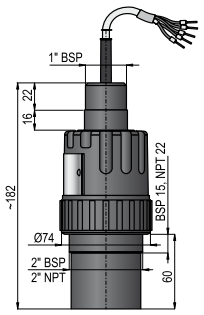
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G
S A A – 1 0 ■ – ■	Mounting brackets
S A A – 1 0 1 – 0	Quick-connect gland for pipe-mounting devices with 1" process connection, PP
S A A – 1 0 6 – 0	Damping gland for mounting SP devices to thin metal roofs, PP



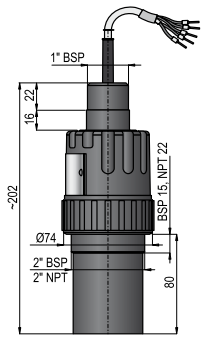
SP□-5A□



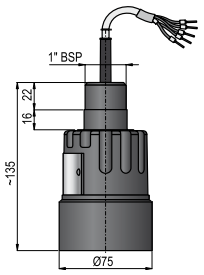
SP□-59□



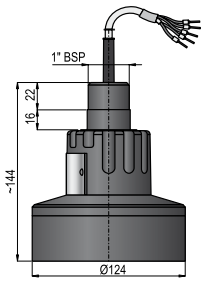
SP□-58□



SP□-57□



SP□-56□



SP□-54□

NIV24
SPA-5A0-4
SPA-590-4
SPA-580-4
SPA-560-4
SPA-540-4
SAA-107-0
SAA-108-0

Integrated Ultrasonic Level Transmitters for Liquids

EasyTREK

EasyTREK high-performance level transmitters embody four decades of NIVELCO's experience in ultrasonic level measurement. Whether measuring the level of sump tanks or open-channel flows, EasyTREK transmitters are the best choice. Installed on the tank's roof or above the liquid's surface, the transmitter produces produces an output signal *(analogue or HART® digital)* proportional to the liquid level. The **EasyTREK** is an integrated blind transmitter with equal measuring performance to that of EchoTREK; it is also readable and programmable remotely through HART® protocol. There are two mounting options fpr **EasyTREK**: a 1½" and a 2" process connection. Its 1" threaded neck facilitates suspending it above the medium, a typical water/wastewater application.

FEATURES

- 2-wire integrated level transmitter
- Non-contact level measurement
- Maximum 25 m measuring range
- Narrow (5°) beam angle
- Full temperature compensation
- IP68
- HART® communication
- Ex version
- 5 years warranty

APPLICATIONS

- For most liquids, including flammable liquids
- Open-channel flow metering
- Wide application range from wastewater to aggressive chemicals
- Level measurement in basins, wells, sumps, lift-stations
- Measuring hydrocarbons, acids, aggressive liquids, any water-based mediums

CERTIFICATES

- ATEX (Ex ia G)
- INMETRO (Ex ia G)
- UKCA Ex (Ex ia G)

SPA-380-4

TRANSDUCERS

Transducer material	EasyTREK
	SP–300
PP	■
PVDF	■
PTFE	■

PROPERTIES

Functions	EasyTREK
	SP–300
Relay	■
HART®	■
IrDA	■
Logger	■
Intrinsic safety	■

PROGRAMMING

Instruments with HART® output can be connected to a PC using a **UNICOMM** HART–USB modem. All measured values can be visualized on the PC screen, and the instruments can be programmed remotely via HART® modem. Up to 15 (non-Ex) instruments can be connected to a single HART® loop. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.

Programmable features via HART® communication:

- Assign 4 mA to low level
- Assign 20 mA to high level
- Error indication on current value output
- Power relay switch points
- Damping time
- Measurement configuration (Units, function, close-end blocking)
- Measurement optimization *(Damping, tracking speed, sound velocity correction)*
- Tank contents profiles: 14 different shapes
- Open-Channel Flow Metering: 21 different profiles
- Relay functions *(differential, flow pulse etc.)*
- 32-point linearization, measurement simulation
- Information / diagnostics *(Echo map and signal / noise)*

TECHNICAL DATA

		EasyTREK SP–300
System		2-wire
Accuracy [1]		± (0.2% of measured distance +0.05% of range)
Resolution		Depending on measured distance: <2 m: 1 mm; 2…5 m: 2 mm; 5…10 m: 5 mm; >10 m: 10 mm
Output	Analog	4…20 mA
	Relay	SPDT, 30 V DC, 1 A DC
	Digital Communication	HART®
Ambient temperature		–30…+80 °C
		Ex version: see "Ex Information"
Process temperature		See Transducer Details, Ex version: see "Ex Information"
Pressure (absolute)		0.5…3 bar
Supply voltage		12…36 V DC / 48…720 mW
Electrical protection		Class III
Housing		Polypropylene (PP) or (PVDF) same as the transducer material; PTFE transducer housing is made of PP;
Seal		PP transducers: EPDM; all other transducers: FPM (Viton®)
Electrical connection		LiYCY 6× 0.5 mm² shielded Ø6 mm cable; standard cable length: 5 m (available up to 30 m)
Ingress protection		IP68
Explosion protection		See "Ex Information"
Weight		1.2…2 kg

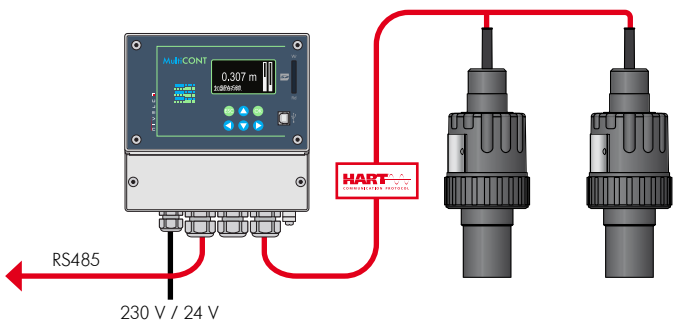
[1] *Under optimal conditions and constant transducer temperature*

Ex INFORMATION

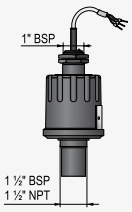
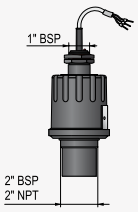
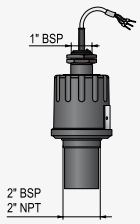
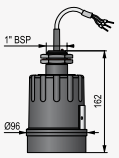
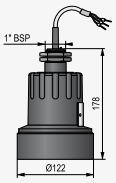
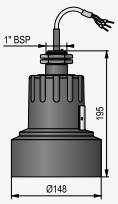
	EasyTREK SP–300
Protection	Intrinsic safety
Ex marking	Ex II 1 G Ex ia IIB T6…T5 Ga
Intrinsic safety data	C_i ≤ 28 nF, L_i ≤ 200 µH, U_i ≤ 30 V, I_i ≤ 140 mA, P_i ≤ 1 W
Ambient temperature	–20…+70 °C
Process temperature	With PP transducer: –20…+70 °C, with PVDF transducer: –20…+80 °C Temperature class T6; with PTFE transducer: –30…+90 °C Temperature class T5
Electrical connection	6× 0.5 mm² shielded Ø6 mm cable

HART® MULTIDROP LOOP

MultiCONT Multichannel Process Controllers process and display measurement data supplied by **NIVELCO**'s HART® equipped transmitters in a Multidrop loop. Connected transmitters can be programmed through **MultiCONT**, and it can also perform data logging tasks. Processed data may be sent to a computer via RS485 and displayed in **NIVISON**.



TRANSDUCER DETAILS

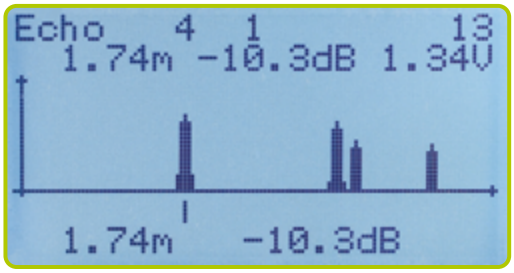
	SP□–39	SP□–38	SP□–37	SP□–36	SP□–34	SP□–32
Beam angle	6°	5°	7°	5°		7°
Transducer material	PP or PVDF					
EasyTREK SP 2-wire						
Upper process connection	1" BSP					
Lower process connection	1½" BSP / NPT	2" BSP / NPT		–		
Max. measuring range [1]	4 m	6 m	8 m	10 m	15 m	25 m
Min. measuring range [1]	0.2 m	0.25 m	0.35 m		0.45 m	0.6 m
Process temperature	–30… +90 °C					
Recommended applications	Small vessels with 1½" or 2" process connection			Small vessels with flange	Medium-sized vessels with flange	Tall vessels with flange

Transducer material	PTFE		
Max. measuring range [1]	3 m	5 m	6 m
Min. measuring range [1]	0.25 m		0.35 m
Process temperature	–30…+90 °C		

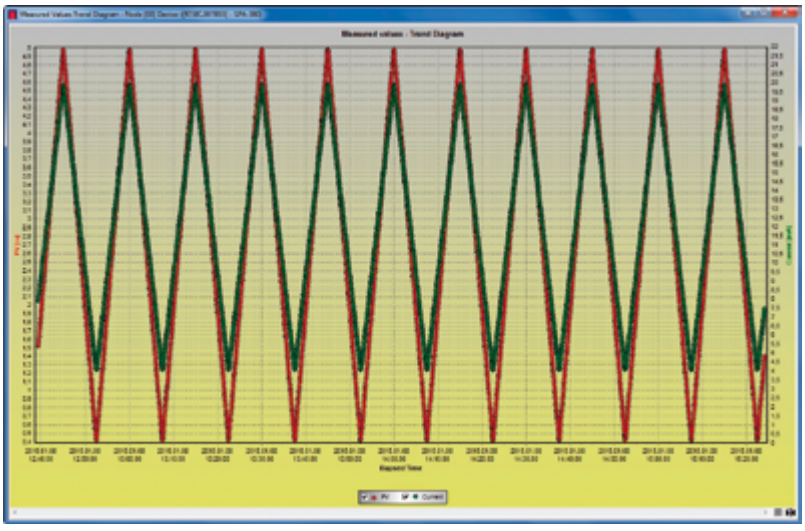
[1] Under optimal conditions and constant transducer temperature

SPA–360–4

ECHO MAP IN MultiCONT



DISPLAY MEASUREMENT VALUE IN EView2



SPA–340–4

EasyTREK SP-39/38/37/36/34/32

5 years

2-wire integrated ultrasonic level transmitters for liquids
with PP, PVDF or PTFE transducer; Ingress protection: IP68

Range / Frequency

S P ■ – 3 □ ■ – ■

9	0.2…4 m / 80 kHz (only for 1" or 1½" process connection)
8	0.25…6 m / 80 kHz (only for 1" or 2" process connection)
7	0.35…8 m / 60 kHz (only for 1" or 2" process connection)
6	0.35…10 m / 60 kHz (only for 1" process connection)
4	0.45…15 m / 40 kHz (only for 1" process connection)
2	0.6…25 m / 20 kHz (only for 1" process connection)

Transducer material

S P □ – 3 ■ ■ – ■

A	PP
B	PVDF
T	PTFE (only for SP-39/38/37)

Process connection

S P ■ – 3 ■ □ – ■

0	BSP thread
N	1½" or 2" NPT and 1" BSP (only for SP-39/38/37)

Output / Certificates

S P ■ – 3 ■ ■ – □

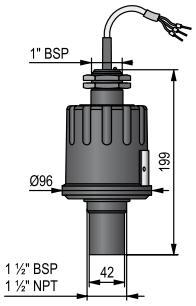
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
7	4…20 mA + HART® + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Cable

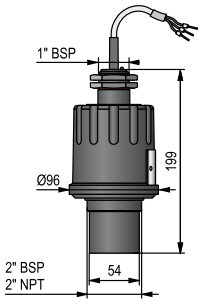
Maximum length 30 m; sold by the meter over the standard 5 m

Accessories sold separately; see relevant page for details

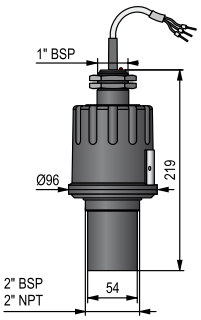
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G
S A A – 1 0 ■ – ■	Mounting brackets
S A A – 1 0 1 – 0	Quick-connect gland for pipe-mounting devices with 1" process connection, PP
S A A – 1 0 6 – 0	Damping gland for mounting SP devices to thin metal roofs, PP



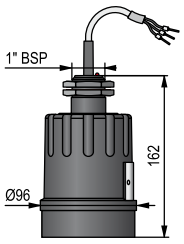
SP□-39□



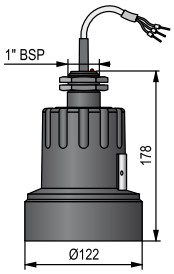
SP□-38□



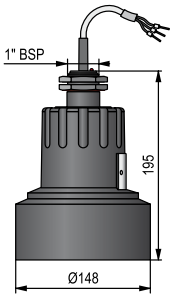
SP□-37□



SP□-36□



SP□-34□



SP□-32□

NIV24
SPA-380-4
SPA-360-4
SPA-340-4
SAT-304-0
SAA-107-0
SAA-108-0

NEW

Ultrasonic Compact Level Transmitters for Liquids

EchoTREK SE–500 Pro high-performance level transmitters embody four decades of **NIVELCO**'s experience in ultrasonic level measurement. Whether measuring the level of sump tanks or open-channel flows, EchoTREK transmitters are the best choice. Installed on the tank's roof above the liquid's surface, the transmitter produces an analog signal proportional to the liquid's level, transmitted via HART®. The EchoTREK is an intelligent compact ultrasonic level transmitter with 4…20 mA output and optional HART® protocol. An optional removable plug-in display provides localized reading. Programming is performed via four buttons, both the display and the buttons have a removable cover. EchoTREK transmitters utilize HART® 7 communication, they can be used in multidrop systems connected to **MultiCONT** process controller/display or a PC via a **UNICOMM** HART–USB / RS485 modem or similar. **EchoTREK Pro** transmitters are available with measuring ranges up to 18 meters, making them fit for a wide range of applications. These ultrasonic level transmitters use NIVELCO's SenSonic range transducers with a full beam angle 5…7 degrees, connected to the intelligent electronics featuring QUEST+ advanced signal processing algorithm.

FEATURES

- 2-wire compact level transmitter
- Non-contact level measurement
- Maximum 18 m measuring distance
- Narrow (5°) beam angle
- Full temperature compensation
- IP67
- Plug-in display unit
- HART® communication
- Advanced threshold management
- Quick start mode
- Faster measurement cycle
- Ex version
- 5 years warranty

SEP–580

AVAILABLE SOON

APPLICATIONS

- For most liquids, including flammable liquids
- Open-channel flow metering
- Wide application range from wastewater to aggressive chemicals
- Level measurement in basins, wells, sumps, lift-stations
- Measuring hydrocarbons, acids, aggressive liquids, any water-based mediums

SEP–5A0

CERTIFICATES

- ATEX (Ex ia G)

OPERATION

As a liquid level measuring device, the **EchoTREK SE–500 Pro** transmitters are not only suitable for measuring the level of liquids but can also be used for measuring the tank content and flow. Ultrasonic level meters use the principle of sound reflection. A device placed on top of the tank emits a short ultrasonic pulse towards the measured material's surface. The sound is reflected from the measured surface and returns to the radiating surface of the device after a distance-dependent flight time. The device measures, processes, and converts the time into distance, level, flow, or volume-proportional signal using a programmable tank or channel sizes.

NIVELCO's narrow-cone SenSonic ultrasonic pulse transducer, temperature-compensated electronics over the entire measuring range, and the QUEST+ process-adaptation signal-processing software together guarantee accurate measurement results. The software, adapted to the QUEST+ process, controls the measurement and provides reliable measurement data in all conditions.

SAP–300 (display)

TECHNICAL DATA

		SE / SG–500 Pro
System		2-wire
Accuracy [1]		± (0.1% of measured distance +0.05% of range)
Resolution		Depending on measured distance: <2 m: 1 mm; 2…5 m: 2 mm; 5…10 m: 5 mm; >10 m: 10 mm
Output	Analog	4…20 mA
	Relay	SPDT, 30 V DC, 1 A DC
	Display	LCD dot matrix display (SAP–300), units and bar graph
	Digital communication	HART®
Ambient temperature		With plastic housing: –25…+70 °C, with metal housing: –30…+70 °C, with display: –25…+70 °C
		Ex version: see "Ex Information"
Process temperature		See Transducer Details / Ex version: see "Ex Information"
Pressure[2] (absolute)		0.5…3 bar (0.05…0.3 MPa)
Supply voltage		12[3]…36 V DC / 48…720 mW
Electrical protection		DC power supply: Class III
Housing		Plastic (PBT), painted aluminum or stainless steel
Seal		In the case of a PP transducer: EPDM; all the other transducers: FPM (Viton®)
Electrical connection		2× M20×1.5 cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø6…12 mm, wire cross section: maximum 1.5 mm² Ex variant: see "Ex Information"
Ingress protection		Transducer: IP68, Housing: IP67
Explosion protection		see "Ex Information"
Weight		1.3…2.3 kg

[1] *Under optimal conditions and constant transducer temperature*
[2] *For pressures below 0.5 bar, ask NIVELCO.*
[3] *At 12 V, only partial operation is possible. For unrestricted, reliable operation, 13.4 V is required.*

Ex INFORMATION

	SE / SG–500 Pro
Protection	Intrinsic safety
Ex marking (ATEX)	Certification in progress.
Intrinsic safety data	
Ambient temperature	
Process temperature	
Electrical connection	2× M20×1.5 metal cable glands

TRANSDUCER DETAILS

	S□□–5A□	S□□–59□	S□□–58□	S□□–57□	S□□–56□	S□□–54□
Beam angle	5°	6°	5°	7°	5°	
Transducer material	**PP / PVDF**					
Process connection	1" BSP / NPT	1½" BSP / NPT	2" BSP / NPT		DN80 flange	DN125 flange
Maximum measuring range[1]	3 m	5 m	8 m	10 m	12 m	18 m
Minimum measuring range[1]	0.15 m	0.18 m	0.2 m	0.25 m		0.35 m
Process temperature	–30…+90 °C					
Recommended applications	Small vessels with 1½" or 2" process connection				Small vessels with flange	Medium-sized vessels with flange

Transducer material	**PTFE**			
Maximum measuring range [1]	2 m	4 m	6 m	7 m
Minimum measuring range [1]	0.18 m	0.2 m		0.55 m
Process temperature	–30…+90 °C			

[1] *Under optimal conditions and constant transducer temperature*

EchoTREK S-5A/59/58/57 Pro — 5 years

2-wire compact ultrasonic level transmitters for liquids
with PP, PVDF or PTFE transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 5 □■ – ■

A	0.15…3 m / 120 kHz (only for 1" process connection)
9	0.18…5 m / 80 kHz (only for 1½" process connection)
8	0.2…6 m / 80 kHz (only for 2" process connection)
7	0.25…8 m / 60 kHz (only for 2" process connection)

Programmer and local display (SAP-300)

S □■ – 5 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 5 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
F	Plastic, PBT, fiberglass-reinforced / PTFE
A	Aluminium (powder-coated) / Polypropylene (PP)
B	Aluminium (powder-coated) / PVDF
T	Aluminium (powder-coated) / PTFE
K	Stainless steel / Polypropylene (PP)
W	Stainless steel / PVDF
L	Stainless steel / PTFE

Process Connection

S ■■ – 5 ■□ – ■

0	BSP thread
N	NPT thread

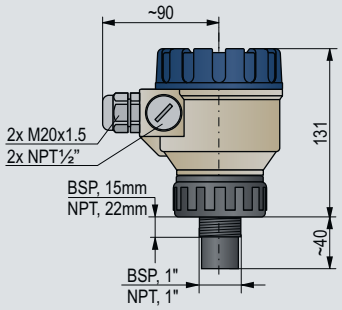
Output / Certificates

S ■■ – 5 ■■ – □

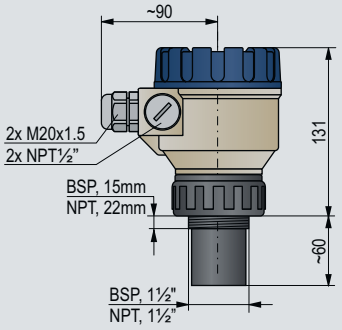
1	4…20 mA + Data logging feature
2	4…20 mA
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
5	4…20 mA + Data logging feature / Ex ia G
6	4…20 mA / Ex ia G
7	4…20 mA + HART® + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
L	4…20 mA + Data logging feature + Relay
R	4…20 mA + Relay
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

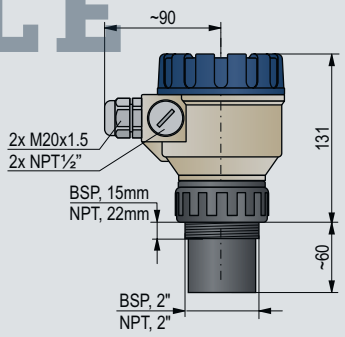
S F A – 3 ■■ – 0	Flanges
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G
S A A – 1 0 ■ – ■	Mounting brackets



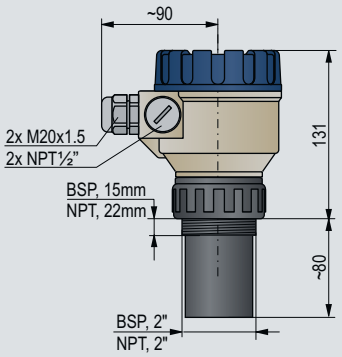
SE□–5A□



SE□–59□



SE□–58□



SE□–57□

NIV24
SAP-300-0
SAT-304-0
SAA-107-0
SAA-108-0

EchoTREK S-56/54 Pro — 5 years

2-wire compact ultrasonic level transmitters for liquids
with PP or PVDF transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 5 □■ – ■

6	0.25…12 m / 60 kHz (min. required flange size: DN80)
4	0.35…18 m / 40 kHz (min. required flange size: DN125)

Programmer and local display (SAP-300)

S □■ – 5 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 5 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
A	Aluminium (powder-coated) / Polypropylene (PP)
B	Painted aluminum / PVDF
K	Stainless steel / Polypropylene (PP)
W	Stainless steel / PVDF

Process Connection

S ■■ – 5 ■□ – ■

DIN flanges: Polypropylene (PP), PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
FF ANSI flanges: Polypropylene (PP), 150 psi	
A	3" FF 150 psi
B	4" FF 150 psi
C	5" FF 150 psi
D	6" FF 150 psi
E	8" FF 150 psi
JIS flanges: Polypropylene (PP), 10K	
G	80A (as per 10K)
H	100A (as per 10K)
P	125A (as per 10K)
R	150A (as per 10K)
S	200A (as per 10K)
Mounting brackets	
K	200 mm mounting bracket, powder-coated steel
L	500 mm mounting bracket, powder-coated steel
M	700 mm mounting bracket, powder-coated steel

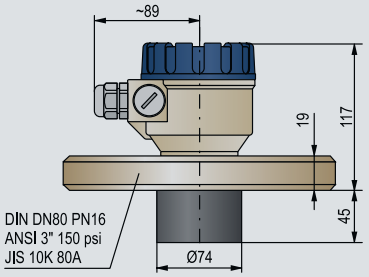
Output / Certificates

S ■■ – 5 ■■ – □

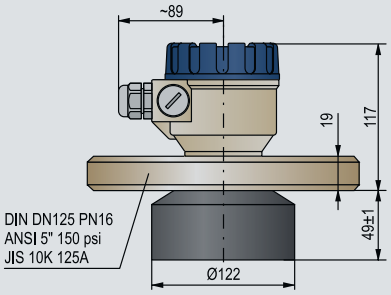
1	4…20 mA + Data logging feature
2	4…20 mA
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
5	4…20 mA + Data logging feature / Ex ia G
6	4…20 mA / Ex ia G
7	4…20 mA + HART + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
L	4…20 mA + Data logging feature + Relay
R	4…20 mA + Relay
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; seerelevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



SE□-56□



SE□-54□

Ultrasonic Compact Level Transmitters for Liquids

EchoTREK SE–300 high-performance level transmitters embody four decades of **NIVELCO**'s experience in ultrasonic level measurement.Whether measuring the level of sump tanks or open-channel flows, EchoTREK transmitters are the best choice. Installed on the tank's roof above the liquid's surface, the transmitter produces an analog signal proportional to the liquid's level, transmitted via HART®. The EchoTREK is an intelligent compact ultrasonic level transmitter with 4…20 mA output and optional HART® protocol. An optional removable plug-in display provides localized reading. Programming is performed via four buttons, both the display and the buttons have a removable cover. EchoTREK transmitters utilize HART® 7 communication, they can be used in multidrop systems connected to **MultiCONT** process controller/display or a PC via a **UNICOMM** HART–USB / RS485 modem or similar. **EchoTREK** transmitters are available with measuring ranges up to 25 meters, making them fit for a wide range of applications. These ultrasonic level transmitters use NIVELCO's SenSonic range transducers with a full beam angle 5…7 degrees, connected to the intelligent electronics featuring QUEST+ advanced signal processing algorithm.

FEATURES

- 2 or 4-wire compact level transmitter
- Non-contact level measurement
- Maximum 25 m measuring distance
- Narrow (5°) beam angle
- Full temperature compensation
- IP67
- Plug-in display unit
- HART® communication
- Ex version

CERTIFICATES

- ATEX (Ex ia G)
- INMETRO (Ex ia G)
- UKCA Ex (Ex ia G)

APPLICATIONS

- For most liquids, including flammable liquids
- Open-channel flow metering
- Wide application range from wastewater to aggressive chemicals
- Level measurement in basins, wells, sumps, lift-stations
- Measuring hydrocarbons, acids, aggressive liquids, any water-based mediums

SG□–380–4
(2-wire)

SBA–46G–1 (4-wire)

TRANSDUCERS

Transducer material	EchoTREK	
	SE / SG–300	ST / SB–400
PP (Polypropylene)	■	■
PVDF	■	■
PTFE	■	■
1.4571 (316Ti) stainless steel	■	■

PROPERTIES

Functions	EchoTREK	
	SE / SG–300	ST/SB–400
Relay	■	■
HART®	■	■
IrDA	■	■
Logger	■	■
Ex ia (Intrinsic safety)	■	–
Display	SAP-200	

OPERATION

Ultrasonic level metering is based on the principle of measuring the travel time of ultrasound pulses from the sensor to the measured surface and back. The reflected signal's time of travel is measured and processed by the electronics, then it is converted to data proportional to distance, level, volume, or flow, considering the tank dimensions or the pre-programmed flume/weir parameters. QUEST+ intelligent signal processing software oversees the measurement and ensures reliable level monitoring.

TECHNICAL DATA

		SE / SG–300	ST / SB–400
System		2-wire	4-wire
Accuracy [1]		± (0.2% of measured distance +0.05% of range)	
Resolution		Depending on measured distance: <2 m: 1 mm; 2…5 m: 2 mm; 5…10 m: 5 mm; >10 m: 10 mm	
Output	Analog	4…20 mA	
	Relay [2]	SPDT, 30 V DC, 1 A DC	#1 SPDT, 250 V AC, 3 A AC1 #2 SPDT, 30 V DC, 1 A DC
	Display	SAP–200: 6-digit plug-in LCD display	
	Digital communication	HART®	
Ambient temperature		With plastic housing: –25…+70 °C with metal housing: –30…+70 °C with display: –25…+70 °C	
		Ex version: see "Ex Information"	
Process temperature		See Transducer Details / Ex version: see "Ex Information"	
Pressure[3] (absolute)		0.5…3 bar (0.05…0.3 MPa), with stainless steel transducer: 0.9…1.1 bar (0.09…0.11 MPa)	
Supply voltage		12[4]…36 V DC / 48…720 mW	85…255 V AC / 2 VA 20…28 V AC/DC / 3 VA / 3 W
Electrical protection		DC power supply: Class III	
			AC power supply: with metal housing: Class I with plastic housing: Class II
Housing		Plastic (PBT), painted aluminum or stainless steel	Plastic (PBT), painted aluminum
Seal		In the case of a PP transducer: EPDM; all the other transducers: FPM (Viton®)	
Electrical connection		2× M20×1.5 cable glands + 2× internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø6…12 mm, wire cross section: maximum 1.5 mm² Ex variant: see "Ex Information"	
Ingress protection		Transducer: IP68, Housing: IP67	
Explosion protection		see "Ex Information"	–
Weight		1.3…2.3 kg	

[1] *Under optimal conditions and constant transducer temperature* [2] *4-wire EchoTREK transmitters have two parallel operating relays*
[3] *For pressures below 0.5 bar, ask NIVELCO.*
[4] *At 12 V, only partial operation is possible. For unrestricted, reliable operation, 13.4 V is required.*

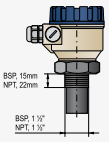
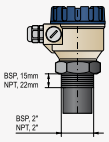
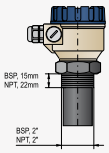
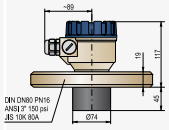
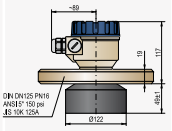
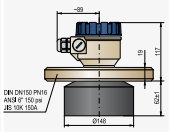
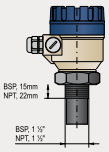
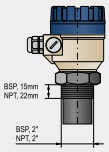
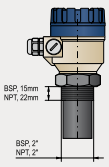
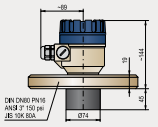
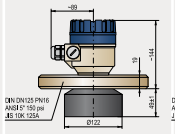
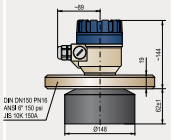
Ex INFORMATION

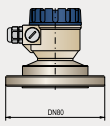
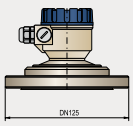
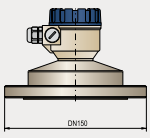
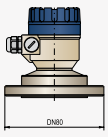
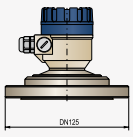
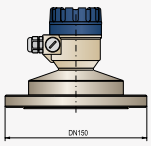
	SE / SG–300
Protection	Intrinsic safety
Ex marking (ATEX)	⟨Ex⟩ II 1 G Ex ia IIB T6…T4 Ga
Intrinsic safety data	C_i ≤ 15 nF, L_i ≤ 200 µH, U_i ≤ 30 V, I_i ≤ 140 mA, P_i ≤ 1 W
Ambient temperature	With plastic housing: –20…+70 °C with metal housing: –30…+70 °C with display: –25…+70 °C
Process temperature	With PP transducer: –20…+70 °C, with PVDF transducer: –20…+80 °C, with PTFE transducer: –30…+90 °C
	With Stainless Steel transducer: –30…+100 °C
Electrical connection	2× M20×1.5 metal cable glands

SEV–390–8 Ex
+ SFA–3☐6

SAP–200
display

TRANSDUCER DETAILS

	S□□–39 / 49	S□□–38 / 48	S□□–37 / 47	S□□–36 / 46	S□□–34 / 44	S□□–32 / 42
Beam angle	6°	5°	7°	5°		7°
Transducer material	PP or PVDF					
EchoTREK SE / SG 2-wire						
EchoTREK ST / SB 4-wire						
Process connection	1½" BSP / NPT	2" BSP / NPT		DN80 flange	DN125 flange	DN150 flange
Maximum measuring range[1]	4 m	6 m	8 m	10 m	15 m	25 m
Minimum measuring range[1]	0.2 m	0.25 m	0.35 m		0.45 m	0.6 m
Process temperature	–30…+90 °C					
Recommended applications	Small vessels with 1½" or 2" process connection			Small vessels with flange	Medium-sized vessels with flange	Tall vessels with flange

Transducer material	**PTFE**			**Stainless steel**		
Maximum measuring range [1]	3 m	5 m	6 m	7 m	12 m	15 m
Minimum measuring range [1]	0.25 m		0.35 m	0.4 m	0.55 m	0.65 m
Process temperature	–30…+90 °C			–30…+100 °C (CIP +120 °C for max. 2 hours)		
EchoTREK S□S / S□M 2-wire						
EchoTREK S□S / S□M 4-wire						

[1] *Under optimal conditions and constant transducer temperature*

SEA–370

SGP–370–8Ex

EchoTREK S-49/48/47 — 5 years

4-wire compact ultrasonic level transmitters for liquids with 2 relays
with PP, PVDF or PTFE transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 4 □■ – ■

9	0.2…4 m / 80 kHz (only for 1½" process connection)
8	0.25…6 m / 80 kHz (only for 2" process connection)
7	0.35…8 m / 60 kHz (only for 2" process connection)

Programmer and local display (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
F	Plastic, PBT, fiberglass-reinforced / PTFE
A	Painted aluminum / Polypropylene (PP)
B	Painted aluminum / PVDF
T	Painted aluminum / PTFE

Process Connection

S ■■ – 4 ■□ – ■

0	BSP thread
N	NPT thread

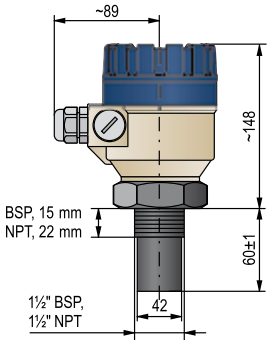
Supply voltage / Output

S ■■ – 4 ■■ – □

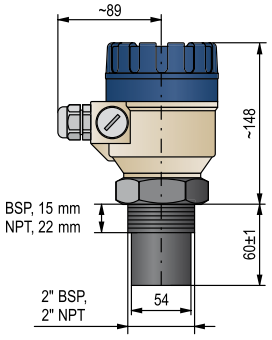
1	85…255 V AC / 4…20 mA + DPDT Relay
3	85…255 V AC / 4…20 mA + HART® + DPDT Relay
G	85…255 V AC / 4…20 mA + HART® + DPDT Relay + Data logging feature
K	85…255 V AC / 4…20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4…20 mA + DPDT Relay
4	24 V AC/DC / 4…20 mA + HART® + DPDT Relay
H	24 V AC/DC / 4…20 mA + HART® + DPDT Relay + Data logging feature
L	24 V AC/DC / 4…20 mA + DPDT + Data logging feature

Accessories sold separately; see relevant page for details

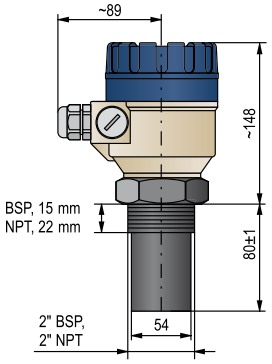
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A A – 1 0 ■ – ■	Mounting brackets



ST□-49□



ST□-48□



ST□-47□

NIV24
SAP-200-0
SAT-304-0
SAA-107-0
SAA-108-0

EchoTREK S-46/44/42 — 5 years

4-wire compact ultrasonic level transmitters for liquids with 2 relays
with PP or PVDF transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 4 □■ – ■

6	0.35…10 m / 60 kHz (Min. required flange size: DN80)
4	0.45…15 m / 40 kHz (Min. required flange size: DN125)
2	0.6…25 m / 20 kHz (Min. required flange size: DN150)

Programmer and local display (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
A	Painted aluminum / Polypropylene (PP)
B	Painted aluminum / PVDF

Process Connection

S ■■ – 4 ■□ – ■

DIN flanges: Polypropylene (PP), PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
FF ANSI flanges: Polypropylene (PP), 150 psi	
A	3" FF 150 psi
B	4" FF 150 psi
C	5" FF 150 psi
D	6" FF 150 psi
E	8" FF 150 psi
JIS flanges: Polypropylene (PP), 10K	
G	80A (as per 10K)
H	100A (as per 10K)
P	125A (as per 10K)
R	150A (as per 10K)
S	200A (as per 10K)
Mounting brackets	
K	200 mm mounting bracket, powder-coated steel
L	500 mm mounting bracket, powder-coated steel
M	700 mm mounting bracket, powder-coated steel

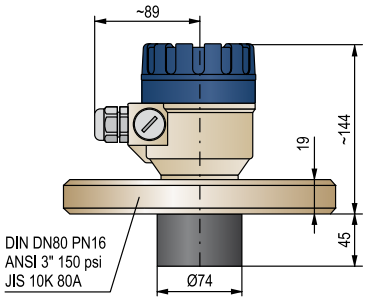
Supply voltage / Output

S ■■ – 4 ■■ – □

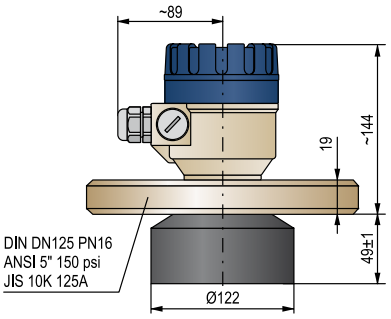
1	85…255 V AC / 4…20 mA + DPDT
3	85…255 V AC / 4…20 mA + HART® + DPDT
G	85…255 V AC / 4…20 mA + HART® + DPDT + Data logging feature
K	85…255 V AC / 4…20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4…20 mA + DPDT
4	24 V AC/DC / 4…20 mA + HART® + DPDT
H	24 V AC/DC / 4…20 mA + HART® + DPDT + Data logging feature
L	24 V AC/DC / 4…20 mA + DPDT + Data logging feature

Accessories sold separately; see relevant page for details

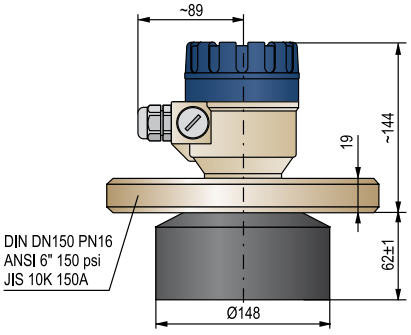
SAP-200-0	Plug-in programmer/display module
SAT-304-0	HART®-USB modem
SAT-504-■	
SAK-305-2	HART®-USB/RS485 modem



ST□-46□



ST□-44□



ST□-42□

EchoTREK S-46/44/42 with stainless steel transducer — 5 years

4-wire compact ultrasonic level transmitters for liquids with 2 relays
with stainless steel transducer face; Ingress protection: IP67

Range / Frequency

S ■■ – 4 □■ – ■

6	0.4…7 m / 60 kHz (flange size: DN80)
4	0.55…12 m / 40 kHz (flange size: DN125)
2	0.65…15 m / 20 kHz (flange size: DN150)

Programmer and local display (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

M	Plastic, PBT, fiberglass-reinforced / stainless steel (AISI SS316Ti, DIN 1.4571)
S	Painted aluminum / stainless steel (AISI SS316Ti, DIN 1.4571)

Process Connection / Material

S ■■ – 4 ■□ – ■

2	DN80 PN16 (only for S-46), PP-coated steel
4	DN125 PN16 (only for S-44), PP-coated steel
5	DN150 PN16 (only for S-42), PP-coated steel

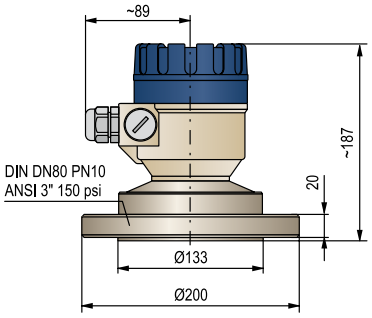
Supply voltage / Output

S ■■ – 4 ■■ – □

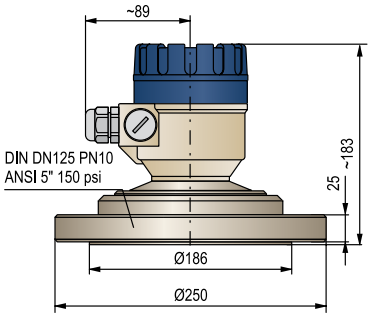
1	85…255 V AC / 4…20 mA + DPDT
3	85…255 V AC / 4…20 mA + HART® + DPDT
G	85…255 V AC / 4…20 mA + HART® + DPDT + Data logging feature
K	85…255 V AC / 4…20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4…20 mA + DPDT
4	24 V AC/DC / 4…20 mA + HART® + DPDT
H	24 V AC/DC / 4…20 mA + HART® + DPDT + Data logging feature
L	24 V AC/DC / 4…20 mA + DPDT + Data logging feature

Accessories sold separately; see relevant page for details

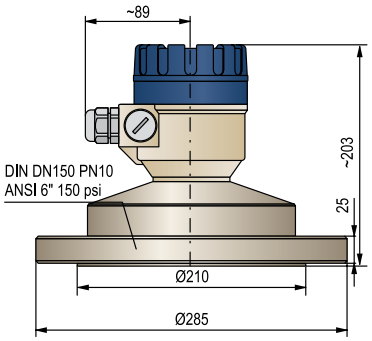
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem



STM / STS-462



STM / STS-444



STM / STS-425

EchoTREK S-39/38/37 — 5 years

2-wire compact ultrasonic level transmitters for liquids
with PP, PVDF or PTFE transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 3 □■ – ■

9	0.2…4 m / 80 kHz (only for 1½" process connection)
8	0.25…6 m / 80 kHz (only for 2" process connection)
7	0.35…8 m / 60 kHz (only for 2" process connection)

Programmer and local display (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
F	Plastic, PBT, fiberglass-reinforced / PTFE
A	Painted aluminum / Polypropylene (PP)
B	Painted aluminum / PVDF
T	Painted aluminum / PTFE
K	Stainless steel / Polypropylene (PP)
W	Stainless steel / PVDF
L	Stainless steel / PTFE

Process Connection

S ■■ – 3 ■□ – ■

0	BSP thread
N	NPT thread

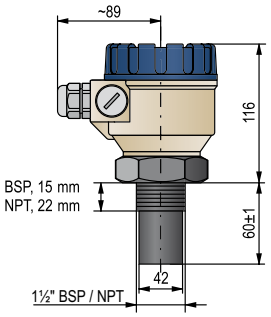
Output / Certificates

S ■■ – 3 ■■ – □

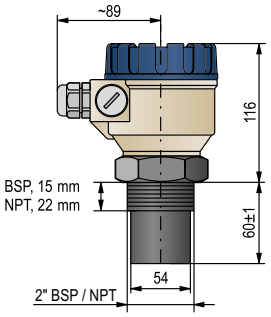
1	4…20 mA + Data logging feature
2	4…20 mA
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
5	4…20 mA + Data logging feature / Ex ia G
6	4…20 mA / Ex ia G
7	4…20 mA + HART® + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
L	4…20 mA + Data logging feature + Relay
R	4…20 mA + Relay
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

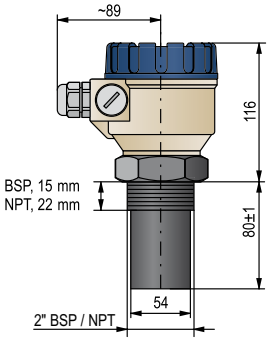
S F A – 3 ■■ – 0	Flanges
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G
S A A – 1 0 ■ – ■	Mounting brackets



SE□-39□



SE□-38□



SE□-37□

NIV24
SEP-380-2
SAP-200-0
SAT-304-0
SAA-107-0
SAA-108-0

EchoTREK S-36/34/32 — 5 years

2-wire compact ultrasonic level transmitters for liquids
with PP or PVDF transducer; Ingress protection: IP67

Range / Frequency

S ■■ – 3 □■ – ■

6	0.35…10 m / 60 kHz (min. required flange size: DN80)
4	0.45…15 m / 40 kHz (min. required flange size: DN125)
2	0.6…25 m / 20 kHz (min. required flange size: DN150)

Programmer and local display (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

P	Plastic, PBT, fiberglass-reinforced / Polypropylene (PP)
V	Plastic, PBT, fiberglass-reinforced / PVDF
A	Painted aluminum / Polypropylene (PP)
B	Painted aluminum /PVDF
K	Stainless steel / Polypropylene (PP)
W	Stainless steel / PVDF

Process Connection

S ■■ – 3 ■□ – ■

DIN flanges: Polypropylene (PP), PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
FF ANSI flanges: Polypropylene (PP), 150 psi	
A	3" FF 150 psi
B	4" FF 150 psi
C	5" FF 150 psi
D	6" FF 150 psi
E	8" FF 150 psi
JIS flanges: Polypropylene (PP), 10K	
G	80A (as per 10K)
H	100A (as per 10K)
P	125A (as per 10K)
R	150A (as per 10K)
S	200A (as per 10K)
Mounting brackets	
K	200 mm mounting bracket, powder-coated steel
L	500 mm mounting bracket, powder-coated steel
M	700 mm mounting bracket, powder-coated steel

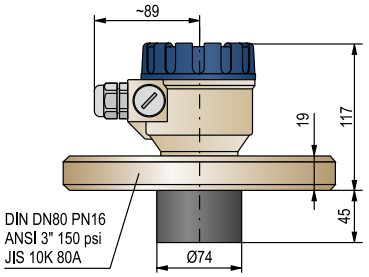
Output / Certificates

S ■■ – 3 ■■ – □

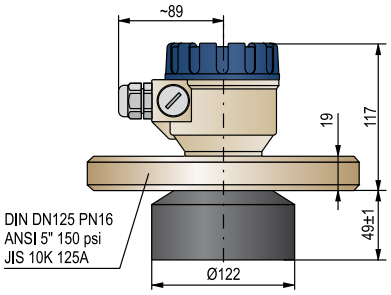
1	4…20 mA + Data logging feature
2	4…20 mA
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
5	4…20 mA + Data logging feature / Ex ia G
6	4…20 mA / Ex ia G
7	4…20 mA + HART + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
L	4…20 mA + Data logging feature + Relay
R	4…20 mA + Relay
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; seerelevant page for details

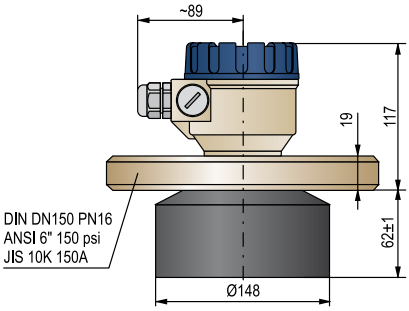
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



SE□-36□



SE□-34□



SE□-32□

EchoTREK S-36/34/32 with stainless steel transducer — 5 years

2-wire compact ultrasonic level transmitters for liquids
with stainless steel transducer face; Ingress protection: IP67

Range / Frequency

S ■■ – 3 □■ – ■

6	0.4…7 m / 60 kHz (flange size: DN80)
4	0.55…12 m / 40 kHz (flange size: DN125)
2	0.65…15 m / 20 kHz (flange size: DN150)

Programmer and local display (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

M	Plastic, PBT, fiberglass-reinforced / stainless steel (AISI SS316Ti, DIN 1.4571)
S	Painted aluminum / stainless steel (AISI SS316Ti, DIN 1.4571)
N	Stainless steel / stainless steel (AISI SS316Ti, DIN 1.4571)

Process Connection / Material

S ■■ – 3 ■□ – ■

2	DN80 PN16 (only for S-36), PP-coated steel
4	DN125 PN16 (only for S-34), PP-coated steel
5	DN150 PN16 (only for S-32), PP-coated steel

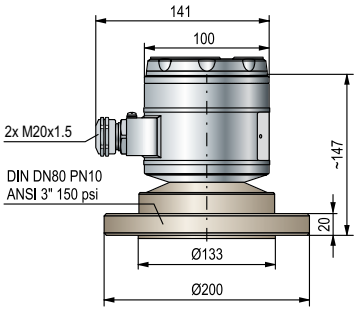
Output / Certificates

S ■■ – 3 ■■ – □

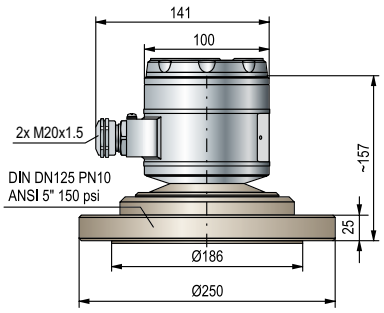
1	4…20 mA + Data logging feature
2	4…20 mA
3	4…20 mA + HART® + Data logging feature
4	4…20 mA + HART®
5	4…20 mA + Data logging feature / Ex ia G
6	4…20 mA / Ex ia G
7	4…20 mA + HART® + Data logging feature / Ex ia G
8	4…20 mA + HART® / Ex ia G
L	4…20 mA + Data logging feature + Relay
R	4…20 mA + Relay
A	4…20 mA + HART® + Data logging feature + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

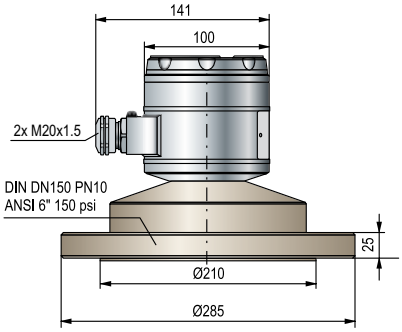
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



SEN-362



SEN-344



SEN-325

4-wire **EasyTREK** ultrasonic level transmitters are designed for solids level monitoring, where previously only more complex, two-part systems have performed adequately. SenSonic narrow beam angle transducers offer superb signal transmission, providing the means for **EasyTREK** units to overcome filling noise, dust, and irregular surface formations. Combined with QUEST+, an advanced adaptive signal processing software, the system offers a solution with world-class performance.

FEATURES

- Non-contact level measurement
- 4-wire integrated (blind) level transmitter
- Maximum 60 m measuring range
- Narrow (5°) beam angle
- Full temperature compensation
- IP65
- HART® communication
- Dust Ex variant
- 5 years warranty

APPLICATIONS

- Level, volume and weight calculation
- Wide application range: light powders to coarse bulk solid materials
- Reliable operation in challenging environments (e. g. dust)

CERTIFICATES

- ATEX (Ex ma ta D)
- EAC Ex (Ex ma ta D)

TECHNICAL DATA

		SCD–300
System		4-wire
Accuracy [1]		± (0.2% of measured distance + 0.1% of range)
Resolution		10 mm
Output	Analog	4…20 mA
	Relay	SPST, 48 V AC / 5 A
	Digital communication	HART®
Ambient temperature		–30… +60 °C
Process temperature		
Process pressure		0.7…1.1 bar (0.07…0.11 MPa) $P_{absolute}$ and ±0.1 bar (0.01 MPa) difference between ambient and tank pressure
Supply voltage		11.4…40 V DC / 4.7 W and 11.4…28 V AC / 5.2 VA
Electrical protection		Class III
Housing		Same as the transducer housing material
Electrical connection		LiYCY type 7× 0.5 mm² shielded Ø7.5 mm cable; standard cable length: 5 m (available up to 30 m)
Ingress protection		IP65
Explosion protection		see "Ex Information"
Weight		~3…3.5 kg, or 6.5 kg

[1] *Under optimal conditions and constant transducer temperature*

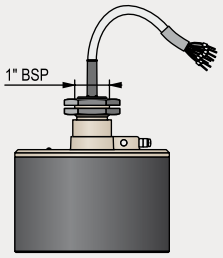
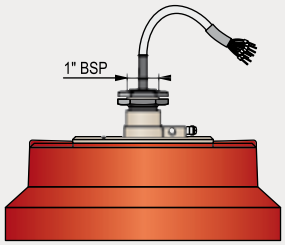
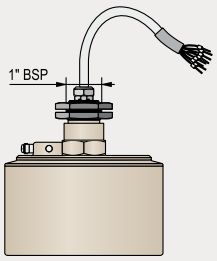
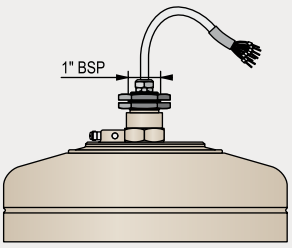
PROPERTIES

Functions	EasyTREK
	SCD–300
Relay or SSR	SPST
HART®	■
Dust Ex version	■

Ex INFORMATION

SCD–300	
Protection	Dust Ex
Ex marking	⟨Ex⟩ II 1 D Ex ma ta IIIC T85°C…T130°C Da
Ambient temperature	–30…+60 °C
Process temperature	
Output	Electronic switch: SPST 48 V AC 50 V DC / 1 A

TRANSDUCER PROPERTIES

	SCD–34□	SCD–33□	SCD–31□
Recommended applications	Small tanks, hoppers, conveyor belts. Both for powders and granules.	Medium-sized silos with solids.	Large silos with solids. Recommended in dusty environments due to its power and low frequency.
EasyTREK (standard version)			
EasyTREK (Ex variant)			
Transducer Material	Standard version: PP + Painted aluminum, Ex variant: Painted aluminum		
Transducer Surface	Closed-cell PVC foam		
Beam Angle	5°		
Max. measuring range [1]	15 m	30 m	60 m
Min. measuring range [1]	0.6 m		1 m

[1] *Under optimal conditions and constant transducer temperature*

SCD–31J–8Ex

SCD–33J–4

SCD–31J–4

EasyTREK SCD-34/33/31 — 5 years

4-wire integrated ultrasonic level transmitters for solids
with PP or cast aluminum sensor housing with PVC foam face

Range / Frequency

S C D – 3 □ ■ – ■

4	0.6…15 m (40 kHz)
3	0.6…30 m (30 kHz)
1	1…60 m (15 kHz)

Process connection

S C D – 3 ■ □ – ■

0	1" BSP thread
J	Aming device

Output / Ex Certificate

S C D – 3 ■ ■ – □

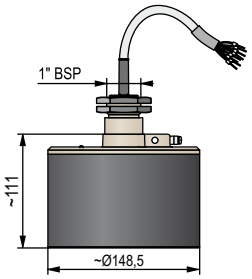
4	4…20 mA + HART® + Relay
8	4…20 mA + HART® + SSR / Ex ma ta IIIC

Cable

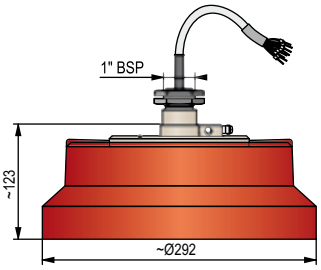
Maximum length 30 m; sold by the meter over the standard 5 m

Accessories sold separately; see relevant page for details

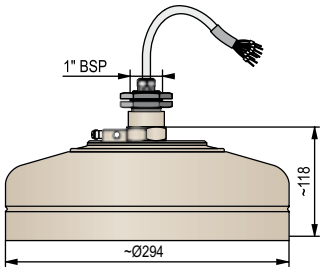
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A A – 1 0 1 – 0	Quick-connect gland for pipe-mounting devices with 1" process connection, PP
S A A – 1 0 2 – 0	Aiming device, 500 mm, aluminum, Pg9, drilled as DN50 PN16



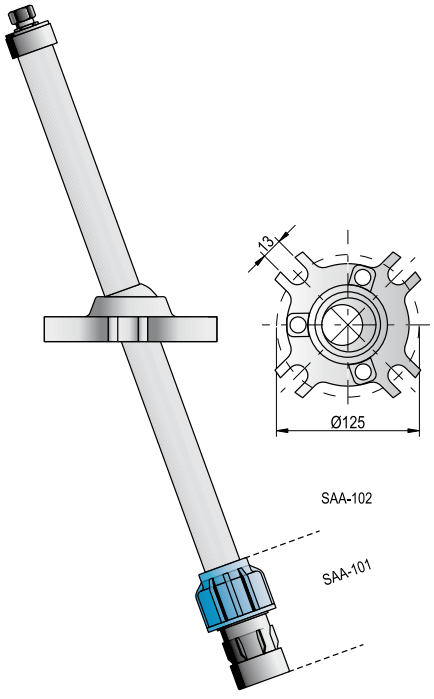
SCD-330 / 340



SCD-310



SCD-310-8Ex



SAA-102

Ultrasonic Compact Level Transmitters for Solids — EchoTREK

4-wire **EchoTREK** compact ultrasonic level transmitters are designed for monitoring the level of solids, where previously only more complex, two-part systems have performed adequately. Sensonic narrow beam angle transducers offer superb signal transmission, providing the means for EasyTREK units to overcome filling noise, dust, and irregular surface formations. Combined with QUEST+, an advanced adaptive signal processing software, the system offers a solution with world-class performance.

FEATURES

- Non-contact level measurement
- 4-wire compact transmitter
- Maximum 60 m measuring range
- Narrow (5°) beam angle
- Full temperature compensation
- IP65
- Plug-in display unit
- HART® communication
- Dust Ex variant

APPLICATIONS

- Level, volume and weight calculation
- Wide application range: light powders to coarse bulk solid materials
- Reliable measurement in challenging applications such as dusting during filling

CERTIFICATES

- ATEX (Ex ma ta/tb D)

TECHNICAL DATA

S□D–300		
System		4-wire
Accuracy [1]		± (0.2% of measured distance + 0.1% of range)
Resolution		10 mm
Output	Analog	4…20 mA
	Relay	SPDT, 250 V AC / 3 A, AC1
	Display	SAP–100 plug-in display unit
	Digital comm.	HART®
Ambient temperature		–30…+60 °C with display: –25…+60 °C
Process temperature		–30…+75 °C
Process pressure		0.7…1.1 bar (0.07…0.11 MPa) $P_{absolute}$ and ±0.1 bar (0.01 MPa) difference between ambient and tank pressure
Supply voltage		Version 1: 85…255 V AC / 6.8 VA
		Version 2: 11.4…40 V DC / 4.1 W and 11.4…28 V AC / 4.6 VA
Electrical protection		Class I
Housing		Painted aluminum
Electrical connection		2× M20×1.5 plastic cable glands for Ø6…Ø12 mm cable, 3× terminal blocks for max. 2.5 mm² wire cross section, 2× internally threaded ½" NPT connection for protective pipes. Ex variant: see "Ex Information"
Ingress protection		IP65
Explosion protection		See "Ex Information"
Weight		~7 kg, or 10 kg

[1] *Under optimal conditions and constant transducer temperature*

Ex INFORMATION

S□D–300	
Protection	Dust Ex
Ex marking	⟨Ex⟩ II 1/2 D Ex ma ta/tb IIIC T85°C…T130°C Da/Db
Ambient temperature	–30…+60 °C, with display: –25…+60 °C
Process temperature	–30…+75 °C
Electrical connection	2× M20×1.5 cable glands with Ex ta IIIC protecion for Ø7…Ø12 mm cable, 3× terminal blocks for max. 2.5 mm² wire cross section, 2× internally threaded ½" NPT connection for protective pipes.

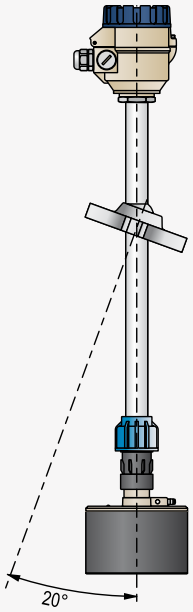
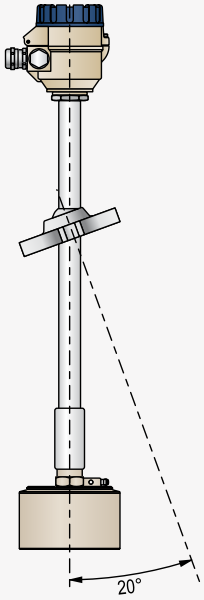
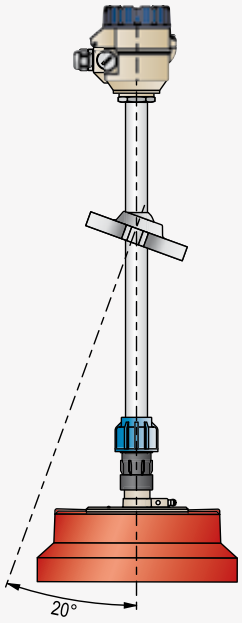
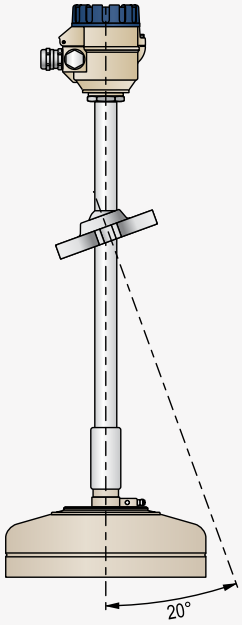
PROPERTIES

Functions	EchoTREK
	STD / SBD–300
Relay	■
HART®	■
Dust Ex variant	■
Display	SAP–100

SAP–100
Display

SBD–300

TRANSDUCER PROPERTIES

	S□D–34J–□	S□D–33J–□	S□D–31J–□
Recommended applications	Small tanks, hoppers, conveyor belts. Both for powders and granules.	Medium-sized silos containing all kinds of bulk solids.	Larger silos containing all kinds of bulk solids. Recommended in dusty environments due to its power and low frequency.
EchoTREK (standard version)			
EchoTREK (Ex variant)			
Transducer Material	Standard version: PP + painted aluminum, Ex variant: painted aluminum		
Transducer Surface	Closed-cell PVC foam		
Beam Angle	5°		
Max. Measuring range [1]	15 m	30 m	60 m
Min. Measuring range [1]	0.6 m		1 m

[1] *Under ideal conditions and constant transducer temperature*

SBD–34J–1

MOUNTING

The SAA–102 ball joint adjustment unit *(part of **EchoTREK** units)* helps optimize coning or arching caused by the filling/emptying process in solids material storage. The transducer's position is adjustable during operation. It is recommended to check the position and the filled material's surface multiple times during filling/emptying. The best result is obtained by aiming the transducer at the center of the tank's bottom.

EchoTREK S_D-34/33/31 — 5 years

4-wire compact ultrasonic level transmitters with aiming device for solids
with PP or cast aluminum sensor housing with PVC foam face

Range / Frequency

S ■ D – 3 □ J – ■

4	0.6…15 m (40 kHz)
3	0.6…30 m (30 kHz)
1	1…60 m (15 kHz)

Programmer and local display (SAP-100)

S □ D – 3 ■ J – ■

T	Not included
B	Included

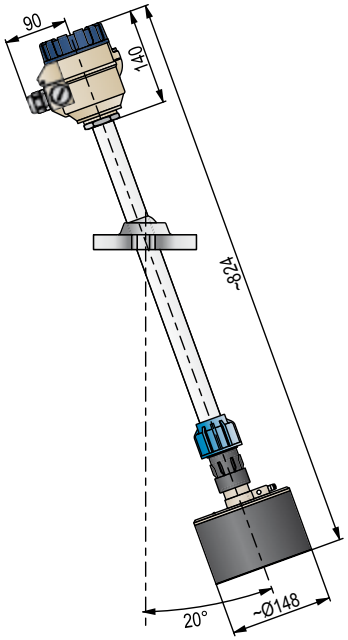
Supply voltage / Output / Certificates

S ■ D – 3 ■ J – □

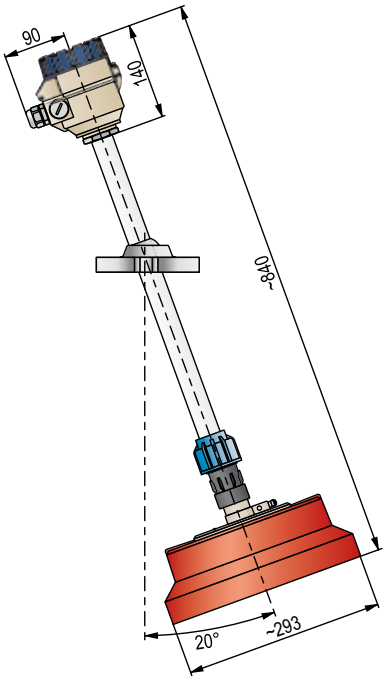
1	85…255 V AC / 4…20 mA + Relay
3	85…255 V AC / 4…20 mA + HART® + Relay
5	85…255 V AC / 4…20 mA + Relay / Ex ma ta/tb D
7	85…255 V AC / 4…20 mA+ HART® + Relay / Ex ma ta/tb D
2	11.4…40 V DC and 11.4…28 V AC / 4…20 mA + Relay
4	11.4…40 V DC and 11.4…28 V AC / 4…20 mA + HART® + Relay
6	11.4…40 V DC and 11.4…28 V AC / 4…20 mA + Relay / Ex ma ta/tb D
8	11.4…40 V DC and 11.4…28 V AC / 4…20 mA + HART® + Relay / Ex ma ta/tb D

Accessories sold separately; see relevant page for details

S A P – 1 0 0 – 0	Plug-in programmer/display module
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



STD-33J / 34J



STD-31J

NIVOSONAR SFA — 5 years

Plastic flanges for ultrasonic level transmitters
Material: Polypropylene (PP)

Type

□ F A – 3 ■ ■ – 0

S	Flanges

Flange size

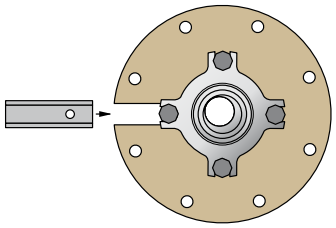
S F A – 3 □ ■ – 0

DIN flanges, PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
7	DN250 PN16
8	DN300 PN16
9	DN350 PN16
FF ANSI flanges, 150 psi	
A	3" FF 150 psi
B	4" FF 150 psi
C	5" FF 150 psi
D	6" FF 150 psi
E	8" FF 150 psi
Y	12" FF 150 psi
K	14" FF 150psi
JIS flanges, 10K	
G	80A (as per 10K)
H	100A (as per 10K)
P	125A (as per 10K)
R	150A (as per 10K)
S	200A (as per 10K)
Z	300A (as per 10K)
W	350A (as per 10K)

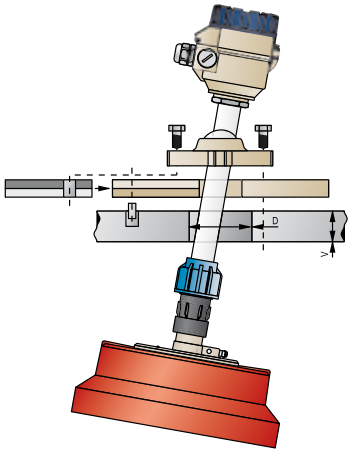
Flange type

S F A – 3 ■ □ – 0

1	Ø35 mm hole (for units with 1" BSP process connection)
3	For units with 2" BSP process connection
4	For units with 2" NPT process connection
5	For mounting to SAA-102 aiming device
6	For units with 1½" BSP process connection
7	For units with 1½" NPT process connection



SFA-3□5



STD-31J + SFA-3□5

Diameter of the opening (D)	Max. thickness of the roof (V)
160 mm	110 mm
190 mm	150 mm
230 mm	200 mm
300 mm	280 mm
340 mm	300 mm

NIVOSONAR SAA — 5 years

Mounting brackets for ultrasonic level transmitters
Material: Plastic / Metal

Type

□ A A – 1 0 ■ – ■

S	Mounting brackets

Insertion length

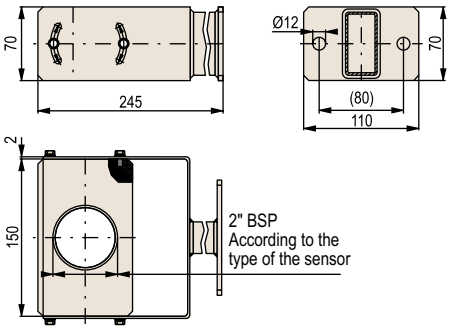
S A A – 1 0 □ – ■

7	200 mm
8	500 mm
9	700 mm

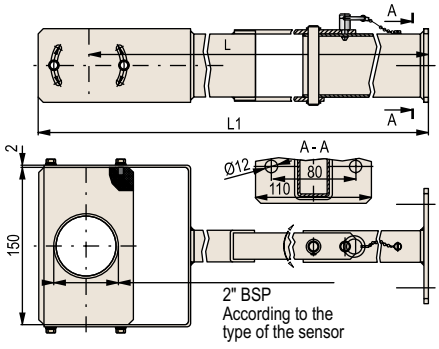
Process connection

S A A – 1 0 ■ – □

0	For 1" BSP threaded process connection
3	For 2" BSP threaded process connection
4	For 1½" BSP threaded process connection
5	For 2" NPT threaded process connection
6	For 1½" NPT threaded process connection



SAA-107



SAA-108, SAA-109

Accessories

UNIDISP SAP-100 — 5 years

Plug-in programming and display module for 4-wire EchoTREK ST-300
Field indications: 6-digits LCD, icons and bargraph display

Type	
S A P – 1 0 0 – 0	Plug-in programmer/display module

SAP-100

UNIDISP SAP-200 — 5 years

Plug-in display module for the listed 2-wire transmitters
Field indications: 6-digits LCD, icons and bargraph display

Label	
S A P – 2 0 □ – 0	
0	Module with label for 2-wire and S-400 EchoTREK
2	Module with label for NIVOCAP, THERMOCONT, UNICONT PD
3	Module with label for NIVOPRESS

SAP-200

UNIDISP SAP-300 — 5 years

Plug-in dot matrix (128 × 64) graphic display for 2-wire transmitters
Field indications: measured value, bargraph display

Type	
S A P – 3 0 0 – 0	Graphic plug-in display module

SAP-300

UNICOMM SAT-305 — 5 years

Infrared interface module with datalogger readout function, equipped with type "B" mini USB connector

Type	
S A T – 3 0 5 – 0	IRDA module

UNICOMM SAT-306 — 5 years

eLINK unit for software/firmware updates for datalogger reading with type "B" mini USB connector
Can be plugged in instead of SAP display module

Type	
S A T – 3 0 6 – 0	eLINK plug-in unit

UNICOMM SAT-506 — 5 years

eLINK unit for software/firmware updates for datalogger reading with type "B" mini USB connector. Can be plugged in the socket of the SAP display module. Provides galvanically isolated power and communication to the device, capable of high-speed program loading.

Type	
S A T – 5 0 6 – 0	eLINK plug-in unit

EView2 — 1 year

EView2 HART® configuration software package for remote programming and viewing of primary measurement values in HART® multidrop systems. Downloadable from our website free of charge.

SENSONAR — 5 years

Mounting nuts

Type	
SIA-340-0M02005	1" BSP female nut / PP
SIB-340-9M02005	1" BSP female nut / PVDF
SSA-390-9M02001	1½" BSP female nut / PP
SSB-390-9M02001	1½" BSP female nut / PVDF
SSA-380-9M02002	2" BSP female nut / PP
SSB-380-9M02002	2" BSP female nut / PVDF

NIV24
SAP-100-0
SAP-200-0
SAP-300-0

LEVEL SWITCHES

The most frequent level instrumentation task is level control and limit-switching. NIVELCO offers reliable level control and limit level switching solutions for most mediums, from potable water to sewage, aggressive alkalis and acids, free-flowing, powdered, bulk, or granular solids.

Most of our level switches have explosion-proof *(ATEX or IEC Ex compliant)* versions.

We offer suitable solutions for industries with special requirements, for example, shipbuilding that requires DNV, Bureau Veritas (BV), or SIL certificates.

NIVOFLOAT
FLOAT SWITCHES

page 107

- Air-tight design, double-chamber
- Adjustable switch differential
- Up to 20 m cable length
- Max. +50 °C process temperature
- Max. 2 bar process pressure
- Level switch from potable water to sewage
- Fail-safe indication and pump control
- Suitable for tanks and basins

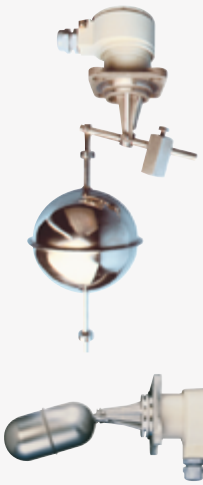
NIVOCONT K
CONDUCTIVE LEVEL SWITCHES

page 109

- Affordable choice
- Limit switch or differential switch versions
- Adjustable sensitivity
- Adjustable delay
- All wetted parts stainless steel
- Compact and separated variants
- For liquids with minimum 10 µS/cm conductivity
- Rod probes up to 3 m

NIVOMAG
MAGNETIC COUPLING SWITCHES

page 113



- Operation without power supply
- Micro-switch separated from the process
- All wetted parts stainless steel
- Fixed or adjustable switch differential
- Submersible versions
- For liquids with minimum 0.7 kg/dm^3 density
- Flame-proof variants available
- Marine certificates, SIL certificate

NIVOPOINT
MAGNETIC TRACKING SWITCHES

page 117

- Operation without power supply
- Reed switch connection
- Stainless steel probe and float
- PFA-coated probe version with plastic float
- Up to 5 switching points
- For liquids with minimum 0.4 kg/dm^3 density
- Multi-point level switch in sealed tanks
- Flame-proof variants available

NIVOSWITCH for LIQUIDS
VIBRATING FORK LEVEL SWITCHES

page 122

- For most liquids with minimum 0.7 kg/dm^3 density and maximum 10^4 mm^2/s viscosity
- No moving parts
- Self-cleaning in most mediums
- Stainless steel and plastic-coated forks
- Rigid pipe length up to 3 m
- Explosion-proof variants available
- IP67, IP68

NIVOSWITCH for SOLIDS
VIBRATING FORK LEVEL SWITCHES

page 119

- For powdered solids with minimum 0.01 kg/dm^3 density
- No moving parts
- Stainless steel fork
- Self-cleaning in most mediums
- Rigid pipe length up to 3 m
- IP67, IP68
- Explosion-proof variants available

NIVOCONT R
VIBRATING ROD LEVEL SWITCHES

page 144

- For granular solids with min. 0.05 kg/dm^3 density
- Insertion lenght up to 20 m
- Stainless steel vibrating section
- Selectable density
- Plastic or aluminum housing
- Relay or electronic switch output
- IP67
- Explosion-proof variants available

NIVOROTA
ROTARY PADDLE LEVEL SWITCHES

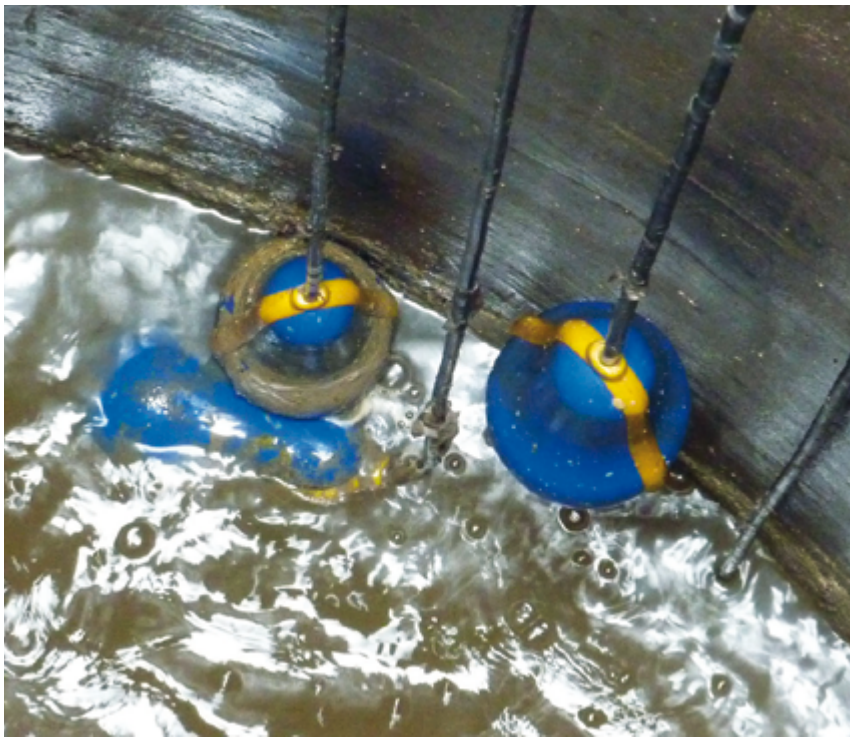
page 150

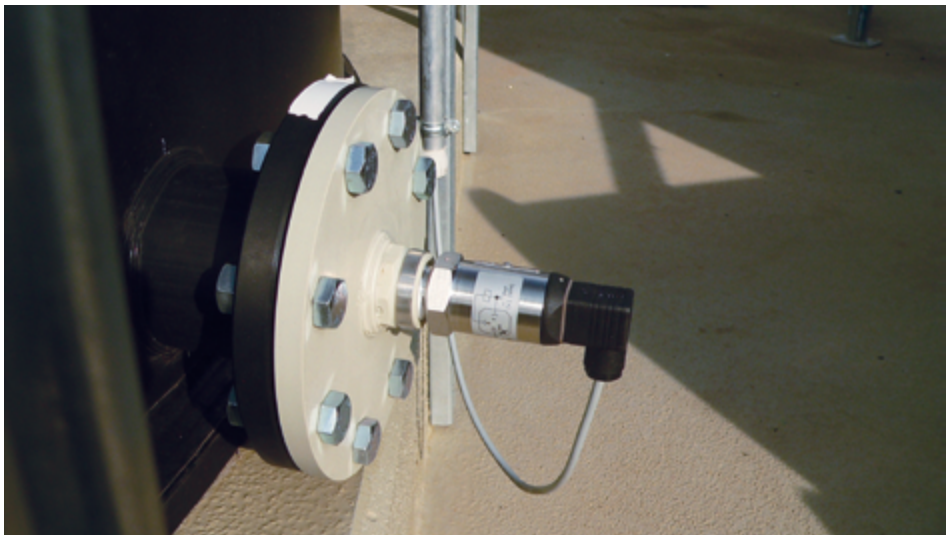
- For granular solids with minimum 0.1 kg/dm^3 density
- Plastic or aluminum housing
- Stainless steel wetted parts
- Motor shut-off feature
- Single or 3-blade paddle
- Insertion length up to 3 m
- High-temperature version
- IP67
- Explosion-proof variants available
- Rotary force independent of the supply voltage
- Low supply voltage is indicated by a blinking LED

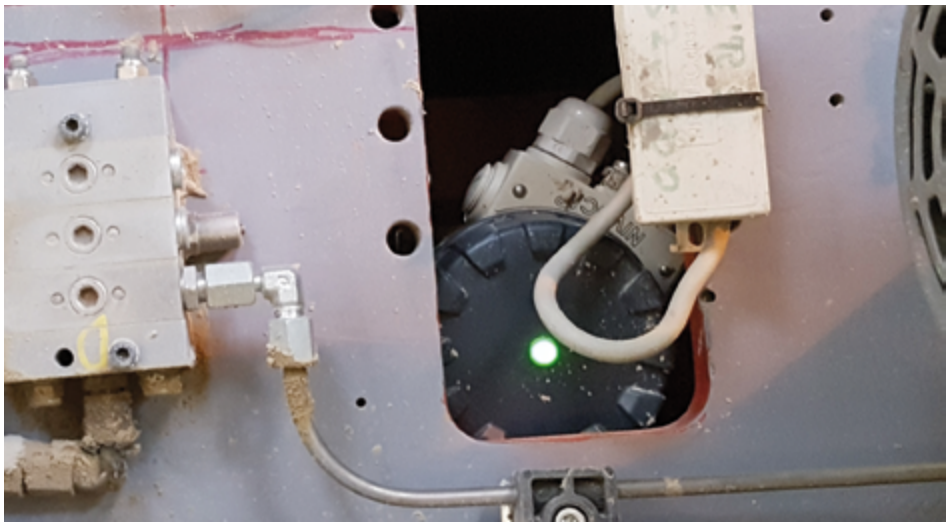
NIVOCAP CK
RF-CAPACITANCE LEVEL SWITCHES

page 156

- For solids with $\varepsilon_r \geq 1.5$ and liquids
- For viscous, sticky materials
- Easy calibration
- Selectable sensitivity
- Immune to material deposits
- Insertion length up to 10 m
- High-temperature version
- IP67
- Explosion-proof variants available







The **NIVOFLOAT NL–100** float level switch is suitable for clean or slightly contaminated water. The **NIVOFLOAT NW–100** tilting-float level switch is for sewage, tanks, basins, or cisterns. The waterproof dual-chambered float is injection-molded polypropylene, and the microswitch is incorporated into the float.

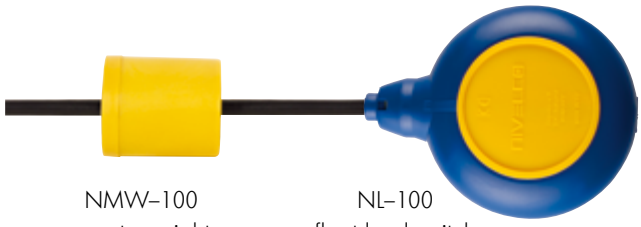
The cable is lead through a waterproof sealed entry point into the monolithic structure of the injection-molded plastic housing. It uses three copper wires of 1 mm^2 cross-section, insulated with PVC or Neoprene. The double-walled design provides outstanding safety for users in terms of life and touch protection. In addition, the **NIVOFLOAT** is suitable for various control tasks, such as liquid level monitoring and pump control. These devices serve reliably provided their operating conditions are appropriately selected.

FEATURES

- Dual-chambered float
- Switching differential is adjustable by counterweight (NL–100)
- Special float shape (NW–100)
- Up to 20 m cable length
- Process temperature up to +50 °C
- Process pressure maximum NL–100: 1 bar; NW–100: 2 bar
- Variants for potable water available
- IP68

APPLICATIONS

- Suitable for drinking water
- Industrial and communal sewage
- Tank filling/emptying control
- Overfill protection



NMW–100
counterweight

NL–100
float level switch

NW–100
float level switch

TECHNICAL DATA

	NL□–1□□–1	NW□–1□□–1
Switching angle	±45°	–
Switching differential	–	~400 mm (constant)
Process temperature	0…+50 °C	
Process pressure	up to 1 bar (0.1 MPa)	up to 2 bar (0.2 MPa)
Material of the float / counterweight	Polypropylene / Polystyrene	Polypropylene
Float volume	430 cm^3	1000 cm^3
Rating of the microswitch	10(4) A, 250 V AC, AC1	10(3) A, 250 V AC, AC1
Electrical life-span	10^7 switches	
Ingress protection	IP68	IP68
Cable	Ø9 mm / 3 × 1 mm^2	
Cable length	5 m, 10 m, 20 m	
Weight (without cable)	250 g	1,1 kg

NIVOFLOAT N-100 — 3 years

Double-chamber float level switch
with PVC or Neoprene cable

Type

N □■ – 1 ■■ – 1

L	For clean water
W	For wastewater

Cable material

N ■□ – 1 ■■ – 1

N	Neoprene
P	PVC

Cable length

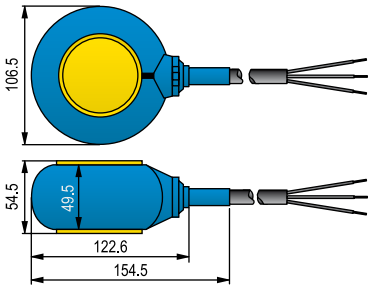
N ■■ – 1 □□ – 1

PVC cable	
0 5	5 m
1 0	10 m
2 0	20 m
Neoprene cable*	
0 5	5 m
1 0	10 m
2 0	20 m

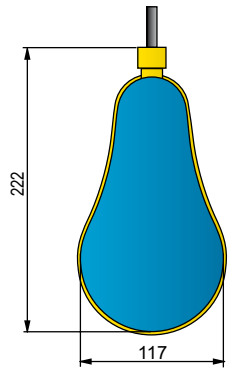
* Variants with a drinking water permit

N ■■ – 1 ■■ – □

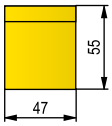
1	Without counterweight



NL□-100



NW□-100



NMW-100

NIVOFLOAT NMW-100 — 3 years

Counterweight for NL type float level switch
Material: polystyrene

N M W – 1 0 0 – 0	Counterweight

Available on request

- Non-standard lengths for over 100 pcs

NIV24
NLP-105-1, NWP-105-1
NLP-110-1, NWP-110-1
NLP-120-1, NWP-120-1
NLN-105-1, NWN-105-1
NLN-110-1, NWN-110-1
NLN-120-1, NWN-120-1
NMW-100-0

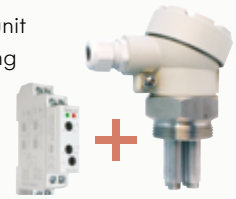
NIVOCONT K conductive level switches can be used in liquids whose conductivity exceeds 10 µS/cm. The level of the liquid is detected by a probe that is immersed in the medium. Single and multiple rod type probes are available. They *(and the tank wall, if conductive)* act as electrodes, and the measured liquid is used as conductive material between them. Up to 4 rods can be fitted in a multiple-probe socket with an additional reference probe if the tank wall is not conductive. The probe's length must correspond with the measured level. When the liquid level reaches the probe, it changes the loop's conductivity, and the output relay is activated. The device senses the change in conductivity between the probes and the reference probe. KLP separators must be used every 0.5 m to provide appropriate distance between the probes.

FEATURES

Level Switches		Compact Level Switches
KRK–512	KRK–622	KKH–2□2
▪ Level switching ▪ Filling-emptying control ▪ Selectable NO/NC relay function ▪ Adjustable sensitivity ▪ Adjustable ON/OFF delay ▪ Delay time indication ▪ AC/DC versions ▪ 5 years warranty	▪ Available functions: – Monitoring of 2 independent levels in 2 tanks – Monitoring of 2 independent levels in 1 tank – Pumping from one tank to another ▪ DIP switch on front panel (8 functions) ▪ Adjustable sensitivity (for each probe separately) ▪ Adjustable relay switching delay (for each probe separately) ▪ AC/DC versions ▪ 5 years warranty	▪ Probe and relay in one unit ▪ 1 or 2 incorporated KRK–512 electronics ▪ 1 or 2 independent relay outputs for pump control or differential level switching ▪ Selectable NO/NC relay function ▪ Adjustable sensitivity ▪ Adjustable ON/OFF delay ▪ Delay time indication ▪ AC/DC versions ▪ 5 years warranty

VERSIONS

Level Switch and Probe	Compact Level Switch
▪ DIN-rail-mounted 1 or 2 channel switching unit ▪ Probe socket with aluminum or plastic housing featuring 1½" BSP process connection ▪ Probe-rods up to 3 m	▪ 1 or 2 channel switching unit in plastic housing with 1½" BSP process connection ▪ Probe-rods up to 3 m



APPLICATIONS

- For conductive liquids with at least 10 µS/cm conductivity
- For empting/filling control or level switching
- Fail-safe indication and pump control
- Water inrush indicator

KRK–512–5

KRK–622–□

KSH–2□□

KKH–2□2–5

TECHNICAL DATA

Probes / Features	Single-Probe			Multi-Probe							Submersible
				Aluminum housing			Plastic housing				
	KSP–201	KSS–201	KSN–201	KSH–							KSK–201
				202	203	204	301	302	303	304	
Number of probes	1			2+s*	3+s*	4+s*	1+s*	2+s*	3+s*	4+s*	1
Process connection	⅜" BSP			1½" BSP							Cable-mountable
Probe socket material	PP	Carbon steel	1.4571 (316Ti)				PP				–
Housing	–			Cast aluminum			PBT				ABS
Probe material	1.4571										1.4401
Insulation of socket	PP	PFA					PP				ABS
Process temperature	max. +80 °C	maximum +200 °C					maximum +80 °C				
Pressure max	max. 3 bar (0.3 MPa)	maximum 16 bar (1.6 MPa)					maximum 3 bar (0.3 MPa)				–
Electrical connection	M4 nut, protected by rubber cap			M20×1.5 cable gland, cable diameter: Ø6…Ø12 mm							Pg7[1]
Ingress protection	IP20			IP65			IP67				IP68
Weight (without probe)	100 g			400 g			200 g				50 g

s = reference probe* [1] *Cable: Ø4…7 mm*

Type / Features	Level Switches		
	KRK–512–5	KRK–622–1	KRK–622–4
Supply voltage (U_n)	24…240 V AC/DC (AC 50…60 Hz)	230 V AC	24 V AC/DC
	–15…+10%		
Power consumption	Max. 2 VA	2.5 W / 5 VA	1.4 W / 2 VA
Ambient temperature	–20…+55 °C		
Probe voltage	Max. 3.5 V AC		
Probe current	Max. 0.1 mA AC	Max. 1 mA AC	
Sensitivity	Adjustable: 5…100 kΩ		
Cable capacitance	100 nF (100 kΩ sensitivity) 800 nF (5 kΩ sensitivity)		
Fixed ON delay	1.5 s	–	
ON/OFF delay	0.5…10 s		
Relay output	1× SPDT 250 V 8 A, AC1 24 V DC 8 A	2× SPDT 250 V 16 A, AC1 24 V DC 16 A	
Electrical connection	Terminal block, max. 2.5 mm²		
Electrical protection	Class II		Class III
Mechanical connection	EN 60715 rail		
Ingress protection	IP20		
Weight	72 g	248 g	147 g

Type / Features	Compact Level Switches	
	KKH–212–5	KKH–222–5
Supply voltage (U_n)	24…240 V AC/DC (AC 50…60 Hz)	
	–15…+10%	
Power consumption	Max. 2 VA	Max. 4 VA
Ambient temperature	–20…+50 °C	
Process temperature	–20…+80 °C	
Medium pressure	1 bar	
Number of probes	2+s*	4+s*
Probe voltage	Max. 3.5 V AC	
Probe current	Max. 0.1 mA	
Sensitivity	Adjustable: 5…100 kΩ	
Fixed ON delay	1.5 s	
ON/OFF delay	0.5…10 s	
Relay output	1× SPDT 250 V 8 A AC1 / DC 24 V 8 A	2× SPDT 250 V 8 A, AC1 / DC 24 V 8 A
Electrical connection	Cable gland: 2× M20×1.5 Ø6…12 mm cables, Terminal block, max. 2.5 mm²	
Electrical protection	Class II	
Process connection	1½" BSP	
Material of probe socket	PP	
Housing material	Polycarbonate	
Ingress protection	IP67	
Weight (without probe)	660 g	800 g

s=reference probe*

PROBES, ACCESSORIES

KS□–201
Single-probe socket

KSK–201
Submersible probe

KLN–2□□
Probe

KLP–201–0 Separator for KSH–300 and KKH–200

KLP–204–0
Separator for KSH–200

NIVOCONT KS — 5 years

Single-probe socket for level detection of electrically conductive liquids
For level detection with KLN electrodes and KR level control unit

Socket- / Insulation material

K S □ – 2 0 1 – 0

P	PP / PP
S	Steel / PFA
N	Stainless steel / PFA

NIVOCONT KSH — 5 years

Multi-probe socket for level detection of electrically conductive liquids
For level detection with KLN electrodes and KR level control unit

Type

K S H – □ 0 ■ – 0

2	Aluminium housing
3	Plastic housing

Probes

K S H – ■ 0 □ – 0

2	2-probes + reference electrode
3	3-probes + reference electrode
4	4-probes + reference electrode

Special version

X07	1½" NPT process connection (only for KSH-2__ version)

NIVOCONT KLN — 5 years

Stainless steel electrode with M6 thread for KS and KKH probe socket

Length

K L N – 2 □ □ – 0

0 5	0.5 m
1 0	1.0 m
1 5	1.5 m
2 0	2.0 m
2 5	2.5 m
3 0	3.0 m

NIVOCONT KLN with plastic coating — 5 years

Use the order codes below after the standard order code of the device.
Special version PE-coated (up to +100 °C).

Length

KLN–205–0–X03	0.5 m
KLN–210–0–X03	1.0 m
KLN–215–0–X03	1.5 m
KLN–220–0–X03	2.0 m
KLN–225–0–X03	2.5 m
KLN–230–0–X03	3.0 m

NIVOCONT KLP — 5 years

Separator (does not fit X03 PE-coated electrodes)

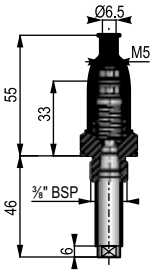
Type

K L P – 2 0 4 – 0	For KSH-200
K L P – 2 0 1 – 0	For KSH-300 and KKH-200

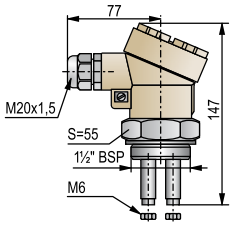
NIVOCONT KSK — 5 years

Submersible probe for conductive liquids
To connect to KR level control unit

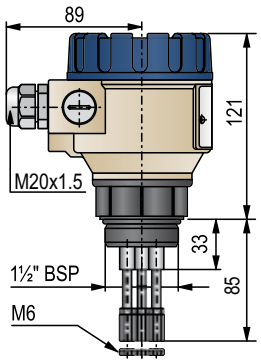
K S K – 2 0 1 – 0	Submersible probe



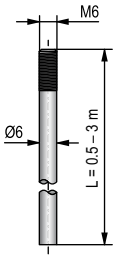
KS□-201



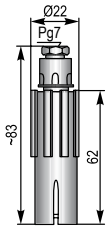
KSH-202



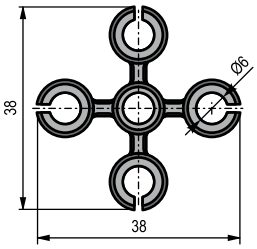
KSH-303



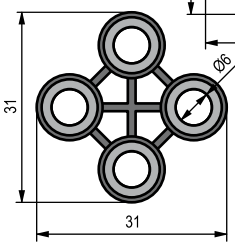
KLN-200



KSK-201



KLP-201



KLP-204

NIV24
KSP-201-0
KSS-201-0
KSN-201-0
KSH-202-0, KSH-302-0
KSH-203-0, KSH-303-0
KSH-204-0, KSH-304-0
KSH-303-0, KSH-304-0
KLN-205-0, KLN-210-0, KLN-215-0, KLN-220-0, KLN-230-0
KLP-204-0, KLP-201-0
KSK-201-0

NIVOCONT KRK-512 — 5 years

Conductive level control switch for KS sockets and KLN probes
with 1x SPDT relay output for limit switching or differential switching with time delay

Type	
□ R K – 5 1 2 – 5	
K	Conductive level switch

NIVOCONT KRK-622 — 5 years

Conductive level control switch for KS sockets and KLN probes
with 2x SPDT relay outputs for limit switching or differential switching with time delay

Supply voltage	
K R K – 6 2 2 – □	
1	230 V AC
4	24 V AC/DC

NIVOCONT KKH — 5 years

Compact conductive level switch with single or dual channel probe socket
including 1 or 2 KRK-512 level control switches

Type	
K K H – 2 □ 2 – 5	
1	Single channel (3 probes)
2	Double channel (5 probes)

NIVOCONT KLN — 5 years

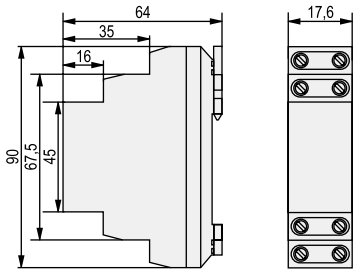
Stainless steel electrode with M6 thread for KS and KKH probe socket

Length	
K L N – 2 □□ – 0	
0 5	0.5 m
1 0	1.0 m
1 5	1.5 m
2 0	2.0 m
2 5	2.5 m
3 0	3.0 m

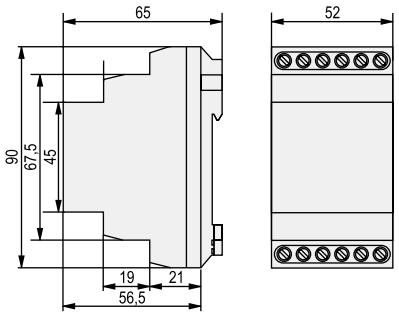
NIVOCONT KLP — 5 years

Separator (does not fit X03 PE coated electrodes)

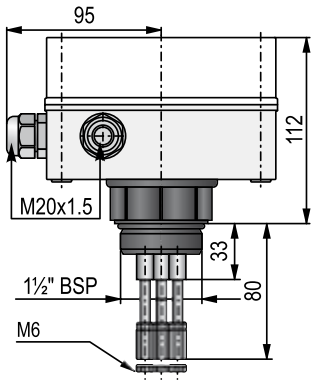
Type	
K L P – 2 0 1 – 0	For KSH-300 and KKH-200



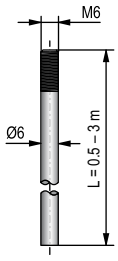
KRK-512-5



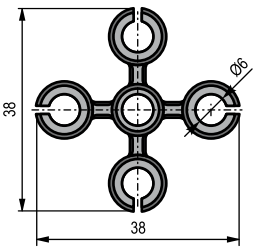
KRK-622-□



KKH-2□2-5



KLN-2□□-0



KLP-201-0

NIV24
KRK-512-5
KRK-622-1, KRK-622-2, KRK-622-4
KLN-205-0, KLN-210-0, KLN-215-0, KLN-220-0, KLN-230-0
KLP-201-0
KKH-212-5, KKH-222-5

The **NIVOMAG MK–200** magnetic float level switches are used for point-level detection and level control of liquids in all types of containers. Operating principle: the float's magnet activates the output switch via a non-contact coupling system. The device is available in numerous side and top-mounted versions, further widening the applicability of the device. For simpler jobs, fixed hysteresis models offer an affordable solution, while for a more complex level control application, the best choice is the adjustable hysteresis variants. Models with rubber and silicon sleeves can be used with contaminated liquids. The **NIVOMAG** switch can be fitted with an **MMK** tester to check functionality even when the liquid levels are not changing.

FEATURES

- Magnetic coupling between switch and float
- Operation w/o external power supply
- Side and top mounted versions
- Underwater version
- Fixed or variable hysteresis
- Max. +250 °C process temperature
- Flame-proof version
- IP65 / IP68
- 5 years warranty

APPLICATIONS

- Overflow protection
- Level controls
- Supplementary fail-safe switch if combined with other devices
- Water tanks, feedwater tanks
- Fuel tanks
- Power plants

CERTIFICATES

- ATEX (Ex d e mb G)
- IEC Ex (Ex d e mb G)
- INMETRO (Ex d e mb G)
- DNV
- Bureau Veritas (BV)
- SIL 1 (Safety Integrity Level)

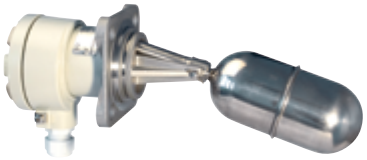
VARIANTS

The following tables and diagrams help select the appropriate model for the job. When selecting a model, liquid density, mounting position, process connection, and the need for adjustable or fixed hysteresis or a rubber sleeve must be considered.

Additional technical data				
Arm length (mm)	0…100	200	300	1000…3000
Maximum float Ø (mm)	Minimum liquid density (kg/dm³)			
52	0.7	0.8	0.85	–
64			0.8	–
124	–	–	–	0.7

Type	MK□–21□	MK□–22□	MK□–23□
Fixed switching differential	■		
Adjustable switching differential		■	■
Straight arm	■	■	■
"L" or "Z" arm	■	■	
Side mounted	■	■	
Top mounted	■ (1)	■ (1)	■
Submersible	■	■	■
Protective Rubber Sleeve	■		
Flanged process connection	■	■	■ (2)
Threaded process connection	■		
Ex variant	■	■	■
Tester	■	■ (3)	

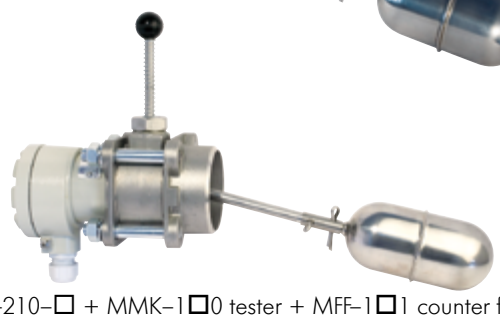
(1) *With "L" arm*
(2) *Only with 92 × 92 flange*
(3) *Only with special counter flange*



MKA–210–□

MKA–220–□

MKZ–210–0



MKA–210–□ + MMK–1□0 tester + MFF–1□1 counter flange

MKA–230–□

TECHNICAL DATA

		Cylindrical float (side and top mounting)				Ball float (top mounting)
		MKA–21☐	MKA–22☐	MKU, MKV, MKZ–21☐	MKS, MKG–21☐	MK☐–23☐
Nominal pressure		25 bar (2.5 MPa) [MKU, MKV, MKZ: 2/25 bar (0.2/2.5 MPa)]				25 bar (2.5 MPa)
Process temperature		See Temperature diagram		0…+80 °C	MKS: 0…+200 °C MKG: 0…+100 °C	See Temperature diagram
		Ex variant: see Temperature specification table and Temperature diagram				
Ambient temperature		–20…+80 °C, Ex variant: see temperature specification for Ex version table				
Liquid density		Minimum 0.7…0.85 kg/dm³, see "Additional technical data" table				
Switching differential		Fixed	Adjustable	Fixed		Adjustable
Insertion length		202…521 mm	254…573 mm	202…521 mm		1265…3265 mm
Material of wetted parts		Stainless steel (1.4571, 1.3960, 1.4404); MKG, MKV: rubber (NBR); MKS, MKZ: silicone				
Housing material		Painted aluminum				
Microswitch		1 microswitch with 1 closing and 1 opening contact (NO and NC) (1)				
Switch rating	Standard	250 V 10 A AC12; 220 V 0.6 A DC13				
	Ex variant	250 V 2.5 A AC12; 220 V 0.3 A DC13				
Electrical connection		M20×1.5 cable gland, cable diameter: Ø6…12 mm (Ex version: Ø10…14 mm), wire cross section: 5 × 0.75…2.5 mm² (MKU, V, Z: integrated cable NSSHöu-J 5 × 1.5 mm², Ø14mm)(2)				
Ingress protection		IP65 (MKU, MKV, MKZ: IP68 up to 20 m underwater)				
Electrical protection		Class I				
Safety integrity level		SIL1				
Ex marking	ATEX	⟨Ex⟩ II 1/2 G Ex d e mb IIC T6…T2 Ga/Gb				
	IEC Ex	Ex d m e IIC T6…T2				
	INMETRO	Ex d e mb IIC T6…T2 Ga/Gb				
Weight		~1.8…3.5 kg				

(1) NO and NC terminals must be connected to an equipotential circuit.
(2) Cable length must be specified when ordered.

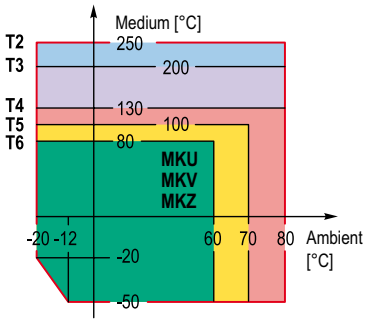
Ex INFORMATION

Temperature specification for Ex variants(3)

Temperature classes		T6	T5	T4	T3	T2
Ambient temperature range		–20…+60 °C	–20…+70 °C	–20…+80 °C	–20…+80 °C	–20…+80 °C
Process temperature range	MKA	–50…+80 °C	–50…+95 °C	–50…+130 °C	–50…+200 °C	–50…+250 °C
	MKG	0…+80 °C	0…+95 °C	–	–	–
	MKS	0…+80 °C	0…+95 °C	0…+130 °C	0…+200 °C	–
	MKU, MKV, MKZ	0…+80 °C	–	–	–	–

(3) The applicable process temperature range is limited according to the temperature diagram.

Temperature diagram



MKA–21☐–☐
with threaded process connection

MKA–21☐–☐
with flanged process connection

MKA–210–4
with "Z" arm

MKA–210–4
with "L" arm

MKU–210–☐

MFF–110
counter flange

MFF–111 counter flange
+ MMK–120 tester

NIVOMAG MK-21 — 5 years

Side / top-mounted magnetic coupling float level switch with fixed switch differential
with SIL1 and marine (DNV, BV) certificates

Version

M K □ – 2 1 ■ – ■

A		Standard
G		With rubber protective sleeve
S		With silicon protective sleeve
U		Underwater (IP68) (cable length must be specified in text of the order)
V		Underwater (IP68), with rubber protective sleeve (cable length should be given in text of the order)
Z		Underwater (IP68), with silicon protective sleeve (cable length must be specified in text of the order)

Process connection

M K ■ – 2 1 □ – ■

0		Square flange
B	*	2" BSP
N	*	2" NPT
1	*	DIN DN80, PN40 / 25 / 16 / 10 steel
2	*	DIN DN100, PN40 / 25 steel
5	*	DIN DN80, PN40 / 25 / 16 / 10, 1.4571 stainless steel
6	*	DIN DN100, PN40 / 25, 1.4571 stainless steel

* Not available with protection sleeve

Protrusion / Arm length / Ex Certificate

M K ■ – 2 1 ■ – □

0		202 mm (189 mm for MKA-21B, 178 mm for MKA-21N)
1		321 / 100 mm
2		421 / 200 mm
3		521 / 300 mm
4	**	"L" or "Z" profile (must be specified in text of the order)
9		202 mm (189 mm for MKA-21B, 178 mm for MKA-21N) / Ex d e mb G
5		321 / 100 mm / Ex d e mb G
6		421 / 200 mm / Ex d e mb G
7		521 / 300 mm / Ex d e mb G
8	**	"L" or "Z" profile (must be specified in text of the order) / Ex d e mb G

Need of IEC Ex is to be specified in the text part of the order

NIVOMAG MK-22 — 5 years

Magnetic coupling float level switch with adjustable switch differential
with SIL1 and marine (DNV, BV) certificates

Version

M K □ – 2 2 ■ – ■

A		Standard
U		Underwater (IP68) (cable length must be specified in text of the order)

Process connection

M K ■ – 2 2 □ – ■

0		Square flange
1		DIN DN80, PN40 / 25 / 16 / 10 steel
2		DIN DN100, PN40 / 25 steel
5		DIN DN80, PN40 / 25 / 16 / 10, stainless steel
6		DIN DN100, PN40 / 25, 1.4571 stainless steel

Protrusion / Arm length / Ex certificate

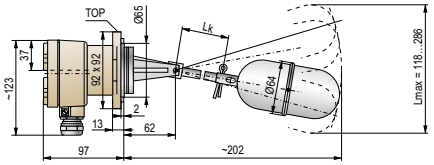
M K ■ – 2 2 ■ – □

0		254 mm
1		373 / 100 mm
2		473 / 200 mm
3		573 / 300 mm
9		254 mm / Ex d e mb G
5		373 / 100 mm / Ex d e mb G
6		473 / 200 mm / Ex d e mb G
7		573 / 300 mm / Ex d e mb G

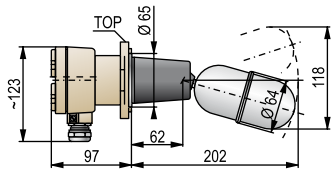
Need of IEC Ex is to be requested in the text part of the order

Cable for underwater version

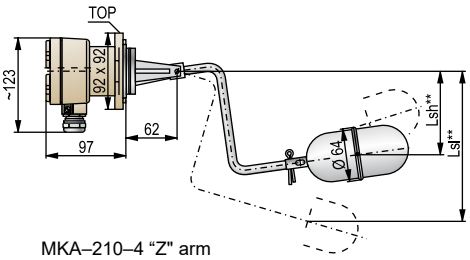
To be specified in the order; sold by the meter



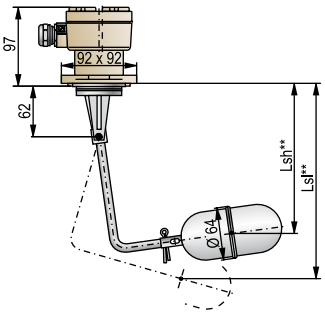
MKA–210–□



MKG–210–□

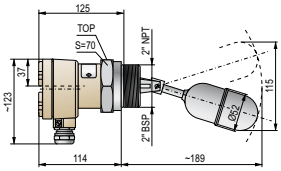


MKA–210–4 “Z" arm

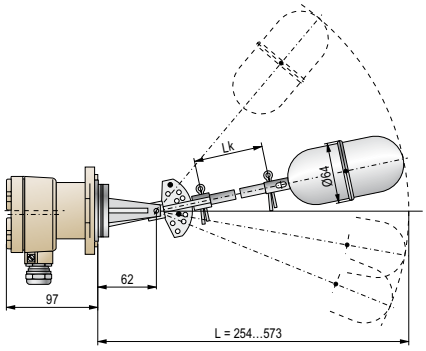


MKA–210–4 “L" arm

*** The type of the arm profile ("L" or "Z") and the upper (Lsh) or the lower (Lsl) switching pointmust be specified in the order*



MKA–21B / 21N



MKA–220–□

NIV24

MKA-210-0

NIVOMAG MK-23 — 5 years

Top-mounted magnetic coupling float level switch and adjustable switch differential with SIL1 and marine (DNV, BV) certificates

Version

M K □ – 2 3 0 – ■

A	Standard

Process connection

M K A – 2 3 □ – ■

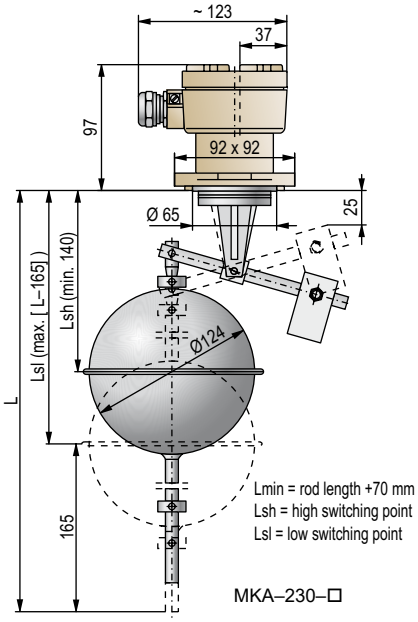
0	Square flange

Protrusion / Arm length / Ex certificate

M K A – 2 3 0 – □

1	1265 mm / 1000 mm
2	2265 mm / 2000 mm
3	3265 mm / 3000 mm
5	1265 mm / 1000 mm / Ex d e mb G
6	2265 mm / 2000 mm / Ex d e mb G
7	3265 mm / 3000 mm / Ex d e mb G

Need of IEC Ex is to be requested in the text part of the order



MKA–230–□

NIVOMAG MFF — 5 years

Counter flange for MK magnetic level switch

Material

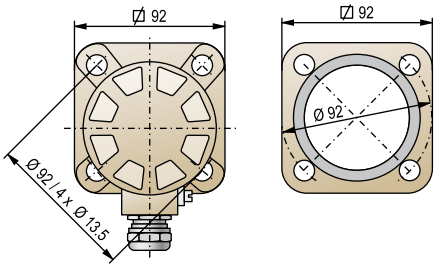
M F F – 1 □ ■ – 0

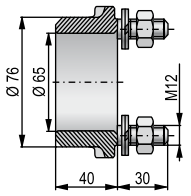
1	Steel (1.7218)
2	Stainless steel (1.4409)

Version

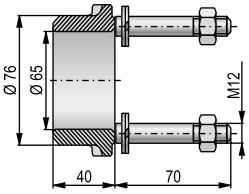
M F F – 1 ■ □ – 0

0	Standard
1	For units with MMK–1_0 tester





MFF–110



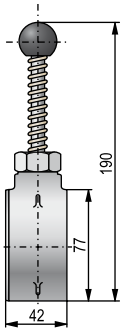
MFF–111

NIVOMAG MMK — 5 years

Tester for MK magnetic level switch

Type

M M K – 1 1 0 – 0	Steel (1.7218)
M M K – 1 2 0 – 0	Stainless steel (1.4409)



MMK–110

NIVOPOINT magnetic float level switches are suitable for single and multi-point level controlling tasks in non-hazardous and hazardous areas. The device consists of a probe tube, a float incorporating a magnet, and the housing that contains the connection terminals. Up to 5 switches can be connected to the probe. A sliding-sleeve on the top of the probe provides a simultaneous ±25 mm adjustment possibility of the positioning of the switches. The wetted parts of the level switch are made of stainless steel. Plastic-coated versions are suitable for measuring aggressive liquids, and ATEX certified variants can be used with explosive materials. The measured medium and application determine floats and process connections.

The mini version of the NIVOPOINT magnetic float level switch is suitable for small tanks. The small size and easy installation make it perfect for detecting the maximum, minimum, or intermediate level using the tank's or device's connection stubs made for other purposes.

FEATURES

- Level switching without auxiliary power
- Up to 5 switching points
- Stainless steel and plastic-coated versions
- +150 °C process temperature
- Mini version
- Wide variety of floats
- IP67 / IP68
- Ex variant
- 5 years warranty

APPLICATIONS

- Multi-point level switching
- For controlling pumps, valves
- Level detection of aggressive liquids
- Level switching of explosive liquids

CERTIFICATES

- ATEX (Ex d G)
- Bureau Veritas (BV) (only for MZ☐ types)

MZS–100
mini version

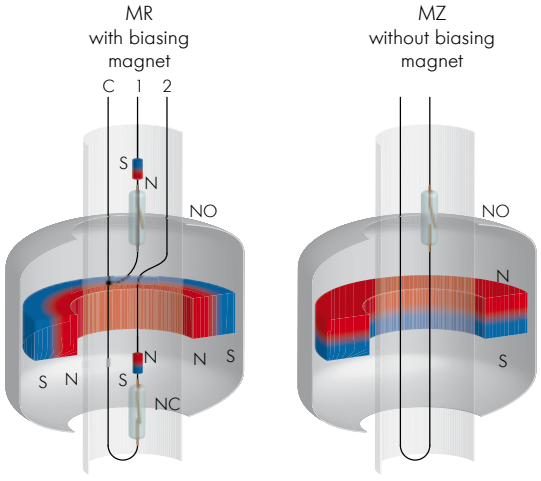
MP☐–100
Plastic-coated
version

MZC–300

MR☐–100
Standard version

TEMPERATURE DATA FOR Ex VERSIONS

Class	T6	T5	T4	T3
Highest ambient temp. from –40 °C	+65 °C	+80 °C	+95 °C	+95 °C
Highest medium temp. from –40 °C	+80 °C	+95 °C	+130 °C	+150 °C



OPERATION

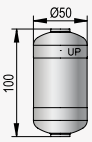
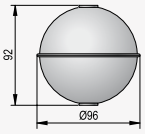
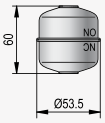
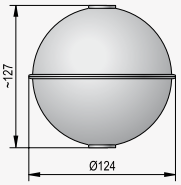
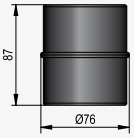
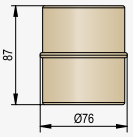
NIVOPOINT magnetic float level switches use the interaction between a magnet in the float and the reed switches in the probe. The float moves along the stem, following the level of the liquid and activating the reed-switches. As the float moves along the reed-switches, it changes their state *(NO or NC)*, and they stay triggered until the liquid's level falls, and the float moves along the reed switches again, breaking off the self-holding state and restoring the previous state of the reed-switches. The mini version does not contain biasing magnets. By following the level, the magnetic float activates the reed switches in the probe. The reed switches opens or close according to the position of the magnetic float. The default state is when the float is at the bottom position.

TECHNICAL DATA

	Standard (MR)	Plastic-coated (MP)	Explosion-proof (MR [Ex])	Mini (MZ)
Insertion length	0.25…3 m[1]			0.1…1.5 m
Material of wetted parts	1.4404 float / 1.4571	PVDF or PP float / PFA or PP-coated probe tube	Titan / 1.4404 / 1.4435 float; 1.4571 probe tube	
Max. process pressure	25 bar (2.5 MPa)	6 bar (0.6 MPa)	25 bar (2.5 MPa)	
Min. medium density	0.8 kg/dm³	0.4 / 0.7 kg/dm³	0.8 kg/dm³	
Float sizes	See "Floats"			
Process temperature	–40…+150 °C	–40…+80 °C	See temperature data for Ex versions table	–40…+120 °C
Ambient temperature	–40…+95 °C			–20…+70 °C
Output	1…5 reed-switches, one connecting point of each is common NO/NC			1…3 reed-switches, NO/NC depending on float orientation
Switching rate	120 W/VA, 250 V AC/DC, 3 A Reed-relay, 9 A maximum altogether			120 W / VA; 250 V AC / DC; max. 3 A
Switching point	See auxiliary table of order codes			up to 3 (to be specified when ordering)
Switching differential	< 10 mm			max. Δ8 mm
Distance between reed-switches	At least 110 mm			At least 90 mm
Electrical connection	M20×1.5 cable gland, cable diameter: 6…12 mm		M20×1.5 cable gland, cable diameter: 7…12 mm[2]	0.5 m long[3] cable with silicon insulation
	Terminal, 0.5…2.5 mm² wire cross section			
Process connection	As per order code			
Seal	Klingerit[4]	–	Klingerit[4]	
Electrical protection	Class I (protective cable 4 mm²)			Class II (reinforced insulation)
Ingress protection	IP67			IP68 (20 m)
Certification	–		ATEX: ⟨Ex⟩ II 1/2G Ex db IIC T6…T3 Ga/Gb	Bureau Veritas
Housing dimensions	116 × 80 × 65 mm		124 × 80 × 65 mm	–
Weight	400 g + 300 g/m		450 g + 300 g/m	~0.15…2.5 kg (depending on order) + cable: 0.03 kg/m

[1] 3…4 m as per special offer, Ex version not available.
[2] The type MR□–□□□–8 Ex devices are shipped without cable glands.
[3] Available with different cable length.
[4] Only for BSP.

FLOATS

	MRC–106–7M–900–00	MRC–105–7M–700–00[1] / MZS–101–3M–800–00[2]	MRC–105–7M–900–00 / MZS–101–3M–900–00[2]	MRC–105–7M–600–00[1] / MZS–101–3M–700–00[2]	MRC–105–7M–800–00	MPP–105–3M–200–00[1]	MPP–105–3M–900–00
Dimensions							
Medium density (min.)	0.45 kg/dm³	0.55 kg/dm³	0.55 kg/dm³	0.8 kg/dm³	0.4 kg/dm³	0.7 kg/dm³	0.4 kg/dm³
Material	Titanium	1.4435	Titanium	1.4404	1.4401	PVDF	PP
Medium pressure	16 bar (1.6 MPa)		25 bar (2.5 MPa)			3 bar (0.3 MPa)	
Device type: Standard (MR)	■	■	■		■		
Device type: Plastic-coated (MP)						■	■
Device type: Ex (MR Ex)	■	■	■		■		
Device type: Mini (MZ)		■	■				

[1] Standard float *[2] Mini version*

NIVOPOINT MR — 5 years

Magnetic tracking float level switch with up to 5 switch points. Output: NO or NC
with stainless steel rod probe and stainless steel float and IP67 aluminum housing

Process connection

M R □ – ■ ■ ■ – ■

A	1" BSP
C	2" BSP
D	1" NPT
G	2" NPT
O	2½" Triclamp
P	3" TriClamp
R	4" TriClamp

Number of switching points

M R ■ – □ ■ ■ – ■

1	1 switch
2	2 switches
3	3 switches
4	4 switches
5	5 switches

Probe length (Ln)**

M R ■ – ■ □ □ – ■

n n	0.3…0.5 m; sold by the 0.1 m
o o	0.6…3 m; sold by the 0.1 m

nn = 03…05 : 0.3…0.5 m
oo = 06…30 : 0.6…3 m, ** 3…4 m as per special offer, Ex version not available

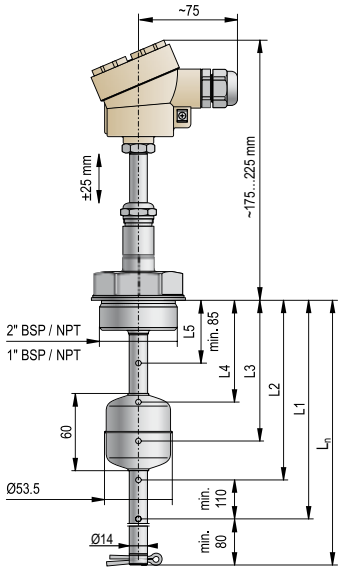
Ex certificate

M R ■ – ■ ■ ■ – □

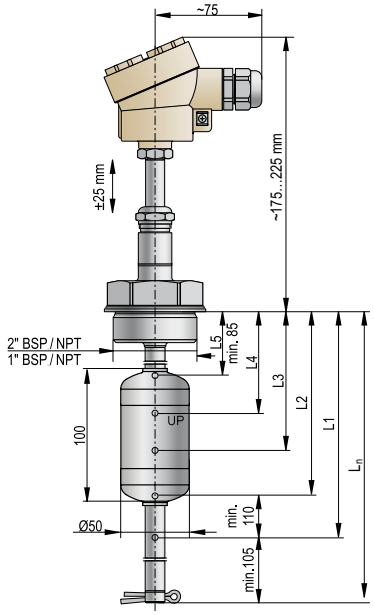
3	For non-hazardous area
7	Ex d G

Available on request (must be specified in the text of the order)

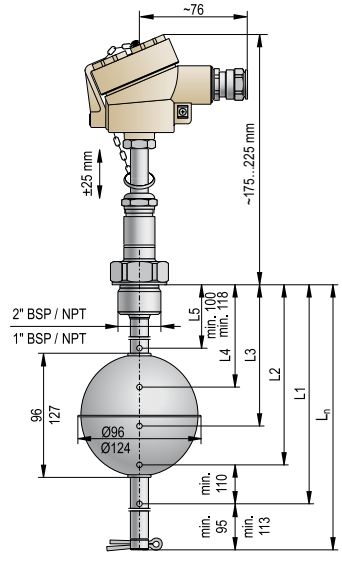
Ø96 mm stainless steel (1.4404) ball float (for min. 0.55 kg/dm³ liquids)
Ø124 mm stainless steel (1.4401) ball float (for min. 0.4 kg/dm³ liquids)
Ø53.5 mm titanium float (for min. 0.55 kg/dm³ liquids)
Ø50x100 mm titanium float (for min. 0.45 kg/dm³ liquids)



MR□-□00-3



MR□-□00-3
+ MRC-106-7M-900-00



MR□-□00-7Ex
+ MRC-105-7M-800-00

Required specifications in the order:

Switching point[3]		Default operation mode[4] NO	Default operation mode[4] NC
L1[1]	..... mm	□	□
L2	..... mm	□	□
L3	..... mm	□	□
L4	..... mm	□	□
L5[2]	..... mm	□	□

[1] *L…L1 ≥ 80 mm, L = insertion length*
[2] *L5 ≥ 85 mm*
[3] *Min. distance of the switching points: 110 mm*
[4] *Default operation mode (NO/NC) is meant with bottom positioned float.*

NIVOPOINT MP — 5 years

Magnetic tracking float level switch with up to 5 switching points. Output: NO or NC with plastic-coated probe and plastic float and IP67 aluminum housing

Process connection

M P □ – ■ ■ ■ – 3

P	DIN DN80, PN16
R	DIN DN100, PN16

Number of switching points

M P ■ – □ ■ ■ – 3

1	1 switch
2	2 switches
3	3 switches
4	4 switches
5	5 switches

Probe length

M P ■ – ■ □ □ – 3

0 5	0.5 m
n n	0.6…3 m; sold by the 0.1 m

nn = 06…30 : 0.6…3 m

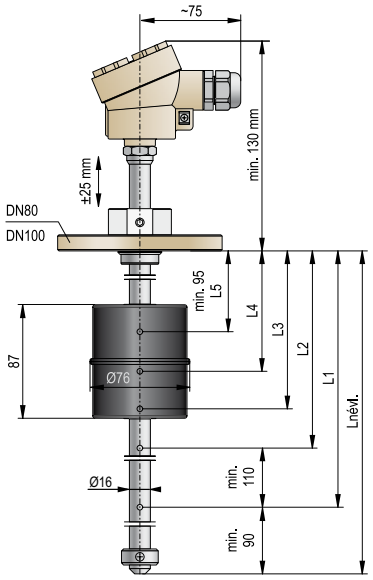
Float / Material

M P ■ – ■ ■ ■ – □

3	Ø76 x 87 / PVDF

Available on request (must be specified in the text of the order)

Ø76 x 87 mm PP float (for min. 0.4 kg/dm³ liquids)



MP□-□00-3

Required specifications in the order:

Switching point [3]		Default operation mode [4] NO	NC
L1[1]	…… mm	☐	☐
L2	…… mm	☐	☐
L3	…… mm	☐	☐
L4	…… mm	☐	☐
L5[2]	…… mm	☐	☐

[1] *L…L1 ≥ 80 mm, L = insertion length*
[2] *L5 ≥ 85 mm*
[3] *Min. distance of the switching points: 110 mm*
[4] *Default operation mode (NO/NC) is meant with bottom positioned float.*

NIVOPOINT MZ — 5 years

Magnetic float switch with up to 3 switching points
with stainless steel rod probe and float, with integrated cable and IP68 protection

Process connection

M Z □ – ■ ■ ■ – 3

C	2" BSP
G	2" NPT
S	¼" BSP (inner thread)
O	2½" TriClamp
P	3" TriClamp
R	4" TriClamp

Number of switching points / Number of floats

M Z ■ – □ ■ ■ – 3

1	1 switch / 1 float
2	2 switches / 2 floats
3	3 switches / 3 floats

Probe length

M Z ■ – ■ □ □ – 3

n n	*	0.1…1.5 m; sold by the 0.1 m

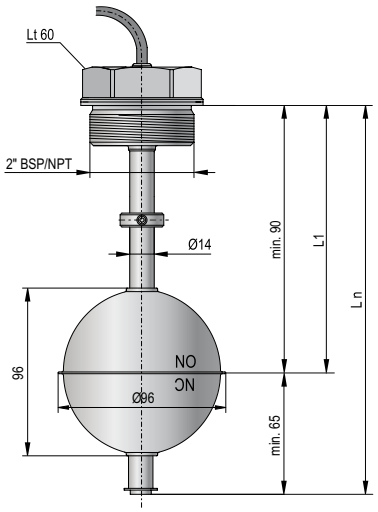
nn = 01…15 : 0.1…1.5 m
* Ln = 100 mm for L1 = 60 mm

Cable

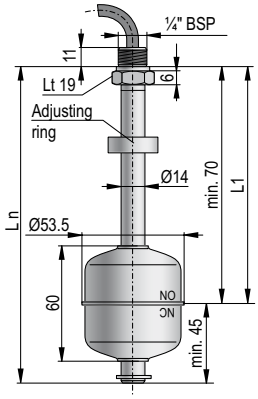
Sold by the meter over the standard 0.5 m

Available on request (must be specified in the text of the order)

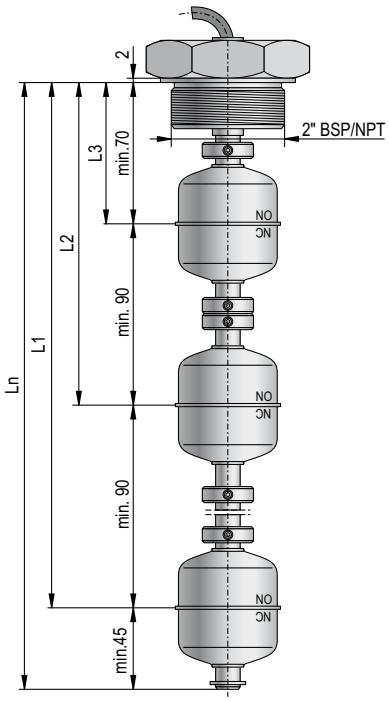
Ø96 mm stainless steel (1.4404) (for min. 0.55 kg/dm³ liquids, from min. 200 mm probe length)
Ø53.5 mm titanium float (for min. 0.55 kg/dm³ liquids)



MZC/MZG–1□□–3



MZS–1□□–3



MZC/MZG–3□□–3

Required specifications in the order

Switching point*	
L1	…… mm
L2	…… mm
L3	…… mm

** For 96 mm floats, the following sizes are valid: L1 max. = L_n – 65 mm, L3 min.: 95 mm; the minimal distance between switching points is 130 mm.*

NIV24
MZS-101-3

NIVOSWITCH R–400/500 vibrating fork level switches with parallel vibrating fork are suitable for detecting the level of liquids. Mounted on pipes, tanks it can control filling/emptying, also can generate fail-safe alarms providing overfill- or dry run protection. The operation principle is based on that the electronic circuit excites a vibration in the fork probe. When the medium reaches and covers the fork, its vibration changes. The fork will start vibrating freely again as the medium sets it free. The electronics senses the change of vibration and gives output signal after a selected delay. The plastic-coated version is recommended to use for aggressive mediums, the highly polished version is recommended to use for abrasive mediums. The PNP/NPN transistor output versions can be connected directly to PLC, or relay unit.

Certain types of **NIVOSWITCH** vibrating forks are able to solve switching tasks of high-current loads with the help of **UNICONT PKK** switching amplifiers. **UNICONT** PKK–312–8Ex is a recommended Intrinsic safety switching unit designed for Ex rated vibrating forks.

FEATURES

- Compact and mini compact version
- Rod length up to 3 meters
- ECTFE/PFA-coated version
- Polished vibrating part
- Hygienic versions with various process connections and 0.5 micron fine polishing
- Selectable sensitivity
- Relay or electronic output
- Switching performance does not depend on the change of liquid conductivity, dielectric constant, pressure and temperature
- Process temperature max. +130 °C
- Output can be toggled by test magnet
- Ex, DNV variants
- IP67, IP65/IP68

APPLICATIONS

- For liquids: min. 0.7 kg/dm^3 density and max. 10^4 mm^2/s viscosity
- Food & beverages industry, water industry, chemical industry, oil industry
- For normal or hazardous, aggressive (acids, solvents) liquids
- Covers a large variety of level detection, applications such as high/low fail-safe limit switch, overfill or dry-run protection, pump controls

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d G)
- IEC Ex (Ex d G)
- *UKCA Ex (Ex ia G)*
- *DNV (only for RF–400 compact types for liquids)*

VARIANTS

This table helps choose the proper version for a given level switching task. Most essential aspect is the consistency of the measurement medium.

Features		Liquids		
		Mini compact	Compact	
		RC□–400	RF□–400/500	RN□–400 Ex
Metal housing		■	■	■
Plastic housing		–	■	–
Extension		■	■	■
High-polished version		■	■	■
Plastic-coated fork		■	■	–
2" process connection		■	■	■
1", 1½" process connection		■	■	■
Relay output		–	■	■
Electronic output		■	–	–
Electrical connection	Terminal	–	■	■
	DIN connector	■	–	–
	M12 connector	■	–	–
	Cable	■	–	–
Intrinsic safety version		■	–	–
Flameproof enclosure		–	–	■
DNV		–	■	–
Function setting (low-high level)		■ (1)	■	■
Function indication		■	■	■
Output test magnet		■	–	–

(1) *Only for 3-wire DC versions*

RPS–101–0
test magnet

PKK–312–8Ex
Ex ia power supply
for Ex ia vibrating forks

RFM–500

RNM–402

RBM–401–3

RCM–401
cable version

RCM–402
with M12
connector

RCM–400
with DIN connector

TECHNICAL DATA

	Mini compact	Compact	
	RC□–400	RF□–400/500	RN□–400 Ex
Insertion length	69…3000 mm		
Material of wetted parts	1.4571 stainless steel or ECTFE/PFA-coating		1.4571
Process connection	As per order code		
Process temperature	–40…+130 °C (see "Thermal properties"), for ECTFE-coated versions: –40…+120 °C		
Ambient temperature	–40…+70 °C (see temperature diagrams) With M12 connector: –25…+70 °C	–30…+70 °C	
Medium pressure	Up to 40 bar (4 MPa) (see pressure diagrams)		
Medium density	> 0.7 kg/dm³		
Medium viscosity	≤ 10 000 mm²/s (cSt)		
Supply voltage	2-wire DC: 15…29 V DC 2-wire AC: 20…255 V AC; 3-wire DC: 12…55 V DC	20…255 V AC / 20…60 V DC	
Power consumption	AC: depending on load; DC: < 0.6 W	< 3 W	
Housing material	1.4571 stainless steel	Painted aluminum or plastic (PBT)	Painted aluminum
Electrical connection	DIN or M12 connector, or 3 m integrated cable[1] 2× 0.5 mm² / 4× 0.75 mm² / 5× 0.5 mm²	2× M20×1.5 plastic cable glands for Ø6…Ø12 mm cable, 2× terminal blocks for max. 2.5 mm² wire cross section, 2× internally threaded ½" NPT connection for protective pipes	
Electrical protection	AC version: Class I, DC version: Class III	Class I	
Ingress protection	DIN connector: IP65; M12 connector: IP67; cable: IP68	IP67	
Weight	~0.5 kg + 1.2 kg/m extension	~1.3 kg + 1.2 kg/m extension	~2.1 kg + 1.2 kg/m extension

[1] *Available cable length: up to 30 m*

Ex INFORMATION

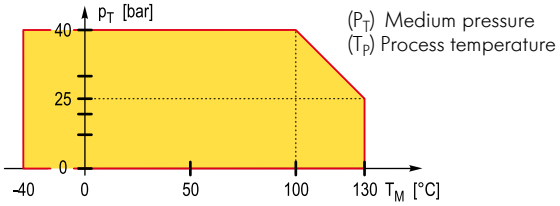
		Mini compact version		Compact version (metal housing)
		RC□–400–8 Ex / L Ex (connector type)	RC□–400–9 Ex (cable type)	RN□–400–N Ex, RN□–400–P Ex, RM□–400–N Ex, RM□–400–P Ex
Explosion protection		Intrinsically safe[2]		Flame-proof housing
Ex marking	IEC Ex	-		Ex d IIB T6…T4 Ga/Gb, –40 °C ≤ T_{amb} ≤ +70 °C
	ATEX	⟨Ex⟩ II 1G Ex ia IIB T6…T4 Ga ⟨Ex⟩ II 1G Ex ia IIC T6…T4 Ga		⟨Ex⟩ II 1/2 G Ex d IIB T6…T4 Ga/Gb
Intrinsic safety limits		U_i = 29 V; I_i = 100 mA; P_i = 1.4 W; C_i = 7 nF; L_i = 0 mH	U_i = 29 V; I_i = 100 mA; P_i = 1.4 W; C_i = 15 nF; L_i = 0 mH	-
Supply voltage		15…29 V DC		20…250 V AC (50/60 Hz) / 20…36 V DC
Electrical connection		DIN connector or M12 connector	3 m integrated cable[1]	2× M20×1.5 cable glands for Ø7…Ø12 mm cable with Ex d IIC protection 2× terminal blocks for max. 1.5 mm² wire cross section, 2× ½" NPT internal threads for cable protective pipes.

[1] *Available cable length: max. 30 m*
[2] *Intrinsically safe vibrating forks must be powered by [Ex ia] certified devices, for example by UNICONT PKK–312–8 Ex.*

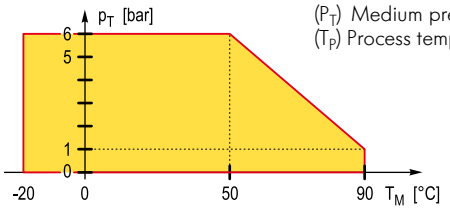
Temperature classes	T6		T5	T4
Mini compact version for liquids (Ex ia)				
Highest ambient temperature	+70 °C		+60 °C	
Highest process temperature	+70 °C	+75 °C	+95 °C	+130 °C
Compact version with flameproof enclosure (Ex d)				
Process temperature minimum: –40 °C; Maximum:	+70 °C	+80 °C	+95 °C	+130 °C
Ambient temperature minimum: –40 °C; Maximum:	+65 °C	+50 °C	+65 °C	+70 °C
Highest surface temperature of the process connection	+70 °C	+80 °C	+95 °C	+125 °C
Highest surface temperature	+75 °C			+130 °C

THERMAL PROPERTIES

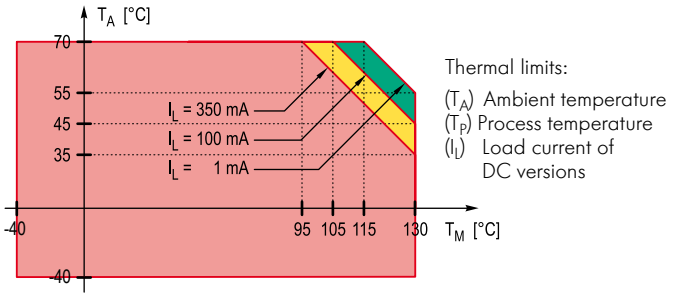
Medium pressure – Process temperature



Medium pressure – Process temperature PP flange version



Mini compact version



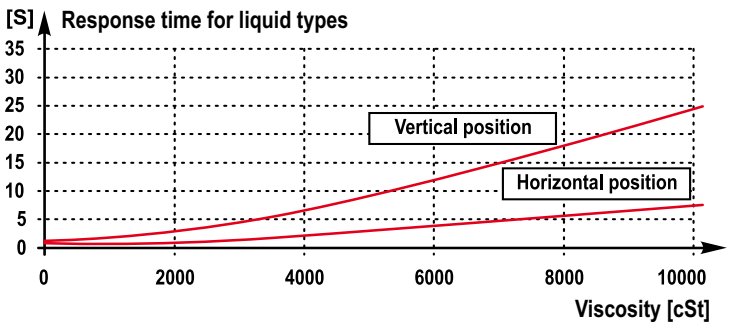
OUTPUT PROPERTIES

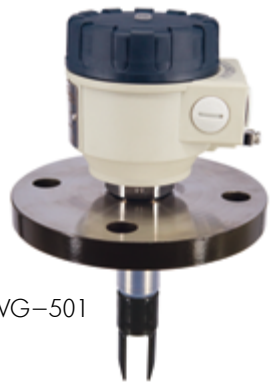
Output		Compact type
		RF□, RV□, RJ□–400/500
Relay		1 or 2 (SPDT) relays 250 V AC, 8 A, AC1 / 250 V AC, 6 A, AC1
Response time	when immersed	≤ 0.5 s
	when free	≤ 1 s[1]

Type	Output		Mini compact type
			RC□, RG□, RB□, RE□–400/500
2-wire DC	DC current change		When immersed: 14 mA ±1 mA
			When free: 9 mA ±1 mA
2-wire AC	AC output for serial connection		Voltage drop (in switched-on state): < 10.5 V
			Residual current (in switched-off state): < 6 mA
	Current load	max. continuous	350 mA, AC 13
		min. continuous	10 mA / 255 V; 25 mA / 24 V
		max. impulse	1.5 A / 40 ms
3-wire DC	Transistor switch		NPN or PNP output can be realized with appropriate wiring
	Voltage drop (in switched-on state)		< 4.5 V
	Current load (max. continuous)		350 mA / U_{max} = 55 V
	Residual current (in switched-off state)		< 100 µA
	Response time	when immersed	0.5 s
		when free	< 1 s[1]

[1] *See viscosity diagram*

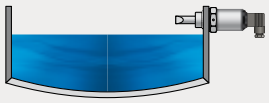
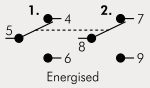
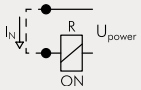
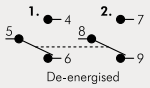
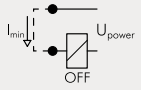
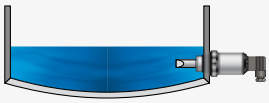
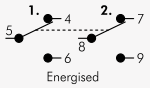
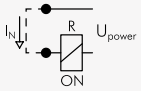
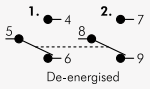
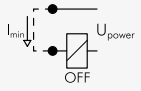
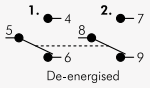
RESPONSE TIME DIAGRAM

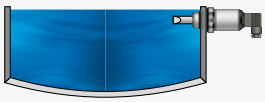




RVG–501

OPERATION

Compact and Mini compact version						
Power supply	Switching		Fail-Safe setting (2)	Status LED	Output	
					Relay	Electronic
ON	High level		 HIGH		 Energised	 ON
			 HIGH		 De-energised	 OFF
	Low level		 LOW		 Energised	 ON
			 LOW		 De-energised	 OFF
OFF	–	–	High / Low		 De-energised	 OFF

2-wire DC version			
Power supply	Switching	Status LED	Output
ON			14 ±1 mA
			9 ±1 mA
OFF	Fork immersed, or fork is free		–

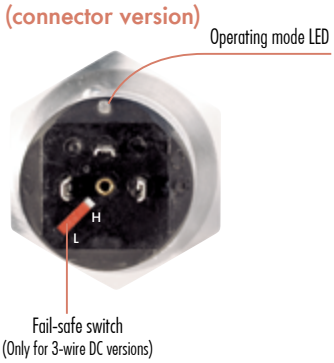
(2) *In the case of the mini-compact version with integrated cable, it is determined by the appropriate wiring.*

OPERATING MODE SWITCH

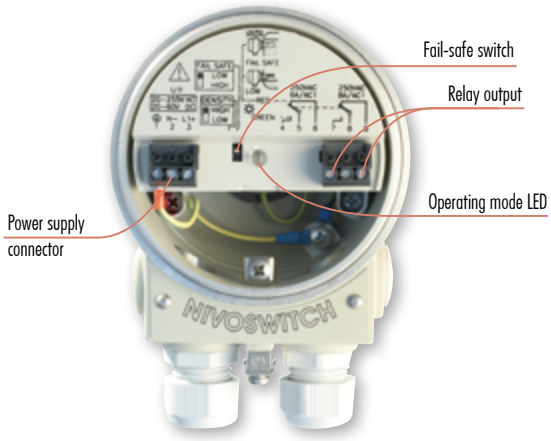
Compact
Fail-safe
 HIGH  LOW
Fail-safe alarm is indicated with de-energized relay or open state of the output

WIRING

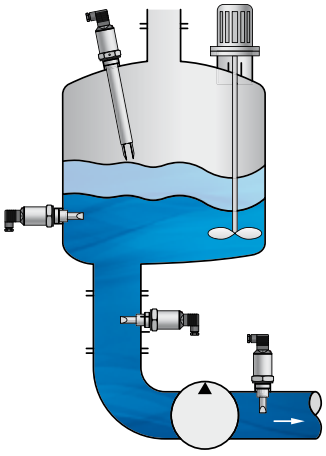
Mini compact (connector version)



Compact



INSTALLATION



NIVOSWITCH RF/RV/RJ-400/500 standard version — 3 years

Compact vibrating fork level switch for liquids

Type

R ■■ – ■□□ – ■

0 0	69 mm
0 1	125 mm

Fork material

R □■ – ■■■ – ■

F	Stainless steel with tumble polish
V	ECTFE-coated fork, PFA-coated extension (only 1" BSP (PVDF) or flange (PP or ECTFE-coated) process connection)
J	High-polished stainless steel

Process connection

R ■□ – ■■■ – ■

M	1" BSP
P	1" NPT
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)
D	DN40 Pipe coupling (DIN 11851)
E	DN50 Pipe coupling (DIN 11851)
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
ECTFE-coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R ■■ – □■■ – ■

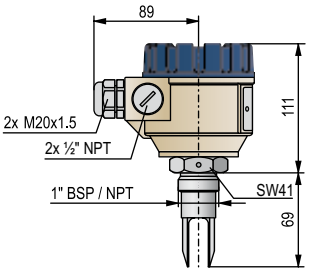
4	Painted aluminum
5	Plastic, PBT, fiberglass-reinforced

Output

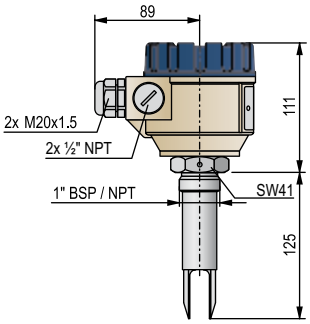
R ■■ – ■■■ – □

0		1 SPDT relay: 250 V AC, 8 A
A		2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
G	*	1 SPDT relay: 250 V AC, 8 A / GL
H	*	2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A / GL

* RF version only, 1" BSP / 1" NPT and stainless steel flanged version only, with GL certification.



RFM / RFP-400 / 500



RFM / RFP-401 / 501

NIVOSWITCH RF/RV/RJ-400/500 extension rod version — 3 years

Compact vibrating fork level switch for liquids
with stainless steel extension rod probe up to 3 m

Fork material

R □■ – ■■■ – ■

F	Stainless steel with tumble polishing
V	ECTFE-coated fork, PFA-coated extension (only 1" BSP (PVDF) or flange (PP or ECTFE-coated) process connection)
J	High-polished stainless steel

Process connection

R ■□ – ■■■ – ■

M	1" BSP
P	1" NPT
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)
D	DN40 Pipe coupling (DIN 11851)
E	DN50 Pipe coupling (DIN 11851)
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
ECTFE-coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R ■■ – □■■ – ■

4	Painted aluminum
5	Plastic, PBT, fiberglass-reinforced

Probe length

R ■■ – ■□□ – ■

For standard polished forks (RF)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m
For high-polished forks (RJ)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m
For ECTFE-coated stainless steel forks (RD, RV)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m

nn = 03…30 : 0.3…3 m

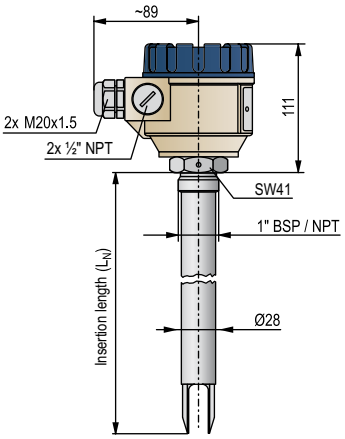
Output

R ■■ – ■■■ – □

0		1 SPDT relay: 250 V AC, 8 A
A		2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
G	*	1 SPDT relay: 250 V AC, 8 A / GL
H	*	2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A / GL

* RF version only, 1" BSP / 1" NPT and stainless steel flanged version only, max. 300 mm, with GL certification.

Non-standard probe lengths are available on request



RFM / RFP-402 / 430
RFM / RFP-502 / 530

NIVOSWITCH RN/RM-400 standard or extension rod version — 3 years

Compact vibrating fork level switch for liquids, standard probe length: 125 mm
or with stainless steel extension rod version up to 3 m

Fork material / Ex certificate

R □■ – 4 ■■ – ■

N	Tumble-polished stainless steel / Ex d G
M	High-polished stainless steel / Ex d G

Process connection

R ■□ – 4 ■■ – ■

M	1" BSP
P	1" NPT
H	1½" BSP
N	1½" NPT
C	2" BSP
L	2" NPT
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)
D	DN40 Pipe coupling (DIN 11851)
E	DN50 Pipe coupling (DIN 11851)
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

S	DN40 PN40 / 25 / 16 / 10
G	DN50 PN40 / 25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A

Housing

R ■■ – □■■ – ■

4	Painted aluminum

Probe length

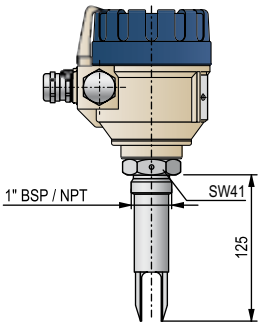
R ■■ – 4 □□ – ■

For standard polished forks (RN)	
0 0	Standard probe: 69 mm
0 1	Standard probe: 125 mm
n n	0.2…3 m; sold by the 0.1 m
For high-polished forks (RM)	
0 0	Standard probe: 69 mm
0 1	Standard probe: 125 mm
n n	0.2…3 m; sold by the 0.1 m
nn = 02…30 : 0,2…3 m	

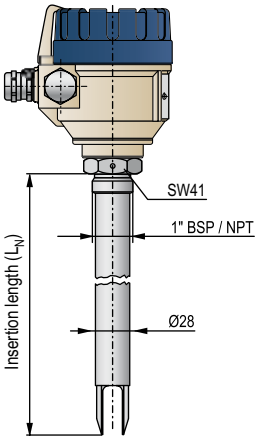
Output

R ■■ – 4 ■■ – □

N	1 SPDT relay: 250 V AC, 8 A
P	2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A



RNM / RNP-401



RNM / RNP-402 / 430

NIVOSWITCH RC/RG/RB/RE-400 standard version — 3 years

Mini compact vibrating fork level switch for liquids

Type

R ■■ – 4 □□ – ■

0 0	69 mm
0 1	125 mm

Fork material

R □■ – 4 ■■ – ■

C	Tumble-polished stainless steel
G	High-polished stainless steel
B	ECTFE-coated fork, PFA-coated extension (only 1" BSP (PVDF) or flange (PP or ECTFE-coated) process connection)
E	Stainless steel without reed sensor (Ex version not available)

Process connection

R ■□ – 4 ■■ – ■

M	1" BSP
P	1" NPT
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)
D	DN40 Pipe coupling (DIN 11851)
E	DN50 Pipe coupling (DIN 11851)
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40 / 25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
ECTFE-coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C), DIN PN16 / ANSI 150 psi	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

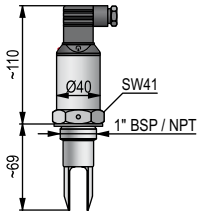
Output / Certificates

R ■■ – 4 ■■ – □

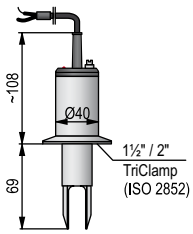
1	2-wire AC, DIN connector
2	2-wire AC, cable
3	3-wire DC, DIN connector
4	3-wire DC, cable
6	2-wire DC, DIN connector
7	2-wire DC, cable
8	2-wire DC, DIN connector / Ex ia G
9	2-wire DC, cable / Ex ia G
K	2-wire DC, M12 connector
L	2-wire DC, M12 connector / Ex ia G
M	3-wire DC, M12 connector

Cable

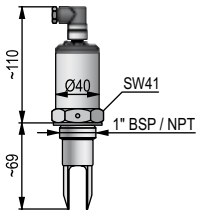
Maximum length 30 m; sold by the meter over the standard 3 m



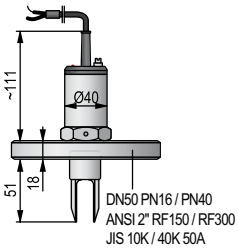
RCM / RCP–400



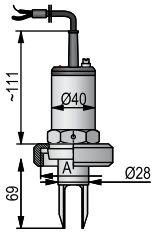
RCT / RCR–400



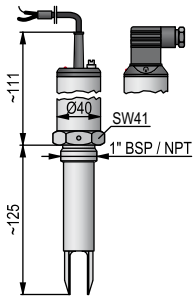
RCM / RCP–400 with M12 connection



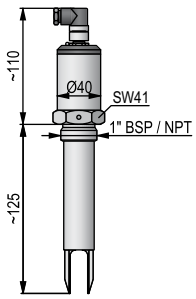
RCG–400



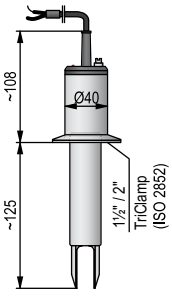
RCD–400



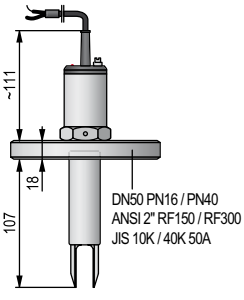
RCM / RCP–401



RCM / RCP–401 with M12 connection



RCT / RCR–401



RCG / RCF–401

	RCD	RCE
Nominal size	DN40	DN50
A	RD 65 x 1/6	RD 78 x 1/6

NIV24
RCM-400-3
RCM-401-3

NIVOSWITCH RC/RG/RB/RE-400 extension rod version — 3 years

Mini compact vibrating fork level switch for liquids
with stainless steel extension rod probe up to 3 m

Fork material

R □■ – 4 ■■ – ■

C	Tumble-polished stainless steel
G	High-polished stainless steel
B	ECTFE-coated fork, PFA-coated extension (only 1" BSP (PVDF) or flange (PP or ECTFE-coated) process connection)
E	Stainless steel without reed sensor (Ex version not available)

Process connection

R ■□ – 4 ■■ – ■

M	1" BSP
P	1" NPT
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)
D	DN40 Pipe coupling (DIN 11851)
E	DN50 Pipe coupling (DIN 11851)
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
ECTFE-coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
S	DN40 PN40/25/16/10
G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C), DIN PN16 / ANSI 150 psi	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

R ■■ – 4 □□ – ■

For standard polished forks (RC, RE)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m
For high-polished forks (RG)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m
For ECTFE-coated stainless steel forks (RA, RB)	
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m

nn = 03…30 : 0,3…3 m

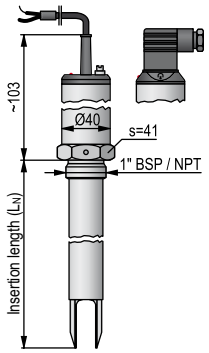
Output / Certificates

R ■■ – 4 ■■ – □

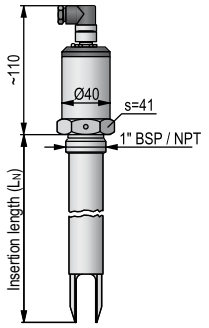
1	2-wire AC, DIN connector
2	2-wire AC, cable
3	3-wire DC, DIN connector
4	3-wire DC, cable
6	2-wire DC, DIN connector
7	2-wire DC, cable
8	2-wire DC, DIN connector / Ex ia G
9	2-wire DC, cable / Ex ia G
K	2-wire DC, M12 connector
L	2-wire DC, M12 connector / Ex ia G
M	3-wire DC, M12 connector

Cable

Maximum length 30 m; sold by the meter over the standard 3 m
R□□–4□□–9 Ex version comes with 3 m cable only



RCM / RCP-402 / 430



RCM / RCP-402 / 430

NIVOSWITCH R–200/300 vibrating fork level switches with diverging vibrating fork are suitable for detecting the level of granular or powdered solids. Mounted on silos, bins it can control filling/emptying, also can generate fail-safe alarms providing overfill protection. The operation principle is based on that the electronic circuit excites a vibration in the fork probe. When the medium reaches and covers the fork, its vibration changes or stops. The fork will start vibrating freely again as the medium sets it free. The electronics senses the change of vibration and gives output signal after a selected delay.

The PNP/NPN transistor output versions can be connected directly to PLC, or relay unit. Certain types of **NIVOSWITCH** vibrating forks are able to solve switching tasks of high-current loads with the help of **UNICONT PKK** switching amplifiers.

FEATURES

- Compact and mini compact version
- Rod length up to 3 meters
- Selectable sensitivity
- Relay or electronic output
- Switching performance does not depend on the change of liquid conductivity, dielectric constant, pressure and temperature
- Process temperature max. +130 °C
- Output can be toggled by test magnet (optional)
- Ex variants
- IP67, IP65 / IP68

APPLICATIONS

- For solids: min. 0.01 kg/dm^3 density
- Level switching for powders, granules
- Chemical industry, food & beverages, paper mill and plastic industry
- For free-flowing, powdered solids, granules
- Covers a large variety of level detection, applications such as high/low fail-safe limit switch, overfill protection

CERTIFICATES

- ATEX (Ex ta/tb D)

VARIANTS

This table helps choose the proper version for a given level switching task. Most essential aspect is the consistency of the measurement medium.

		Solids	
Features		Mini compact (RC□/RL□–300)	Compact (RF□/RR□–200/300)
Metal housing		■	■
Plastic housing			■
Extension		■	■
1", 1½" process connection		■	■
Relay output			■
Electronic output		■	
Electrical connection	Terminal		■
	DIN connector	■	
	Cable	■	
Dust Ex version			■
Function setting *(low-high level)*		■[1]	■
Function indication		■	■
Density selection		■	■
Output test magnet		■	

[1] *Only for 3-wire DC versions*

RPS–101–0
test magnet

RLH–302

RCM–301

RRH–301

TECHNICAL DATA

	Mini compact (RC□ / RL□–300)	Compact (RF□–200/300 / RR□–200/300)
Insertion length	137…3000 mm	
Material of wetted parts	1.4571 stainless steel	
Process connection	As per order code	
Process temperature	–40…+130 °C (see temperature diagrams)	
Ambient temperature	–40…+70 °C (see "Thermal properties")	
Medium pressure	Up to 40 bar (4 MPa) (see: pressure diagrams)	
Medium density	≥ 0.01 kg/dm³	
Supply voltage	2-wire DC: 15…27 V DC 2-wire AC: 20…255 V AC; 3-wire DC: 12…55 V DC	20…255 V AC / 20…60 V DC
Power consumption	AC: depending on load; DC: < 0.6 W	< 3 W
Housing material	1.4571 stainless steel	Painted aluminum or plastic (PBT)
Electrical connection	DIN or M12 connector, or 3 m integrated cable(1) 2× 0.5 mm² / 4× 0.75 mm² / 5× 0.5 mm²	2× M20×1.5 plastic cable glands for Ø6…Ø12 mm cable, 2× terminal blocks for max. 2.5 mm² wire cross section, 2× internally threaded ½" NPT connection for protective pipes
Electrical protection	AC version: Class I, DC version: Class III	Class I
Ingress protection	DIN connector: IP65; M12 connector: IP67; cable: IP68	IP67
Weight	~0.5 kg + 1.2 kg/m extension	~1.3 kg + 1.2 kg/m extension

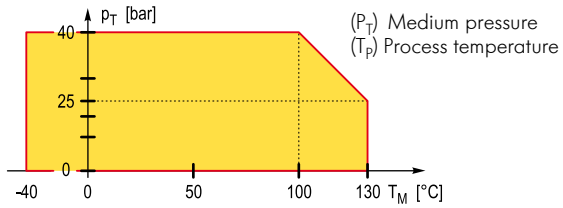
(1) *Available cable length: max. 30 m*

Ex INFORMATION

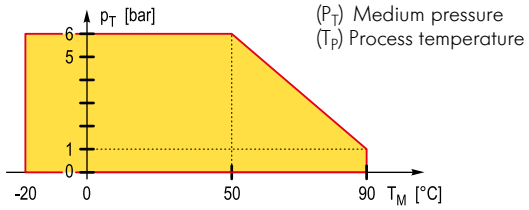
		Compact version, metal housing (RF□/RR□–300–B Ex)
Explosion protection		Dust-ex
Ex marking	ATEX	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T140 °C Da/Db
Supply voltage		20…250 V AC / 20…50 V DC
Electrical connection		2× M20×1.5 cable glands for Ø7…Ø12 mm cable
		Ex ta IIIC protection
		2× terminal blocks for max. 1.5 mm² wire cross section, 2× ½" NPT internal threads for cable protective pipes.

THERMAL PROPERTIES

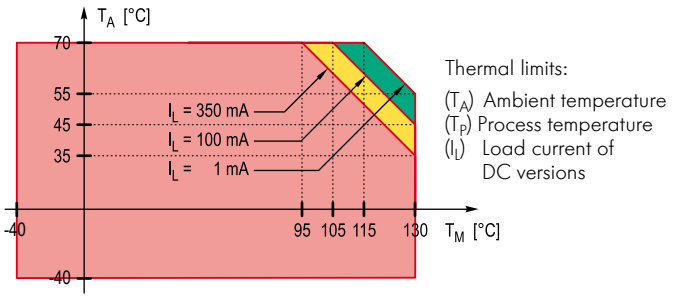
Medium pressure – Process temperature



Medium pressure – Process temperature PP flange version



Mini compact version



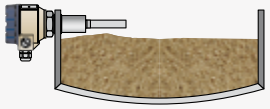
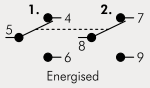
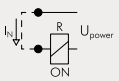
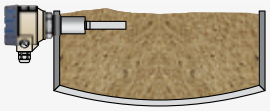
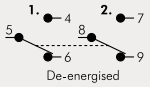
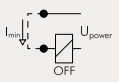
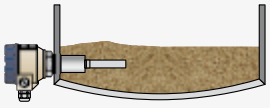
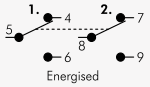
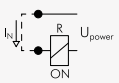
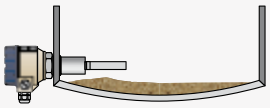
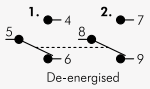
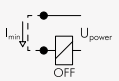
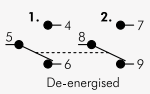
OUTPUT PROPERTIES

		Compact version	
Output		**RF□-200/300 / RR□-200/300**	
Relay		1 or 2 (SPDT) relays 250 V AC, 8 A, AC1 / 250 V AC, 6 A, AC1	
Response time	when immersed	≤ 0.5 s	
	when free	≤ 1 s – H density	3 s – L density

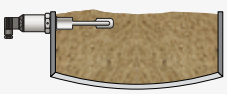
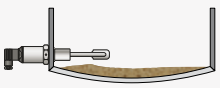
			Mini compact version	
Type	**Output**		**RC□-300 / RL□-300**	
2-wire DC	DC current change		When immersed: 14 mA ±1 mA	
			When free: 9 mA ±1 mA	
2-wire AC	AC output for serial connection		Voltage drop (in switched-on state): < 10.5 V	
			Residual current (in switched-off state): < 6 mA	
	Current load	max. continuous	350 mA, AC 13	
		min. continuous	10 mA / 255 V; 25 mA / 24 V	
		max. impulse	1.5 A / 40 ms	
3-wire DC	Transistor switch		NPN or PNP output can be realized with appropriate wiring	
	Voltage drop (in switched-on state)		< 1.8 V	
	Current load (max. continuous)		350 mA / U_{max} = 55 V	
	Residual current (in switched-off state)		< 10 µA	
	Response time	when immersed	0.5 s	
		when free	≤ 1 s – H density	< 3 s – L density

OPERATION

Compact and Mini compact version

Power supply	Switching		Fail-Safe setting[2]	Status LED	Output	
					Relay	Electronic
ON	High level		HIGH		 Energised	 ON
			HIGH		 De-energised	 OFF
	Low level		LOW		 Energised	 ON
			LOW		 De-energised	 OFF
OFF	–	–	High / Low		 De-energised	 OFF

2-wire DC version

Power supply	Switching	Status LED	Output
ON			14 ±1 mA
			9 ±1 mA
OFF	Fork immersed, or fork is free		–

OPERATING MODE SWITCHES

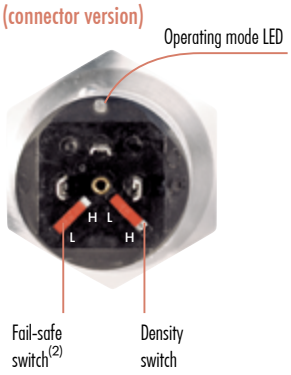
Compact	
Fail-safe	
 HIGH / LOW	Fail-safe alarm is indicated with de-energized relay or open state of the output

Compact	
Density	
 HIGH	Medium density ≥ 0.5 kg/dm³
 LOW	Medium density < 0.5 kg/dm³

[2] *In the case of the mini-compact version with integrated cable, it is determined by the appropriate wiring.*

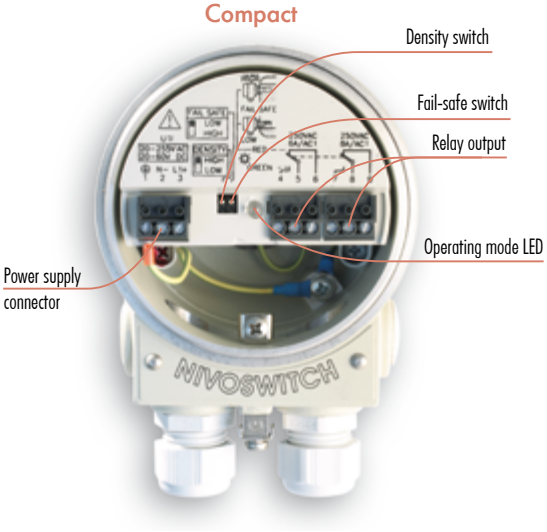
WIRING

Mini compact (connector version)

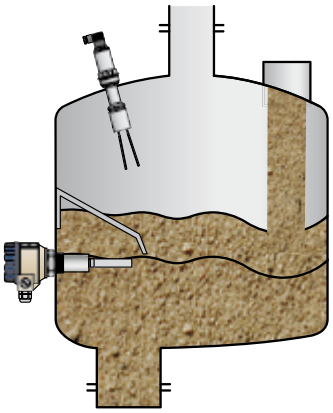


(2) Only for 3-wire DC versions.

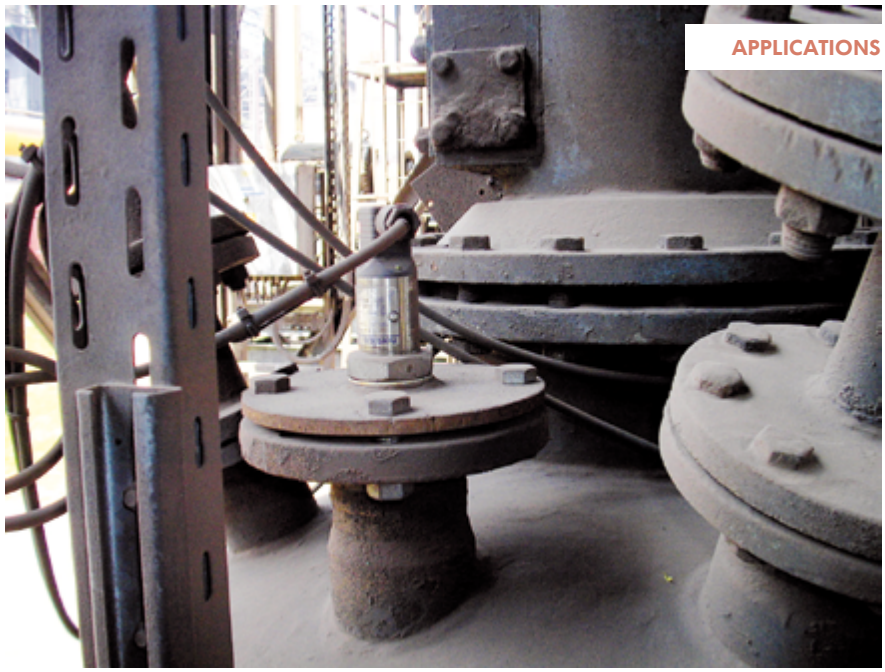
Compact



INSTALLATION



APPLICATIONS



NIVOSWITCH RF-200/RF-300 standard version — 3 years

Compact vibrating fork level switch for light free-flowing solids
Standard probe length: 125 mm

Process connection

R F □ – ■■■ – ■

M	1" BSP
P	1" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R F ■ – □■■ – ■

2	Plastic, PBT, fiberglass-reinforced (Ex version not available)
3	Painted aluminum

Probe length

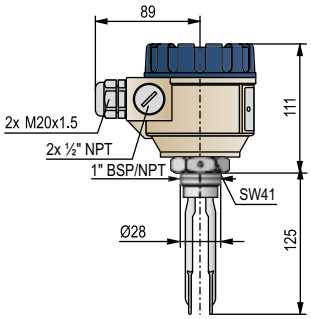
R F ■ – ■□□ – ■

0 1	125 mm

Output / Certificates

R F ■ – ■■■ – □

0	1 SPDT relay: 250 V AC, 8 A
A	2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B	1 SPDT relay: 250V AC, 8 A / Ex ta/tb D



RFM / RFP-201 / 301

NIVOSWITCH RF-200/RF-300 extension rod version — 3 years

Compact vibrating fork level switch for light free-flowing solids
with stainless steel extension rod up to 3 m

Process connection

R F □ – ■ ■ ■ – ■

M	1" BSP
P	1" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A

PP flanges (max. 6 bar; –20 °C to +90 °C)

F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R F ■ – □ ■ ■ – ■

2	Plastic, PBT, fiberglass-reinforced (Ex version not available)
3	Painted aluminum

Probe length

R F ■ – ■ □ □ – ■

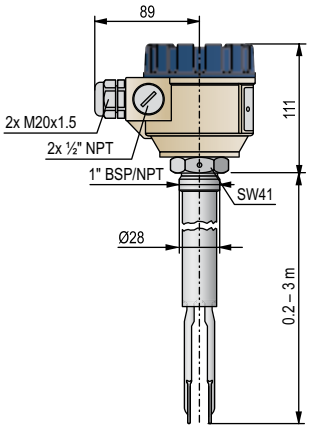
0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m

nn = 03…30 : 0.3…3 m

Output / Certificates

R F ■ – ■ ■ ■ – □

0	1 SPDT relay: 250 V AC, 8 A
A	2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B	1 SPDT relay: 250V AC, 8 A / Ex ta/tb D



RFM / RFP–202 / 230
RFM / RFP–302 / 330

NIVOSWITCH RC-300 standard version — 3 years

Mini compact vibrating fork level switch for light, free-flowing solids
Standard probe length: 125 mm

Process connection

R C □ – 3 ■■ – ■

M	1" BSP
P	1" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A

PP flanges (max.: 6 bar; –20…+90 °C)

F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

R C ■ – 3 □□ – ■

0 1	125 mm

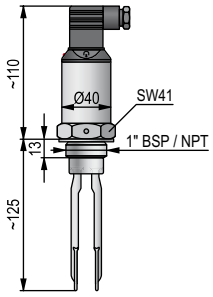
Output / Certificates

R C ■ – 3 ■■ – □

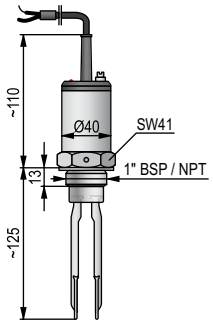
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable

Maximum length 30 m; sold by the meter over the standard 3 m



RCM / RCP–301
with DIN connection



RCM / RCP–301
with integrated cable

NIVOSWITCH RC-300 extension rod version — 3 years

Mini compact vibrating fork level switch for light, free-flowing solids
with stainless steel extension rod up to 3 m

Process connection

R C □ – 3 ■ ■ – ■

M	1" BSP
P	1" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A

PP flanges (max.: 6 bar; –20 °C to +90 °C)

F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

R C ■ – 3 □□ – ■

0 2	0.2 m
n n	0.3…3 m; sold by the 0.1 m

nn = 03…30 : 0.3…3 m

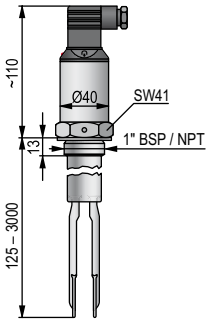
Output / Certificates

R C ■ – 3 ■ ■ – □

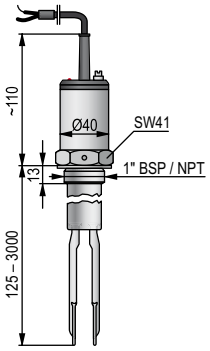
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable

Maximum length 30 m; sold by the meter over the standard 3 m



RCM / RCP–302 / 330
with DIN connector



RCM / RCP–302 / 330
with integrated cable

NIVOSWITCH RR-200/300 short or standard version — 3 years

Compact vibrating fork level switch with welded fork for powders and granules
Short probe length: 137 mm, standard probe length: 175 mm

Type

R R ■ – ■□□ – ■

0 1	Short probe, Probe length: 137 mm
0 2	Standard probe, Probe length: 175 mm

Process connection

R R □ – ■■■ – ■

H	1½" BSP
N	1½" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A
PP flanges (maximum 6 bar; –20...+90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

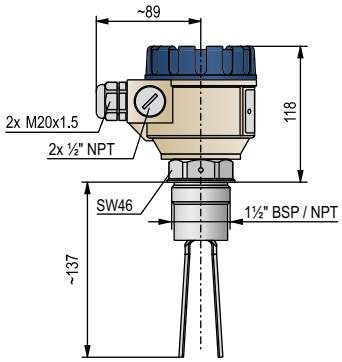
R R ■ – □■■ – ■

2	Plastic, PBT, fiberglass-reinforced (Ex version not available)
3	Painted aluminum

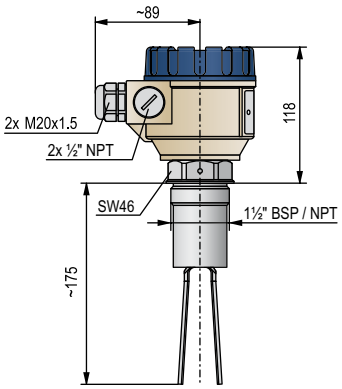
Output / Certificates

R R ■ – ■■■ – □

0	1 SPDT relay: 250 V AC, 8 A
A	2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B	1 SPDT relay: 250 V AC, 8 A / Ex ta/tb D



RRH / RRN-201 / 301



RRH / RRN-202 / 302

NIVOSWITCH RR-200/RR-300 extension rod version — 3 years

Compact vibrating fork level switch with welded fork for powders and granules
with stainless steel extension rod up to 3 m

Process connection

R R □ – ■ ■ ■ – ■

H	1½" BSP
N	1½" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A

PP flanges (maximum 6 bar; –20…+90 °C)

F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R R ■ – □ ■ ■ – ■

2	Plastic, PBT, fiberglass-reinforced (Ex version not available)
3	Painted aluminum

Probe length

R R ■ – ■ □ □ – ■

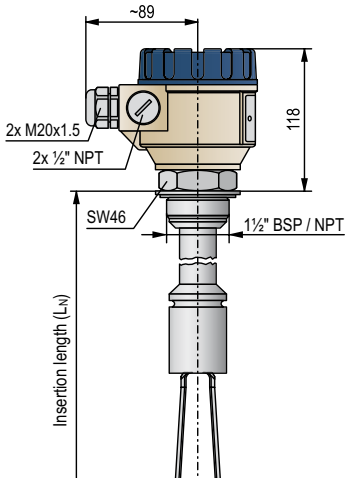
0 3	0.3 m
n n	0.4…3 m; sold by the 0.1 m

nn = 04…30 : 0.4…3 m

Output / Certificates

R R ■ – ■ ■ ■ – □

0	1 SPDT relay: 250 V AC, 8 A
A	2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B	1 SPDT relay: 250 V AC, 8 A / Ex ta/tb D



RRH / RRN-203 / 230
RRH / RRN-303 / 330

NIVOSWITCH RL-300 short or standard version — 3 years

Mini compact vibrating fork level switch with welded fork for powders and granules
Short probe length: 137 mm, standard probe length: 175 mm

Type

R L ■ – 3 □□ – ■

0 1	Standard probe, Probe length: 137 mm
0 2	Standard probe, Probe length: 175 mm

Process connection

R L □ – 3 ■■ – ■

H	1½" BSP
N	1½" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)
Stainless steel flanges; Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; –20…+90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

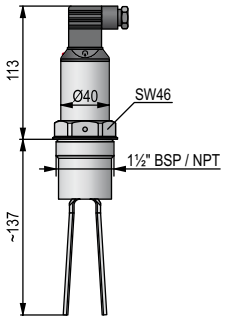
Output / Certificates

R L ■ – 3 ■■ – □

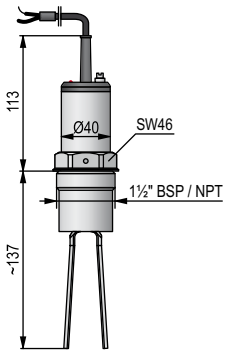
1	2-wire AC, DIN connector
2	2-wire AC, integrated cable
3	3-wire DC, DIN connector
4	3-wire DC, integrated cable
6	2-wire DC, DIN connector
7	2-wire DC, integrated cable

Cable

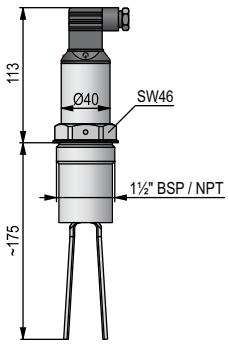
Maximum length 30 m; sold by the meter over the standard 3 m



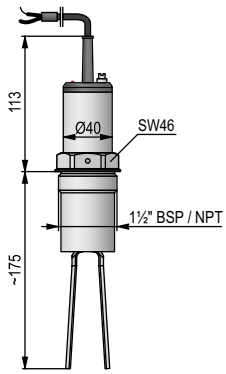
RLH / RLN–301
with DIN connector



RLH / RLN–301
with integrated cable



RLH / RLN–302
with DIN connector



RLH / RLN–302
with integrated cable

NIVOSWITCH RL-300 extension rod version — 3 years

Mini compact vibrating fork level switch with welded fork for powders and granules
with stainless steel extension rod up to 3 m

Process connection

R L □ – 3 ■ ■ – ■

H	1½" BSP
N	1½" NPT
U	Stainless steel flanges; welded (MFT–□□□–H type flanges [available from size DN40] should be ordered separately)

Stainless steel flanges;
Flanges conform to: EN 1092-1 / ANSI B 16.5

G	DN50 PN40 / 25
B	ANSI 2" RF 600 / 400 psi
K	JIS 40K 50A

PP flanges (max. 6 bar; –20…+90 °C)

F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

R L ■ – 3 □□ – ■

0 3	0.3 m
n n	0.4…3 m; sold by the 0.1 m

nn = 04…30 : 0.4…3 m

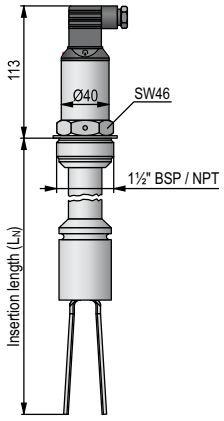
Output / Certificates

R L ■ – 3 ■ ■ – □

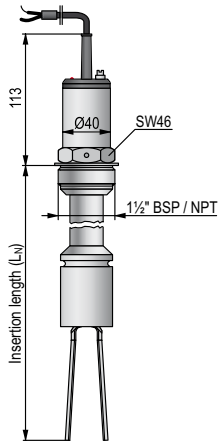
1	2-wire AC, DIN connector
2	2-wire AC, integrated cable
3	3-wire DC, DIN connector
4	3-wire DC, integrated cable
6	2-wire DC, DIN connector
7	2-wire DC, integrated cable

Cable

Maximum length 30 m; sold by the meter over the standard 3 m



RLH / RLN–303 / 330
with DIN connector



RLH / RLN–303 / 330
with integrated cable

UNICONT PKK-312-8 Ex — 3 years

DIN-rail-mountable intrinsically safe remote switching unit dedicated to the
Ex ia rated NIVOSWITCH R-400 series mini compact vibrating fork level switches

Type	
P K K – 3 1 2 – 8	24 V DC / [Ex ia G/D] (for Ex ia G vibrating forks)

UNICONT PK-300 — 3 years

DIN-rail-mountable programmable current controlled remote switching unit
featuring 1...22 mA input current and powering capabilities for transmitters

Type	
P K K – 3 1 2 – 1	230 V AC
P K K – 3 1 2 – 2	110 V AC
P K K – 3 1 2 – 3	24 V AC
P K K – 3 1 2 – 4	24 V AC/DC
P K K – 3 1 2 – 7	24 V AC/DC / [Ex ia G/D]

NIVOSWITCH RP — 3 years

Sliding sleeve for NIVOSWITCH R-300/R-400 series vibrating forks
only for extended versions without coating and with a minimum length of 300 mm

Type	
R P H – 1 1 2 – 0	1½" BSP (1.4571, max. up to 6 bar medium pressure)
R P N – 1 1 2 – 0	1½" NPT (1.4571, max. up to 6 bar medium pressure)
R P H – 1 2 2 – 0	1½" BSP (1.4571, max. up to 6 bar medium pressure, for coated version)
R P N – 1 2 2 – 0	1½" NPT (1.4571, max. up to 6 bar medium pressure, for coated version)

NIVOSWITCH RP — 3 years

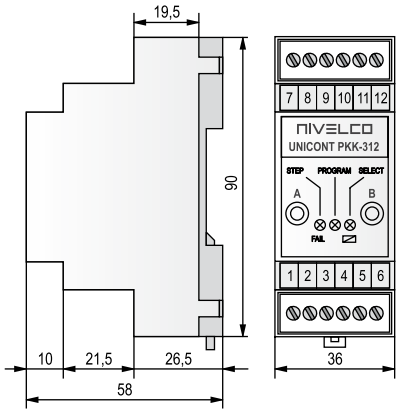
Stainless steel weld-in socket for flush mounting with O-ring sealing
for NIVOSWITCH R□M-400 vibrating forks

Type	
R P G – 1 0 1 – 0	1" BSP
R P K – 1 0 1 – 0	1" NPT

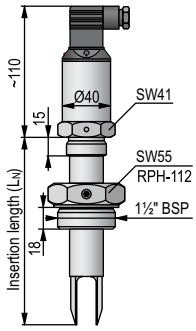
NIVOSWITCH RPS — 3 years

Magnetic screwdriver for operation test of
mini compact NIVOSWITCH vibration forks

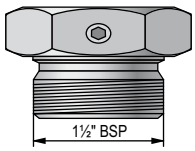
Type	
R P S – 1 0 1 – 0	Test magnet



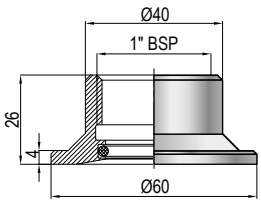
PKK-312



RCM-403 / 430 + RPH-112



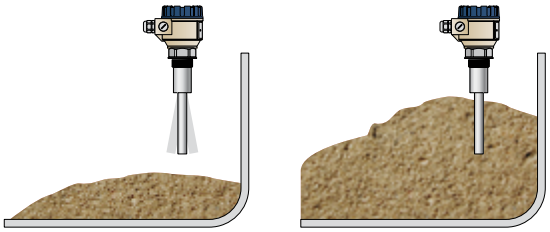
RPH-112 / 122



RPG-101

The **NIVOCONT R** series vibrating rod level switches are robust instruments, designed for low and high level indication of granules and powders with a minimum of 0.05 kg/dm^3 density. Mounted on tanks, silos or hopper bins, it controls filling/dumping, and sends alarm signals when necessary.

The circuit induces a vibration in the rod probe, when the medium touches the rod, the vibration changes, when the level drops and the medium no longer touches the rod, it starts to vibrate freely again. The electronics senses the change of vibration and sends an output signal after a predetermined delay.



FEATURES

- Length up to 20 m
- Adjustable sensitivity
- Highest process temperature: +160 °C
- Universal supply voltage
- Dust explosion protection
- Fine-polished probe
- IP67

RKH–502–5 Ex

RKR–500 / 600

RKK–500 / 600

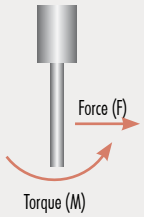
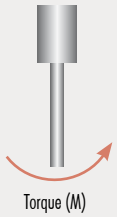
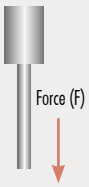
APPLICATIONS

- Powders, pellets, granulates
- Grains
- Ground products
- Stone-powder, chippings
- Cement, sand
- Coal, slag

CERTIFICATES

- ATEX (Ex ta/tb D)
- IEC Ex (Ex ta/tb D)
- UKCA Ex (Ex ta/tb D)
- KCs Ex (Ex ta/tb D)

LOADABILITY

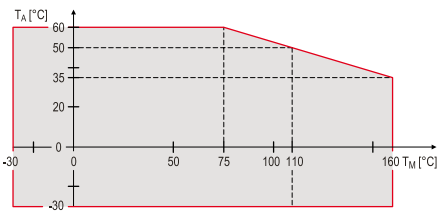
	Standard	With extension pipe	With extension cable
Type of load			
Force	max. 500 N	–	max. 45 kN
Torque	max. 100 Nm	max. 100 Nm	–

MOUNTING OPTIONS

	Standard version		With extension pipe	With extension cable
High level switching	Top-mounted	Side-mounted[1]	Vertical mounting from the top	
Low level switching	Side-mounted[1]			

[1] Protect the device against falling material by installing a baffle plate. The device must be installed with a slope greater than the slope angle is required for powdery materials.

TEMPERATURE DIAGRAM



Ambient temperature (T_A) versus process temperature (T_P)

TECHNICAL DATA

		Standard (R□H/R□N–500/600)	With extension pipe (R□R/R□L–500/600)	With extension cable (R□K/R□C–500/600)	With custom extension (R□E/R□F–500/600)
Insertion length		207 mm	0.3…3 m	1…20 m	0.2…2 m
Material of wetted parts		1.4571		Vibrating part: 1.4571, Cable: PE cover	1.4571
Housing material		Painted aluminum (R–500 series); or plastic (PBT) (R–600 series)			
Process connection		R□H, R□R, R□K, R□E: 1½" BSP; R□N, R□L, R□C, R□F: 1½" NPT			
Process temperature		–30…+110 °C; high-temperature version[2]: –30…+160 °C		–30…+80 °C	–30…+110 °C; high-temp. version[3]: –30…+160 °C
Ambient temperature		–30…+60 °C			
Process pressure		max. 25 bar (2.5 MPa)		max. 6 bar (0.6 MPa)[2]	
Medium density[1]		min. 0.05 kg/dm³ (grain size max max. 10 mm)			
Response time (selectable)	Getting immersed	<1.8 s or 5 ±1.5 s			
	Getting free	<2 s or 5 ±1.5 s			
Supply voltage (universal)		Standard type: 20…255 V AC/DC			
Power consumption		≤2.5 VA / 2 W			
Electrical connections		2× M20x1.5 cable glands for Ø6…12 mm cable; 2× terminal blocks for max. 1.5 mm² wire cross section; 2× internally threaded 1½" NPT connection for protective pipes.			
Ingress protection		Housing: IP67[3]			
Electrical protection		Class I (to be grounded!)[3]			
Weight	plastic housing	1.5 kg	1.5 kg (+1.4 kg/m)	1.5 kg (+0.6 kg/m)	1.5 kg
	aluminum housing	1.88 kg	1.88 kg (+1.4 kg/m)	1.88 kg (+0.6 kg/m)	1.88 kg

[1] Depend on friction and grain size of the medium. [2] Only with metal housing. [3] Devices with custom extension must be installed and mounted appropriately, which is the responsibility of the customer. Only the appropriate mounting ensures IP67 protection, up to 6 bar (0.6 MPa) maximum tank pressure, and Class I electrical protection.

OUTPUT PROPERTIES

Output	Relay	Electronic
Output type and rating	SPDT 250 V AC, 8 A, AC1	SPST 50 V, 350 mA
Output protection	–	Overvoltage, overcurrent and overload
Voltage drop (switched on)	–	< 2.7 V 350 mA
Residual current (switched off)	–	< 10 µA

Ex INFORMATION

R□□–5□□–5 Ex		
Protection		Dust Ex
Ex marking[2]	ATEX	⟨Ex⟩ II1/2 D Ex ta/tb IIIC T90°C…T170°C Da/Db
	IEC Ex	Ex t IIIC T* Da/Db IP67 *(see Temperature data table)
	KCs Ex	Ex t IIIC T*
Electrical connection		2× M20×1.5 cable glands with Ex ta IIIC protection for Ø7…Ø12 mm cabel, 2× plug-in terminal blocks for max. 1.5 mm² wire cross section, 2× internally threaded ½" NPT connection for protective pipes.
Supply voltage (universal)		20…250 V AC (50/60Hz) / 20…50 V DC

[2] Only with metal housing

THERMAL LIMITS OF Ex COMPLIANT VERSIONS

Thermal Properties	With extension cable			Standard or with extension pipe				High-temperature
Process temperature (T_M)[4] Min.: –30 °C	+60 °C	+70 °C	+80 °C[5]	+60 °C	+70 °C	+95 °C	+110 °C	+160 °C
Ambient temperature (T_A)[4] Min.: –30 °C	+60 °C	+50 °C	+60 °C	+60 °C	+50 °C	+60 °C	+50 °C	+35 °C
Max. surface temp. of process connection	+85 °C		+95 °C	+85 °C		+95 °C		+135 °C
Max. surface temperature	+85 °C		+95 °C	+85 °C		+95 °C	+110 °C	+160 °C
Temperature classes	**T90°C**		**T100°C**	**T90°C**		**T100°C**	**T115°C**	**T170°C**

[4] To operate the level switch at the maximum values of the related thermal properties the applied cable must permanently withstand up to +90 °C temperature.
[5] Process temperature for max. 1 hour: +95 °C

NIVOCONT R-500/R-600 standard version — 5 years

Vibrating rod level switch for powders and granular solids
Standard probe length: 207 mm

Versions

R □■ – ■ 0 2 – ■

K	Standard version (+110 °C)
H	High-temperature version (+160 °C)
S	Standard version (+110 °C) with fine-polished probe
T	High-temperature version (+160 °C) with fine-polished probe

Process connection

R ■□ – ■ 0 2 – ■

H	1½" BSP
N	1½" NPT

Housing

R ■■ – □ 0 2 – ■

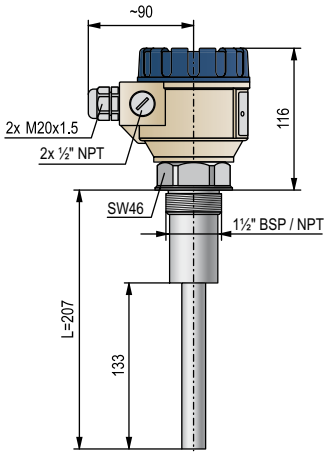
5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (Ex version is not available)

Output / Certificates

R ■■ – ■ 0 2 – □

1	SPDT, relay; 250 V AC, 8 A
3	SPST, solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D

Need of IEC Ex is to be requested in the text part of the order



RKH / RKN-500 / 600

NIV24
RKH-502-1

NIVOCONT R-500/R-600 extension pipe version — 5 years

Vibrating rod level switch for powders and granular solids
with stainless steel extension pipe up to 3 m

Versions

R □■ – ■■■ – ■

K	Standard version (+110 °C)
H	High-temperature version (+160 °C)
S	Standard version (+110 °C) with fine-polished probe
T	High-temperature version (+160 °C) with fine-polished probe

Process connection

R ■□ – ■■■ – ■

R	1½" BSP
L	1½" NPT

Housing

R ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (not available in Ex version)

Probe length

R ■■ – ■□□ – ■

n n	0.3…0.5 m
o o	0.6…3 m; sold by the 0.1 m

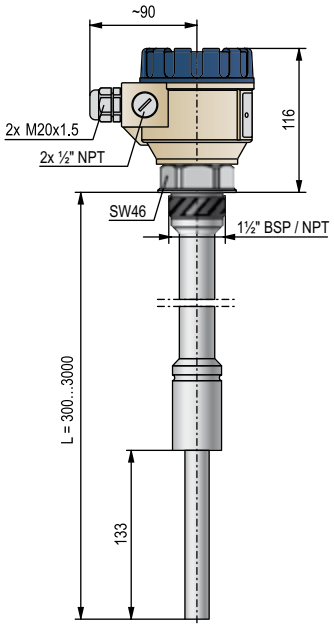
nn = 03…05 : 0.3…0.5 m
oo = 06…30 : 0.6…3 m

Output / Certificates

R ■■ – ■■■ – □

1	SPDT, relay; 250 V AC, 8 A
3	SPST, solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D

Need of IEC Ex is to be requested in the text part of the order



RKR / RKL-500 / 600

NIVOCONT R-500/R-600 extension cable version — 5 years

Vibrating rod level switch for powders and granular solids
with PE-coated extension cable up to 20 m

Process connection

R K □ – ■ ■ ■ – ■

K	1½" BSP
C	1½" NPT

Housing

R K ■ – □ ■ ■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (not available in Ex version)

Probe length

R K ■ – ■ □ □ – ■

0 1	1 m
n n	2…20 m; sold by the meter

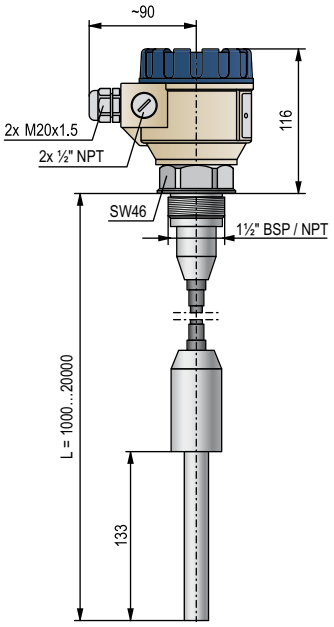
nn = 02…20 : 2…20 m

Output / Certificates

R K ■ – ■ ■ ■ – □

1	SPDT, relay; 250 V AC, 8 A
3	SPST, solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D

Need of IEC Ex is to be requested in the text part of the order



RKK / RKC–500 / 600

NIVOCONT R-500/R-600 custom extension version — 5 years

Vibrating rod level switch for powders and granular solids with custom extension 1" stainless steel (1.4571) pipe cut to desired length, up to 2 m (the extension steel tube is not part of the package).

Versions

R □■ – ■ 0 2 – ■

K	Standard version (+110 °C)
H	High temperature version (+160 °C)

Process connection

R ■□ – ■ 0 2 – ■

E	1½" BSP
F	1½" NPT

Housing

R ■■ – □ 0 2 – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced

Output

R ■■ – ■ 0 2 – □

1	SPDT, relay; 250 V AC, 8 A
3	SPST, solid-state output

NIVOCONT R-500/R-600 with remote-mounted electronics — 5 years

Vibrating rod level switch with electronics separated from the probe
Use the order codes below after the standard order code of the device:

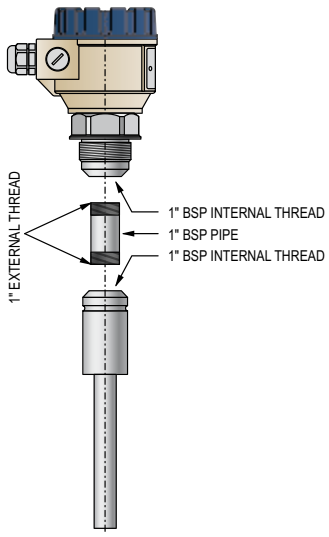
Special versions

X09

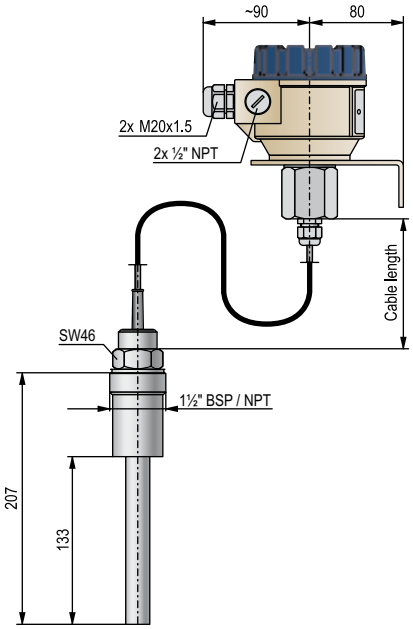
Extension cable

Max. 10 m; sold by the meter

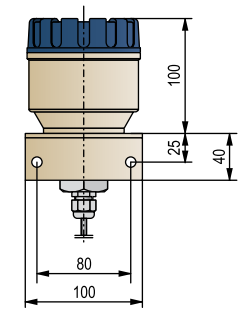
Order example:
Remotely mounted version with standard probe and 3 m extension cable: RKH-502-1-X09/3 m



RKE / RKF–500 / 600



RKH–500/600–X09



RKH–500/600–X09

Rotary Paddle Level Switches

NIVOROTA

The **NIVOROTA** rotary paddle level switch detects the level of lumpy or powders, grains, and granules. Mounted onto tanks, silos, and hoppers, it monitors and controls the level, filling, and dumping of the stored materials such as stone, ash, sand, coal, feed, beet slices, etc. A small electric motor drives the paddle, which rotates freely in the absence of material. When the material reaches the paddle, the motor is switched off, and the output switch is triggered. When the material level drops, the paddle is free to spin again, the motor is reactivated, and the switch returns to its original state. The **NIVOROTA E-700 & E-800** series rotary paddle level switches provide all the advantageous features of the previous series in one unit. Dust Ex versions are available for use in hazardous environments.

FEATURES

- Level switching of free-flowing solids
- Extension cable or rod up to 3 m
- Automatic motor shutdown
- High-temperature version
- IP67
- Dust-Ex certified version
- Rotary force independent of the supply voltage
- Low supply voltage is indicated by a blinking LED

APPLICATIONS

- Food industry: sunflower seeds, sunflower hulls, coffee and, cocoa powder, flour, sugar, etc.
- Chemical industry: plastic powders, granules, pellets
- Building industry: cement, sand, calcium powder, gypsum
- Energy industry: active soot, coal powder, fly ash

VARIANTS

	E–700	E–800
Metal housing	■	–
Plastic housing	–	■
Single-blade paddle	■	■
Multi-blade paddle	■	■
Flexible coupling	■	■
Cable length	■	■
DC supply voltage	■	■
Dust Ex version	■	–
High-temperature version	■	–
1" process connection	■	■
1½" process connection	■	■
Torque adjustment	■	■

CERTIFICATES

- ATEX (Ex ta/tb D)
- UKCA Ex (Ex ta/tb D)

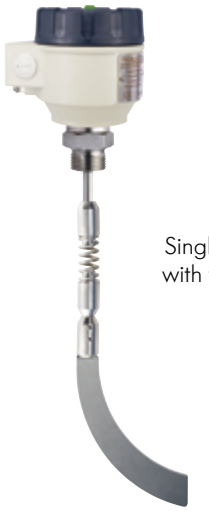
VARIANTS

For appropriate model selection the following must be taken into consideration:

- Insertion length: level switching application *(low or high level switch)* and the position of installation determine the insertion length.
- Number of blades: specific gravity and particle size of the material provides orientation for the number of blades. Most commonly used is the stainless steel, single blade paddle. The paddle can be passed through the respective threaded connection. For lighter materials the use of 3-blade paddle is recommended. The available devices have 1 or 3-blades, they can be ordered with either paddle variant, and the paddles can be ordered separately as well.
- Flexible coupling: Use if the shaft of the instrument has to be protected against falling materials. *(rocks, larger, lumpy materials)*

Material	Density (kg/dm³) (1)
Wheat	0.4…0.5
Flour	0.6 … 0.8
Wood chip	0.3 … 0.4
Sawdust	0.3 … 0.35
Whiting	0.8 … 1
Lime hydrate dust	0.4 … 0.5
PVC dust	0.3 … 0.6
PVC granule	0.3 … 0.6
Sunflower seeds	0.3 … 0.5
Sunflower hulls	0.1 … 0.2
Feed	0.2 … 0.6
Ground paprika	0.8 … 1

(1) *Informational data*



EL–700
Single-blade paddle
with flexible coupling

EM–700
High-temperature
version with extension rod

EL–700
3-blade
paddle version

TECHNICAL DATA

	Standard version		High-temperature version
	EL□–7□□	EL□–8□□	EM□–7□□
Insertion length	Standard: 200 mm; with extension rod: 0.3…3 m; with extension cable: 1…3 m		
Paddle material, number of blades	1.4571 stainless steel / 1, 2, 3; as per order code		
Rotation speed	~1 rpm (@50 Hz)		
Material of wetted parts	1.4571 stainless steel, material of the seal: NBR		1.4571 stainless steel, material of the seal: FPM
Medium density (guideline value)	Minimum 0.1 kg/dm³		
Process temperature	–20…+120 °C	–20…+80 °C	–20…+200 °C
	Ex variant: see "Ex Information"		
Ambient temperature / relative humidity	–30…+60 °C / maximum 90%		
Process pressure	Maximum 3 bar (0.3 MPa)		
Output	SPDT 250 V AC, 6 A, AC1		
Paddle-rotation / shutdown indication	Two-toned (green / red) LED		
Process connection	1" BSPT; 1½" BSPT; mounting plate (BSPT thread can also be screwed into BSP or NPT thread)		
Supply voltage	230 V AC, 120 V AC, 24 V AC, 24 V DC (18…28 V DC)		
Power consumption	Maximum 4 VA (4 W)		
Electrical connection	2× M20×1.5 plastic cable glands, for 6…12 mm cable + 2× internally threaded ½" NPT connection for protective pipes 2× terminal blocks for 0.5…1.5 mm² wire cross section		
Electrical protection	Class I		
Ingress protection	IP67		
Housing material	Painted aluminum or plastic (PBT)		Painted aluminum
Weight	Standard: 1.6 kg, extension rod: 1.6 kg + extension 1.6 kg/m, extension cable: 2.6 kg + extension 1.4 kg/m, counterweight: 1 kg		

Ex INFORMATION

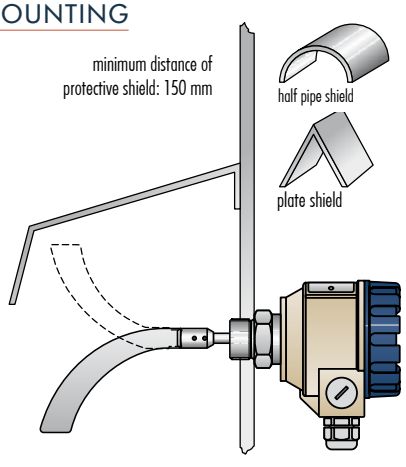
	Standard (EL□-7□□-5, 6, 7, 8 Ex)	High-temperature (EM□-7□□-5, 6, 7, 8 Ex)
Ex marking	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C…T135°C Da/Db	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C…T200°C Da/Db
Ex supply voltage	E□□–7□□–5 Ex: U_0 ≤ 253 V AC; E□□–7□□–6 Ex: U_0 ≤ 132 V AC; E□□–7□□–7 Ex: U_0 ≤ 26.4 V AC; E□□–7□□–8 Ex: U_0 ≤ 28 V DC	
Process and ambient temperature	See below	
Cable entry	M20×1.5 cable gland with "Ex ta" certification	
Cable outer diameter	Ø6…Ø12 mm	
Electrical connection	Wire cross-section: 0.5…1.5 mm²	

Type	Temperature class	T85°C	T100°C	T135°C	T200°C
Standard EL□–7□□–5, 6, 7, 8 Ex	Maximum surface temperature	+60 °C	+90 °C	+120 °C	
	Maximum process temperature				
	Maximum ambient temperature		+60 °C	+50 °C	
	Waiting time for opening the cover	40 minutes	30 minutes	10 minutes	
High-temperature EM□–7□□–5, 6, 7, 8 Ex	Maximum surface temperature	+60 °C	+90 °C	+120 °C	+200 °C
	Maximum process temperature				
	Maximum ambient temperature	+60 °C			
	Waiting time for opening the cover	40 minutes	30 minutes	15 minutes	0 minute

OPERATING MODES

Power supply	Status LED	Output microswitch	Paddle
ON	Green	C — NC, NO — De-Energized	Rotates
	Red	C — NC, NO — Energized	Does not rotate
OFF	Off	C — NC, NO — De-Energized	Does not rotate

MOUNTING



Protective shield for low fail-safe unit

NIVOROTA E-700/E-800 standard version — 3 years

Rotary paddle level switch for powders and granular solids
Standard probe length: 200 mm

Version

E □■ – ■■■ – ■

L	Standard bidirectional version
M	High temperature bidirectional version (only with aluminum housing)

Paddle / Process connection

E ■□ – ■■■ – ■

A		1-blade paddle (EAL–701–1) / 1" BSPT
H		1-blade paddle (EAL–701–1) / 1½" BSPT
F	*	3-blade paddle (EAL–709–1) / 1½" BSPT

* Mounting plate is ordered separately

Housing / Material of process connection

E ■■ – □■■ – ■

7	Painted aluminum / 1.4571
8	Plastic, PBT, fiberglass-reinforced / 1.4571 (Ex version not available)

Insertion length

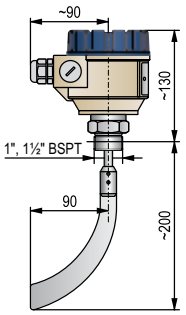
E ■■ – ■□□ – ■

0 2	200 mm

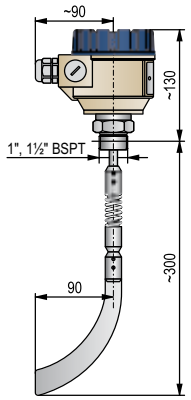
Supply voltage / Certificates

E ■■ – ■■■ – □

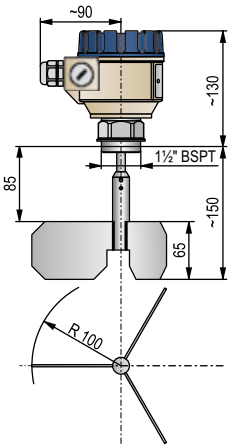
1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex ta/tb D
6	120 V AC / Ex ta/tb D
7	24 V AC / Ex ta/tb D
8	24 V DC / Ex ta/tb D



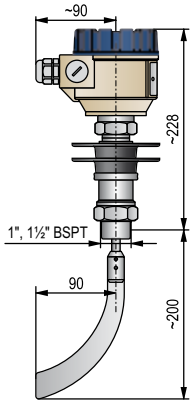
ELA / ELH–702 / 802



ELA / ELH–702 / 802 + EAS–701



ELF–702 / 802



EMA / EMH–702

NIV24
ELA–702–1
ELH–702–1

NIVOROTA E-700/E-800 extension rod version — 3 years

Rotary paddle level switch for powders and granular solids
with stainless steel extension rod up to 3 m

Version

E □ R – ■■■ – ■

L	Standard bidirectional version
M	High temperature bidirectional version (only with aluminum housing)

Version / Paddle / Process connection

E ■□ – ■■■ – ■

R	With extension rod / 1-blade paddle (EAL–701–1) / 1½" BSPT

Housing / Material of process connection

E ■ R – □■■ – ■

7	Painted aluminum / 1.4571
8	Plastic, PBT, fiberglass-reinforced / 1.4571 (Ex version not available)

Insertion length

E ■ R – ■□□ – ■

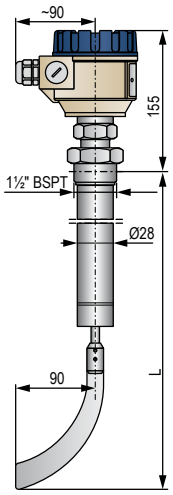
n n	0.3…3 m probe with extension rod; sold by the 0.1 m

nn = 03…30 : 0.3…3 m

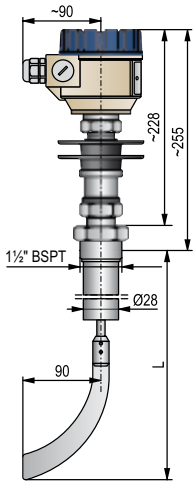
Supply voltage / Certificates

E ■ R – ■■■ – □

1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex ta/tb D
6	120 V AC / Ex ta/tb D
7	24 V AC / Ex ta/tb D
8	24 V DC / Ex ta/tb D



ELR–703 / 730



EMR–703 / 730

NIVOROTA E-700/E-800 extension cable version — 3 years

Rotary paddle level switch for powders and granular solids
with stainless steel extension cable probe up to 3 m

Version

E □■ – ■■■ – ■

L		Standard bidirectional version
M		High temperature bidirectional version (only with aluminum housing)

Version / Paddle / Process connection

E ■□ – ■■■ – ■

K		With extension cable / 1-blade paddle (EAL–701–1) / 1½" BSPT
L	*	With extension cable / 3-blade paddle (EAL–709–1) / 1½" BSPT

* Mounting plate is ordered separately

Housing / Material of process connection

E ■■ – □■■ – ■

7	Painted aluminum / 1.4571
8	Plastic, PBT, fiberglass-reinforced / 1.4571 (Ex version not available)

Insertion length

E ■■ – ■□□ – ■

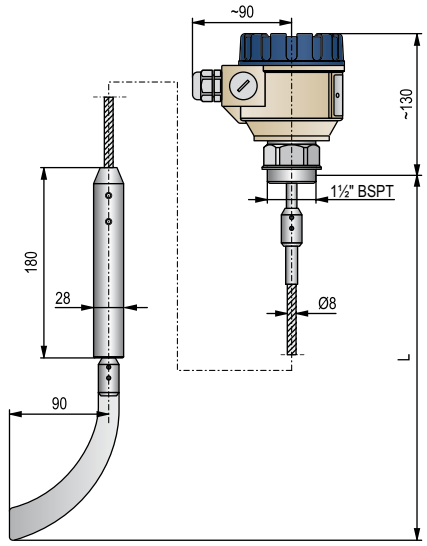
n n	1, 2 or 3 m probe with extension cable; sold by the meter

nn = 10, 20, 30 : 1, 2 or 3 m

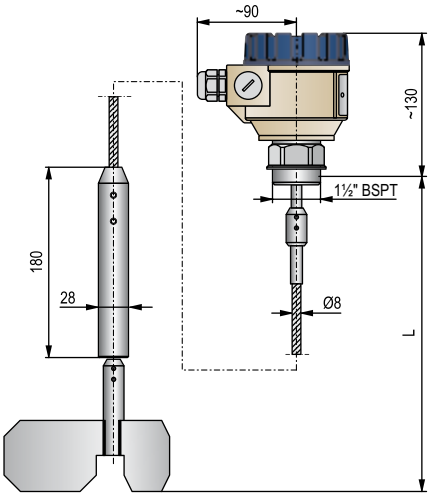
Supply voltage / Certificates

E ■■ – ■■■ – □

1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex ta/tb D
6	120 V AC / Ex ta/tb D
7	24 V AC / Ex ta/tb D
8	24 V DC / Ex ta/tb D



ELK–710 / 730
ELK–810 / 830



ELL–710 / 730
ELL–810 / 830

NIVOROTA E-700/800 accessories (sold separately) — 3 years

Mounting – type / material

E A M – 7 0 □ – 0

1	1" female nut / 1.4571
2	1½" female nut / 1.4571
3	Sliding sleeve for extension rod version / 1.4571
4	Mounting plate, 1" hole / 1.4571
5	Mounting plate, 1" hole / carbon steel
6	Mounting plate, 1½" hole / 1.4571
7	Mounting plate, 1½" hole / carbon steel

□ A A – 6 0 ■ – 0

E

Adapters – process connection / material

E A A – 6 0 □ – 0

1	1" BSP – 1½" BSP / 1.4571
2	1" BSP – 1½" NPT / 1.4571
3	1½" BSP – 2" BSP / 1.4571
9	1½" BSP – 3" BSP / 1.4571
EKH-402-1M00001	1½" BSP – 1¼" NPT / 1.4571
EKN-402-1M00002	1½" BSP – 2" NPT / 1.4571

Paddles – type / material

E A L – 7 0 □ – 1

1	1-blade curved, 168 mm / 1.4571
2	1-blade curved, 120 mm / 1.4571
3	2-blade flexible, 172 mm / 1.4571
4	2-blade flexible, 120 mm / 1.4571
5	1-blade straight, 170 mm / 1.4571
6	1-blade straight, 70 mm / 1.4571
7	1-blade 90°, 130 mm / 1.4571
8	3-blade extended, 268 mm / 1.4571
9	3-blade standard, 120 mm / 1.4571

Length size

E A R – 7 0 □ – 1

n	0.1...0.5 m extension pipe, 1.4571, sold by the 0.1 m

n = 1 ...5 : 0.1...0.5 m

Rigid pipe for extension cable version

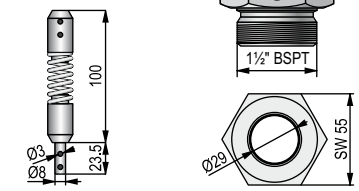
E A K – 7 □ □ – 1

n n	0.1...3 m Ø12x1, 1.4571, sold by the 0.1 m

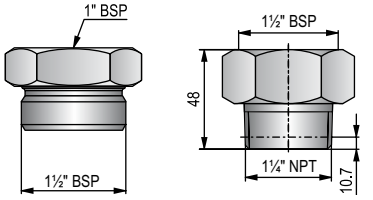
nn = 01...30 : 0.1...3 m

Accessories

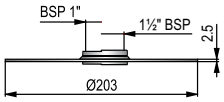
E A S – 7 0 1 – 0	Flexible Coupling / 1.4571
E A W – 7 0 1 – 0	Weight / 1.4571
EAM-704-0M00003	Mounting plate sealing
4cesp3x20ykoy	Mounting sleeve

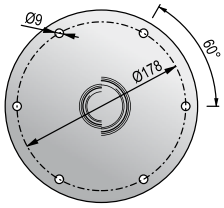


EAS–701–0 EAM–703–0

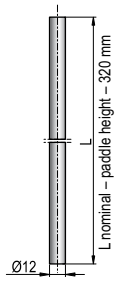


EAA–601–0 EKH–402–1M00001

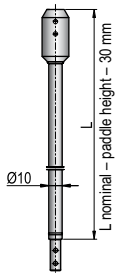




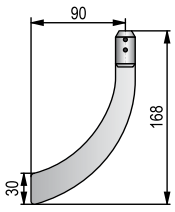
EAM–704 / 707



EAK–7□□–1



EAR–70□–1



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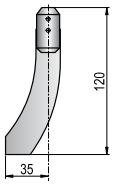

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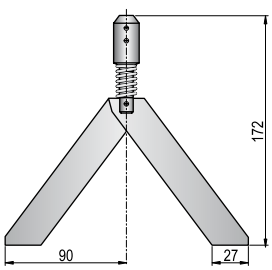

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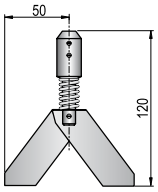
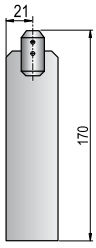


EAL–704–1



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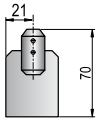

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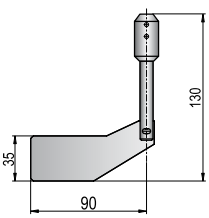

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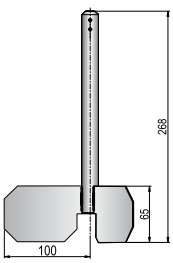
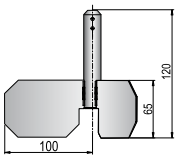


EAL–708–1



EAL–709–1

The **NIVOCAP CK** capacitance level switches operate as capacitance meters in the RF *(radio-frequency)* range providing excellent immunity to deposits. **NIVOCAP CK–100** is an outstanding choice for viscous, sticky substances where the rival vibrating or the other contact measurement technologies are not suited.
The mechanical construction consists of a stainless steel probe and a reference probe between two insulation layers. The microcontroller based electronics of the **NIVOCAP CK** evaluates continuously the voltage level proportional to the capacitance difference between the two probes and the housing. This way it provides more stabile measurement compared to the analog capacitance switches. The units are available only with painted aluminum housing, because one of the measurement reference points is the housing itself. The guard ring – an insulated section of the probe – makes the disregarding of material deposits possible, thus preventing false switching. The maximum probe length of the **NIVOCAP CK** series is 3 meter for probes with extension cable or rod available up to 10 meter in length. The high-temperature and the Dust-Ex approved models are suitable for harsh environments so they are ideal choice for power generation applications. In the case of liquids, only the lower, metalic part of the protruting probe allowed to be in contact with the medium!

FEATURES

- Intelligent electronic level switch
- Immune to material deposits
- Easy calibration
- Selectable sensitivity
- Fail-safe operating mode
- Extension rod or cable
- Calibration with external magnet
- High-temperature version
- Dust-Ex variants available
- 5 years warranty

APPLICATIONS

- For viscous, sticky materials
- For solids with $\varepsilon_r \geq 1.5$ relative dielectric constant and liquids
- Pharmaceutical and food industry
- Powerplant processes

CERTIFICATES

- ATEX (Ex ta/tb D)
- IEC Ex (Ex ta/tb D)

CKH–104 CMR–100 CKK–100

OPERATION, SET-UP

During operation, the electronics evaluates the capacitance difference of the connected measurement probe continuously. As long as the measured medium does not touch the probe, the measured capacitance is constant in reference to the housing. However, when the medium reaches the probe, the initial capacitance value starts to increase. The device picks up the change in the capacitance compared to a reference value recorded during the calibration procedure. For this reason, an empty-tank calibration must be performed after installing the instrument so that the unit can learn the default capacitance of the setup, and the learned value will be the reference capacitance value. The unit can be calibrated with an external magnet without removing the housing cover since the housing cover may not be removed in Dust-Ex environments when the unit is energized, but the unit needs power to be calibrated.
The sensitivity of the unit can be selected with a push-button in 4 ranges and fine-tuned with a potentiometer within the selected range.

CALIBRATION

The instrument must be calibrated after it is installed. The purpose of the calibration process is that the electronics learns the capacitance values belonging to the particular levels and use the data as reference values.
Calibration starts with pressing the CAL button or touching the marked point on the housing with the magnetic calibration tool for 5 seconds.
If the unit is installed in a hazardous *(Dust Ex)* environment, the housing cover cannot be removed as long as the unit is powered, and the device can be calibrated with the magnet without removing the housing cover.
The supplied permanent magnetic screw allows calibration through the aluminum housing. In this case, the status LED will blink blue during the calibration.
All the other settings *(sensitivity range, sensitivity fine-tuning, delay, fail-safe operating mode, and turning magnetic calibration on)* must be carried out outside the hazardous environment *(e. g., in a control room)* before mounting the instrument. Calibration can be performed multiple times.

SENSITIVITY SETTINGS

Sensitivity (range)	Capacitance value	ε_r	Typical measured medium
1 ● ○ ○ ○	18 pF	> 7.0	Wastewater, slurries, and water-based solutions
2 ○ ● ○ ○	8.3 pF	4.0…7.0	Grains, fertilizers, feed
3 ○ ○ ● ○	2.6 pF	2.0…4.0	Sand, rubber, oils, coal
4 ○ ○ ○ ●	0.5 pF	1.5…2.0	Plastics, fly ash, cement

TECHNICAL DATA

	Standard version	With extension rod	With extension cable
Probe length	300…600 mm	0.7…3 m	1…10 m
Material of wetted parts	1.4571 / 316Ti stainless steel + PPS insulation		Probe: 1.4571 / 316Ti stainless steel + PPS Insulation; Cable: PE coating
Process connection	¾", 1", 1½" BSP / NPT threaded connection; as per order code		
Output	See output data table		
Ambient temperature	−30…+65 °C		
Process temperature (for solids)	−30…+110 °C		−25 …+80 °C
Process temperature [High-temperature version] (for solids)	−30…+235 °C		–
Process temperature (for liquids)	0… +65 °C		
Process pressure	16 bar (1.6 MPa)		
Response time (selectable)	0.15…15 s		
Sensitivity	Coarse settings: available with push button out of 4 ranges; 4 indication LED Fine adjustment: with potentiometer within the selected range		
Fail-safe mode	Low, high (selectable with DIP-switch)		
Calibration	With push button or external magnet		
Status display	Status LED, Calibration LED		
ε_r	Minimum 1.5		
Supply voltage	20…255 V AC / 20…50 V DC		
Power consumption	≤ 2.5 VA / 2 W		
Housing material	Painted aluminum		
Electrical connection	2× M20×1.5 plastic cable glands, for 6…12 mm cable + 2× internally threaded ½" NPT connection for protective pipes; 2× terminal blocks for 0.5…1.5 mm² wire cross section		
Electrical protection	Class I		
Ingress protection	IP67		
Weight	2 kg	2 kg + 1.4 kg /m	2 kg + 0.6 kg/m

OUTPUT DATA

Type	Relay	Electronic
Output type	SPDT	SPST
Output rating	250 V AC, 8 A, AC1	250 V AC, 50 V DC
Output protection	–	Overvoltage, overcurrent and overload

Ex INFORMATION

Protection		Dust Ex						
Ex marking	ATEX	⟨Ex⟩ II 1/2D Ex ta/tb IIIC T85°C…T220°C Da/Db						
	IEC Ex [1]	Ex ta IIIC T85°C…T220°C Da/Db						
Electrical connection		2× M20×1.5 metal cable glands for Ø8…Ø13 mm cable						
Thermal properties		With extension cable			Standard, or with extension rod			
		Standard version						High-temperature version
Process temperature min.: −30 °C; Max:		+60 °C	+70 °C	+80 °C	+60 °C	+70 °C	+95 °C	+110 °C	+220 °C
Ambient temperature min.: −30 °C; Max:		+65 °C	+60 °C	+60 °C	+65 °C	+60 °C	+60 °C	+50 °C	+35 °C
Highest permissible surface temperature of the process connection		+80 °C	+80 °C	+90 °C	+80 °C		+90 °C	+95 °C	+195 °C
Temperature classes		T85°C		T95°C	T85°C		T95°C	T110°C	T220°C

[1] *IEC Ex compliance is optional; must be requested in the order.*

NIVOCAP CK-100 with standard probe — 5 years

High-frequency (RF) capacitance level switch for powders and granular solids, and for liquids
Standard probe length: 300…600 mm

Version

C □■ – 1 ■■ – ■

K	Standard version
M	High temperature version

Probe version / Process connection

C ■□ – 1 ■■ – ■

D	Standard / ¾" BSP
G	Standard / ¾" NPT
M	Standard / 1" BSP
P	Standard / 1" NPT
H	Standard / 1½" BSP
N	Standard / 1½" NPT

Housing

C ■■ – □■■ – ■

1	Painted aluminum

Probe length

C ■■ – 1 □□ – ■

n n	Standard version 0.3…0.6 m

nn = 03…06 : 0.3…0.6 m

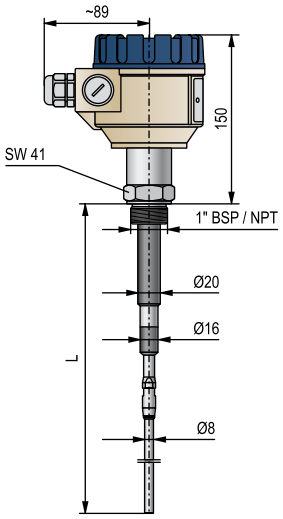
Output / Certificates

C ■■ – 1 ■■ – □

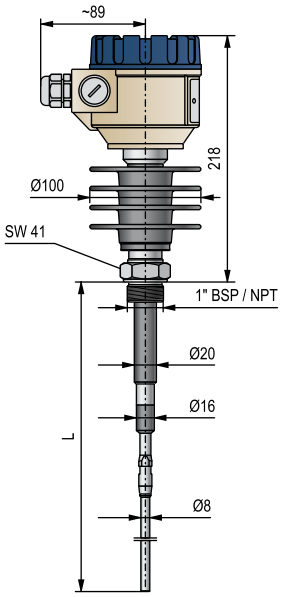
1	SPDT, relay; 250 V AC, 8 A
3	Solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D
7	SPST, solid-state output / Ex ta/tb D

Available on request (must be specified in the text of the order)

X32	2" TriClamp (ISO 2852) process connection



CKM / CKP-103 / 106



CMM / CMP-103 / 106

NIVOCAP CK-100 with extension rod — 5 years

High-frequency (RF) capacitance level switch for powders and granular solids, and for liquids with stainless steel extension rod up to 3 m

Version

C ☐■ – 1 ■■ – ■

K	Standard version
M	High temperature version

Probe version / Process connection

C ■☐ – 1 ■■ – ■

E	With extension rod / ¾" BSP (max. 1.5 m)
F	With extension rod / ¾" NPT (max. 1.5 m)
V	With extension rod / 1" BSP
Z	With extension rod / 1" NPT
R	With extension rod / 1½" BSP
L	With extension rod / 1½" NPT

Housing

C ■■ – ☐■■ – ■

1	Painted aluminum

Probe length

C ■■ – 1 ☐☐ – ■

0 7	0.7 m
n n	0.8…3 m probe with extension rod; sold by the 0.1 m

nn = 08…30 : 0.8…3 m

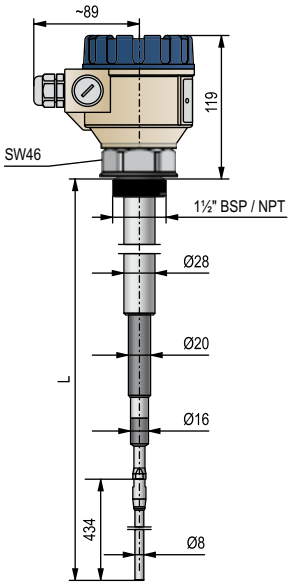
Output / Certificates

C ■■ – 1 ■■ – ☐

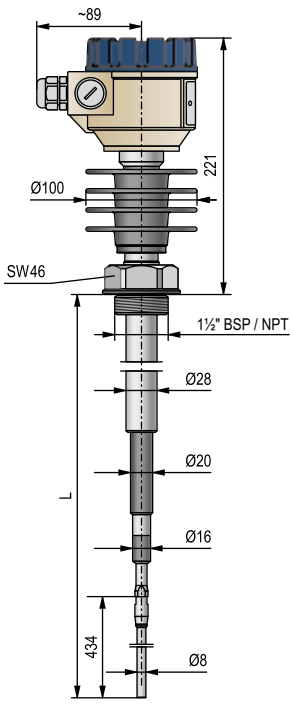
1	SPDT, relay; 250 V AC, 8 A
3	Solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D
7	SPST, solid-state output / Ex ta/tb D

Available on request (must be specified in the text of the order)

X32	2" TriClamp (ISO 2852) process connection



CKR / CKL-107 / 130



CMR / CML-107 / 130

NIVOCAP CK-100 extension cable version — 5 years

High-frequency (RF) capacitance level switch for powders and granular solids, and for liquids with PE-coated stainless steel extension cable up to 10 m

Version

C ☐ ■ – 1 ■ ■ – ■

K	Standard version

Probe version / Process connection

C K ☐ – 1 ■ ■ – ■

K	With extension cable / 1½" BSP
C	With extension cable / 1½" NPT

Housing

C K ■ – ☐ ■ ■ – ■

1	Painted aluminum

Probe length

C K ■ – 1 ☐ ☐ – ■

n n	1...10 m probe with extension cable; sold by the 0.5 m

nn = 10...A0 : 1...10 m

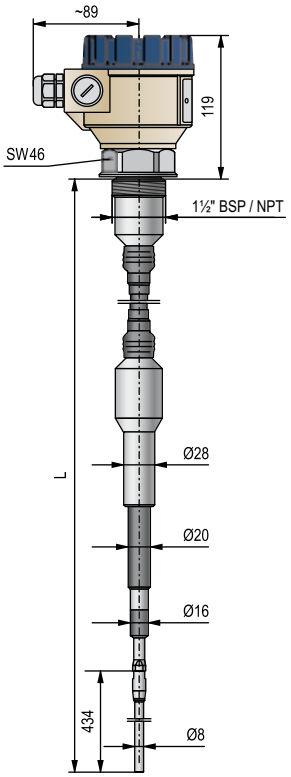
Output / Certificates

C K ■ – 1 ■ ■ – ☐

1	SPDT, relay; 250 V AC, 8 A
3	Solid-state output
5	SPDT, relay; 250 V AC, 8 A / Ex ta/tb D
7	SPST, solid-state output / Ex ta/tb D

Available on request (must be specified in the text of the order)

X32	2" TriClamp (ISO 2852) process connection



CKK / CKC-110 / 1A0

ANALYTICAL TRANSMITTERS

There is a constant demand for analytical measurements in practically all industries. Analysis of fluids and reliable control over the feeding of various chemicals is especially crucial in the water and wastewater, pharmaceutical, chemical, food and beverage, power industries. **NIVELCO's AnaCONT** analytical range provides HART®-capable transmitters for pH, ORP, dissolved oxygen and conductivity measurement.

- The AnaCONT LEP pH transmitters are able to cover the whole 0...14 pH scale.
- The AnaCONT LER ORP transmitters measure in ±1000 mV measuring range.
- The AnaCONT LED dissolved oxygen transmitters use 10 ppm or 20 ppm probes.

The **AnaCONT LEP** and **LER** transmitter families are available in compact, integrated and remote mount versions.

The small size of the **AnaCONT LCK** mini compact transmitter allows it to be used in a wide variety of applications.

AnaCONT LEP / LER
pH AND ORP TRANSMITTER

page 163

- 2-wire pH and ORP transmitter
- Compact and integrated transmitter
- Measuring range: pH: 0…14, ORP: ±1000 mV
- Replaceable electrodes
- Temperature-compensated
- 4…20 mA + HART® communication
- Remote-mount versions up to 10 m
- IP67, IP68
- Explosion-proof variants available

AnaCONT LED
DISSOLVED OXYGEN TRANSMITTER

page 170

- 2-wire DO transmitter
- Compact transmitter
- Measuring range: 0…20 ppm
- Replaceable probe
- Temperature-compensated
- 4…20 mA + HART® communication
- Power relay output
- Remote mount versions up to 10 m
- IP67
- Explosion-proof variants available

AnaCONT LCK
CONDUCTIVITY TRANSMITTER

page 174

- 2-wire EC transmitter
- Mini compact version
- Measuring range: 1 µS/cm…2 mS/cm
- Optional plug-in 4-digit LED display
- 4…20 mA + HART® communication
- IP68 / IP65

AnaCONT instruments are designed to measure pH and redox potential values of liquids and aqueous solutions.

pH measurement: Continuous measurement of acidity *(pH<7)* and of basicity *(pH>7)* liquids can be performed by the help of AnaCONT transmitters. The necessary feeding of chemicals and other technological functions can be controlled by the processed measured values. The potential difference between the submerged measuring and reference probe generates a voltage proportional to the concentration of the hydrogen ion in the measured fluid. This voltage is evaluated by the signal processing electronic module of the instrument. Based on the signals of the submerged probe and the temperature sensor the smart signal processing electronic module calculates a pH value normalized to +25 °C and generates a proportional output signal. The long term stability and accuracy of the measurement requires a periodic calibration of the sensors using the standard buffer solutions.

Redox potential (ORP) measurement: Similarly to the pH measurement, the measurement of the redox potential is based on the potential difference between measuring and reference probes. Oxidation or reduction occurs on the platinum surface of the measuring probe. Redox potential is a parameter that indicates the sum of oxidants and reducers in the measured medium. The output signals of the probes are processed by the electronic unit and it converts them into a proportional output signal. In order to get the desired medium parameters the reduction of liquids or feeding of suitable oxidant is executed based on the processed values.

FEATURES

- Compact and integrated variants
- Remote-mount versions up to 10 m
- Measuring range: pH: 0…14;
  ORP: ±1000 mV
- Wide probe selection to suit a host of applications
- User friendly software, graphic display
- 4…20 mA, HART®, relay output
- Measurement simulation
- Wide range of accessories
- IP67 / IP68

LPP / LPR–100

LEP / LER–200

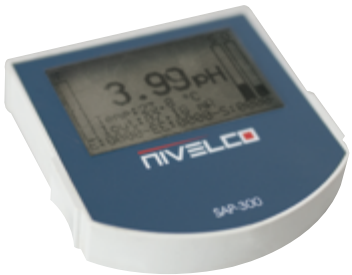
APPLICATIONS

- Checking of water quality
- Water production, wastewater treatment
- Pharmaceutical industry
- Food and beverage industry

CERTIFICATES

- ATEX (Ex ia G)

pH, ORP electrodes



SAP–300 Display

Cleaning solution

Calibration solution

MultiCONT

TECHNICAL DATA

		L□P – pH transmitter	L□R – ORP transmitter
Measuring values		Range: 0…14 pH Reserve: ±2 pH Resolution: 0.01 pH (internal resolution 0.004 pH) Linearity: ±0.004 pH	Range: ±1000 mV Reserve: ±200 mV Resolution: 0.1 mV (internal resolution 0.8 mV) Linearity: ±0.001%
		Accuracy [1]: 0.1% of the measured value ±1 digit ±0.01% / °C, Measuring rate: 300 ms, on the display (refreshing rate): 1 s	
Temperature measurement (semiconductive sensor)		Range: −50…+130 °C. Accuracy: ±0.5 °C. Resolution: 0.1 °C	
Liquid-potential (complementary) electrode		Stainless steel housing of the temperature sensor (1.4571), connection: SN6	
Probe input		Combined probe, galvanically isolated, input impedance: >10^{12} Ω, connection: SN6	
Supply voltage / Power consumption		12…36 V DC / 48…720 mW, galvanically isolated, protection against surge transients	
Output	Analog	4…20 mA, (3.9…20.5 mA), R_{tmax} = 1200 Ω galvanically isolated, transient overvoltage protection	
	Relay	SPDT: 30 V DC, 1 A DC	
	Display	SAP–300 LCD graphic display, units of measure and bar graph (only for compact version)	
	Digital communication	HART®	
Process temperature (pressure dependent) [1]		PP probe housing: −10…+90 °C, PVDF probe housing: −15…+100 °C	
Pressure (absolute) [1]		0.5…10 bar (0.05…1 MPa) @ +25 °C	
Ambient temperature		With metal housing: −30…+70 °C, with plastic housing: −25…+70 °C, both with display: −20…+70 °C	
Seal		PP probe housing: EPDM, All other probe housing: FPM (Viton®)	
Ingress protection		Probe housing: IP68, Electronic housing: IP67; Integrated version: IP68	
Housing material		**Compact version:** Painted aluminum or plastic PBT. **Integrated version:** Same as the probe housing	
Probe housing material		Polypropylene (PP), PVDF	
Electrical connection		**Compact version:** 2× M20×1.5 metal cable gland for cable: Ø7…Ø13 mm, or 2× M20×1.5 plastic cable gland for cable: Ø6…Ø12 mm connecting cable cross section: 0.5…1.5 mm^2 (shielded cable is recommended) + 2× internally threaded ½" NPT connection for protective pipes. **Integrated version:** 6× 0.5 mm^2 shielded cable Ø6 mm × 5 m (up to max. 30 m cable length	
Electrical protection		Class III electric shock protection	

[1] Depending on probe

Ex INFORMATION

Protection type	Intrinsic safety
Ex marking	⟨Ex⟩ II1G Ex ia IIB T6 Ga
Intrinsic safety data	C_i ≤ 15 nF, L_i ≤ 200 µH, U_i ≤ 30 V, I_i ≤ 140 mA, P_i ≤ 1 W Ex transmitters must use an Ex ia power supply
Process temperature	PP probe housing: −10…+70 °C, PVDF probe housing: −15… +80 °C
Ambient temperature	Metal housing: −30…+70 °C, with display: −20…+70 °C, Plastic housing: −20…+70 °C

PROBES

pH Probes

Order code	Max. temp.	Max. pressure	Min. conductivity	Material / Mounting angle	pH	Application areas
L□P–□1□	+80 °C	6 bar	50 µS/cm	Glass / max. 45°	1…12	Potable water, swimming pools, public/industrial wastewater, water in chemical industry, suspensions
L□P–□2□		8 bar	150 µS/cm			Process water, potable water, slightly contaminated wastewater
L□P–□3□	16 bar (<25 °C) / 6 bar (<100 °C)		500 µS/cm			Process water, wastewater, water in chemical industry
L□P–□4□	6 bar (<25 °C) / 3 bar (<100 °C)		150 µS/cm		3…14	Highly alkaline mediums, chemical industry
L□P–□5□	+60 °C	0.5 bar			1…12	Swimming pools, applications in atmospheric pressure
L□P–□6□		3 bar				Potable water, swimming pools, slightly contaminated industrial and wastewater
L□P–□7□	+80 °C	6 bar				
L□P–□8□	+60 °C	3 bar		Polycarbonate / max. +90°		Potable water, swimming pools, process water, slightly contaminated industrial and wastewater

ORP Probes

Order code	Max. temp.	Max. pressure	Min. conductivity	Material / Mounting angle	Application areas
L□R-□1□	+80 °C	6 bar	50 µS/cm	Glass / max. 45°	Potable water, swimming pools, public / industrial wastewater
L□R-□2□	16 bar (<25 °C) / 6 bar (<100 °C)		500 µS/cm		Polluted water emulsions, mediums containing sulphides, high-pressure applications
L□R-□4□	+60 °C	3 bar	150 µS/cm		Potable water, swimming pools, slightly polluted water
L□R-□5□	+80 °C	6 bar			Slightly polluted water, chemical applications
L□R-□6□	+60 °C	3 bar		Polycarbonate / max. 90°	Potable water, swimming pools, slightly polluted water

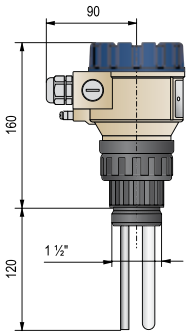
MOUNTING VERSIONS

The constructions of the sensors on the compact and integrated versions are identical, so all accessories are applicable for both versions.

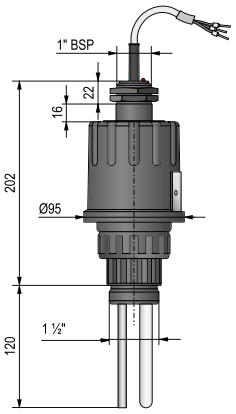
Using the accessories designed specifically for the AnaCONT family helps optimizing the installation of the transmitters making the installation process easier.

By using extension pipes and extension cables, the remote-mount versions allow the mounting of the electronics and the electrode part at any distance from each other.

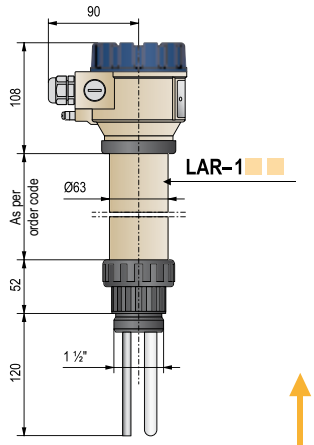
COMPACT TRANSMITTER



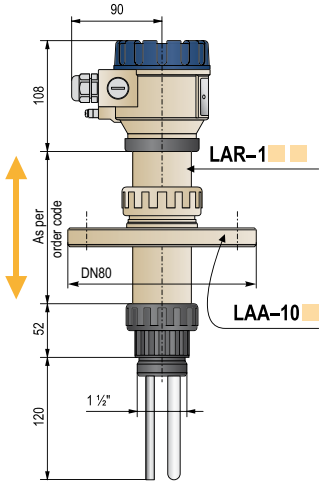
INTEGRATED TRANSMITTER



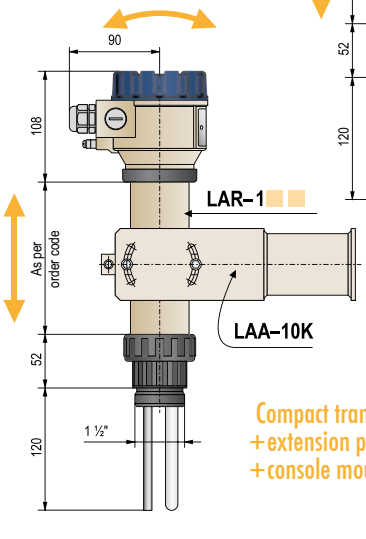
Compact transmitter + extension pipe



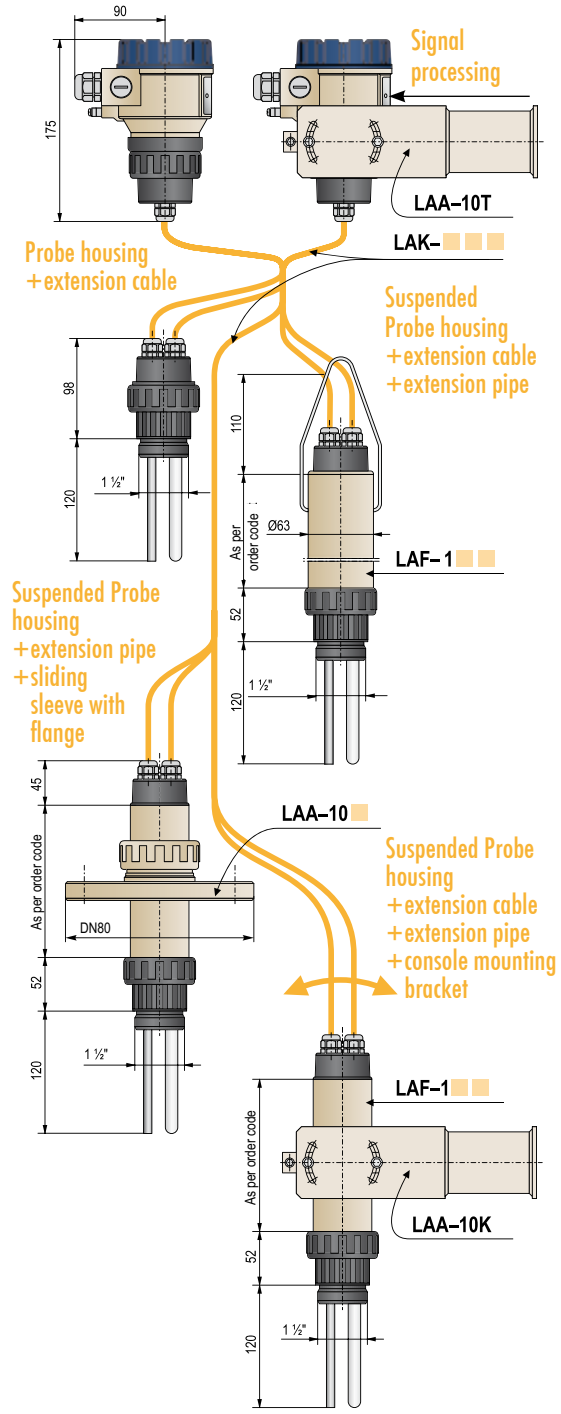
Compact transmitter +extension pipe +sliding sleeve with flange



Compact transmitter +extension pipe +console mounting bracket

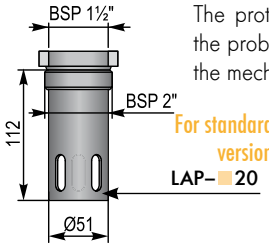


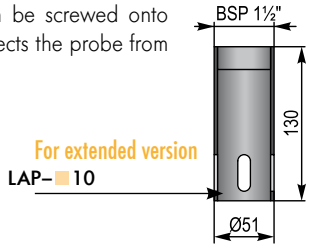
DETACHED COMPACT TRANSMITTER



PROTECTIVE TUBE

The protective tube can be screwed onto the probe socket. It protects the probe from the mechanical impacts.





AnaCONT LEP/LGP-100/-200 — 5 years

2-wire compact liquid analytical pH transmitter with 4…20 mA / 4…20 mA + HART® and relay output
pH measuring range: 0…14 pH, IP67/IP68 protection

Type

L ■ □ – ■ ■ ■ – ■

P	Compact pH transmitter

Programmer and local indicator (SAP-300)

L □ P – ■ ■ ■ – ■

E	Not included
G	Included

Housing

L ■ P – □ ■ ■ – ■

1	Plastic, PBT, fiberglass-reinforced
2	Painted aluminum

Probe: pH range / Max. pressure / Max. temperature / Medium

L ■ P – ■ □ ■ – ■

1	1...12 / 6 bar / +80 °C / with solid particles
2	1...12 / 8 bar / +80 °C / clear fluid
3	1...12 / 16 bar @ +25 °C / 6 bar @ +100 °C / with solid particles
4	3...14 / 6 bar @ +25 °C / 3 bar @ +100 °C / clear fluid
6	1...12 / 3 bar / +60 °C / clear fluid
7	1...12 / 6 bar / +80 °C / clear fluid
8	1...12 / 3 bar / +60 °C / clear fluid (horizontally mountable)

Process connection / Material

L ■ P – ■ ■ □ – ■

1	1½" BSP / PP
2	1½" BSP / PVDF
4	1½" NPT / PP
5	1½" NPT / PVDF

Output / Certificates

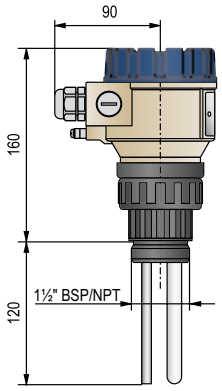
L ■ P – ■ ■ ■ – □

2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA + HART® / Ex ia G
R	4...20 mA + Relay
H	4...20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

For further accessories see AnaCONT accessories



LEP-100

AnaCONT LPP-100 — 5 years

2-wire integrated liquid analytical pH transmitter with 4…20 mA + HART® and relay output
pH measuring range: 0…14 pH, IP68 protection

Type

L P □ – 1 ■ ■ – ■

P	Integrated pH transmitter

Probe: pH range / Max. pressure / Max. temperature / Medium

L P P – 1 □ ■ – ■

1	1…12 / 6 bar / +80 °C / with solid particles
2	1…12 / 8 bar / +80 °C / clear fluid
3	1…12 / 16 bar @ +25 °C / 6 bar @ +100 °C / with solid particles
4	3…14 / 6 bar @ +25 °C / 3 bar @ +100 °C / clear fluid
6	1…12 / 3 bar / +60 °C / clear fluid
7	1…12 / 6 bar / +80 °C / clear fluid
8	1…12 / 3 bar / +60 °C / clear fluid (horizontally mountable)

Process connection / Material

L P P – 1 ■ □ – ■

1	1½" BSP / PP
2	1½" BSP / PVDF
4	1½" NPT / PP
5	1½" NPT / PVDF

Output / Certificates

L P P – 1 ■ ■ – □

4	4…20 mA + HART®
8	4…20 mA + HART® / Ex ia G
H	4…20 mA + HART® + Relay

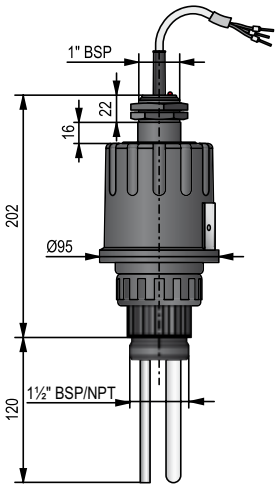
Cable

Max. length 30 m; sold by the meter over the standard 5 m
LPP-1_ _-8 Ex version comes with a 5 m cable only

Accessories sold separately; see relevant page for details

S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

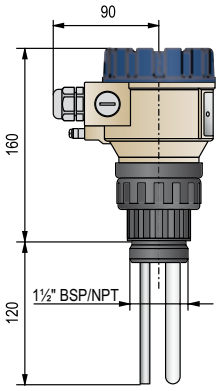
For further accessories see AnaCONT accessories



LPP-100

AnaCONT LER/LGR-100/-200 — 5 years

2-wire compact liquid analytical ORP (redox potential) transmitter with 4…20 mA / 4…20 mA + HART® and relay output; ORP measuring range: ±1000 mV, IP67/IP68 protection



LER-100 / 200

Type

L ■ □ – ■ ■ ■ – ■

R	ORP transmitter

Programmer and local display (SAP-300)

L □ R – ■ ■ ■ – ■

E	Not included
G	Included

Housing

L ■ R – □ ■ ■ – ■

1	Plastic, PBT, fiberglass-reinforced
2	Painted aluminum

Probe: Min. conductivity / Max. pressure / Max. temperature / Medium

L ■ R – ■ □ ■ – ■

1	50 µS/cm / 6 bar / +80 °C / with solid particles
2	500 µS/cm / 16 bar @ +25 °C / 6 bar @ +100 °C / with solid particles
4	150 µS/cm / 3 bar / +60 °C / clear fluid
5	150 µS/cm / 6 bar / +80 °C / clear fluid
6	150 µS/cm / 3 bar / +60 °C / clear fluid (horizontally mountable)

Process connection / Material

L ■ R – ■ ■ □ – ■

1	1½" BSP / PP
2	1½" BSP / PVDF
4	1½" NPT / PP
5	1½" NPT / PVDF

Output / Certificates

L ■ R – ■ ■ ■ – □

2	4…20 mA
4	4…20 mA + HART®
6	4…20 mA / Ex ia G
8	4…20 mA + HART® / Ex ia G
R	4…20 mA + Relay
H	4…20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

For further accessories see AnaCONT accessories

AnaCONT LPR-100 — 5 years

2-wire integrated liquid analytical ORP (redox potential) transmitter with 4…20 mA + HART®
and relay output; ORP measuring range: ±1000 mV, IP68 protection

Type

L P □ – 1 ■ ■ – ■

R	Integrated ORP transmitter

Probe: Min. conductivity / Max. pressure / Max. temperature / Medium

L P R – 1 □ ■ – ■

1	50 µS/cm / 6 bar / +80 °C / with solid particles
2	500 µS/cm / 16 bar @ +25 °C / 6 bar @ +100 °C / with solid particles
4	150 µS/cm / 3 bar / +60 °C / clear fluid
5	150 µS/cm / 6 bar / +80 °C / clear fluid
6	150 µS/cm / 3 bar / +60 °C / clear fluid (horizontally mountable)

Process connection / Material

L P R – 1 ■ □ – ■

1	1½" BSP / PP
2	1½" BSP / PVDF
4	1½" NPT / PP
5	1½" NPT / PVDF

Output / Certificates

L P R – 1 ■ ■ – □

4	4...20 mA + HART®
8	4...20 mA + HART® / Ex ia G
H	4...20 mA + HART® + Relay

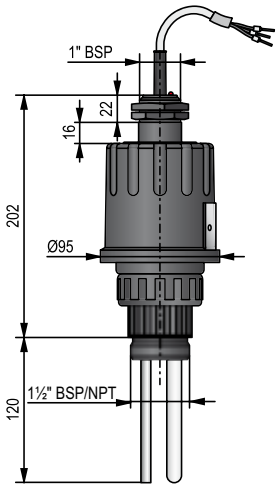
Cable

Max. length 30 m; sold by the meter over the standard 5 m
LPR-1_ _-8 Ex version comes with 5 m cable only

Accessories to order (see relevant page for details)

S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

For further accessories see AnaCONT accessories



LPR-100

The dissolved oxygen *(DO)* measurement gives the quantity of dissolved oxygen in a liquid, in ppm or mg/l values. The sensor with an oxygen-permeable membrane is submerged in the liquid and it provides an electronic signal proportional to the oxygen concentration.

The electronics calculates and transmits the DO value normalized to +25 °C on the basis of the output current of the DO sensor and the potential of the temperature sensor immersed in the medium.

FEATURES

- Compact DO transmitter
- Remote mount versions up to 10 m
- Measuring range: 0…20 ppm
- Replaceable probe
- Temperature compensation
- Graphic display
- 4…20 mA, HART®, relay output
- Wide range of accessories
- IP67
- Ex variant

APPLICATIONS

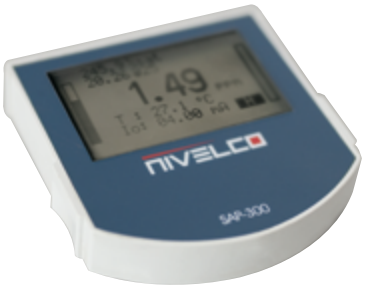
- Checking of water quality
- Wastewater treatment
- Pharmaceutical industry
- Food and beverage industry
- Effluent treatment
- Checking of aeration in potable water
- Pools

CERTIFICATES

- ATEX (Ex ia G)

LED–100

SAT–504
HART® modem



SAP–300
graphic display

PROBES

DO sensors			
	Type	4x085g0023ydo	4x085g0022ydo
DO sensor	Application area	Fish- and crawfish farms, water conditioning of large aquariums. Controlling of oxygen concentration in water plants, determination of biological condition in surface water. 	Potable water production, river monitoring, water treatment sites, controlling of dissolved oxygen level in wastewater plants, determination of biological condition in surface water. 
	DO range	0…20 ppm	0…10 ppm
	Process temperature	Maximum +50 °C	
	Process pressure	Maximum 1 bar	
	Flow speed	Minimum 0.05 m/s	
	Material / thickness of membrane	PTFE / 125 µm	PTFE / 50 µm

TECHNICAL DATA

		AnaCONT L□D – DO transmitter
Measurement data	Range	0…20 ppm / 0…10 ppm
	Reserve	20%
	Resolution	0.01 ppm (internal resolution: 0.005 ppm)
	Linearity	±0.05 ppm
	Accuracy [1]	0.5% of the measured value ±1 digit ±0.01% / °C
	Measuring cycle	300 msec, on display: 1 sec
Temperature measuring (semiconductive sensor)		Range: –50…+130 °C, Accuracy: ±0.5 °C, Resolution: 0.1 °C
Liquid potential (complementary) electrode		Housing of the temperature sensor: stainless steel (1.4571), connection: SN6
Electrode input		DO sensor input: galvanically isolated current input, 0.725 V polarization voltage, connection: SN6
Supply voltage / Power consumption		12…36 V DC / 48…720 mW, galvanically isolated, transient overvoltage protection
Output	Analog	4…20 mA, (3.9…20.5 mA), R_{tmax} = 1200 Ω galvanically isolated, transient overvoltage protection
	Relay	SPDT: 30 V DC, 1 A DC
	Display	LCD graphic display (SAP–300), units of measure and bar graph
	Digital communication	HART®
Process temperature (pressure dependent) [1]		PP probe housing: –10…+90 °C, PVDF probe housing: –15…+100 °C
Pressure (absolute) [1]		Max. 0.1 MPa (1 bar) at +25 °C
Ambient temperature		Aluminum housing: –30…+70 °C, Plastic housing: –25…+70 °C, with display: –20…+70 °C
Seal		PP probe housing: EPDM, all other probe housing: FPM (Viton®)
Ingress protection		Probe housing: IP68, Electronic housing: IP67
Housing material		Plastic (PBT) or painted aluminum
Material of probe housing		Polypropylene (PP), PVDF
Electrical connection		2× M20×1.5 plastic cable glands for cable: Ø6…Ø12 mm, or 2× M20×1.5 metal cable glands for cable: Ø7…Ø13 mm wire cross section: 0.5…1.5 mm² (shielded cable is recommended), + 2× internally threaded ½" NPT connection for protective pipes
Electrical protection		Class III electric shock protection

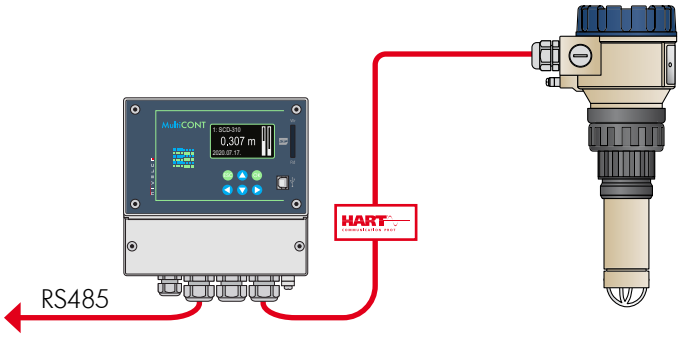
[1] *Depending on probe*

Ex INFORMATION

Protection	Intrinsic safety
Ex marking	Ex II1G Ex ia IIB T6 Ga
Intrinsic safety data	C_i ≤ 15 nF, L_i ≤ 200 µH, U_i ≤ 30 V, I_i ≤ 140 mA, P_i ≤ 1 W Ex transmitters must use an Ex ia power supply
Process temperature	0…+50 °C
Ambient temperature	Aluminum housing: –30…+70 °C, Plastic housing: –20…+70 °C, With display: –20…+70 °C

AnaCONT IN SYSTEM WITH MultiCONT

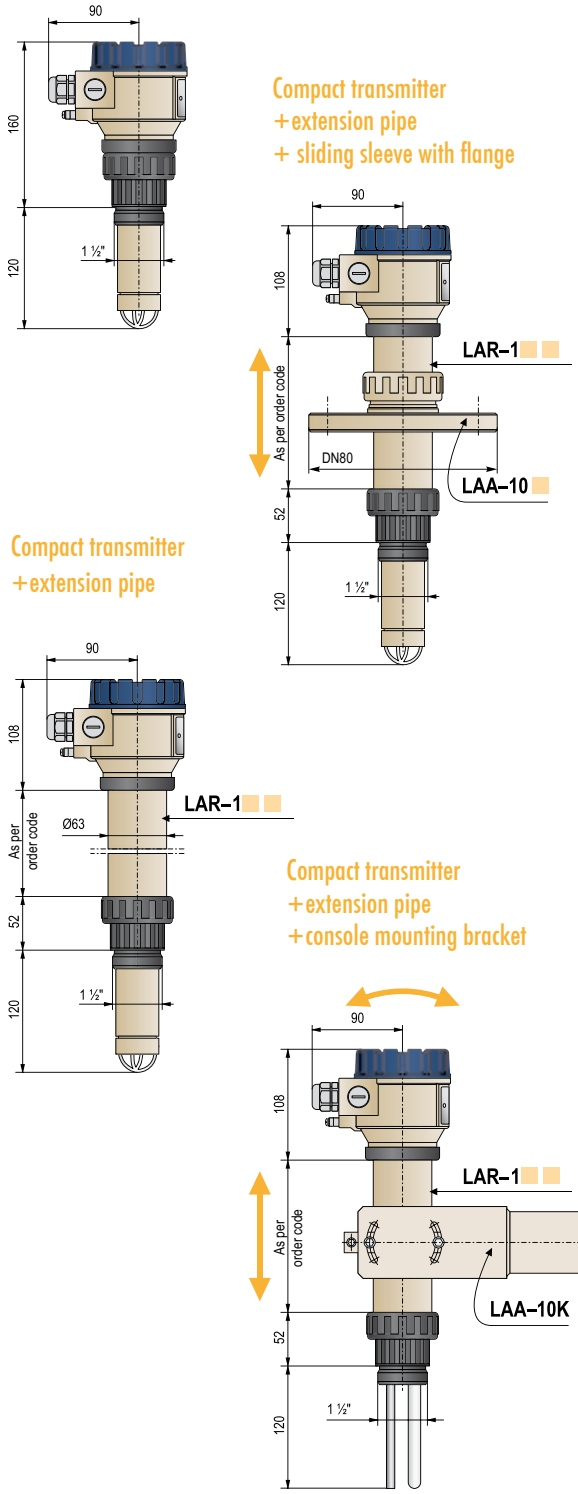
The **MultiCONT** can handle digital data from up to 15 HART® transmitters measuring different values *(e.g., DO temperature, level, pressure)*. The digital *(HART®)* information is processed, displayed, and – if necessary – it can be transmitted via RS485 to a PC. The transmitter can also be programmed remotely. Data can be visualized on a computer using the **NIVISION** process visualization software.



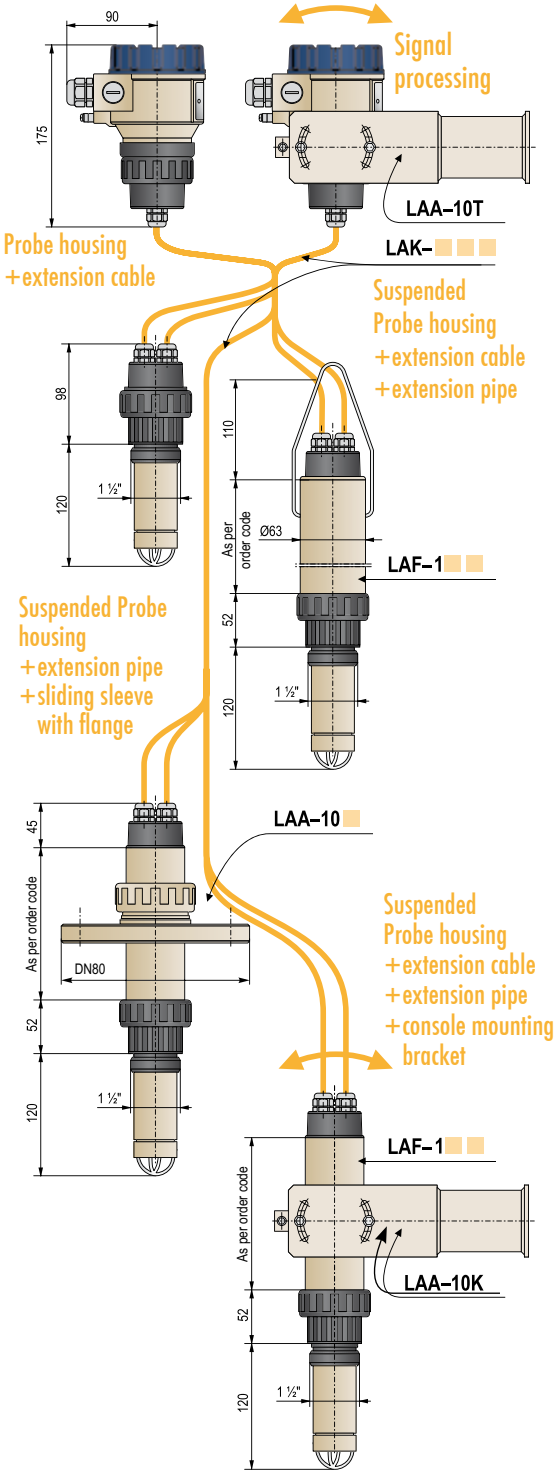
MOUNTING VERSIONS

The construction of the sensors of the compact and integrated versions are identical, so all accessories can be used with both types.
Using the accessories designed specifically for the **AnaCONT** family helps optimize the installation of the transmitters making the installation process easier.
By using extension pipes and extension cables, the remote-mount versions allow mounting the electronics and the sensor at any distance from each other.

COMPACT TRANSMITTER

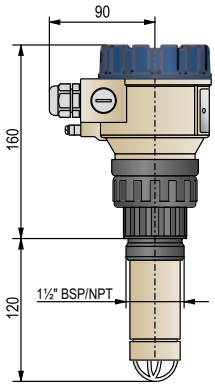


DETACHED COMPACT TRANSMITTER



AnaCONT LED/LGD-100/-200 — 5 years

2-wire compact liquid analytical DO (dissolved oxygen) transmitter with current / HART® and relay output
DO measuring range: depending on the applied sensor: 10 ppm or 20 ppm



LED-100

Type

L ■□ – ■■■ – ■

D	Compact DO transmitter

Programmer and local indicator (SAP-300)

L □ D – ■■■ – ■

E	Not included
G	Included

Housing

L ■ D – □■■ – ■

1	Plastic, PBT, fiberglass-reinforced
2	Painted aluminum

Probe

L ■ D – ■□■ – ■

2	DO1-mA-10 (10 ppm)
1	DO1-mA-20 (20 ppm)

Process connection / Material

L ■ D – ■■□ – ■

1	1½" BSP / PP
2	1½" BSP / PVDF
4	1½" NPT / PP
5	1½" NPT / PVDF

Output / Certificates

L ■ D – ■■■ – □

2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA + HART® / Ex ia G
R	4...20 mA + Relay
H	4...20 mA + HART® + Relay

Accessories sold separately; see relevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G

For further accessories see AnaCONT accessories

The **AnaCONT** 2-wire mini compact conductivity transmitters are designed to measure the conductivity of liquids and convert the signal to 4…20 mA output. They are suitable for measuring clean, non-crystallizable liquids. The design and the small size of the transmitter, and the wide temperature range make the device useful in diverse industrial applications. The two probes are immersed in the measured liquid. The distance between the probes and their surface defines the cell constant *(K)* of the instrument. The cell constant determines the measuring range and thus the application area.

FEATURES

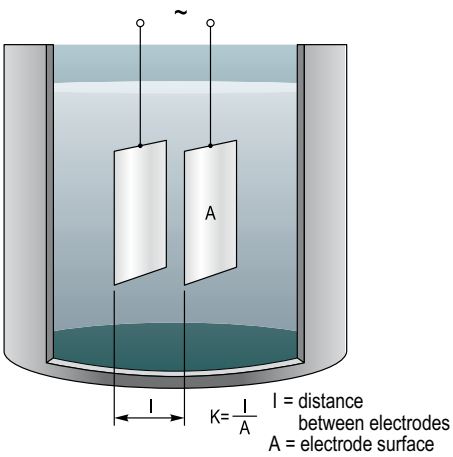
- Mini compact version
- Application oriented measuring range
- Optional plug-in display
- 4…20 mA, HART®
- IP68

APPLICATIONS

- Water production
- Water processing
- Water purification
- Wastewater treatment
- Pharmaceutical industry
- Food and beverage industry

Mini compact
LCK–21☐ + PLK–501

PROBE

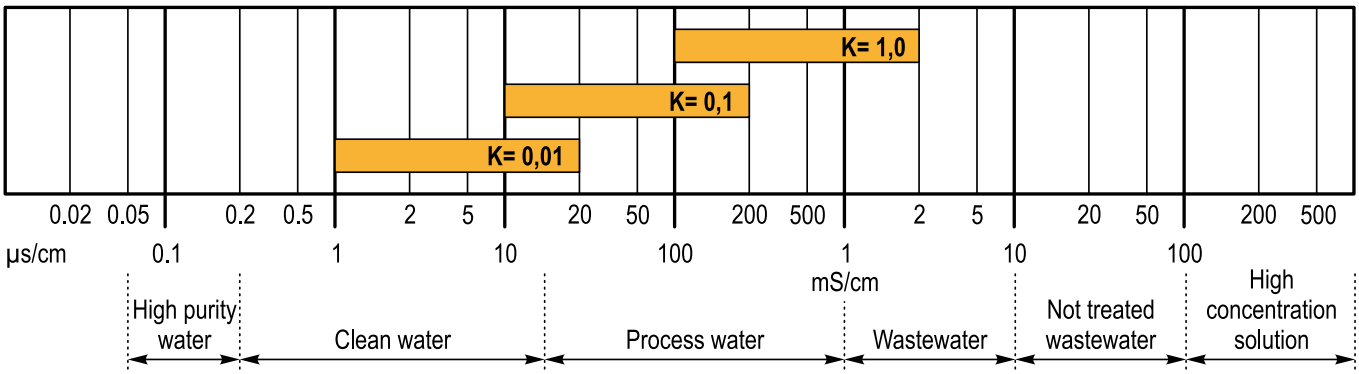


TECHNICAL DATA

		AnaCONT LCK – mini compact
Measurement data	Range	1…20 µS/cm 10…200 µS/cm 100…2000 µS/cm
	Margin of error	Typically 3% ±1 digit, max. 5%
Supply voltage		12…36 V DC galvanically isolated, transient overvoltage protection
Probe		2-electrodes, built-in
Cell constant		K = 0.01; K = 0.1; K = 1
Output	Analog	4…20 mA
	Display	Optional UNICONT PLK–501 display
	Digital communication	HART®
Process temperature		–10…+70 °C
Process pressure		0…16 bar (0…1.6 MPa)
Ambient temperature		0… +70 °C
Seal		Viton®
Process connection		As per order code
Ingress protection		Probe housing: IP68, Electronic housing: IP65
Housing material		stainless steel 1.4571
Probe housing material		1.4571 + PP
Electrical connection		ISO 4400 connector
Electrical protection		Class III
Weight		~350 g

LCK–232–2

OPERATION



AnaCONT LCK-200 — 5 years

2-wire mini compact liquid analytical conductivity transmitter with 4…20 mA / 4…20 mA + HART® output
Conductivity measuring range: 1…20 µS/cm or 10…200 µS/cm or 100…2000 µS/cm

Measuring range

L C K – 2 □ ■ – ■	
1	1…20 µS/cm
2	10…200 µS/cm
3	100…2000 µS/cm (¾" version not available)

Process connection

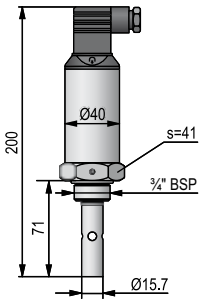
L C K – 2 ■ □ – ■	
1	¾" BSP
2	1" BSP
T	1½" TriClamp (ISO 2852)
R	2" TriClamp (ISO 2852)

Output

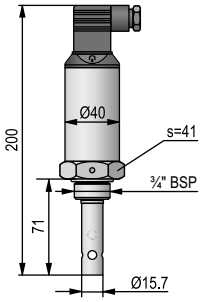
L C K – 2 ■ ■ – □	
2	4…20 mA
4	4…20 mA + HART®

Accessories (sold separately; see relevant page for details)

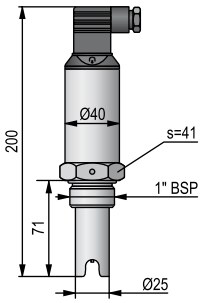
P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output
N A Z – 1 0 5 – 0	¾" BSP / 1" NPT (1.4571)
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem



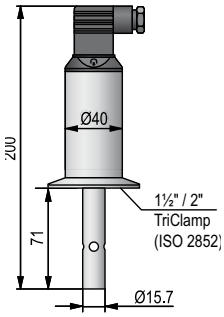
LCK-211



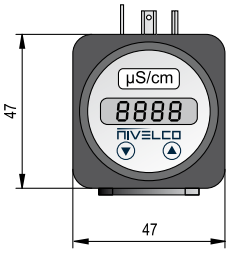
LCK-221



LCK-232



LCK-2□T/R



PLK-501

NIV24
PLK-501-2

AnaCONT accessories to order

5 years

Various installations can be achieved with the use of accessories

Material

L A R – □■■ – 0

1	PP

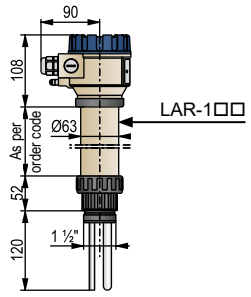
Extension length

L A R – 1 □□ – 0

n n	0.2…3 m; sold by the 0.1 m

nn = 02…30 : 0.2…3 m

Extension pipe = L
All cables of required length and terminals are included!



Material

L A F – □■■ – 0

1	PP

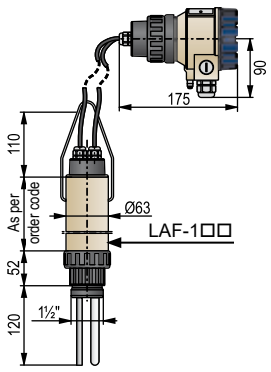
Extension length

L A F – 1 □□ – 0

n n	0.2…3 m; sold by the 0.1 m

nn = 02…30 : 0.2…3 m

Extension pipe = L
Attention! Cables and terminals are NOT included! The cable and terminal set LAK–□□□ for the version with an extension pipe for separate mounting is ordered separately (L + the distance between the mounting point and the electronics)!



Material

L A K – □■■ – 0

1	PP

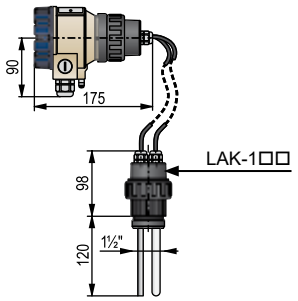
Extension length

L A K – 1 □□ – 0

n n	1…10 m cable set; sold by the meter

nn = 10…A0 : 1…10 m

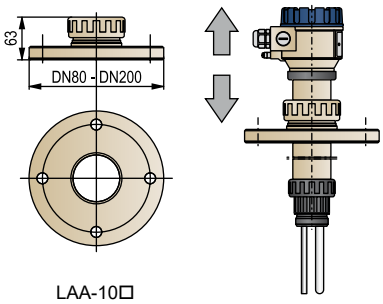
Terminals are included in the cable set!



Process connection / Material

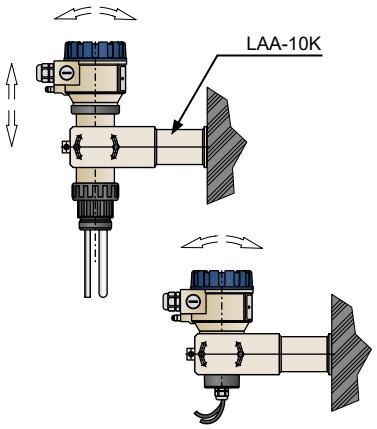
L A A – 1 0 □ – 0

2	DN80 PN16 / PP
3	DN100 PN16 / PP
4	DN125 PN16 / PP
5	DN150 PN16 / PP
6	DN200 PN16 / PP



Consoles

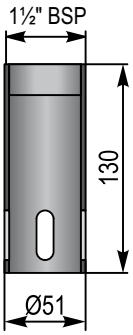
L A A – 1 0 K – 0	200 mm mounting bracket for extended version
L A A – 1 0 T – 0	200 mm mounting bracket for basic version



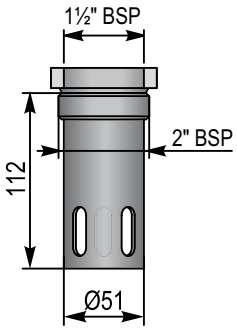
Material	
L A P – □■ 0 – 0	
1	PP

Size	
L A P – 1 □ 0 – 0	
1	1½" internal thread for extended version
2	2" external thread for basic version

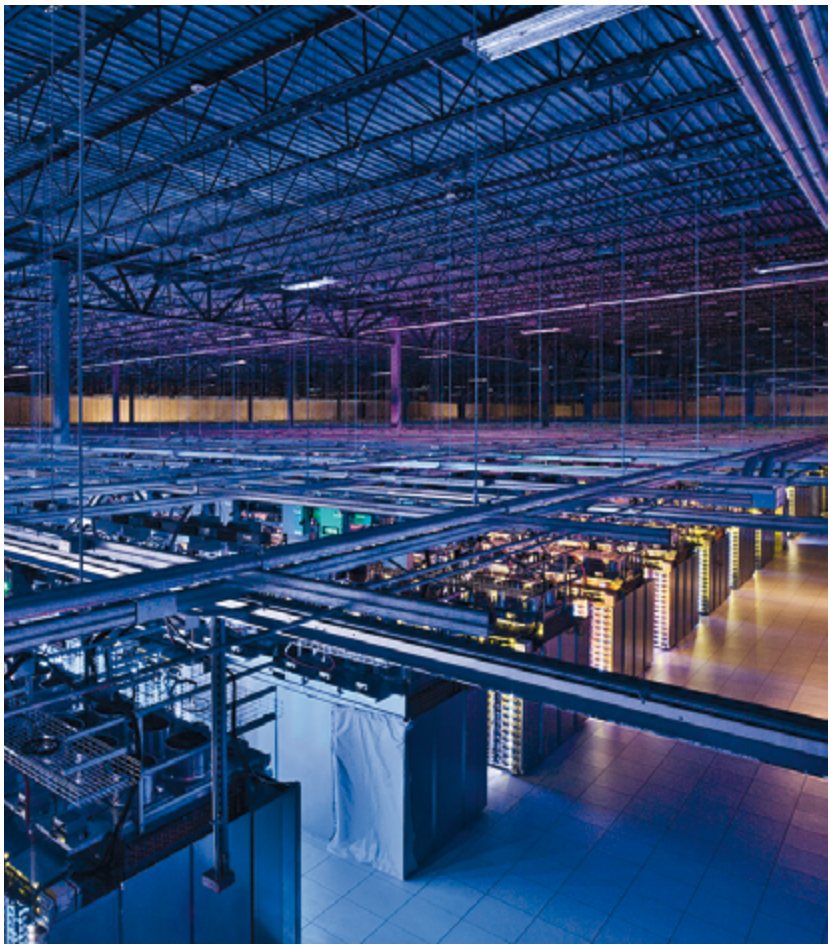
Other components, accessories	
pH probes	
4xpher112seph	1...12 / 6 bar / +80 °C / with solid particles
4xphed112seph	1...12 / 8 bar / +80 °C / clear fluid
4xphex112seph	1...12 / 16 bar@+25 °C / 6 bar@+100 °C / with solid particles
4xpheph314sep	3...14 / 6 bar@+25 °C; 3 bar@+100 °C / clear fluid
4xphes112seph	1...12 / 3 bar / +60 °C / clear fluid
4xphep112seph	1...12 / 6 bar / +80 °C / clear fluid
4xphekl112sep*	1...12 / 3 bar / +60 °C / clear fluid
Solutions for pH probes	
4vpuf4ph250ph	Buffer solution pH4 / 250 ml
4vpuf7ph250ph	Buffer solution pH7 / 250 ml
4vpuf10ph25ph	Buffer solution pH10 / 250 ml
4vtarkcl350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl310ph	Storage solution KCl 3 mol / 1 l
4vtiszold25ph	Cleaning solution / 250 ml
ORP probes	
4xrherptyyorp	50 µS/cm / 6 bar / +80 °C / with solid particles
4xrhexptyyorp	500 µS/cm / 16 bar@+25 °C / 6 bar@+100 °C / with solid particles
4xrhesptyyorp	150 µS/cm / 3 bar / +60 °C / clear fluid
4xrhepptyyorp	150 µS/cm / 6 bar / +80 °C / clear fluid
4xrheklptyorp*	150 µS/cm / 3 bar / +60 °C / clear fluid
Solutions for ORP probes	
4vpuf46550mor	Buffer solution ORP 465 mV / 50 ml
4vpuf465250or	Buffer solution ORP 465 mV / 250 ml
4vpuf22050mor	Buffer solution ORP 220 mV / 50 ml
4vtarkcl350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl310ph	Storage solution KCl 3 mol / 1 l
4vtiszold25ph	Cleaning solution / 250 ml
DO probes	
4x085g0022ydo	085G0027 DO 10 ppm
4x085g0023ydo	085G0030 DO 20 ppm
* Horizontally mountable	



LAP-110



LAP-120



Notes

FLOW MEASUREMENT

NIVELCO's open-channel flow metering system offers 9 different sizes, compact types of Parshall flumes made of plastic *(PP)*. The flume together with EasyTREK ultrasonic level transmitter and MultiCONT process controller makes a complete flow-measurement system.

The NIVOSONAR GPA enables flow measurements on gravitational sewers, brook channels, irrigation channels or any other open-channel with the help of a Parshall flume.

NIVOSONAR
OPEN-CHANNEL FLOW MEASUREMENT

page 181

- 9 different sizes, compact versions of Parshall flumes made of plastic (PP)
- Factory calibrated dimensions
- Measuring range: 0.94…6627 m^3/h
- Level transmitters are sold separately: EasyTREK or EchoTREK
- 4…20 mA, HART® communication
- For open-channels, treated effluent sewage measurements
- Certification of measurement


REAKTOR


EchoTREK

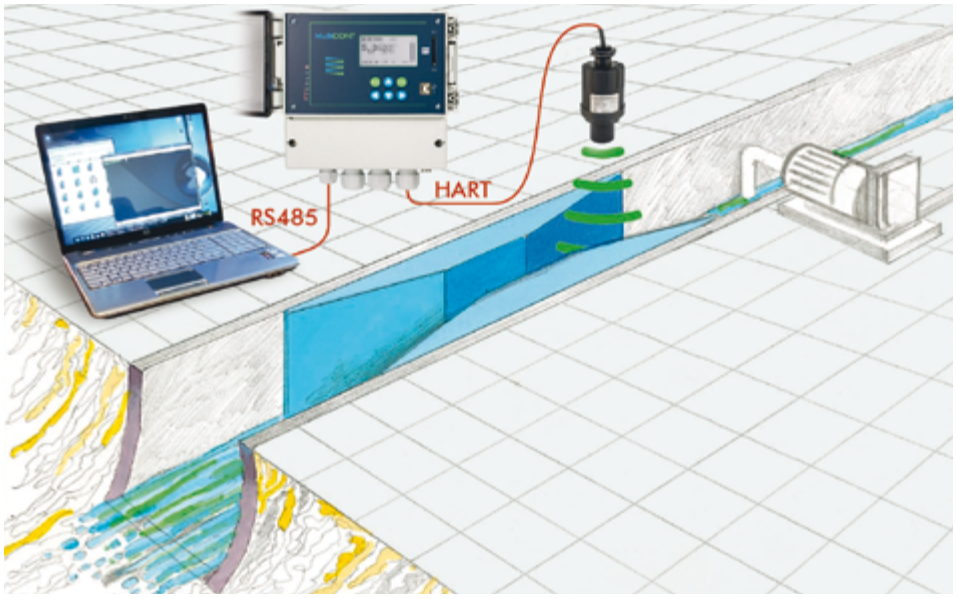
The **NIVOSONAR GPA** open-channel flow metering system measures the flow of liquids in various open channels and gravitational sewers. The flow-measuring system consists of an **EasyTREK** or **EchoTREK** ultrasonic level transmitter and a Parshall flume reducing element. Depending on the flow rate, nine channels of different sizes and measuring ranges are available with a total measuring range of 0.94…6627 m^3/h. The Parshall flume is a rigid structure welded out of polypropylene sheets, with narrow tolerances to ensure high-accuracy metering; therefore, great care should be taken during transport and installation to prevent the flume getting deformed. Parshall flumes are delivered as compact units, and they are easy to install, with no special skills required.
When selecting the mounting position, laminar flow conditions must be ensured. Flow measurement in closed channels using a Parshall flume is possible only if the liquid does not fully occupy the entire cross-section of the channel *(e. g., gravitational sewers)*. In such cases, it is inevitable to disassemble the pipeline network to insert a meter shaft to install the reducing element.

APPLICATION

If a Parshall flume is applied as a reducing element, the stagnation pressure causes the liquid level to rise. This change of the level is proportional to the velocity and rate of the liquid flow. An **EasyTREK** or an **EchoTREK** ultrasonic level transmitter measures the fluid level changes and transmits the measured data to the **MultiCONT** Multichannel Process Controller or a PC via HART® using a **UNICOMM** HART®–USB/RS485 modem. The ultrasonic transmitters are programmable, they gather and transmit *(4…20 mA, RS485)* the measured data, which is displayed remotely, and they can also have multiple relay outputs. The flowmeter formula of the selected Parshall flume is included in each NIVELCO ultrasonic transmitter's software. The **EasyTREK** and **EchoTREK** ultrasonic level transmitters (upon choice) and the **MultiCONT** process controller – which are required to build a complete measuring system – can be purchased separately.

FEATURES

- 9 different sizes, compact verions of Parshall flumes made of plastic (PP)
- Reliable measurement with ultrasonic level transmitter
- Level transmitter can be used for all flume types
- Displaying of flow measurement and average or total flow



APPLICATIONS

- For open-channels, gravitational channels
- Measurement of feed or process water
- Yield measurement of irrigation canals
- Treated sewage effluent measurement

PROPERTIES

Type		NIVOSONAR GPA								
		P1	P2	P3	P4	P5	P6	P7	P8	P9
Q_{min}	m^3/h	0.94	1.88	2.8	5.5	8.1	10.5	15.8	20.8	31.3
Q_{max}	m^3/h	22.3	54.4	196	604	1324	2152	3232	4359	6627
W	cm	2.54	5.08	7.62	15.24	22.86	30.48	45.7	61	91.4
B	cm	30	34	39	53	75	120	130	135	150
C	cm	9.29	13.49	17.8	39.4	38.1	61	76.2	91.44	121.9
D	cm	16.75	21.35	25.88	39.69	57.47	84.46	102.6	120.7	157.2
E	cm	23	26.4	46.7	62	80	92.5	92.5	92.5	92.5
L	cm	63.5	77.5	91.5	152.4	162.6	286.7	294.3	301.9	316.9
O	cm	5	5	5	10	10	10	10	10	10
U	cm	24.8	28.6	49.2	69.6	87.6	100.1	100.1	100.1	100.1
V	cm	30.7	35.35	39.9	54	80	100	120	140	180
m	kg	9	10.6	19.1	49	81	146	183	231	252
h_d / h_a		0.6					0.7			
a		0.0609	0.1197	0.1784	0.354	0.521	0.675	1.015	1.368	2.081
b		1.552	1.553	1.555	1.558	1.558	1.556	1.560	1.564	1.569

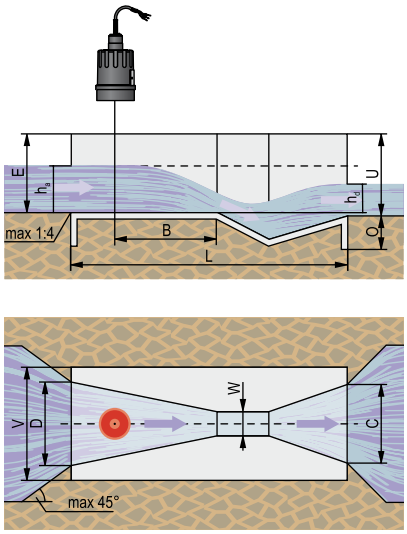
$Q = a \cdot h_a^{\ b}$ $[m^3/s]$, where h_a: the measured level in meters, a: see table, b: see table

NIVOSONAR GPA — 3 years

Parshall flume for open channel flow metering through liquid level measurement
Welded construction of PP-sheets

Prices on request

Measuring range	
G P A – 1 P □ – 0	
1	Qmin = 0.94 m³/h, Qmax = 22.3 m³/h
2	Qmin = 1.88 m³/h, Qmax = 54.4 m³/h
3	Qmin = 2.8 m³/h, Qmax = 196 m³/h
4	Qmin = 5.5 m³/h, Qmax = 604 m³/h
5	Qmin = 8.1 m³/h, Qmax = 1324 m³/h
6	Qmin = 10.5 m³/h, Qmax = 2152 m³/h
7	Qmin = 15.8 m³/h, Qmax = 3232 m³/h
8	Qmin = 20.8 m³/h, Qmax = 4359 m³/h
9	Qmin = 31.3 m³/h, Qmax = 6627 m³/h



GPA-1P□

NIV24
GPA-1P1-0
GPA-1P2-0

TEMPERATURE MEASUREMENT

The most frequently measured physical parameter in the modern process automation industry is temperature.

NIVELCO's temperature measuring instruments are designed primarily to measure this vital parameter. The device range includes simple thermal sensors to pressure-resistant, explosion-proof, high-temperature thermometers that communicate digitally, and multi-point transmitters. The product line starts with a simple Pt100 temperature sensor and ends with high-temperature version transmitters with Ex d flameproof housing and HART® communication and multi-point temperature transmitters. The number of order code variations and special types is very high, so NIVELCO provides suitable solutions for most applications. Our product range and the number of available design variations are extensive; we can provide our customers with the most suitable device for every application.

THERMOPOINT 2-wire Temperature Transmitters are suitable for continuous multi-point measurement, indication, and transmission of the temperature of grain and feed stored in silos.

The **THERMOCON**T product range can be divided into two parts in terms of output types. **THERMOCONT T** encapsulated temperature sensors and **THERMOCONT TT** temperature transmitters.

The **THERMOCONT TT** transmitters have a 4…20 mA output and, as an option, digital HART® communication. The temperature sensors have a robust external protective tube, which is available with PFA-coating as well. The highest process temperature of these instruments is +600 °C.

THERMOPOINT
MULTI-POINT TRANSMITTER

page 185

- 2-wire multi-point temperature transmitter
- Temperature measurement of powdered, granular solids or liquids
- Up to 15 sensors / probe
- Up to 50 m probe length
- Temperature trend monitoring
- −40…+125 °C range
- HART® communication
- Explosion-proof variants

THERMOCONT TT
TEMPERATURE TRANSMITTER

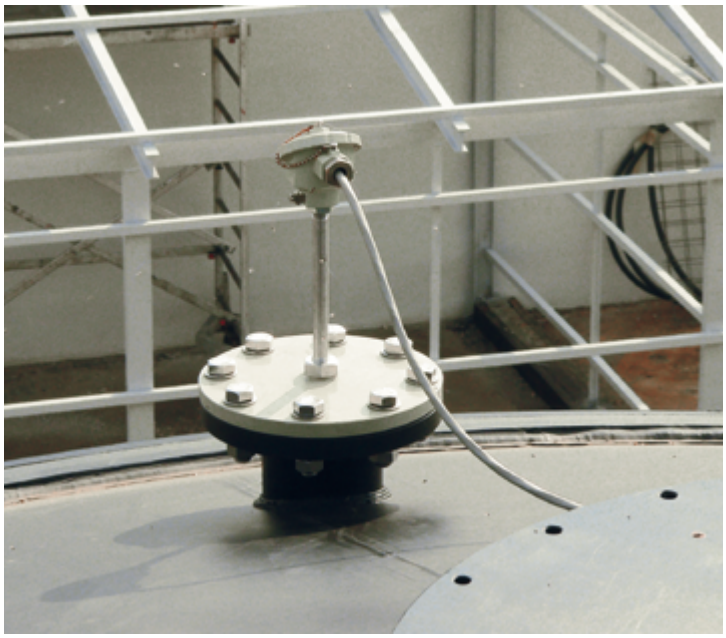
page 190

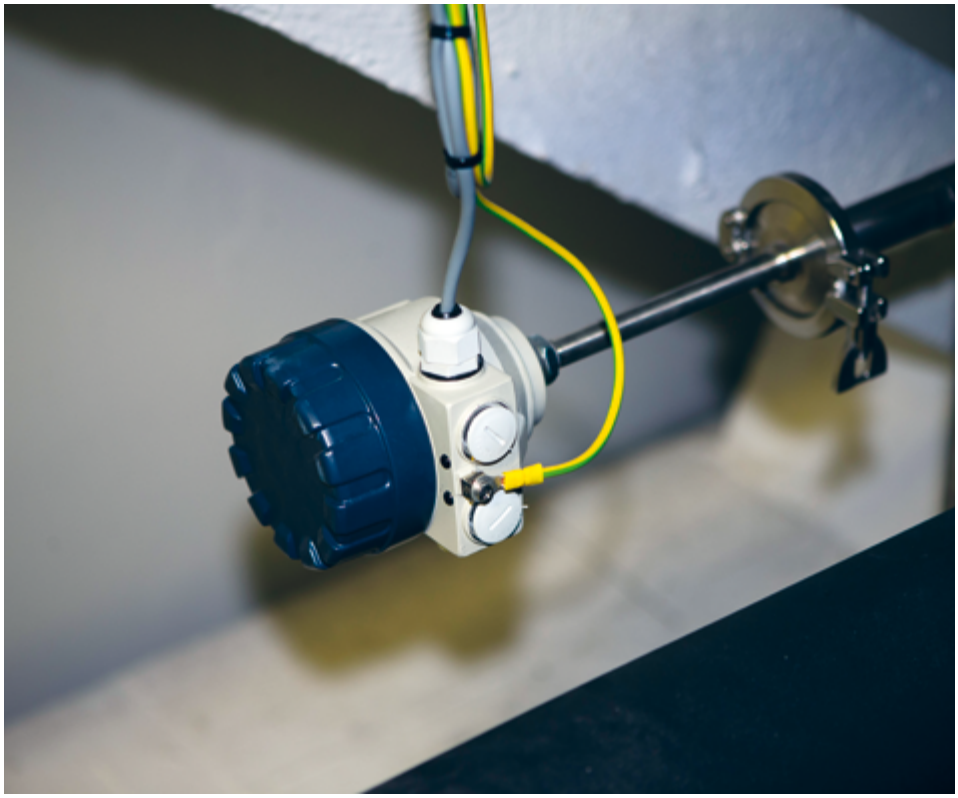
- −50…+600 °C range
- Plug-in display module
- 4…20 mA, HART® communication
- Integral "A" or "B" class Pt100 probe
- Probe length up to 3 m
- Stainless steel or PFA-coated probes
- Heavy duty housing
- Multiple head positions
- Explosion-proof variants

THERMOCONT T
TEMPERATURE SENSOR

page 194

- −50…+600 °C range
- Resistance Temperature Detectors
- "A" or "B" accuracy class
- 2 or 4-wire versions
- Fast response sensor version
- Probe length up to 3 m
- Stainless steel or PFA-coated
- Vibration-resistant version
- Temperature sensor for gases
- Explosion-proof variants





THERMOPOINT 2-wire temperature transmitters are suitable for continuous multi-point measurement, indication and transmission of the temperature of regular and hazardous liquids, powders and granular solids. The temperature of grains and feed stored in silos have to be monitored to maintain their quality. Monitoring of the total volume of the silo is required to provide information on possible quality loss or the presence of germs or fungus. Eventual temperature increases will alert the operator to perform a required operation. Temperature measurement is done by electronic temperature sensors placed at equal distances in a plastic-coated flexible stainless steel tube. Each sensor sends the measured temperature of its environment to the transmitter head.
The 2-wire loop-operated transmitter head communicates through HART® with control room devices such as a **MultiCONT** or a PC for further processing or datalogging. An advantage of **MultiCONT** based systems is that, if level measurement is required, the system can be augmented with level transmitters. The advantage of using a multi-functional system is that new transmitters can easily be inserted into the existing loop, using HART® communication.

FEATURES

- 2-wire multi-point temperature transmitter
- Communicates via HART®
- Up to 50 m probe length
- Up to 15 sensors
- Max. 35 kN tensile force
- Replaceable sensors
- Digitally addressed sensors
- −40…+125 °C medium temp.
- IP67
- Ex variant

APPLICATIONS

- For normal and hazardous materials
- Temperature measurement of powdered, granular or free-flowing solids
- For transmitting temperature data from remote locations
- Grain industry
- Feed industry
- Food industry

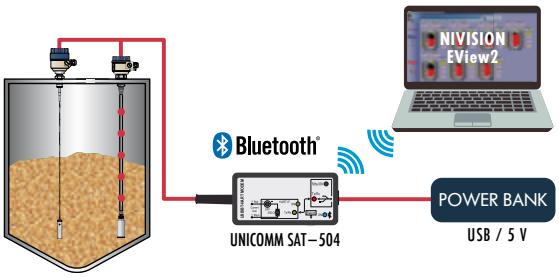
CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex ia D)
- ATEX (Ex ta/tb D)
- ATEX (Ex ta D)

SYSTEM SET-UP VARIATIONS

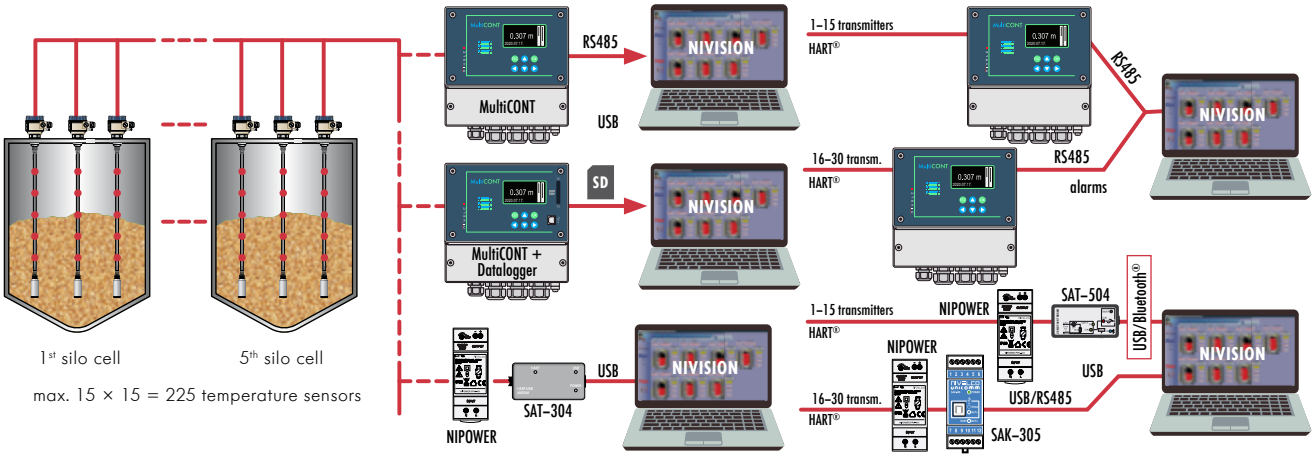
Depending on the application, the system set up can be the following:

1. Information transmitted by the cable via HART® communication are received by **MultiCONT** and re-transmitted to a PC via RS485 protocol. The relays of the of **MultiCONT** can serve alarm functions.
2. Same as above, but a **MultiCONT** with datalogger function stores the incoming data on an SD card. The stored data can be processed or archived on a PC.
3. HART® signals are transmitted directly to a PC using an **UNICOMM** HART®–USB modem. Data can be processed by **NIVELCO's NIVISION** software. If more than 15 transmitters are needed they have to be redistributed between multiple **MultiCONT** or HART® modem units.



A MULTIFUNCTION SYSTEM

If level measurement is needed the appropriate level transmitter *(for example: MicroTREK or EchoTREK)* can be connected to the same HART® loop. Because of the limitations of the HART® standard, the total number of temperature and level transmitters should not exceed 15. Variants of the combined system set up are the same as described earlier.



TECHNICAL DATA

		For liquids		For solids
		Rigid Probe version	Flexible Probe version	Flexible plastic-coated Probe version
Insertion length		1…4 m	1…50 m	
Number of temperature sensors		Up to 15		
Position of sensors		Up to 10 m: 1 sensor at every one meter, between 11 and 50 m: 1 sensor at every two meters from the bottom positioned sensor		
Temperature range		−40…+105 °C (for max. 1 hour: +125 °C)		−40…+80 °C (for max. 1 hour: +85 °C)
Highest process pressure		25 bar (2.5 MPa)	16 bar (1.6 MPa)	3 bar (0.3 MPa)
Resolution (digital)		0.1 °C		
Accuracy		−40…−10 °C: ±2 °C; −10…+85 °C: ±0.5 °C; +85…+125 °C: ±2 °C		
Measurement cycle		Maximum (Nx1) seconds, where N is the number of sensors		
Probe	Tensile force	–		35 kN
	Dimension	Ø14 mm	Ø16 mm	Ø17 mm + 1 mm coating
Material of wetted parts		Stainless steel: 1.4571	Stainless steel: 1.4571 + 1.4301	Stainless steel: 1.4571 + Antistatic PE-coated steel + 1.4301
Ambient temperature		With plastic housing: −30… +65 °C; with metal housing: −30…+65 °C; with SAP-300 display: −20…+65 °C		
Output	Analog	4…20 mA		
	Digital	HART®		
	Display	SAP-300 LCD		
Output load		$R_{max} = (U_{Supply} - U_{Supply\ min.})/0.02$ A [Ω], load during HART® communication: R_{min} = 250 Ω		
Supply voltage		11…36 V DC (in case of HART® multi-drop: 10…36 V DC)		
Electrical protection		Class III		
Ingress protection		Electronic housing: IP67		
		Probe housing: IP68 (up to process pressure)		Probe housing: IP66
Process connection		As per order code		
Electrical connection		2× M20×1.5 plastic cable gland, cable outer diameter: Ø6…Ø12 mm, wire cross section: max. 1.5 mm²; 2× internally threaded ½" NPT connection for protective pipes		
Housing material		Painted aluminum (EN AC-42000), stainless steel (1.4571/Ti316) or plastic (PBT)		
Weight		1.7 kg + probe: 0.6 kg/m	2.9 kg + probe cable: 0.3 kg/m + weight 3 kg	2.9 kg + probe cable: 0.7 kg/m

Ex INFORMATION

	T□□−□□□−6 Ex	T□□−5□□−5 Ex, T□□−7□□−5 Ex	T□□−5□□−8 Ex, T□□−7□□−8 Ex, T□□−5□□−9 Ex, T□□−7□□−9 Ex	
Ex marking	⟨Ex⟩ II 1 G Ex ia IIB T6…T4 Ga	⟨Ex⟩ II 1 D Ex ia IIIC T85°C Da	⟨Ex⟩ II 1 D Ex ta IIIC T105°C Da	⟨Ex⟩ II 1/2 D Ex ta/tb IIIC T85°C Da/Db
Waiting time for opening the cover	–	–	0 minutes	30 minutes
Ex electrical limits	Only Ex ia power supply may be used! $U_i \le 30$ V DC $I_i \le 140$ mA $P_i \le 1$ W $C_i \le 15$ nF $L_i \le 200$ µH		$U_o \le 30$ V DC $I_o \le 1$ A	
Supply voltage	U_i = 11…30 V DC (in case of HART® multi-drop U_i = 10…30 V DC)			
Process temperature	See Thermal Limits of Ex Compliant Models Table			
Ambient temperature	See Thermal Limits of Ex Compliant Models Table, for SAP-300 display: −20…+60 °C			
Cable introduction	M20×1.5 cable gland		certified "Ex ta" protective gland M20×1.5	
Cable diameter	Ø7…12 mm			
Electrical connection	Wire cross section: 0.5…1.5 mm²			

THERMAL LIMITS OF Ex COMPLIANT MODELS

Thermal limits of Ex ia IIB compliant models

Type of enclosure and measuring pipe	Ambient temperature	Process temperature	Temperature class
Metal enclosure with rigid or flexible measuring tube	−30…+65 °C	−40…+80 °C −40…+95 °C −40…+105 °C	T6 T5 T4
Plastic enclosure with rigid or flexible measuring tube	−20…+65 °C	−40…+80 °C −40…+95 °C −40…+105 °C	T6 T5 T4
Metal enclosure with plastic-coated flexible measuring tube	−30…+65 °C	−40…+80 °C	T6

Thermal limits of Ex ta/tb IIIC, Ex ta IIIC and Ex ia IIIC compliant models

Housing position	Ambient temperature	Process temperature	Temperature class		
			Ex ta/tb IIIC	Ex ta IIIC	Ex ia IIIC
Outside the tank	−30…+65 °C	−40…+80 °C	T85°C	T105°C	T85°C
Inside the tank	−30…+65 °C		–		

THERMOPOINT TM/TJ-500/600 with cable probe — 5 years

2-wire compact multipoint temperature transmitter for liquids
with stainless steel cable probe and weight, max. cable length: 50 m

Version

T □■ – ■■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD display

Process connection / Probe length

T ■□ – ■■■ – ■

K	1½" BSP / 1…30 m
E	1½" NPT / 1…30 m
N	1½" BSP / 31…50 m
L	1½" NPT / 31…50 m

Housing

T ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced
7	Stainless steel

Number of sensors

T ■■ – ■□■ – ■

n	1…9; each sensor
o	10…15; each sensor

n = 1…9 : 1…9
o = A…F : 10…15

Cable length

T ■■ – ■■□ – ■

p	2…9 m; sold by the meter
q	10…30 m; sold by the meter
r	31…39 m; sold by the meter
s	40…50 m; sold by the meter

p = 2…9 : 2…9 m
q = A…Z : 10…30 m (letters I, O, Q, X, Y not used)
r = 1…9 : 31…39 m
s = A…L : 40…50 m (letter I not used)

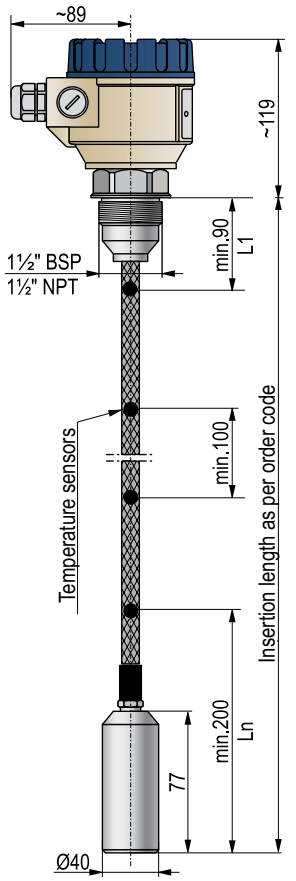
Output / Certificates

T ■■ – ■■■ – □

4	HART®
6	HART® / Ex ia G

Accessories to order (see relevant page for details)

TMK-555-4M-200-01	Stainless steel Counterweight (comes with the unit)
SAP-300-0	Graphic plug-in display module
SAT-304-0	HART®-USB modem
SAT-504-■	
SAK-305-6	HART®-USB/RS485 modem / Ex ia G



TMK- / TME- / TMN- / TML-□□1/□□Z

THERMOPOINT TM/TJ-500/600 with rod probe — 5 years

2-wire compact multipoint temperature transmitter for liquids
with stainless steel rod probe, max. probe length: 4 m

Version

T □■ – ■■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD display

Process connection

T ■□ – ■■■ – ■

R	1" BSP
A	1" NPT
J	M20x1.5

Housing

T ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced
7	Stainless steel

Number of sensors*

T ■■ – ■□■ – ■

n	1…9; each sensor
o	10…15; each sensor

n = 1...9 : 1...9
o = A...F : 10...15
* Number of temperature sensors is depending on the insertion length!

Probe length**

T ■■ – ■■□ – ■

p	1…4 m; sold by the meter

p = 1...4 : 1...4 m
** Special probe length is available on request

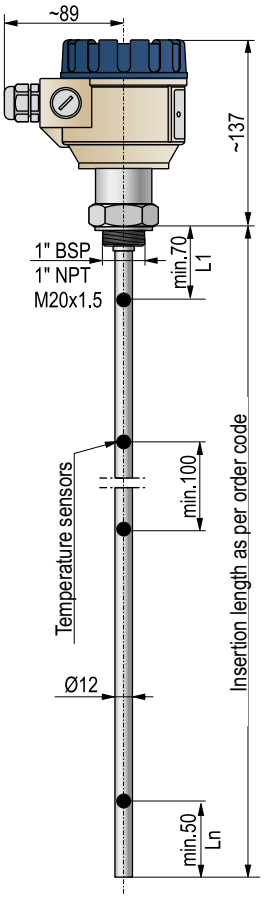
Output / Certificates

T ■■ – ■■■ – □

4	HART®
6	HART® / Ex ia G

Accessories sold separately; see relevant page for details

S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



TMR- / TMA- / TMJ-□□1/□□4

THERMOPOINT TM/TJ-500 with coated cable probe — 5 years

2-wire compact multipoint temperature transmitter for free-flowing solids
with PE-coated stainless steel cable probe and weight, max. cable length: 50 m

Version

T □■ – ■■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD display

Process connection / Probe length

T ■□ – ■■■ – ■

H	1½" BSP / 1…30 m
C	1½" NPT / 1…30 m
F	1½" BSP / 31…50 m
G	1½" NPT / 31…50 m

Housing

T ■■ – □■■ – ■

5	Painted aluminum
7	Stainless steel

Number of sensors

T ■■ – ■□■ – ■

n	1…9; each sensor
o	10…15; each sensor

n = 1…9 : 1…9
o = A…F : 10…15

Cable length

T ■■ – ■■□ – ■

p	2…9 m; sold by the meter
q	10…30 m; sold by the meter
r	31…39 m; sold by the meter
s	40…50 m; sold by the meter

p = 2…9 : 2…9 m
q = A…Z : 10…30 m (letters I, O, Q, X, Y not used)
r = 1…9 : 31…39 m
s = A…L : 40…50 m (letter I not used)

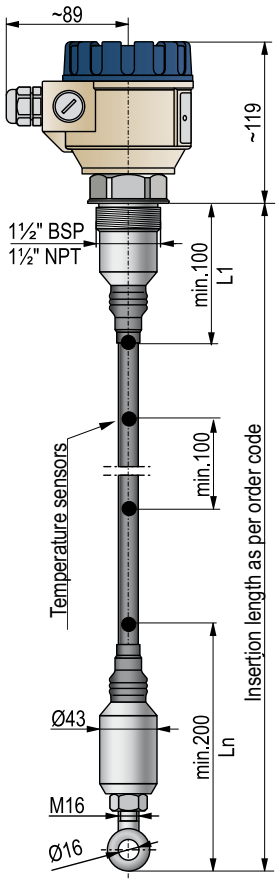
Output / Certificates

T ■■ – ■■■ – □

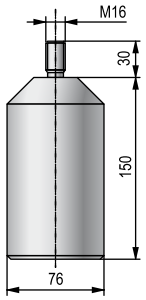
5	HART® / Ex ia D
6	HART® / Ex ia G
8	HART® / Ex ta/tb D
9	HART® / Ex ta D

Accessories sold separately; see relevant page for details

CTN-103-0M-400-00	Stainless steel Counterweight, Ø80 x 150 mm
SAP – 300 – 0	Graphic plug-in display module
SAT – 304 – 0	HART®-USB modem
SAT – 504 – ■	
SAK – 305 – 6	HART®-USB/RS485 modem / Ex ia G



TMH- / TMC- / TMF- / TMG-□□1/□□Z



CTN-103-0M-400-00

THERMOCONT TT field devices, incorporating a Pt100 sensor, are 2-wire temperature transmitters with a 4…20 mA analog output or transmitter/indicator if equipped with a plug-in display. Intrinsically safe versions are available in standard and flame-proof housing.

The measured temperature can also be transmitted via HART®. **THERMOCONT TT** Temperature Transmitters are suitable for measuring the temperature of liquids in tanks and pipes and that of free-flowing, powdered solids and gases. Wall-mounted versions are available for ambient temperature measurement. The PFA-coated stainless steel probes can be used to measure the temperature of aggressive materials. The reinforced probe version is an ideal solution for the oil, gas, and heavy chemical industries and also an excellent choice for jobs where a robust probe is advantageous. A remote version of the transmitter is also available, which can be connected to a standard Pt100 sensor with a simple 4-wire cable.

FEATURES

- Temperature transmitting and displaying
- Measuring range: –50…+600 °C
- 4…20 mA output
- HART® communication
- Variety of head positions
- Stainless steel probe
- Plastic-coated version
- Flame-proof casing
- Strengthened probe version
- Ex variants
- IP65

TBJ–500

TBW–620

TBJ–500

TVS–500Ex strengthened probe version

APPLICATIONS

- For normal and hazardous mediums
- For temperature metering of liquids, vapors, gases and granules, powders
- Temperature transmitting for far distances
- Temperature metering in tanks, tubes, furnaces or boilers
- Temperature metering of halls or rooms

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d G)
- ATEX (Ex d ia G)

SAP–202 (display)

POSITION OF THE DISPLAY

Requested head position differing from standard ("A") version must be requested in the order

TECHNICAL DATA

		Version	Standard [TT□, TB□]	High-temperature [TV□, TL□]	Plastic-coated [TR□, TW□]	Strengthened probe [T□S, T□Z]
Measuring Range			−50…+200 °C T□W: −40…+70 °C	−50…+600 °C (3)	−50…+200 °C	−50…+600 °C (3)
Insertion length			As per order code, up to 3000 mm			
Process connection			As per order code			½" / 1" NPT threaded
Highest process pressure			25 bar (2.5 MPa) @ +20 °C, 16 bar (1.6 MPa) @ +400 °C			40 bar (4 MPa)
Material of wetted parts (2)			1.4571 stainless steel		PFA / (PTFE or PVDF)	1.4571 stainless steel
Probe			Class "A" or Class "B" Pt100 temperature sensor, as per order code			
Accuracy (1)	Output current	Class "A" Pt100	± (0.3+ |0.0025 t |) °C	± (1.5+ |0.004 t |) °C	± (0.3+ |0.0025 t |) °C	
		Class "B" Pt100	± (0.4+ |0.0055 t |) °C	± (1.5+ |0.006 t |) °C	± (0.4+ |0.0055 t |) °C	
		Temperature error	± 0.02 °C / °C			
	Displayed current	Class "A" Pt100	± (0.2+ |0.0025 t |) °C	± (1.5+ |0.004 t |) °C	± (0.2+ |0.0025 t |) °C	
		Class "B" Pt100	± (0.35+ |0.0055 t |) °C	± (1.5+ |0.006 t |) °C	± (0.35+ |0.0055 t |) °C	
		Temperature error	± 0.002 °C / °C			
Supply voltage			10…36 V DC; Ex: 12…30 V DC, see "Ex information"			
Output	Analog		4…20 mA, output limit values: 3.9…20.5 mA			
	Digital communication		HART®			
	Output load		$R_{max} = (U_t - 12\ V)/0.022\ A$			
	Display	type	SAP–202			
		resolution	0.1 °C	0.4 °C	0.1 °C	
Error indication			3.8 mA / 22 mA			
Ambient temperature			−40…+70 °C, with display: −25…+70 °C; see "Ex information"			
Electrical protection			Class III			
Ingress protection			IP65			
Electrical connection			Plastic or metal cable gland: M20×1.5; Cable outer diameter: Ø6…Ø12 mm; / see "Ex information" Wire cross section: 0.25…1.5 mm²			
Housing material			Painted aluminum or plastic (PBT)	Painted aluminum	Painted aluminum or plastic (PBT)	Painted aluminum
Weight	with aluminum housing		~900 g + probe 500 g/m (for T□W … types ~900 g total)			~1.55 kg + probe 0.25 kg / 100 mm
	with plastic housing		~500 g + probe 500 g/m (for T□W types ~500 g total)	–	~500 g + probe 500 g/m (for T□W types ~500 g total)	–

(1) *t = measured temperature.*
(2) *Not valid for T□W types.*
(3) *With heatsink above +200 °C.*

Ex INFORMATION

T□□–5□□–□ Ex			
Protecton	Intrinsic safety	Flameproof enclosure	Intrinsic safety with flameproof enclosure
Ex marking	⟨Ex⟩ II 1 G Ex ia IIB T6…T1 Ga	⟨Ex⟩ II 2 G Ex d IIB T6…T1 Gb	⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T1 Ga/Gb
Intrinsic safety data	U_{max} = 30 V I_{max} = 140 mA P_{max} = 1.0 W C_i < 14 nF L_i < 180 µH	–	U_{max} = 30 V I_{max} = 140 mA P_{max} = 1.0 W C_i < 14 nF L_i < 180 µH
Ambient temperature	−40…+75 °C, with display −25…+75 °C		
Cable gland	Metal, M20×1.5, cable outer diameter: Ø6…Ø12 mm	Ex d IIB certified metal M20×1.5, cable outer diameter: Ø9…Ø11 mm	

Temperature classes	T6	T5	T4	T3	T2	T1
Ambient temperature	+60 °C	+75 °C	+75 °C	+70 °C	+60 °C	+45 °C
Process temperature	+80 °C	+95 °C	+120 °C	+190 °C	+290 °C	+440 °C

THERMOCONT TT/TB/TW/TR/TV/TL-500/-600 — 5 years

2-wire compact temperature indicator / transmitter for liquids, gases and free-flowing solids with class "A" or "B"s Pt100 temperature sensor

Version

T □■ – ■■■ – ■

T	Transmitter, up to +200 °C
V	Transmitter, up to +600 °C
W	Transmitter, up to +200 °C , PFA-coated
B	Transmitter with local LCD display, up to +200 °C
L	Transmitter with local LCD display, up to +600 °C
R	Transmitter with local LCD display, up to +200 °C, PFA-coated

Process connection

T ■□ – ■■■ – ■

W	With console for wall mounting
C	½" BSP
D	¾" BSP
E	1" BSP
H	½" NPT
J	M20x1.5
L	1" TriClamp
K	1½" TriClamp
N	2" TriClamp
O	DN25 Pipe coupling (DIN 11851)
P	DN40 Pipe coupling (DIN 11851)
R	DN50 Pipe coupling (DIN 11851)
F	DN50, PN16, 1.4571 flange + PTFE lining
A	2" ANSI, 1.4571 flange + PTFE lining

Housing

T ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (only for +200 °C versions, not available in Ex version)

Sensor

T ■■ – ■□■ – ■

0	None
1	Class "A" Pt100
2	Class "B" Pt100

Probe length

T ■■ – ■■□ – ■

0	60 mm
1	160 mm
2	250 mm
3	400 mm
4	500 mm
5	1000 mm
6	1500 mm
7	2000 mm
8	2500 mm
9	3000 mm

Output / Certificates

T ■■ – ■■■ – □

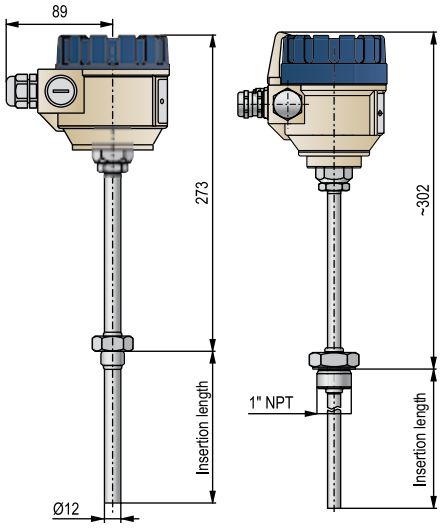
2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA + HART® / Ex ia G
A	4...20 mA / Ex d G
B	4...20 mA + HART® / Ex d G
C	4...20 mA / Ex d ia G
D	4...20 mA + HART® / Ex d ia G

Available on request (must be specified in the text of the order)

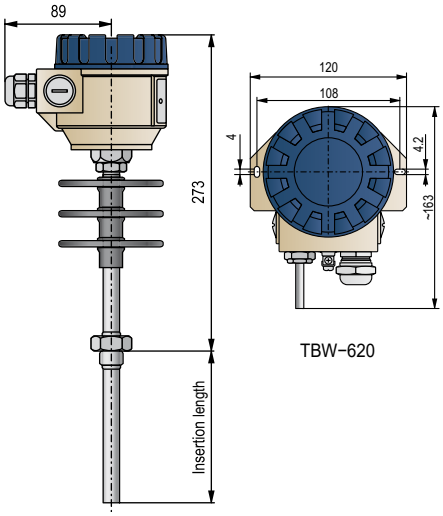
Non-standard, customized 4...20 mA output calibration

Accessories (sold separately; see relevant page for details)

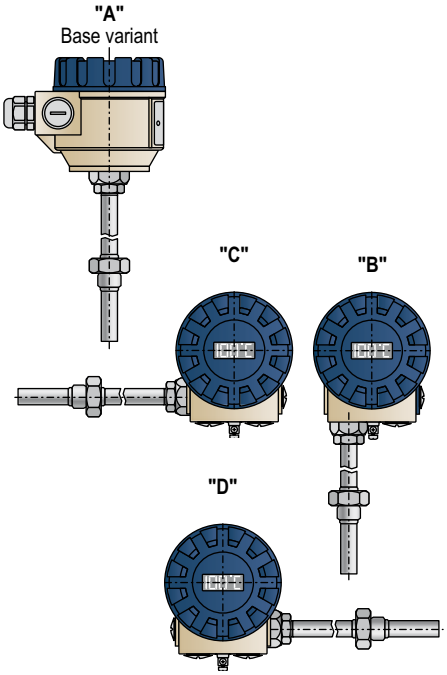
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



TT□-500 / 600 TT□-500 Ex d



TVJ-500 TBW-620



Requested head position differing from standard ("A") version must be requested in the order.

THERMOCONT TT/TB/TV/TL-500/-600 with strengthened probe — 5 years

2-wire compact temperature indicator / transmitter for liquids, gases and free-flowing solids with strengthened, drilled probe, with Pt100 temperature sensor

Version

T □■ – ■■■ – ■

T	Transmitter, up to +200 °C
V	Transmitter, up to +600 °C
B	Transmitter with local LCD display, up to +200 °C
L	Transmitter with local LCD display, up to +600 °C

Process connection

T ■□ – ■■■ – ■

S	1" NPT
Z	½" NPT

Housing

T ■■ – □■■ – ■

5	Painted aluminum
6	Plastic, PBT, fiberglass-reinforced (only for +200 °C versions, not available in Ex version)

Sensor

T ■■ – ■□■ – ■

1	Class "A" Pt100
2	Class "B" Pt100

Probe length

T ■■ – ■■□ – ■

0	60 mm
1	160 mm
2	250 mm
3	400 mm
4	500 mm
5	1000 mm
6	1500 mm
7	2000 mm
8	2500 mm
9	3000 mm

Output / Certificates

T ■■ – ■■■ – □

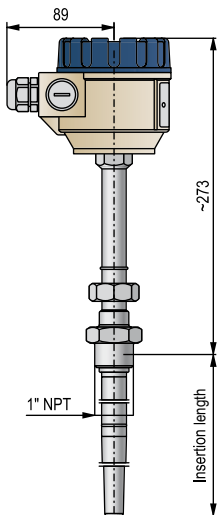
2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA + HART® / Ex ia G
A	4...20 mA / Ex d G
B	4...20 mA + HART® / Ex d G
C	4...20 mA / Ex d ia G
D	4...20 mA + HART® / Ex d ia G

Available on request (must be specified in the text of the order)

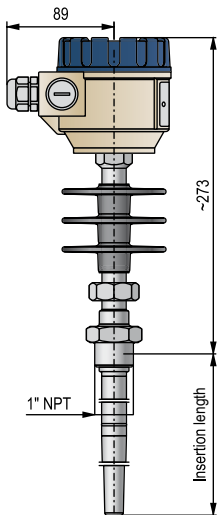
Non-standard, customized 4…20 mA output calibration

Accessories (sold separately; see relevant page for details)

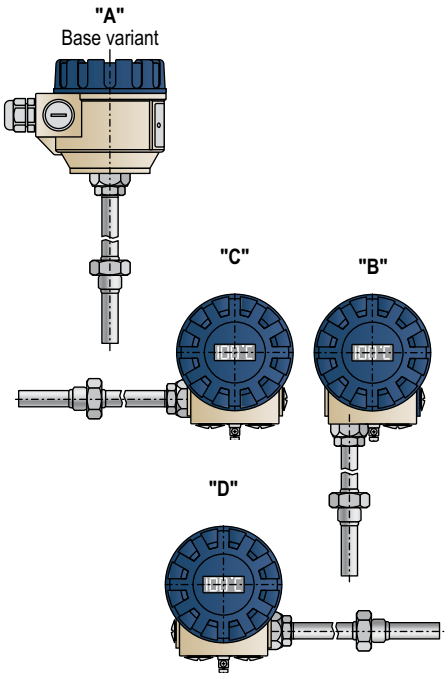
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



TTS-500 / 600



TVS-500



Requested head position differing from standard ("A") version must be requested in the order.

The wide range of **THERMOCONT** temperature sensors covers almost all demands in the area of industrial temperature measurement. The numerous versions and multiple kinds of applicable probes make **THERMOCONT** a suitable choice for all industries. PFA-coated probe versions having a steel flange with a PTFE-insert can be used in chemical and petrochemical applications where aggressive mediums could damage the steel probes. The vibration-resistant versions are suitable for special applications where the measurement is exposed to high vibrations. The strengthened probe versions are designed primarily for oil, gas, and steam pipeline industrial applications. The shock-proof stainless steel construction includes the inner and external *(double)* tube and the welded flange. This type also provides an excellent solution for all applications where a robust design is advantageous. Fit for unique technologies and industrial processes, special versions are also available along with the standard models.

FEATURES

- Thermocouples and RTDs *(Resistance Temperature Detectors)*
- Temperature range: −50…+600 °C
- Multiple kinds of thermo-sensors
- Stainless Steel probe
- Fast response sensor version
- Plastic-coated version
- Vibration-resistant version
- Heavy-duty robust version
- Ex variant
- IP65

APPLICATIONS

- Temperature metering in tanks, tubes, furnaces or boilers
- Can be mounted to special technological places
- For temperature metering of liquids, vapors, gases
- Temperature metering in bearings
- Special versions for unique applications

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d G)
- ATEX (Ex d ia G)

TSP
standard
temperature sensor

TECHNICAL DATA

Features \ Type		THERMOCONT T					
		Standard [TSP]	Vibration-resistant [TSV]	Fast response [TSG]	Plastic-coated [TPP]	Strengthened probe [TN□, TU□]	For gases [TXP]
Sensor	Accuracy class [1]	"A" or "B" accuracy class in accordance to EN 60751					"A" class
	Type	Single or dual		Single-sensor only	Single or dual		
	Vibration resistance	–	EN 60751.4.4.2	–		EN 60751.4.4.2	
	Grounding	Ground-independent					
	Material of inner protective tube	A38				1.4571	PTFE
Head	Housing material	Painted EN AC 44100 aluminum				Painted EN AC 43100	
	Cable gland	M20×1.5 plastic				M20×1.5 / ½" NPT	M20×1.5 or without cable glands, ½" NPT interior thread
	Cable	Ø6…Ø12 mm, see "Ex Information"					
	Electrical connection	Terminal with fixing screw					
External Protection	Material	1.4571 stainless steel			PFA / (PTFE / PVDF)	1.4571 stainless steel	
	Probe length	60…3000 mm				160…3000 mm [2]	120…500 mm
	Process connection	As per order code					M33x2; 1" NPT
General data	Range	−50…+600 °C			−50…+200 °C	−50…+600 °C	−50…+150 °C
	Medium pressure	25 bar (2.5 MPa) at +20 °C 16 bar (1.6 MPa) at +400 °C			1 bar (0.1 MPa)	1" NPT – 40 bar (4 MPa) or pressure rating of flanges	Maximum 80 bar (8 MPa)
	Time-constant	< 3 min		< 20 s	4.5 min	–	
	Ambient temperature	−20…+80 °C, see "Ex Information"				−20…+80 °C	−30…+80 °C
	Grounding	External, grounding screw on the housing					
	Electrical protection	Class III					
	Ingress protection	IP65					IP67
	Ex marking	See "Ex information" for TS / TP types table				⟨Ex⟩ II 1 G Ex ia IIC T6…T1 Ga ⟨Ex⟩ II 2 G Ex d IIB T6…T1 Gb ⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T1 Ga/Gb	⟨Ex⟩ II 1 G Ex ia IIB T6…T4 Ga ⟨Ex⟩ II 2 G Ex d IIB T6…T4 Gb ⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T4 Ga/Gb
	Ex Information					**"d"**: Supply voltage: max. 28 V, Current: max. 100 mA **"ia"**: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, C_i = 0 nF, L_i = 0 mH **"d ia"**: U_i = 30 V, I_i = 140 mA, P_i = 1.4 W, C_i = 0 nF, L_i = 0 mH	U_i: 30 V, I_i: 140 mA, P_i: 1.1W, C_o = 0, L_o = 0

[1] In standard temperature ranges (below +400 °C), the margin of error for class "A" resistance temperature sensors is below ±1 °C; in the case of class "B" temperature sensors, it is ±2.3 °C maximum.
[2] If the measured medium is abrasive, the maximum probe length is limited to 1000 mm.

Ex INFORMATION FOR TS/TP TYPES

	TSG–□□□–□ Ex	TP□–□□□–□ Ex	TS□–□□□–□ Ex (except: TSG)
Ex marking (ATEX)	⟨Ex⟩ II 1 G Ex ia IIC T6…T1 Ga	⟨Ex⟩ II 1 G Ex ia IIB T6…T1 Ga ⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T1 Ga/Gb	⟨Ex⟩ II 1 G Ex ia IIC T6…T1 Ga
Intrinsic safety data	U_{imax} = 30 V; I_{imax} = 100 mA; P_{imax} = 750 mW; C_i =0 nF; L_i =0 mH	U_{imax} = 30 V; I_{imax} = 140 mA; P_{imax} = 1 W; C_i =0 nF; L_i =0 mH	U_{imax} = 30 V; I_{imax} = 100 mA; P_{imax} = 750 mW; C_i =0 nF; L_i =0 mH
Ex marking (ATEX)		⟨Ex⟩ II 2 G Ex d IIB T6…T1 Gb	⟨Ex⟩ II 2 G Ex d IIB T6…T1 Gb
Intrinsic safety data		U_{imax} = 30 V; I_{imax} = 140 mA	
Ex marking (ATEX)			⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T1 Ga/Gb
Intrinsic safety data			U_{imax} = 30 V; I_{imax} = 140 mA; P_{imax} = 1 W; C_i =0 nF; L_i =0 mH
Electrical protection	Class III		
Ingress protection	IP67		
Electrical connection	Wire cross section: 0.5…1.5 mm²		
Housing	Painted aluminum (EN AC 43100)		

Ex INFORMATION

	Temperature sensors [TSP]			Temperature sensors with strengthened probe [TNP]	Temperature sensors for gases [TXP]
Protection type	Ex ia	Ex d	Ex d ia	Ex ia, Ex d, Ex d ia	Ex d, Ex d ia
Cable	Ø6…Ø12 mm	Ø7…Ø12 mm			Ø6…Ø12 mm

Temperature classes					
T6	T5	T4	T3	T2	T1
Ambient temperature from −20 °C					
+65 °C	+70 °C	+70 °C	+80 °C	+80 °C	+80 °C
Process temperature from −20 °C					
+85 °C	+100 °C	+135 °C	+200 °C	+300 °C	+450 °C

Type / Features	THERMOCONT TGP bearing temp. sensor	THERMOCONT TFP temperature sensor
Operating temperature	−50…+180 °C	−50…+200 °C
Ambient Temperature	−30…+100 °C	
Sensor	Pt100	
Sensor diameter	Ø8 mm	Ø6, Ø8 mm
Accuracy class	"A" or "B" accuracy class in accordance to EN 60751	
Measuring current	1 mA	Max. 5 mA
Material of sensor tube	1.4571 stainless steel / Cu protector cover	1.4571
Process connection	As per order code	
Electrical connection	SHFP type silicone rubber and shield, 3× 0.75 mm²	PTFE-coated, 0.35 mm² wire cross section cable
Cable Shielding	Tinned copper braid protective jacket	
Cable length	0.6…12 m, as per order code	As per order code
Insertion length	As per order code	
Ingress protection	IP65	IP54
Electrical protection	Class III	
Insulation resistivity	Min. 10 MΩ, @ +20 °C ±5 °C min. 1 MΩ at the highest value operating temperature	
Voltage-test	500 V, 50 Hz AC for 1 min., @ +20 °C ±5 °C	
Weight	550 g	max. 600g (as per order length)
Time constant	< 20 s	
Pressure	Max. 60 bar (6 MPa)	

TXP
temperature sensor
for gases

TN
strengthened
probe version
thermowell
temperature
sensor

TGP
bearing temperature
sensor

TFP
temperature sensor

THERMOCONT TN/TU — 5 years

Heavy-duty temperature sensor with strengthened probe for liquids, gases and free-flowing solids with single or dual type Pt100 temperature sensor or thermocouple, max. probe length: 1 m

Sensor tube

T □■ – ■■■ – ■

N	Drilled, tapered
U	Drilled straight

Sensor

T ■□ – ■■■ – ■

K	Thermocouple NiCr-Ni (IEC 584)
P	Resistance Temperature Sensor Pt100 (IEC 751)

Process connection*

T ■■ – □■■ – ■

1	1" NPT
2	DN40 PN40 (PN25)
5	DN50 PN40 (PN25)
F	2" ANSI 300RF
T	1½" ANSI 300RF

* On request: other process connections

Sensor classification / Arrangement

T ■■ – ■□■ – ■

Thermocouple	
1	Class 1, single
4	Class 1, dual
Resistance Temperature Sensor	
1	Class "A", single, 2-wire
4	Class "A", dual, 3-wire
7	Class "A", single, 4-wire

Protrusion length

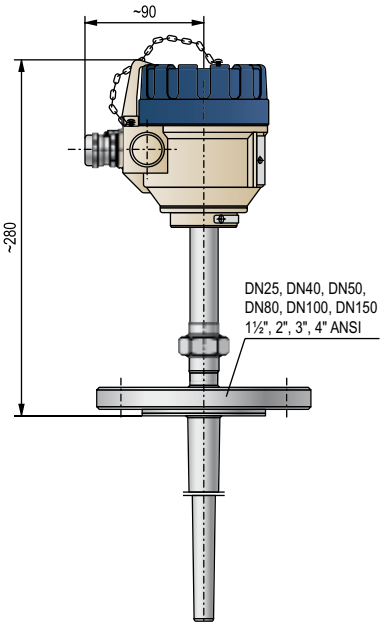
T ■■ – ■■□ – ■

TN - Drilled, tapered	
1	160 mm
3	250 mm
6	400 mm
8	500 mm
9	600 mm
A	700 mm
B	800 mm
C	900 mm
D	1000 mm
TU - Drilled straight	
1	160 mm
3	250 mm
6	400 mm
8	500 mm
9	600 mm
A	700 mm
B	800 mm
C	900 mm
D	1000 mm

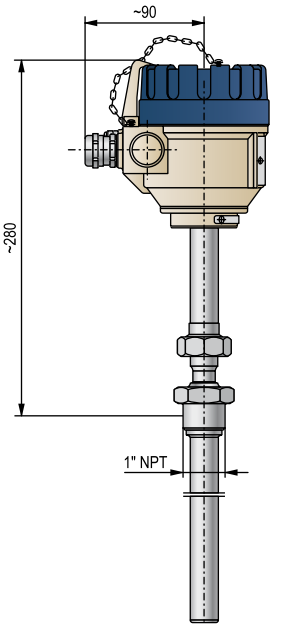
Ex certificate

T ■■ – ■■■ – □

0	None
7	Ex ia G
8	Ex d ia G
9	Ex d G



TNP / TNK-□□□



TUP / TUK-□□□

THERMOCONT TX

5 years

Heat stabilized temperature sensor with strengthened case for gases
with single or dual type Pt100 temperature sensor, max. probe length: 0.5 m

Sensor

T X □ – ■■■ – ■

P	Resistance Temperature Sensor Pt100 (IEC 751)

Process connection*

T X P – □■■ – ■

1	1" NPT
V	M33x2

* On request: other process connections

Sensor classification / Arrangement

T X P – ■□■ – ■

1	Class "A" Pt100, single, 2-wire
4	Class "A" Pt100, dual, 3-wire
7	Class "A" Pt100, single, 4-wire

Protrusion length

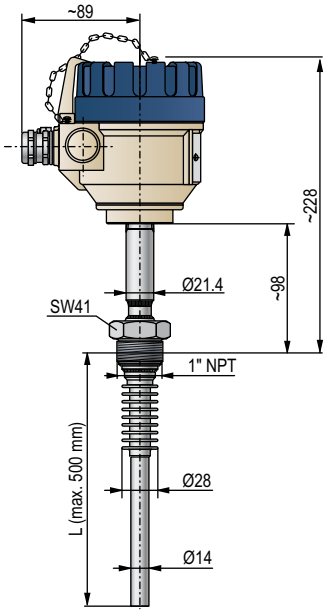
T X P – ■■□ – ■

0	120 mm
1	160 mm
2	200 mm
3	250 mm
4	300 mm
5	350 mm
6	400 mm
7	450 mm
8	500 mm

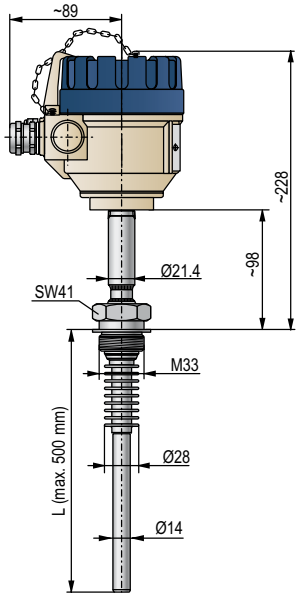
Ex certificate

T X P – ■■■ – □

0	None
8	Ex d ia G
9	Ex d G



TXP-1□□



TXP-V□□

THERMOCONT TFP — 5 years

Resistance thermometer (RTD) with single or dual type Pt100 temperature sensor with stainless steel protective tube and integrated cable

Process connection

T F P – □ ■ ■ – ■

1		Ø6 mm 1.4571
2		Ø8 mm 1.4571
3		Ø8 mm, M12x1.5 (special)
4		Ø6 mm, M8x1 (special)
5	*	Ø6 mm, fast response
6	*	Ø8 mm, fast response

* Mounting bolts are ordered separately

Pt100 sensor

T F P – ■ □ ■ – ■

1		Class "A", single
2		Class "B", single
4	**	Class "A", dual
5	**	Class "B", dual
6	**	Class "B", single, 4-wire
7	**	Class "A", single, 4-wire

** only with Ø8 mm tube diameter

Probe length

T F P – ■ ■ □ – ■

1		60 mm
2		100 mm
3		160 mm
4		250 mm
5	***	10 mm
6	***	30 mm
7		400 mm
8		500 mm

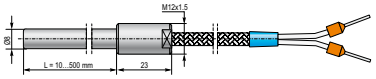
*** only for TFP-300, TFP-400 types

Cable length

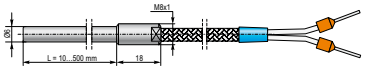
T F P – ■ ■ ■ – □

0	0.6 m
1	1 m
2	2 m
3	3 m

TFP–1□□ / 2□□



TFP–3□□



TFP–4□□

TFP–5□□ / 6□□

THERMOCONT TGP — 5 years

Bearing resistance thermometer (RTD) with class "A" or "B" Pt100 temperature sensor with stainless steel protective tube and integrated cable

Process connection

T G P – □ ■ ■ – ■

1	Rimmed
2	M20x1.5
3	½" NPT
4	½" BSP

Pt100 sensor

T G P – ■ □ ■ – ■

1	Class "A", 3-wire
2	Class "B", 3-wire

Probe length

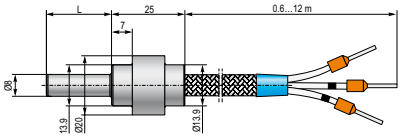
T G P – ■ ■ □ – ■

1	30 mm
2	50 mm
3	100 mm
4	160 mm
5	380 mm

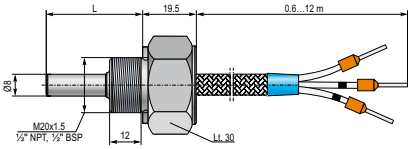
Cable length

T G P – ■ ■ ■ – □

0	0.6 m
1	1 m
2	2 m
3	3 m
4	6 m
5	12 m



TGP–1□□



TGP–2□□

NIV24
TFP-121-0
TFP-121-1
TFP-121-2

THERMOCONT TS/TP — 5 years

Resistance thermometer (RTD) with single or dual type Pt100 temperature sensor with stainless steel rod probe with or without plastic coating, max. probe length: 3 m

Version

T □■ – ■■■ – ■

S		1.4571 (stainless steel)
P		PFA/(PTFE or PVDF)-coated stainless steel (only with flange and M20x1.5 or ½" process connection)

Sensor / Version

T ■□ – ■■■ – ■

P		Pt100
V		Pt100 / Shock-proof
G		Pt100 / Fast-response (only Ex ia version is available)
B	*	Pt100 / Shock-proof, dismountable

*Ex version available soon

Process connection

T ■■ – □■■ – ■

0	Flange DN25 PN25, 1.4571
1	M20x1.5
2	½" BSP
3	½" NPT
4	⅜" BSP
5	Flange DN40 PN25/16, 1.0037
6	Flange DN50 PN25/16, 1.0037
7	Flange DN80 PN25/16, 1.0037
8	Flange DN100 PN25, 1.0037
9	Flange DN150 PN25, 1.0037

Pt100 Sensor

T ■■ – ■□■ – ■

1	Class "A"
2	Class "B"
4	Class "A", dual
5	Class "B", dual
6	Class "B" + 4-wire
7	Class "A" + 4-wire

Probe length

T ■■ – ■■□ – ■

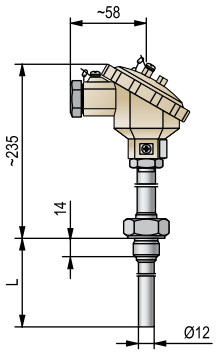
0	60 mm
1	160 mm
2	250 mm
3	400 mm
4	500 mm
5	1000 mm
6	1500 mm
7	2000 mm
8	2500 mm
9	3000 mm

Ex certificate

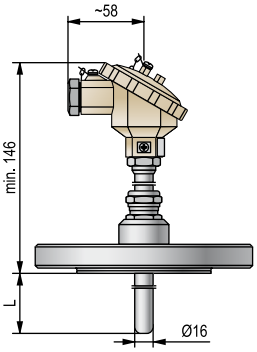
T ■■ – ■■■ – □

0	None
7	Ex ia G
8	Ex d ia G
9	Ex d G

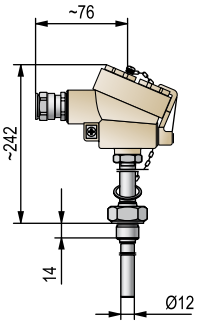
On request: other process connections and probe lengths



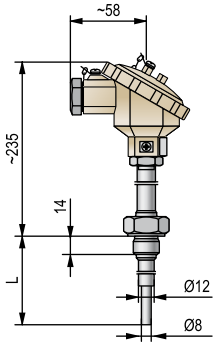
TSP / TSV-□□□



TPP-□□□



TSP / TSV-□□□-8Ex
TSP / TSV-□□□-9Ex



TSG-□□□


THERMOCOUPLE

INDUSTRIAL SENSORS

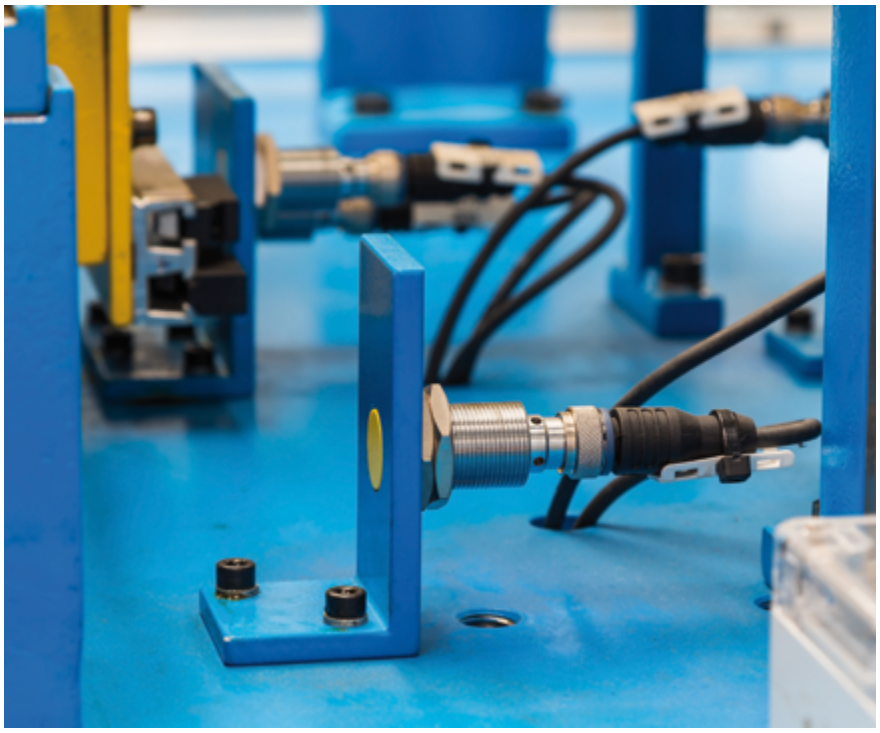
Non-contact proximity switches are popular devices in industrial process automation. MICROSONAR ultrasonic proximity sensors are an ideal choice for simple applications where the use of high-performance units, such as EasyTREK or EchoTREK, is not necessary.

MICROSONAR proximity sensors use the non-contact ultrasonic principle to detect and measure the position of an object. They act as proximity switches, or transmit the distance measured between the sensor cover and the target.

MICROSONAR
ULTRASONIC PROXIMITY SENSOR

page 203

- Non-contact distance measurement
- Narrow 5° beam angle
- Up to 6 m measuring range
- Position, distance detection
- Local programming with magnet or cable
- 4…20 mA, 0…10 V, PNP / NPN switch output
- Short circuit and reverse polarity protection




NIVELCO
MICROSONAR
CE

MICROSONAR proximity sensors use the non-contact ultrasonic principle to detect and measure the position of an object. They act as proximity switches, or distance measured between the sensor cover and the target. For transmitter models, the output signal is either 4…20 mA or 0…10 V, which can be assigned to any section of the nominal range. Switching points of the proximity switch option can be set to any point within the range.

FEATURES

- Non-contact sensor
- Analog or switch output
- Narrow beam angle
- Two measuring ranges (1 m / 6 m)
- Adjustable sensing distance
- Selectable processing parameters
- Error indication output
- Maintenance-free operation
- LED indication
- Protection against short circuit and inverse polarity
- Local and remote programming
- 5 years warranty

APPLICATIONS

- Measuring distance to objects
- Proximity sensing and switching
- For small transport vehicles, trolleys, fork-lifts
- For packaging equipments
- For positioning equipments

UTP-211

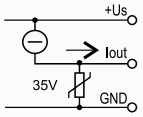
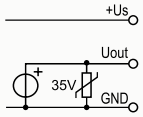
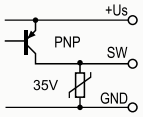
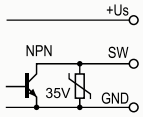
URS-213

UTP-261-4

TECHNICAL DATA

Properties		Cylindrical housing			Rectangular housing		
		UT□–211	UT□–212	UR□–213 UR□–214	UTP–261	UTP–262	URP–263 URP–264
Nominal range	X_{min} (m)	0.2			0.4		
	X_{max} (m)	1.0			6.0		
Ultrasonic frequency		160 kHz			60 kHz		
Total beam angle		5°					
Measure sequence time (T_p)		25 ms			80 ms		
Resolution		0.25 mm	0.25 mm	0.1 mm	1.5 mm	1.5 mm	0.1 mm
Output		4…20 mA	0…10 V	switch	4…20 mA	0…10 V	switch
Programming		With contact of PRG wire, or with magnet					
Ambient temperature		–20…+70 °C					
Supply voltage		10.8…30 V DC					
Consumption U_s = 12 V		< 55 mA	< 41 mA	< 31 mA (1)	< 54 mA	< 40 mA	< 30 mA (1)
Consumption U_s = 24 V		< 63 mA	< 49 mA	< 39 mA (1)	< 61 mA	< 47 mA	< 37 mA (1)
Input protection		Reverse polarity, transient overvoltage, ESD					
Integrated cable		Shielded cable with PVC coating L = 3 m					
Cable core		4 × 0.5 mm²					
Electrical protection		Class III					
Ingress protection		U□S–21□: IP67, U□P–21□: IP68			IP68		
Process connection		U□S–21□: M30×1.5 U□P–21□: G1"			To be fixed on a flat surface with 4 screws		
Housing material		U□S: stainless steel with PP covering U□P: PP housing			PP housing potted with resin		
Weight		400 g			530 g		

(1) Unloaded

Output data	UT□–2□1–4	UT□–2□2–4	UR□–2□3–4	UR□–2□4–4
Type of output				
Voltage rating	–	–	Max. 30 V DC	
Current rating	–	–	Max. 200 mA	
Residual voltage	–	–	< 2.5 V	
Switching delay or damping time (Tp) (2)	U□□–21□–4: 25 ms (a = 1), 100 ms (a = 4), 200 ms (a = 8), 400 ms (a = 16) (3)			
	U□□–26□–4: 80 ms (a = 1), 320 ms (a = 4), 640 ms (a = 8), 1280 ms (a = 16) (3)			
Temperature error	±0.02% / °C			
Linearity error	±0.35%		–	–
Repeatability	1.5 mm		1 mm	
Output signal	4…20 mA	0…10 V (U_s > 13 V)	–	–
Load resistance	≤ 500 Ω (U_s > 14 V)	≥ 1 kΩ	–	–
Output protection	EMC	EMC, short circuit	EMC, short circuit, overload	

(2) Under proper reflection conditions
(3) Value of "a" can be programmed

MICROSONAR U-200 — 5 years

Programmable ultrasonic proximity switches with PNP or NPN output
or ultrasonic transmitters with 4…20 mA or 0…10 V output for object sensing

Range

U ■■ – 2 □■ – 4

1	0.2…1 m
6	0.4…6 m (only with plastic housing)

Function

U □■ – 2 ■■ – 4

R	Switch
T	Transmitter

Housing / Protection

U ■□ – 2 ■■ – 4

P	Plastic (PP) / IP68
S	Stainless steel + PP / IP67

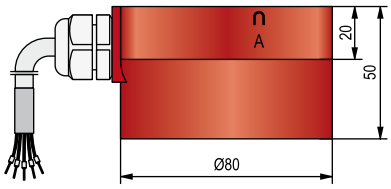
Output

U ■■ – 2 ■□ – 4

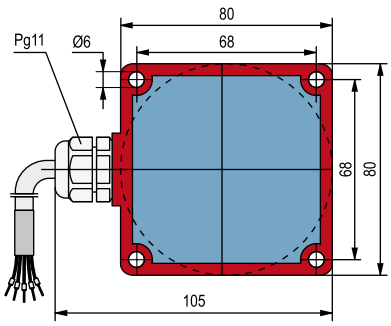
1	4…20 mA (only with UT_)
2	0…10 V (only with UT_)
3	PNP (only with UR_)
4	NPN (only with UR_)

Cable

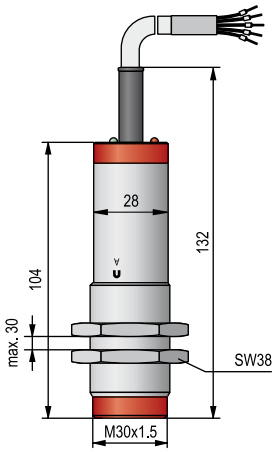
Max. length 30 m; sold by the meter over the standard 3 m



U□P-2□□



U□P-2□□



U□S-21□

PRESSURE SENSORS

In the world of industrial metrology, monitoring and controlling the pressure of fluids and gases and the processing of the measured results are of the highest priority. NIVELCO covers the needs of several industries and application areas with the wide selection of the NIPRESS family.

Features of the NIPRESS device families:

- Advanced pressure measuring technologies
- Relative and absolute pressure measurement
- Devices for nearly all mediums
- Several accuracy classes
- Several mounting options
- Excellent overload resistance
- 2- or 3-wire systems
- Devices with lots of different electrical and process connections
- Solutions for rough conditions *(aggressive medium, wide temperature range, dynamic pressure changes)*
- Solutions for stringent hygienic requirements
- Excellent price/value ratio

Main categories of the NIPRESS device family:

- Pressure switches
- Pressure transmitters
- Differential pressure transmitters

NIPRESS DK
PRESSURE SWITCHES

page 207

- Silicon, ceramic or stainless steel sensor
- Relative or absolute measuring mode
- Up to 4 contacts
- Swiveling and configurable 4-digit display module
- Versions configurable via PC or programming device
- Stainless steel housing versions
- Ex ia variants*
- Integrated cable version

NIPRESS D
PRESSURE TRANSMITTERS

page 217

- Ceramic or stainless steel sensor
- Relative or absolute measuring mode
- For high-pressure (up to 2200 bar)
- For vacuum, overpressure and absolute pressure measurement
- Measuring range downscale
- HART® communication versions
- Two-chamber cast aluminum or stainless steel housing
- Ex ia or Ex d variant*
- SIL 2 variant*

NIPRESS DD
DIFFERENTIAL TRANSMITTERS

page 231

- Piezoresistive silicon or stainless steel sensor
- Relative measuring mode
- Measuring range downscale
- Up to 2 contacts
- Cast aluminum housing
- Static overpressure 400 bar
- HART® communication versions
- High accuracy
- Mechanical robust versions
- Hastelloy® sensor version
- Ex ia variants*

**Ex or SIL versions are available only on request for custom price.*


bar
4430
NIVELCO
HIDRA


4.436
11.905m
IN EXPLOSIVE ATMOSPHERE
KEEP TIGHT WHEN CIRCUIT ALIVE

NIPRESS pressure switches are used in hydraulic and pneumatic applications for monitoring and controlling the pressure via switching outputs. Due to the simple handling as well as the variety of software features *(switching points and hysteresis freely configurable, delay function, storing min-/max-value, scalable display and analog output signal, etc.)* the pressure switches with display are especially suitable for general plant and machine construction and processing industry applications.

The DK–100 series are electronic pressure switches with silicon sensors for pneumatics and vacuum applications.

The DK–200 series, with ceramic sensor, is excellent for measuring, controlling, and processing technology applications in hydraulics and mechanical engineering.

The DK–100 and DK–200 series pressure switches can be configured and programmed with one of the two optionally available configuration kits *(CIS Set USB kit for PC or P6 programming device)*.

The DK–300 series are electronic pressure switches with a stainless steel internal or flush sensor. This device is a successful combination of an intelligent pressure switch and a digital display.

The DK–400 series are electronic pressure switches with a welded stainless steel flush sensor. This device is a successful combination of an intelligent pressure switch and a digital display. This makes it suitable for numerous applications in various industrial sectors and is also ideal for viscous and pasty mediums.

The DK–500 series are electronic pressure switches with a stainless steel sensor. This device is a successful combination of an intelligent pressure switch and a digital display. This makes it suitable for numerous applications in various industrial sectors. It comes with a swiveling display and PNP contact outputs.

The DK–600 series are electronic pressure switches with a ceramic sensor. This device is a successful combination of an intelligent pressure switch and a digital display. This makes it suitable for numerous applications in various industrial sectors. Due to the flush diaphragm, it is suitable for viscous, pasty, and highly contaminated media. The robust swiveling stainless steel housing is designed for rough conditions and in harsh operating environments. The standard version of the device comes with PNP contact.

The DK–700 series are electronic pressure switches with a welded stainless steel flush sensor. This device is a successful combination of an intelligent pressure switch and a digital display. This pressure switch has been developed for the process industry, especially for the food and pharmaceutical industry. It comes with a swiveling display and with PNP contact outputs.

The DK–800 series are intelligent pressure switches and a digital display with a ceramic sensor designed for general industrial applications. Its flush diaphragm version is suitable for viscous, pasty, and highly contaminated media. The standard version comes with PNP contact outputs and a swiveling display.

SPECIFICATIONS

- Relative or absolute pressure switching
- –1…600 bar pressure range
- Piezoresistive or ceramic sensor
- With or without a display
- IP54, IP65, IP67
- 5 years warranty

DK–100

APPLICATIONS

- Pressure switching of gases, steam, and fluids
- Overpressure measurement
- For tanks, pipes, and pressurized vessels
- Mobile hydraulics, dry-run protection, flow monitoring, grease monitoring, gas compressors, test and construction engineering

DK–200

DK–700

TECHNICAL DATA

Type		DK–100	DK–200	DK–300
Measuring Range		–1…10 bar	0…400 bar	–1…600 bar
Overload capability		As per order code		
Accuracy		1%		p ≥ 0.4 bar: 0.25%; 0.5%
Process temperature		–25… +85 °C		–40…+125 °C
Ambient temperature				–40…+85 °C (with integrated cable –5…+70 °C)
Materials of the wetted parts	Sensor	Silicon	Ceramic	Stainless steel
	Sensor Seal	NBR	FKM (option: EPDM)	FKM, welded
	Process conn.	Aluminum	Stainless steel	
Housing		PA 6.6 black		
Output		1, 2 PNP (option: 1…5 V)	1, 2 PNP	1, 2 PNP (option: 4…20 mA / 0…10 V)
Supply voltage		12…30 V DC		2-wire: 13…36 V DC, Ex version* 15…28 V DC, 3-wire: 15…36 V DC
Load resistance		–	–	2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω] 3-wire: R_{min} = 10 kΩ
Process connection		⅛" BSP (inner tread)	¼" BSP	¼", ½", ¾" BSP; ¼", ½" NPT; M20×1.5
Electrical connection		M8×1	M12×1	ISO 4400, M12×1, integrated cable
Ingress protection		IP54	IP67	IP65
Electrical protection		Class III (SELV)		
Weight		~35 g	~90 g	~160 g

Type		DK–400	DK–500	DK–600	DK–700	DK–800
Measuring Range		–1…40 bar	–1…600 bar		–1…40 bar	–1…600 bar
Overload capability		As per order code				
Accuracy		p ≥ 0.4 bar: 0.25%; 0.5%		0.5%	p ≥ 0.4 bar: 0.25%; 0.5%	0.5%
Process temperature		–40…+125 °C (silicone oil) –10…+125 °C (food grade oil)	–40…+125 °C		–40…+125 °C (silicone oil) –10…+125 °C (food grade oil)	–40…+125 °C
Ambient temperature		–40…+85 °C (with integrated cable –5…+70 °C)	–40…+85 °C			–40…+85 °C (with integrated cable –5…+70 °C)
Materials of the wetted parts	Sensor	Stainless steel (option: Hastelloy® C)	Stainless steel	Ceramic	Stainless steel	Ceramic
	Sensor Seal	FKM < 200 °C, FFKM > 200 °C	FKM, welded	FKM (option: EPDM, max. 160 bar)	FKM < 200 °C, FFKM > 200 °C	FKM (option: EPDM, max. 160 bar)
	Process connection	Stainless steel		Stainless steel (option: PVDF (½" BSP, max. 60 bar))	Stainless steel	Stainless steel (option: PVDF (½" BSP, max. 60 bar))
Housing		Stainless steel				
Output		1, 2 PNP (option 4…20 mA / 0…10 V)				
Supply voltage		2-wire: 13…36 V DC, Ex version*: 15…28 V DC, 3-wire: 15…36 V DC	2-wire: 13…36 V DC, Ex version*: 15…28 V DC, 3-wire: 24 V DC			2-wire: 13…36 V DC, Ex version*: 15…28 V DC, 3-wire (0…10 V): 15…36 V DC
		Without analog output: 15…36 V DC				
Load resistance		2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω] 3-wire: R_{min} = 10 kΩ				2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω], 3-wire (0…10 V): R_{min} = 10 kΩ
Process connection		As per order code		¼", ½" BSP / NPT	As per order code	
Electrical connection		ISO 4400, M12×1, integrated cable	ISO 4400, M12×1 /5			M12×1 /5, M12×1 /8, integrated cable
Ingress protection		IP65	IP67			IP65
Electrical protection		Class III (SELV)				
Weight		~160…250 g	~400 g		~500 g	~200 g

**Ex or SIL versions are available only on request for custom price.*

NIPRESS DK-100 — 5 years

3-wire mini compact pressure switch for gauge pressure
Output: PNP transistor, diaphragm: silicon measuring element, measuring range: –1…10 bar

Measuring method

D ☐ S – 1 ■ 3 – ■

K	Switch

Process connection

D K ☐ – 1 ■ 3 – ■

S	⅛" BSP (inner thread)

Range / Overpressure*

D K S – 1 ☐ 3 – ■

0	–1…0 bar / 2 bar
5	0…1 bar / 2 bar
L	0…3.5 bar / 7 bar
A	0…10 bar / 13 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K S – 1 ■ ☐ – ■

3	1%

Output

D K S – 1 ■ 3 – ☐

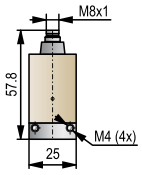
7	1 PNP switching output
9	2 PNP switching outputs

Available on request (must be specified in the text of the order)

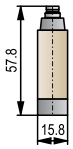
Analog output 1…5 V (with max. 1 PNP output)
Setting of customized switching points

Accessories (ordered separately)

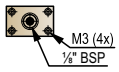
JBD-P6D-S4Q0	P6 programming device for DK-100 pressure switch
JBD-CIS-680U	USB modem with software



DKS-1☐3-☐
front view



DKS-1☐3-☐
side view



DKS-1☐3-☐
bottom view

NIPRESS DK-200 — 5 years

3 or 4-wire mini compact pressure switch for absolute and gauge pressure
Output: PNP transistor, diaphragm: ceramic, measuring range: 0…400 bar

Measuring method

D □ A – 2 ■ 3 – ■

K	Switch

Process connection

D K □ – 2 ■ 3 – ■

A	¼" BSP

Range / Overpressure*

D K A – 2 □ 3 – ■

S	0…2 bar / 7 bar
M	0…5 bar / 12 bar
A	0…10 bar / 25 bar
T	0…20 bar / 50 bar
N	0…50 bar / 120 bar
F	0…100 bar / 250 bar
U	0…200 bar / 400 bar
J	0…400 bar / 600 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K A – 2 ■ □ – ■

3	1%

Output

D K A – 2 ■ 3 – □

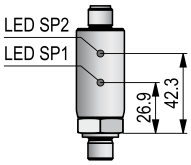
7	1 PNP switching output
9	2 PNP switching outputs

Available on request (must be specified in the text of the order)

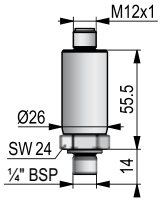
- EPDM sealing
- Absolute pressure measuring method
- Oil and grease-free version
- Oxygen application (max. 25 bar, FKM sealing)
- Custom switching points

Accessories to order

JBD-P6D-S6N0	P6 programming device for DK-200 pressure switch
JBD-CIS-685U	USB modem with software



DKA-2□3-□
front view



DKA-2□3-□
side view

NIPRESS DK-300 — 5 years

3 / 5 / 8-wire mini compact pressure switch for absolute and gauge pressure
Output: 1, 2 PNP transistor, 4…20 mA or 0…10 V, with swiveling LCD display,
Diaphragm: stainless steel flush and inner, measuring range: –1…600 bar

Measuring method

D □■ – 3 ■■ – ■

K	Switch

Process connection

D K □ – 3 ■■ – ■

A	¼" BSP
C	½" BSP
J	M20x1.5
D	¾" BSP, flush membrane (max. 40 bar)
G	¼" NPT
H	½" NPT

Range / Overpressure*

D K ■ – 3 □■ – ■

0	–1…0 bar / 5 bar
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar
E	0…60 bar / 210 bar
F	0…100 bar / 210 bar
G	0…160 bar / 600 bar
H	0…250 bar / 1000 bar
J	0…400 bar / 1000 bar
K	0…600 bar / 1000 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K ■ – 3 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%

Output / Certificates

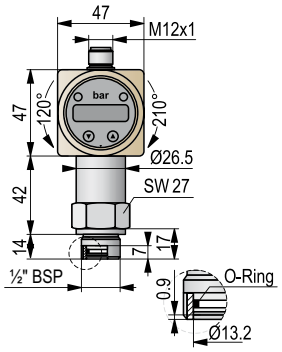
D K ■ – 3 ■■ – □

7		1 PNP switching output
9		2 PNP switching outputs 2 PNP switching outputs (only with M12x1 (5-pin) electrical connection)
F	**	4…20 mA + 1 PNP switching output / Ex ia G

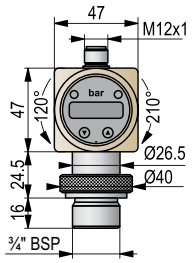
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

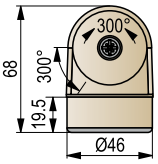
Absolute pressure measuring method (p ≥ 0.4 bar)
M12x1 (5-pin) electronic connection, plastic
M12x1 (5-pin) electronic connection, metal
Integrated cable version (IP67), PVC cable (–5 °C…+70 °C), with cable gland
PVC cable add-on price per meter
4…20 mA (max. 1 switching output)
0…10 V 3-wire (max. 2 switching outputs, but with M12x1 (5 pin) electric connection



DKC-3□□-□
front view



DKD-3□□-□
front view



DKD-3□□-□
plan view

NIPRESS DK-400 — 5 years

3 / 5 / 8-wire mini compact pressure switch for absolute and gauge pressure
Output: 1, 2 PNP transistor, 4…20 mA or 0…10 V, with swiveling LCD display, diaphragm: stainless steel flush,
Measuring range: –1…40 bar

Measuring method / Temperature

D □■ – 4 ■■ – ■

K	Switch / up to +125 °C
L	Switch / up to +300 °C (in the case of vacuum, up to +150 °C, p ≤ 70 bar max +200 °C permanent)

Process connection

D ■□ – 4 ■■ – ■

C	½" BSP (p > 2.5 bar)
J	M20x1.5 (p > 2.5 bar)
D	¾" BSP
E	1" BSP
F	1½" BSP
K	2" BSP
T	¾" TriClamp (4 bar ≤ p ≤ 8 bar)
L	1" TriClamp (0.25 bar ≤ p ≤ 16 bar)
M	1½" TriClamp (p ≤ 16 bar)
N	2" TriClamp (p ≤ 16 bar)
O	DN25 Pipe coupling (DIN 11851) 0.25…40 bar
P	DN40 Pipe coupling (DIN 11851) 0.25…40 bar
R	DN50 Pipe coupling (DIN 11851) 0.25…25 bar
I	DN40 / PN40 1.4404 flange (p ≤ 40 bar)
Q	DN50 / PN40 1.4404 flange (p ≤ 40 bar)
U	DN80 / PN16 1.4404 flange (p ≤ 16 bar)
V	VARIVENT® DN40/50 (p ≤ 25 bar)

Range / Overpressure*

D ■■ – 4 □■ – ■

0	–1…0 bar / 5 bar
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 4 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%

Output / Certificates

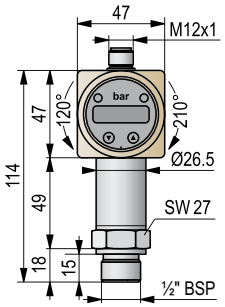
D ■■ – 4 ■■ – □

7		1 PNP switching output
9		2 PNP switching outputs
F	**	4…20 mA + 1 PNP switching output / Ex ia G

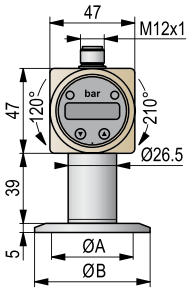
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

Absolute pressure measuring method (p ≥ 0.4 bar)
M12x1 (5-pin) electronic connection, metal
Integrated cable version (IP67), PVC cable (–5 °C…+70 °C), with cable gland
PVC cable add-on price per meter
4…20 mA (max. 1 switching output)
0…10 V 3-wire (max. 2 switching outputs, but with M12x1 (5 pin) electric connection)
Hastelloy C membrane
FFKM sealing
Filled with food compatible oil (up to +150 °C)

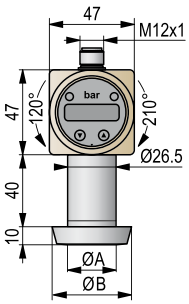


D□C-4□□-□
front view



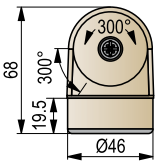
D□□-4□□-□
front view

TriClamp	¾"	1"	1½"	2"
A	14	23	32	45
B	25	50.5		64



D□□-4□□-□
front view

	DN25	DN40	DN50
A	23	32	45
B	44	56	68.5



D□□-4□□-□
plan view

NIPRESS DK-500 — 5 years

3 / 5-wire mini compact pressure switch for absolute and gauge pressure, with stainless steel housing
Output: 1, 2 PNP transistor, 4…20 mA or 0…10 V, with swiveling LCD display, diaphragm: stainless steel,
Measuring range: –1…600 bar

Measuring method

D □■ – 5 ■■ – ■

K	Switch

Process connection

D K □ – 5 ■■ – ■

A	¼" BSP
C	½" BSP
G	¼" NPT
H	½" NPT

Range / Overpressure*

D K ■ – 5 □■ – ■

0	–1…0 bar / 5 bar
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar
E	0…60 bar / 210 bar
F	0…100 bar / 210 bar
G	0…160 bar / 600 bar
H	0…250 bar / 1000 bar
J	0…400 bar / 1000 bar
K	0…600 bar / 1000 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K ■ – 5 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%

Output / Certificates

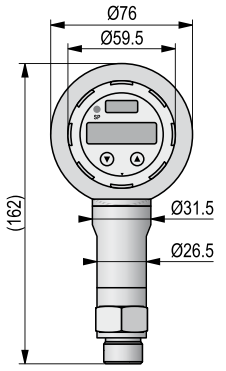
D K ■ – 5 ■■ – □

7		1 PNP switching output
9		2 PNP switching outputs
F	**	4…20 mA + 1 PNP switching output / Ex ia G

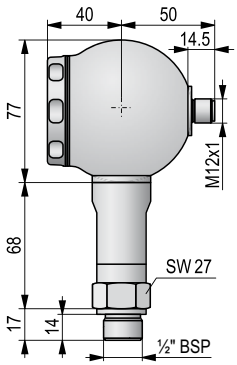
** Ex or SIL versions are available on special request.

Available on request (must be specified in the text of the order)

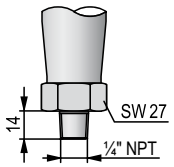
Absolute pressure measuring method (p ≥ 0.4 bar)
4…20 mA



DKC-5□□-□ with display, front view



DKC-5□□-□ side view



DKG-5□□-□ side view

NIPRESS DK-600 — 5 years

3 or 5-wire mini compact pressure switch for absolute and gauge pressure, with stainless steel housing
Output: 1, 2 PNP transistor, 4…20 mA or 0…10 V, with swiveling LCD display, diaphragm: ceramic,
Measuring range: –1…600 bar

Measuring method

D □■ – 6 ■ 2 – ■

K	Switch

Process connection

D K □ – 6 ■ 2 – ■

A	¼" BSP
C	½" BSP
G	¼" NPT
H	½" NPT

Range / Overpressure*

D K ■ – 6 □ 2 – ■

0	–1…0 bar / 4 bar
3	0…0.4 bar / 1 bar
4	0…0.6 bar / 2 bar
5	0…1 bar / 2 bar
6	0…1.6 bar / 4 bar
7	0…2.5 bar / 4 bar
8	0…4 bar / 10 bar
9	0…6 bar / 10 bar
A	0…10 bar / 20 bar
B	0…16 bar / 40 bar
C	0…25 bar / 40 bar
D	0…40 bar / 100 bar
E	0…60 bar / 100 bar
F	0…100 bar / 200 bar
G	0…160 bar / 400 bar
H	0…250 bar / 400 bar
J	0…400 bar / 600 bar
K	0…600 bar / 800 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K ■ – 6 ■□ – ■

2	0.5%

Output / Certificates

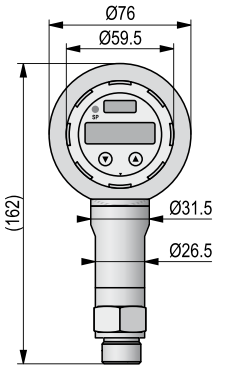
D K ■ – 6 ■ 2 – □

7		1 PNP switching output
9		2 PNP switching outputs
F	**	4…20 mA + 1 PNP switching output / Ex ia G

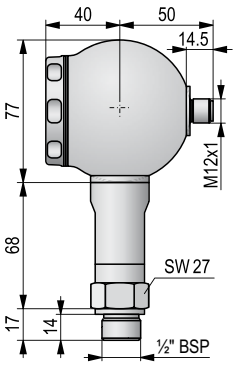
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

Absolute pressure measuring method
EPDM sealing (max. 160 bar)
PVDF process connection (only ½" BSP, max. 60 bar)
Oxygen application (max. 25 bar, FKM sealing)
4…20 mA



DKC-6□2-□ with display, front view



DKC-6□2-□ side view

NIPRESS DK-700 — 5 years

3 or 5-wire mini compact pressure switch for absolute and gauge pressure, with stainless steel housing
Output: 1…2 PNP transistor, 4…20 mA or 0…10 V, with swiveling LCD display, diaphragm: stainless steel flush,
Measuring range: –1…40 bar

Measuring method / Temperature

D □■ – 7 ■■ – ■

K	Switch / up to +125 °C
L	Switch / up to +300 °C (in the case of vacuum, up to +150 °C, p ≤ 70 bar max +200 °C permanent)

Process connection

D ■□ – 7 ■■ – ■

C	½" BSP (p ≥ 1 bar)
D	¾" BSP
E	1" BSP
T	¾" TriClamp
L	1" TriClamp
M	1½" TriClamp
N	2" TriClamp
O	DN25 Pipe coupling (DIN 11851) 0.25…40 bar
P	DN40 Pipe coupling (DIN 11851) 0.25…40 bar
R	DN50 Pipe coupling (DIN 11851) 0.25…25 bar
V	VARIVENT® DN40/50 (p ≤ 25 bar)

Range / Overpressure*

D ■■ – 7 □■ – ■

0	–1…0 bar / 5 bar
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0 …1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 7 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%

Output / Certificates

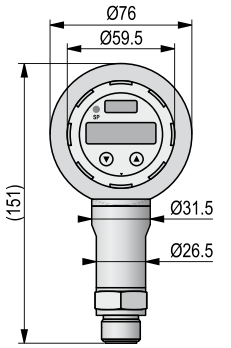
D ■■ – 7 ■■ – □

7		1 PNP switching output
9		2 PNP switching outputs
F	**	4…20 mA + 1 PNP switching output / Ex ia G

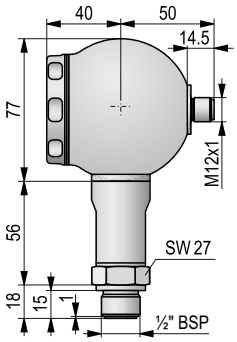
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

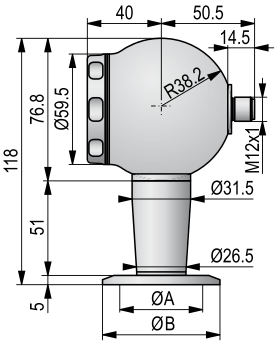
Absolute pressure measuring method (p ≥ 1 bar)
FFKM sealing
Filled with food compatible oil (up to +150 °C)
4…20 mA



D□C-7□□-□ with display, front view

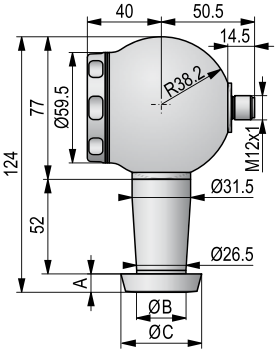


D□C-7□□-□ side view



D□□-7□□-□ side view

TriClamp	¾"	1"	1½"	2"
A	14	23	32	45
B	25	50,5		64



D□□-7□□-□ side view

	DN25	DN40	DN50
A	10		11
B	23	32	45
C	44	56	68,5

NIPRESS DK-800 — 5 years

5 or 8-wire mini compact pressure switch for absolute and gauge pressure
Output: 1, 2 PNP transistor, with swiveling LCD display, diaphragm: ceramic,
Measuring range: –1…600 bar

Measuring method

D □■ – 8 ■ 2 – ■

K	Switch

Process connection

D K □ – 8 ■ 2 – ■

A	¼" BSP
C	½" BSP
D	¾" BSP, flush membrane (0.6 bar ≤ p ≤ 60 bar)
G	¼" NPT
H	½" NPT

Range / Overpressure*

D K ■ – 8 □ 2 – ■

0	–1…0 bar / 4 bar
3	0…0.4 bar / 1 bar
4	0…0.6 bar / 2 bar
5	0…1 bar / 2 bar
6	0…1.6 bar / 4 bar
7	0…2.5 bar / 4 bar
8	0…4 bar / 10 bar
9	0…6 bar / 10 bar
A	0…10 bar / 20 bar
B	0…16 bar / 40 bar
C	0…25 bar / 40 bar
D	0…40 bar / 100 bar
E	0…60 bar / 100 bar
F	0…100 bar / 200 bar
G	0…160 bar / 400 bar
H	0…250 bar / 400 bar
J	0…400 bar / 600 bar
K	0…600 bar / 800 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D K ■ – 8 ■□ – ■

2	0.5%

Output / Certificates

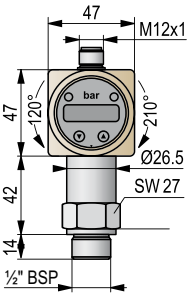
D K ■ – 8 ■ 2 – □

7		1 PNP switching output
9		2 PNP switching outputs
F	**	4…20 mA + 1 PNP switching output / Ex ia G

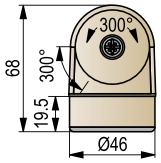
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

Absolute pressure measuring method
EPDM (p ≤ 160 bar), NBR sealing
PVDF process connection (only ½" BSP, max. 60 bar)
Oxygen application (max. 25 bar, FKM sealing)
Integrated cable version (IP67), PVC cable (–5 °C…+70 °C), with cable gland
PVC cable add-on price per meter
M12x1 (5-pin) electrical connection, metal



DKC-8□2-□ with display, front view



DKC-8□2-□ with display, plan view

NIPRESS pressure transmitters with multiple sensor technologies combined with various housing materials can be used for almost all relative or absolute fluid or gas pressure measurement tasks requiring different accuracy. Their design, high overload capability and the possibility to install the units in any physical position makes them suitable for a wide range of industrial applications.


D–400

D–200 series with a ceramic internal sensor is suitable for the measurement of aggressive gases, steam and fluids, but not recommended for materials that are prone to sediment, crystallize, or stiffen. It's not recommended for dynamic overpressure either. The transmitters measure overpressure and can be used in 2-wire system.

D–300 series with a stainless steel internal sensor is suitable for static or dynamic stress, but not recommended for materials that are prone to sediment, crystallize, or stiffen. Absolute pressure measurement is feasible at ranges over 0.1 bar.

D–400 series with a stainless steel flush sensor is especially suitable for contaminated liquids and measuring bottom pressure in containers. The high-temperature versions of the family can be used for process temperature up to +150 °C or up to +300 °C. Absolute pressure measurement is feasible over 0.4 bar. The standard pressure-transmitting liquid of the sensors is silicone oil, but the units can also be ordered with a pressure transferring liquid suitable for food industry.

D–500 series with a ceramic flush sensor is suitable for the measurement of aggressive, contaminated, pasty media, and low pressure oxygen applications.

D–600 series screw-in pressure transmitters with a ceramic flush sensor are suitable for measuring the pressure of fluids, oils, and gases. Due to their flush sensor, they are ideal for measuring viscose and polluted media. For aggressive media, we recommend a PVDF process connection.

D–700 series screw-in pressure transmitters with a ceramic flush sensor can be used for low pressure measurements. Due to their flush sensor, they are ideal for the measurement of viscose and pasty media. With PVDF housing and process connection they are suitable for using in aggressive media. For special applications they can be ordered with PTFE-coating.

D–800 series with stainless steel flush sensor consist of robust screw-in pressure transmitters with excellent performance. Its modular construction provides high flexibility to the user.

D–900 series with ceramic internal sensor was designed especially for applications in plant and machine engineering as well as laboratory equipment. The pressure transmitter is suitable for measuring small system pressure, however due to its optional 99.9% Al_2O_3 sensor it also offers high-temperature, overpressure, and media resistance.

D–A00 series with a stainless steel internal or flush sensor is ideal for the process industry as well as for pharmaceutical usage. It can be used for measuring the pressure of gases and steam up to 600 bar. The pressure transmitter provides HART® communication, and is available with several process connections and housing materials *(internal or external threads, flanges)*. It's high-temperature version with cooling elements is applicable up to +300 °C.

D–B00 series with a ceramic flush sensor has a really high overpressure resistance due to its 99.9% Al_2O_3 sensor. It is ideal for the measurement of gases, steam, and fluids. The pressure transmitter is equipped with HART® communication and is available with several process connections and housing materials.

D–C00 series with a stainless steel internal sensor can be used for measuring extremely high pressures *(up to 2200 bar)*, which makes it suitable for hydraulic applications. The base element of the device is a thin film sensor, which is welded to the pressure port. The series offers high reliability, and easy handling.

The standard pressure transmitting liquid of the NIPRESS transmitters is silicone oil, but the units can also be ordered with a pressure transferring liquid suitable for food industry. Depending on the type the pressure transmitters can be applied both in 2 and 3-wire systems. Some transmitters can be equipped with the loop-powered, programmable, plug-in display UNICONT PLK–501, which is ordered separately.

SPECIFICATIONS

- Relative or absolute pressure measurement
- –1…2200 bar pressure range
- Piezoresistive or capacitive, ceramic or sainless steel sensors
- Compact tubular housing devices
- Stainless steel or cast aluminum
- Chemical resistant seal
- Optional plug-in display *(for certain devices)*
- IP65, IP67, IP68
- 5 years warranty

APPLICATIONS

- Pressure measurement of gases, steam, and fluids
- Vacuum, overpressure or absolute pressure measurement
- In tanks, pipes, and pressurized vessels
- HVAC, hydraulics, pneumatics, mechanical and plant engineering, energy industry, food and beverage industry, pharmaceutical industry, chemical industry, oil- and gas industry

TECHNICAL DATA

Type		D–200	D–300	D–400	D–500
Measuring Range		–1…400 bar	–1…600 bar	–1…400 bar	–1…600 bar
Overload capability		As per order code			
Accuracy		0.5%; –1…0 bar: 1%	Without SIL: 0.1%; p ≥ 0.4 bar: 0.25%; 0.5%; 0.2%	(0.4 bar ≤ p ≤ 40 bar): ±0.25%; 0.5%	0.5%; 1% (as per order codes)
Process temperature		–25…+125 °C	–40…+125 °C	–40…+125 °C (silicone oil, high-temp. version up to +300 °C, up to max. 160 bar), –10…+125 °C (food grade oil, high-temp. version up to +250 °C, up to max. 160 bar)	–40…+125 °C
Ambient temperature		–25…+85 °C	–40…+85 °C (with integrated cable –5…+70 °C)		
Materials of the wetted parts	Sensor	Ceramic	Stainless steel		Ceramic
	Sensor seal	FKM (Viton®) (option: EPDM)	FKM (Viton®) (option: NBR, EPDM (p ≤ 160 bar))	FKM (Viton®, max. +200 °C) (option: FFKM)	FKM (Viton®) (option: EPDM (p ≤ 160 bar))
	Process conn.	Stainless steel			Stainless steel (option: PVDF)
Housing		Stainless steel			
Output		2-wire: 4…20 mA, 3-wire: 0…10 V			
Supply voltage		2-wire: 8…32 V DC, 3-wire: 14…30 V DC	2-wire: standard version 8…32 V DC, Ex variant* 10…28 V DC, SIL variant* 14…28 V DC, 3-wire: 14…30 V DC		
Load resistance		2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω]; 3-wire: R_{min} = 10 kΩ			
Process connection		As per order code			
Electrical connection		ISO 4400, M12×1 /4	ISO 4400, M12×1 /4, integral cable version		
Ingress protection		IP65 / IP67	IP65 / IP67 / IP68		
Electrical protection		Class III (SELV)			
Weight		~120 g	~140 g	~200 g	~140 g

Type		D–600	D–700	D–800	D–900
Measuring Range		0…60 bar	0…20 bar	0…40 bar	0…20 bar
Overload capability		As per order code			
Accuracy		0.5%	±0.5%; p ≥ 0.6 bar: ±0.25%; ±1% (PTFE-coated)	p ≤ 0.4 bar: 0.5%; p ≥ 0.4 bar: 0.25%; Optional: p ≥ 0.4 bar 0.1% (without SIL)	p ≥ 0.6 bar: 0.25%; 0.5%
Process temperature		–40…+125 °C			
Ambient temperature		–25…+85 °C (with integrated cable: –5…+70 °C)	–40…+85 °C (with integrated cable: –5…+70 °C)		
Materials of the wetted parts	Sensor	Ceramic		Stainless steel	Ceramic
	Sensor seal	FKM (Viton®) (option: EPDM, NBR))	FKM (Viton®) (option: EPDM, FFKM)	FKM (Viton®) (option: EPDM)	
	Process conn.	Stainless steel (option: PVDF)		Stainless steel	
Housing					
Output		2-wire: 4…20 mA, 3-wire: 0…10 V			
Supply voltage		2-wire: 8…32 V DC, Ex variant*: 10…28 V DC, SIL variant*: 14…28 V DC, 3-wire: 14…30 V DC	2-wire: 9…32 V DC, Ex variant*: 14…28 V DC, 3-wire: 12.5…32VDC	2-wire: 8…32 V DC, Ex variant*: 10…28 V DC, SIL variant*: 14…28 V DC, 3-wire: 14…30 V DC	2-wire: 9…32 V DC, Ex variant*: 14…28 V DC, 3-wire: 12.5…32 V DC
Load resistance		2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω] 3-wire: R_{min} = 10 kΩ			
Process connection		¾" BSP	1½" BSP	¾" BSP	½" BSP / NPT; ¼" BSP; M20×1.5
Electrical connection		ISO 4400, M12x1 /4, integral cable version			
Ingress protection		IP65 / IP67 / IP68			
Electrical protection		Class III (SELV)			
Weight		~150 g	~200 g		

**Ex or SIL versions are available only on request for custom price.*

TECHNICAL DATA

Type		D–A00	D–B00	D–C00
Measuring Range		0…600 bar (optionally also from −1 bar)	0…20 bar	0…2200 bar
Overload capability		As per order code		
Accuracy		0.1%	p ≥ 1 bar: 0.1%; p < 1 bar: 0.2%; 1% (PTFE-coated)	0.5%
Process temperature		−40…+125 °C (silicone oil) −10…+125 °C (food grade oil)	−25…+125 °C	−40…+140 °C
Ambient temperature		−40…+70 °C (without display) −20…+70 °C (with display)		−25…+85 °C
Materials of the wetted parts	Sensor	Stainless steel (option: Hastelloy® C)	Ceramic	Stainless steel
	Sensor Seal	FKM (option: FFKM (p ≤ 100 bar))	FKM (option: EPDM)	–
	Process conn.	Stainless steel	Stainless Steel (optional: PVDF (1½" BSP))	Stainless steel
Housing		Cast aluminum or stainless steel		Stainless steel
Output		4…20 mA, HART®		2-wire: 4…20 mA, 3-wire: 0…10 V
Supply voltage		2-wire standard version and Ex ia variant*: 12…28 V DC, Ex d variant*: 13…28 V DC		2-wire: 12…36 V DC, Ex variant*: 14…28 V DC, 3-wire: 14…30 V DC
Load resistance		2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω], load during HART® communication: R_{min}: 250 Ω		2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω], 3-wire: R_{min} = 10 kΩ
Process connection		As per order code		
Electrical connection		M20×1.5 (for cable Ø5…Ø14 mm)		ISO 4400, M12x1 /4, integral cable version
Ingress protection		IP67		IP65 / IP67 / IP68
Electrical protection		Class III (SELV)		
Weight		~400 g		~240 g

**Ex or SIL versions are available only on request for custom price.*

D–600

D–700

D–500

D–B00

D–A00

NIPRESS D-200 — 5 years

2 or 3-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA, diaphragm: ceramic, measuring range: 0…400 bar

Measuring method

D □■ – 2 ■■ – ■

R	Gauge
E	Absolute

Process connection

D ■□ – 2 ■■ – ■

A	¼" BSP according to EN837 (manometer)
C	½" BSP according to EN837 (manometer)
G	¼" NPT

Range / Overpressure*

D ■■ – 2 □■ – ■

0	–1…0 bar / 3 bar (only with 1% accuracy)
5	0…1 bar / 3 bar
6	0…1.6 bar / 5 bar
7	0…2.5 bar / 5 bar
8	0…4 bar / 12 bar
9	0…6 bar / 12 bar
A	0…10 bar / 20 bar
B	0…16 bar / 50 bar
C	0…25 bar / 50 bar
D	0…40 bar / 120 bar
E	0…60 bar / 120 bar
F	0…100 bar / 200 bar
G	0…160 bar / 400 bar
H	0…250 bar / 400 bar
J	0…400 bar / 650 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 2 ■□ – ■

2	0.5%
3	1% (only –1…0 bar)

Output

D ■■ – 2 ■■ – □

2	4…20 mA
3	0…10 V

Available on request (must be specified in the text of the order)

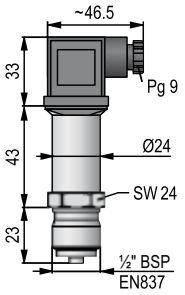
EPDM sealing
M12x1 (4-pin) IP67 electrical connection, plastic
Oil and grease-free version
Oxygen application (max. 25 bar, FKM sealing)

Accessories ** (sold separately)

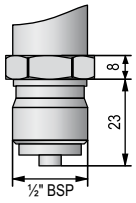
PLK-501-2	Plug-in display
PLK-501-3	Plug-in display with PNP output

** Only for 2-wire version and ISO 4400 connector.

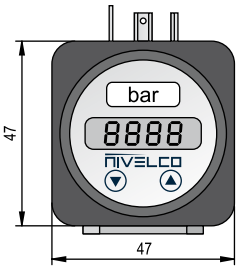
JBD-TTR-04SA	½" BSP / ½" BSP shock absorber



DRC-2□2



½" BSP EN 837



PLK-501

NIV24
DRC-252-2
DRC-272-2
DRC-292-2
DRC-2A2-2
DRC-2B2-2
PLK-501-2

NIPRESS D-300 — 5 years

2 or 3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: stainless steel, measuring range: –1…600 bar

Measuring method

D □■ – 3 ■■ – ■

R	Gauge
E	Absolute (p ≥ 0.4 bar)

Process connection

D ■□ – 3 ■■ – ■

A	¼" BSP
C	½" BSP
G	¼" NPT (max. 40 bar)
H	½" NPT
J	M20x1.5

Range / Overpressure*

D ■■ – 3 □■ – ■

0	–1…0 bar / 5 bar
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar
E	0…60 bar / 210 bar
F	0…100 bar / 600 bar
G	0…160 bar / 600 bar
H	0…250 bar / 1000 bar
J	0…400 bar / 1000 bar
K	0…600 bar / 1000 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 3 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%
6	0.2%
4	0.1% (not in combination with SIL)

Output / Certificates

D ■■ – 3 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G
C	**	4…20 mA, SIL 2
D	**	4…20 mA, SIL 2 / Ex ia G

** Ex or SIL versions are available on request.

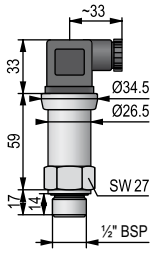
Available on request (must be specified in the text of the order)

EPDM, FKM, NBR sealing
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (–5 °C…+70 °C)
PVC cable sold separately by the meter
Blue Ex PVC cable sold separately by the meter

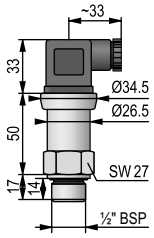
Accessories *** (ordered separately)

PLK–501–2	Plug-in display
PLK–501–3	Plug-in display with PNP output

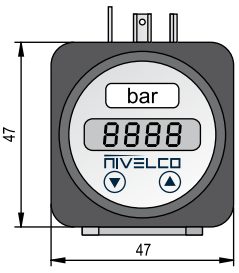
*** Only for 2-wire version and ISO 4400 connector.



DR□-3□□, DE□-3□□
p ≤ 40 bar



DR□-3□□, DE□-3□□
p ≥ 60 bar



PLK-501

NIV24
DRC-3A2-2
DRC-3B2-2
PLK-501-2

NIPRESS D-400 — 5 years

2 or 3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: stainless steel flush, measuring range: −1…400 bar

Measuring method

D □■ – 4 ■■ – ■

R	Gauge up to +125 °C
E	Absolute up to +70 °C (p ≥ 0.6 bar)
H	Gauge up to +150 °C (p ≤ 160 bar)
J	Gauge up to +300 °C (p ≤ 160 bar, p ≤ 70 bar max. +200 °C permanent)

Process connection

D ■□ – 4 ■■ – ■

B	½" BSP (p > 1.5 bar)
C	½" BSP (sensor: 1.4404) max. +125 °C, −1…40 bar; without media separator
J	M20x1.5 (p > 2.5 bar)
D	¾" BSP (p > 0.6 bar)
E	1" BSP (p > 0.25 bar)
S	1" NPT (0.25…40 bar)
F	1½" BSP
T	¾" TriClamp (4…8 bar)
L	1" TriClamp (0.25…16 bar)
M	1½" TriClamp (p ≤ 16 bar)
N	2" TriClamp (p ≤ 16 bar)
O	DN25 Pipe coupling (DIN 11851; 0.25…40 bar)
P	DN40 Pipe coupling (DIN 11851; 0.25…40 bar)
R	DN50 Pipe coupling (DIN 11851; 0.25…25 bar)
I	DN25 / PN40 1.4404 flange (p ≤ 40 bar)
Q	DN50 / PN40 1.4404 flange (p ≤ 40 bar)
U	DN80 / PN16 1.4404 flange (p ≤ 16 bar)
K	DN100 / PN16 1.4404 flange (p ≤ 16 bar)
V	VARIVENT® DN40 / 50 (p ≤ 10 bar)

Range / Overpressure*

D ■■ – 4 □■ – ■

0	−1…0 bar / 5 bar (max. +70 °C)
1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar
E	0…60 bar / 100 bar
F	0…100 bar / 200 bar
G	0…160 bar / 400 bar
H	0…250 bar / 400 bar
J	0…400 bar / 600 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 4 ■□ – ■

1	0.25% (0.4 bar ≤ p ≤ 40 bar)
2	0.5%
4	0.1% (only for DRC, DEC types)

Output / Certificates

D ■■ – 4 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G
C	**	4…20 mA, SIL 2
D	**	4…20 mA, SIL 2 / Ex ia G

** Ex or SIL versions are available on request.

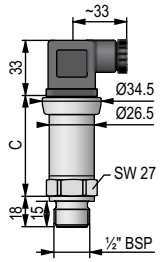
Available on request (must be specified in the text of the order)

Filled with food grade oil (not available for D_C-_ _ _-_; max. +150 °C)
EPDM sealing (max. 160 bar)
FFKM sealing (max. 100 bar)
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (−5 °C…+70 °C; max. 40 bar)
PVC cable add-on price per meter

Accessories *** (sold separately)

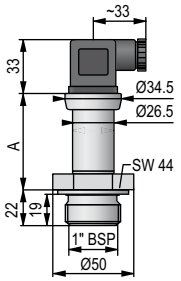
PLK-501-2	Plug-in display
PLK-501-3	Plug-in display with PNP output

*** Only for 2-wire version and ISO 4400 connector.



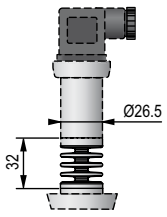
DRB-4□□, DEB-4□□

Pressure	p ≤ 40 bar	p > 40 bar
C	60	59.5

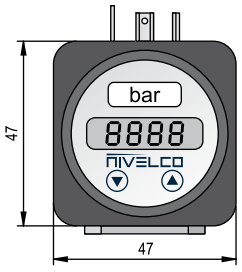


DRE-4□□, DEE-4□□

Pressure	p ≤ 40 bar	p > 40 bar
A	60	59



Cooling element (+300°C)



PLK-501

NIV24
PLK-501-2

NIPRESS D-500 — 5 years

2 or 3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: ceramic flush, measuring range: –1…600 bar

Measuring method

D □■ – 5 ■■ – ■

R	Gauge
E	Absolute

Process connection

D ■□ – 5 ■■ – ■

A	¼" BSP
C	½" BSP
G	¼" NPT
H	½" NPT
J	M20x1.5

Range / Overpressure*

D ■■ – 5 □■ – ■

0	–1…0 bar / 4 bar (only with 1% accuracy)
3	0…0.4 bar / 1 bar
4	0…0.6 bar / 2 bar
5	0…1 bar / 2 bar
6	0…1.6 bar / 4 bar
7	0…2.5 bar / 4 bar
8	0…4 bar / 10 bar
9	0…6 bar / 10 bar
A	0…10 bar / 20 bar
B	0…16 bar / 40 bar
C	0…25 bar / 40 bar
D	0…40 bar / 100 bar
E	0…60 bar / 100 bar
F	0…100 bar / 200 bar
G	0…160 bar / 400 bar
H	0…250 bar / 400 bar
J	0…400 bar / 600 bar
K	0…600 bar / 800 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 5 ■□ – ■

2	0.5%
3	1% (only with PTFE coated version or underpressure ranges)

Output / Certificates

D ■■ – 5 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G
C	**	4…20 mA, SIL 2
D	**	4…20 mA, SIL 2 / Ex ia G

** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

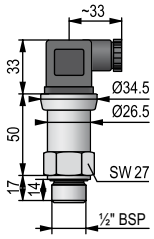
PVDF process connection (only with ½" BSP, max. 60 bar)
EPDM sealing (p ≤ 160 bar)
FFKM sealing
PTFE coating on the sensor (only with 1% accuracy)
Oxygen application (max. 25 bar, FKM sealing)
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (–5…+70 °C)
PVC cable add-on price per meter

Accessories *** (sold separately)

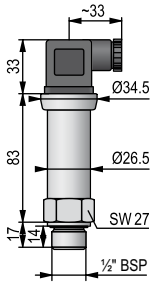
P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

*** Only for 2-wire version and ISO 4400 connector.

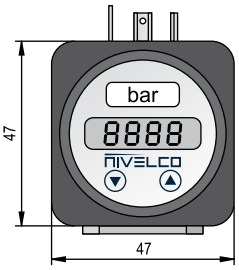
JBD-TTR-04SA	½" BSP / ½" BSP shock absorber



D□C-5□2-□



D□C-5□2-□
for SIL and SIL / Ex ia versions



PLK-501

NIV24
PLK-501-2

NIPRESS D-600 — 5 years

2 or 3-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: ceramic flush, measuring range: 0…60 bar

Measuring method

D □ D – 6 ■■ – ■	
R	Gauge

Process connection

D R □ – 6 ■■ – ■	
D	¾" BSP

Range / Overpressure*

D R D – 6 □■ – ■		
3		0…0.4 bar / 1 bar
4		0…0.6 bar / 2 bar
5		0…1 bar / 2 bar
6		0…1.6 bar / 4 bar
7		0…2.5 bar / 4 bar
8		0…4 bar / 10 bar
9		0…6 bar / 20 bar
A		0…10 bar / 20 bar
B		0…16 bar / 40 bar
C		0…25 bar / 40 bar
D	**	0…40 bar / 100 bar
E	**	0…60 bar / 200 bar

* Custom measuring range, based on prior negotiations.
** Only available with stainless steel process connection

Accuracy

D R D – 6 ■□ – ■	
2	0.5%

Output / Certificates

D R D – 6 ■■ – □		
2		4…20 mA
3		0…10 V
6	***	4…20 mA / Ex ia G
C	***	4…20 mA, SIL 2
D	***	4…20 mA, SIL 2 / Ex ia G

*** Ex or SIL versions are available on request.

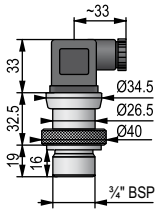
Available on request (must be specified in the text of the order)

PVDF process connection (p ≤ 25 bar)
EPDM, NBR sealing
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (–5 °C…+70 °C)
PVC cable add-on price per meter

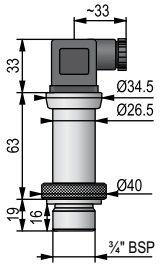
Accessories **** (sold separately)

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

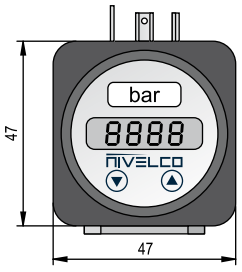
**** Only for 2-wire version and ISO 4400 connector.



DRD-6□2-□



DRD-6□2-□
for SIL and SIL / Ex ia versions



PLK-501

NIV24
PLK-501-2

NIPRESS D-700 — 5 years

2 or 3-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: ceramic flush, measuring range: 0…20 bar

Process connection

D R □ – 7 ■■ – ■

F	1½" BSP

Range / Overpressure*

D R F – 7 □■ – ■

O	0…0.04 bar / 2 bar
P	0…0.06 bar / 2 bar
1	0…0.1 bar / 4 bar
R	0…0.16 bar / 4 bar
2	0…0.25 bar / 6 bar
3	0…0.4 bar / 6 bar
4	0…0.6 bar / 8 bar
5	0…1 bar / 8 bar
6	0…1.6 bar / 15 bar
7	0…2.5 bar / 25 bar
8	0…4 bar / 25 bar
9	0…6 bar / 35 bar
A	0…10 bar / 35 bar
B	0…16 bar / 45 bar
T	0…20 bar / 45 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D R F – 7 ■□ – ■

1	0.25% (p ≥ 0.6 bar)
2	0.5%
3	1% (only option with PTFE sheeting)

Output / Certificates

D R F – 7 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G

** Ex or SIL versions are available on request.

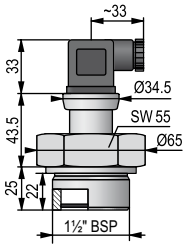
Available on request (must be specified in the text of the order)

With PVDF process connection and housing (only with 0.5% accuracy)
PTFE sheeting on sensor (only with 1% accuracy, p ≥ 0.4 bar)
EPDM sealing
FFKM sealing
M12x1 (4-pin) IP67 electrical connection, metal
Oxygen application
Integrated cable version (IP68), PVC cable (–5 °C…+70 °C)
PVC cable add-on price per meter

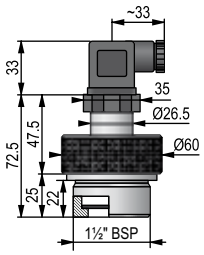
Accessories *** (sold separately)

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

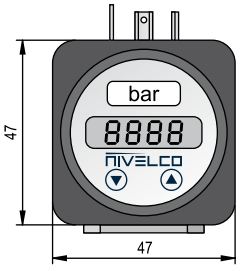
*** Only for 2-wire version and ISO 4400 connector.



DRF-7□□-□



DRF-7□□-□ / PVDF



PLK-501

NIV24
PLK-501-2

NIPRESS D-800 — 5 years

2 or 3-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: stainless steel flush, measuring range: 0…40 bar

Measuring method

D □ D – 8 ■■ – ■

R	Gauge

Process connection

D R □ – 8 ■■ – ■

D	¾" BSP

Range / Overpressure*

D R D – 8 □■ – ■

1	0…0.1 bar / 0.5 bar
R	0…0.16 bar / 1 bar
2	0…0.25 bar / 1 bar
3	0…0.4 bar / 2 bar
4	0…0.6 bar / 5 bar
5	0…1 bar / 5 bar
6	0…1.6 bar / 10 bar
7	0…2.5 bar / 10 bar
8	0…4 bar / 20 bar
9	0…6 bar / 40 bar
A	0…10 bar / 40 bar
B	0…16 bar / 80 bar
C	0…25 bar / 80 bar
D	0…40 bar / 105 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D R D – 8 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5% (p ≤ 0.4 bar)
4	0.1% (not in combination with SIL)

Output / Certificates

D R D – 8 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G
C	**	4…20 mA, SIL 2
D	**	4…20 mA, SIL 2 / Ex ia G

** Ex or SIL versions are available on request.

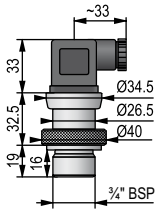
Available on request (must be specified in the text of the order)

EPDM sealing
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (–5 °C…+70 °C)
PVC cable add-on price per meter

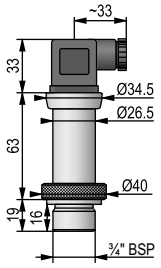
Accessories *** (sold separately)

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

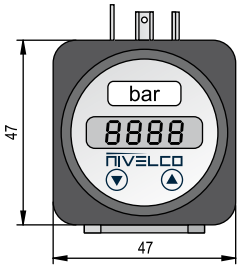
*** Only for 2-wire version and ISO 4400 connector.



DRD-8□□-□



DRD-8□□-□
for SIL and SIL / Ex ia versions



PLK-501

NIV24
PLK-501-2

NIPRESS D-900 — 5 years

2 or 3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: ceramic, measuring range: 0…20 bar

Measuring method

D □■ – 9 ■■ – ■

R	Gauge
E	Absolute (p ≥ 1 bar)

Process connection

D ■□ – 9 ■■ – ■

A	¼" BSP
C	½" BSP
H	½" NPT
J	M20x1.5

Range / Overpressure*

D ■■ – 9 □■ – ■

O	0…0.04 bar / 2 bar
P	0…0.06 bar / 2 bar
1	0…0.1 bar / 4 bar
R	0…0.16 bar / 4 bar
2	0…0.25 bar / 6 bar
3	0…0.4 bar / 6 bar
4	0…0.6 bar / 8 bar
5	0…1 bar / 8 bar
6	0…1.6 bar / 15 bar
7	0…2.5 bar / 25 bar
8	0…4 bar / 25 bar
9	0…6 bar / 35 bar
A	0…10 bar / 35 bar
B	0…16 bar / 45 bar
T	0…20 bar / 45 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – 9 ■□ – ■

1	0.25% (p ≥ 0.6 bar)
2	0.5%

Output / Certificates

D ■■ – 9 ■■ – □

2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia G

** Ex or SIL versions are available on request.

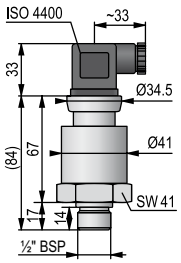
Available on request (must be specified in the text of the order)

PVDF process connection (only ½" BSP, p ≤ 10 bar)
EPDM sealing (max. 160 bar)
M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP68), PVC cable (–5 °C…+70 °C)
PVC cable add-on price per meter

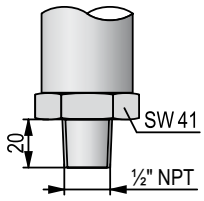
Accessories *** (sold separately)

PLK – 501 – 2	Plug-in display
PLK – 501 – 3	Plug-in display with PNP output

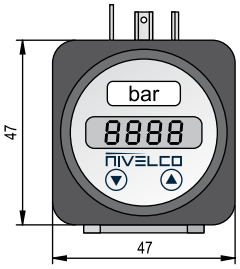
*** Only for 2-wire version and ISO 4400 connector.



D□C-9□□-□



D□H-9□□-□



PLK-501

NIV24
PLK-501-2

NIPRESS D-A00 — 5 years

2-wire compact pressure transmitter for absolute and gauge pressure measurement
Output: 4…20 mA + HART®, with LCD display, diaphragm: stainless steel flush and inner, measuring range: 0…600 bar

Measuring method / Temperature

D □■ – A ■ 4 – ■

R	Gauge / max. +125 °C
E	Absolute / max. +125 °C (p ≥ 1 bar)
H	Gauge / max. +150 °C
J	Gauge / max. +300 °C (p ≤ 70 bar, max. +200 °C permanent)

Process connection

D ■□ – A ■ 4 – ■

A	¼" BSP (max. +125 °C)
C	½" BSP (max. +125 °C)
H	½" NPT (max. +125 °C)
J	M20x1.5 (max. +125 °C)
E	1" BSP (0.25…400 bar)
S	1" NPT (p > 0.25 bar)
F	1½" BSP (max. 40 bar)
T	¾" TriClamp (4…8 bar)
L	1" TriClamp (0.25…16 bar)
M	1½" TriClamp (p ≤ 16 bar)
N	2" TriClamp (p ≤ 16 bar)
O	DN25 Pipe coupling (DIN 11851) 0.25…40 bar
P	DN40 Pipe coupling (DIN 11851) 0.25…40 bar
R	DN50 Pipe coupling (DIN 11851) 0.25…25 bar
I	DN25 / PN40 1.4404 flange (p ≤ 40 bar)
Q	DN50 / PN40 1.4404 flange (p ≤ 40 bar)
U	DN80 / PN16 1.4404 flange (p ≤ 16 bar)
K	DN100 / PN16 1.4404 flange (p ≤ 16 bar)
W	2" RF / 150 psi 1.4404 flange (p ≤ 10 bar)
Z	3" RF / 150 psi 1.4404 flange (p ≤ 10 bar)
V	VARIVENT® DN40 / 50 (p ≤ 25 bar)

Range / Overpressure*

D ■■ – A □ 4 – ■

3	0…0.4 bar / 2 bar
5	0…1 bar / 5 bar
S	0…2 bar / 10 bar
8	0…4 bar / 20 bar
A	0…10 bar / 40 bar
T	0…20 bar / 80 bar
D	0…40 bar / 105 bar
F	0…100 bar / 210 bar
U	0…200 bar / 600 bar
J	0…400 bar / 1000 bar
K	0…600 bar / 1000 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D ■■ – A ■□ – ■

4	0.1%

Output / Certificates

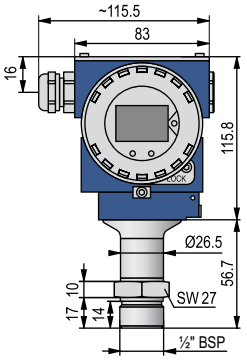
D ■■ – A ■ 4 – □

4		4…20 mA + HART®
8	**	4…20 mA + HART® / Ex ia G
B	**	4…20 mA + HART® / Ex d G (stainless steel housing not available)
E	**	4…20 mA + HART®, SIL 2 / Ex ia G
F	**	4…20 mA + HART®, SIL 2 / Ex d G (stainless steel housing not available)

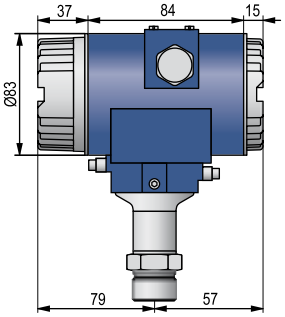
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

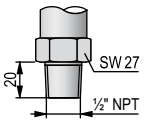
Filled with food compatible oil (max. +150 °C)
EPDM sealing
FFKM sealing (p ≤ 100 bar, max. +200 °C)
Hastelloy sensor (p ≥ 1 bar)
Tantalum sensor (p ≥ 1 bar, not available with the internal diaphragm version)
Stainless steel housing



D□C-A□4-□
front view



D□C-A□4-□
side view



D□H-A□4-□

NIPRESS D-B00 — 5 years

2-wire compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA + HART®, with LCD display, diaphragm: ceramic flush, measuring range: 0…20 bar

Measuring method

D □■ – B ■■ – ■

R	Gauge

Process connection

D R □ – B ■■ – ■

C	½" BSP
H	½" NPT
F	1½" BSP
P	DN40 Pipe coupling (DIN 11851)
R	DN50 Pipe coupling (DIN 11851)
I	DN25 / PN40 1.4404 flange
Q	DN50 / PN40 1.4404 flange
U	DN80 / PN16 1.4404 flange
W	2" RF / 150 psi 1.4404 flange (p ≤ 10 bar)
Z	3" RF / 150 psi 1.4404 flange (p ≤ 10 bar)

Range / Overpressure*

D R ■ – B □■ – ■

P	0…0.06 bar / 2 bar
R	0…0.16 bar / 4 bar
3	0…0.4 bar / 6 bar
5	0…1 bar / 8 bar
S	0…2 bar / 15 bar
I	0…5 bar / 25 bar
A	0…10 bar / 35 bar
T	0…20 bar / 45 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D R ■ – B ■□ – ■

4	**	0.1% (p ≥ 1 bar)
6		0.2% (p < 1 bar)
3		1% (only with PTFE-coated version)

** versions under 1 bar are available on request

Output / Certificates

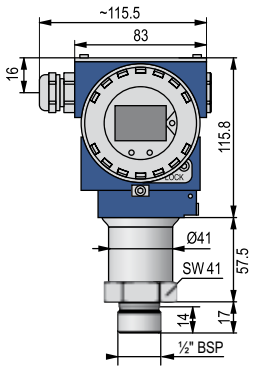
D R ■ – B ■■ – □

4		4…20 mA + HART®
8	***	4…20 mA + HART® / Ex ia G (min. 60 mbar range)
B	***	4…20 mA + HART® / Ex d G (stainless steel housing not available)

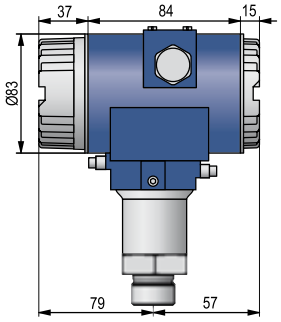
*** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

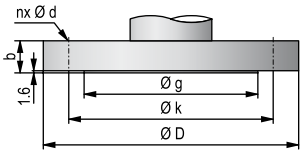
Stainless steel housing
PVDF process connection (only 1½" BSP)
PTFE sheeting on sensor (only with 1% accuracy, p ≥ 0.4 bar)
EPDM sealing



DRC-B□□-□
front view



DRC-B□□-□
side view



DRW-B□□-□ / DRZ-B□□-□

	2" / 150	3" / 150
D	152.4	190.5
g	91.9	127
k	120.7	152.4
b	19.1	23.9
n	4	
d	19.1	

NIPRESS D-C00 — 5 years

2 or 3-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: stainless steel, measuring range: 0…2200 bar

Measuring method

D ☐■ – C ■ 2 – ■

R	Gauge

Process connection

D R ☐ – C ■ 2 – ■

A	¼" BSP (EN 837, p ≤ 1000 bar)
C	½" BSP (EN 837, p ≤ 1000 bar)
J	M20x1.5 (inner thread)

Range / Overpressure*

D R ■ – C ☐ 2 – ■

K	0…600 bar** / 800 bar
L	0…1000 bar / 1400 bar
M	0…1600 bar / 2200 bar
N	0…2000 bar / 2800 bar
V	0…2200 bar / 2800 bar

* Custom measuring range, based on prior negotiations.
** Available only with BSP ½" process connection EN 837

Accuracy

D R ■ – C ■☐ – ■

2	0.5%

Output / Certificates

D R ■ – C ■ 2 – ☐

2		4…20 mA
3		0…10 V
6	***	4…20 mA / Ex ia G

*** Ex or SIL versions are available on request.

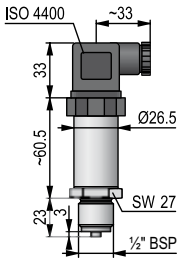
Available on request (must be specified in the text of the order)

M12x1 (4-pin) IP67 electrical connection, metal
Integrated cable version (IP67), PVC cable (–5 °C…+70 °C), with cable gland
PVC cable add-on price per meter

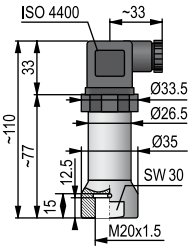
Accessories to order*****

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

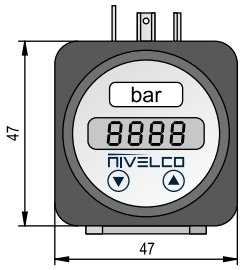
***** Only for 2-wire version and ISO 4400 connector.



DRC-C☐2-☐



DRJ-C☐2-☐



PLK-501

NIV24
PLK-501-2

NIPRESS differential pressure transmitters are available with different sensor technologies combined with compact stainless steel or cast aluminum or plastic housings. The wide variety of the product range can measure the pressure of numerous fluids and gases, monitor ventilation ducts, filters and fans in HVAC areas as well as measure the level in closed, pressurized tanks.

DD–200 series with a stainless steel *(optionally Hastelloy® C-276)* sensor is for 2-wire systems with HART® communication. The differential pressure transmitter's main application area is the process industry, and can be used in closed, pressurized tanks. The device also has an LCD display and operating module.

DD–200

DD–300 series with a stainless steel sensor can be pressurized on both sides with fluids or gases. The differential pressure transmitter measures the difference between the positive and negative side. Due to its compact size, it can be installed in tight spaces.

DD–400 series with two piezoresistive stainless steel sensors and with swiveling display. The process connection can be used for measuring the pressure difference between gases and fluids.

DD–600 family uses a silicon sensor, has various measuring ranges between 0…1 bar. It is a wall-mountabledesign, suitable for measuring dry, non-aggressive gases and compressed air. This device has short circuit protection and inverse polarity protection.

The NIPRESS DD–600 can be used for a wide range of different HVAC applications. Its robust design makes it excellent for laboratory and industrial use. The preferred areas of use are in heating, ventilation and air conditioning systems; clean rooms and medical technology, filter technology and draft-metering.

SPECIFICATIONS

- Relative or absolute pressure difference measurement
- –1…70 bar pressure range
- Piezoresistive or capacitive sensor
- Stainless steel, cast aluminum or plastic housing
- Optional swiveling display
- IP65, IP67
- 5 years warranty

APPLICATIONS

- Differential pressure measurement of gases, steam, and fluids
- Overpressure measurement
- Filter and vent controlling
- In tanks, pipes, and pressurized vessels
- HVAC, mechanical and plant engineering, oil- and gas industry, chemical industry, energy industry, food and beverage industry

Type		DD–200	DD–300	DD–400	DD–600
Measuring Range		0…20 bar	0…16 bar	0…70 bar	0…1 bar
Overload capability		As per order code			
Accuracy		0.1%; 0.075%	0.5%	2%	1% (p ≥ 6 mbar) 2% (p < 6 mbar)
Process temperature		–40…+100 °C (with silicone oil filling)	–25…+125 °C	–40…+125 °C	0…+50 °C
Ambient temperature		Without display: –40…+85 °C With display: –20…+65 °C	–25…+85 °C		0…+50 °C
Materials of the wetted parts	Sensor	Stainless steel (option: Hastelloy® C)	Stainless steel		Silicon
	Sensor seal	FKM (option: EPDM, PTFE)	FKM		–
	Process conn.	Stainless steel			Brass nickel plated
Housing		Cast aluminum	Aluminum, black anodized	PA 6.6 polycarbonate	ABS
Output		4…20 mA, HART®	2-wire: 4…20 mA, 3-wire: 0…10 V	3-wire: 4…20 mA	2-wire: 4…20 mA, 3-wire: 0…10 V / 0…20 mA
Supply voltage		Ex ia variant[1]: 12…28 V DC, Ex d variant[1]: 13…28 V DC	2-wire: 12…36 V DC, Ex ia variant[1]: 14…28 V DC, 3-wire: 14…36 V DC	24 V DC ±10%	2-wire: 11…32 V DC[2] 3-wire: 19…32 V DC[2]
Load resistance		Load during HART® communication: R_{min}: 250 Ω	2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω], 3-wire: R_{min} = 10 kΩ	500 Ω	2-wire: $R_{max}=[(U_{Supply} - U_{Supply\ min.})/0.02\ A]$, [Ω] 3-wire: R_{min} = 10 kΩ
Process connection		¼" NPT (inner tread)	As per order code		
Electrical connection		M20×1.5 (for cable Ø5…Ø14 mm)	ISO 4400	M12×1 /5	M12×1.5
Ingress protection		IP67	IP65		IP54
Electrical protection		Class III (SELV)			
Weight		~3.5 kg	~250 g	~350 g	~165 g

[1]*Ex or SIL versions are available only on request for custom price.*

[2]*With automatic zero adjustment: 24…32 V DC.*

NIPRESS DD-200 — 5 years

2-wire compact differential pressure transmitter for gauge pressure measurement, with dual-compartment housing
Output: 4…20 mA + HART®, with LCD display, diaphragm: stainless steel, measuring range: 0…20 bar

Measuring method

D ☐ G – 2 ■■ – ■

D	Differential

Process connection

D D ☐ – 2 ■■ – ■

G	¼" NPT (inner thread)

Range / Max. static pressure*

D D G – 2 ☐■ – ■

7	0…0.06 bar / 160 bar
D	0…0.4 bar / 160 bar
H	0…2.5 bar / 160 bar
M	0…20 bar / 160 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D D G – 2 ■☐ – ■

4	0.1%
7	0.075%

Output / Certificates

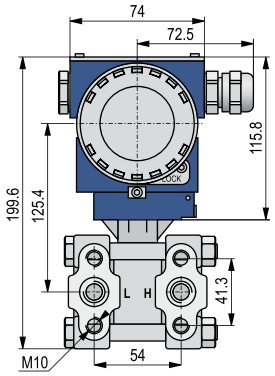
D D G – 2 ■■ – ☐

4		4…20 mA + HART®
8	**	4…20 mA + HART® / Ex ia G
B	**	4…20 mA + HART® / Ex d G

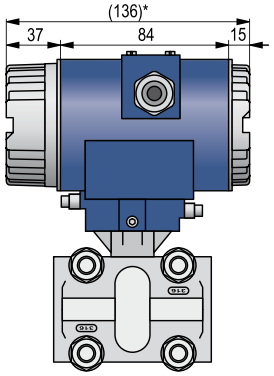
** Ex or SIL versions are available on request.

Available on request (must be specified in the text of the order)

EPDM sealing
PTFE sealing
Hastelloy C sensor
Special version up to 400 bar static pressure (p ≥ 0.4 bar)



DDG-2☐4-☐
front view



DDG-2☐4-☐
side view

** without display and operating modul the marked size is 19 mm less*

NIPRESS DD-300 — 5 years

2 or 3-wire mini compact differential pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, diaphragm: stainless steel, measuring range: 0…16 bar

Measuring method

D □■ – 3 ■■ – ■

D	Differential

Process connection

D D □ – 3 ■■ – ■

C	½" BSP
J	M20x1.5
O	7/16" UNF DIN 3866
A	¼" BSP (inner thread)

Range / Nominal pressure*

D D ■ – 3 □■ – ■

4	0…0.02 bar / 0.2 bar
6	0…0.04 bar / 0.4 bar
9	0…0.1 bar / 1 bar
B	0…0.2 bar / 1 bar
C	0…0.25 bar / 2.5 bar
D	0…0.4 bar / 2.5 bar
E	0…0.6 bar / 6 bar
F	0…1 bar / 6 bar
I	0…1.6 bar / 16 bar
H	0…2.5 bar / 16 bar
Q	0…4 bar / 16 bar
J	0…6 bar / 16 bar
T	0…10 bar / 16 bar
L	0…16 bar / 16 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D D ■ – 3 ■□ – ■

2	0.5% (available up to 1:5 DP/PN)
3	1%

Output / Certificates

D D ■ – 3 ■■ – □

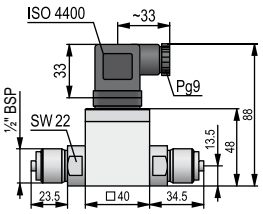
2		4…20 mA
3		0…10 V
6	**	4…20 mA / Ex ia

** Ex or SIL versions are available on request.

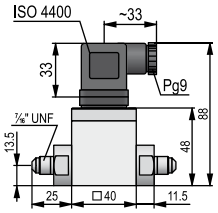
Accessories *** (sold separately)

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output

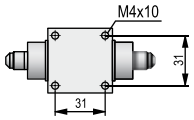
*** Only for 2-wire version and ISO 4400 connector.



DDC-3□2-□
front view



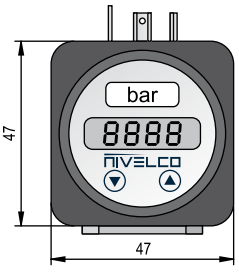
DDO-3□2-□
front view



DDO-3□2-□
bottom view

Differential pressure range, P_D [bar]	Nominal pressure, P_N (Max. static pressure, P_{max}) [bar]					
	0.2 (0.5)	0.4 (1)	1 (3)	2.5 (6)	6 (20)	16 (60)
0…0.02	±1%					
0…0.04	±1%	±1%				
0…0.1	±0.5%	±1%	±1%			
0…0.2	±0.5%	±0.5%	±1%	±1%		
0…0.25		±0.5%	±1%	±1%		
0…0.4		±0.5%	±1%	±0.5%		
0…0.6			±0.5%	±0.5%	±1%	
0…1.0			±0.5%	±0.5%	±1%	
0…1.6				±0.5%	±0.5%	
0…2.5					±0.5%	±1%
0…4					±0.5%	±0.5%
0…6					±0.5%	±0.5%
0…10						±0.5%
0…16						±0.5%

Accuracy, p > 1 bar:	±0.5%, or 1/5 ≤ p_D/p ≤ 1/1
	±1%, or 1/10 ≤ p_D/p ≤ 1/5
Accuracy, p ≤ 1 bar:	±0,5%, or 1/2 ≤ p_D/p ≤ 1/1
	±1%, or 1/10 ≤ p_D/p ≤ 1/2



PLK-501

NIV24
PLK-501-2

NIPRESS DD-400 — 5 years

3-wire mini compact differential pressure transmitter for gauge pressure measurement
Output: 4…20 mA + PNP transistor output, with LCD display, diaphragm: stainless steel, measuring range: 0…70 bar

Measuring method

D ☐ ■ – 4 ■ 5 – 2

D	Differential

Process connection

D D ☐ – 4 ■ 5 – 2

A	¼" BSP
C	½" BSP
G	¼" NPT
H	½" NPT

Range / Max. static pressure*

D D ■ – 4 ☐ 5 – 2

F	0…0.1 bar …1 bar adjustable / 7 bar
G	0…0.2 bar …2 bar adjustable / 20 bar
O	0…0.35 bar …3.5 bar adjustable / 35 bar
K	0…0.7 bar …7 bar adjustable / 70 bar
M	0…2 bar …20 bar adjustable / 70 bar
N	0…3.5 bar …35 bar adjustable / 70 bar
P	0…7 bar …70 bar adjustable / 70 bar

* Custom measuring range, based on prior negotiations.

Accuracy

D D ■ – 4 ■ ☐ – 2

5	2%

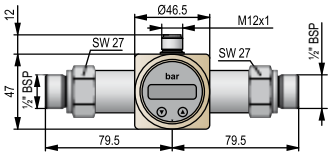
Output

D D ■ – 4 ■ 5 – ☐

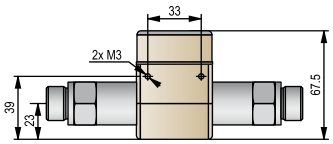
2	4…20 mA

Available on request (must be specified in the text of the order)

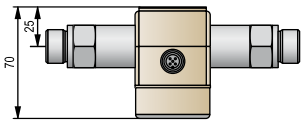
Second PNP switching output



DDC-4☐3-☐
front view



DDC-4☐3-☐
bottom view



DDC-4☐3-☐
plan view

NIPRESS DD-600 — 5 years

2 or 3-wire wall-mountable differential pressure transmitter for gauge pressure measurement
Output: 4…20 mA or 0…10 V, silicon sensor element, measuring range: 0…1000 mbar

Measuring method

D □■ – 6 ■■ – ■

D	Differential

Process connection

D D □ – 6 ■■ – ■

P	Ø6.6 x 11, for Ø6 flexible tube
R	Ø4.45 x 10, for Ø4 flexible tube

Range / Overpressure*

D D ■ – 6 □■ – ■

R	0...1.6 mbar / 200 mbar
S	0...4 mbar / 200 mbar
2	0...10 mbar / 200 mbar
6	0...40 mbar / 345 mbar
C	0...250 mbar / 1000 mbar
F	0...1000 mbar / 3000 mbar

* Custom measuring range, based on prior negotiations.

Accuracy

D D ■ – 6 ■□ – ■

3	1% (p ≥ 6 mbar)
5	2% (p < 6 mbar)

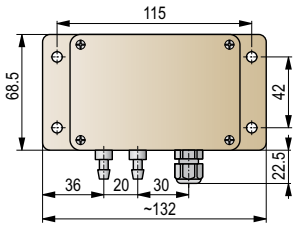
Output / Certificates

D D ■ – 6 ■■ – □

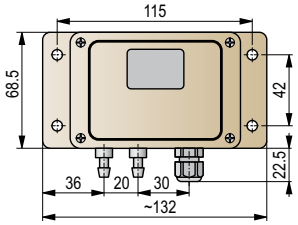
2	4...20 mA
3	0...10 V

Available on request (must be specified in the text of the order)

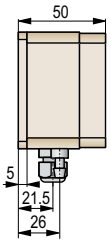
LCD display
2x switching outputs (2-wire system: PNP; 3-wire system: relay; only with LCD display version)
Automatic zero adjustment
Square root extraction function for flow measurement (only with LCD display version)



DD□-6□□-□
front view



DD□-6□□-□
with display



DD□-6□□-□
side view


4.496
bar


bar
4440
NIVELCO
HIDRA
ON
OFF

SIGNAL PROCESSING UNITS

Integrating **NIVELCO's** wide range of level-measuring instruments into process control systems requires intelligent and versatile signal processing and control devices.

When we designed our devices, we maximized the compatibility with our transmitters and sensors. With our signal processing units and controllers, our customers can create complete industrial measuring and process control systems using only **NIVELCO** instruments.

Our process-controlling devices are sold under the name of **MultiCONT** and **UNICONT PM**.

MultiCONT
MULTICHANNEL PROCESS CONTROLLER

page 239

- Programmer, display and controller for transmitters with HART® protocol
- 1 to 15 input channels
- 4…20 mA, HART®, RS485 output
- Datalogger function
- SD card slot
- Expandable with interface modules
- Highly informative dot-matrix display
- Ex ia intrinsically safe variants

UNICONT PM
UNIVERSAL CONTROLLER

NEW

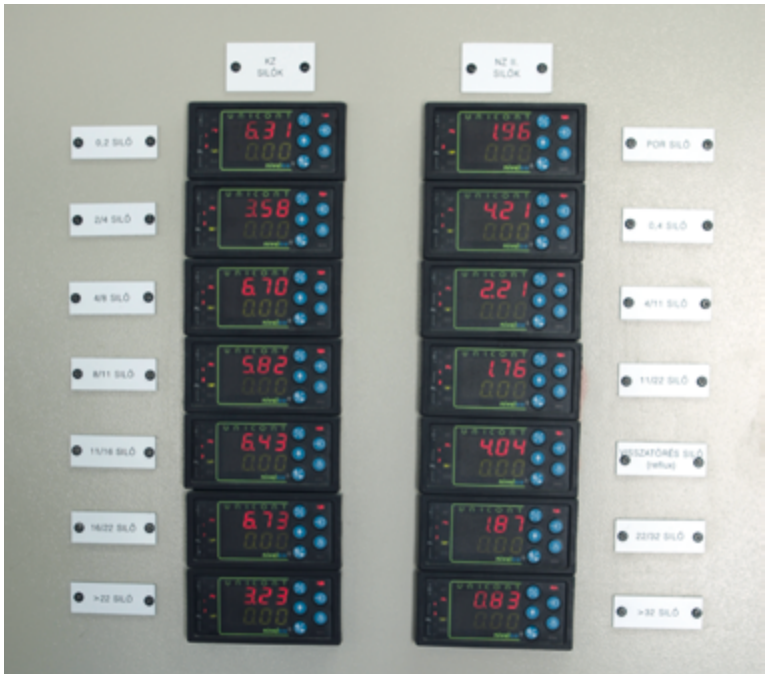
page 242

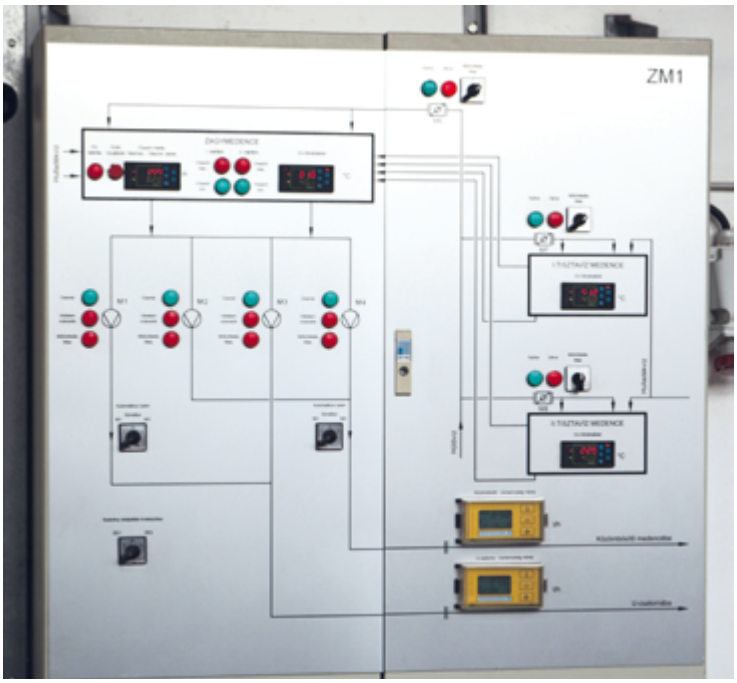
- Dual-line, 7 segment, 4-digit LED display
- Wide range of resistance thermometers (Pt, JPt, Cu)
- 0…20 mA, 4…20 mA or 0…10 V input
- Up to 3 power relays
- ON-OFF, PD or PID control
- Auto tuning
- Heating / cooling control
- Current transformer (CT) input

UNICONT PSW
UNIVERSAL PUMP CONTROL SYSTEM

page 246

- Low-cost automatic pump control system
- Ultrasonic level measurement
- 0.4…3 m measuring range
- Programmable pump cycling
- Controlling of one-phase pumps
- Incorporated circuit breaker
- IP68 protected sensor




ZM1


MultiCONT
MultiCONT
MultiCONT


W1
W2
W3
C1
C2
C3

The **MultiCONT** unit is a universal interface between **NIVELCO's** HART®-capable intelligent level transmitters and other elements of the process control systems like the PCs, PLCs, displays and actuators. Besides its role as an interface, the **MultiCONT** can power the 2-wire transmitters while handling of complex control tasks. The large LCD or OLED dot-matrix display is comprehensive and informative. As a special feature, it can display the echo map when the MultiCONT works with an EchoTREK, PiloTREK, MicroTREK, or EasyTREK transmitter. The **MultiCONT** supports communication with a maximum of 15 standard HART®-capable 2 and 4-wire NIVELCO transmitters or four Ex ia HART®-capable 2-wire NIVELCO transmitters. If a **MultiCONT** is used with **NIVELCO's MicroTREK** or **PiloTREK** microwave level transmitters, the maximum number of transmitters in a loop cannot exceed 6 for normal transmitters and 2 for Ex-certifited transmitters. If the number of transmitters in a system exceeds the number of transmitters a **MultiCONT** can handle, other **MultiCONT** units can be added to the system via RS485. The transmitters can be programmed remotely, and their parameters and the measured data can also be downloaded using a **MultiCONT**. Outputs, such as the 4…20 mA, relays, and digital outputs can be controlled using measured and calculated values.

The internal current outputs *(up to 2)* of the **MultiCONT** can transmit and even modify the information supplied by the transmitters. The built-in relays *(up to 5)* can be freely programmed and assigned to the transmitters. The large LCD or OLED dot-matrix display handles a wide range of informative display functions. One notable feature is the "Echo-Map "visualization when communicating with NIVELCO's **EchoTREK** and **EasyTREK** transmitters.

FEATURES

- Provides a flexible solution to commissioning process control systems containing HART®-based intelligent *(level, temperature or pressure)* transmitters
- Galvanically isolated 4…20 mA outputs for transmitters
- Depending on the type of the transmitters, 1 to 15 *(standard)* or 1 to 4 *(Ex ia)* channels
- Highly informative large LCD or OLED display
- Ex ia variant
- Simple 6-button programming
- Trend logging in internal memory or SD memory card
- USB connector for downloading data from internal FLASH memory
- Universal interface module expansion via RS485
- "Echo-Map" for EchoTREK, PiloTREK, MicroTREK and EasyTREK ultrasonic transmitters

PRN–200

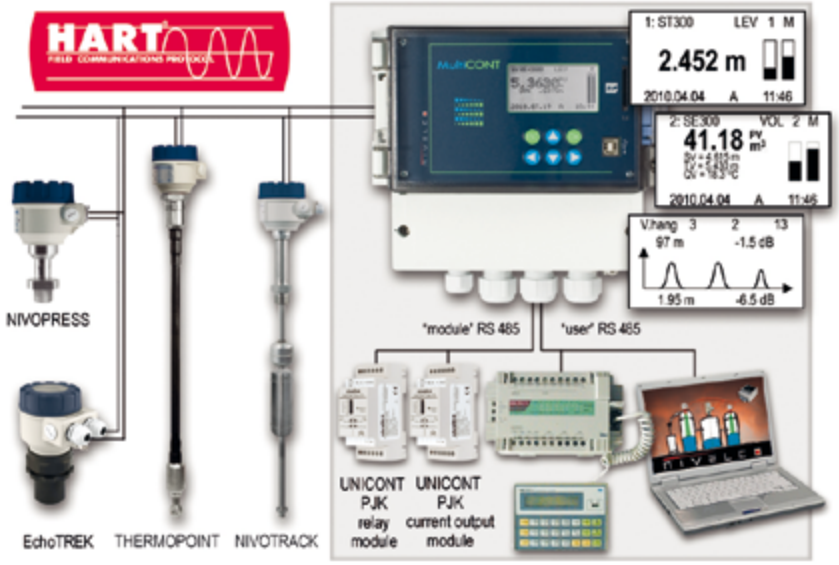
APPLICATIONS

- Remote programming, displaying of transmitters data
- Power supply for 2-wire transmitters
- Process controller for HART®-capable transmitters
- Displaying measured data in numerical and bargraph mode
- Data transmission via RS485 *(via HART® or Modbus protocol)*
- Simple data-logging function
- Trend or flow-measurement logging

CERTIFICATES

- ATEX [Ex ia G]
- ATEX [Ex ia D]
- IEC Ex [Ex ia G]
- INMETRO [Ex ia G]
- UKCA Ex [Ex ia G]

A TYPICAL NETWORK CONTROLLED BY A MultiCONT



TECHNICAL DATA

MultiCONT P□□–2□□–□		
Power supply / power consumption / max. supply voltage		85…255 V AC 50…60 Hz / 12 VA / 255 V_{eff} ; 11.4…28 V AC 50…60 Hz / 12 VA / 28 V_{eff} ; 11.4…40 V DC / 11 W / 40 V DC
Supply voltage for transmitters		30 V DC / 60 mA (Ex variant: 25 V DC / 22 mA)
Graphic display		128 × 64 dot-matrix (LCD / OLED)(1)
Relay		Max. 5, SPDT 250 V AC, AC1, 5 A
Analog output		Max. 2, galvanically isolated 4…20 mA, max. load: 500 Ω, with overvoltage protection
Number of powered transmitters		Max. 15× standard, or max. 4× Ex
RS485 interface	"user"	Galvanically isolated, HART® and Modbus protocol
	"module"	Galvanically isolated, HART® protocol
Logger unit		Capacity: flash = 65 000 entries; SD card = depending on card size (max. 32 GB)
Housing material		Polycarbonate (PC)
Mounting		Wall-mountable
Ambient temperature		–20…+50 °C
Ingress protection		IP65
Electrical protection		Class I / III
Weight		900 g
Ex information		
Ex marking	ATEX	Ⓔx II (1) G [Ex ia Ga] IIB, Ⓔx II (1) D [Ex ia Da] IIIC
	IEC Ex(1)	[Ex ia Ga] IIB
Intrinsic safety data		U_o = 30 V; I_o = 140 mA; P_o = 1 W; L_o = 4 mH; C_o = 200 nF; U_m = 253 V
Supply voltage for transmitters		25 V DC / 22 mA
Ambient temperature		–20…+50 °C

(1) *In the case of OLED, the lifetime of the display depends on the way the user applies the screen saver function and hence it is not covered by the warranty.*

SPECIAL FEATURES

Trend logging *(optional)*

MultiCONT versions with an on-board logger can store the measured values and three additional parameters of the transmitters to the system into the internal flash memory or an SD memory card. There are two logging modes, time-controlled and event-controlled. Monitoring the average, minimum, and maximum value or highest flow values can be used only with NIVELCO transmitters in flow-metering mode. The content of the internal memory is retrievable through USB, within the capacity of 65 000 entries. The unit can handle SD cards up to 32 GB capacity.

NIVISION *(optional)* Process Visualization Software

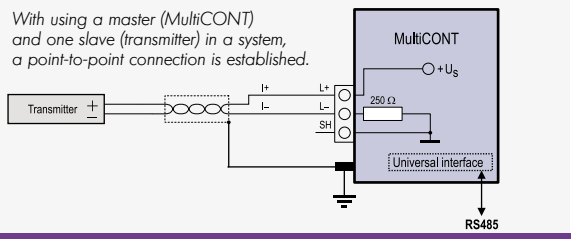
RS485-capable versions of the **MultiCONT** can communicate with NIVELCO's **NIVISION** process visualization software to graphically indicate parameters of process control systems on a PC. The process, the measured values, or any calculated values can be visualized in tables with **NIVISION**. **NIVISION** performs data logging, trend monitoring, database handling, and various other tasks in addition to basic visualization. The software is sold as a custom-tailored product.

OUTPUT TYPES

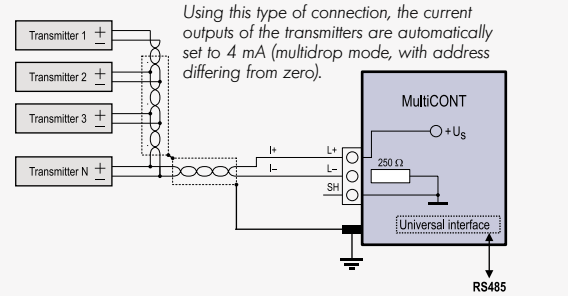
Outputs	Display only (without relay)	Number of relays				
		1	2	3	4	5
Only display (w. o. RS485 or current output)	■	■	■	■	■	■
RS485 Interface	■	■	■	■	■	■
1× 4…20 mA output	■	■	■	■	■	
2× 4…20 mA output	■	■	■	■	■	
RS485 + 1× 4…20 mA analog output	■	■	■	■	■	
RS485 + 2× 4…20 mA analog outputs	■	■	■	■	■	

COMMUNICATION BETWEEN MultiCONT & TRANSMITTERS

Point-To-Point connection



Multi-point connection (Multidrop). Multiple slaves connected in parallel



SYSTEM SET-UP

There is a Master-Slave relation between **MultiCONT** and the connected transmitters. Through the **MultiCONT** the transmitters can be programmed or their parameters checked and modified. Reading the process values of the transmitters is easy to do by the **MultiCONT**. In case of using **MultiCONT** with multiple transmitters, the units should be addressed with numbers *(Short address)* differing from zero. Using two transmitters with the same Short address is not possible. **MultiCONT** can handle a number of max. 15 transmitters with HART® communication. When using 2-wire transmitters, the current output of the transmitters will be limited to 4 mA, because of the capacity of the **MultiCONT's** power supply, which is rated at 60 mA with standard transmitters.

MultiCONT P-200 — 5 years

Wall-mountable universal multichannel process controller unit to remote program and read all NIVELCO transmitters featuring HART® communication, expandable with relay and current output modules

Type

P □■ – 2 ■■ – ■

E	Standard, non expandable
R	Expandable (with universal interface module)

Version / Display

P ■□ – 2 ■■ – ■

W	IP65 Enclosure / LCD
A	IP20 Enclosure / logger / LCD
C	IP65 Enclosure, transparent cover / LCD
D	IP65 Enclosure, transparent cover, logger / LCD
L	IP65 Enclosure / OLED
K	IP65 Enclosure, transparent cover / OLED
N	IP65 Enclosure, transparent cover, logger / OLED

Input

P ■■ – 2 □■ – ■

1	Single channel for one unit
2	2 channels for up to 2 units
4	4 channels for up to 4 units
8	8 channels for up to 8 units
M	15 channels for up to 15 units

Output**

P ■■ – 2 ■□ – ■

0	Display
1	Display and 1 relay
2	Display and 2 relays
3	Display and 3 relays
4	Display and 4 relays
5	Display and 1 relay and 1 current output
6	Display and 2 relays and 1 current output
7	Display and 3 relays and 1 current output
8	Display and 4 relays and 1 current output
9	Display and 4 relays and 2 current outputs
A	Display and RS485
B	Display, RS485 and 1 current output
C	Display, RS485, 1 current output and 2 relays
D	Display and 5 relays
E	Display, RS485 and 5 relays
R	Display, RS485, 1 current output and 1 relay
W	Display, RS485, 2 current outputs and 2 relays
Y	Display, RS485, 2 current output and 4 relays

** Other output configurations on request

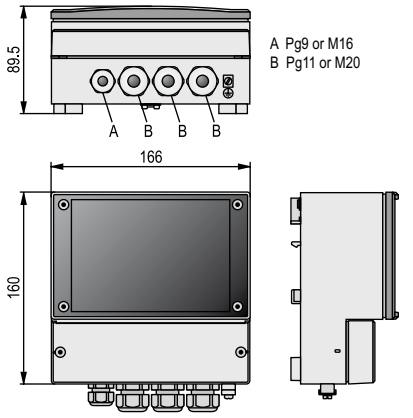
Power supply / Certificates

P ■■ – 2 ■■ – □

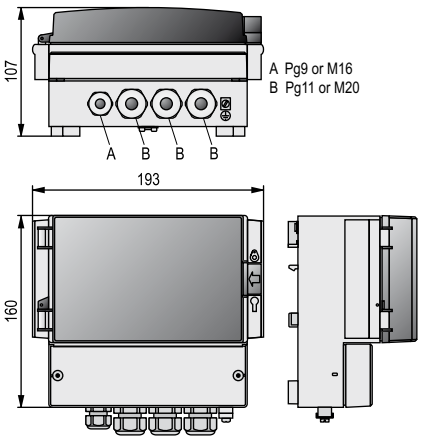
1	85…255 V AC
2	11.4…28 V AC and 11.4…40 V DC
5	85…255 V AC / [Ex ia G/D] (max. 4 channels)
6	11.4…28 V AC and 11.4…40 V DC / [Ex ia G/D] (max. 4 channels)

Check relevant page for the prices of UNICONT PJK

Need of IEC Ex is to be requested in the text part of the order



PEW-2□□



PEC-2□□

The **UNICONT PMM–300** is a universal, one or two-channel process controller with relay and analog outputs and a PID algorithm supporting versatile functions. It can be used from standard to extraordinary temperature control *(cooling, heating)* tasks. Besides the usual inputs, practically all generally used temperature sensors can be connected. Due to its auto-tuning feature, the controller can be successfully handled by technicians unaccustomed to process control. The 4-digit displays allow viewing even from greater distances.

The **UNICONT PMM–300** is highly accurate and easy to handle, thus suitable for applications as a panel instrument both in laboratories and industrial process control.

FEATURES

- Programmable inputs
- 4-digit LED display
- Heavy-duty relay contacts or analog output
- 4…20 mA output
- ON/OFF, PD or PID control algorithm
- Auto-tuning feature
- Relay outputs up to 4
- 32-point linearization
- Window comparator differential metering

APPLICATIONS

- Temperature display
- Switching, control or transmitting tasks
- Power valve control
- Sequence control
- Dual-channel display

PMM–300

TECHNICAL DATA

		PMM–300	
Universal Inputs	Thermocouples	K, J, T, E, L, U, N, R, S, B, M, A, C	
	Resistive thermal devices (RTD)	Pt100, JPt100, Pt500, JPt500, Pt1000, JPt1000, Cu100, Ni100, KTY81	
	Current	4…20 mA, 0…20 mA	
	Voltage	–5+20 mV, 0…100 mV, 0…500 mV	
	Resistance	0…500 Ω, 0…2000 Ω	
	Current input	10 Ω, Voltage input > 10 MΩ	
Output	Control relays (2×)	SPDT 250 V AC 5 A AC11	
	Alarm relays (2×)	SPST (NO/NC programmable) 30 V DC / 250 V AC 3 A AC11	
	Solid-state relay (SSR) drivers (2×)	12 V DC, 15 mA	
	Current outputs (2×)	0/4…20 mA DC (max. load: 600 Ω), galvanically isolated short circuit protected, programmable	
	Power Supply for transmitters	24 V DC, 100 mA, shot circuit protected	
	RS485 Modbus	Bit rate: 600…38,400 bps selectable, device address: 0…254 programmable	
Control	Features	Setting time	Setting unit
	Proportional band (P)	0…409.5%	0.1%
	Integral time (I)	0…4095 s	1 s
	Derivate time (D)	0…4095 s	1 s
	Cycle time(T)	0…255 s	1 s
	Dead band	0…255	in PV resolution
	Hysteresis		
Display		PV (upper display), red, 4-digits, 7 segments, digit height: 10 mm SV (lower display), green, 4-digits, 7 segments, digit height: 10 mm	
Programming PV		Digital, by front panel keys	
Accuracy of setting and displaying		±0.2%FS ±1 digit	
Sensor wire-break alarm		"Er 11." on SV display (only if the controller is on)	
Cold junction compensation		External temperature sensor to be connected to terminal block. The function can be disabled	
Wire resistance compensation		3-wire, automatic	
Ambient humidity		Up to 85% (relative) non-condensing	
Ambient temperature		Operational: 0…+55 °C, storage: –20…+60 °C	
Supply voltage		85…265 V AC, 50/60 Hz, 8 VA, 120 V 375 V DC 8 VA 16…32 V DC, 8 W, 13…30 V AC, 8 VA	
Electrical connection		Plug-in terminal blocks (recommended wire cross section: 0.5…2.5 mm²)	
Electrical protection		Class II	
Ingress protection		Front: IP54, back: IP20	
Memory protection		Data stored in EEPROM	
Dimensions		101.5 × 48 × 156 mm	
Weight		300 g	

UNICONT PMM-300 — 3 years

Universal panel controller and display unit with 4…20 mA analog, relay, RS485, Usupply
Universal inputs, PID control algorithm, auto tuning (AT) function, size: 96 x 48 mm

Version

P M □ – 3 ■■ – ■

M	Standard

Input

P M M – 3 □■ – ■

1	1× universal input (IN1)
2	2× universal inputs (IN1, IN2)
3	1× universal input (IN1) + linearization
4	2× universal inputs (IN1, IN2) + linearization

Output

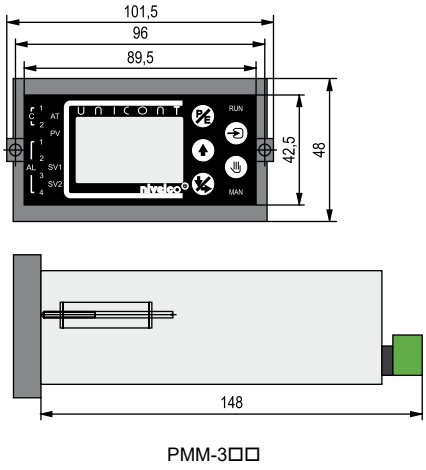
P M M – 3 ■□ – ■

1	2× relays (C1, C2), Iout 1
2	2× relays (C1, C2), Iout 1, Usupply / Iout 2
3	4× relays (C1, C2, AL3, AL4), Iout 1
4	4× relays (C1, C2, AL3, AL4), Iout 1, Usupply / Iout 2, RS485

Supply voltage

P M M – 3 ■■ – □

1	85…265 V AC, 120…375 V DC
2	24 V AC/DC



PMM-3□□

NIV24
PMM-311-1
PMM-312-1
PMM-313-1

The **UNICONT PMG–500** series universal controllers are 1/16 DIN *(48 × 48 mm)* process controllers with relay and analog outputs or a PID algorithm supporting versatile functions. The universal analog PID-controllers can be used with widespread RTD *(Pt, JPt, Cu)* resistance thermometers and different thermocouples for temperature measurement, control, and processing the signals of transmitters with 0…20 mA, 4…20 mA, and 0…10 V DC, 0…5 V DC, 1…5 V DC, 0…100 mV DC output. The controller's output signal can be a relay, continuous 4…20 mA process current signal, or SSR-driver. An additional alarm relay provides for limit monitoring. The unit is microprocessor-based, has auto-tuning software, and its PID controller can find the optimal PID constants. The PMG–500 series are capable of RS485 communication and has an input for receiving the output signal of a current transformer (CT). The sizeable two-tone display can be read easily, even from far away.

PMG–500

FEATURES

- Universal input
- 4…20 mA output, relay outputs
- SSR driver output
- RS485 communication
- ON-OFF and PID control
- Auto tuning (AT) feature
- Current transformer (CT) input
- 48 × 48 mm front panel

APPLICATIONS

- Temperature display
- Switching, control tasks
- Simultaneous cooling / heating control
- For automated manufacturing processes
- Alarm indication

TECHNICAL DATA

			NEW PMG–51☐
Input	RTDs (3-wire, automatic wire-resistance comp.)		DPt100, DPt50, JPt100 (–199.9…+650 °C), Cu100, Cu50 (–199.9…+200 °C), Ni120 (–80…+200 °C)
	Thermocouples (automatic cold junction compensation)		K (–200…+1350 °C); J (–200…+800 °C); E (–200…+800 °C)
			T (–200…+400 °C); B (0…+1800 °C); R (0…+1750 °C)
			S (0…+1750 °C); N (–200…+1300 °C); C (0…+2300 °C)
			G (0…+2300 °C); L (–200…+900 °C); U (–200…+400 °C); Platinel II (0…+1390 °C)
	Voltage		0…10 V DC; 0…5 V DC; 1…5 V DC, 0…100 mV DC
	Current		0…20 mA DC; 4…20 mA DC
	Current transformer (CT)		0.0…50.0 mA (1/1000 CT: 0.0…50.0 A)
Output	PID	Proportional band (P)	0.1…999.9 °C / °F (%)
		Integral time (I)	0…9999 s
		Derivate time (D)	
		Cycle time(T)	Relay, SSR output: 0.1…120.0 s. Optional current or SSR output: 1.0…120.0 s
	Type of output	Relay	250 V AC 3 A AC1, closing contact
		SSR driver	11 V DC ±2 V, max. 20 mA
		Current	DC 0…20 mA or 4…20 mA (max. load: 500 Ω)
	RS485		Modbus RTU
Alarm output			1× SPST (NO/NC programmable) 250 V AC, 3 A 1a, AC1
Accuracy of setting & displaying			±0.3% ±1 digit of full range or ±3 °C
Display	PV (primary value)		Red, 4-digits, 7 segments; digit height: 14 mm
	SV (secondary value)		Green, 4-digits, 7 segments; digit height: 10 mm
Supply voltage			100…240 V AC 50/60 Hz, max. 8 VA, operational voltage 90…110%
Ingress protection			Front: IP54, back: IP20
Electrical protection			Class II
Ambient temperature			Operational: –10…+50 °C, storage: –20…+60 °C
Ambient humidity			35…85% (relative) non-condensing
Dimensions			48 × 48 × 70.5 mm (front panel cut-out: $45^{+0.5}$ × $45^{+0.5}$ mm)
Weight			105 g

UNICONT PMG-500 — 3 years

Universal panel controller and display unit with 4…20 mA analog, relay, SSR output
1 universal input, PID and ON/OFF control, size: 48 x 48 mm

Output

P M G – 5 1 □ – ■

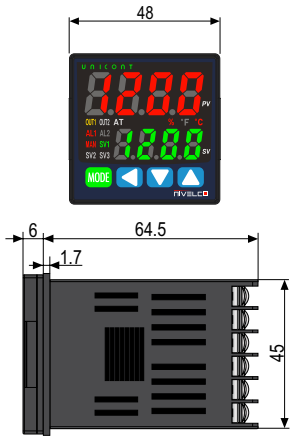
1	3× relays (R1, R2, AL1), Iout (input current repeater function)
2	2× relays (R1, AL1), 1× solid-state driver / 4…20 mA (control current output)
3	2× relays (R1, AL1), 1× solid-state driver / 4…20 mA (control current output), RS485
4	1× SSR, 1× SSR / 4…20 mA (control current output), AL1 relay (24 V version not available)

P M G – 5 1 ■ – □

1	100…240 V AC
2	24 V AC / 24…48 V DC

Accessories to order

P A M – 5 0 0 – 0	Front panel adapter from 96 x 48 mm to 48 x 48 mm anodized aluminum



PMG–51□

NIV24
PMG–512–1
PMG–513–2

The low-cost **UNICONT PSW** pump control unit is designed for fully automatic level control of small domestic or communal sewage shafts, sumps, or wet wells. An IP68 protected ultrasonic level transmitter performs continuous level measurement and delivers 4…20 mA level data to the **UNICONT PSW** unit featuring a user-programmable controller. This controller featuring relay output incorporated in the **UNICONT PSW** directly controls the single-phase pump acting in the sump, well, etc. The current controlled switch operates in differential level switch mode as default; the low and high levels are programmable. With the help of an optional programmable timer, automatic pump cycling can be performed to prevent jamming of the pump in case of long idle periods. This function is helpful in case of infrequent usage or low water consumption. If safety is a priority, the optional **NIVOFLOAT NLP** float level switches may be used for additional dry-run or overfill protection. A single-pole Miniature Circuit Breaker or a Motor Protection Switch can be turned on or off.

FEATURES

- Reasonable price
- Maintenance-free
- Fully automatic pump control
- Ultrasonic level measurement
- 0.3…3 m measuring range
- Programmable pump cycling
- IP68 / IP65
- Optional dry-run or overfill protection

APPLICATIONS

- Domestic sewage shafts, wetwells
- Sumps
- Tanks, flood storage
- Drainage sumps, pools

TECHNICAL DATA

PSW–1□□–1		
Supply voltage		230 V AC ±10%
Protection	Miniature Circuit Breaker	CLS 4-C10 / 2 10 A bipolar
	Motor Protection Switch	Z-MS2P-10 6.3…10 A
Output		1…1 piece of NO relay, 250 V AC, 8 A, AC1
Functions	Automatic pump out control [1]	Field programmable high level (Pump ON) and low level (Pump OFF)
	Timed pump cycling	10 s…100 days
	Overfill protection, fail-safe indication	Float switch [2]
Control unit	Electrical connection	4 plastic cable glands, terminal: max. 4 mm² wire cross section
	Electrical protection	Class I
	Mechanical connection	Wall-mountable
	Ingress protection	IP65
	Ambient temperature	–25…+45 °C
	Weight	~2 kg
Level transmitter	Range	0.3…3 m
	Operating principle	Ultrasonic
	Housing material	PP
	Medium tempereature	–25…+60 °C
	Process connection	1" BSP
	Cable	3 m shielded, PVC insulation
	Supply voltage	24 V DC
	Ingress protection	IP68

[1] Programmed by the manufacturer; can be modified freely in 0.4…3 m range
[2] Accessory, sold separately

SIGNAL PROCESSING UNITS

UNICONT PSW-100 — 5 years

Ultrasonic wall-mountable pump control unit with measuring range: 0.4…3 m
Functions: automatic pump out control, timed pump cycling, optional motor protection

Timer function

P S W – 1 □ ■ – ■

0	Without
1	With

Short circuit protection

P S W – 1 ■ □ – ■

1	Circuit breaker
2	Motor protection switch

Supply voltage

P S W – 1 ■ ■ – □

1	230 V AC
2	110 V AC
4	24 V AC/DC

Optional: NIVOFLOAT for overfill protection as an expansion of the pump control system
See NIVOFLOAT float level switches for further information

Cable

Max. length 30 m; sold by the meter over the standard 3 m

Ultrasonic transmitter

Control unit

SYSTEM COMPONENTS

The broad product portfolio of NIVELCO requires many types of system accessory components. These devices facilitate the integration of NIVELCO's level instruments to process control systems. The system component range consists of universal displays, loop displays, interface, and other expansion modules, time relays, etc.

The **UNICONT PGK** Intrinsic safety-isolator power supply modules provide intrinsically safe power for 2-wire transmitters operating in hazardous locations and ensure galvanic isolation between input and output. The special feature of the unit is its high accuracy signal conversion.

The **UNICOMM SAK–305** communication modules communicate between HART®-capable field transmitters and process controller PCs or PLCs via USB or RS485.

UNICONT PJK
UNIVERSAL INTERFACE MODULE

page 250

- MultiCONT expansion module
- RS485 communication
- Output variations:
  – 2× current outputs
  – 2× relay outputs (250 V AC, 8 A)
  – 1× current output and 1× relay
- DIN-rail-mountable
- Provides galvanic isolation
- Level controlling and limit level indication

UNICONT PKK
CURRENT CONTROLLED SWITCH

page 251

- 4…20 mA input
- DIN-rail-mountable
- Can power 2-wire transmitter
- Galvanic isolation
- Power relay (SPDT) output
- Switching amplifier for vibrating forks
- Wire monitoring
- Ex ia intrinsically models

UNICONT PDF / PLK
LOOP DISPLAYS

page 253

- 4…20 mA loop operated
- Operation without external power supply
- 6-digit plug-in LCD display
- 20 mm digit height
- Universal field display for any transmitters
- 4…20 mA / HART® converter version
- Flameproof stainless steel housing
- Explosion-proof models

UNICONT PGK
INTRINSICALLY SAFE ISOLATOR / POWER SUPPLY MODULES

page 256

- Isolated power supply for intrinsically safe transmitters
- For transmitters operating in hazardous applications
- 4…20 mA, HART® communication
- For high-precision transmitters
- Up to 5 ms response time
- Up to 1 µA transmission accuracy
- DIN-rail-mountable
- Ex ia intrinsically models

NIPOWER
SWITCHING-MODE POWER SUPPLY MODULE

page 257

- Output voltage: 12 / 24 V DC
- Output current: 2000 mA / 1250 mA
- Stabilized DC output
- Switching-mode power supply
- Short-circuit protection
- Overload, overvoltage, overcurrent protection
- DIN-rail-mountable

UNICOMM
HART® MODEM

page 259

- HART®–USB/RS485 modem
- DIN-rail-mountable version
- Test clip connector version
- No need for power supply
- Galvanic isolation
- Ex ia intrinsically models

NITIME
TIME RELAY

page 258

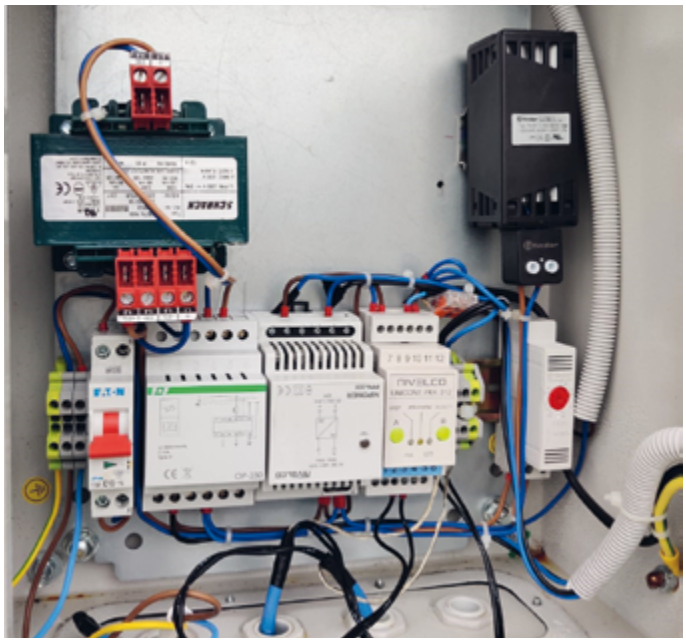
- 2 and 10 function types
- Wide time range: from 0.1 s…100 days
- Small size
- Universal supply voltage
- DIN-rail-mountable
- Relay output

NIFLANGE
MOUNTING FLANGES

page 262

- Complies with DIN, ANSI, and JIS standards
- Materials:
  - Carbon steel
  - Carbon steel + PTFE
  - 1.4571 stainless steel
  - Polypropylene
- Size: DN20…DN300
- High-pressure resistance
- BSP, NPT, M20x1.5, process connection
- Welded variant

APPLICATIONS



The **UNICONT PJK** series is a universal interface module that can be controlled via RS485 and *(depending on the type)* provides relay(s) and/or 4…20 mA current output(s). The DIP switch on the front panel of the module is for setting the address. The Universal Interface Modules can be widely-used as a part of the following applications:

- Expanding MultiCONT multichannel process controller with relays or current outputs
- Peripheral unit of PLC process control systems
- Peripheral unit of PC automated process control systems

The **UNICONT PJK–100** universal interface modules provide an essential solution if the number of relays or current outputs of the **MultiCONT** is not enough in a system. The device can also be used as a peripheral unit for PLC or PC-controlled process control systems communicating via Modbus RTU protocol. The number of relays in the **UNICONT PJK–100** extension modules and the **MultiCONT** together must not exceed 64, and the number of analog outputs *(4…20 mA)* must not exceed 16. There is a special module with both relay and current output in the variety of the **UNICONT PJK–100** series. The maximum number of these modules is 32. The programming of the **UNICONT PJK** modules can be done via HART® or Modbus protocol with the help of the central unit of the communication network, which can be a process control computer or a **MultiCONT** device. The switches in the front panel of the module are only for setting the address.

PJK–102

FEATURES

- RS485 interface
- Modbus or HART® communication protocol
- Output:
  - 2 current
  - 2 relay
  - Current and relay *(for mixed systems)*
- DIN-rail-mountable

APPLICATIONS

- Universal Interface Module
  - Expansion module for **MultiCONT**
  - For PLC process control systems
  - For automated process control systems operating on RS485

TECHNICAL DATA

PJK–1□□–4	
Supply voltage	24 V DC ±10%
Power consumption	10 mA + N_{relay} x 11 mA + $N_{current\ generator}$ x 25 mA) ±10%
Ambient temperature	–20…+50 °C
Electrical connection	Max. 2.5 mm² twisted, or max. 4 mm² solid wire
Electrical protection	Class III
Mechanical connection	EN 60715-35 rail
Ingress protection	IP20
Weight	110 g

Type		PJK–102–4	PJK–111–4	PJK–110–4	PJK–120–4
Output units		2 relays	1 relay + 1 current output	1 current output	2 current outputs
Relay	Relay	SPDT		–	
	Rating	250 V AC, 8 A, AC1		–	
	Insulation voltage	2500 V 50 Hz		–	
	Electrical / mechanical lifespan	10^5 / 2 x 10^6 switchings		–	
	Impulse width in pulse mode	0.1…25.5 s		–	
	Electrical protection	Class II		–	
Current generator	Linear range	–		3.601…21.999 mA	
	Error indication	–		≤ 3.6 mA / ≥ 22 mA	
	Resolution	–		14 bit	
	Accuracy	–		40 µA	
	Temperature dependence	–		Max. 15 µA / 10 °C	

UNICONT PKK–312 series area 4…20 mA current-controlled limit switches featuring galvanic isolation, also available as intrinsically safe units. The input 4…20 mA signals can be transferred from passive or active outputs of 2 or 4-wire transmitters. The value of the input signal will be compared in the unit of the set *(taught)* value, and the state of the galvanically isolated relay changes with the comparison mode programming.

The double throw output relay can be programmed for the following functions:
- Limit switch *(high or low fail-safe)*
- ON-OFF control with selectable switching difference
- Monitoring of discontinuity or short-circuit of the cable
- Window comparison operation mode with energized or de-energized relay state

The **UNICONT PKK–312–8 Ex** is a special version designed to operate with NIVELCO's Ex rated, DC-powered 2-wire **NIVOSWITCH** vibrating fork level switches as an intrinsically safe power supply and amplifier unit. Without any programming, the galvanically isolated limit switch can produce relay-switching signals based on monitoring the vibrating fork's output current changes between the freely vibrating and the immersed states.

PKK-312

FEATURES
- 4…20 mA input
- Relay output
- Rail-mountable
- Intrinsic safety Associated Apparatus

APPLICATIONS
- Galvanically isolated limit switch
- Power supply for transmitters
- Cable state monitoring

CERTIFICATES
- ATEX [Ex ia G/D]
- UKCA Ex [Ex ia G/D]

TECHNICAL DATA

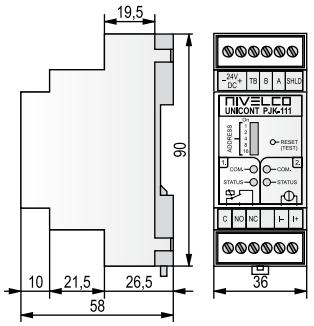
PKK–312–□		
Nominal input current range		1…22 mA
Accuracy of switching level / Threshold level		±0.1 mA
Discontinuity threshold / Lower value fault current		3.7 mA
Short circuit threshold / Upper value fault current		22 mA
Input impedance		10 Ω
Input overload capability		Max. 100 mA (permanent)
Switching delay		0.1 s; 1 s; 2 s; 5 s selectable
Relay	Output	1× SPDT
	Rating	250 V AC, 8 A, AC1
	Insulation strength	4000 V 50 Hz
	Electrical / Mechanical life time	10^5 / 2 × 10^6 switching
Electrical connection		Max. 2.5 mm² twisted, or max 4 mm² solid wire
Mechanical connection		EN 60715-35 rail
Ingress protection		IP20
Weight		~210 g

	Standard version				Ex version			
	PKK–312–							
	–1	–2	–3	–4	–5 Ex	–6 Ex	–7 Ex	–8 Ex
Supply voltage (U)	230 V AC ±10% 50…60 Hz	110 V AC ±10% 50…60 Hz	24 V AC ±10% 50…60 Hz	24 V AC ±10%, 50…60 Hz, 24 V DC ±15%	230 V AC ±10% 50…60 Hz	110 V AC ±10% 50…60 Hz	24 V AC ±10%, 50…60 Hz, 24 V DC ±15%	
Power consumption	< 2.7 VA			< 2.5 W	< 2.5 VA		< 2.5 VA / < 2.5 W	
Switching levels	2 values in the range of 1…22 mA				2 values in the range of 1…22 mA			10.5 mA; 12.5 mA
Ex marking	–				⟨Ex⟩ II (1) G [Ex ia Ga] IIB ⟨Ex⟩ II (1) D[Ex ia Da] IIIC		⟨Ex⟩ II (1) G [Ex ia Ga] IIC ⟨Ex⟩ II (1) D[Ex ia Da] IIIC	
Intrinsic safety data	–				U_0 = 28.4 V; I_0 = 140 mA; P_0 = 1 W; L_0 = 6 mH; C_0 = 50 nF		U_0 = 28.4 V; I_0 = 80 mA; P_0 = 0.6 W L_0 = 4 mH; C_0 = 50 nF	
Output load capability	U_0 = 30 V; I_{MAX} = 70 mA; $U_{OUT\ min}$ = 16 V			U_0 = 24 V; I_{MAX} = 80 mA; $U_{OUT\ min}$ = 23 V	I_T = 22 mA; U_{OUT} ≈12 V		I_T = 22 mA; U_{OUT} ≈15 V	–
Electrical protection	Class II			Class III	Class II		Class III	
Ambient temperature	–25…+55 °C							

UNICONT PJK-100 — 5 years

DIN-rail-mountable universal interface module that can be controlled via RS485 line and provides relay(s) and/or 4…20 mA current output(s)

Type	
P J K – 1 0 2 – 4	With 2x SPDT relay output
P J K – 1 1 0 – 4	With 1x 4…20 mA current output
P J K – 1 1 1 – 4	With 1x 4…20 mA current output and 1x SPDT relay output
P J K – 1 2 0 – 4	With 2x 4…20 mA current output

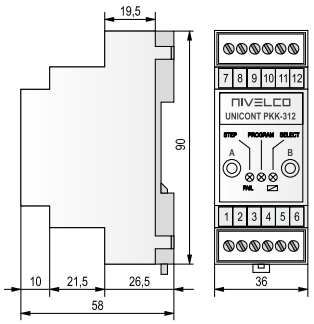


PJK−111

UNICONT PKK-300 — 5 years

DIN-rail-mountable programmable current controlled remote switching unit featuring 1…22 mA input current and powering capability for transmitters

Type	
P K K – 3 1 2 – 1	230 V AC
P K K – 3 1 2 – 2	110 V AC
P K K – 3 1 2 – 3	24 V AC
P K K – 3 1 2 – 4	24 V AC/DC
P K K – 3 1 2 – 5	230 V AC / [Ex ia G/D]
P K K – 3 1 2 – 6	110 V AC / [Ex ia G/D]
P K K – 3 1 2 – 7	24 V AC/DC / [Ex ia G/D]
P K K – 3 1 2 – 8	24 V DC / [Ex ia G/D] (for Ex ia G vibrating forks)



PKK−312

NIV24
PKK-312-1
PKK-312-8 Ex

The **UNICONT** series 2-wire passive loop-indicators are universally scalable process value indicators of NIVELCO, operating without the need for power supply. The process indicators find their use where the process value has no control function *(such as switching ON/OFF, pressure control, etc.)*. The 3-wire HART® converter type **UNICONT** devices offer the optimal solution where local displaying is needed besides the remote data processing and the field transmitters having 4…20 mA output are needed to be integrated into HART® multidrop system. The devices are applicable not only for NIVELCO transmitters but for all transmitters which use standard 4…20 mA output.
The **UNICONT PDF** devices are digital, 2-wire passive / 3-wire active, field process indicators suitable for temperature, pressure, level, etc. indication with 6-digit SAP–202 LCD display. Explosion-proof versions are available for hazardous environments. The HART® capable **UNICONT PDF** 3-wire process indicators require an additional power supply. Besides displaying the loop current or the process values, these units convert input current to HART® signals and enable devices with analog outputs to be integrated into HART® multidrop systems. A robust enclosure makes applications under harsh conditions also possible. The **UNICONT PDF–600** series with flameproof *(Ex d)* stainless steel housing meets the special requirements of certain industry segments, such as food and beverage, maritime, oil, and gas.

FEATURES

- 4…20 mA input
- 2-wire loop display
- 3-wire 4…20 mA + HART® transmitter
- Wall-mountable
- Scalable display
- IP67
- Ex variant

APPLICATIONS

- General display
- For 4…20 mA transmitters
- 4…20 mA–HART® converter
- Displaying level, volume, temperature, pressure, etc.

CERTIFICATES

- ATEX (Ex ia G), (Ex d G), (Ex d ia G)
- INMETRO (Ex ia G), (Ex d G), (Ex d ia G)

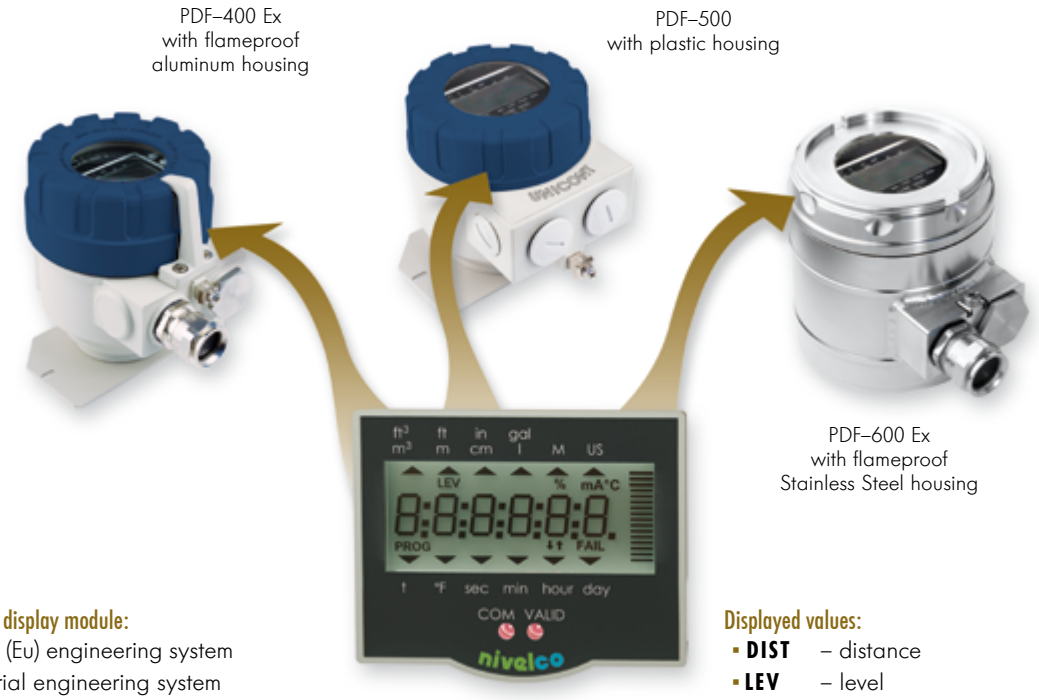
PDF–401–6 Ex

TECHNICAL DATA

	Standard version	Ex variant	Standard with HART® output	Ex variant with HART® output
Powering	2-wire		3-wire	
Measured value (input signal)	4…20 mA current loop			
Measuring Range	3.6…22 mA		0…22 mA	
Output	–		4…20 mA and/or HART® for 4…20 mA current limit values: 3.9…20.5 mA terminal resistor for HART®: R_{tmin} = 250 Ω	
Supply voltage	–		10…36 V DC Ex variant: 10…30 V	
Display	SAP–202 display, range of displayed value: –9999…+29,999			
Accuracy	±0.1% if displayed value is >10,000; ±0.2% if displayed value is <10,000			
Temperature error	±0.05% / 10 °K			
Voltage drop	<1.6 V		<1 V	
Overvoltage capability	140 mA			
Damping time	Selectable: 3 s, 5 s, 10 s or 20 s			
Ambient temperature	Standard: –40…+70 °C, with display: –25…+70 °C; Ex variant: see "Ex Information" table			
Electrical connection	Standard: M20×1.5 cable gland, cable diameter: Ø6…Ø12 mm; Ex variant: see "Ex Information" table			
Electrical protection	Class III			
Ingress protection	IP67			
Housing	Painted aluminum or plastic PBT	Painted aluminum or stainless steel	Painted aluminum or plastic PBT	Painted aluminum or stainless steel
Weight	With aluminum housing: ~0.9 kg			
	With plastic housing: ~550 g	With SS housing: ~2.5 kg	With plastic housing: ~550 g	With SS housing: ~2.5 kg

Ex INFORMATION

	PDF–401 / 501 / 601–6 Ex	P□F–401 / 501 / 601–8 Ex	PDF–401–C Ex PDF–601–C Ex	P□F–401–D Ex P□F–601–D Ex	P□F–401–A Ex P□F–601–A Ex	P□F–401–B Ex P□F–601–B Ex
Protection type	Intrinsic safety		Intrinsic safety with flameproof enclosure		Flameproof enclosure	
Ex marking	Ⓔx II 1 G Ex ia IIC T6 Ga	Ⓔx II 1 G Ex ia IIB T6 Ga	Ⓔx II 1 G Ex d+ia IIB T6 Ga		Ⓔx II 2 G Ex d IIB T6 Gb	
Intrinsic safety data	U_i = 30 V; I_i = 100 mA; P_i = 0.7 W; C_i ≈ 0 nF; L_i < 200 µH	U_i = 30 V; I_i = 140 mA; P_i = 1.1 W; C_i < 20 nF; L_i < 200 µH	U_i = 30 V; I_i = 140 mA; P_i = 1.1 W; L_i < 200 µH C_i ≈ 0 nF	C_i < 20 nF	Supply voltage: 10…30 V	
Electrical connection	Plastic M20×1.5 cable glands, cable: Ø6…Ø12 mm		M20×1.5 Ex d cable glands for Ø8…Ø12 mm cable			
	Shielded twisted cable with 0.25…1.5 mm² wire cross section					
Ambient temperature	–25…+70 °C	–40…+70 °C, with display: –25…+70 °C	–25…+70 °C	–40…+70 °C, with display: –25…+70 °C	–25…+70 °C	–40…+70 °C, with display: –25…+70 °C



Symbols on the display module:

- **M** – metric (Eu) engineering system
- **US** – imperial engineering system
- **°F, °C, m, cm, in, ft, l, m³, gal, ft³**
- **PROG** – programming mode

Displayed values:

- **DIST** – distance
- **LEV** – level
- **VOL** – volume
- **%** – percentage
- **mA and °C** – current and temperature
- ◆ – arrow *(shows the selected symbol)*

Plug-in Loop Displays UNICONT PLK

The **UNICONT PLK–501** plug-in displays with 4-digit LED indicator can be connected to the 2-wire transmitters with its DIN 43650 / ISO 4400 connector *(such as the NIPRESS pressure gauge / transmitter, AnaCONT LCK conductivity transmitter).*
The displayed numerical values can be freely scaled to the current input by the user, setting the maximum and the minimum value.

FEATURES

- 4…20 mA input
- 4-digit LED display
- Swiveling display
- Operation without external power
- PNP switch output
- IP65

APPLICATIONS

- Mountable between standard ISO 4400 connectors
- For 2-wire transmitters with 4…20 mA output

UNICONT PLK–501

TECHNICAL DATA

PLK–501–2, PLK–501–3	
Input	4…20 mA
Output	PNP open collector switch, max. rating: 125 mA
Display	4-digit LED with 7 mm height
Ambient temperature	–25…+70 °C
Setting range	–1999…+9999
Damping time	0.3…30 s
Electrical protection	Class III
Ingress protection	IP65
Electrical connection	ISO 4400 connector
Housing	Plastic
Weight	~100 g

AnaCONT
LCK–211 + PLK–501

UNICONT PDF/PTF-400/500/600 — 5 years

Wall-mountable universally scalable 2-wire passive process value indicators
and 3-wire active field loop current display / HART converter units, input: 4…20 mA

Version

P □ F – ■ 0 1 – ■

T	Without local LCD display
D	With local LCD display

Housing

P ■ F – □ 0 1 – ■

4	Painted aluminum
5	Plastic, PBT, fiberglass-reinforced
6	Stainless steel

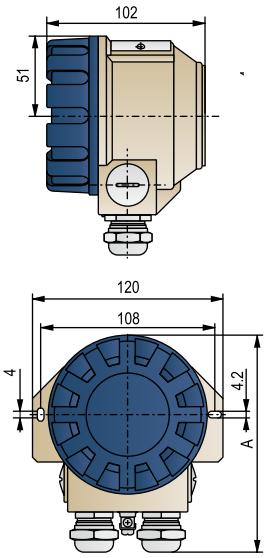
Output / Certificates

P ■ F – ■ 0 1 – □

2	-
4	4…20 mA + HART®
6	- / Ex ia G
8	4…20 mA + HART® / Ex ia G
A	- / Ex d G
B	4…20 mA + HART® / Ex d G
C	- / Ex d ia G
D	4…20 mA + HART® / Ex d ia G

Accessories (sold separately; see relevant page for details)

S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART®-USB modem
S A T – 5 0 4 – ■	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



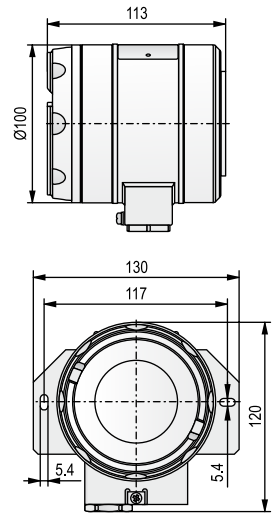
PTF-401 / 501

UNICONT PLK-501 — 5 years

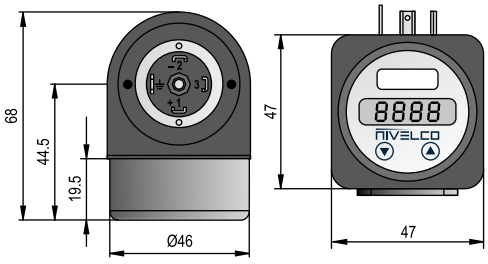
2-wire plug-in loop indicator can be inserted between connectors
complies with DIN 43650 / ISO 4400 , input: 4…20 mA

Type

P L K – 5 0 1 – 2	Plug-in display
P L K – 5 0 1 – 3	Plug-in display with PNP output



PTF-601



PLK-501

NIV24

PLK-501-2

The **UNICONT PGK–301 Ex** is a DIN-rail-mountable, partially intrinsically safe device that supplies limited power to two-wire transmitters following intrinsic safety rules. Furthermore, it provides galvanic isolation between explosion-hazardous and non-explosion-hazardous spaces between the power supply, signal input, and signal outputs. Galvanic isolation reduces the risk of ground loops and noise entering the current loop. Depending on the type, signal transmission can be the traditional 4…20 mA input / 4…20 mA output current transmission, or via digital HART® communication, or both simultaneously. The signal of the field current loop is transmitted to the safe space by microprocessor signal processing, which is inherently a high-precision transmission. Such accuracy is required for precision transmitters. If the fast conversion is preferred, choose the high-speed types. Intrinsic safety limits determine the maximum number of connected transmitters.

PGK–301

TECHNICAL DATA

		PGK–301–			
		–A Ex	–B Ex	–C Ex	–D Ex
		High-precision		High-speed	
Input		4…20 mA			
Output	Normal operation	4…20 mA			
	Current error	3.6 mA: I_{IN}=3.6 mA or I_{IN} > 24 mA			
Protection		Input / output: with overcurrent and overvoltage protection			
Loop resistance		300…1000 Ω / 24 V DC			
Communication		–	HART®	–	HART®
Supply voltage		20…35 V DC			
Power supply indication		Green LED			
Power supply for transmitters		23 V DC galvanically isolated			
Galvanic isolation		> 2 kV			
Power consumption		Max. 2.2 W			
Current signal	Resolution	1 µA		8 µA	
	Accuracy (@ 20 °C)	Typically max. 2.5 µA		Typically max. 20 µA	
Response time		100 ms		5 ms	
Ingress protection		IP20			
Temp. dependence		< 1 µA/ °C			
Ambient temperature		–20…+60 °C			
Electrical connection		Terminal, wire cross section: 0.5…2.5 mm²			
Electrical protection		Class III			
Mechanical connection		EN 60715-rail-mountable, module width: 22.5 mm			
Weight		250 g			

FEATURES

- Intrinsically safe isolation
- Power supply for transmitters
- 20…35 V DC supply voltage
- 4…20 mA, HART® communication
- Up to 1 µA transmission accuracy
- DIN-rail-mountable
- IP20
- 5 years warranty

APPLICATIONS

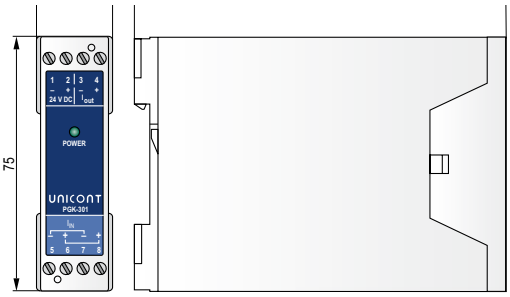
- For high-precision transmitters
- For transmitters operating in hazardous applications
- For certified measurement instruments
- Also for temperature and pressure transmitters
- For 2-wire 4…20 mA transmitters

CERTIFICATES

- ATEX [Ex ia G]
- IEC Ex [Ex ia G]

Ex INFORMATION

	Type	PGK–301–A Ex, –C Ex	PGK–301–B Ex, –D Ex
Protection type		Intrinsic safety	
Ex marking	ATEX	⟨Ex⟩ II (1) G [Ex ia Ga] IIC	⟨Ex⟩ II (1) G [Ex ia Ga] IIB
	IEC Ex	[Ex ia Ga] IIC	[Ex ia Ga] IIB
Intrinsic safety limit data		L_o = 2 mH C_o = 60 nF	L_o = 9 mH C_o = 450 nF
		U_o = 26 V I_o = 94 mA P_o = 0.65 W	
		U_m = 253 V AC	



PGK–301

UNICONT PGK-301 — 5 years

DIN-rail-mountable intrinsically safe isolator and power supply module

Function / Output	
P G K – 3 0 1 – □	
A	High-precision / 4…20 mA
B	High-precision / 4…20 mA + HART®
C	High-speed / 4…20 mA
D	High-speed / 4…20 mA + HART®

IEC Ex compliance is optional; it must be specified in the order.

NIV24
PGK-301-A, PGK-301-B

The rail-mountable **NIPOWER PPK–421** and **PPK–431** switching-mode power supply modules provide stabilized 12 or 24 V DC output for low-power consumption devices. The output current is limited by an electronic fuse. Both devices are short-circuit protected.

FEATURES

- Stabilized DC output
- Switching-mode power supply
- DIN-rail-mountable
- Short-circuit protection
- Overload protection
- Overvoltage protection
- IP20

APPLICATIONS

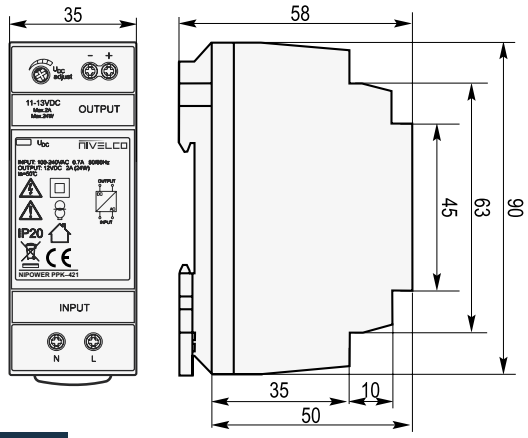
- Any transmitters
- Sensors
- Inductive, capacitive proximity switches
- Infrared sensors
- Ultrasonic Proximity sensors

TECHNICAL DATA

	PPK–421	PPK–431
Supply voltage (U_{IN})	100…240 V AC / 50…60 Hz	
Output voltage (U_{OUT})	12 V DC (11…13 V DC adjustable)	24 V DC (23…25 V DC adjustable)
Output current [1]	2000 mA	1250 mA
Consumption without load	max. 8 VA / 0.3 W	max. 8 VA / 0.4 W
Consumption with maximum load	max. 50 VA / 30 W	max. 60 VA / 33 W
Rated power	24 W	30 W
Overload capability	Max. 120%	
Efficiency	88%	89%
Electronic output protection	Short-circuit, overload, overvoltage, overcurrent	
Output voltage indicator	Blue LED	
Ripple & Noise	120 mV	150 mV
Operating temperature	–20…+50 °C	
Electrical strength between input and output	3 kV AC	
Electrical connection	Terminal, wire cross section: max. 2.5 mm²	
Electrical protection	Class II, reinforced insulation	
Mechanical connection	EN 60715 rail	
Ingress protection	IP20	
Weight	120 g	

[1] Correct air-flow is needed to prevent overheating

PPK–4□1



PPK–4□1

NIPOWER PPK-400 — **3 years**

DIN-rail-mountable power supply unit
Power supply: 100…240 V AC / 50…60 Hz, output voltage: 12 V DC or 24 V DC

Type	
P P K – 4 2 1 – 1	12 V DC / max. 2 A
P P K – 4 3 1 – 1	24 V DC / max. 1.25 A

NIV24
PPK-421-1
PPK-431-1

NITIME time relays are suitable for all kinds of timing tasks of technological equipments. Microprocessor controlled operation, multiple functions, universal power supply voltage, and slim module width are the main characteristics making NITIME time relays applicable also for automation tasks of lights, pumps, heating, coolers, fans, and motors.

FEATURES

- 2 and 10-function types
- Wide time range
- Small size
- Universal supply voltage
- DIN-rail-mountable
- Relay output
- IP20

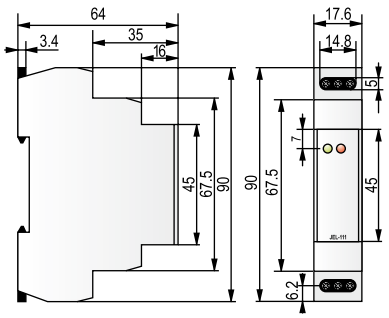
APPLICATIONS

- Process controlling of repeated tasks
- Timed cycling of pumps or compressors
- Timing of technological equipments
- Sequential control

TECHNICAL DATA

	Type	JEL–111	JEL–121
Number of functions		10	2
Time ranges		0.1 s…10 day	0.1 s…100 day
Time setting		Rotary switch and potentiometer	
Reset time		Max. 150 ms	
Time deviation		5%	
Repeat accuracy		0.2%	
Temperature coefficient		0.01% / °C	
Supply voltage		12…240 V AC/DC (AC 50…60 Hz)	
Power consumption		0.7…3 VA AC / 0.5…1.7 W DC	
Output	Relay	1× SPDT	
	Rated current	16 A AC1	
	Inrush current	30 A (< 3 s)	
	Output indication	Multifunctional red LED	
	Switching voltage	250 V AC (AC1) / 24 V DC	
	Breaking capacity	4000 VA AC 384 W DC	
	Min. breaking capacity	DC 500 mW	
	Electrical lifespan (AC1)	0.7×10^5	
	Mechanical lifespan	3×10^7	
Electrical connection		Terminal for cables with max 2.5 mm² wire cross section	
Electrical protection		Class II	
Mechanical connection		EN 60715 rail	
Ingress protection		IP20	
Ambient temperature		–20…+55 °C	
Weight		63 g	65 g

JEL-121 JEL-111



JEL-1□1

NITIME	3 years

DIN-rail-mountable multifunctional time relay module
12…240 V AC/DC power supply, SPDT output

Type	
J E L – 1 1 1 – 1	Multifunctional timer
J E L – 1 2 1 – 1	Cyclic timer

NIV24
JEL-111-1
JEL-121-1

The **UNICOMM** interface modules can establish communication between HART®-capable field devices and the process-controller computer. The communication can be done via USB or RS485 line, and also via Bluetooth®. The **UNICOMM** HART® modems are applicable not only for NIVELCO transmitters but for all HART®-capable transmitters which use standard HART® communication. The device is galvanically isolated from both *(USB and HART®)* sides. When it is used as a HART®–USB modem, connected to the USB of a PC, the modem does not need an external power supply. The **UNICOMM SAK–305** modules can be connected to a suitable device with RS485 interface input, used as a HART®–RS485 modem. The communication protocol is HART® on the RS485 line. In this case, the device needs an external power supply. Ex variants can be connected to transmitters placed in hazardous areas.

FEATURES

- Transferring measurement data to PC
- Connecting field transmitter to the PC via USB, RS485 or Bluetooth®
- 24 V current loop power supply (SAT–504)
- Switchable HART® terminal resistor (SAT–504, 250 Ω)
- DIN-rail-mountable version
- No need for power supply
- Galvanic isolation
- IP20

APPLICATIONS

- Communication interface (modem) between HART®-capable transmitters and PC
- Minimal system configuration: Windows XP, USB port

CERTIFICATES

- ATEX [Ex ia G]

TECHNICAL DATA

Type		SAT–304	SAT–504	SAK–305
Input		HART®		
Output		USB	USB, Bluetooth®	USB / RS485 (HART® over RS485)
Power supply		Supplied from USB	Supplied from USB or from power bank	Supplied from USB / 24 V DC (10…30 V) nominal voltage
Current consumption		<100 mA	<150 mA	USB: current consumption <60 mA 24 V DC: power consumption <1.5 W
Current loop power supply		–	24 V, max. 20 mA, switchable	–
Ambient temperature		–25…+55 °C		–20…+70 °C
Housing material		Polystyrene		PPO
Electrical connection	PC	Connection: USB 1.1 "B" socket		USB 1.1 "B" socket / RS485 Terminal
		Cable: USB "A–B" 1.8 m		USB "A–B" 1.8 m / RS485 Twisted shielded pair max. 1000 m
	HART® line	Connection: Test clip		Screw terminal
		Cable: spiral 0.6 m (1.1 m)		Twisted shielded pair with 0.5…2.5 mm² wire cross section Resistance max. 75 Ω, Capacitance max. 200 nF
Mechanical connection		–		EN 60715-rail-mountable
Ingress protection		IP20		
Electrical protection		Class III	Class III 1 kV galvanic isolation	Class III
Weight		100 g		

Ex INFORMATION

UNICOMM SAK–305–6 Ex	
Ex marking	Ⓔx II (1) G [Ex ia Ga] IIC
Intrinsic safety limit data	U_i = 30 V, I_i = 100 mA, L_i = 200 uH, C_i = 2 nF
U_m	253 V AC

SAT–504–2

SAK–305

SAT–304

UNICOMM SAT-304 — 5 years

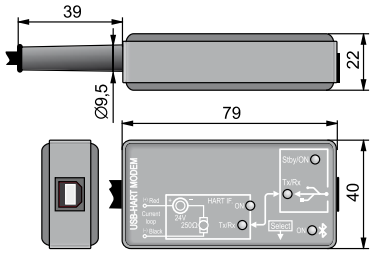
HART®-USB communication modem for transmitters with HART® output
USB 1.1 "B" connector and test clip

Type	
S A T – 3 0 4 – 0	HART®-USB modem

UNICOMM SAT-504 — 5 years

HART®-USB communication modem for transmitters with HART® output
USB 1.1 "B" connector and test clip

Function	
S A T – 5 0 4 – □	
0	HART®-USB modem
1	HART®-USB modem + power supply for transmitter
2	HART®-USB modem + power supply for transmitter + Bluetooth®

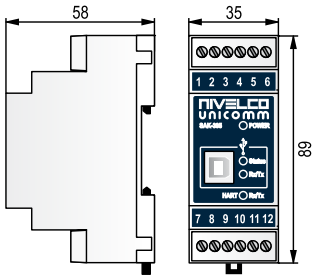


SAT-504-2

UNICOMM SAK-305 — 5 years

DIN-rail-mountable HART®-USB communication modem for transmitters with HART® output
Connection to PC: USB/RS485 interface

Type	
S A K – 3 0 5 – 2	HART®-USB/RS485 modem
S A K – 3 0 5 – 6	HART®-USB/RS485 modem / Ex ia G



SAK-305

NIV24
SAT-304-0
SAT-504-1

NIFLANGE flanges are suitable for almost any device for installation in an existing flanged connection *(e. g., tank, storage containers)*. With a wide range of internal process connections, it can be fitted to numerous devices. In addition it can be ordered welded to the device on request.

FEATURES

- Complies with DIN, ANSI, and JIS standards
- Materials:
  - Carbon steel
  - Carbon steel + PTFE
  - 1.4571 stainless steel
  - Polypropylene
- Size: DN20…DN300
- High-pressure resistance (max. 63 bar)
- BSP, NPT, M20×1.5 process connections
- Welded variant

APPLICATIONS

It can be used with any threaded device, e. g. PiloTREK, NIVOCAP, EasyTREK, EchoTREK, NIVOCONT K, NIVOMAG, NIVOSWITCH, NIVOROTA, NIVOCAP CK, analytical instruments, THERMOCONT, NIPRESS.

MFT–601

MKA–21□–□

NIFLANGE MFT — 5 years

Available in carbon steel, PTFE lined carbon steel, polipropylene (PP), and stainless steel, DIN, ANSI, and JIS flanges

Prices on request

Standard / Flange material / Form	
M F T – □■■ – ■	
1	DIN / Carbon steel / EN 1092 B1
2	DIN / 1.4571 / EN 1092 B1
3	DIN / Polypropylene / EN 1092 A
4	DIN / Carbon steel + PTFE / EN 1092 B1
5	ANSI / Carbon steel / ASME B16.5 RF
6	ANSI / 1.4571 / ASME B16.5 RF
7	ANSI / PP/ ASME B16.5 FF
8	ANSI / Carbon steel + PTFE / ASME B16.5 RF
A	JIS / Carbon steel / B 2220 RF
B	JIS / 1.4571 / B 2220 RF
C	JIS / PP / B 2220 FF
D	JIS / Carbon steel + PTFE / B 2220 RF

Dimension DIN / ANSI / JIS	
M F T – ■□■ – ■	
A	DN20 / ¾" / 20A
B	DN25 / 1" / 25A
C	DN32 / 1¼" / 32A
7	DN40 / 1½" / 40A
0	DN50 / 2" / 50A
1	DN65 / 2½" / 65A
2	DN80 / 3" / 80A
3	DN100 / 4" / 100A
4	DN125 / 5" / 125A
5	DN150 / 6" / 150A
6	DN200 / 8" / 200A
8	DN250 / 10" / 250A
9	DN300 / 12" / 300A

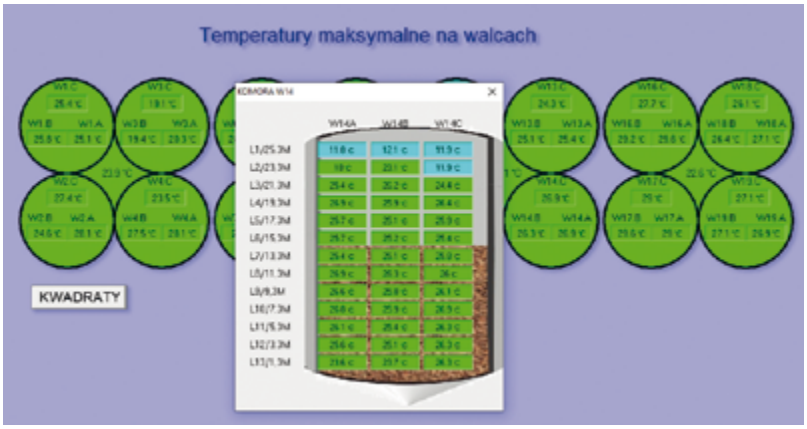
Pressure DIN / ANSI / JIS	
M F T – ■■□ – ■	
5	PN6 / - / 5K
6	PN10 / - / 10K
1	PN16 / 150 psi / 16K
2	PN25 / 300 psi / 30K
3	PN40 / 600 psi / 40K
4	PN63 / 900 psi / 63K

Internal dimension	
M F T – ■■■ – □	
1	¼" BSP
C	½" BSP
D	½" NPT
E	¾" BSP
4	¾" NPT
2	1" BSP
5	1" NPT
7	1½" BSP
8	1½" NPT
3	2" BSP
6	2" NPT
9	M20x1.5
H	Weldable to vibrating fork

NIVISION is a VISION X9 based process visualization software that uses the XSDL *(Extensible Structure Declaration Language)* programming and configuring language. **NIVISION** can visualize a process control system built with NIVELCO instruments on a PC. The instruments can be intelligent transmitters with analog output, digital communication, or various switches based on different measuring principles. The tank-farm layout with tanks, instrumentation, and other process devices can easily be visualized. **NIVISION** offers a wide range of visualization elements of the measured and limit values, time-based trends, databases, and logs. Exporting and importing different database types is also a basic feature of the software. A clear and transparent overview of all processes involved in an application makes stock and material management a simple task with a well-constructed **NIVISION** project. Another great feature of the software is that a **NIVISION** project can be visualized on a remote computer *(with no NIVISION installed)* through a local area network *(LAN)* or the internet using a browser. It is a perfect solution for small and medium-sized process control systems where setting up a SCADA system is too expensive.

FEATURES

- Tank configuration
- Transmitter configuration
- Tank-farm visualization
- Displaying measured values
- Displaying limit values
- Trend monitoring
- Data logging
- Database handling
- Archiving
- Other log functions (alarms)
- Remote connection (LAN / Internet)

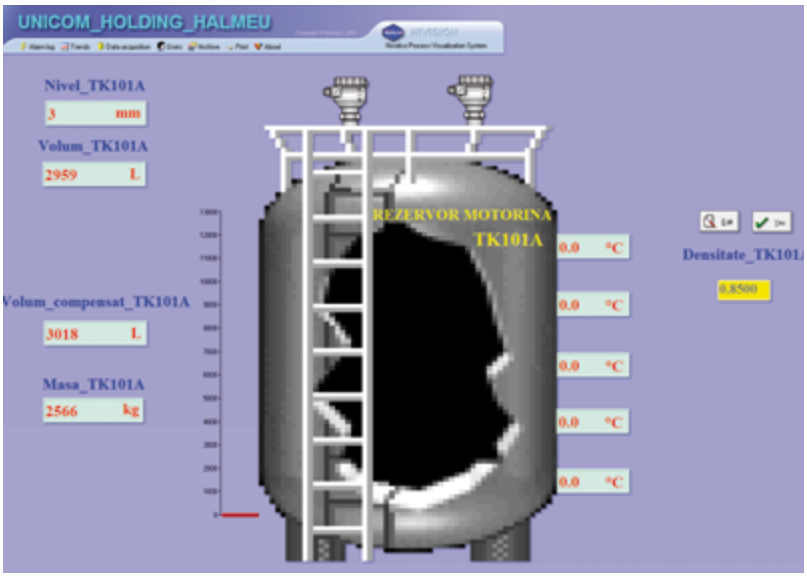


APPLICATIONS

The steps of customizing NIVISION for a specific application:

- The end-user draws the technological, operational and functional requirements of, the application.
- Based on the customer's requirements the developer configures the visualization project in the **NIVISION** developer system graphically and performes the required programming. Developmer mode can only be accessed by the project developer.
- The finalized project can be executed by the end-user using the NIVISION runtime system.

The basic element of the software is the "UNIT" which contains the applied instrument *(with graphical representation)*, the instrument's variables, event handling, communication and data display. With the help of these units, a complete process instrumentation system can be set up for visualization.



NIVIS01	1 year
NIVISION process visualisation, measurement logging and database management software for MultiCONT and all NIVELCO transmitters with installation on-the-spot	
Price on request	
NIVISION licence fee	
APPLICATION DEVELOPMENT (For any process controlling task in accordance to order demands, in engineering work day)	

The HART® configuration software is designed to detect, poll, and display primary measurement data as well as to program NIVELCO's HART®-compatible transmitters remotely.
Installed on a PC the software allows the menu driven remote programming *(device parameters + HART commands)*. The software collects data from the detected NIVELCO units, performs cyclic polling, and displays the measurement data.

FEATURES

- Free configuration program
- Remote programming and querying measurement data for up to 15 HART®-compatible transmitters in one multidrop loop
- Linearization tables
- Echo Map
- Sensor calibration
- Measurement data monitoring and gathering
- Handling multiple HART® modems

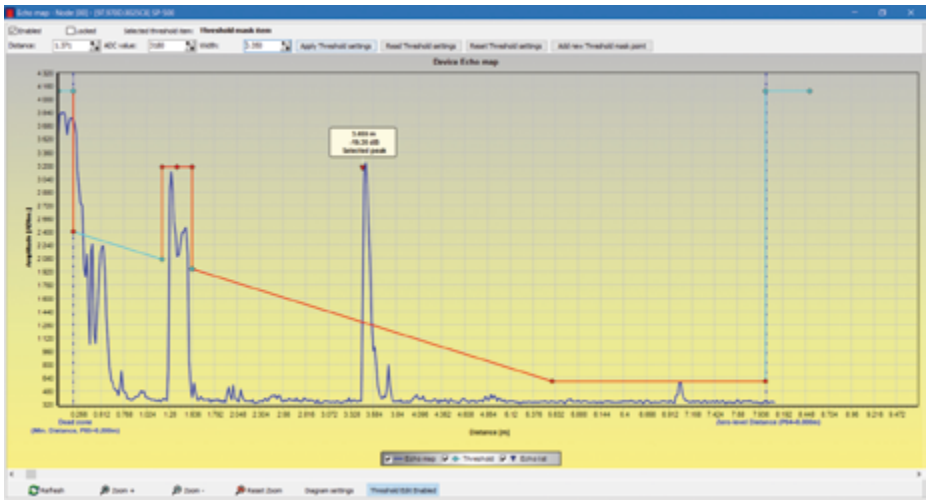
APPLICATIONS

- Commissioning transmitters
- Remote programming
- Displaying measurement data
- Error detection
- Limited trend monitoring

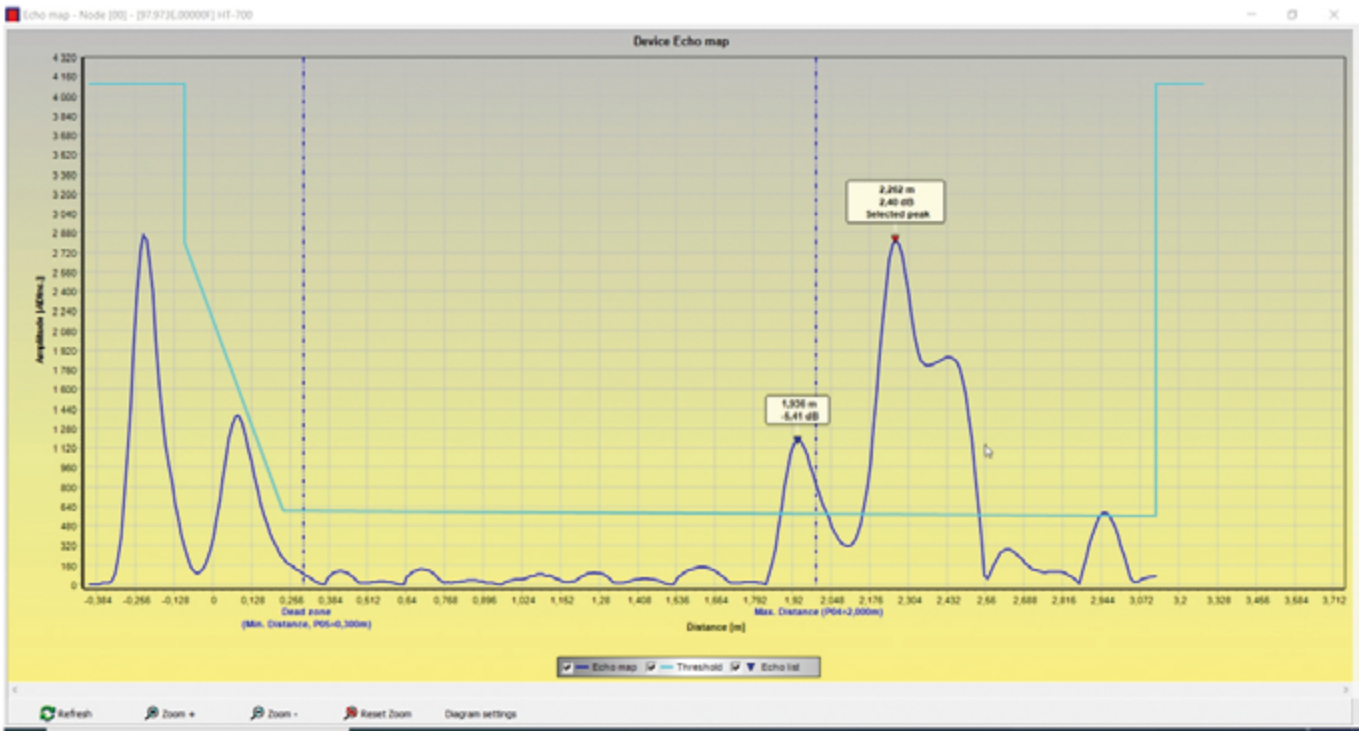
FREE DOWNLOAD

SYSTEM REQUIREMENTS

Operating system	MS Windows 10, 8, 7, Vista, XP, 2000
Connection	RS232, RS485, USB
Disk space	100 MB
Memory	512 MB RAM
HART® modem	UNICOMM SAT–304, SAK–305, SAT–504



SP–500 Pro / EView2 – Threshold edit view. The red corner points can be modified.



HT–700 / EView2 – Displaying the new measurement evaluation process

MAIN INFORMATION

This product catalog is valid from **January 9, 2023***; henceforth, all prior product catalogs are obsolete.
NIVELCO reserves the right to make any changes without any prior notice.
The illustrations of the products in this product catalog are only for informational purposes.
Doublechecking specifications in the datasheets, user, and programming manuals is recommended.

DELIVERY

There are four kinds of delivery:

Normal delivery:

- Standard products are usually manufactured within three weeks and shipped on the fourth week.**
- Delivery times may differ in the case of custom products. The estimated delivery time is either provided in the quotation or in the confirmation of the custom order.

Fast delivery:

- Units ordered under the NIVEX service are shipped within 5…8 working days from receiving the order if the order is accepted. Before ordering products with a NIVEX mark (in capital letters), availability of the relevant products in the required quantity must be checked and confirmed by NIVELCO. There is a 5% surcharge over the list price for the NIVEX service.
- NIV24 service is available for models indicated in tables at the bottom right of the relevant price sheets. Products ordered with the remark NIV24 will be shipped on the day following the confirmation of the order for a maximum of 5 items. There is a 5% surcharge over the list price for the NIV24 service.

WARRANTY

NIVELCO undertakes a guarantee of 1 to 5 years for its products.*** The warranty periods for each product group (1 year…5 years) are indicated on the price sheets of the respective products. NIVELCO fulfills the warranty obligations on the premises of the company.

ORDER CODES & ARTICLE NUMBERS

All order codes for complete instruments have seven characters (with some exceptions for special constructions with seven characters + "X…"). Order codes can be found in this product catalog, brochures, User and Programming Manuals and other marketing documents on our website. Article numbers are found in our Order Confirmations, Offers and Invoices. Article numbers have eight characters, and they are constructed like the order code + "M" (in some cases, this last character may be different). This distinction between order code and article number has relevance only to NIVELCO's internal administration, not to the technical content.

e. g.,
order code: SGP–380–4
article number: SGP3804M

INSPECTION & CLEANING

There is a 25.00 EUR inspection fee for checking returned devices. It is dropped if the repair or replacement is ordered or it is covered by warranty.
We charge 25.00 EUR for cleaning returned units that are dirty. If a device is returned without a thorough cleaning, disinfection, and a correctly filled and signed Returned Equipment Handling Form, we reserve the right to return or destroy the device at the purchaser's expense, whichever the purchaser chooses.

* In case of any discrepancies between the corrsponding printed and online data or other kind of information, please consider the online information as the valid one.

** The indicated delivery time varies depending on the quantity ordered.

*** Except for analytical sensors!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HUNGARIAN PARALYMPIC COMMITTEE

NIVELCO – official sponsor of the Hungarian Paralympic Team

ISO CERTIFIED 9001 & 14001

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