PRODUCT CATALOGUE

2017

NIVELCO

an instrumentation expert

PiloTREK W-100

Level transmitter family – The new flagship from NIVELCO

Thanks to our esteemed partners hundreds of the new generation PiloTREK W-100 level transmitters have been commissioned since November 2012. We are proud that on the first challenge, our PiloTREK non-contact microwave level transmitter won the Product Award of the MagyarRegula 2012 exhibition, as an innovative Hungarian development.

The 25 GHz (K-band) PiloTREK Pulse Radars are regarded the most progressive non-contact level transmitters of the industrial process automation field. Their accuracies are excellent and their short and narrow antennas make their installation simple and low cost. NIVELCO's new K-band radar featuring ±3 mm accuracy and short dead band excels with its versatile housing concept lining up plastic, aluminium and stainless steel versions. Its antenna range incorporates stainless steel horn and enclosed plastic tube varieties. The enclosed antenna versions can be replaced without removing the antenna enclosure from the process. Local programming of the PiloTREK is aided by a plug-in display module. If on-site reading is not desired this module may not be required thus reducing cost of ownership.

The signal processing algorithm of the new PiloTREK is based on NIVELCO's 30 years of experience with non-contact level measurement making it an excellent choice for applications simple and challenging alike.

MAIN FEATURES

- 2-wire K-band Pulse Burst Radar
- 25 GHz frequency
- 23 metre measuring range for liquids and slurries
- ± 3 mm accuracy
- Easy installation due to small antennas
- Horn and enclosed antenna types
- Sanitary types for meeting high hygienic requirements
- High temperature version
- Plug-in graphical display module
- Ex version

INDUSTRY SEGMENTS

- Water, wastewater
- Power generation
- Food and beverage
- Pharmaceutical
- Chemical

APPLICATIONS

- Liquids and slurries in general

SUBSIDIARY AND 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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ESTEEMED PARTNER!

NIVELCO Process Control Co. is celebrating its 35th anniversary in 2017. Founded in 1982 to concentrate on the manufacture of industrial level measurement and control products, **NIVELCO** is now a world-class level specialist, based in Hungary. The **NIVELCO** strength originates from the solid base created by a family business, guided over 80 turbulent years by four basic principles:

- *Respect for the Knowledge and Experience of the Founders*
- *Professional Pride in our Products*
- *Responsibility for our Colleagues and Customers*
- *Ensuring our Products and Services provide Value*

The **NIVELCO Group** successfully maintained its leading position alongside other major instrument manufacturers throughout the economic crises of recent years. Indeed **NIVELCO** further increased the number of export markets served. Thanks to this healthy position, a four-year support contract was signed recently with the Hungarian Paralympic Association, helping to support a successful Olympic participation in the XXIII Winter Olympic Games in 2018.
The whole **NIVELCO Company** looks forward to applying these basic principles, and our existing and ever-developing skills, to the future requirements of our industrial control customers, in increasingly more demanding world markets.

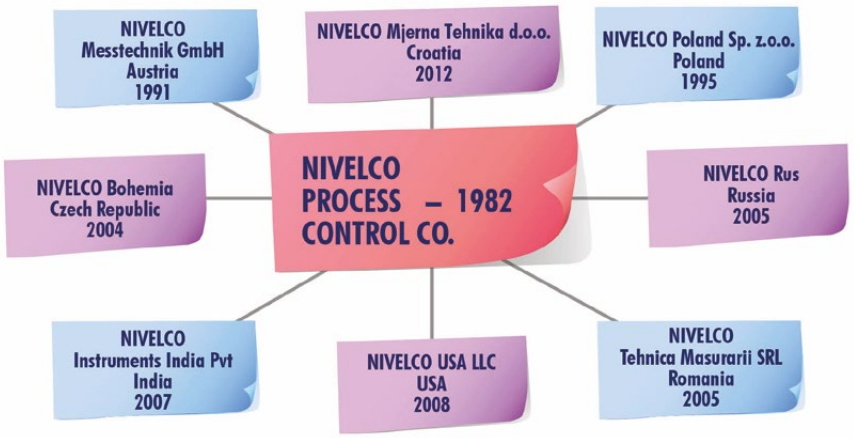
Tamás Szőllős

THE STORY OF A FAMILY VENTURE

After training as an engineer in the "ITT Standard" telephone company, in 1939 Endre Szőllős started his own business designing and producing telephone systems for business and industry. While the World War II did not provide an easy period for Endre and his colleagues, the business grew and provided good training for his sons. Following their University courses in electrical engineering and economics respectively, Tamás and András Szőllős were able to lead the company forward, after the early death of Endre in 1969. By 1982, the production of a series of industrial controllers had led to a developing specialisation in level measurement and control: and **NIVELCO** was founded. In 1989, when International trade from Hungary became straightforward, **NIVELCO** had a full, proven level control product range and capability, backed by well established in-house manufacturing and engineering facilities. In 1989 the **NIVELCO** launch of the World's first "Compact" ultrasonic level transmitter had a major impact, offering a combined sensor / transmitter in one unit, leading the world market.

NIVELCO took the opportunity offered by these newly available export markets, and opened trading relationships with various identified distributors and sales agents. Building on existing sales links into neighbouring countries, **NIVELCO** also invested in their own sales organisations and offices in Austria and Poland, and then later in the Czech Republic, Romania and Russia. Our success in these ventures demonstrates that by maintaining our business principles, expertise and specialist skills, **NIVELCO** can compete successfully with the best suppliers to the industry, by providing:

- Wide range of products to suit all applications
- Investment in advanced technology expertise and high quality product development
- High specification quality management and control systems
- Worldwide marketing, sales and service support
- Fast, flexible in-house production and customer order logistics
- Company-wide IT System to provide full product design and production data
- Fair, modest pricing, ensuring the capital for future customer support and development
- Continuing investment in our people and their working relationships



Despite that in today's globalised world, the multinational giants - set up for mass production - can rule the market, there are many medium-size companies who specialise in satisfying customer needs, and manufacture products with high intellectual added value. The achievements of **NIVELCO** demonstrate that flexible, customer-led medium-size companies can find their place in the market and maintain their independence.

NIVELCO'S TIMELINE

1982	NIVELCO formed
1982	NIVOSONAR,
	the first Ultrasonic level transmitter
1984	NIVOCONT Vibrating rod level switch
1986	NIVOCAP Capacitance level transmitter
1989	NIVOSONAR Compact
	Ultrasonic level transmitter: A WORLD FIRST!
1991	NIVELCO Messtechnik (Austria)
1992	New factory opened in Budapest
1994	NIVOPOINT Float level switch
1994	NIVOMAG Magnetic coupling level switch
1995	Accreditation to ISO 9001
	NIVELCO Company in Poland
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 the transmitters
2003	ATEX Hazardous Area Approvals
2004	MultiCONT the new system concept
	NIVELCO Bohemia (Czech Republic)
2005	MicroTREK Radar-based level transmitter
	NIVELCO T.M. Company in Romania
2007	NIVELCO Instruments (India)
2007	NIVELCO Company in Russia
2008	NIVELCO Company in USA
2009	AnaCONT
	pH, ORP and conductivity transmitter
	The first SIL product certification
2010	AnaCONT Dissolved oxygen transmitter
2012	PiloTREK Non-contact radar level transmitter
2013	NIVOCAP CK RF-capacitance level switch
2016	The first FM approval

Efficient industrial production relies on the information provided by modern high technology sensors and instrumentation. In the 1980's the whole sensor manufacturing industry was radically changed by developments in microprocessors and electronics. **NIVELCO** achieved the significant market position it holds today by recognising these developments.

Recognising the growth in the market demand, **NIVELCO** earned recognition primarily with its level transmitter, and gained a substantial global market share, based on its purposeful business policies and constant investment in technology.

Year by year **NIVELCO** produced every 20th ultrasonic transmitter sold in the world, every 50th vibration level switch, and every 100th radar level transmitter.

In this way **NIVELCO** has established and maintained a leading and respected world market position, and in the past 35 years has sold more than 900,000 units of level instrumentation: **NIVELCO** is now the 4th largest ultrasonic level transmitter producer in the world.

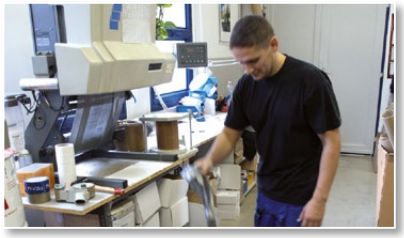
2017

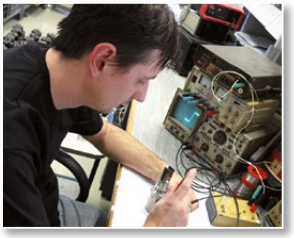
THE HEADQUARTERS

From cramped beginnings in 1982, with 15 employees occupying 150 m^2 in Budapest, **NIVELCO** has invested in extensive facilities capable of total control of the production requirement. In the year 2000, a further expansion to the new factory created a capacity of 10,000 m^2, giving significant space for future development: this is currently allocated to the **NIVELCO Trade Center**, and some associated activities. In the currently unused factory areas, the **NIVELCO Trade Center** provides leased space to host headquarters for other companies. **NIVELCO** engineering, manufacture and production is exclusively in Hungary: the other subsidiaries deal only with sales and marketing activities, plus consulting, installation and service.
The modern air-conditioned factory and excellent working conditions ensure a neat and tidy environment, and create the right conditions for producing good quality work.

PRODUCTION

NIVELCO has invested heavily in the best production machinery available, with all aspects of the required production being undertaken in the factory. Here, computer-controlled CNC machining centres, as well as surface mount electronics production facilities and fume extraction, make a clean and efficient unit. The investment is driven using a global IT system for production control and logistics. In this way **NIVELCO** maintains total control over the build, and has achieved quality management system approval to ISO9001. All production output is tested using automatic systems, heat-soaked and cycled where needed in special test chambers.





SALES AND SUPPORT

Efficient technical sales support to customers, contractors and distributors has always formed an essential part of the **NIVELCO** business approach, and the application knowledge and experience developed in the sales team is a major business strength. Input from the **NIVELCO** sales team covering the five regions in Hungary, and the **NIVELCO** sales companies in Poland, the Czech Republic, Romania, India and Russia, as well as that from export distributors and sales agents, is treated as a valuable resource to be shared, and to guide product planning and development.To provide and present this experience to new sales personnel, and distributors, **NIVELCO** produce articles for publication, plus application notes and reference site information for presentation on the website. Hands-on demonstrations are encouraged, notably using a **NIVELCO** Exhibition bus that brings products and practical presentations to customers across Europe: frequent training courses in the Budapest training centre provide customers, installers and staff from sales distributors with hands-on experience. The NIVELCO showroom provides a permanent resource where equipment can be demonstrated in action.

MARKETING

The marketing department at the Hungarian headquarters supplies all marketing materials such as brochures, advertisements and presentations, for the subsidiary companies to show the unified **NIVELCO** corporate image. The marketing team coordinates the constant updating of all information on the multilingual **NIVELCO** website and is also responsible for keeping up-to-date downloadable colour brochures, technical documentation, etc.
The **NIVELCO** movie (presented on the website) was shot by our own **NIVELCO** crew to present the manufacturing capability and the wide application possibilities of **NIVELCO** instruments.

Other priority tasks for the marketing department involve participation in exhibitions and organisation of regular professional training courses for our sales partners and customers, presenting detailed knowledge and information about the **NIVELCO** instruments.

EXPORT MARKETING

Doing some business with East Bloc countries was what we had as export in the 80's, when **NIVELCO** was formed: the East Bloc was still its old self and markets were closed. Nevertheless **NIVELCO** was an export driven company, and almost a decade later, in 1990, we were able to show our muscles to the world for the first time. This was the beginning of **NIVELCO**'s export success. Twenty years later, exporting more than 80% of its production, **NIVELCO** has now proved itself to be an export oriented company. Covering over 65 countries through our own subsidiary companies and through distributors, our products reach almost all world markets. To aid distributors and our own subsidiaries, regular training programmes are organised in order for their staff to keep up with technology driving **NIVELCO**'s high tech instruments. Sales meetings held annually provide a vehicle for information transfer and for an exchange of ideas between people from all over the world. When our dealers participate in international exhibitions, they are supported with operational models, exhibition accessories and experts. With the success seen with the **NIVELCO** non-European subsidiaries (like USA, Russia and India), there is the strong intention to open further similar subsidiaries in the near future.

REFERENCES, STATISTICS

Palm oil (Malaysia)

IN ALL INDUSTRIES AND ALMOST EVERYWHERE IN THE WORLD! This phrase best describes the wide application possibilities of **NIVELCO** instruments. Many references to **NIVELCO** installations and applications are quoted on the website – tank contents measurement in food, pharmaceuticals and chemicals; environment protection applications; sump control in wastewater systems, and flow monitoring in effluent channels are just some of those illustrated. **ALMOST NO MATTER WHAT IS TO BE MEASURED!** No matter what level you need to measure – whether it is sewage in the USA, animal feed pellets in Hungary, palm oil in Malaysia, cement, sand and building materials in Austria – trust **NIVELCO** instruments to do the job.

Contsruction materials (Austria)

Wastewater treatment (Poland)

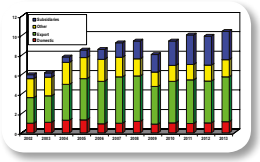
Animal food (Hungary)

Sewage pump station (USA)

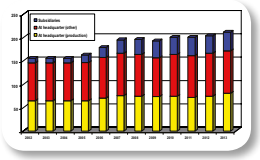
Land reclamation (South Korea)

STATISTICS

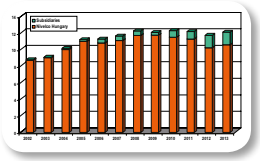
The **NIVELCO** story over the last more than 35 years has been one of consistent growth – growth in factory production output and sales value, growth in employees and in our business resources. Achieving a 7-fold sales growth from an employee base growing 3-fold, productivity has also more than doubled over the period, assisted by some EU subsidies for IT and technological development. As a consequence of effective and purposeful management, the capital employed within the **NIVELCO Group** has gradually grown, and reached 12 million Euros in 2012.



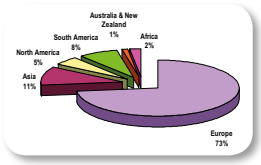
Sales (million EUR)



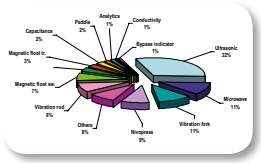
Employees (person)



Employed capital (million EUR)



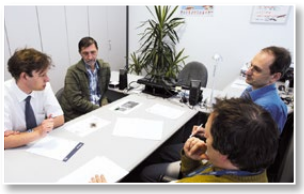
Geographics split of sales in 2014



Product split of sales in 2014

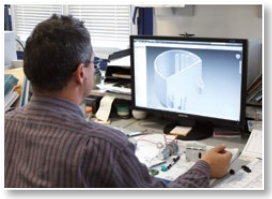
Europe, including Hungary, presents the major established market, with 70 % of sales. In terms of the product ranges, the sales split for 2014 shows that while ultrasonics still maintain a 30 % share of the total business, further new products have established a solid market presence, and already radar systems have achieved significant sales.

RESEARCH AND DEVELOPMENT



The main profile of the Research and Development Department is the development of all manufactured products and technologies including mechanics, hardware and software. More importantly, the Development Team is responsible for designing new products in accordance with customer needs, and driving these into production. Besides the new developments there is also continuous modernisation and revamping of the existing well-known products as well as supporting and optimising the product line to achieve better and better product quality. Creating a wide product portfolio – wider than the competitors – to be able to provide suitable solutions to special market needs, it is necessary to undergo many official design approval procedures, such as are needed with ATEX, PED, or shipping approvals, or with measurement accuracy and performance certi-fications like OIML, GOST, or SIL. In the course of these procedures, close co-operation has been established between **NIVELCO** and the international classification institutions (BKI, TÜV, GL, DNV, BV, OMH, etc).

Our policy and our essential goal is to design and launch high technology, carefully tested products into the market, products which can be easily manufactured, that can have a fast delivery time, operate according to the customers needs, and can be sold at a competitive price. Having extensive practical experience and professional knowledge, the engineering team at **NIVELCO** has established the knowledge, structure and procedures to achieve this goal. **NIVELCO** maintains close links with academia and suppliers to utilise the most advanced developments available. Strong working links have been established with the Budapest University of Technology and Economics and with the Óbuda University, and with other academic institutions, which has led to the recruitment of many well trained engineers.



GENERAL DESCRIPTION

Since its foundation NIVELCO has focused on the manufacture of industrial level measurement products. Our focus has not changed, demonstrated by our wide level transmitter portfolio employing many different types of level measurement methods. Our ultrasonic level transmitter selection is definitely the widest on the market offering integrated, compact, 2- or 4-wire transmitters for liquids or solids with remarkable number of optional choices.

- **The K-band PiloTREK non-contact level transmitters are regarded the most progressive non-contact level transmitters of the industrial process automation field.**
- **The high-precision NIVOTRACK magnetostrictive level transmitters with 0.1 mm resolution are applicable for custody transfer liquid level measurements.**
- **The NIVOFLIP bypass liquid level indicators are suitable for high temperature applications and high pressure processes.**
- **The NIVOCAP capacitance level transmitters provides highly reliable measurement thanks to the well-know and accepted capacitive principle.**

Most of our transmitters are available in PFA coated version for aggressive mediums, and all transmitter families have explosion-proof models applicable in hazardous environments.

NON-CONTACT MICROWAVE

PiloTREK

- 25 GHz (K-band) measuring signal
- 2-wire compact transmitter
- Accuracy up to ±3 mm
- Measuring range up to 23 m
- Max. 25 bar and 180°C
- 4-20 mA + HART communication
- $\varepsilon_r > 1.9$
- IP67 protection
- Explosion-proof models

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GUIDED MICROWAVE

MicroTREK

- 2-wire compact transmitter
- TDR principle
- ±5 mm or ±20 mm accuracy
- $\varepsilon_r > 1.4$
- Measuring range up to 24 m
- 4-20 mA + HART communication
- Max. 40 bar and +200°C
- Rod or cable probes
- Plug-in graphic display module
- Explosion-proof models

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CAPACITANCE LEVEL TRANSMITTERS

NIVOCAP

- 2-wire compact transmitter
- Rod or cable probes up to 20 m
- $\varepsilon_r > 1.5$
- Fully or partly insulated probes
- 32-point linearization
- High sensitivity
- 4-20 mA + HART communication
- Explosion-proof models

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HYDROSTATIC LEVEL TRANSMITTERS

NIVOPRESS D

- 2-wire compact level and pressure transmitter
- -1 bar - 400 bar
- High overload capability
- Accuracy: 0.25%
- Stainless steel diaphragm
- Plug-in display module
- 4-20 mA + HART communication
- Explosion-proof models

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HYDROSTATIC LEVEL TRANSMITTERS

NIVOPRESS N

- 2 or 3-wire submersible transmitter
- Stainless steel or fully plastic body
- Up to 200 m range
- 4-20 mA + HART communication
- Linearity error: 0.25 %
- Incorporated Pt100 temperature sensor
- Venting tube in cable
- IP68 protection
- Explosion-proof models

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MAGNETOSTRICTIVE TRANSMITTERS

NIVOTRACK

- 2-wire compact and mini compact transmitter
- 0.1 mm or 1 mm resolution
- Max. 15 m measurement range
- For liquids with min. 0.4 kg/dm³ density
- Distance, level and volume measurement
- Rigid or flexible probes
- OIML R-85 international certification
- Explosion-proof models

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BYPASS LEVEL INDICATORS

NIVOFLIP

- Operation without power supply
- 500–5500 mm measuring range
- ±10 mm accuracy
- Stainless steel or titan float
- Optional strap-on level switches
- Max. 100 bar process pressure
- DIN and ANSI flanges
- High temperature version up to +250°C
- PED approval

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SET-UP AND CONFIG SOFTWARE

EView2

- Configuration and calibration software for up to 15 transmitters
- Downloadable free of charge
- Remote programming tool for all HART capable **NIVELCO** level, temperature, pressure and liquid analytical transmitters
- Query, edit, load & save transmitter parameters
- Limited trend monitoring capability
- Easy editing for linearisation table entries

ULTRASONIC INTEGRATED

EasyTREK FOR LIQUIDS

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

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ULTRASONIC COMPACT

EchoTREK FOR LIQUIDS

- For liquid level measurement
- 2- and 4- wire compact transmitter
- Narrow 5° beam angle
- Max. 25 m measurement range
- PP, PVDF, PTFE and s.s. transducers
- 32-point linearization
- Plug-in display module
- 4-20 mA + HART communication
- Explosion-proof models, IP67

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ULTRASONIC INTEGRATED

EasyTREK FOR SOLIDS

- For free flowing solid measurement
- 4-wire integrated transmitter
- Narrow 5° beam angle
- Max. 60 m measurement range
- PP and aluminium sensors
- Joystick aiming device
- 4-20 mA + HART communication
- Explosion-proof models, IP6X

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ULTRASONIC COMPACT

EchoTREK FOR SOLIDS

- For free flowing solid measurement
- 4-wire compact transmitter
- Narrow 5° beam angle
- Max. 60 m measurement range
- PP and aluminium sensors
- Joystick aiming device
- Plug-in display module
- 4-20 mA + HART communication
- Explosion-proof models, IP6X

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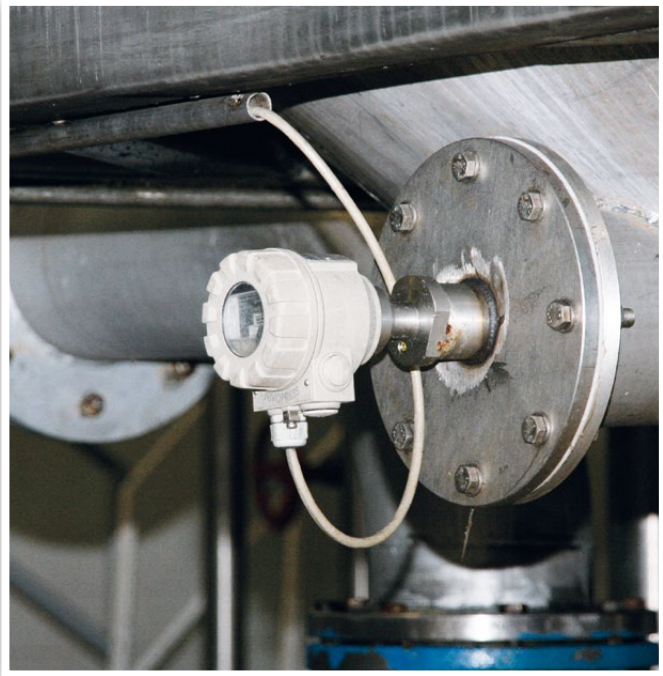



2 bar GÖZ
nivelco

GENERAL DESCRIPTION

The 25 GHz (K-band) **PiloTREK** Pulse Radars are regarded as the most progressive non-contact level transmitters of the industrial process automation field. Their accuracies are excellent and their short and narrow antennas make their installation simple and low cost. **NIVELCO's** K-band radar featuring ±3 mm accuracy and short dead band excels with its versatile housing concept lining up plastic, aluminium and stainless steel versions. Its antenna range incorporates stainless steel horn or parabolic antenna and enclosed plastic tube varieties. The enclosed antenna versions can be replaced without removing the antenna enclosure from the process. Local programming of the **PiloTREK** is aided by a plug-in display module. If on-site reading is not desired this module may not be required thus reducing cost of ownership. The signal processing algorithm of the **PiloTREK** is based on **NIVELCO's** 30 years of experience with non-contact level measurement making it an excellent choice for applications simple and challenging alike.

MAIN FEATURES

- *2-wire K-band Pulse Burst Radar*
- *25 GHz frequency*
- *Max. 23 m measuring range for liquids and slurries*
- *± 3 mm accuracy*
- *Easy installation due to small antennas*
- *Parabolic, horn and enclosed antenna types*
- *IP68 rated integrated type*
- *Sanitary types for meeting high hygienic requirements*
- *High temperature version*
- *Plug-in graphical display module*
- *Ex version*

WES-140

WPP-140

WGK-150

INDUSTRY SEGMENTS

- *Water, wastewater*
- *Power generation*
- *Food and beverage*
- *Pharmaceutical*
- *Chemical*

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *IEC approved (Ex ia)*

APPLICATION

- *Liquids and slurries in general*

OPERATION

The operation of the non-contact microwave level transmitters is based on the measurement of the time of flight of the microwave burst. The propagation speed of microwave impulses is practically the same in air, gases and in vacuum, independently from the process temperature and pressure, so the measured distance is not affected by the physical parameters of medium to be measured. The level transmitter induces microwave impulses a few nanosecond long in the antenna and a part of the energy of the emitted signals is bounced (reflected) back from the measurement surface depending on the measured media. The time of flight of the reflected signal is measured and processed by the electronics, and then this is converted to distance, level or volume proportional data. The measurability of the level of a specific medium is depending on the signal strength of the reflected microwave impulses. The signal strength of the reflected impulses is considerably depending on the distance to be measured, the relative dielectric constant of the measured medium and the turbulence of the surface. The relative dielectric constant (ε_r) of the medium should be more than 1.4 in case of parabolic design, or it should be more than 1.9 with horn antenna types.

ANTENNA TYPES

Antenna type	Antenna diameter					
	DN40 (1 ½")			DN50 (2")	DN80 (3")	DN150 (6")
	Process connection					
	1½" BSP/NPT	2" TRICLAMP	DN50 MILCH	2" BSP/NPT	DN80 – DN150 flanges	
Stainless steel (1.4571 / 316 Ti) horn	■	–	–	■	■	–
Plastic (PP) enclosure	■	–	–	■	–	–
Plastic (PTFE) enclosure	■	■	■	■	–	–
Stainless steel (1.4571 / 316 Ti) parabolic	–	–	–	–	–	■

TECHNICAL DATA

Type		Integrated	Compact		
			Plastic housing	Metal housing	High temperature version
Measured values		Level, Distance; Calculated values: Volume, Mass			
Frequency of the measurement signal		~25 GHz (K-band)			
Measuring range		0.2 m – 23 m (depending on the antenna type - see: special data of the antenna variations)			
Linearity error [1]		< 0.5 m: ±25 mm; 0.5 m – 1 m: ±15 mm; 1 m – 1.5 m: ±10 mm; 1.5 m – 8 m: ±3 mm; > 8 m: ±0.04% of the measured distance			
Minimum beam angle		11° (depending on the antenna type)	6° (depending on the antenna type; see: special data of the antenna variations)		
Minimum ε_r of the medium		1.9 (depending on the meas. range)	1.4 (depending on the meas. range; see: max. measurement range vs. ε_r diagram)		
Resolution		1 mm			
Temperature error (as per EN 61298-3)		0.05% FSK / 10 °C (-20 °C ... +60 °C			
Power supply		20 V ... 36 V DC			
Output	Digital communication	4-20 mA + HART			
	Display	–	SAP-300 graphical display unit		
Measuring frequency		10...60 sec as per the application settings			
Antenna diameter		38 mm (1 ½"), 48 mm (2"), 75 mm (3"), 148 mm (6")			
Antenna material		Horn: 1.4571 (316 Ti) stainless steel; enclosure: PP, PTFE	Horn, Parabolic: 1.4571 (316 Ti) stainless steel; enclosure: PP, PTFE		Horn, Parabolic: 1.4571 (316 Ti); enclosure: PTFE
Process temperature		-30 °C ... +100 °C, (up to 120 °C for max. 2 min) with PP antenna enclosure: max.: 80 °C			-30 °C ... + 180 °C
Max. process pressure		25 bar at 120 °C; with plastic antenna enclosure: 3 bar at 25 °C			
Ambient temperature		-20 °C ... +60 °C			
Process connection		Threaded, Flanged or Sanitary connections (as per order codes)			
Ingress protection		IP68	IP67		
Electrical connection		LiYCY type. 2x 0.5 mm² shielded Ø 6 mm cable; standard cable length: 5 m (can be ordered up to 30 m)	2x M20 x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø7...Ø13 mm, wire cross section: max.1.5 mm²		
Electrical protection		Class III.			
Housing material		Plastic (PP)	Plastic (PBT)	Paint coated aluminium or Stainless steel	
Sealing		Viton, EPDM			
Communication certifications		R&TTE, FCC			
Mass		1 – 1.6 kg		Aluminium: 2–2.6 kg St. steel: 3.3–3.9 kg	Aluminium: 2.7 - 3.3 kg Stainless steel: 4 - 4.6 kg

[1] *Under reference conditions of reflection and stabilized temperature*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type		W□M -1□□-8 Ex	W□S / W□K -1□□-8 Ex
Protection type		Intrinsically safe	
Ex marking	ATEX	See: www.nivelco.com	
	IEC Ex [2]		
Intrinsically safe data			
Power supply		20 V ... 30 V DC	
Ambient temperature		-20 °C ... +60 °C	
Electrical connection		2x M20 x1.5 metal cable glands, cable outer diameter: Ø7 ... Ø13 mm, wire cross section: max.1.5 mm²	
		In case of WPM type: LiYCY type. 2x 0.5 mm² shielded Ø 6 mm cable; maximum cable length: 5 m	

TEMPERATURE DATA FOR Ex CERTIFIED MODELS

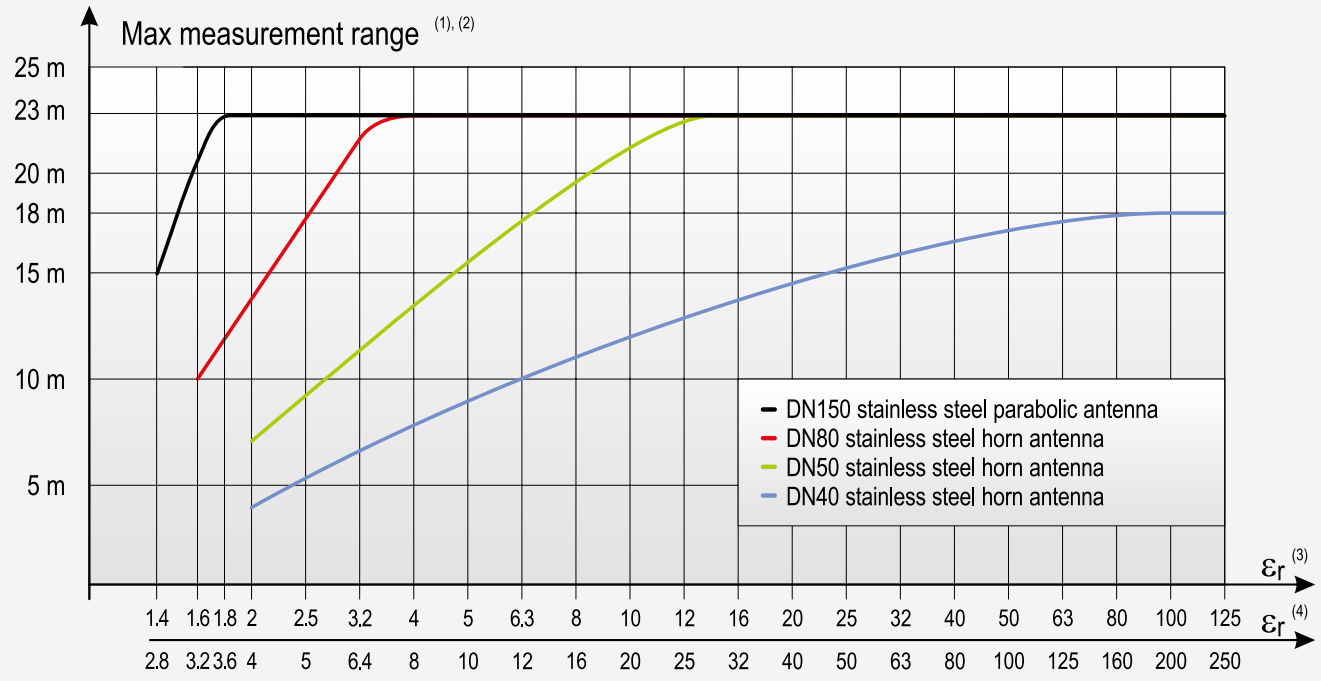
[2] *Need of IEC Ex is to be specified with order*

Temperature data	W□M -1□□-8 Ex		WES / WGS -1□□-8 Ex WEK / WGK -1□□-8 Ex			WHS / WJS-1□□-8 Ex WHK / WJK-1□□-8 Ex
Maximum permissible temperature at the antenna (min.: – 30 °C)	+ 80 °C	+ 80 °C	+ 80 °C	+ 90 °C	+ 100 °C	+ 180 °C
Maximum permissible surface temperature of the process connection (min.: – 30 °C)	+ 75 °C	+ 80 °C	+ 75 °C	+ 90 °C	+ 100 °C	+ 175 °C
Temperature classes	T6	T5	T6	T5	T4	T3

SPECIAL DATA OF THE ANTENNA VARIATIONS

Type	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□
Name	DN40 (1 ½") s. steel horn antenna	DN50 (2") s. steel horn antenna	DN80 (3") stainless steel horn antenna with flange	DN150 (6") s. steel parabolic antenna
Process connection	1½" BSP, 1½"NPT	2" BSP, 2"NPT	DN80 – DN150 flanges	DN150 flange
Material of wetted parts	1.4571 (316 Ti), PTFE; in case of WPM: 1.4571 (316 Ti), PTFE, PP			1.4571 (316 Ti), PTFE
Beam angle	19°	16°	11°	6°
Dead zone	0.2 m			0.4 m

Type	W□P-14□	W□M / W□S / W□K-14□ + WAT-14T-0	W□M / W□S / W□K-14□ + WAT-14R-0	W□P-15□
Name	DN40 (1 ½") PP or PTFE encapsulated antenna	Sanitary type DN40 (1 ½") horn antenna with PTFE antenna enclosure		DN50 (2") PP or PTFE encapsulated antenna
Housing	Plastic	Plastic / Paint coated aluminium / Stainless steel		Plastic
Process connection	1½" BSP, 1½"NPT	2" TRICLAMP	DN50 MILCH	2" BSP, 2" NPT
Material of wetted parts	PP or PTFE	1.4571 (316 Ti), PTFE		PP or PTFE
Dead zone	0.3 m			



(1) *Under reference conditions of reflection (as per EN 61298-3, moreover in case of interference-free environment, from min. 10 m² target surface) and stabilized temperature. The plastic antenna enclosures result 10 % (PTFE) or 20 % (PP) decrease in the maximal measurement range!*
(2) *In some instances (e.g. disturbing reflections, steam or gas condensation, EMC noises) the maximal measurement range might decrease by 50 % !*
(3) *Dielectric constant (εr) of liquids used in storage tanks with flat liquid surface*
(4) *Dielectric constant (εr) of liquids used in process tanks or where liquid surface is waving*

POLARIZATION

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

BACKGROUND MAPPING

The background mapping feature provides excellent solution to ignore unwanted false reflections coming from (not-moving) disturbing objects. For this purpose the instrument needs to map the totally empty tank to create a "background image". Then the measurement evaluation software of **PiloTREK** will automatically recognise and ignore the false reflections coming from the disturbing objects inside the tank.

PROGRAMMING, ECHO MAP

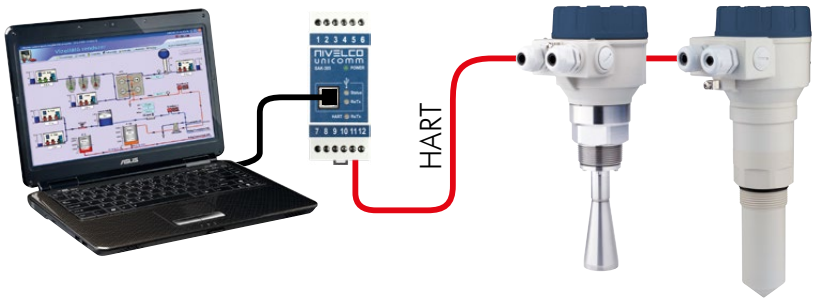
With the help of the **SAP-300** plug-in display a simplified full-parameter programming can be accomplished, the parameters of measurement and output can be set using the text-based menu system.
The large LCD dot-matrix display displays the measured values in numerical and bar graph form. The Echo Map feature helps to detect false reflections and aids the optimization of the measurement configuration.

MOUNTING

To avoid unwanted multiple reflections the instrument should not be mounted in the middle of the tank or in the vicinity of the filling place or the outlet of the tank. The ideal position for the **PiloTREK** is on the r = (0.3…0.5) R in case of cylindrical tank. The distance between the sensor and the tank wall should be at least 200 mm.
The mounting placement should be as far as possible from the disturbing objects inside the tank and from the sources of disturbing effects such as waving, vortex or strong vibrations. The antenna face should be parallel to the medium surface within ± 2-3°. To avoid overheating the instrument should be protected against direct sunshine.

PiloTREK TRANSMITTERS IN SYSTEM WITH A PC

The instruments with **HART** output can be connected to a PC using a **UNICOMM HART-USB** modem. Max. 15 normal (non-Ex) instruments can be connected to a single HART loop. All measured values can be visualized and/or the instruments can be remote programmed via digital HART communication. 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.

WES-119

WHS-140
+ WAT-14T

PiloTREK WP-100

2-wire integrated compact 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

* Ex version not available

Antenna / Connection size

W P ■ – 1 □ ■ – ■

4	Horn DN40 / 1 1/2"
5	Horn DN50 / 2"

Process connection

W P ■ – 1 ■ □ – ■

0	BSP
N	NPT

Output / Ex

W P ■ – 1 ■ ■ – □

4	4-20 mA + HART
8	4-20 mA + HART / Ex ia

Cable

Maximum length 30 m; each started 1 m over the standard 5 m
Ex version comes with 5 m cable only

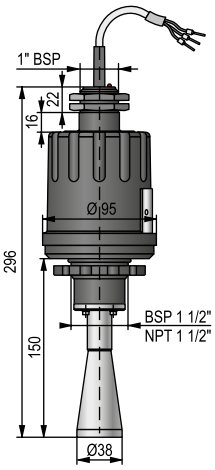
Accessories to order (see relevant page for details)

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

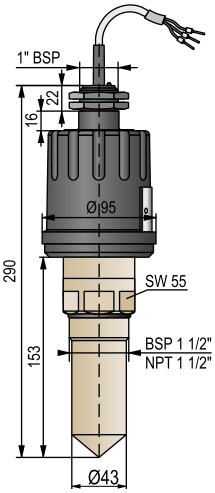
Antenna enclosures

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

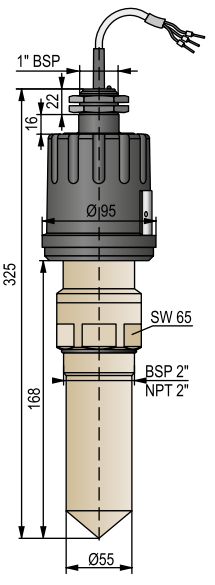
** To be ordered together with the transmitter, Ex version not available



WPM-140 / 14N



WPP-140 / 14N



WPP-150 / 15N

PiloTREK WP-100

2-wire integrated compact pulse burst radar level transmitter for liquids
with DN80 stainless steel horn antenna or plastic encapsulated 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 drilled like PN25
7	DN100 PP flange drilled like PN25
A	3" RF 150 psi 1.4571 flange
B	4" RF 150 psi 1.4571 flange
E	3" FF PP flange drilled like 150 psi
F	4" FF PP flange drilled like 150 psi
J	JIS 10K 80A 1.4571 flange
K	JIS 10K 100A 1.4571 flange
P	JIS 80A PP flange drilled like 10K
R	JIS 100A PP flange drilled like 10K

Output / Ex

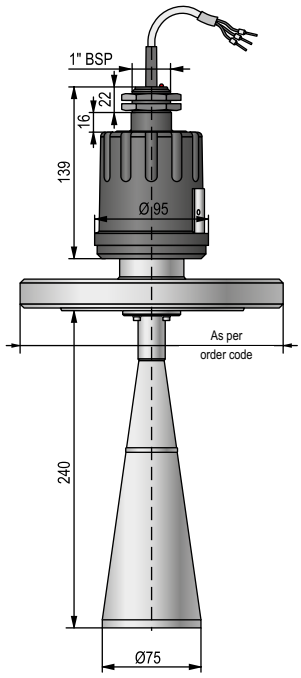
W P M – 1 8 ■ – □	
4	4-20 mA + HART
8	4-20 mA + HART / Ex ia

Cable

Maximum length 30 m; each started 1 m over the standard 5 m
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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



WPM-18□

PiloTREK W-100

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 aluminium housing

Antenna / Housing

W ■ □ – 1 ■ ■ – ■

P	**	PP / Plastic, PBT, glass fibre reinforced
M		1.4571 / Plastic, PBT, glass fibre reinforced
S		1.4571 / Aluminium (paint coated)
K		1.4571 / Stainless steel

** Ex version not available

Antenna / Connection size

W ■ ■ – 1 □ ■ – ■

4	Horn DN40 / 1 1/2"
5	Horn DN50 / 2"

Process connection

W ■ ■ – 1 ■ □ – ■

0	BSP
N	NPT

Output / Ex

W ■ ■ – 1 ■ ■ – □

4	4-20 mA + HART
8	4-20 mA + HART / Ex ia

Need of IEC is to be specified with order

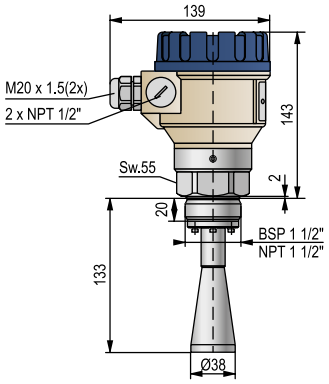
Accessories to order (see relevant page for details)

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

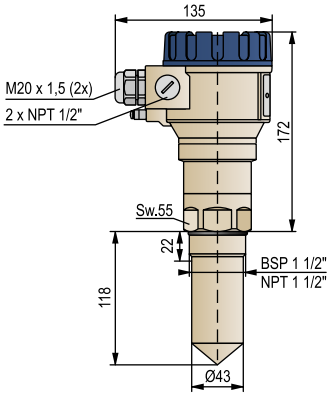
Antenna enclosures

WAP – 140 – 0	**	PP antenna enclosure with 1 1/2" BSP process connection for DN40 antenna
WAP – 14N – 0	**	PP antenna enclosure with 1 1/2" NPT process connection for DN40 antenna
WAT – 140 – 0	**	PTFE antenna enclosure with 1 1/2" BSP process connection for DN40 antenna
WAT – 14N – 0	**	PTFE antenna enclosure with 1 1/2" NPT process connection for DN40 antenna
WAP – 150 – 0	**	PP antenna enclosure with 2" BSP process connection for DN50 antenna
WAP – 15N – 0	**	PP antenna enclosure with 2" NPT process connection for DN50 antenna
WAT – 150 – 0	**	PTFE antenna enclosure with 2" BSP process connection for DN50 antenna
WAT – 15N – 0	**	PTFE antenna enclosure with 2" NPT process connection for DN50 antenna
WAT – 14T – 0	**	PTFE antenna enclosure with 2" TriClamp 1.4571 process connection for DN40 antenna
WAT – 14R – 0	**	PTFE antenna enclosure with DN50 Pipe coupling 1.4571 process connection for DN40 antenna

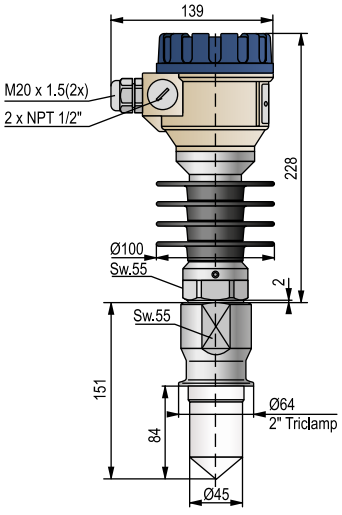
*** To be ordered together with the transmitter, Ex version not available



WES-140 / 14N



WEP-140 / 14N



WHS-140 + WAT-14T

PiloTREK W-100

2-wire compact radar level transmitter for liquids
with DN80 stainless steel horn antenna or plastic encapsulated 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 aluminium housing

Antenna / Housing

W ■ □ – 1 8 ■ – ■

M	1.4571 / Plastic, PBT, glass fibre reinforced
S	1.4571 / Aluminium (paint coated)
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 drilled like PN25
7	DN100 PP flange drilled like PN25
A	3" RF 150 psi 1.4571 flange
B	4" RF 150 psi 1.4571 flange
E	3" FF PP flange drilled like 150 psi
F	4" FF PP flange drilled like 150 psi
J	JIS 10K 80A 1.4571 flange
K	JIS 10K 100A 1.4571 flange
P	JIS 80A PP flange drilled like 10K
R	JIS 100A PP flange drilled like 10K

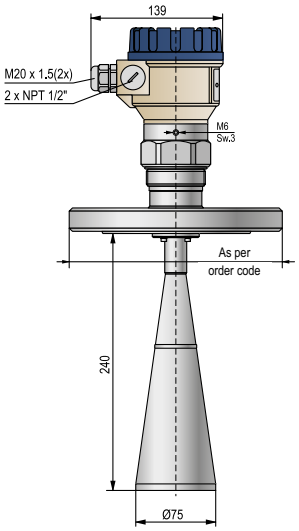
Output / Ex

W ■ ■ – 1 8 ■ – □

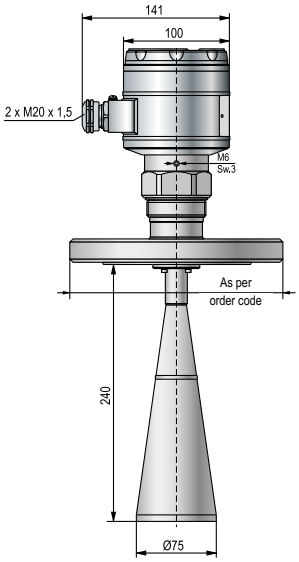
4	4-20 mA + HART
8	4-20 mA + HART / Ex ia

Accessories to order (see relevant page for details)

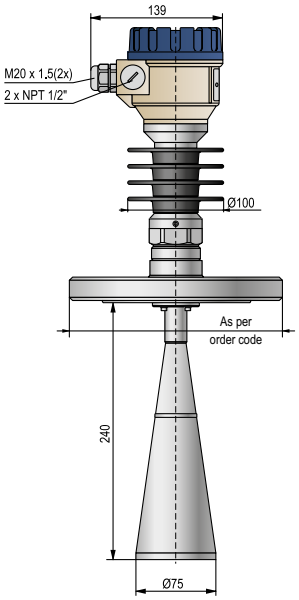
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



WES-18□



WEK-18□



WHS-18□

PiloTREK W-100 with parabolic antenna

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, glass fibre reinforced
S	1.4571 / Aluminium (paint coated)
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 drilled like PN25
D	6" RF 150 psi 1.4571 flange
H	6" FF PP flange drilled like 150 psi
M	JIS 10K 150A 1.4571 flange
T	JIS 150A PP flange drilled like 10K

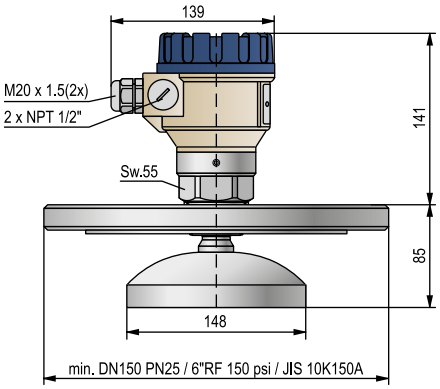
Output / Ex

W ■ ■ – 1 1 ■ – □

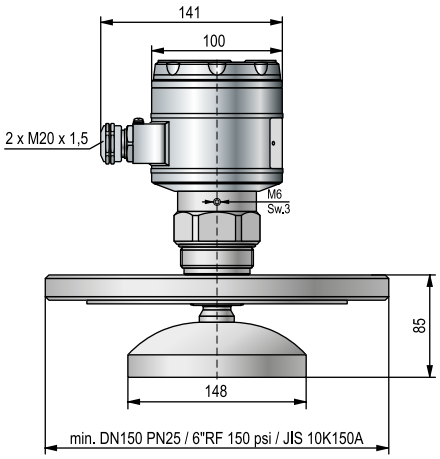
4	4-20 mA + HART
8	4-20 mA + HART / Ex ia

Accessories to order (see relevant page for details)

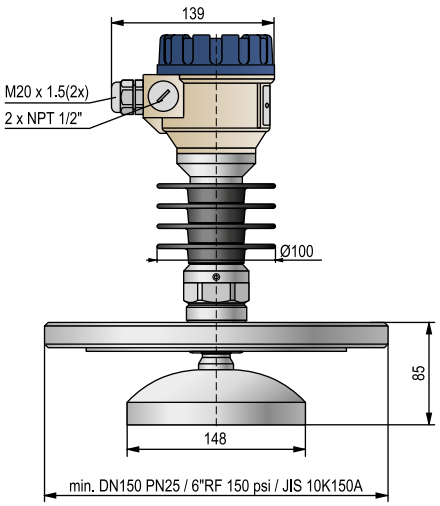
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



WES-115



WEK-115



WHS-115

GENERAL DESCRIPTION

The **MicroTREK** Guided Wave Radar level transmitter is designed for continuous level measuring of conductive or non-conductive liquids, pulps and solids. **MicroTREK** level gauge operates based on the well-known TDR (Time Domain Reflectometry) principle. Micropulses are sent along a probe guide at the speed of light. As soon as the impulse reaches the surface of the medium, it is reflected back to the electronic module. Level distance is directly proportional to the flight time of the impulse.
The reflected signal is dependent on the dielectric constant of the material, the feasibility of the measurement is $\varepsilon_r \geq 1.4$. The TDR technology is unaffected by the properties of the medium as well as that of the space above it. Measurement is also unaffected by the change in the physical properties of the materials such as temperature, pressure, dielectric constant.

MAIN FEATURES

- *Measuring range up to 24 m*
- *Accuracy: ± 5 mm*
- *Measurement is independent of dielectric constant, temperature, pressure and density variations*
- *Rod, cable and coaxial probes*
- *Segmented rod probe version*
- *Minimum εr ≥ 1.4*
- *2-wire version*
- *Graphic display*
- *4-20 mA + HART output*
- *Medium temperature range: –30 °C...+200 °C*
- *Maximum process pressure: 40 bar*
- *IP67 protection*

HHA-400 HTK-400

SAP-300 display

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex iaD)*
- *ATEX approved (Dust Ex)*
- *IEC approved (Ex ia)*
- *IEC approved (Ex iaD)*

APPLICATIONS

Mono cable / Mono rod Mono segmented rod	Twin cable	Twin rod	Coaxial Pipe
■ Cement, limestone, fly ash, alumina, carbon black ■ All high-viscosity liquids ■ Mineral powders ■ Clean and contaminated liquids ■ For stilling wells (calibration required) ■ Aggressive mediums with plastic coated probes ■ Slightly conductive foams ■ High temperature applications ■ Bypass applications	■ Tank parks with solvents, oil or fuels ■ Water storage tanks ■ Plastic granules ■ For products with low dielectric constant ($\varepsilon_r > 1.8$) ■ For any liquids, light granules ■ For narrow tanks ■ Where minimum dead-zone is needed ■ Mounting close to tank wall is possible	■ Plastic granule vessels ■ 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 or tanks with max. 6 m height ■ 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 vapour 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	Metal housing	High temperature version
Measured values		Distance, level; calculated values: volume, mass		
Measuring range		Depends on the probe type and dielectric constant (ε_r) of the measured medium		
Probe types		Mono cable, twin cable, mono rod, twin rod, 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 ≥ 10m: ± 0.2 % of the probe length		
	Resolution	± 3 μA		
Minimum ε_r of the medium		1.4 (depending on the probe type)		
Power supply		18 V ... 35 V DC		
Output	Digital communication	4-20 mA + HART		
	Display	SAP-300 graphical display unit		
Medium temperature		-30 °C ... +90 °C		-30 °C ... +200 °C
		With plastic coated probes see: Technical data of the coated probes		
Maximum medium pressure		4 MPa (40 bar); with plastic lined flange: max. 2.5 MPa (25 bar); with coaxial pipe probe: max. 1.6 MPa (16 bar)		
Ambient temperature		-20 °C ... +60 °C	-30 °C ... +60 °C, with display: -20 °C...+60 °C	
Process connection		Threaded, Flanged or Sanitary connections (as per order codes)		
Ingress protection		IP67		
Electrical connection		2x M20x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø 7 ... Ø 13 mm, wire cross section: max.1.5 mm²		
Electrical protection		Class III.		
Housing material		Plastic (PBT)	Paint coated aluminium or stainless steel	
Sealing		FPM (Viton®), optional: FFKM (Kalrez®), EPDM		
Explosion protection		—	see: Special data for Ex certified models	
Mass (head unit)		1.5 kg	2 kg	2.5 kg

[1] Under reference conditions and stabilized temperature

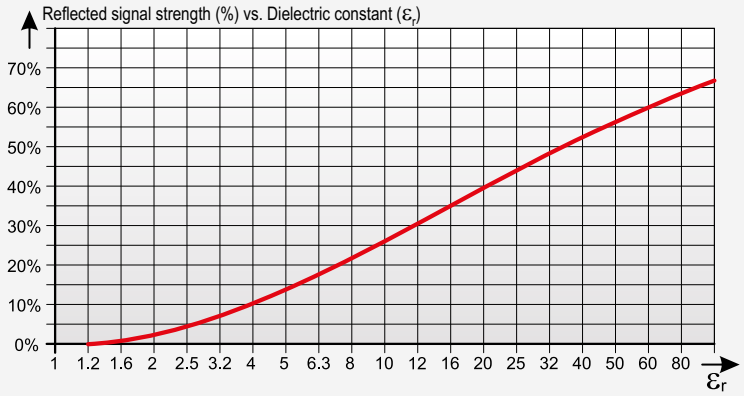
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type		H□□-4□□-8 Ex / H□□-6□□-8 Ex		H□□-4□□-5 Ex H□□-6□□-5 Ex	H□□-4□□-6 Ex H□□-6□□-6 Ex
		Probe without coating	Coated probe		
Protection type		Intrinsically safe		Dust Ex	Intrinsically safe and Dust Ex
Ex marking	ATEX	See: www.nivelco.com			
	IEC Ex [2]				
Intrinsically safe data					
Power supply		18 V... 28 V DC			
Electrical connection		2x M20x1.5 metal cable glands, cable outer diameter: Ø 7...Ø 13 mm, wire cross section: max.1.5 mm²			
Ambient temperature		-30 °C ... +60 °C, with display: -20 °C...+60 °C			

[2] Need of IEC Ex is to be specified with order

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	Edible 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
Benzene	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

PROBE SELECTION

Reliable microwave measurement depends on the correct selection of probes taking into consideration the properties of the medium and other vessel conditions.

Probe type	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 Ø 4 mm	24 m	300 / 20 mm	400 / 100 mm	1"; 1 1/2"	2.1
Mono cable Ø 8 mm				1 1/2"	
Mono rod Ø 8 mm	3 m			1"	
Mono / segmented rod Ø 14 mm	6 m			1 1/2"	
Twin cable Ø 4 mm	24 m	150 / 20 mm	300 / 100 mm		1.8
Twin rod Ø 8 mm	3 m				
Coaxial pipe Ø 28 mm	6 m	0 / 10 mm	0 / 100 mm	1"; 1 1/2"	1.4
Coated cable Ø 6 mm	24 m	300 / 20 mm	400 / 100 mm	1"; 1 1/2" TriClamp; DN40 MILCH, DN50	2.4
Coated rod Ø 12 / 16 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)

TECHNICAL DATA OF THE PROBES

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
Denomin.	Cable	Rod	Rod / segmented rod	Cable	Twin cable	Twin rod	Coaxial
Max. meas. dist.	24 m	3 m	6 m	24 m		3 m	6 m
Min. meas. dist.(ε_r=80 / ε_r= 2.4)	0.3 m / 0.4 m				0.15 m / 0.3 m		0 m
Minimum ε_r of the medium	2.1				1.8		1.4
Sensing space around the probe	Ø 600 mm				Ø 200 mm		0 mm
Process connection	1" BSP; 1"NPT	1" BSP	1 1/2" BSP				1" BSP; 1"NPT
	1 1/2" BSP; 1 1/2" NPT	1"NPT	1 1/2" NPT				1 1/2" BSP; 1 1/2" 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
Mass	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 on the cable	PTFE-GF25	PTFE
Weight dimensions	Ø 25x100 mm	–		Ø 40x260 mm	Ø 40x80 mm	–	
Weight material	1.4571	–		1.4571		–	

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

TECHNICAL DATA OF THE COATED PROBES

Type	H□F, H□G	H□X	H□Y	H□M	H□Q	H□O	H□I
Denomin.	FEP coated cable				PFA coated rod		PP coated rod
Max. meas. dist.	24 m				3 m		
Min. meas. dist. (ε_r=80 / ε_r= 2.4)	0.3 m / 0.4 m						
Minimum ε_r of the medium	2.4						
Sensing space around the probe	Ø 600 mm						
Process connection	1" BSP; 1"NPT	1 1/2" TriClamp	DN 40 MILCH	DN 50 PN25 flange		1 1/2" TriClamp	DN 50 PN25
Max. medium temp.	+150 °C						+60 °C
Probe material	1.4401				1.4571		
Probe coating material	FEP				PFA		PP
Probe nominal Ø	Ø 6 mm				12 mm		16 mm
Fillet coating material	–			PFA			PP
Weight material	1.4571			1.4571 + PFA coating	–		
Mass	0.16 kg/m				0.5 kg/m		0.6 kg/m

MicroTREK H-400/H-500 with cable probe

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	Transmitter / Flange temp. max. 200°C (with St. St. probe only)
B	Transmitter with local LCD indicator / Flange temperature max. 90°C
P	Transmitter with local LCD indicator / Flange temp. max. 200°C (with St. St. probe only)

Probe / Process connection

H ■ □ – ■ ■ ■ – ■

K	Mono cable, Ø 4 mm, 1.4401 / 1" BSP / max. 24 m
L	Mono cable, Ø 4 mm, 1.4401 / 1" NPT / max. 24 m
V	Mono cable, Ø 4 mm, 1.4401 / 1 1/2" BSP / max. 24 m
W	Mono cable, Ø 4 mm, 1.4401 / 1 1/2" NPT / max. 24 m
N	Mono cable, Ø 8 mm, 1.4401 / 1 1/2" BSP / max. 24 m
J	Mono cable, Ø 8 mm, 1.4401 / 1 1/2" NPT / max. 24 m
T	Twin cable, 2x Ø 4 mm, 1.4401 / 1 1/2" BSP / max. 24 m
U	Twin cable, 2x Ø 4 mm, 1.4401 / 1 1/2" NPT / max. 24 m
F	Mono cable, Ø 4 mm, + FEP coated / 1" BSP / max. 24 m
G	Mono cable, Ø 4 mm, + FEP coated / 1" NPT / max. 24 m
X	6 WEEKS! Mono cable, Ø 4 mm, + FEP coated / Triclamp 1 1/2" / max. 24 m
Y	6 WEEKS! Mono cable, Ø 4 mm, + FEP coated / Sanitary DN40 / max. 24 m
M	6 WEEKS! Mono cable, Ø 4 mm, + PFA/FEP coated / DN50, PN25, 1.4571+PFA/FEP lining

Housing

H ■ ■ – □ ■ ■ – ■

4	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced (Ex version not available; HT, HB only)
6	Stainless steel

Probe length

H ■ ■ – ■ □ □ – ■

n n	1.0-24.0 m (each 1 m), for mono cable, Ø 4 mm, 1.4401
n n	1.0-24.0 m (each 1 m), for mono cable, Ø 8 mm, 1.4401
n n	1.0-24.0 m (each 1 m), for twin cable, 1.4401
n n	1.0-24.0 m (each 1 m), for mono cable, Ø 4 mm, 1.4401 + FEP

nn = 01-24 : 1.0-24.0 m

Output / Approval

H ■ ■ – ■ ■ ■ – □

4	4-20 mA + HART
5	4-20 mA + HART / Ex tD (only for HT, HB and probes without coating)
6	4-20 mA + HART / Ex iaD
8	4-20 mA + HART / Ex ia

Need of IEC is to be specified with 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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

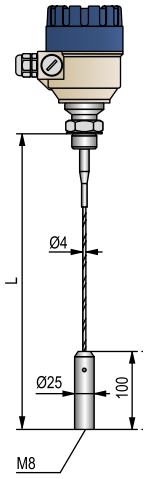
Various process connections (price information on request)

- DIN and ANSI flanges
- TriClamp
- DN 40 Pipe coupling (DIN 11851)

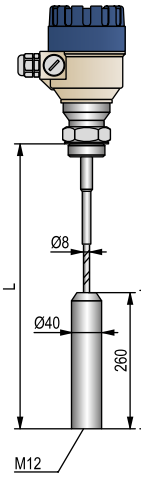
Special sealings

- EPDM
- FFKM 6 WEEKS!

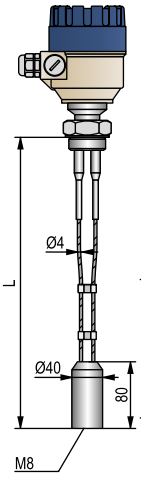
The above process connections and special sealings should be ordered separately and should be specified in the text part of the order



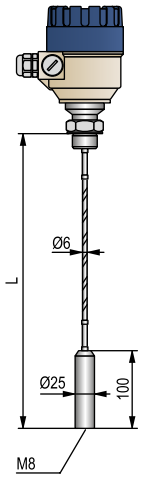
H□K / H□L / H□V / H□W-400/500



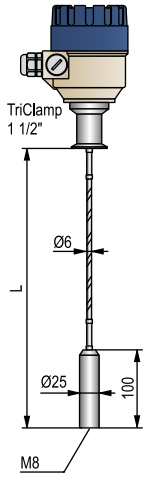
H□N / H□J-400/500



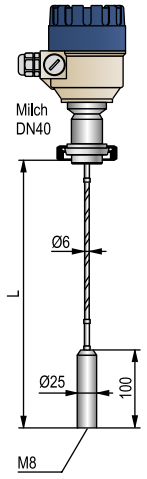
H□T / H□U-400/500



H□F / H□G-400 /500



H□X-400 / 500



H□Y 400 / 500

MicroTREK H-400/H-500 with rod probe

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	Transmitter / Flange temp. max. 200°C (with St. St. probe only)
B	Transmitter with local LCD indicator / Flange temperature max. 90°C
P	Transmitter with local LCD indicator / Flange temp. max. 200°C (with St. St. probe only)

Probe / Process connection

H ■□ – ■■■ – ■

R	Mono rod, 1.4571 / 1" BSP / max. 3 m
P	Mono rod, 1.4571 / 1" NPT / max. 3 m
D	Twin rod, 1.4571 / 1 1/2" BSP / max. 3 m
E	Twin rod, 1.4571 / 1 1/2" NPT / max. 3 m
Q	6 WEEKS! Mono rod + PFA coated / DN50, PN25, 1.4571+PFA lining
I	6 WEEKS! Mono rod + PP coated / DN50, PN25, 1.4571+PP lining
O	6 WEEKS! Mono rod + PFA coated / 1 1/2" Triclamp PFA coated

Housing

H ■■ – □■■ – ■

4	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced (Ex version not available; HT, HB only)
6	Stainless steel

Probe length

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, PP coated
n n	1.0-3.0 m (each 0.1 m), for mono rod, 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 / Approval

H ■■ – ■■■ – □

4	4-20 mA + HART
5	4-20 mA + HART / Ex tD (only for HT, HB and probes without coating)
6	4-20 mA + HART / Ex iaD
8	4-20 mA + HART / Ex ia

Need of IEC is to be specified with 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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

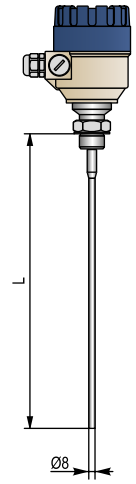
Various process connections (price information on request)

- DIN and ANSI flanges
- TriClamp
- DN 40 Pipe coupling (DIN 11851)

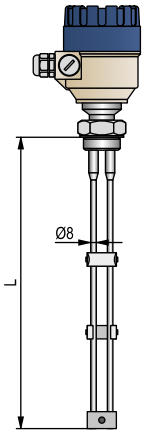
Special sealings

- EPDM
- FFKM 6 WEEKS!

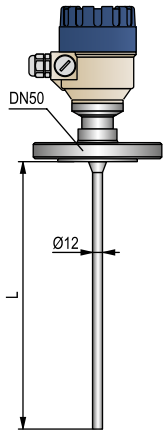
The above process connections and special sealings should be ordered separately and should be specified in the text part of the order



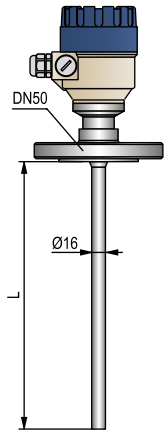
H□R / H□P-400 / 500



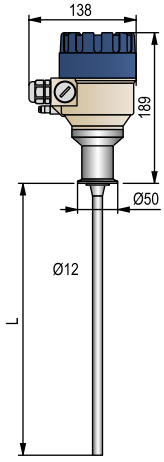
H□D / H□E-400 / 500



H□Q-400 / 500



H□I-400 / 500



H□O-400 / 500

MicroTREK H-400/H-500 with rod or coaxial probe

2-wire compact TDR level transmitter for liquids and free-flowing solids
with stainless steel Ø 14 mm rod or coaxial probe

Version / Temperature

H □■ – ■■■ – ■

T	Transmitter / Flange temperature max. 90°C
H	Transmitter / Flange temp. max. 200°C (with St. St. probe only)
B	Transmitter with local LCD indicator / Flange temperature max. 90°C
P	Transmitter with local LCD indicator / Flange temp. max. 200°C (with St. St. probe only)

Probe / Process connection

H ■□ – ■■■ – ■

S	*	Mono rod, 1.4571 / 1 1/2" BSP / max. 6 m
Z	*	Mono rod, 1.4571 / 1 1/2" NPT / 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 / 1 1/2" BSP / max. 6 m
H		Coaxial, 1.4571 / 1 1/2" NPT / max. 6 m

* Can be ordered with sectionalized probe which should be given in the text of the order. The length of the probe section is 1 m.

Housing

H ■■ – □■■ – ■

4	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced (Ex version not available; HT, HB only)
6	Stainless steel

Probe length

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 sectionalized mono rod, 1.4571

nn = 10-60 : 1.0-6.0 m

Output / Approval

H ■■ – ■■■ – □

4	4-20 mA + HART
5	4-20 mA + HART / Ex tD (only for HT, HB and mono rod probes)
6	4-20 mA + HART / Ex iaD
8	4-20 mA + HART / Ex ia

Need of IEC is to be specified with order

Available on request (see relevant page for details)

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

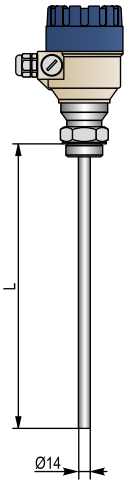
Various process connections (price information on request)

- DIN and ANSI flanges
- TriClamp
- DN 40 Pipe coupling (DIN 11851)

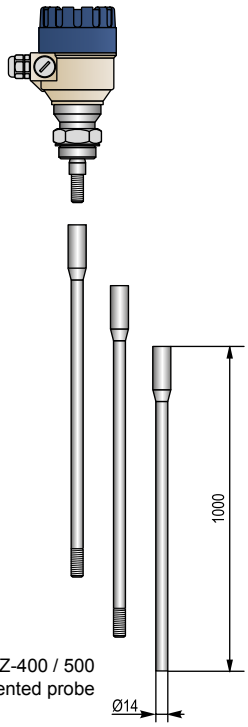
Special sealings

- EPDM
- FFKM 6 WEEKS!

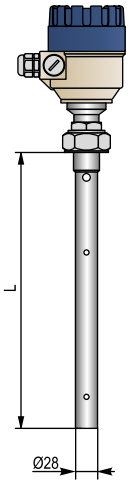
The above process connections and special sealings should be ordered separately and should be specified in the text part of the order



H□S / H□Z-400 / 500



H□S / H□Z-400 / 500
with segmented probe



H□A / H□B / H□C /
H□H-400 / 500

GENERAL DESCRIPTION

NIVOCAP 2-wire capacitive level transmitters provide an ideal solution for level measurement of conductive or non-conductive liquids. The probe of the instrument and the reference probe (which can be either the metal wall of the tank or installed separately) operate as opposing plates of a capacitor. Between the plates of this capacitor the air is replaced by a medium with greater dielectric constant than the air during filling the tank, therefore the capacitance is changing directly proportional to the level. The incorporated electronic circuitry measures the capacitance difference and converts it to an output signal proportional to level.

MAIN FEATURES

- *Maximum 20 m measurement range*
- *Vertical mounting*
- *Rod or cable probe versions*
- *-30...+200°C medium temperature*
- *Max. 40 bar medium pressure*
- *32 point linearization table*
- *Indirect assignment of 0% and 100%*
- *4-20 mA + HART output*
- *Ex version*
- *IP67 protection*

APPLICATIONS

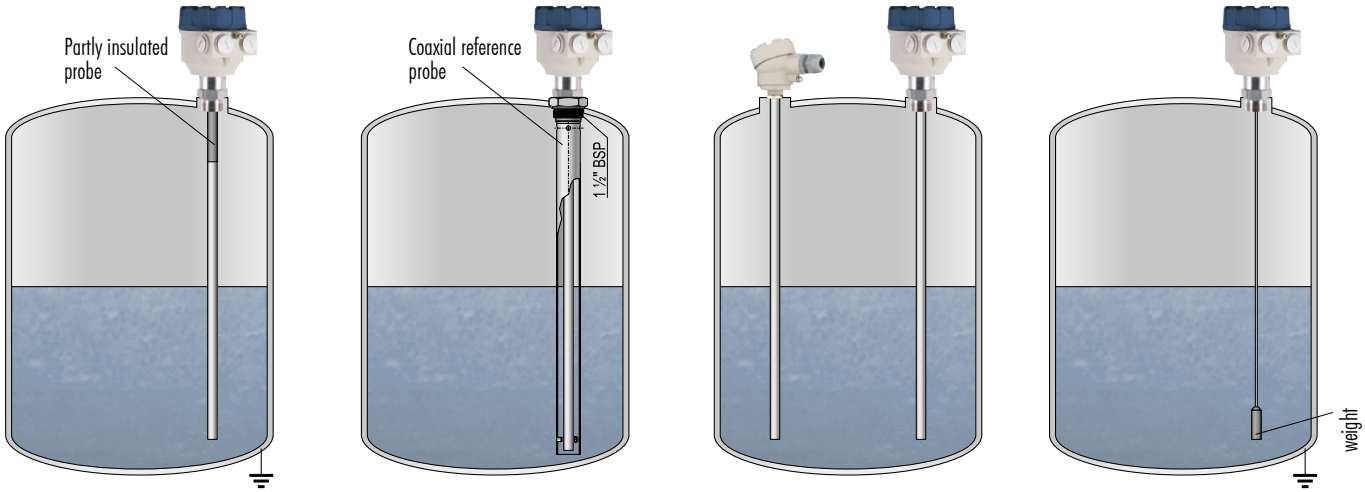
- *Level and volume measurement*
- *Level measurement of conductive and non-conductive materials*
- *Level measurement of liquids*
- *For high pressure and high temperature mediums*

CERTIFICATIONS

- *ATEX approved (Ex ia)*

CHR-200 CAF-110 CFR-100 CTR-300 CTK-200

MEASUREMENT ARRANGEMENTS



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

Rod probe
With coaxial tube reference probe

Rob probe
With reference rod probe

Cable probe with weight
Metal tank

TECHNICAL DATA

Version		Rod probe	High temp. rod probe	Cable probe
Measurement 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 codes		
Material of wetted parts	Threaded part	1.4571 stainless steel		
	Probe	Fully or partially PFA coated 1.4301 stainless steel		Fully FEP coated steel cable
Housing material		Plastic (PBT), paint coated aluminium or stainless steel		
Medium temperature		–30°C … +130 °C	–30°C … +200 °C	–30°C … +130 °C
Ambient temperature		–25°C … +70 °C		
Medium pressure		max. 4 MPa (40 bar)		max. 1.6 MPa (16 bar)
Power supply / consumption		12 – 36 V DC / max. 800 mW, overvoltage protection against transients		
Output data	Output signals	Analogue: 4–20 mA (3.9…20.5 mA) $R_{max} = U_t$-11.4 V/0.02A Error indication: 3.8 mA or 22 mA		
		Digital communication: 4–20 mA + 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 sec selectable		
	Linearity error	±0.3% FS		
	Temperature error	±0.02% /°C FS		
Electrical connection		2x M20x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø 7 … Ø 13 mm, wire cross section: max.1.5 mm²		
Electrical protection		Class III.		
Ingress protection		IP67		
Mass		≈ 2.5 kg with 0.5 m probe	≈ 3 kg with 0.5 m probe	≈ 2 kg with 3 m probe

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type		C□□-2□□-□ Ex / C□□-3□□-□ Ex
Protection type		Intrinsically safe
Ex marking		See: www.nivelco.com
Instrintiallly safe data		
Temperature classification	T6...T4 temp. class	Tambient: -25 °C ... +70 °C; Tmedium max. 80 °C ... 120 °C
	T3 temperature class	Tambient: -25 °C ... +45 °C; Tmedium max. 190 °C

PROBE SELECTION

Consequences of the capacitive operation principle: Relative dielectric constant of the medium should be taken into consideration. Measurement will be accurate only in case of suitable probe and reference probe selection.

	Medium		
	Conductive	Non-conductive	
		$\varepsilon_r > 2$	$2 > \varepsilon_r > 1.5$
Insulated probe, reference probe	■	■	–
Partly insulated probe, reference probe	–	■	■

	Reference probe		
	Rod	Tube	Tank wall
Conductive tank	■	■	■
Non-conductive tank	■	■	–

NIVOCAP C-200/C-300 with rod probe

2-wire compact capacitance 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 indicator / 130°C
H	Transmitter / 200°C
P	Transmitter with local LCD indicator / 200°C

Process connection size / Insulation

C ■□ – ■■■ – ■

M	3/4" BSP / Fully PFA insulated stainless steel
Z	3/4" 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	1 1/2" BSP / Fully PFA insulated stainless steel
T	1 1/2" BSP / Partially PFA insulated stainless steel
B	1 1/2" NPT / Fully PFA insulated stainless steel
D	1 1/2" NPT / Partially PFA insulated stainless steel

Housing

C ■■ – □■■ – ■

2		Aluminium (paint coated)
3		Plastic, PBT, glass fibre 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; each started 100 mm
Partially PFA insulated	
0 2	0.2 m
n n	0.3-3 m; each started 100 mm

nn = 03-30 : 0.3-3 m

Output / Approval

C ■■ – ■■■ – □

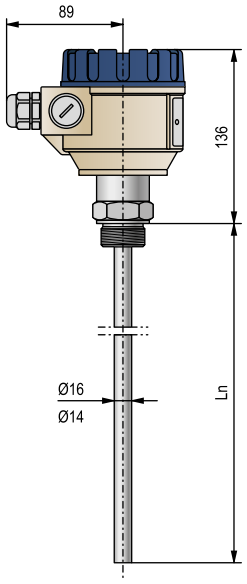
2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex
8	4-20 mA+ HART / Ex

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

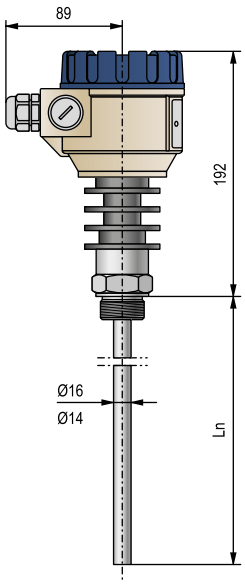
X07	1 1/2" Triclamp (ISO 2852)
X07	2" Triclamp (ISO 2852)
X12	DN 40 Pipe coupling (DIN 11851)
X12	DN 50 Pipe coupling (DIN 11851)

Accessories to order (see relevant page for details)

CBR-205-2M-900-01	Adapter 1" BSP / 3/4" NPT (1.4571)
CBR-205-2M-900-02	Adapter 1" BSP / 2" BSP (1.4571)
SAP – 202 – 0	Plug-in display module
SAT – 304 – 0	HART-USB modem
SAK – 305 – 2	HART-USB/RS485 modem
SAK – 305 – 6	HART-USB/RS485 modem / Ex ia



CTR-200 / 300



CHR-200 / 300

NIVOCAP C coaxial reference probe

For use with NIVOCAP rod probe type capacitance level transmitters
Internal process connection for NIVOCAP: 1" BSP, process connection: 1 1/2" BSP/NPT

Connection type

C □ F – 1 ■ ■ – 0

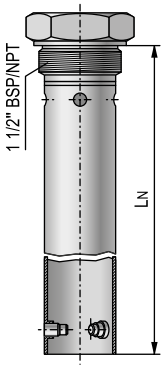
A	BSP
D	NPT

Probe length

C ■ F – 1 □ □ – 0

0 2	0.2 m
n n	0.3-3 m; each started 0.1 m

nn = 03-30 : 0.3-3 m



CAF-100

NIVOCAP C reference rod probe

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

Connection type

C □ ■ – 1 ■ ■ – 0

F	BSP
E	NPT

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

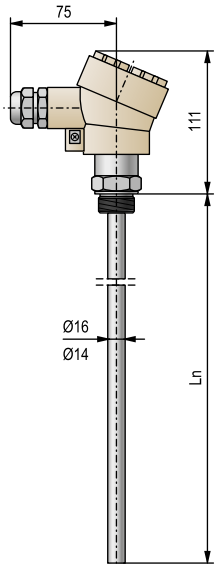
Fully PFA insulated

0 2	0.2 m
n n	0.3-3 m; each started 100 mm

Partially PFA insulated

0 2	0.2 m
n n	0.3-3 m; each started 100 mm

nn = 03-30 : 0.3-3 m



CFP-100

NIVOCAP C-200/C-300 with cable probe

2-wire compact capacitance 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 indicator / 130°C

Process connection / Cable type

C ■□ – ■■■ – ■

K	1" BSP / Fully FEP insulated steel
V	1 1/2" BSP / Fully FEP insulated steel
E	1" NPT / Fully FEP insulated steel
F	1 1/2" NPT / Fully FEP insulated steel

Housing

C ■■ – □■■ – ■

2		Aluminium (paint coated)
3		Plastic, PBT, glass fibre reinforced
4	*	Stainless steel

* Ex version under approval

Probe length

C ■■ – ■□□ – ■

Fully FEP insulated	
0 1	1 m
n n	2-20 m; each started 1 m
Partially FEP insulated	
0 1	1 m
n n	2-20 m; each started 1 m

nn = 02-20 : 2-20 m

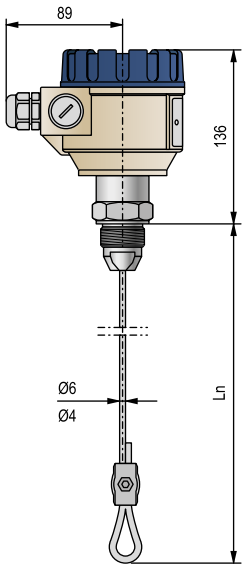
Output / Approval

C ■■ – ■■■ – □

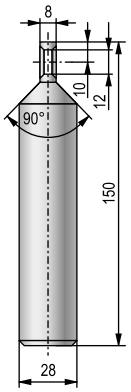
2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex ia
8	4-20 mA+ HART / Ex ia

Accessories to order (see relevant page for details)

CTK-103-0M-400-01	St.st. counterweight Ø 28x150 mm
CBR-205-2M-900-01	Adapter 1" BSP / 3/4" 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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



CTK-200 / 300



CTK-103-0M-400-01

GENERAL DESCRIPTION

NIVOPRESS D hydrostatic level- and pressure transmitters operate in 2-wire systems and convert relative or absolute pressure (input signal) into 4-20 mA (output signal). The piezoresistive sensor measures the hydrostatic pressure and it compares the water head with the actual atmospheric pressure. The sensor is protected by a stainless steel flush diaphragm which transfers the pressure value to the piezoresistive sensor through silicon oil. Intelligent electronics provides on-site programming with SAP-200 plug-in display or remote programming with HART communication. Intrinsically safe (Ex ia approved) models are available for use in hazardous environments. **NIVOPRESS D** hydrostatic gauge pressure transmitters are suitable for level- and pressure measurement tasks in tanks, vessels and pipes especially in food and beverages industry (for example milk and any other food dollops) applications. The flat surface of the diaphragm avoids the risk of material build up and the maximum medium temperature of 125 °C allows proper (CIP) cleaning required by the regular cleaning processes of the food industry and similar hygienic applications.

MAIN FEATURES

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

APPLICATIONS

- *Liquids and masses in tanks and vessels*
- *Chemicals with dense vapour or gas layers above the surface*
- *Foaming liquids*
- *Viscous or corrosive materials*

CERTIFICATIONS

- *ATEX approved (Ex ia)*

SAP-203 display


DT-500

OPERATION

Principle of Level Measuring by Hydrostatic pressure:

Providing constant density the level depends on the pressure head.

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

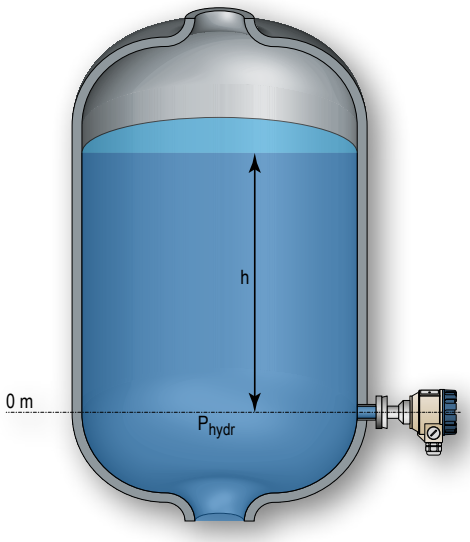
$$\downarrow$$

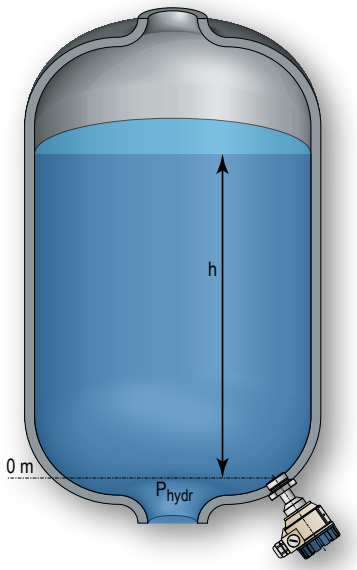
$$h = 10^{5} \frac{P_{hydr}}{\rho \cdot g}$$

$$\downarrow$$

Possible maximum 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 middle of the diaphragm and level of the medium
$P_{hydr.max}$ = highest pressure value set in the default





TECHNICAL DATA

Type		NIVOPRESS D-500 / D-700	NIVOPRESS D-600
Measured process value		level, pressure	
Sensor		Piezoresistive silicium sensor, with stainless steel flush diaphragm	
System		2-wire	
Power supply		10 ... 36 V DC	
Measurement range		-1 ... 400 bar (as per order codes)	
Overpressure		0.5 ... 600 bar (as per order codes)	
Downscale rate		≈ 1 : 2	
Zero point offset		50% of the measurement range	
Accuracy (linearity error)		p > 0.4 bar: ±0.25 %; p ≤ 0.4 bar: ±0.5 %	
Output	Analogue	4–20 mA	
	Display	SAP-203 - 6-digit plug-in LCD display	
	Digital communication	4–20 mA + HART	
Ambient temperature		-40 °C ... +70 °C, with display: -25 °C ... +70 °C	-30 °C ... +70 °C, with display: -25 °C ... +70 °C,
		Ex type: see „Special data for Ex certified models" table	
Range of temperature compensation		p < 100 bar: 0 °C ... +70 °C p ≤ 0.4 bar: 0 °C ... 50 °C	
Medium temperature		-25 °C ... +125 °C	
Material of wetted parts	Protection diaphragm	1.4435 (316L) stainless steel	
	Process connection		
	Sealing	p < 100 bar: Viton; p > 100 bar: NBR; on special request: EPDM	
Pressure transmitting medium		Silicon oil, on special request: food industry compatible oil	
Housing material		Paint coated aluminium or stainless steel	Plastic (PBT)
Process connection		As per order codes	
Electrical connection		2 x M20x1.5 plastic cable glands, for 6...12 mm cable + 2 x NPT ½ " internal thread for cable protective pipe terminal block for 0.5...1.5 mm² wire cross section	
		Ex type: see „Special data for Ex certified models" table	
Electrical protection		Class III.	
Ingress protection		IP65	
Weight		≈ 2 kg	≈ 1.6 kg

SPECIAL DATA FOR Ex CERTIFIED MODELS

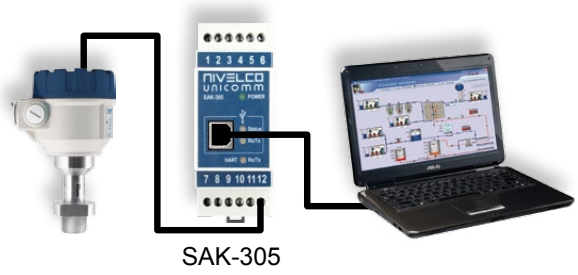
Type	D□□–5□□–□ Ex / D□□–6□□–□ Ex
Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Electrical connection	2x M20x1.5 metal cable glands for Ø7...Ø13 mm cable, cross-section max. 1,5 mm²
Process temperature range	Without display: -40 °C ... +70 °C; With display: -25 °C ... +70 °C

NIVOPRESS D IN HART MULTIDROP LOOP

The **MultiCONT** can handle a max. of 15 normal HART or max 4 Ex-proof HART capable **NIVELCO** transmitters. The digital (HART) information is processed, displayed and if needed it can be transmitted via RS485 communication line to a PC. Remote programming of the transmitters is also possible. Visualisation on PC can be accomplished with **NIVISION** process visualisation software.

NIVOPRESS D IN SYSTEM WITH A PC

The instruments with HART output can be connected to a PC using an **UNICOMM** HART-USB modem. Max. 15 normal instruments can be connected to a single HART loop. All measured values can be visualized and/or the instruments can be remote programmed via digital HART communication. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.



NIVOPRESS D-500/D-600

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

Version

D □■ – ■■ 1 – ■

T		Transmitter
B		Transmitter with local LCD indicator

Process connection

D ■□ – ■■ 1 – ■

C		1/2" BSP (p>2.5 bar) (Ex version not available)
E		1" BSP
S	6 WEEKS!	1" NPT
F		1 1/2" BSP
T	6 WEEKS!	1 1/2" NPT
L	6 WEEKS!	1" Triclamp (ISO 2852, only over 0.6 bar)
M	6 WEEKS!	1 1/2" Triclamp (ISO 2852, only over 0.4 bar)
N	6 WEEKS!	2" Triclamp (ISO 2852, only over 0.25 bar)
O		DN 25 Pipe coupling (DIN 11851)
P		DN 40 Pipe coupling (DIN 11851)
R		DN 50 Pipe coupling (DIN 11851)

Housing

D ■■ – □■ 1 – ■

5		Aluminium (paint coated)
6		Plastic, PBT, glass fibre 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 / Approval

D ■■ – ■■ 1 – □

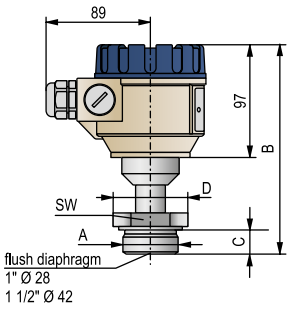
2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex ia
8	4-20 mA + HART / Ex ia

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

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

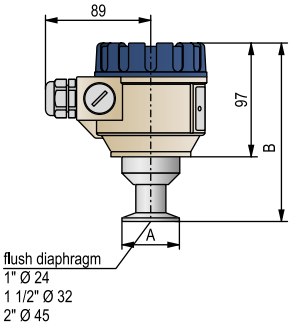
Accessories to order (see relevant page for details)

SAP – 203 – 0	Plug-in display module
SAT – 304 – 0	HART-USB modem
SAK – 305 – 2	HART-USB/RS485 modem
SAK – 305 – 6	HART-USB/RS485 modem / Ex ia



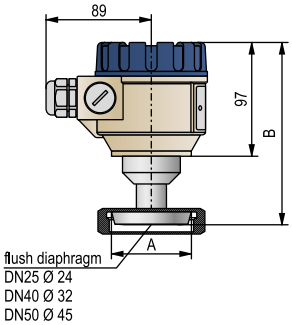
DTC / DTE / DTS / DTF/
DTT-500/600

Type	DTC	DTE	DTS	DTF	DTT
A	½" BSP	1" BSP	1" NPT	1 ½" 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
Tri-Clamp	1"	1 ½"	2"
A	50,3	50,3	64
B	183	183	167



DTO / DTP / DTR-500/600

Type	DTO	DTP	DTR
MILCH	DN 25	DN 40	DN 50
A	44	56	68,5
B	186	170	166

GENERAL DESCRIPTION

The **NIVOPRESS N** hydrostatic level transmitters are designed to measure the level of clean or contaminated liquids.
The pressure sensor at the bottom of the probe measures the sum of the hydrostatic pressure (P_{hydr}) of the liquid column above it and the atmospheric pressure (P_{atm}). The atmospheric pressure is led to the sensor through a breathing capillary which is equipped with a moisture filter that prevents the moisture reaching and damaging the electronics. This enables the atmospheric pressure to be subtracted from the measured pressure to get the hydrostatic pressure which is proportional to the height of the liquid column (h). The electronics converts the sensor's signal into an output signal. If temperature measurement (of the liquid) is needed beside the level measurement a combined (level + temperature) transmitter should be used.
The installation and wiring of the transmitter is helped by the wide variety of accessories. A sewage adapter working on the principle of the diving bell can be snapped into the place of the protecting cap to avoid the direct contact between the sensor and the measured contaminated liquid. An extra mechanical protection is built in the **NZ** type transmitters in the form of a mechanical filter. The **N-500** types can be used in hazardous environments. The **NZ** screw-in type transmitters are recommended for applications where there is a risk of flooding. The **NB/NG** plastic housing types are designed for those applications where the aggressive medium (e.g. saline solutions or seawater) could cause galvanic corrosion of the stainless steel body.

MAIN FEATURES

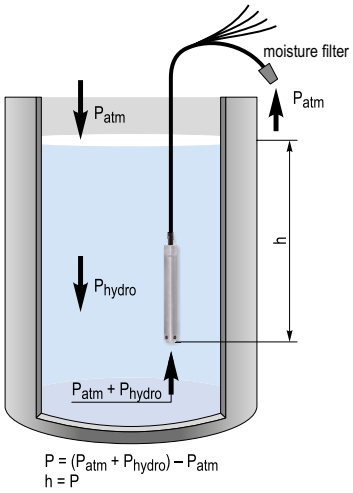
- *Measuring range up to 200 m*
- *Remote programmable*
- *IP68 protection*
- *Submersible or screw-in types*
- *Ø 22 / 24 mm tube*
- *HART communication*
- *2- or 3-wire versions*
- *Ex versions*
- *2 x 4–20mA output (level + temperature)*
- *Built-in Pt100 temperature sensor*
- *Overvoltage and inverse polarity protection*
- *Wide range of accessories*
- *Approved for potable water*
- *Available with capacitance ceramic, piezorezistive stainless steel or ceramic sensor*

APPLICATIONS

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

CERTIFICATIONS

- *ATEX approved (Ex ia)*




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 overvoltage protection unit


NAA-209 cable mounting unit

TECHNICAL DATA

Type		2-wire				3-wire
		NB, NG	NK, NN / ND, NH	NC, NT	NP, NF / NZ, NR	NPH, NFH / NZH, NRH
Sensor type	Principle	Piezoresistive		Capacitance	Piezoresistive	
	Material	Ceramic			Stainless steel	
Housing		Plastic	Stainless steel			
Measuring range		0 … 20 m water head			0 … 200 m water head	
		As per order code; the current output can be customized in the pressure range from 2% to 130% with remote programming				
Overload allowed (versus range)		3 x		20x (h ≤ 3 mvo) 10x (h > 3 mvo)	3 x	
Output		4 – 20 mA + HART		4 – 20 mA	4 – 20 mA + HART	0 – 10V (0 V ≤ 80 mV) measured to the power supply
Power supply		12 – 30 V DC				18 – 30 V DC / 6 mA
Temperature measurement		NPD and NZD types: power supply: 12 – 30 V DC / 4 – 20 mA; 0…+60°C, Accuracy: ±3 °C N□P types: Pt100 B temperature sensor, other types with HART output: temperature can be queried as HART Secondary Value, Accuracy: ±3 °C				–
Linearity error (level)		± 0.45 %			± 0.25 %	
Temperature error		≤ ± 0.1 % / 10 K				≤ ± 0.2 % / 10 K
Process temperature [1]		–30 °C … +60 °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		Ø 7 mm; 0.34 mm²				
Cable length		0 … 300 m as order code				
Dimensions		Ø 24x212 mm	NK,NN: Ø 22x173 mm ND,NH: Ø 38x174 mm	Ø 40x146 mm	NP,NF: Ø 22x173 mm NZ,NR: Ø 38x174 mm	
Mass		Probe: 0.15 kg	NK,NN: Probe: 0.2 kg ND,NH: Probe: 0.3 kg	Probe: 0.4 kg	NP,NF: Probe: 0.2 kg NZ,NR: Probe: 0.3 kg	
Material of wetted parts	Sensor	Al_2O_3			1.4404 (316L)	
	Housing	POM	1.4571 (316 Ti)			
	Cable coating	Polyurethane (PUR) or FEP				
	Sealings	VITON (FKM)				
	Protecting cap	POM	1.4571 (316 Ti)	–	1.4571 (316 Ti)	

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	NP / NF / NZ / NR / NK / NN / ND / NH□-5□□-□ Ex
Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Power supply	14 – 30 V DC
Operation temperature range	–30 °C … +60 °C

TECHNICAL DATA OF ACCESSORIES

Cable terminal box	NAA-101
Dimensions	93 x 93 x 55 mm
Ingress protection	IP65
Process temperature range	–40 °C … +70 °C
Material	Polystyrene
Cable gland	M20x1.5 (cable outer diameter: 5 … 10 mm)
Electrical connection	Terminal block (for max. 2.5 mm² wire cross section)
Cable terminal box with overvoltage protection	**NAA-102**
Data	See: NAA-101
Electrical data	See: OVP

Cable mounting wedge clamp	NAA-209	
Max. mechanical load	300 m cable	
Material	Polyamide, stainless steel wedge clamp	
Process temperature range	–20 °C … + 60 °C	
Overvoltage protection unit	**OVP22/33 [2]**	**OVP32/33 [2]**
Type	field use	EN 60715 rail mountable
Dimensions	72 x 42 x 19 mm	62 x 65 x 18 mm
Ingress protection	IP54	IP20
Breakdown voltage	33 V	
Absorbed energy	600 W / 1 ms	
Serial resistance	13 Ω	
Leakage current	≤ 10 µA	

[1] High temperature (up to 75°C) version is available on special request
[2] Only for 2-wire 4–20 mA equipments

NIVOPRESS N-200

2-wire borehole hydrostatic level transmitter for liquids
with capacitance 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	Two-wire, 4-20 mA output
P	Level: 4-20mA + Temperature: Pt100 sensor

Version

N ■■ – □■■ – ■

2	Standard

Range

N ■■ – 2 □■ – ■

1	0-1 m w.h. (0-100 mbar)
2	0-2 m w.h. (0-200 mbar)
3	0-5 m w.h. (0-500 mbar)
4	0-10 m w.h. (0-1.000 mbar)
5	0-20 m w.h. (0-2.000 mbar)

Breathing cable length

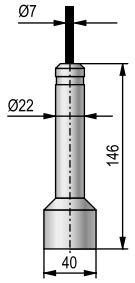
N ■■ – 2 ■□ – □

PUR 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
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 (should be given in the text of the order)

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



NC□ / NT□-200

NIVOPRESS N-400/N-500

2- or 3-wire borehole 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, 3/4" BSP process connection / PUR
R		Piezoresistive stainless steel sensor, 3/4" BSP process connection / FEP

Output

N ■□ – ■■■ – ■

K		Two-wire, 4-20 mA + HART
H	*	Three-wire, 0-10 VDC output
D	*	Level: 4-20 mA + HART + Temperature: 4-20mA (electronic temp. sensor)
P		Level: 4-20 mA + HART + Temperature: Pt100 sensor

* Ex version not available

Version

N ■■ – □■■ – ■

4	Standard
5	Ex

Range

N ■■ – ■□■ – ■

1	0-1 m w.h. (0-100 mbar)
2	0-2 m w.h. (0-200 mbar)
3	0-5 m w.h. (0-500 mbar)
4	0-10 m w.h. (0-1.000 mbar)
5	0-20 m w.h. (0-2.000 mbar)
6	0-50 m w.h. (0-5.000 mbar)
7	0-100 m w.h. (0-10.000 mbar)
8	0-200 m w.h. (0-20.000 mbar)

Breathing cable length

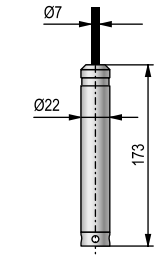
N ■■ – ■■□ – □

PUR 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
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

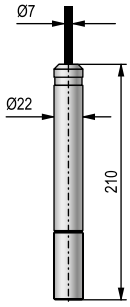
nn = 01-99 : 1-99 m
oo = A0-A9 : 100-190 m
pp = B0-B9 : 200-290 m

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

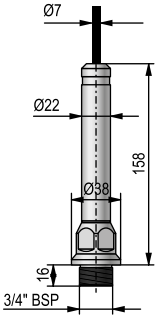
High temperature (up to 75°C) version (Ex version not available)
Customised 4-20 mA output calibration



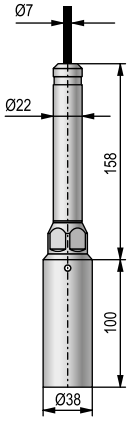
NP□ / NF□-400/500



NP□ / NF□-400/500
+ NAW-104



NZ□ / NR□-400/500



NZ□ / NR□-400/500
+ NAZ-103

NIV24
NPK-431-0
NPK-441-0

NIVOPRESS N-400

2-wire borehole 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, 3/4" BSP process connection / PUR / 1.4571
H		Piezoresistive ceramic sensor, 3/4" BSP process connection / FEP / 1.4571

* Ex version not available

Output

N ■□ – ■■■ – ■

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

Version

N ■■ – □■■ – ■

4	Standard
5	Ex

Range

N ■■ – ■□■ – ■

1	0-1 m w.h. (0-100 mbar)
2	0-2 m w.h. (0-200 mbar)
3	0-5 m w.h. (0-500 mbar)
4	0-10 m w.h. (0-1.000 mbar)
5	0-20 m w.h. (0-2.000 mbar)

Breathing cable length

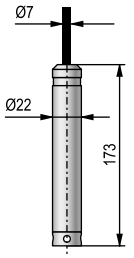
N ■■ – ■■□ – □

PUR 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
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

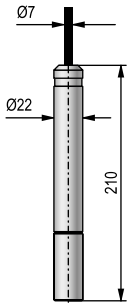
nn = 01-99 : 1-99 m
oo = A0-A9 : 100-190 m
pp = B0-B9 : 200-290 m

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

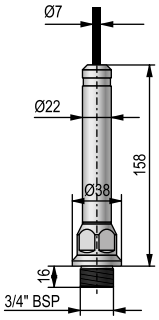
High temperature (up to 75°C) version
Customised 4-20 mA output calibration



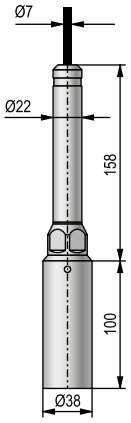
NK□ / NN□-400



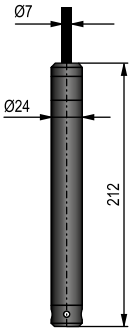
NK□ / NN□-400
+ NAW-104



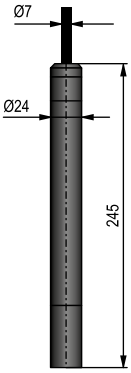
ND□ / NH□-400



ND□ / NH□-400
+ NAZ-103



NB□ / NG□-400



NB□ / NG□-400
+ NAW-107

NIVOPRESS N accessories to order

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 1 1/2" BSP
6	Sliding sleeve 1 1/2" NPT
N A A – 2 0 9 – 0	Cable mounting wedge clamp

Overvoltage protection units

O V P – □ 2 S – L	
2	IP54
3	IP20, DIN rail mounting

Sewage adapters

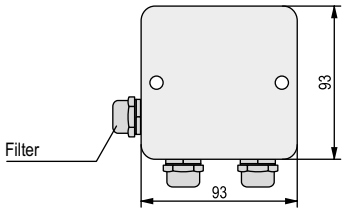
N A W – 1 0 □ – 0	
4	Can be mounted instead of the protective cap / 1.4571
7	Can be mounted instead of the protective cap / POM (applicable when there is no risk of filting)
N A Z – 1 0 3 – 0	Sewage adapter (for 3/4" threaded process connection) / 1.4571

Adapters

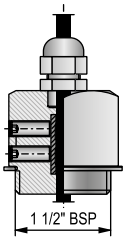
N A Z – 1 0 1 – 0	3/4" BSP / 1/2" BSP (1.4571)
N A Z – 1 0 2 – 0	3/4" BSP / M20x1,5 BSP (1.4571)
N A Z – 1 0 4 – 0	1" BSP / 1/2" BSP (1.4571)
N A Z – 1 0 5 – 0	3/4" BSP / 1" NPT (1.4571)
N A Z – 1 0 6 – 0	3/4" BSP / 1" BSP (1.4571)

Accessories to order (see relevant page for details)

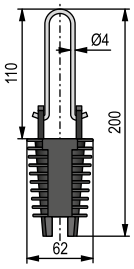
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



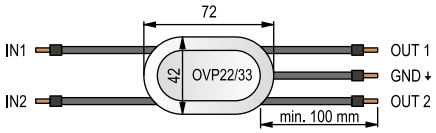
NAA-101 / NAA-102



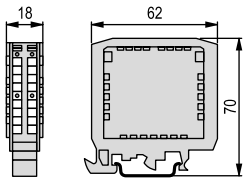
NAA-105



NAA-209



OVP-22 / 33



OVP-32 / 33

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

GENERAL DESCRIPTION

NIVOTRACK magnetostrictive level transmitters are an ideal solution for high accuracy measurement of clean fluids. Its high precision renders the **NIVOTRACK** suitable for custody transfer measurement of liquids such as fuels, solvents, alcohol derivatives etc. Units with flexible tube do not only make this accurate measurement for higher tanks possible, but offer a more convenient way for shipment and installation. Plastic coated versions of the **NIVOTRACK** substantially expand the field of application by a wide range of aggressive materials. Integrating the transmitter into a process control system is easy thanks to the intelligent signal processing and communication software as well as the wide of range of accessories offered.

MAIN FEATURES

- *0.1 mm or 1 mm resolution*
- *Insertion length maximum 15 m*
- *OIML R85 international certification*
- *Compact type*
- *Rigid or flexible guide tube*
- *Plastic coated version for chemicals*
- *4-20 mA and HART output*
- *Graphic display*
- *99 point linearization table*
- *Measurement optimisation*
- *Volume measurement*
- *ATEX certified versions*
- *IP67 protection*

APPLICATIONS

- *Custody transfer measurement*
- *Oil and gas industry*
- *Fuels and gasoline products*
- *Pharmaceutical industry*
- *Chemical industry*
- *Food industry*
- *Alcohols and beverages*
- *Installation in bypass tubes feasible*
- *Supplementary level transmitter for NIVOFLIP magnetic flip indicator*

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex d)*
- *ATEX approved (Ex d ia)*
- *OIML R85 international certification*
- *IEC approved (Ex ia)*
- *IEC approved (Ex d)*
- *IEC approved (Ex d ia)*
- *FM & CSA approved*

MCA-500 mini type

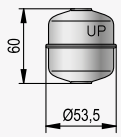
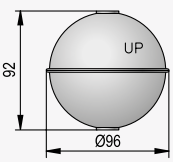
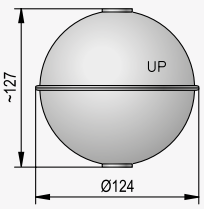
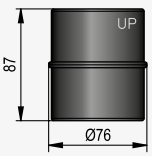
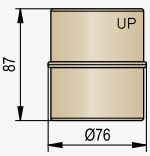
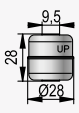
MTA-500 rigid probe version

MG□-500 plastic coated version

SAP-300 graphic display

MTK-500 flexible probe version

FLOATS

Type	MBA-505-2M-800-00(1)	MBA-505-2M-200-00(1)	MBK-530-2M-400-00(2)	MBA-505-2M-900-00(2)	MGU-505-2M-200-00(2)	MGU-505-1M-200-00(2)	4w34bs-16yyyyy(3)
Dimensions							
Medium density (min.)	0.55 kg/dm³	0.8 kg/dm³	0.55 kg/dm³	0.4 kg/dm³	0.7 kg/dm³	0.4 kg/dm³	0.8 kg/dm³
Material	Titan	1.4404	1.4435	1.4401	PVDF	PP	1.4404
Medium pressure	2.5 MPa (25 bar)				0.6 MPa (6 bar)	0.3 MPa (3 bar)	1 MPa (10 bar)

(1) *Designed for min. 2" process connection, only order with rigid probe*
(2) *Flange to be ordered separately*
(3) *Designed for min. 1" process connection, only order with mini type*

TECHNICAL DATA

Type		Rigid probe version	Flexible probe version	Plastic coated rigid probe version	Mini version with rigid probe
Measured process value		Liquid level, distance, volume			
Nominal length (L)		0.5 m … 4.5 m	2 m … 15 m	0.5 m … 3 m	0,5 m … 1,5 m
Material of the tube		1.4571 (316 Ti) stainless steel		PFA coated st. steel	1.4571 stainless steel
Max. process pressure [1]		2.5 MPa (25 bar)	1.6 MPa (16 bar)	0.3 MPa (3 bar g)	1 MPa (10 bar)
Medium temperature		-40 °C … +90 °C, see: temperature diagram			
Standard float diameter / material [2]		Ø 53.5 x 60 mm cylindrical / 1.4404 (316L)	Ø 96 mm ball / 1.4435 (316L)	Ø 76 x 87 mm cylindrical / PVDF / PP	Ø 28 x 28 mm cylindrical 1.4404 (316L)
Medium density		Depends on the applied float			
Material of wetted parts		Stainless steel: 1.4571, 1.4404 (316 Ti, 316 L)		PFA, PVDF, PP	St. steel: 1.4571, 1.4404
Ambient temperature		–40 °C…+70 °C, plastic housing: –25 °C…+70 °C, with display: –25 °C…+70 °C, Ex type: see temperature diagram in the user's manual			
Output	Analogue	4-20 mA (limit values: 3.9 … 20.5 mA)			
	Digital	4-20 mA + HART			
	Display	SAP-300 graphic display			
Damping time		Adjustable 0 s … 99 s			
Error indication		22 mA or 3.8 mA or holding			
Output load		Rt = (Ut-12.5V) / 0.02 A, Ut = power supply voltage			
Power supply		12.5 V – 36 V DC			
Electrical protection		Class III.			
Ingress protection		IP67			
Process connection		as per order code			
Electric connection		2x M20x1.5 plastic cable glands for 6…12 mm cable + 2x NPT ½ " internal thread for cable protective pipe terminal block for 0.5…1.5 mm² wire cross section Ex type: see „Special data for Ex certified models" table			
Housing		Plastic (PBT) or paint coated aluminum or stainless steel			
Mass		1.7 kg + m. probe: 0.6 kg/m	2.9 kg + m. probe: 0.3 kg/m + counter weight 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 max. process pressure is 0.3 MPa (3 bar)*
[2] *Requested float type should be specified when placing an order*

MEASUREMENT DATA

Type	1 mm resolution	0.1 mm resolution
Nonlinearity (of the displayed and the transmitted value on the HART line) [3]	± 2 mm or ± 0.02% F.S. whichever is greater	± 1 mm or ± 0.01% F.S. whichever is greater
Hysteresis [3]	< ± 1 mm	< ± 0.25 mm
Zero span (in LEVEL measurement mode)	Anywhere within the active range	
Measurement range (reducing)	Min. range: 200 mm; Max. range: as per probe length	
Temperature error	0.04 mm / 10 °C between (-25 °C … +50 °C)	
Current output data	Resolution: 2 µA, Accuracy: 10 µA, Temperature error: 200 ppm/ °C	

[3] *Under reference conditions*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type		M□□-5□□-□ Ex M□□-7□□-□ Ex			M□□-5□□-E Ex M□□-5□□-F Ex
Housing	Construction	Single compartment			Dual compartment
	Material	Paint coated aluminium or stainless steel			Paint coated aluminium
Protection type		Intrinsically safe	Flameproof enclosure	Intrinsically safe with flameproof enclosure	Flameproof enclosure
Ex marking		ATEX and IEC Ex			FM & CSA
		see: www.nivelco.com			
Cable gland		Brass Nickel plated M 20 x 1.5 cable gland	Brass Nickel plated M 20 x 1.5 Ex d approved cable gland		NPT ½" conduit entry
Cable outer diameter		Ø 7 … 13 mm	Ø 9 … 11 mm		

NIVOTRACK M-500/M-600 with rigid probe

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 indicator

Process connection

M ■□ – ■■■ – ■

A		1" BSP
C		2" BSP
D		1" NPT
G		2" NPT
U		Without process connection for sliding sleeve
L	*	Without float, for NIVOFLIP

* Probe length = center to center of NIVOFLIP + 300 mm or 400 mm as per the float type

Housing

M ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (Ex version not available)
7	Stainless steel

Probe length**

M ■■ – ■□□ – ■

n n	0.5-1 m
o o	1.1-3 m; each started 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 / Approval / 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
6	4-20 mA / 1 mm / Ex ia
7	4-20 mA + HART / 0.1 mm / Ex ia
8	4-20 mA + HART / 1 mm / Ex ia
A	4-20 mA / 0.1 mm / Ex d
B	4-20 mA + HART / 0.1 mm / Ex d
C	4-20 mA / 0.1 mm / Ex d + Ex ia
D	4-20 mA + HART / 0.1 mm / Ex d + Ex ia
E	4-20 mA + HART / 0,1 mm / XP Zone 1 / NPT 1/2" / Dual Compartment
F	4-20 mA / 0,1 mm / XP Zone 1 / NPT 1/2" / Dual Compartment

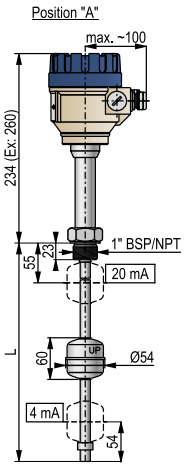
For certified level measurement for custody transfer only the HART output with 0.1 mm resolution version including local display unit can be ordered.
Need of IEC is to be specified with order.

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

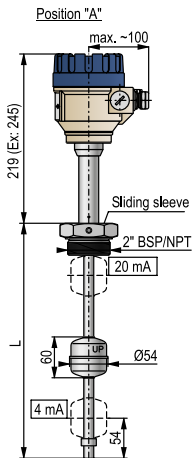
Ø 96 mm ball float (for min. 0.55 kg/dm³ liquids)
Ø 124 mm ball float (for min. 0.4 kg/dm³ liquids)
Ø 53.5 mm titan float (for min. 0.55 kg/dm³ liquids)
Side viewed "B" head position model
Only devices with 2" process connection and Ø 53.5 mm floats can be installed without previous disassembly.

Accessories to order (see relevant page for details)

MBH-105-2M-300-00	Sliding sleeve: 1" BSP
MBK-105-2M-300-00	Sliding sleeve: 2" BSP
MBL-105-2M-300-00	Sliding sleeve: 1" NPT
MBN-105-2M-300-00	Sliding sleeve: 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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



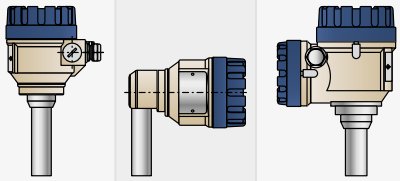
MTA / MTD-500/600

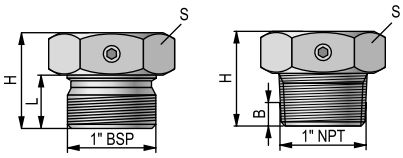


MTU-500/600

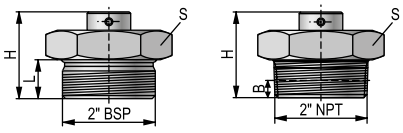
Housing position

Single compartment		Dual compartment
Position "A"	Position "B"	





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



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

Type	Material	P. 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

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 indicator

Process connection

M ■ □ – ■ ■ ■ – ■

K	2" BSP
N	2" NPT

Housing

M ■ ■ – □ ■ ■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■ ■ – ■ □ □ – ■

n n	2-3 m
o o	3.1-15 m; each started 100 mm

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

Output / Resolution / Approval

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
6	4-20 mA / 1 mm / Ex ia
7	4-20 mA + HART / 0.1 mm / Ex ia
8	4-20 mA + HART / 1 mm / Ex ia
A	4-20 mA / 0.1 mm / Ex d (up to 10 m)
B	4-20 mA + HART / 0.1 mm / Ex d (up to 10 m)
C	4-20 mA / 0.1 mm / Ex d + Ex ia (up to 10 m)
D	4-20 mA + HART / 0.1 mm / Ex d + Ex ia (up to 10 m)

For certified level measurement for custody transfer only the HART output with 0.1 mm resolution version including local display unit can be ordered.
Need of IEC is to be specified with order.

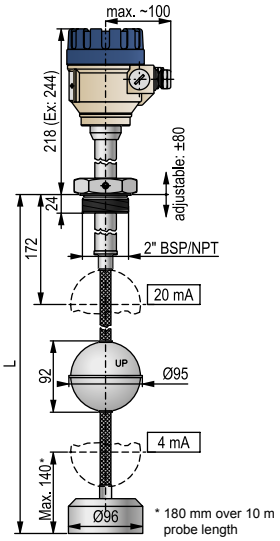
Available on request (should be given in the text of the order)

Ø 124 mm ball float (for min. 0.4 kg/dm³ liquids)
Side viewed "B" head position model

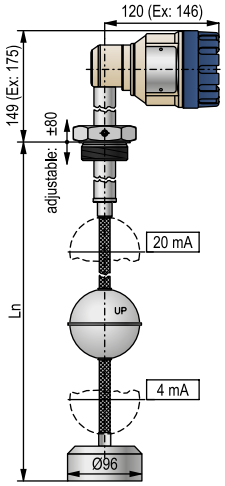
Accessories to order (see relevant page for details)

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

Position "A"



Position "B"



MTK / MTN-500/600

NIVOTRACK M-500/M-600 with plastic coated rigid probe

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 indicator

Process connection

M ■ □ – ■ ■ ■ – ■

U	Without process connection for sliding sleeve

Housing

M ■ U – □ ■ ■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■ U – ■ □ □ – ■

n n	0.5-1 m
o o	1.1-3 m; each started 100 mm

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

Output / Resolution / Approval

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
6	4-20 mA / 1 mm / Ex ia
7	4-20 mA + HART / 0.1 mm / Ex ia
8	4-20 mA + HART / 1 mm / Ex ia
A	4-20 mA / 0.1 mm / Ex d
B	4-20 mA + HART / 0.1 mm / Ex d
C	4-20 mA / 0.1 mm / Ex d + Ex ia
D	4-20 mA + HART / 0.1 mm / Ex d + Ex ia

For certified level measurement for custody transfer only the HART output with 0.1 mm resolution version including local display unit can be ordered.
Need of IEC is to be specified with order.
The material of the float (PVDF or PP) should be given in text of the order. The standard float material is PVDF.

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

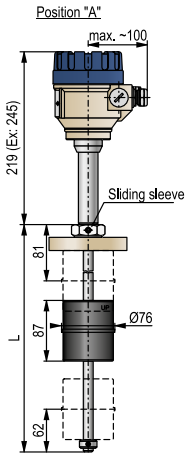
Side viewed "B" head position model

Process connection

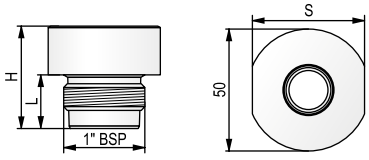
MGH-105-2M-300-00	Sliding sleeve: 1" BSP
MGL-105-2M-300-00	Sliding sleeve: 1" NPT
M F T – 3 2 1 – 2	PP flange drilled like DN80, PN16 + 1" BSP sliding sleeve in should be ordered
M F T – 3 3 1 – 2	PP flange drilled like DN100, PN16 + 1" BSP sliding sleeve should be ordered

Accessories to order (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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



MEU-500/600



MGH-105-2M-300-000

Type	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	PVDF	1" NPT	46	42	25

NIVOTRACK M-500/M-600 mini version with rigid probe

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 indicator

Process connection

M ■ □ – ■ ■ ■ – ■

A	1" BSP
D	1" NPT

Housing

M ■ ■ – □ ■ ■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (Ex version not available)
7	Stainless steel

Probe length

M ■ ■ – ■ □ □ – ■

n n	0.5-1 m
o o	1.1-1.5 m; each started 100 mm

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

Output / Resolution / Approval

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
6	4-20 mA / 1 mm / Ex ia
7	4-20 mA + HART / 0.1 mm / Ex ia
8	4-20 mA + HART / 1 mm / Ex ia

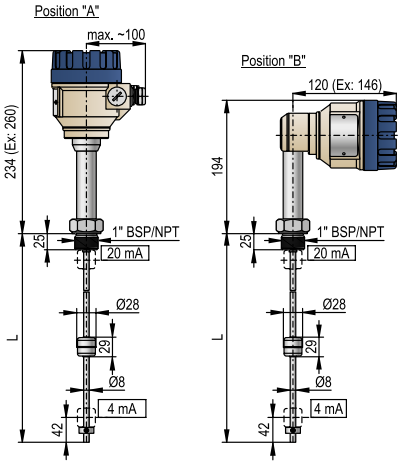
Need of IEC is to be specified with order

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

Side viewed "B" head position model

Accessories to order (see relevant page for details)

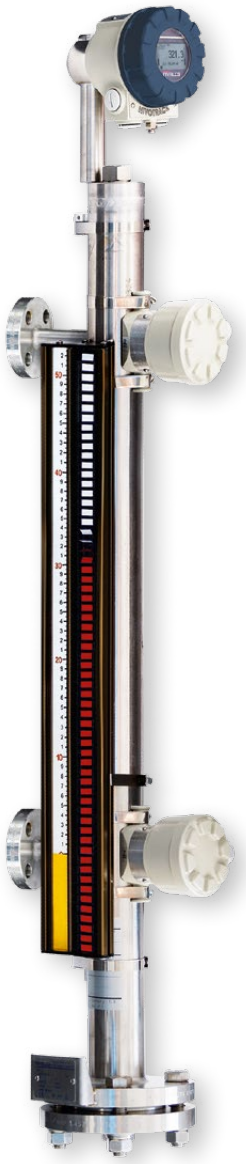
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



MMA / MMD-500/600

GENERAL DESCRIPTION

The **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) approval, so it can be used for level indication of pressurized vessels up to 100 bar process pressure. The high temperature types are applicable up to 250 °C process temperature. The **NIVOFLIP** can be equipped with optional limit switches or with **NIVELCO**'s **NIVOTRACK** high-precision magnetostrictive level transmitter if level transmission is needed.



MAIN FEATURES

- *Clearly visible optical display*
- *Measuring range: 500-5500 mm*
- *± 10 mm accuracy*
- *Max. 100 bar process pressure*
- *High temperature version*
- *Optional level switches*
- *Optional magnetostrictive level transmitter*

APPLICATIONS

- *Oil and gas industries*
- *Chemical industry*
- *Power generation*
- *Boilers*
- *Pressurized vessels*
- *Tanks*

FLOAT SELECTION

Type	Float material	
	Stainless steel	
Max. process pressure	40 bar	63 bar
Medium density	0.8 – 1.25 kg/dm³	0.85 – 1.25 kg/dm³
Max. process temp.	250 °C	
	Titan Ti Gr.2	
Max. process pressure	40 bar	100 bar
Medium density	0.65 – 1.1 kg/dm³	0.7 – 1.1 kg/dm³
Max. process temp.	250 °C	

CERTIFICATIONS

- *PED approval*
- *ATEX approval: MAK-100 level switches*

OPERATION

The welded bypass chamber that is the body of the indicator and the tank form one pressurized system. Mounted on suitable connection flanges located on the side of the tank the liquid level in the bypass tube and the tank is equal. A float in the bypass tube incorporating a polarized magnet tracks the level of the liquid. The bi-coloured magnetic flaps mounted on the tube composing a bar are serving as visual indicators by changing their colour as the float passes. The rotated flaps represent the actual level. The lower 100 mm of the bottom section of the indicating bar has different colour providing for an optical error signal in case the liquid level drops below the lower connection point of the instrument.

NIVOFLIP LEVEL INDICATOR SYSTEM

The **NIVOFLIP** bypass liquid level indicator can be equipped with **MAK-100-☐** external level switches and this way it can provide limit level indication. In case of using MAK-100 level switch the minimal medium density should be 0.1 kg/dm³ more than the specified. When the provided accuracy of the magnetic flaps is not enough, the high-precision **NIVOTRACK M☐L-500/700** magnetostrictive level transmitters are recommended to use. Equipped with the OIML R85 approved **NIVOTRACK** the measurement system is applicable for custody transfer measurements. The rigid probe magnetostrictive transmitter without float and process connection can be mounted externally by clamps to the bypass chamber. All optional units are operated via magnetic coupling, there is no direct contact with the measured medium.

PROPERTIES

NIVOFLIP	Normal type	High temperature type
Stainless steel float	■	■
Titan float	■	■
PED approval	■	■
Max. 100 bar medium pressure	■	–
Max. 250 °C medium temperature	–	■
Optional level switch	■	■
Optional level transmitter	■	■

TECHNICAL DATA

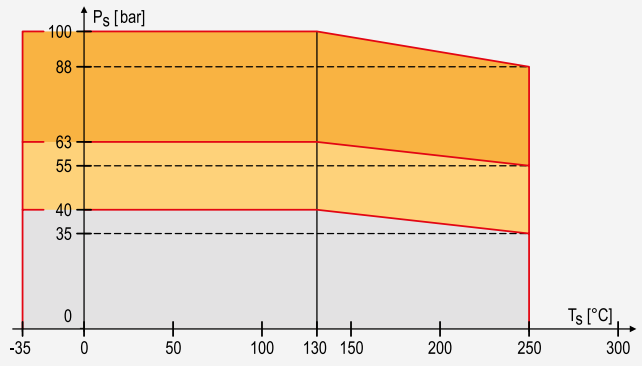
Type		Standard type	High temperature type
Visual display		Bi-coloured magnetic flaps	
Display	scale	cm	
	accuracy	± 10 mm	
	resolution	5 mm	
	error indication	lower 100 mm, inverse polarized flaps	
Tube diameter		Ø 60.3 mm	
Flange distance (center to center)		500 – 5500 mm (as per order code)	
Process connection		DIN, ANSI flanges (as per order code)	
Aerating connection		M20x1,5	
Process pressure		max. 100 bar	max. 88 bar
Medium temperature		-35°C ... +130°C	-35°C ... +250°C
Ambient temperature		-40°C ... +60°C	
Medium density [1]		with stainless steel float: 0.8-1.25 kg/dm³, with titan float: 0.6-1.1 kg/dm³	
Level switch		optional, freely adjustable MAK-100 level switch [2]	
Level transmitter		optional NIVOTRACK M□L-500 / 700 magnetostrictive level transmitter [2]	
Mass		about 25 kg for 1 m center to centre distance	

[1] *In case of using MAK-100 level switch the minimal medium density should be 0.1 kg/dm³ more than the above specified*
[2] *In case of using NIVOTRACK level transmitter or MAK-100 level switch the maximum temperature values are shown on the diagram below*

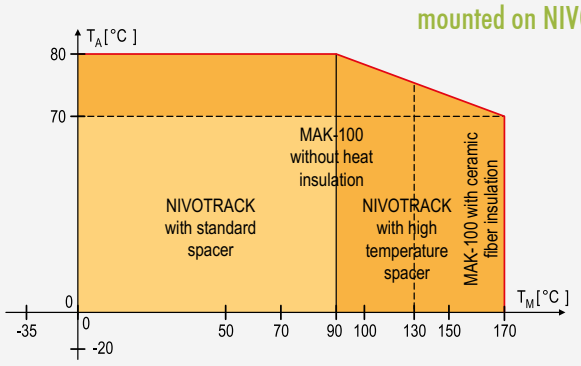
Maximum process pressure		Maximum process temperature		
Process connection	Bypass tube / Flange rating	T_{max} = 130 °C		T_{max} = 250 °C
		Standard	High temperature type	
		Maximum process pressure		
DIN flanges DN15 – DN50	Ø 60mm / PN40	40 bar	40 bar	35 bar
	Ø 60mm / PN63	63 bar	63 bar	55 bar
	Ø 60mm / PN100	100 bar	100 bar	88 bar
ANSI flanges ½" – 2"	Ø 2.35" / 400 Class	580 psi	580 psi	500 psi
	Ø 2.35" / 600 Class	930 psi	930 psi	800 psi
	Ø 2.35" / 900 Class	1440 psi	1440 psi	1275 psi

TEMPERATURE DIAGRAM

Temperature (T_S) – Pressure (P_S) diagram



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



MAK-100 MAGNETIC LEVEL SWITCHES

GENERAL DESCRIPTION

The **MAK-100** type magnetic level switches are optional accessories for **NIVOFLIP** bypass level indicators. In the stainless steel bypass tube the float of **NIVOFLIP** tracks the liquid level. The float (incorporating a permanent magnet) operates the freely positioned **MAK-100** level switch via magnetic coupling and provides non-contact signal transfer to the microswitch. There should be at least 100 mm distance between two switching points.

TEMPERATURE DATA FOR Ex CERTIFIED MODELS

TEMPERATURE CLASSES		
Classes	Max. medium temp.	Max. ambient temp.
T6	+80 °C	-20 ... +60 °C
T5	+95 °C	-20 ... +70 °C
T4	+130 °C	-20 ... +80 °C

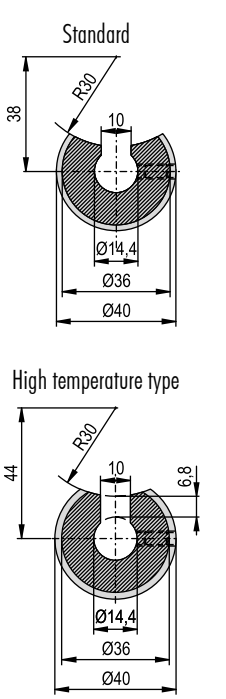
TECHNICAL DATA

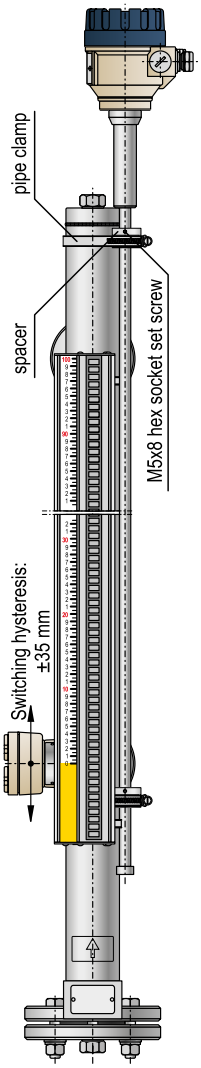
Type	MAK-100-0	MAK-100-6
Medium temperature	max.: 130°C	see: temperature classes table
Ambient temperature	–20°C ... +80°C	
Material of the switch-housing	Paint coated aluminium	
Switch	1 microswitch, with NO, NC contacts	
Switching data	250V 2.5 A AC12 220V 0.3 A DC13	only Ex ia certified and approved intrinsically safe isolator power supply should be used
Switching hysteresis	±35 mm	
Electrical connection	M20x1.5 cable gland, terminal for max. 2.5 mm² wire cross section	
Ingress protection	IP65	
Electrical protection	Class I.	
Ex marking	–	see: www.nivelco.com
Mass	1.5 kg	

NIVOTRACK MOUNTED ON NIVOFLIP

The probe length of the magnetostrictive level transmitter should be 300 / 400 mm longer then the center to center distance of the bypass tube in accordance to the float type. The level transmitter is place onto the bypass tube that the top of the magnetostrictive probe is in the same height with the top of the bypass tube. The end of the probe should extend the inverse polarized error indication flaps with 20 / 40 mm.
The supplied aluminium spacers are fixed with hex socket set screws and they are mounted to the bypass tube with pipe clamps. In case of the high temperature type there is a ceramic fiber insulation blanket between the magnetostrictive probe and the bypass tube.

MAK-100





NIVOFLIP ML

Bypass level indicator with optical display and magnetic float for liquids
with stainless steel (0.8-1.2 kg/dm³) or titan float (0.6-1.1 kg/dm³) and up to 40 bar process pressure

Version

M □ ■ – 1 ■ ■ – ■

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

Process connection

M ■ □ – 1 ■ ■ – ■

A	DN15 (B form)
B	DN20 (B form)
C	DN25 (B form)
D	DN40 (B form)
E	DN50 (B form)
F	ANSI 1/2"
G	ANSI 3/4"
H	ANSI 1"
J	ANSI 1 1/2"
K	ANSI 2"

Bypass tube / Pressure

M ■ ■ – □ ■ ■ – ■

1	60.3 mm tube diameter / PN40; 400 psi

Measuring range (center to center)

M ■ ■ – 1 □ □ – ■

0 5	0.5 m
n n	0.6-5.5 m; each started 0.1 m

nn = 06-55 : 0.6-5.5 m

Float material

M ■ ■ – 1 ■ ■ – □

0	Stainless steel
1	Titan

The instrument can be equipped with high resolution NIVOTRACK M_L-500 magnetostrictive level transmitter up to 170°C medium temperature! (Centre to centre distance + 300 mm/1.4571 float or centre to centre distance + 400 mm/ titanium float.)

Special version

XC6	Feet/inch scale

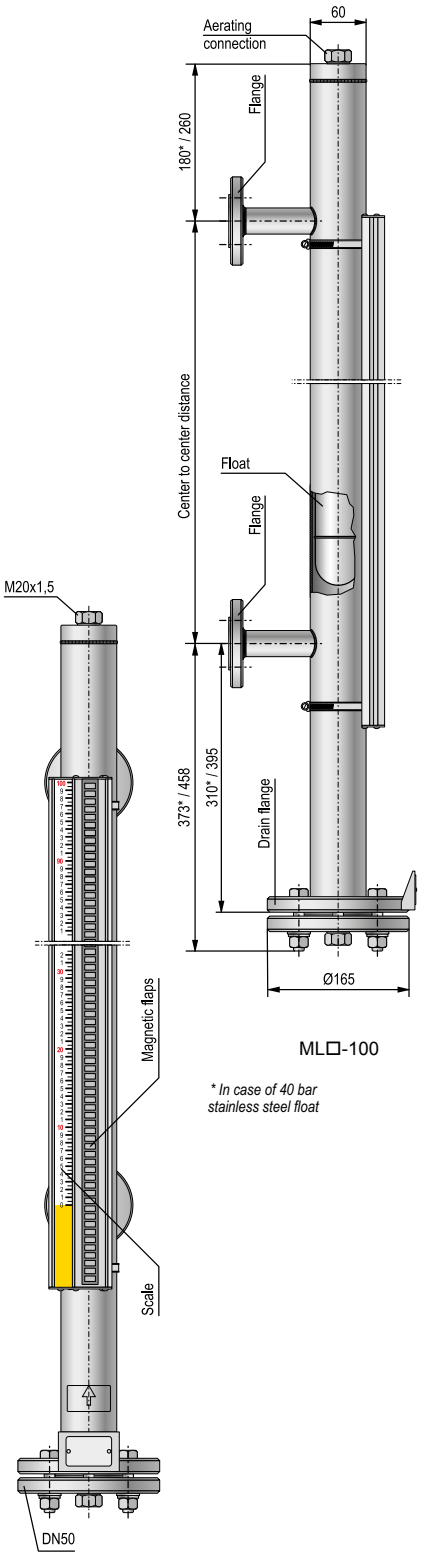
NIVOFLIP MAK-100

Magnetic coupling limit switch for NIVOFLIP ML bypass level indicator
with contact output, factory positioned at ordered distances

Approval

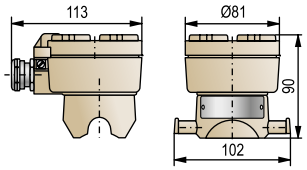
M A K – 1 0 0 – □

0	None
6	Ex ia



ML□-100

** In case of 40 bar stainless steel float*



MAK-100

NIVOFLIP ML

Bypass level indicator with optical display and magnetic float for liquids
with stainless steel (0.8-1.2 kg/dm³) or titan float (0.6-1.1 kg/dm³) and up to 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 1/2"
G	ANSI 3/4"
H	ANSI 1"
J	ANSI 1 1/2"
K	ANSI 2"

Bypass tube / Pressure

M ■ ■ – □ ■ ■ – ■

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

Measuring range (center to center)

M ■ ■ – ■ □ □ – ■

0 5	0,5 m
n n	0.6-5.5 m; each started 0.1 m

nn = 06-55 : 0.6-5.5 m

Float material

M ■ ■ – ■ ■ ■ – □

0	Stainless steel (only for PN63, 600 psi type)
1	Titan

The instrument can be equipped with high resolution NIVOTRACK M_L-500 magnetostrictive level transmitter up to 170°C medium temperature! (Centre to centre distance + 300 mm/1.4571 float or centre to centre distance + 400 mm/ titanium float.)

Special version

XC6	Feet/inch scale

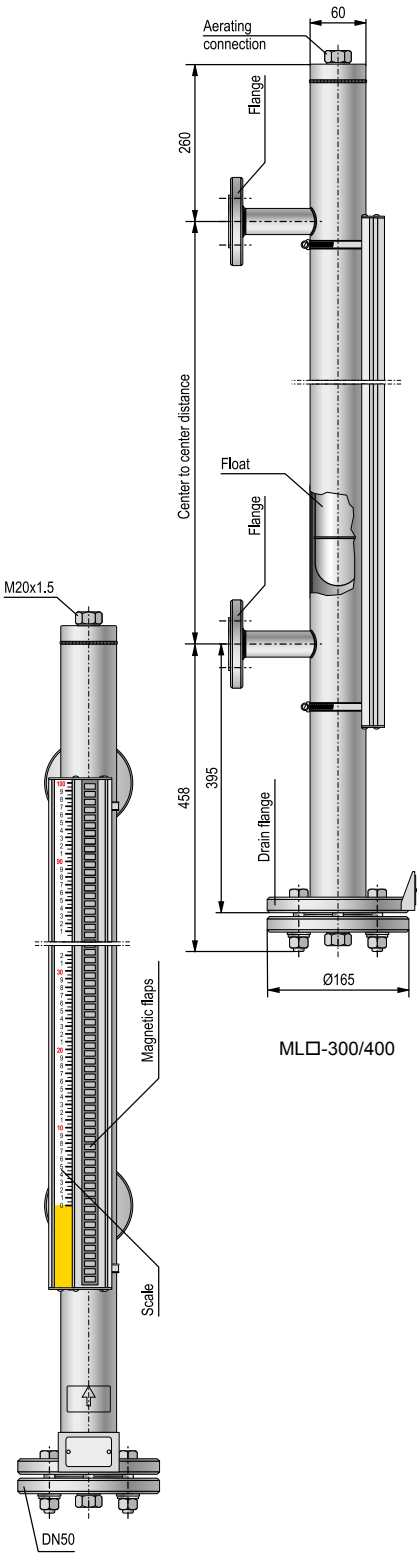
NIVOFLIP MAK-100

Magnetic coupling limit switch for NIVOFLIP ML bypass level indicator
with contact output, factory positioned at ordered distances

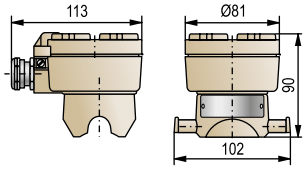
Approval

M A K – 1 0 0 – □

0	None
6	Ex ia



MLC-300/400



MAK-100

GENERAL DESCRIPTION

The newest generation **EasyTREK SP-500** series level transmitters are based on **NIVELCO's** 30 years of experience with ultrasonic level measurement. The **EasyTREK** is an integrated, blind transmitter with equal measuring performance as the **EchoTREK** but readable and programmable remotely only through HART 7 protocol coming as standard. The IP68 rated units having transducer and processing electronics incorporated in one single housing manufactured uniformly with black colour instead of the previously used red or dark blue colours which were synonymous with **NIVELCO's** ultrasonic units. The new **EasyTREK** transmitters utilize HART 7 communication so they can be used in multi-drop systems connected to **MultiCONT** process controller/display, or to a PC with the help of the **UNICOMM HART**-modem or similar. The units can be remotely programmed also with Handheld Field Communicator.
The members of the new **EasyTREK SP-500** series can be recognised from the more compact size, the increased maximum measuring range and the decreased minimum measuring range. Thanks to the **QUEST2™** advanced signal processing algorithm set the level transmitters provide reliable liquid level measurement in wide range of applications.

MAIN FEATURES

- *2-wire Integrated transmitter*
- *Non-contact level measurement*
- *Can be powered from 12 V battery*
- *Max. 25 m measuring range*
- *Narrow (5°) beam angle*
- *Temperature compensated*
- *HART 7*
- *Handheld compatibility*
- *IP68 protection*

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*
- *Suitable for level measurement of hydrocarbons, acids, any water based medium*

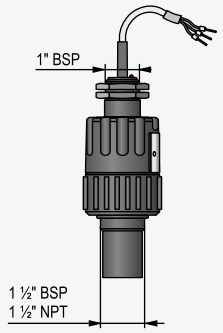
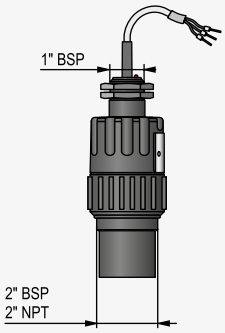
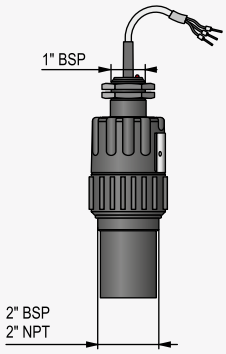
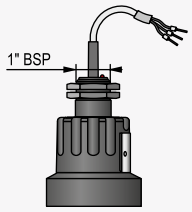
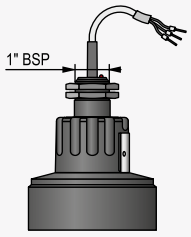
TECHNICAL DATA

Type		EasyTREK SP-500
System		2-wire
Power supply		12...36 V DC
Accuracy [1]		± (0.2 % of measured distance +0.05 % of range)
Resolution		1 mm
Output	Analogue	4-20 mA
	Relay	SPDT, 30 V DC, 1A DC
	Digital Communication	HART 7
Ambient temperature		-30 °C ... +80 °C
Process temperature		see: Transducer data table
Pressure (absolute)		0.05 .. 0.3 MPa (0.5 ... 3 bar)
Housing		Polypropylene (PP) or PVDF) same as the transducer material; In case of Teflon (PTFE) transducer the housing material is PP
Electrical connection		LiYCY 6 x 0.5 mm² shielded Ø 6 mm cable; standard cable length: 5 m (can be ordered up to 30 m)
Electrical protection		Class III.
Ingress protection		IP68
Mass		1.2 – 2 kg

[1] *Under optimal circumstances of reflection and stabilised transducer temperature*

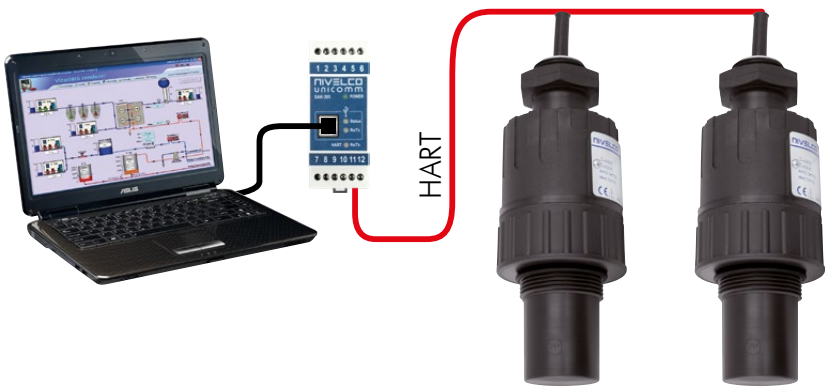
SPA-590-4

TRANSDUCER DATA

Transducer type	SP□-59	SP□-58	SP□-57	SP□-56	SP□-54
Beam angle	6°	5°	7°	5°	
Transducer material	PP or PVDF				
EasyTREK 2-wire					
Process connection	1" BSP and 1 ½" BSP or NPT	1" BSP and 2" BSP or NPT		1" BSP	
Max. measuring range [1]	6 m	8 m	10 m	15 m	25 m
Min. measuring range [1]	0.2 m		0.25 m		0.35 m
Process temperature	- 30 °C ... +90 °C				
Recommended applications	Small / mid-size vessels with 1 ½" or 2" process connection			Medium to large vessels	Tall vessels

[1] *Under optimal circumstances of reflection and stabilised transducer temperature*

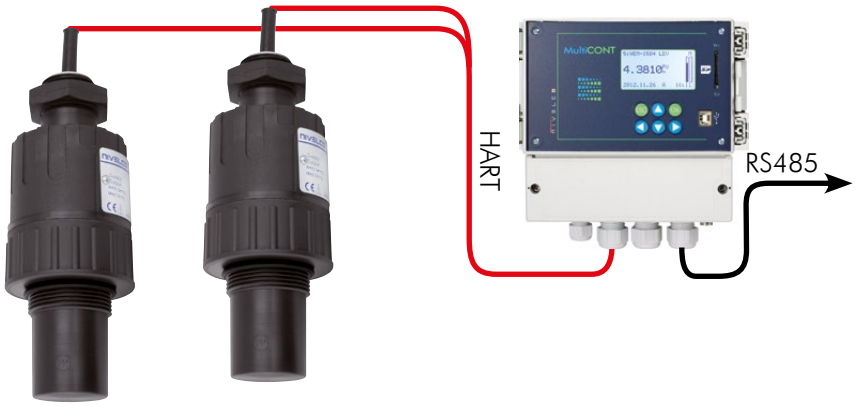
EasyTREK TRANSMITTERS IN SYSTEM WITH A PC



The instruments with HART output can be connected to a PC using a **UNICOMM** HART-USB modem. All measured values of the **EasyTREK** level transmitters can be visualized and/or the instruments can be remote programmed via digital HART communication. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.

EasyTREK LEVEL TRANSMITTERS IN HART MULTIDROP LOOP

The **MultiCONT** processes and displays measurement data supplied by **NIVELCO's** HART equipped transmitters connected to a Multidrop loop. The transmitters (also mixed models) can be connected and remote programming can be also performed through the **MultiCONT**. Re-transmission of the data is possible via RS485 communication line to a PC or PLC when needed.



EasyTREK SP-59/58/57/56/54

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

Type

S P ■ – 5 □ ■ – ■

9	0.2-6 m (80 kHz, 1" or 1 1/2" mounting)
8	0.2-8 m (80 kHz, 1" or 2" mounting)
7	0.25-10 m (60 kHz, 1" or 2" mounting)
6	0.25-15 m (60 kHz, 1" mounting)
4	0.35-25 m (40 kHz, 1" mounting)

Transducer material

S P □ – 5 ■ ■ – ■

A	PP
B	PVDF
T	PTFE (Only for SP-59/58/57)

Mounting

S P ■ – 5 ■ □ – ■

0	BSP thread
N	1 1/2" or 2" NPT and 1" BSP (Only for SP-59/58/57)

Output / Approval

S P ■ – 5 ■ ■ – □

4	*	4-20 mA + HART
8	*	4-20 mA + HART / Ex ia
H	*	4-20 mA + HART + Relay

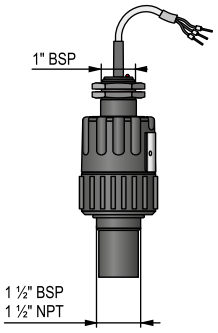
* Under development

Cable

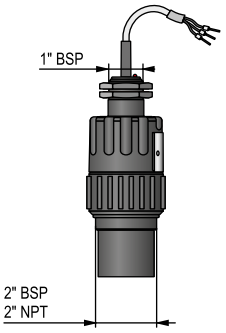
Maximum length 30 m; each started 1 m over the standard 5 m

Accessories to order (see relevant page for details)

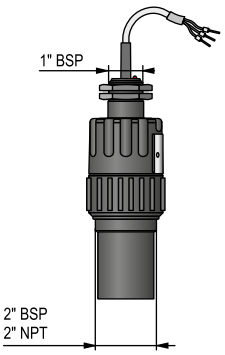
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia
S A A – 1 0 7 – 0	200 mm mounting bracket for process connection BSP 1"
S A A – 1 0 8 – 0	500 mm mounting bracket for process connection BSP 1"
S A A – 1 0 9 – 0	700 mm mounting bracket for process connection BSP 1"
S A A – 1 0 1 – 0	Fast connecting 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



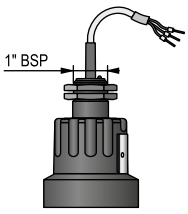
SP□-59□



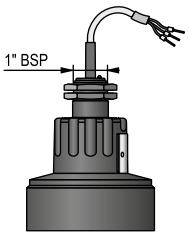
SP□-58□



SP□-57□



SP□-56□



SP□-54□

GENERAL DESCRIPTION

The **EasyTREK** high performance level transmitters are based on **NIVELCO**'s 30 years of experience with ultrasonic level measurement. Whether for liquid level measurement in sumps or tanks, for tank contents measurement, or open channel flow measurement, **EasyTREK** transmitters provide the answer. Installed on the tank roof, or above the liquid surface to be measured, the transmitters give analogue output proportional to liquid level or transmit HART digital data.
The **EasyTREK** is an integrated, blind transmitter with equal measuring performance as the **EchoTREK** but readable and programmable remotely only through HART protocol coming as standard. The two mounting options of the **EasyTREK**: 1 ½" and 2" process connections as its bottom or flanges for a mounting on the top of the tank. Its 1" threaded neck facilitates suspending it above the medium, a typical water / wastewater application.

MAIN FEATURES

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

APPLICATIONS

- *For most liquids, including flammable liquids*
- *Open channel flow metering*
- *Wide application area from wastewater to aggressive chemicals*
- *Level measurement in basins, wells, sumps, lift-stations*
- *Suitable for level measurement of hydrocarbons, acids, aggressive liquids, any water based medium*

CERTIFICATES

- *ATEX approved (Ex ia)*

SPA-380-4

SPB-360-4

TRANSDUCERS

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

PROPERTIES

Functions	EasyTREK
	SP-300
Relay	■
HART	■
IrDA	■
Logger	■
Intrinsically safe	■

PROGRAMMING

Using a PC and **UNICOMM** HART modem, it is possible to create your own multi-drop HART network, where the PC displays all **EasyTREK** measurement data and also allows reprogramming of the units as necessary.
In this way the outputs derived from the displayed data can be programmed via the PC, which acts as the master.

Programmable features via HART communication:

- *Assign 4 mA to low level*
- *Assign 20 mA to high level*
- *Error indication output current value*
- *Power relay switch points*
- *Damping time*
- *Measurement configuration (Units, function, close-end blocking)*
- *Measurement optimisation (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

Type		EasyTREK SP-300
System		2-wire
Accuracy [1]		± (0.2 % of measured distance +0.05 % of range)
Resolution		Depending on the measured distance: <2 m: 1 mm; 2 … 5 m: 2 mm; 5 … 10 m: 5 mm; >10 m: 10 mm
Output	Analogue	4-20 mA
	Relay	SPDT, 30 V DC, 1A DC
	Digital Communication	4-20 mA + HART
Ambient temperature		-30 °C ... +80 °C
		Ex version: see „Special data for Ex certified models" table
Process temperature		See: "Special data of the transducers" table, Ex version: see „Special data for Ex certified models" table
Pressure (absolute)		0.05 … 0.3 MPa (0.5 ... 3 bar)
Power supply		12...36 V DC / 48 ...720 mW
Electrical protection		Class III.
Housing		Polypropylene (PP) or (PVDF) same as the transducer material; In case of Teflon (PTFE) transducer the housing material is PP
Sealing		In case of PP transducer: EPDM; all the other transducers: FPM (Viton)
Electrical connection		LiYCY 2x 0.5 mm² shielded Ø 6 mm cable; standard cable length: 5 m (can be ordered up to 30 m)
Ingress protection		IP68
Explosion protection		See: „Special data for Ex certified models" table
Mass		1.2 – 2 kg

[1] *Under optimum conditions and stabilized transducer temperature*

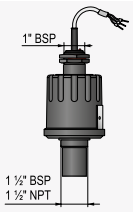
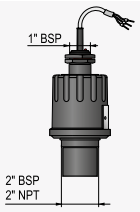
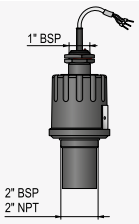
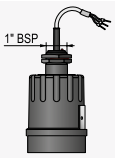
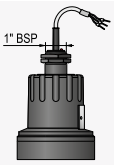
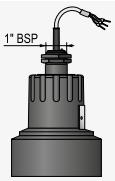
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	EasyTREK SP-300
Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Ambient temperature	-20 °C ... +70 °C
Process temperature	with PP transducer: -20 °C...+70 °C, with PVDF transducer: -20 °C...+80 °C, with PTFE transducer: -30 °C ... +90 °C
Electrical connection	LiYCY type 2x 0.5 mm² shielded Ø 6 mm cable; max. cable length: 5 m

ULTRASONIC LEVEL TRANSMITTERS IN HART MULTIDROP LOOP

The **MultiCONT** processes and displays measurement data supplied by **NIVELCO**'s HART equipped transmitters connected to a Multidrop loop. Up to 15 transmitters (also mixed models) can be connected and remote programming can be also performed through the **MultiCONT**. Re-transmission of the data is possible via RS485 communication line to a PC or PLC when needed.

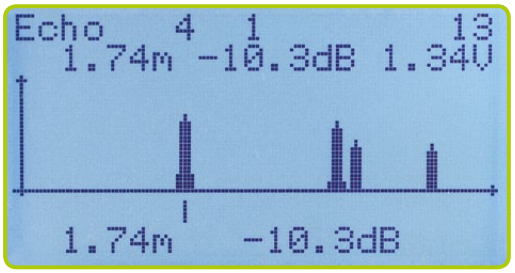
SPECIAL DATA OF THE TRANSDUCERS

Transducer type	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					
EasyTREK SP 2-wire						
Process connection	1" BSP and 1½" BSP or NPT	1" BSP and 2" BSP or NPT		1" BSP		
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 °C ... +90 °C					
Recommended applications	Small vessels with 1 ½" or 2" process connection			Small vessels with flange	Mid-size vessels with flange	Tall vessels with flange

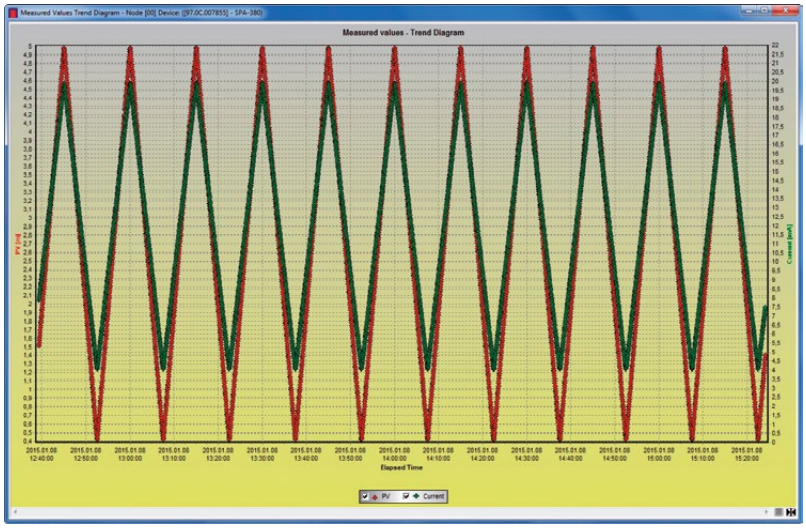
Transducer material	PTFE		
Max. measuring range [1]	3 m	5 m	6 m
Min. measuring range [1]	0.25 m		0.35 m
Process temperature	–30 °C ... +90 °C		

[1] *Under optimum conditions and stabilized transducer temperature*

ECHO MAP WITH MultiCONT



DISPLAY MEASUREMENT VALUE WITH EView2



SPA-360-4

SPA-340-4

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

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

Type

S P ■ – 3 □ ■ – ■

9	0.2-4 m (80 kHz, 1" or 1 1/2" mounting)
8	0.25-6 m (80 kHz, 1" or 2" mounting)
7	0.35-8 m (60 kHz, 1" or 2" mounting)
6	0.35-10 m (60 kHz, 1" mounting)
4	0.45-15 m (40 kHz, 1" mounting)
2	0.6-25 m (20 kHz, 1" mounting)

Transducer material

S P □ – 3 ■ ■ – ■

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

Mounting

S P ■ – 3 ■ □ – ■

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

Output / Approval

S P ■ – 3 ■ ■ – □

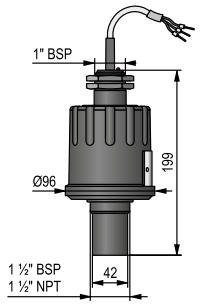
3	4-20 mA + HART + Data logging feature
4	4-20 mA + HART
7	4-20 mA + HART + Data logging feature / Ex ia
8	4-20 mA + HART / Ex ia
A	4-20 mA + HART + Data logging feature + Relay
H	4-20 mA + HART + Relay

Cable

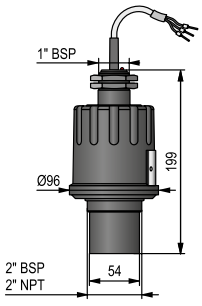
Maximum length 30 m; each started 1 m over the standard 5 m

Accessories to order (see relevant page for details)

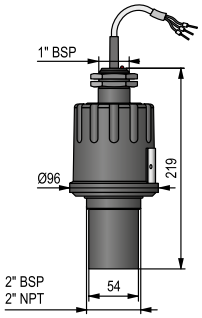
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia
S A A – 1 0 7 – 0	200 mm mounting bracket for process connection BSP 1"
S A A – 1 0 8 – 0	500 mm mounting bracket for process connection BSP 1"
S A A – 1 0 9 – 0	700 mm mounting bracket for process connection BSP 1"
S A A – 1 0 1 – 0	Fast connecting 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



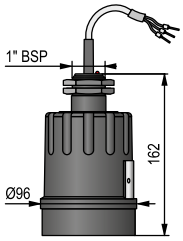
SP□-39□



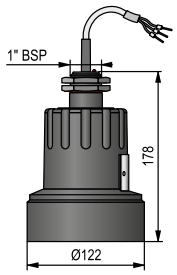
SP□-38□



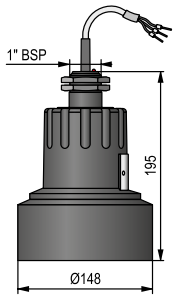
SP□-37□



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

GENERAL DESCRIPTION

The **EchoTREK** high performance level transmitters are based on **NIVELCO**'s 30 years of experience with ultrasonic level measurement. Whether for liquid level measurement in sumps or tanks, for tank contents measurement, or open channel flow measurement, **EchoTREK** transmitters provide the answer. Installed on the tank roof, or above the liquid surface to be measured, the transmitters give analogue output proportional to liquid level or transmit HART digital data.
The **EchoTREK** is an intelligent compact ultrasonic level transmitter with 4-20 mA output offering HART protocol as option. Local reading is ensured by a plug-in display which can be removed if displaying is not needed. Four keys provide for programming, both display and keys are located under a removable cover. The unit is tank-top mountable only.
The level transmitters can be used in multi-drop systems connected to **NIVELCO**'s **MultiCONT** process controller/display, or to a PC with the help of the **UNICOMM** HART USB/RS485 modem or similar. **EchoTREK** are available with measurement ranges up to 25 m providing wide application possibilities. The ultrasonic level transmitters are using **NIVELCO**'s established SenSonic range transducers with a full beam angle of 5 to 7 degrees connected to the intelligent electronics featuring the QUEST+ advanced signal processing algorithm.

MAIN FEATURES

- *2- /4-wire compact level transmitters*
- *Non-contact level measurement*
- *Maximum 25 m measuring range*
- *Narrow (5°) beam angle*
- *Full temperature compensation*
- *IP67 rated*
- *Plug-in display unit*
- *HART communication*
- *Ex version*

APPLICATIONS

- *For most liquids, including flammable liquids*
- *Open channel flow metering*
- *Wide application area from wastewater to aggressive chemicals*
- *Level measurement in basins, wells, sumps, lift-stations*
- *Suitable for level measurement of hydrocarbons, acids, aggressive liquids, any water based medium*

CERTIFICATIONS

- *ATEX approved (Ex ia)*

SG□-380-4 (2-wire)

SB□-480-4 (4-wire)

TRANSDUCERS

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

PROPERTIES

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

OPERATION

The ultrasonic level metering technology is based on the principle of measuring the time required for the ultrasound pulses to cover the distance from the sensor to the level to be measured and back. The echoes bounced back from the surface of the medium to be measured reach the sensor surface after the time of flight of the ultrasonic impulse. The time of flight of the reflected signal is measured and processed by the electronics, and then this is converted to distance, level, volume or flow proportional data with the help of the customizable tank dimensions or the pre-programmed flume / weir parameters. The intelligent QUEST+ process adaptive signal processing software system ensures that the electronics identifies and validates the liquid surface signal, giving reliable level monitoring.

TECHNICAL DATA

Type		EchoTREK SE/SG-300	EchoTREK ST/SB-400
System		2-wire	4-wire
Accuracy [1]		± (0.2 % of measured distance +0.05 % of range)	
Resolution		Depending on the measured distance: <2 m: 1 mm; 2 ... 5 m: 2 mm; 5 ... 10 m: 5 mm; >10 m: 10 mm	
Output	Analogue	4-20 mA	
	Relay [2]	SPDT, 30 V DC, 1A 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	4-20 mA + HART	
Ambient temperature		with plastic housing: -25 °C ... +70 °C with metal housing: -30 °C ...+70 °C with display: -25 °C ... +70 °C	
		Ex version: see „Special data for Ex certified models" table	
Process temperature		See: "Special data of the transducers" table, Ex version: see „Special data for Ex certified models" table	
Pressure (absolute)		0.05 ... 0.3 MPa (0.5 ... 3 bar), with stainless steel transducer: 0.09 .. 0.11 MPa (0.9 ... 1.1 bar)	
Power supply		12...36 V DC / 48 ...720 mW	85...255 V AC / 2 VA 20...28 V AC/DC / 3 VA/3 W
Electrical protection		in case of DC power supply: Class III.	
			in case of AC power supply: with metal housing: Class I. with plastic housing: Class II.
Housing		Plastic (PBT), paint coated aluminium or stainless steel	Plastic (PBT), paint coated aluminium
Sealing		In case of PP transducer: EPDM; all the other transducers: FPM (Viton)	
Electrical connection		2xM20x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø6...12 mm, wire cross section: max.1.5 mm^2 Ex version: See: „Special data for Ex certified models" table	
Ingress protection		Transducer: IP68, Housing: IP67	
Explosion protection		See: „Special data for Ex certified models" table	–
Mass		1.3 – 2.3 kg	

[1] *Under optimum conditions and stabilized transducer temperature*

[2] *The 4-wire EchoTREK transmitters have two parallel operating relays*

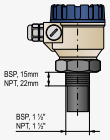
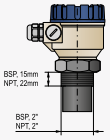
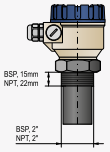
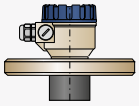
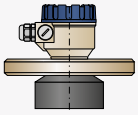
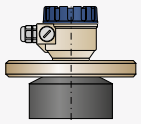
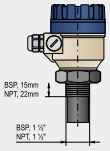
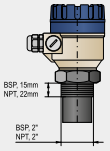
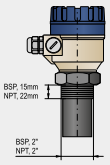
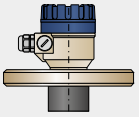
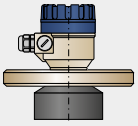
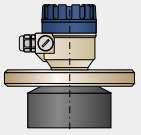
SPECIAL DATA FOR Ex CERTIFIED MODELS

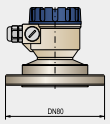
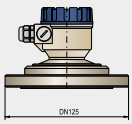
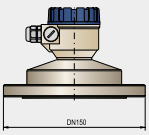
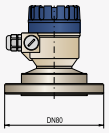
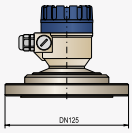
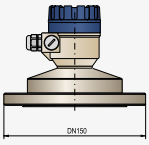
Type	EchoTREK SE/SG-300
Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Ambient temperature	with plastic housing: -20 °C ... +70 °C, with metal housing: -30 °C ... +70 °C, with display: -25 °C ... +70 °C
Process temperature	with PP transducer: -20 °C...+70 °C, with PVDF transducer: -20 °C...+80 °C, with PTFE transducer: -30 °C ... +90 °C
	with stainless steel transducer: -30 °C...+100 °C
Electrical connection	2x M20x1.5 metal cable glands

SEV-390-8 Ex
+ SFA-3□6

SAP-200
Diplay

SPECIAL DATA OF THE TRANSDUCERS

Transducer type	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	1 ½" BSP / NPT	2" BSP / NPT		DN 80 flange	DN 125 flange	DN 150 flange
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 °C ... +90 °C					
Recommended applications	Small vessels with 1 ½" or 2" process connection			Small vessels with flange	Mid-size vessels with flange	Tall vessels with flange

Transducer material	PTFE			Stainless steel		
Max. measuring range [1]	3 m	5 m	6 m	7 m	12 m	15 m
Min. measuring range [1]	0.25 m		0.35 m	0.4 m	0.55 m	0.65 m
Process temperature	–30 °C ... +90 °C			–30 °C ... +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 optimum conditions and stabilized transducer temperature*

SEM-340

SEA-345

EchoTREK S-49/48/47

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

Type

S ■■ – 4 □■ – ■

9	0.2-4 m (80 kHz, Process connection: 1 1/2")
8	0.25-6 m (80 kHz, Process connection: 2")
7	0.35-8 m (60 kHz, Process connection: 2")

Programmer and local indicator (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

P	Plastic, PBT, glass fibre reinforced / Polypropylene (PP)
V	Plastic, PBT, glass fibre reinforced / PVDF
F	Plastic, PBT, glass fibre reinforced / PTFE
A	Aluminium (paint coated) / Polypropylene (PP)
B	Aluminium (paint coated) / PVDF
T	Aluminium (paint coated) / PTFE

Mounting

S ■■ – 4 ■□ – ■

0	BSP thread
N	NPT thread

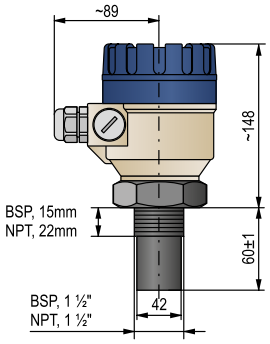
Power supply / Output

S ■■ – 4 ■■ – □

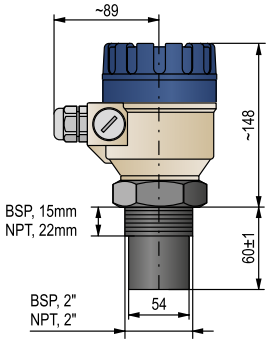
1	85-255 V AC / 4-20 mA + DPDT Relay
3	85-255 V AC / 4-20 mA + HART + DPDT Relay
G	85-255 V AC / 4-20 mA + HART + DPDT Relay + Data logging feature
K	85-255 V AC / 4-20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4-20 mA + DPDT Relay
4	24 V AC/DC / 4-20 mA + HART + DPDT Relay
H	24 V AC/DC / 4-20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

Accessories to order (see relevant page for details)

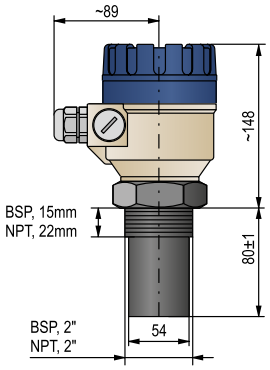
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A A – 1 0 7 – 3	200 mm mounting bracket for 2" BSP process connection
S A A – 1 0 8 – 3	500 mm mounting bracket for 2" BSP process connection
S A A – 1 0 9 – 3	700 mm mounting bracket for 2" BSP process connection
S A A – 1 0 7 – 4	200 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 8 – 4	500 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 9 – 4	700 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 7 – 5	200 mm mounting bracket for 2" NPT process connection
S A A – 1 0 8 – 5	500 mm mounting bracket for 2" NPT process connection
S A A – 1 0 9 – 5	700 mm mounting bracket for 2" NPT process connection
S A A – 1 0 7 – 6	200 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 8 – 6	500 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 9 – 6	700 mm mounting bracket for 1 1/2" NPT process connection



ST□-49□



ST□-48□



ST□-47□

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

EchoTREK S-46/44/42

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

Type

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 indicator (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

P	Plastic, PBT, glass fibre reinforced / Polypropylene (PP)
V	Plastic, PBT, glass fibre reinforced / PVDF
A	Aluminium (paint coated) / Polypropylene (PP)
B	Aluminium (paint coated) / PVDF

Mounting

S ■■ – 4 ■□ – ■

DIN flanges: Polypropylene (PP), drilled like PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
FF ANSI flanges: Polypropylene (PP), drilled like 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), drilled like 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, paint coated steel
L	500 mm mounting bracket, paint coated steel
M	700 mm mounting bracket, paint coated steel

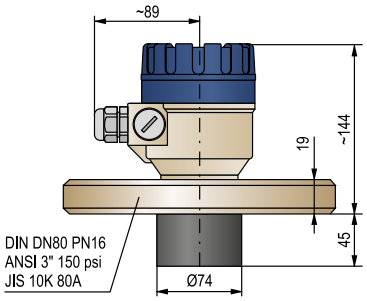
Power supply / Output

S ■■ – 4 ■■ – □

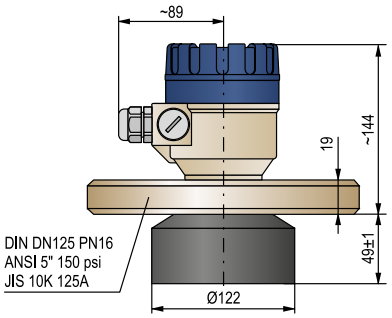
1	85-255 V AC / 4-20 mA + DPDT
3	85-255 V AC / 4-20 mA + HART + DPDT
G	85-255 V AC / 4-20 mA + HART + DPDT + Data logging feature
K	85-255 V AC / 4-20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4-20 mA + DPDT
4	24 V AC/DC / 4-20 mA + HART + DPDT
H	24 V AC/DC / 4-20 mA + HART + DPDT + Data logging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

Accessories to order (see relevant page for details)

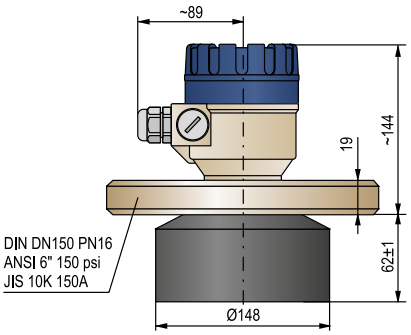
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem



ST□-46□



ST□-44□



ST□-42□

EchoTREK S-46/44/42 with stainless steel transducer

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

Type

S ■■ – 4 □■ – ■

6	6 WEEKS!	0.4-7 m (60 kHz, flange size: DN80)
4	6 WEEKS!	0.55-12 m (40 kHz, flange size: DN125)
2	6 WEEKS!	0.65-15 m (20 kHz, flange size: DN150)

Programmer and local indicator (SAP-200)

S □■ – 4 ■■ – ■

T	Not included
B	Included

Housing / Transducer material

S ■□ – 4 ■■ – ■

M	Plastic, PBT, glass fibre reinforced / Stainless Steel (AISI SS316Ti, DIN 1.4571)
S	Aluminium (paint coated) / Stainless Steel (AISI SS316Ti, DIN 1.4571)

Mounting

S ■■ – 4 ■□ – ■

DIN flanges, drilled like PN16

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

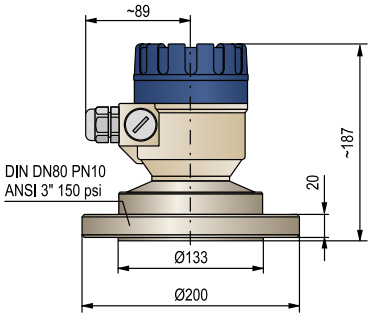
Power supply / Output

S ■■ – 4 ■■ – □

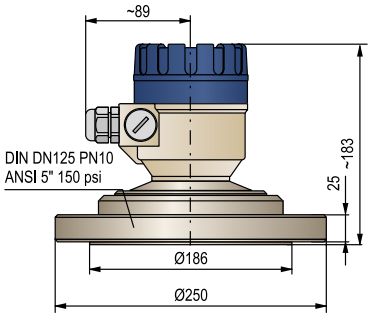
1	85-255 V AC / 4-20 mA + DPDT
3	85-255 V AC / 4-20 mA + HART + DPDT
G	85-255 V AC / 4-20 mA + HART + DPDT + Data logging feature
K	85-255 V AC / 4-20 mA + DPDT + Data logging feature
2	24 V AC/DC / 4-20 mA + DPDT
4	24 V AC/DC / 4-20 mA + HART + DPDT
H	24 V AC/DC / 4-20 mA + HART + DPDT + Data logging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

Accessories to order (see relevant page for details)

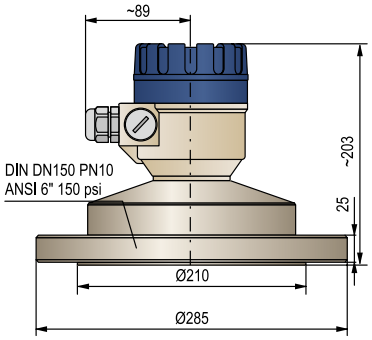
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem



STM / STS-462



STM / STS-444



STM / STS-425

EchoTREK S-39/38/37

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

Type

S ■■ – 3 □■ – ■

9	0.2-4 m (80 kHz, Process connection: 1 ½")
8	0.25-6 m (80 kHz, Process connection: 2")
7	0.35-8 m (60 kHz, Process connection: 2")

Programmer and local indicator (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

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

Mounting

S ■■ – 3 ■□ – ■

0	BSP thread
N	NPT thread

Output / Approval

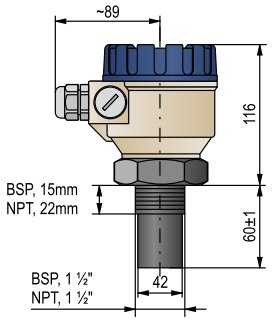
S ■■ – 3 ■■ – □

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
6		4-20 mA / Ex
7		4-20 mA + HART + Data logging feature / Ex
8		4-20 mA + HART / Ex
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
P		PROFIBUS
E	*	PROFIBUS / Ex

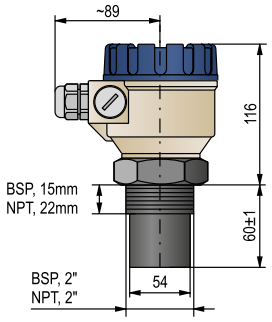
* Under development

Accessories to order (see relevant page for details)

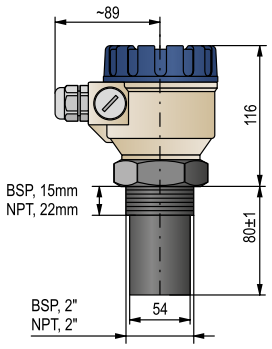
S F A – 3 ■■ – 0	Flanges
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia
S A A – 1 0 7 – 3	200 mm mounting bracket for 2" BSP process connection
S A A – 1 0 8 – 3	500 mm mounting bracket for 2" BSP process connection
S A A – 1 0 9 – 3	700 mm mounting bracket for 2" BSP process connection
S A A – 1 0 7 – 4	200 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 8 – 4	500 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 9 – 4	700 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 7 – 5	200 mm mounting bracket for 2" NPT process connection
S A A – 1 0 8 – 5	500 mm mounting bracket for 2" NPT process connection
S A A – 1 0 9 – 5	700 mm mounting bracket for 2" NPT process connection
S A A – 1 0 7 – 6	200 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 8 – 6	500 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 9 – 6	700 mm mounting bracket for 1 1/2" NPT process connection



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

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

Type

S ■■ – 3 □■ – ■

6		0.35-10 m (60 kHz, min. required flange size: DN 80)
4		0.45-15 m (40 kHz, min. required flange size: DN 125)
2	*	0.6-25 m (20kHz, min. required flange size: DN 150)

* Ex version not available

Programmer and local indicator (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

P	Plastic, PBT, glass fibre reinforced / Polypropylene (PP)
V	Plastic, PBT, glass fibre reinforced / PVDF
A	Aluminium (paint coated) / Polypropylene (PP)
B	Aluminium (paint coated) / PVDF
K	Stainless steel / Polypropylene (PP)
W	Stainless steel / PVDF

Mounting

S ■■ – 3 ■□ – ■

DIN flanges: Polypropylene (PP), drilled like PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
FF ANSI flanges: Polypropylene (PP), drilled like 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), drilled like 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, paint coated steel
L	500 mm mounting bracket, paint coated steel
M	700 mm mounting bracket, paint coated steel

Output / Approval

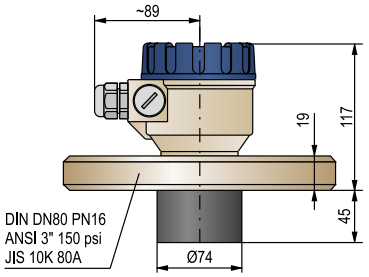
S ■■ – 3 ■■ – □

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
6		4-20 mA / Ex
7		4-20 mA + HART + Data logging feature / Ex
8		4-20 mA + HART / Ex
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
P		PROFIBUS
E	**	PROFIBUS / Ex

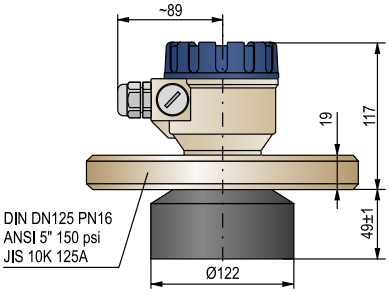
** Under development

Accessories to order (see relevant page for details)

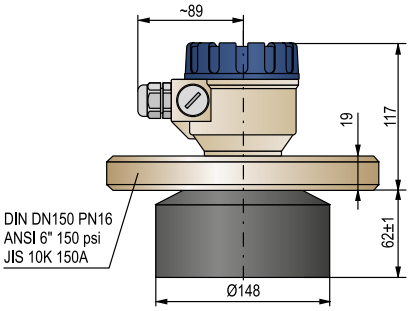
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



SE□-36□



SE□-34□



SE□-32□

EchoTREK S-36/34/32 with stainless steel transducer

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

Type

S ■■ – 3 □■ – ■

6		0.4-7 m (60 kHz, flange size: DN 80)
4		0.55-12 m (40 kHz, flange size: DN 125)
2	*	0.65-15 m (20 kHz, flange size: DN 150)

Programmer and local indicator (SAP-200)

S □■ – 3 ■■ – ■

E	Not included
G	Included

Housing / Transducer material

S ■□ – 3 ■■ – ■

M	*	Plastic, PBT, glass fibre reinforced / Stainless Steel (AISI SS316Ti, DIN 1.4571)
S		Aluminium (paint coated) / Stainless Steel (AISI SS316Ti, DIN 1.4571)
N		Stainless Steel / Stainless Steel (AISI SS316Ti, DIN 1.4571)

* Ex version not available

Mounting

S ■■ – 3 ■□ – ■

DIN flanges: drilled as PN16

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

Output / Approval

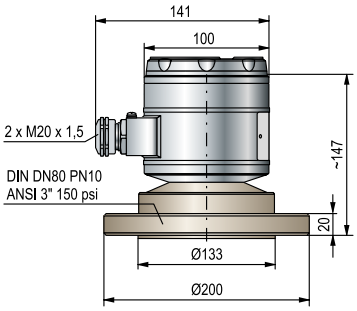
S ■■ – 3 ■■ – □

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
6		4-20 mA / Ex
7		4-20 mA + HART + Data logging feature / Ex
8		4-20 mA + HART / Ex
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
P		PROFIBUS
E	**	PROFIBUS / Ex

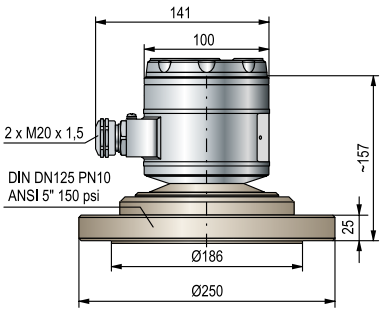
** Under development

Accessories to order (see relevant page for details)

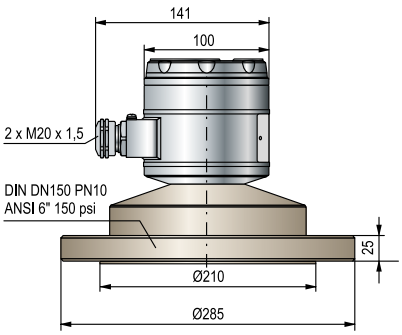
S A P – 2 0 0 – 0	Plug-in programmer/display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



SEN-362



SEN-344



SEN-325

GENERAL DESCRIPTION

The 4-wire **EasyTREK** ultrasonic level transmitters are offered for solids level monitoring tasks where previously only more complex, two part systems have performed adequately. **NIVELCO**'s high efficiency **SenSonic** narrow beam angle transducers, giving superb signal transmission, make possible that the **EasyTREK** units overcome filling noise, dusting and irregular surface formations in most cases to give a high performance, compact, powder and solids level measurement transmitter. This is provided by the **QUEST+** software, using advanced process adaptive signal processing for reliable echo monitoring, offering a best-in-class solution.

MAIN FEATURES

- *Non-contact level measurement*
- *4-wire integrated (blind) level transmitters*
- *Maximum 60 m measuring range*
- *Narrow (5°) beam angle*
- *Full temperature compensation*
- *IP65 protection*
- *HART communication*
- *Dust Ex version*

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*

CERTIFICATIONS

- *ATEX approved (Dust Ex)*

TECHNICAL DATA

Type		EasyTREK SCD-300
System		4-wire
Accuracy [1]		± (0.2% of measured distance + 0.1 % of range)
Resolution		10 mm
Output	Analogue	4-20 mA
	Relay	SPST, 48 V AC / 5 A, AC12
	Digital Communication	4-20 mA + HART
Ambient temperature		-30 °C ... +60 °C
Process temperature		-30 °C ... +75 °C
Process pressure		0.07 ... 0.11 MPa (0.7 ... 1.1 bar) $P_{absolute}$ and ±0.01 MPa (0.1 bar) difference between ambient and tank pressure
Power supply		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 7x 0.5 mm² shielded Ø 7.5 mm cable; standard cable length: 5 m (can be ordered up to 30 m)
Ingress protection		IP65
Explosion protection		See: „Special data for Ex certified models" table
Mass		3 – 3.5 kg

[1] *Under optimum conditions and stabilized transducer temperature*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	EasyTREK SCD-300
Protection type	Dust Ex
Ex marking	See: www.nivelco.com
Ambient temperature	-30 °C ... +60 °C
Process temperature	
Electrical connection	LiYCY type 7x 0.5 mm² shielded Ø 7.5 mm cable; standard cable length: 5 m

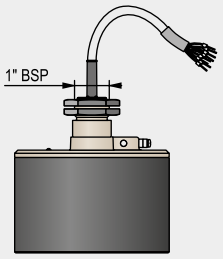
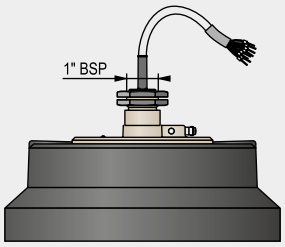
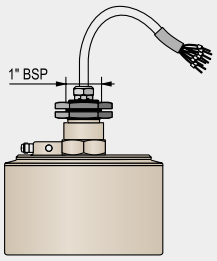
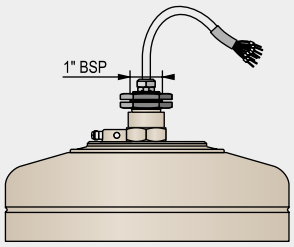
TRANSDUCERS

Transducer material	EasyTREK SCD-300
PP (Normal version)	■
Aluminium (Ex version)	■

PROPERTIES

Functions	EasyTREK SCD-300
Relay	■
HART	■
Dust Ex version	■

TRANSDUCER DATA AND DIMENSIONS

Transducer type	SCD-34	SCD-33	SCD-31
Recommended applications	Small tanks, hoppers, conveyor belts. Both powders and granules.	Medium sized silos containing all kinds of bulk solids.	Larger silos containing all kinds of bulk solids. Due to its power and low frequency recommended if dust generation is significant.
EasyTREK (normal type)			
EasyTREK (Ex type)			
Transducer material	Normal type: PP and aluminium, Ex type: Paint coated aluminium		
Surface of the transducer	Closed cell Polyurethane foam sensor face (PUR)		
Beam angle	5°		
Max. measuring range [1]	15 m	30 m	60 m
Min. measuring range [1]	0.6 m		1 m

[1] *Under optimum conditions and stabilized transducer temperature*

SCD-31J-8 Ex

SCD-31J-4

EasyTREK SCD-34/33/31

4-wire integrated compact ultrasonic level transmitters for solids
with PP or aluminium cast sensor housing with polyurethane foam face

Type

S C D – 3 □ ■ – ■	
4	0.6-15 m (40 kHz)
3	0.6-30 m (30 kHz)
1	1-60 m (15 kHz)

Mounting

S C D – 3 ■ □ – ■	
0	1" BSP thread
J	Aming device

Output / Approval

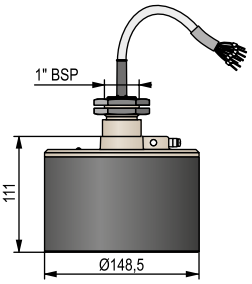
S C D – 3 ■ ■ – □	
4	4-20 mA + HART + Relay
8	4-20 mA + HART + SSR / Ex

Cable

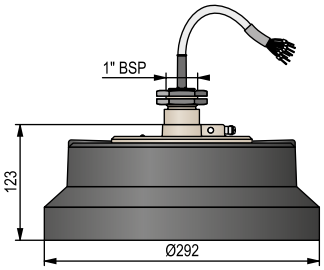
Maximum length 30 m; each started 1 m over the standard 5 m

Accessories to order (see relevant page for details)

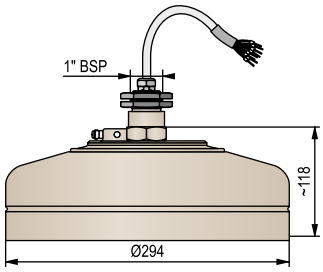
S F A – 3 ■ ■ – 0	Flanges
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia
S A A – 1 0 1 – 0	Fast connecting gland for pipe mounting devices with 1" process connection, PP
S A A – 1 0 2 – 0	Aiming device, 500 mm, aluminium, Pg9, drilled as DN50 PN16
S A A – 1 0 6 – 0	Damping gland for mounting SP devices to thin metal roofs, PP



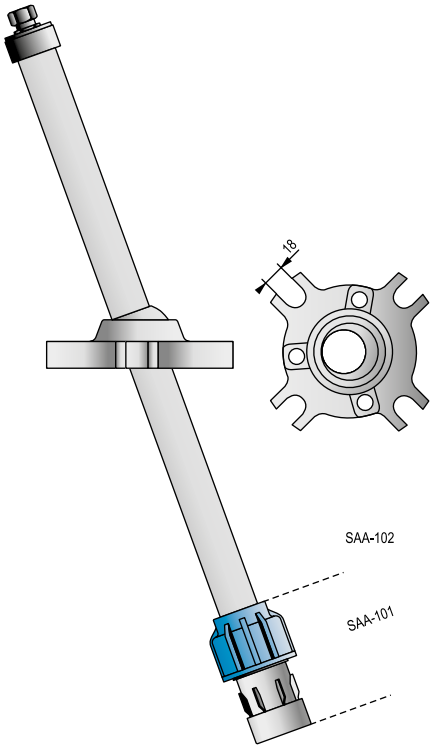
SCD-330 / 340



SCD-310



SCD-310-8 Ex



SAA-102

GENERAL DESCRIPTION

The 4-wire **EchoTREK** compact ultrasonic level transmitters are offered for solids level monitoring tasks where previously only more complex, two part systems have performed adequately. **NIVELCO**'s high efficiency **SenSonic** narrow beam angle transducers, giving superb signal transmission, make possible that the **EchoTREK** units overcome filling noise, dusting and irregular surface formations in most cases to give a high performance, compact, powder and solids level measurement transmitter. This is provided by the **QUEST+** software, using advanced process adaptive signal processing for reliable echo monitoring, offering a best-in-class solution.

MAIN FEATURES

- *Non-contact level measurement*
- *4-wire compact transmitters*
- *Maximum 60 m measuring range*
- *Narrow (5°) beam angle*
- *Full temperature compensation*
- *IP67 protection*
- *Plug-in display unit*
- *HART communication*
- *Dust Ex version*

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*

CERTIFICATIONS

- *ATEX approved (Dust Ex)*

TECHNICAL DATA

Type		EchoTREK S□D-300
System		4-wire
Accuracy [1]		± (0.2% of measured distance + 0.1 % of range)
Resolution		10 mm
Output	Analogue	4-20 mA
	Relay	SPDT, 250 V AC / 3 A, AC1
	Display	SAP-100 plug-in display unit
	Digital comm.	4-20 mA + HART
Ambient temperature		-30 °C ... +60 °C with display: -25 °C ... +60 °C
Process temperature		-30 °C ... +75 °C
Process pressure		0.07 ... 0.11 MPa (0.7 ... 1.1 bar) $P_{absolute}$ and ±0.01 MPa (0.1 bar) difference between ambient and tank pressure
Power supply		I. version: 85 .. 255 V AC / 6.8 VA
		II. version: 11.4 ... 40 V DC / 4.7 W and 11.4 ... 28 V AC / 5.2 VA
Electrical protection		I. version: Class I.
		II. version: Class III.
Housing		Paint coated aluminium
Electrical connection		2x M20x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø6...Ø12 mm, wire cross section: max.1.5 mm² Ex version: See: „Special data for Ex certified models" table
Ingress protection		Transducer: IP65, Housing: IP67
Explosion protection		See: „Special data for Ex certified models" table
Mass		5 kg

[1] *Under optimum conditions and stabilized transducer temperature*

TRANSDUCERS

Transducer material	EchoTREK STD/SBD-300
PP (Normal version)	■
Aluminium (Ex version)	■

PROPERTIES

Functions	EchoTREK STD/SBD-300
Relay	■
HART	■
Dust Ex version	■
Display	SAP-100

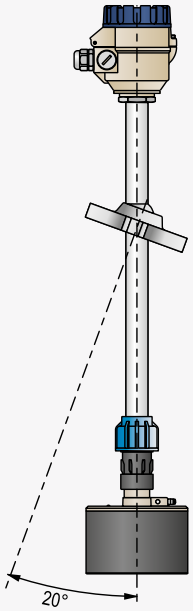
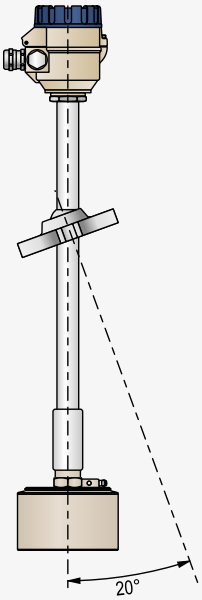
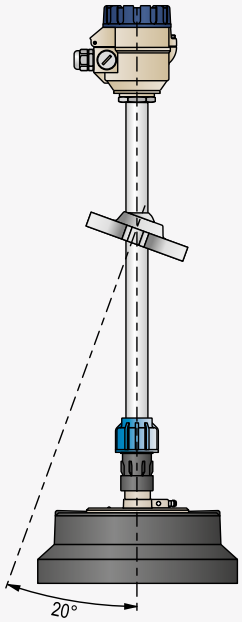
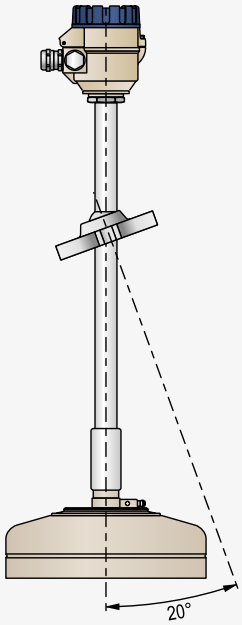
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	EchoTREK S□D-300
Protection type	Dust Ex
Ex marking	See: www.nivelco.com
Ambient temperature	-30 °C ... +60 °C, with display: -25 °C ... +60 °C
Process temperature	-30 °C ... +75 °C
Electrical connection	2x M20x1.5 metal cable glands

SAP-100 Display

SBD-300

TRANSDUCER DATA AND DIMENSIONS

Transducer type	S□D-34	S□D-33	S□D-31
Recommended applications	Small tanks, hoppers, conveyor belts. Both powders and granules.	Medium sized silos containing all kinds of bulk solids.	Larger silos containing all kinds of bulk solids. Due to its power and low frequency recommended if dust generation is significant.
EchoTREK (normal type)			
EchoTREK (Ex type)			
Transducer material	Normal type: PP and aluminium, Ex type: Paint coated aluminium		
Surface of the transducer	Closed cell Polyurethane foam sensor face (PUR)		
Beam angle	5°		
Max. measuring range [1]	15 m	30 m	60 m
Min. measuring range [1]	0.6 m		1 m

[1] *Under optimum conditions and stabilized transducer temperature*

MOUNTING

Coning or arching is a general feature of solid material storage is caused by the filling / emptying process. Optimising the aiming by the **SAA-102** joystick (part of the **EchoTREK** units) is recommended in these situations. The joystick aiming device offers a suitable solution to minimize most of the unfavourable effects of coning or arching. The optimal tilting position can be adjusted during operation and recommended to be checked at multiple levels during the filling / emptying process. As a general rule, best result is obtained by the transducer aimed towards the centre of the tank bottom.

STD-34J-6 Ex

EchoTREK S-34/33/31

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

Type

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 indicator (SAP-100)

S □ D – 3 ■ J – ■

T	Not included
B	Included

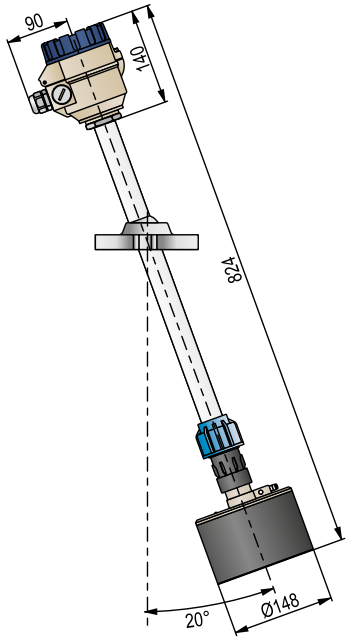
Power supply / Output / Approval

S ■ D – 3 ■ J – □

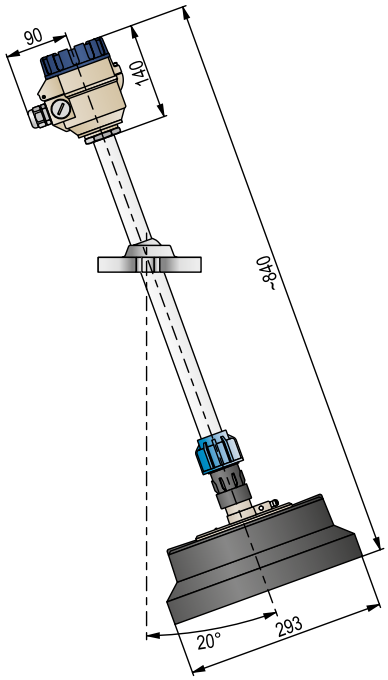
1	85-255 V AC / 4-20 mA + Relay
3	85-255 V AC / 4-20 mA + HART + Relay
5	85-255 V AC / 4-20 mA + Relay / Ex
7	85-255 V AC / 4-20 mA + HART + Relay / Ex
2	11.4-40 V DC and 11.4-28 V AC / 4-20 mA + Relay
4	11.4-40 V DC and 11.4-28 V AC / 4-20 mA + HART + Relay
6	11.4-40 V DC and 11.4-28 V AC / 4-20 mA + Relay / Ex
8	11.4-40 V DC and 11.4-28 V AC / 4-20 mA + HART + Relay / Ex

Accessories to order (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 K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



STD-33J / 34J



STD-31J

NIVOSONAR SFA

Separate plastic flanges for ultrasonic level transmitters
Material: Polypropylene (PP)

Type

□ F A – 3 ■ ■ – 0

S	Flanges

Flange size

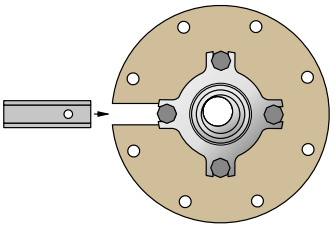
S F A – 3 □ ■ – 0

DIN flanges, drilled like PN16	
2	DN80 PN16
3	DN100 PN16
4	DN125 PN16
5	DN150 PN16
6	DN200 PN16
7	DN250 PN16
8	DN300 PN16
FF ANSI flanges, drilled like 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 150psi
JIS flanges, drilled like 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)

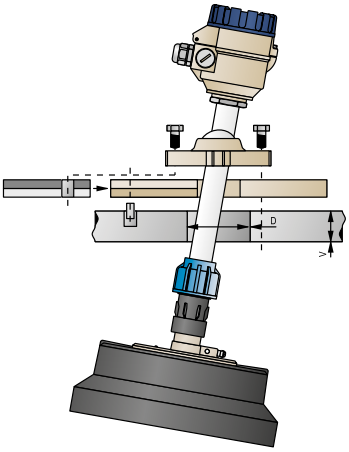
Flange type

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 1 1/2" BSP process connection
7	For units with 1 1/2" NPT process connection



SFA-3□5



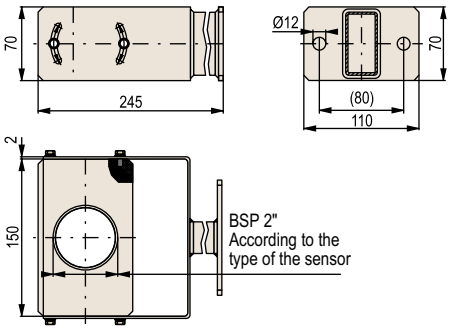
STD-31J + SFA-3□5

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

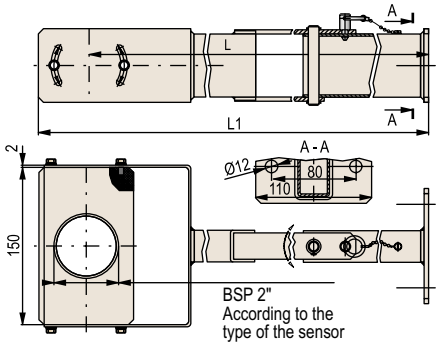
NIVOSONAR SAA

Separate mounting brackets for ultrasonic level transmitters
Material: Plastic / Metal

S A A – 1 0 7 – 0	200 mm mounting bracket for process connection BSP 1"
S A A – 1 0 8 – 0	500 mm mounting bracket for process connection BSP 1"
S A A – 1 0 9 – 0	700 mm mounting bracket for process connection BSP 1"
S A A – 1 0 7 – 3	200 mm mounting bracket for 2" BSP process connection
S A A – 1 0 8 – 3	500 mm mounting bracket for 2" BSP process connection
S A A – 1 0 9 – 3	700 mm mounting bracket for 2" BSP process connection
S A A – 1 0 7 – 4	200 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 8 – 4	500 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 9 – 4	700 mm mounting bracket for 1 1/2" BSP process connection
S A A – 1 0 7 – 5	200 mm mounting bracket for 2" NPT process connection
S A A – 1 0 8 – 5	500 mm mounting bracket for 2" NPT process connection
S A A – 1 0 9 – 5	700 mm mounting bracket for 2" NPT process connection
S A A – 1 0 7 – 6	200 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 8 – 6	500 mm mounting bracket for 1 1/2" NPT process connection
S A A – 1 0 9 – 6	700 mm mounting bracket for 1 1/2" NPT process connection



SAA-107



SAA-108, SAA-109

UNIDISP SAP-100

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

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

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

SAP-200

UNIDISP SAP-300

Plug-in dot matrix (128x64) graphical 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-306

eLINK unit for software/firmware updates with B-type mini USB connector
can be plugged in instead of SAP display module

Type	
S A T – 3 0 6 – 0	Plug-in unit

EView2

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!

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

GENERAL DESCRIPTION

The most frequent level instrumentation task is level control and limit level switching whether if the measurement medium is liquid or solid.

This is the reason why NIVELCO focuses on level switches in addition to the level transmitters.

NIVELCO has designed and manufactures instruments that offer reliable level control and limit level switching solutions for most media from potable water to sewage, aggressive alkalis and acids, or free- flowing, powdered, bulk or granular solids.

Thanks to this very wide level switch selection we are able to provide suitable instruments for most level instrumentation applications.

Most of our level switches have explosion-proof versions (in accordance to ATEX and/or IEC Ex).

Moreover we offer suitable solutions for special requirements, for example the ship-building industry with a need for Germanischer Lloyd (GL), Det Norske Veritas (DNV), Bureau Veritas (BV) or SIL approvals.

FLOAT SWITCHES

NIVOFLOAT

- Hermetically moulded, double chamber
- Adjustable switch differential
- Max. 20 m cable length
- Max. +50°C medium temperature
- Max. 2 bar process pressure
- Level switch from potable water to sewage
- Low specific weight of the floating body
- Fail-safe indication and pump control
- Suitable also for tanks and basins

page 81

CONDUCTIVE LEVEL SWITCHES

NIVOCONT K

- Low cost level switch
- Limit switch or differential switch versions
- Adjustable sensitivity
- Adjustable time delay
- All wetted parts stainless steel
- Compact and remote mount types
- For liquids with min. 10 μS/cm conductivity
- Rod probes up to 3 m

page 83

MAGNETIC COUPLING SWITCHES

NIVOMAG

- 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 min. 0.7 kg/dm^3 density
- Flame-proof models
- Marine approvals, SIL approval

page 87

MAGNETIC TRACKING SWITCHES

NIVOPOINT

- Operation without power supply
- Reed switches separated from process
- Stainless steel probe and float
- PFA coated probe version with plastic float
- Up to 5 switch points
- For liquids with min. 0.4 kg/dm³ density
- Multi-point level switch in closed tanks
- Flame-proof models

page 91

VIBRATING ROD LEVEL SWITCHES

NIVOCONT R

- For granular solids with min. 0.05 kg/dm³ density
- Rod or cable extension up to 20 m
- Stainless steel vibrating section
- Selectable density
- Plastic or aluminium housing
- Relay or electronic switch output
- IP67 protection
- Explosion-proof models

page 113

VIBRATING FORK LEVEL SWITCHES

NIVOSWITCH for LIQUIDS

- For most liquids with min. 0.7 kg/dm³ density and max. 10^4 mm²/s viscosity
- No moving parts
- Self-cleaning for most mediums
- Stainless steel and plastic coated forks
- Rigid rod extension up to 3 m
- Explosion-proof models
- IP67, IP68 protection

page 96

ROTARY PADDLE LEVEL SWITCHES

NIVOROTA

- For granular solids with min. 0.1 kg/dm³ density
- Plastic or aluminium housing
- Stainless steel wetted parts
- Motor shut-off feature
- Single or 3-vane paddles
- Rod or cable extended versions up to 3 m
- High temperature version
- IP67 protection
- Explosion-proof models

page 119

VIBRATING FORK LEVEL SWITCHES

NIVOSWITCH for SOLIDS

- For powdered solids with min. 0.01 kg/dm³ density
- No moving parts
- Stainless steel forks
- Self-cleaning for most mediums
- Rigid rod extension up to 3 m
- IP67, IP68 protection
- Explosion-proof models

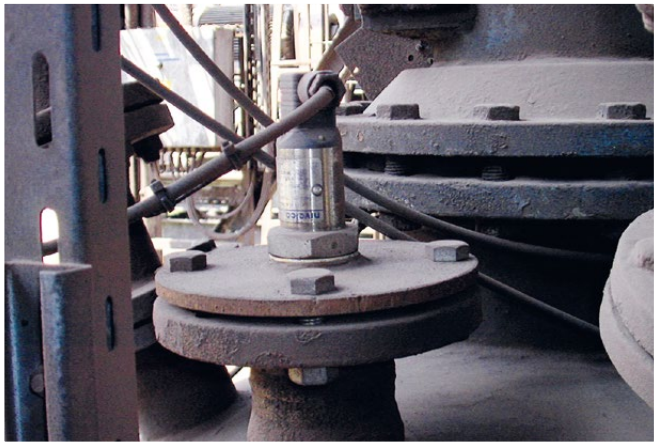
page 96

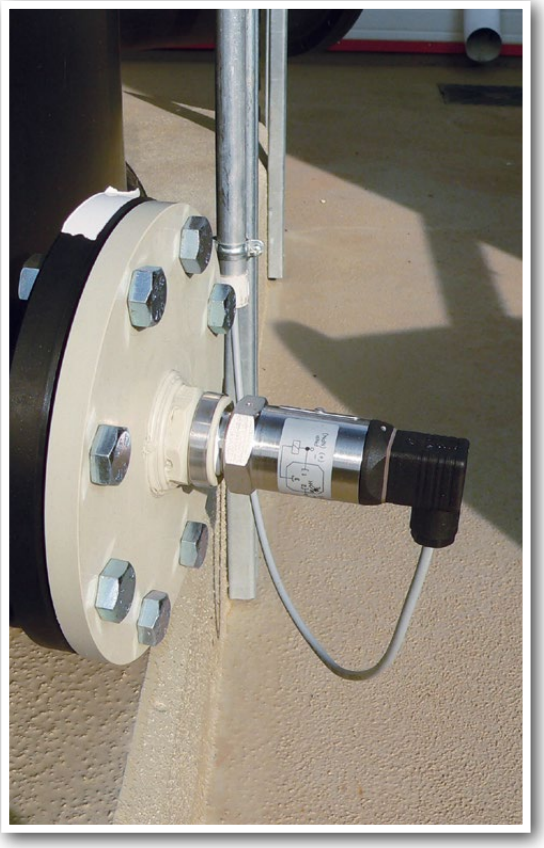
RF-CAPACITANCE LEVEL SWITCHES

NIVOCAP CK

- For solids with $\varepsilon_r \geq 1.5$ and liquids
- For adhering, sticky materials
- Easy calibration
- Selectable sensitivity
- Build-up immunity
- Rod or cable extended versions up to 10 m
- High temperature version
- IP67 protection
- Explosion-proof models

page 125





GENERAL DESCRIPTION

The **NIVOFLOAT NL-100** type floating level switch is suitable for level switching of various kinds of water, the **NIVOFLOAT NW-100** type tilting float level switch is suitable for level switching of various liquids, especially sewage in shafts, tanks, basins or cisterns. The double-chambered float is made of injection moulded tough polypropylene that ensures good waterproof protection. The contacting microswitch is incorporated in the float.
The cable of the **NIVOFLOAT** level switch is fed through a waterproof sealed entry into the monolithic structure of the injection moulded plastic housing. The cable of the level switch is a flexible insulated copper cable with 3x1 mm² cross section and PVC or Neoprene outer insulation. Different control tasks such as liquid level monitoring and pump control can be accomplished with **NIVOFLOAT**.

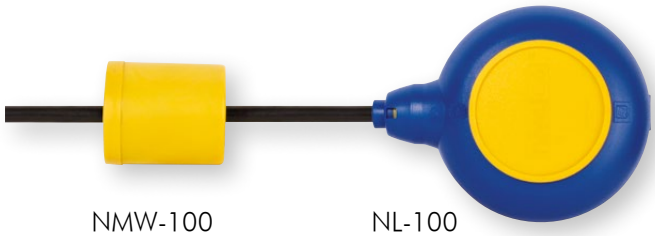
NIVOFLOAT NL-100

MAIN FEATURES

- *Double-chambered float*
- *Switching differential is adjustable by counterweight*
- *Maximum 20 m cable length*
- *Medium temperature max. +50°C*
- *Process pressure max. 1 bar*
- *Can be certified for potable water*
- *IP68 protection*

APPLICATIONS

- *For potable water*
- *For industrial and communal sewage*
- *Tank filling / emptying control*
- *For overfill protection*



NMW-100
counterweight

NL-100
float level switch

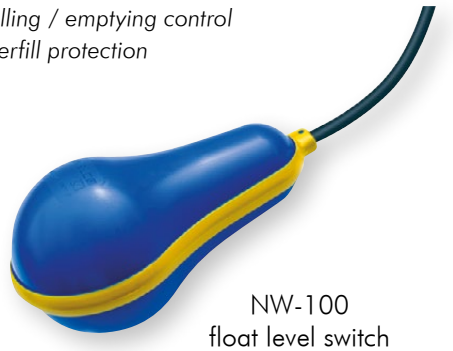
NIVOFLOAT NW-100

MAIN FEATURES

- *Special float shape*
- *Double-chambered float*
- *Maximum 20 m cable length*
- *Medium temperature max. +50°C*
- *Process pressure max. 2 bar*
- *Can be certified for potable water*
- *IP68 protection*

APPLICATIONS

- *For industrial and communal sewage*
- *Suitable also for drinking water*
- *Tank filling / emptying control*
- *For overfill protection*



NW-100
float level switch

TECHNICAL DATA (NL)

Type	NL□-1-□□-1
Switching angle	± 45°
Medium temperature	0°C ... +50°C
Medium pressure	0.1 MPa (1 bar)
Material of the float	Polypropylene
Material of the counterweight	Polystyrene
Float volume	430 cm³
Rating of the microswitch	10(4) A, 250V AC, AC1
Electrical life-span	10^7 switches
Mechanical protection	IP68
Cable	Ø 9 mm / 3 x 1 mm²
Cable length	5 m, 10 m, 20 m
Mass	250 g, without cable

TECHNICAL DATA (NW)

Type	NW□-1-□□-1
Switching differential	~ 400 mm (constant)
Medium temperature	0°C ... +50°C
Medium pressure	0.2 MPa (2 bar)
Material of the float	Polypropylene
Float volume	1000 cm³
Rating of the microswitch	10(3) A, 250V AC, AC1
Electrical life-span	10^7 switches
Mechanical protection	IP68
Cable	Ø 9 mm / 3 x 1 mm²
Cable length	5 m, 10 m, 20 m
Mass	1.1 kg, without cable

NIVOFLOAT N-100

Double-chamber float level switch
with PVC or Neoprene cable

Type

N □■ – 1 ■■ – 1

L	For clean water
W	For waste water

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

N ■■ – 1 ■■ – □

1	Without counterweight

NIVOFLOAT NMW-100

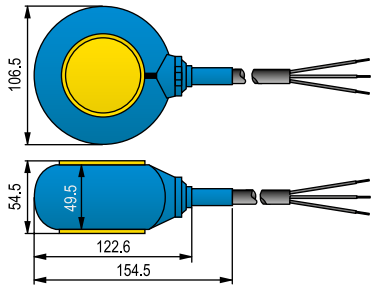
Counterweight for NL type float level switch
Material: polystyrene

Type

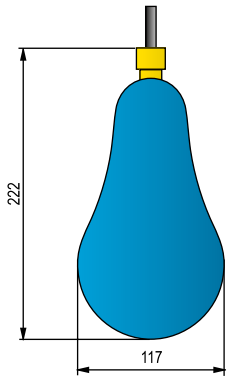
N M W – 1 0 0 – 0

Available on request

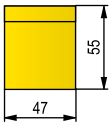
- Non-standard lengths for over 100 pcs



NL□-100



NW□-100



NMW-100

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

GENERAL DESCRIPTION

Level switches, based on the conductivity principle, can be applied to liquids with conductivity higher than 10 µS/cm. For detecting the level, probes are immersed into the tank. These probes (and the tank wall if conductive) serve as contacts of an electric circuit. Probes can be of single or multiple rod versions. A maximum of 4 probe rods can fit in the multiple probe socket with an additional reference probe if tank wall is not conductive. The probe length should be in accordance with the level to be detected. When the liquid level reaches the probe, it will create a short-circuit and the output relay will be activated. The device senses the conductivity difference between the probes and the reference probe. The KLP separators should be used at every 0.5 m to provide suitable distance between the probes.

MAIN FEATURES

Level switches

KRK-512	KRK-522
■ *Level switching*	■ *2 independent relay outputs for 1 level*
■ *Filling-emptying control*	■ *2 independent relay outputs for 2 independent levels*
■ *Selectable NO/NC relay function*	■ *2 relay outputs for pump control*
■ *Adjustable sensitivity*	■ *Selectable NO/NC relay function*
■ *Adjustable delay ON and delay OFF time*	■ *Adjustable sensitivity*
■ *Delay time indication*	■ *Adjustable delay ON and delay OFF time*
■ *AC/DC versions*	■ *AC/DC versions*

Compact level switches

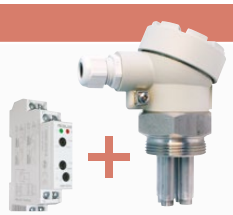
KKH-2□2

- *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 delay ON and delay OFF time*
- *Delay time indication*
- *AC/DC versions*

VERSIONS

Level switch and probe

- *DIN rail mounted 1 or 2 channel switching unit*
- *Probe set with aluminium or plastic housing featuring 1 1/2" BSP process connection*
- *Probe-rods up to 3 m*



Compact level switch

- *1 or 2 channel switching unit in plastic housing with 1 1/2" BSP process connection*
- *Probe-rods up to 3 m*

APPLICATIONS

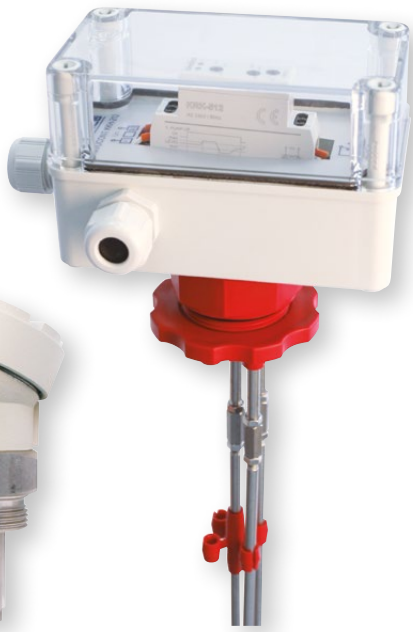
- *For conductive liquids with min 10 µS/cm conductivity*
- *For empting / filling control or level switch tasks*
- *Fail-safe indication and pump control*
- *Water inrush indicator*

KRK-512-5

KRK-522-□

KSH-3□□-0

KSH-2□□-0



KKH-2□2-5

TECHNICAL DATA

Probes	Single Probe			Multi Probe							Submersible
				Aluminium housing			Plastic housing				
	KSP-201	KSS-201	KSN-201	KSH-202	KSH-203	KSH-204	KSH-301	KSH-302	KSH-303	KSH-304	KSK-201
Number of probes	1			2+s*	3+s*	4+s*	1+s*	2+s*	3+s*	4+s*	1
Process connection	3/8" BSP			1 1/2" BSP							Cable mountable
Probe socket material	PP	carbon steel	1.4571	1.4571			PP				–
Housing	–			Aluminium cast			PBT				ABS
Probe material	1.4571										1.4401
Insulation of socket	PP	PFA					PP				–
Medium temperature	max. +80 °C	max. +200 °C					max. +80 °C				
Pressure max	max. 0.3 MPa (3 bar)	max. 1.6 MPa (16 bar)					max. 0.3 MPa (3 bar)				–
Electrical connection	With rubber cap			M20x1.5 cable gland, cable diameter: 6...12mm							Pg9 (1)
Ingress protection	IP20			IP65			IP67				IP68
Mass (without probe)	0.1 kg			0.4 kg			0.2 kg				0.05 kg

s = reference probe* (1) *Cable: Ø 4...7 mm*

LEVEL SWITCHES

Type	KRK-512-5	KRK-522-□	
Power supply (U_n)	24...240 V AC/DC	110 V AC, 230 V AC	24 V AC/DC
	–15 %...+10%		
Power consumption	max. 2.5 VA / W	max. 4.5 VA / W	
Ambient temperature	–20 °C...+55 °C		
Probe voltage	3.5 V AC	5 V AC	
Probe current	max. 0.2 mA AC	max. 1 mA AC	
Sensitivity	Adjustable: 5 kΩ...100 kΩ		
Cable capacitance	100 nF (100 kΩ sens.) 800 nF (5 kΩ sens.)	max. 4 nF	
Fixed on-delay (t_1)	1.5 sec	–	
On and off-delay	0.5...10 sec		
Relay output	1x SPDT 250 V 8A, AC1 24 V DC min. 500 mW	2x SPDT 250V 16A, AC1 24 V DC min. 500 mW	
Electrical connection	Terminal block, max. 2.5 mm² / with insulation 1.5 mm²		
Electrical protection	Class II.	Class II.	Class III.
Mechanical connection	EN 60715 rail		
Ingress protection	IP20		
Mass	72 g	240 g	

COMPACT LEVEL SWITCHES

Type	KKH-212-5	KKH-222-5
Power supply (U_n)	24 V...240 V AC/DC	
	–15 %...+10%	
Power consumption	max. 2.5 VA / W	max. 5 VA / W
Ambient temperature	–20 °C...+50 °C	
Medium temperature	max. +80 °C	
Medium pressure	1 bar	
Number of probe	2+s*	4+s*
Probe voltage	3.5 V AC	
Probe current	max. 0.2 mA	
Sensitivity	Adjustable: 5 kΩ...100 kΩ	
Fixed on-delay	1.5 sec	
On and off-delay	0.5...10 sec	
Relay output	1x SPDT 250 V 8A AC1 / DC 24V 8A	2x SPDT 250V 8A, AC1 / DC 24V 8A
Electrical connection	Cable gland: 2xM20x1,5 Ø 6...12 mm cables, Terminal block, max. 2.5 mm² / with insulation 1.5 mm²	
Electrical protection	Class II.	
Process connection	1 1/2" BSP	
Material of probe socket	PP	
Housing material	Polycarbonate	
Ingress protection	IP67	
Mass	660 g (without probe)	800 g (without probe)

s=reference probe*

KS□-201-0
Single probe socket

KSK-201-0
Submersible probe

KLN-2□□-0
Probe

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

KLP-204-0
Separator for KSH-200

NIVOCONT KS

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

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	1 1/2" NPT process connection

NIVOCONT KLN

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 PE coating

Use the order code extension below after the standard order code of the device:

Special version

X03	PE coated (up to 100°C); each started 0.5 m

Order example: KLN-210-0-X03

NIVOCONT KLP

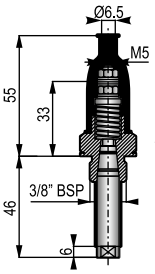
Separator

Type

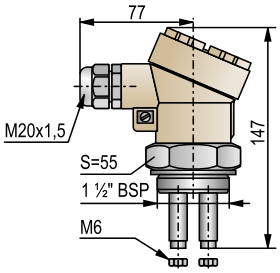
K L P – 2 0 4 – 0	For KSH-200
K L P – 2 0 1 – 0	For KSH-300 and KKH-200

NIVOCONT KSK

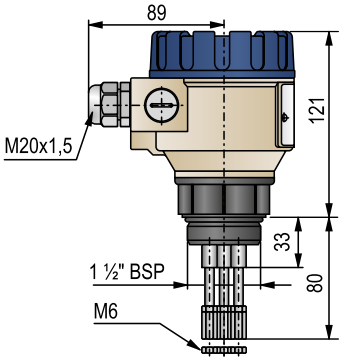
Submersible probe for conductive liquids
For connection to KR level control unit



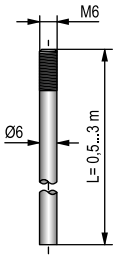
KS□-201



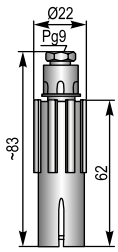
KSH-202



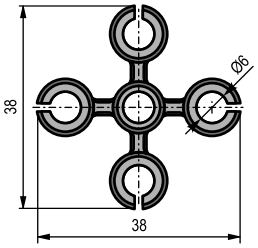
KSH-303



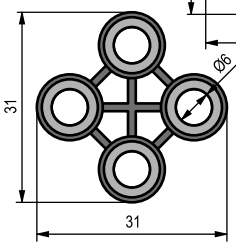
KLN-200



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

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

NIVOCONT KRK-522

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

Power supply

K R K – 5 2 2 – □

1	230 V AC
2	110 V AC
4	24 V AC/DC

NIVOCONT KKH

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

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

Length

K L N – 2 □□ – 0

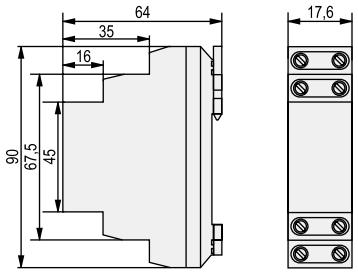
0 5	0.5 m
1 0	1.0 m
1 5	1.5 m
2 0	2.0 m
2 5	2.5 m
3 0	3.0 m

NIVOCONT KLP

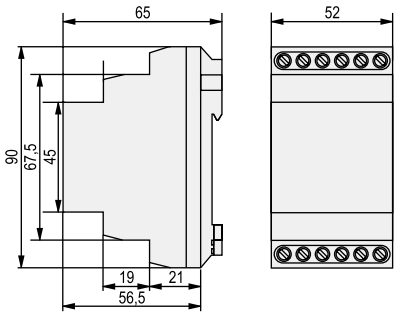
Separator

Type

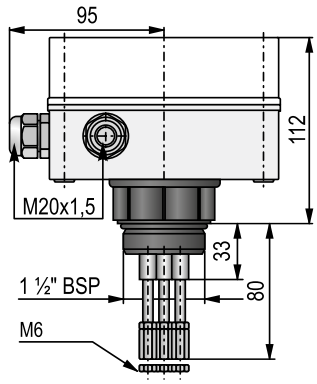
K L P – 2 0 1 – 0	For KSH-300 and KKH-200



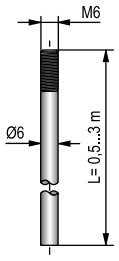
KRK-512-5



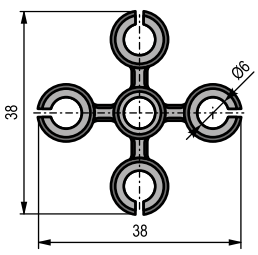
KRK-522-□



KKH-2□2-5



KLN-2□□-0



KLP-201-0

NIV24
KRK-512-5
KRK-522-1, KRK-522-2, KRK-522-4
KLN-205-0, KLN-210-0, KLN-215-0, KLN-220-0, KLN-230-0
KLP-201-0
KKH-212-5, KKH-222-5

GENERAL DESCRIPTION

NIVOMAG MK-200 series magnetic float level switches are used for point level detection and level control of liquids in all types of vessels. Operation principle: the permanent magnet of the float activates the output microswitch by a non-contact coupling system.
The great variety of both the top and side mounted versions makes it easy to install the switch in any tank at any location. For the simplest level switching you can select models with fixed hysteresis, while for level control application we offer NIVOMAG switches with adjustable hysteresis. Models with rubber or silicon sleeves can be applied for contaminated liquids. You can fit the NIVOMAG switch with an **MMK** type tester, to check the switching function even when the liquid levels aren't changing.

MAIN FEATURES

- *Magnetic coupling between the switch and the float*
- *Operation w/o external power supply*
- *Side or top mounted versions*
- *Underwater version*
- *Fixed or variable hysteresis*
- *Max. 250°C medium temperature*
- *Flame-proof version*
- *IP65 / IP68 protection*

APPLICATIONS

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

CERTIFICATIONS

- *ATEX approved (Ex d e mb)*
- *IEC approved (Ex d e mb)*
- *SIL 1 Safety Integrity Level*
- *Germanischer Lloyd (GL)*
- *Det Norske Veritas (DNV)*
- *Bureau Veritas (BV)*

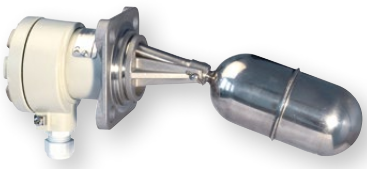
TYPE SELECTION

To assist in the selection of the correct model the following tables and diagrams are provided. When selecting a model due consideration must be given to liquid density, mounting position and process connection and to determine if there is a need for adjustable or fixed hysteresis or a rubber sleeve.

Minimum liquid density (kg/dm³)				
Arm length (mm) / Max. float Ø (mm)	0 – 100	200	300	1000-3000
52	0.7	0.8	0.85	–
64	0.7	0.8	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	■	■	■
Rubber protection sleeve	■		
Flanged process connection	■	■	■ (2)
Threaded process connection	■		
Ex version	■	■	■
Tester	■	■ (3)	

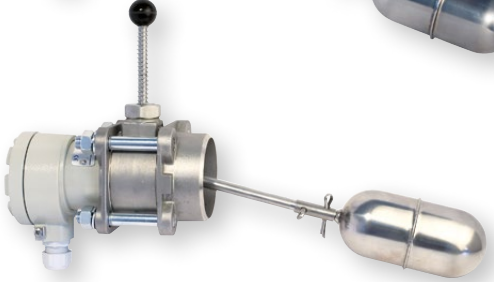
(1) *with "L" arm*
(2) *only with 92x92 flange*
(3) *only without counterflange*



MKA-210-□

MKG-210-□

MKA-220-□



MKA-210-□ + MMK-1□0 tester + MFF-1□1 counterflange

MKA-230-□

TECHNICAL DATA

Type		Cylindrical float (side and top mounting)				Ball float (top mounting)
		MKA-21 MKU-21	MKA-22 MKU-22	MKG-21 MKV-21	MKS-21 MKZ-21	MKA-23
Nominal pressure		2.5 MPa (25 bar) [MKU, MKV, MKZ: 0.2/2.5 MPa (2 bar/25 bar)]				2.5 MPa (25 bar)
Medium temperature		see: Temperature diagram		MKG: 0 °C ... 100 °C MKV / MKZ: 0 °C ... 80 °C	MKS: 0 °C ... 200 °C	see: Temperature diagram
		Ex version: see Temperature specification table				
Ambient temperature		–20°C...+80°C, Ex version: see temperature specification for Ex version table				
Liquid density		min. 0.7–0.85 kg/dm³, see: min. liquid density 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), and MKG: rubber (NBR), MKS: silicone				
Housing material		Paint coated aluminium				
Microswitch		1 micro-switch with 1 closing and 1 opening contact (NO and NC) (1)				
Switch rating	Standard	250V 10A AC12; 220V 0.6A DC13				
	Ex version	250V 2.5A AC12; 220V 0.3A DC13				
Electrical connection		M20x1.5 cable gland, terminal (MKU, MKV, MKZ: integrated cable NSSHöu-J 5x1.5 mm², Ø15 mm) (2)				
Ingress protection		IP65 (MKU, MKV, MKZ: IP68 up to 20 m underwater)				
Electrical protection		Class I.				
Safety integrity level		SIL1				
Ex marking	ATEX	See: www.nivelco.com				
	IEC Ex (3)					
Mass		≈ 1.8 – 3.5 kg				

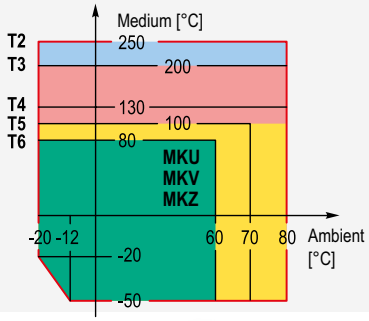
(1) *NO and NC terminals should be connected to equipotential circuits*
(2) *Cable length should be specified when ordered*
(3) *Need of IEC is to be specified with order*

ADDITIONAL DATA FOR Ex CERTIFIED MODELS

Temperature specification for Ex versions

Temperature classes					
Class	T6	T5	T4	T3	T2
Medium temperature range	–50°C... +80°C	–50°C... +95°C	–50°C... +130°C	–50°C... +200°C	–50°C... +250°C
Ambient temperature range	–20°C... +60°C	–20°C... +70°C	–20°C... +80°C	–20°C... +80°C	–20°C... +80°C

Temperature diagram:



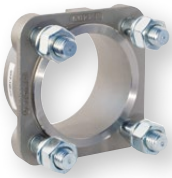

MKA-21□-□
with threaded process connection


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

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

Version

M K □ – 2 1 ■ – ■

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

Process connection

M K ■ – 2 1 □ – ■

0		Square flange
B	*	2" BSP
N	*	2" NPT
1	*	DIN DN 80 PN 40, steel
2	*	DIN DN 100 PN 40, steel
5	*	DIN DN 80 PN 40, stainless steel
6	*	DIN DN 100 PN 40, stainless steel

* Not available with protection sleeve

Protrusion / Arm length / Approval

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 (should be given in text of the order)
9		202 mm (189 mm for MKA-21B, 178 mm for MKA-21N) / Ex
5		321 / 100 mm / Ex
6		421 / 200 mm / Ex
7		521 / 300 mm / Ex
8	**	"L" or "Z" profile (should be given in text of the order) / Ex

Need of IEC is to be specified with order

NIVOMAG MK-22

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

Version

M K □ – 2 2 ■ – ■

A	Standard
U	Underwater (IP68) (cable length should be given in text of the order)

Process connection

M K ■ – 2 2 □ – ■

0	Square flange
1	DIN DN 80 PN 40, steel
2	DIN DN 100 PN 40, steel
5	DIN DN 80 PN 40, stainless steel
6	DIN DN 100 PN 40, stainless steel

Protrusion / Arm length / Approval

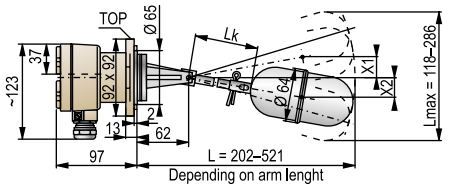
M K ■ – 2 2 ■ – □

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

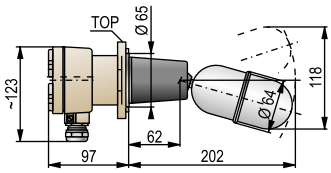
Need of IEC is to be specified with order

Cable for underwater version

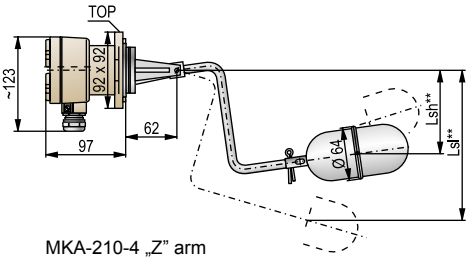
To be specified in the order; each started 1 m



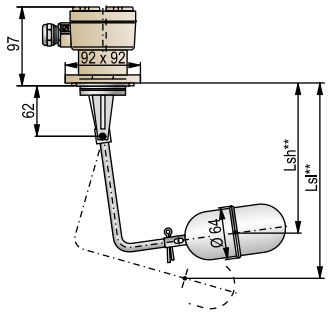
MKA-210-□



MKG-210-□

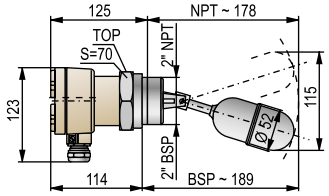


MKA-210-4 „Z" arm

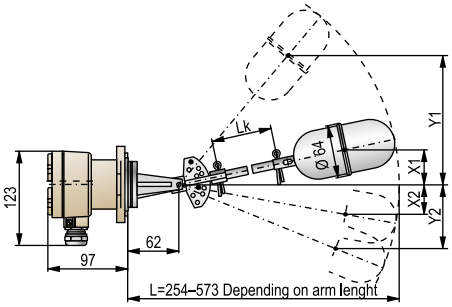


MKA-210-4 „L" arm

** *The type of the arm profile ("L" or "Z") and the upper (Lsh) or the lower (Lsl) switching point should be given in the text of the order*



MKA-21B / 21N



MKA-220-□

NIV24
MKA-210-0

NIVOMAG MK-23

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

Version

M K □ – 2 3 0 – ■

A	Standard

Process connection

M K A – 2 3 □ – ■

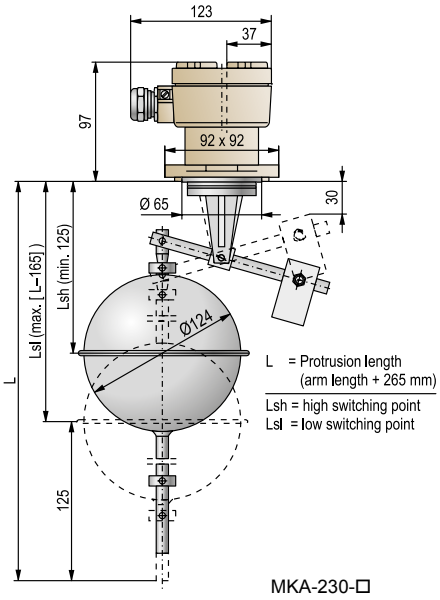
0	Square flange

Protrusion / Arm length / Approval

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
6	2265 mm / 2000 mm / Ex
7	3265 mm / 3000 mm / Ex

Need of IEC is to be specified with order



MKA-230-□

NIVOMAG MFF

Counter flange for MK magnetic level switch

Material

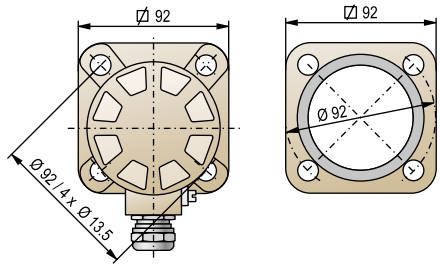
M F F – 1 □ ■ – 0

1	Steel (1.7218)
2	Stainless steel (1.4409)

Version

M F F – 1 ■ □ – 0

0	Standard
1	For units with MMK-100 tester

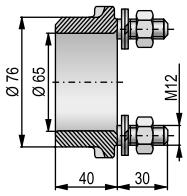


NIVOMAG MMK

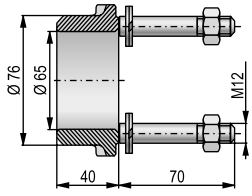
Tester for MK magnetic level switch

Type

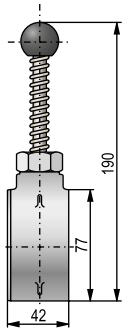
M M K – 1 1 0 – 0	Steel
M M K – 1 2 0 – 0	Stainless steel



MFF-110



MFF-111



MMK-110

GENERAL DESCRIPTION

The **NIVOPOINT** magnetic float level switches are suitable for single, or multipoint level controlling tasks in non-hazardous or hazardous areas. The device consists of a probe tube, a float incorporating a magnet and a housing containing the connection terminals. A maximum of 5 switches can be incorporated in the probe. A sliding sleeve on the top of the probe provides for a simultaneous ±25 mm adjustment possibility of the positioning of the switches. The wetted parts of the level switch are made of stainless steel. The plastic coated versions are suitable for level detecting of aggressive liquids, and the ATEX certified versions are applicable for level switching of explosive materials. Floats and process connections can be selected according to the measured medium and the application.
The mini type **NIVOPOINT** magnetic float level switches are suitable for maximum level indication in small tanks. The small size and easy mounting of the switch allows maximum level detection in appliances or tanks using process connections made for different other purposes.

MAIN FEATURES

- *Level switching without auxiliary power*
- *Maximum 5 switching points*
- *Stainless steel and*
- *Plastic coated versions*
- *150 °C medium temperature*
- *Mini version*
- *Wide variety of floats*
- *Ex version*
- *IP65 / IP68 protection*

APPLICATIONS

- *Multipoint level switching*
- *For controlling pumps, valves*
- *Level detection of aggressive liquids*
- *Level switching of explosive liquids*

CERTIFICATIONS

- *ATEX approved (Ex d)*
- *Bureau Veritas (BV) (only for MZ□ types)*

MZS-100
Mini type

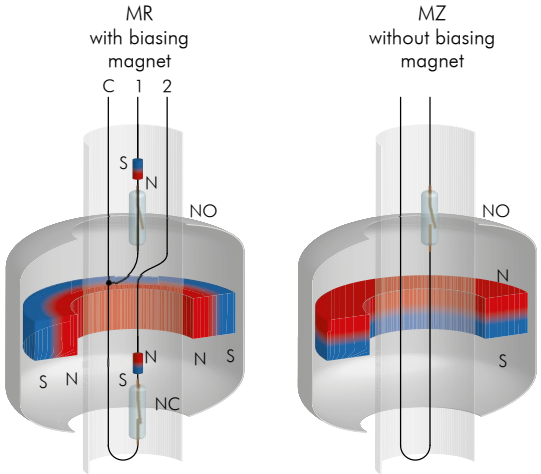
MP□-100
Plastic coated version

MZC-300

MR□-100
Standard version

TEMPERATURE DATA FOR Ex VERSIONS

Class	T6	T5	T4	T3
Max. ambient temp. from –40 °C	+80 °C	+95 °C	+85 °C	+70 °C
Max. medium temp. from –40 °C	+85 °C	+100 °C	+130 °C	+150 °C



OPERATION

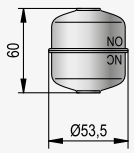
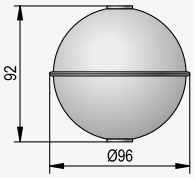
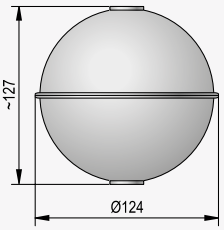
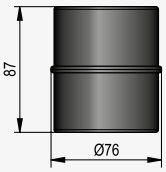
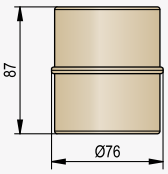
NIVOPOINT magnetic float level switches work on the basis of the interaction of the built-in magnet in the float and the reed switches in the probe. The float of **NIVOPOINT** level switch devices moves alongside the probe tube tracking the level of the measured liquid and activating the reed switches. When the float moves ahead the reed switches, it changes the default state (NO or NC) of the reed switches, which stay in self-holding state with the help of opposite polarized magnets next to the reed switches. When the liquid level decreases, the float moves ahead the reed switches again, breaks off the self-holding state and restores the previous state of the reed switches. The mini type **NIVOPOINT** level switches do not contain biasing magnets. By tracking the level, the magnetic float activates the reed switch in the probe. The reed switch opens or closes according to the position of the magnetic float. The default state is meant with bottom positioned float, the normally opened or closed state of the reed switch can be changed by the inversion of the float.

TECHNICAL DATA

Type	Standard	Plastic coated	Explosion-proof	Mini type
Insertion length	0.25 m ... 3 m			0.1 m ... 0.5 m
Material of wetted parts	1.4404 float / 1.4571	PVDF or PP float / PFA coated probe tube	1.4404 float / 1.4571	
Max. process pressure	2.5 MPa (25 bar)	0.3 MPa (3 bar)	2.5 MPa (25 bar)	
Min. medium density	0.55 / 0.8 kg/dm³	0.4 / 0.7 kg/dm³	0.8 kg/dm³	
Float sizes	see: float selection table			
Medium temperature	-40 °C...+150 °C	-40 °C...+80 °C	see: temperature data for Ex versions table	-40 °C ... +120 °C
Ambient temperature	-40 °C...+100 °C			-20 °C ... +70 °C
Output	1...5 pcs reed-switches, one connecting point of each is common, NO/NC			1...3 pcs reed-switches, NO or NC depending on float orientation
Switching rate	120 W / VA, 250 V AC/DC, 3 A reed relay, summary max. 9 A			120 W/VA 250 V AC/DC max. 3 A
Switching point	see: auxiliary table of order codes			40 mm ±3 mm from the bottom of the protection tube
Switching differential	< 10 mm			≈ 10 mm
Distance between reed-switches	minimum 110 mm			minimum 90 mm
Electrical connection	M 20x1.5 cable gland, cable outer diameter: 6...12 mm		M 20x1.5 cable gland, cable outer diameter: 9.5... 10 mm	0.5 m long[1], 2 x 0.75 mm² cable with silicon insulation (outer diameter: 5 mm)
	terminal, 0.5 ... 2.5 mm² wire cross section			
Process connection	as per order code			
Sealing	Klingerit	–	Klingerit	
Electrical protection	Class I.			Class II.
Ingress protection	IP65			IP68 (20 m)
Certification	–		See: www.nivelco.com	Bureau Veritas
Dimension of the housing	116 x 80 x 65 mm		124 x 80 x 65 mm	–
Mass	0.4 kg + 0.3 kg/m		0.45 kg + 0.3 kg/m	0.15 kg + cable: 0.05 kg/m

[1] *available to order with different cable length*

FLOAT SELECTION

Type	MRC-105-7M-600-00[1] / MZS-101-3M-700-00[2] / MRC-105-7M-900-00[3]		MRC-105-7M-700-00	MRC-105-7M-800-00	MPP-105-3M-200-00[1]	MPP-105-3M-900-00
Dimensions						
Standard type	■		■	■		
Plastic co. type					■ [2]	■
Ex type	■		■	■		
Mini type	■					
Medium density (min.)	0.55 kg/dm³	0.8 kg/dm³	0.55 kg/dm³	0.4 kg/dm³	0.7 kg/dm³	0.4 kg/dm³
Material	Titan	1.4404	1.4435	1.4401	PVDF	PP
Med. pressure	2.5 MPa (25 bar)				0.6 MPa (6 bar)	0.3 MPa (3 bar)

[2] *Mini type* [1] *Standard float* [3] *Titan float*

NIVOPOINT MR

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 IP65 aluminium housing

Process connection

M R □ – ■ ■ ■ – ■

A	1" BSP
C	2" BSP
D	1" NPT
G	2" NPT

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; each started 0.1 m
o o	0.6-3 m; each started 0.1 m

nn = 03-05 : 0.3-0.5 m
oo = 06-30 : 0.6-3 m

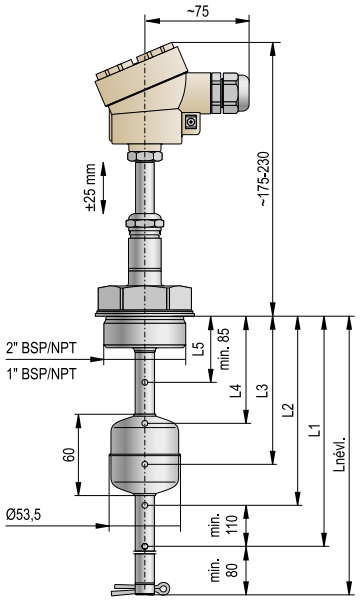
Approval

M R ■ – ■ ■ ■ – □

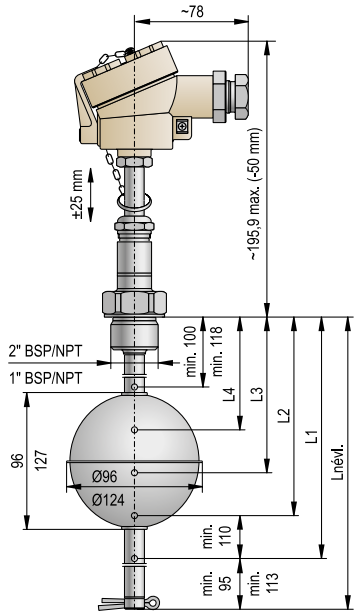
3	For non-hazardous area
7	Ex d

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

Ø 96 mm ball float (for min. 0.55 kg/dm³ liquids)
Ø 124 mm (for min. 0.4 kg/dm³ liquids)
Ø 53.5 mm titan float (min. 0.55 kg/dm³)
Only devices with 2" process connection and Ø 53.5 mm float can be installed without removing the float.



MR□-□00-3



MR□-□00-7 Ex

Specification is required 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 MP

Magnetic tracking float level switch with up to 5 switch points. Output: NO or NC
with plastic coated probe and plastic float and IP65 aluminium housing

Process connection

M P □ – ■ ■ ■ – 3

P	DIN DN 80, PN16
R	DIN DN 100, 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; each started 0.1 m

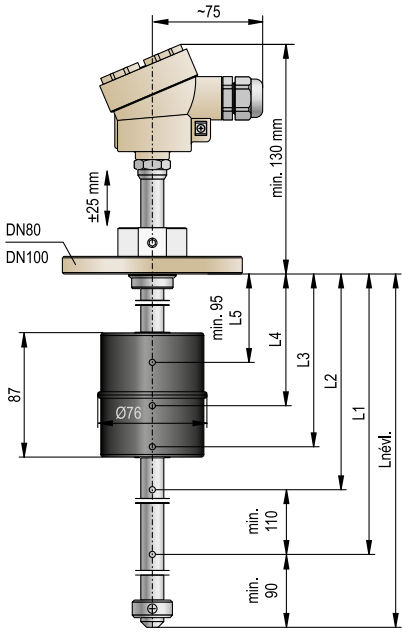
nn = 06-30 : 0.6-3 m

Float / Material

M P ■ – ■ ■ ■ – □

3	Ø 76x87 / PVDF or PP

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



MP□-□00-3

Specification is required 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 MZC

Magnetic float switch with up to 3 switch 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

Number of switching points / Number of floats

M Z ■ – □ ■ ■ – 3

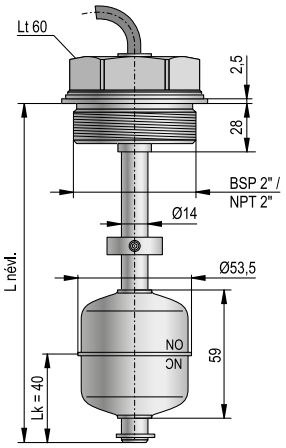
1	1 switch / 1 float
2	2 switches / 2 floats
3	3 switches / 3 floats

Probe length

M Z ■ – ■ □ □ – 3

n n	0.1-1.5 m; each started 0.1 m

nn = 1-15



MZC-1□□-3

NIVOPOINT MZS

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

Number of switching points / Number of floats

M Z S – □ 0 ■ – 3

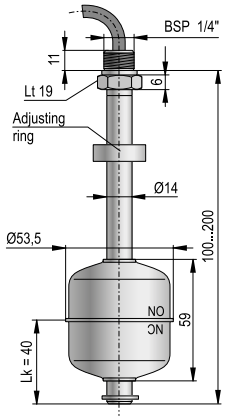
1	1 switches / 1 floats
2	2 switches / 2 floats
3	3 switches / 3 floats

Probe length

M Z S – ■ 0 □ – 3

n	0.1-0.5 m; each started 0.1 m

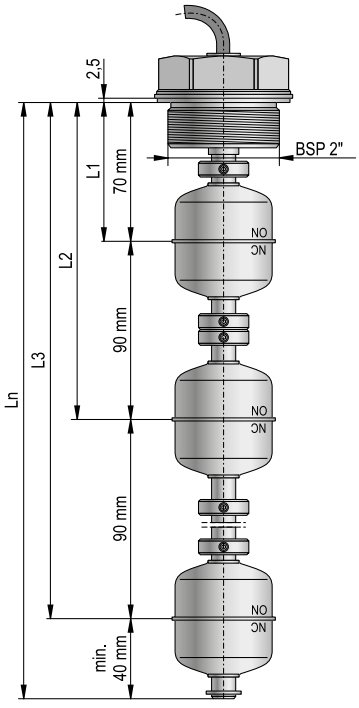
n = 1-5



MZS-1□□-3

Cable for MZC and MZS types

Each started 1 m over the standard 0.5 m



MZC-3□□-3

Specification is required in the order:

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

[1] *L1 ≥ 70 mm, Ln = insertion length*
[2] *Ln–L3 ≥ 40 mm*
[3] *Min. distance of the switching points: 90 mm*
[4] *Default operation mode can be selected with the rotation of the float according to the reading direction (NO/NC)*

NIV24
MZS-101-3

GENERAL DESCRIPTION

NIVOSWITCH vibrating fork level switches are suitable for level detection of liquids or granular, powdered solids. Units with parallel vibrating fork are suitable for liquids, units with non parallel vibrating fork are suitable for solids. Mounted on pipes, silos, tanks or hopper bins 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 or stops. The fork will start vibrating 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. **NIVOSWITCH** vibrating forks are able to solve switching tasks of high-current loads with the help of **UNICONT PKK** switching amplifiers. **UNICONT PKK-312-8 Ex** is a recommended intrinsically safe switching unit designed for Ex rated vibrating forks.

MAIN FEATURES

- *Compact and mini compact type*
- *Rod extension up to 3 meters*
- *Plastic 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*
- *Medium temperature max. 130°C*
- *Output test with optional test magnet*
- *Ex version*
- *IP67, IP65/IP68 protection*

APPLICATIONS

- *For liquids: min. 0.7 kg/dm^3 density and max. 10^4 mm^2/s viscosity, for solids: min. 0.01 kg/dm^3 density*
- *Level switch of liquids, powders, granules*
- *Food & beverages industry, animal feed, chemical industry, oil industry*
- *For normal or hazardous, aggressive (acids, solvents) liquids*
- *For free-flowing, powdered solids, granules*
- *Covers a large variety of level detection, applications such as high/low fail safe limit switch, overfill or dry run protection, pump controls*

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex d)*
- *ATEX approved (Dust Ex)*
- *IEC approved (Ex d)*
- *Germanischer Lloyd (only for RF-400 compact types for liquids)*
- *FM*
- *CSA*

TYPE SELECTION

Type selection is aided by this table for choosing the proper version to a given level switching task. Most essential aspect is the consistency (liquid or solid) of the measurement medium.

Application		Liquids		Solids	
Features		 Mini compact	 Compact	 Mini compact	 Compact
Metal housing		■	■	■	■
Plastic housing			■		■
Extension		■	■	■	■
Highly polished version		■	■		
Plastic coated fork		■	■		
1" process connection		■	■		
1 ½" process connection				■	■
Relay output			■		■
Electronic output		■		■	
Electronic connection	Terminal		■		■
	DIN connector	■		■	
	M12 connector	■			
	Cable	■		■	
Intrinsically safe version		■			
Flameproof enclosure			■		
Dust Ex version					■
Germanischer Lloyd			■		
Function setting (low-high level)		■ [1]	■	■ [1]	■
Function indication		■	■	■	■
Density selection				■	■
Output test magnet		■		■	

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


RPS-101-0
test magnet


PKK-312-8 Ex
Ex ia power supply
for Ex ia type vibrating forks


RFM-500


RNM-401


RAM-403


RCM-400
cable
version


RCM-400
with M12
connector


RCM-400
with DIN
connector


RRH-300


RLH-300

TECHNICAL DATA

Type	Mini compact		Compact	
	For liquids	For solids	For liquids	For solids
Insertion length	69-3000 mm	137-3000 mm	69-3000 mm	137-3000 mm
Material of wetted parts	1.4571 or PFA coating	1.4571 stainless steel	1.4571 or PFA coating	1.4571 stainless steel
Process connection	As per order code			
Medium temperature	– 40°C … +130°C (see: temperature diagrams), for PFA coated types: -40 °C … +120 °C			
Ambient temperature	– 40°C … +70°C (see: temperature diagrams) with M12 connector: – 25 °C … +70 °C		– 30°C … +70°C	– 40°C … +70°C
Medium pressure	max. 4 MPa (40bar) (see: pressure diagrams)			
Medium density	> 0.7 kg/dm³	≥ 0.01 kg/dm³	> 0.7 kg/dm³	≥ 0.01 kg/dm³
Medium viscosity	≤ 10000 mm²/s (cSt)	–	≤ 10000 mm²/s (cSt)	–
Power supply	2-wire DC: 15-29 V DC 2-wire AC: 20-255 V AC;	2-wire DC: 15-27 V DC 3-wire DC: 12-55 V DC	20-255V AC, 20-60V DC	
Power consumption	AC: depending on load; DC: < 0.6 W		AC: 1.2-17 VA; DC: < 3 W	
Housing material	1.4571 stainless steel		Paint coated aluminium or plastic (PBT)	
Electrical connection	Connector, or 3 m integrated cable [1] 2x0.5 mm² / 4x0.75 mm² /5x0.5 mm²		2xM20x1.5 cable gland, for Ø 6-12 mm cable, terminal for 0.5 – 1.5 mm² wire cross section	
Electrical protection	AC version: Class I.; DC version: Class III.		Class I.	
Ingress protection	DIN connector type: IP65, M12 con. type: IP67, cable type: IP68		IP67	
Mass	≈ 0.5 kg + 1.2 kg/m extension		≈ 1.3 kg + 1.2 kg/m extension	

[1] available cable length: max. 30 m

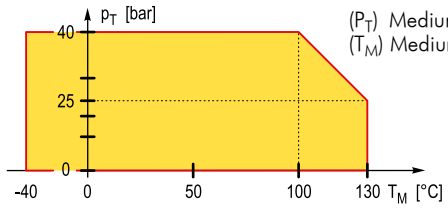
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	NIVOSWITCH liquids		NIVOSWITCH solids
	Mini compact type with 2-wire DC output [2]	Compact type with metal housing	
Protection type	Intrinsically safe	Flameproof enclosure	Dust Ex
Ex marking	ATEX	ATEX & IEC Ex FM & CSA	ATEX
	see: www.nivelco.com		
Medium temperature	See: Temperature data tables		–40 °C … +130 °C
Ambient temperature			–40 °C … +70 °C
Electrical connection	Connector or max. 3 m integrated cable	2 pcs. metal M20x1.5 cable glands for Ø 8 … 13 mm cable	

[2] Intrinsically safe vibrating forks should be powered by [Ex ia] certified and approved devices, for example by UNICONT PKK-8 Ex

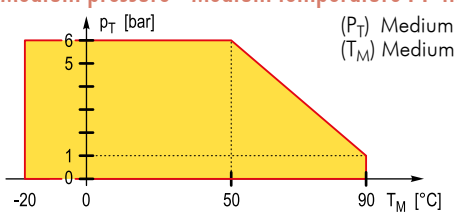
TEMPERATURE DATA

Medium pressure - Medium temperature



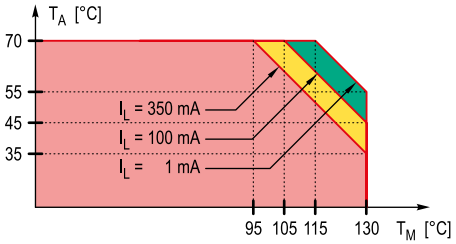
(P_T) Medium pressure
(T_M) Medium temperature

Medium pressure - Medium temperature PP flange version



(P_T) Medium pressure
(T_M) Medium temperature

Temperature classes		T6	T5	T4	
Mini compact type for liquids (Ex ia)					
Max. ambient temperature		+70°C	+60°C	+60°C	
Min. ambient temperature	with DIN connector or integrated cable	–40°C			
	with M12 connector	–25°C			
Max. medium temperature		+70°C	+75°C	+95°C	+130°C
Compact types with flameproof enclosure (Ex d)					
Medium temperature min.: -40 °C; Max:		+70 °C	+80 °C	+95 °C	+130 °C
Ambient temperature min.: -40 °C; Max:		+65 °C	+50 °C	+65 °C	+70 °C
Max. surface temperature of the process connection		+70 °C	+80 °C	+95 °C	+125 °C
Max. surface temperature		+75 °C	+80 °C	+95 °C	+130 °C



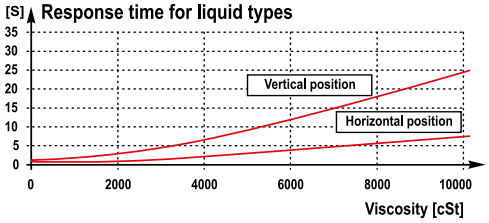
Mini – Compact version

Temperature limits:
(T_A) Ambient temperature
(T_M) Medium temperature
(I_L) Load current of DC versions

OUTPUT DATA

Compact type				
Output		For liquids	For solids	
Relay		1 or 2 pcs (SPDT) relays 250 V AC, 8 A, AC1 / 250 V AC, 6 A, AC1		
Response time	when immersed	≤ 0.5 sec		
	when free	≤ 1sec [1]	≤ 1 sec – H density	3 sec – L density

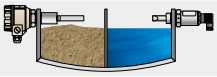
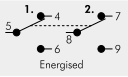
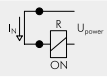
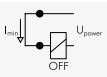
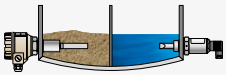
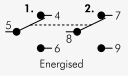
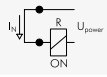
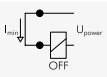
RESPONSE TIME DIAGRAM

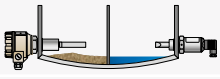


Mini compact type					
Type	Output		For liquids	For solids	
2-wire DC	DC current change		when immersed: 14 mA ± 1 mA		
			when free: 9 mA ± 1 mA		
2-wire AC	AC output for serial connection		voltage drop (in switched-on state): < 10.5 V		
			residual current (in switched-off state): < 6 mA		
	Current load	max. continuous	350 mA, AC 13	350 mA, AC 13; Ex version: 140 mA	
		min. continuous	10 mA / 255 V; 25 mA / 24 V		
		max. impulse	1.5 A / 40 msec		
3-wire DC	Transistor switch		NPN or PNP output can be realized with appropriate wiring		
	Voltage drop (in switched-on state)		< 4.5 V	< 1.8 V	
	Current load (max. continuous)		350 mA / Umax=55 V	350 mA / Umax=55 V (Ex version: 200 mA)	
	Residual current (in switched-off state)		< 100 μA	< 10 μA	
	Response time	when immersed	0.5 sec		
		when free	< 1sec [1]	≤ 1 sec – H density	< 3 sec – L density

[1] see: viscosity diagram

OPERATION

Compact and Mini compact type						
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 or 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] Can be done with appropriate wiring in case of mini compact type with integrated cable

OPERATION MODE SWITCHES

Compact	
Fail-Safe	
high	Fail-safe alarm is indicated with de-energised relay or open state of the output
low	

Compact	
Density	
high	Medium density ≥ 0.5 kg/dm³
low	Medium density < 0.5 kg/dm³

NIVOSWITCH RF/RD/RJ-400/500 with short or standard probe

Compact vibrating fork level switch for liquids
Short probe length: 69 mm, standard probe length: 125 mm

Type

R ■■ – ■□□ – ■

0 0	Short probe: 69 mm
0 1	Standard probe: 125 mm

Fork material

R □■ – ■■■ – ■

F		Stainless steel with tumble polishing
D	6 WEEKS!	PFA coated stainless steel (only 1" BSP or flange process connection)
J	6 WEEKS!	Highly polished stainless steel

Process connection

R ■□ – ■■■ – ■

M	1" BSP
P	1" NPT
T	1 1/2" Triclamp (ISO2852)
R	2" Triclamp (ISO2852)
D	DN 40 Pipe coupling (DIN 11851)
E	DN 50 Pipe coupling (DIN 11851)
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PFA coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; from -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

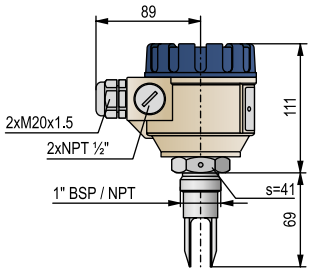
R ■■ – □■■ – ■

4	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced

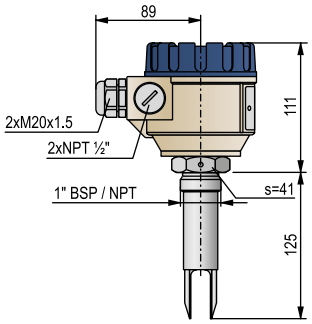
Output

R ■■ – ■■■ – □

0	1 SPDT relay, 250 V AC, 8 A
A	2 SPDT relay, 1 x 250 V AC, 8 A and 1 x 250 V AC, 6 A



RFM / RFP-400 / 500



RFM / RFP-401 / 501

NIVOSWITCH RF/RD/RJ-400/500 with rod extended probe

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

Fork material

R □■ – ■■■ – ■

F		Stainless steel with tumble polishing
D	6 WEEKS!	PFA coated stainless steel (only 1" BSP or flange process connection)
J	6 WEEKS!	Highly polished stainless steel

Process connection

R ■□ – ■■■ – ■

M	1" BSP
P	1" NPT
T	1 1/2" Triclamp (ISO2852)
R	2" Triclamp (ISO2852)
D	DN 40 Pipe coupling (DIN 11851)
E	DN 50 Pipe coupling (DIN 11851)
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PFA coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; from -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R ■■ – □■■ – ■

4	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced

Probe length

R ■■ – ■□□ – ■

For standard polished forks (RF)	
0 2	0.2 m
n n	0.3-3 m; each started 0.1 m
For highly polished forks (RJ)	
0 2	0.2 m
n n	0.3-3 m; each started 0.1 m
For PFA coated stainless steel forks (RD)	
0 2	0.2 m
n n	0.3-3 m; each started 0.1 m

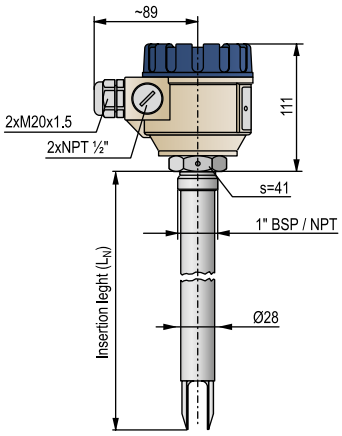
nn = 03-30 : 0.3-3 m

Output

R ■■ – ■■■ – □

0	1 SPDT relay, 250 V AC, 8 A
A	2 SPDT relay, 1 x 250 V AC, 8 A and 1 x 250 V AC, 6 A

Non-standard probe lengths available on request



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

NIVOSWITCH RN/RM-400 with standard or rod extended probe

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

Fork material / Approval

R □ ■ – 4 ■ ■ – ■

N	Stainless steel with tumble polishing / Ex d
M	Highly polished stainless steel / Ex d

Process connection

R ■ □ – 4 ■ ■ – ■

M	1" BSP
P	1" NPT
H	1 1/2" BSP
N	1 1/2" NPT
C	2" BSP
L	2" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A

Housing

R ■ ■ – □ ■ ■ – ■

4	Aluminium (paint coated)

Probe length

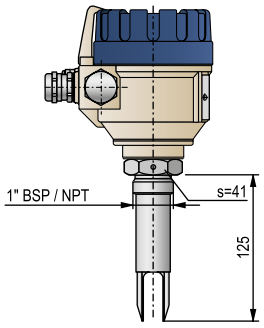
R ■ ■ – 4 □ □ – ■

For standard polished forks (RN)	
0 1	Standard probe: 125 mm
n n	0.2-3 m; each started 0.1 m
For highly polished forks (RM)	
0 1	Standard probe: 125 mm
n n	0.2-3 m; each started 0.1 m
nn = 02-30 : 0.2-3 m	

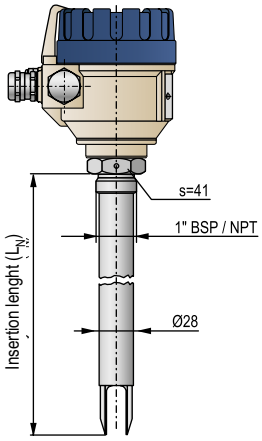
Output

R ■ ■ – 4 ■ ■ – □

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



RNM / RNP-401



RNM / RNP-402 – 430

NIVOSWITCH RC/RG/RA/RE-400 with short or standard probe

Mini compact vibrating fork level switch for liquids
Short probe length: 69 mm, standard probe length: 125 mm

Type

R ■■ – 4 □□ – ■

0 0	Short probe: 69 mm
0 1	Standard probe: 125 mm

Fork material

R □■ – 4 ■■ – ■

C		Stainless steel with tumble polishing
G	6 WEEKS!	Highly polished stainless steel
A	6 WEEKS!	PFA coated stainless steel fork (only 1" BSP or flange process connection)
E		Without function test reed

Process connection

R ■□ – 4 ■■ – ■

M	1" BSP
P	1" NPT
T	1 1/2" Triclamp (ISO2852)
R	2" Triclamp (ISO2852)
D	DN 40 Pipe coupling (DIN 11851)
E	DN 50 Pipe coupling (DIN 11851)
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PFA coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C), drilled like DIN PN16 / ANSI 150 psi	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

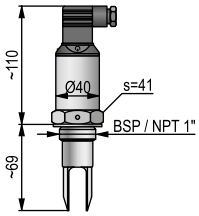
Output / Approval

R ■■ – 4 ■■ – □

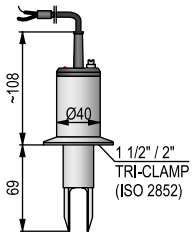
1	2-wire AC, DIN connector
2	2-wire AC, cable
3	3-wire DC, DIN connector
4	3-wire DC, cable
6	2-wire DC, DIN connector
7	2-wire DC, cable
8	2-wire DC, DIN connector / Ex ia
9	2-wire DC, cable / Ex ia
K	2-wire DC, M12 connector
L	2-wire DC, M12 connector / Ex ia
M	3-wire DC, M12 connector

Cable

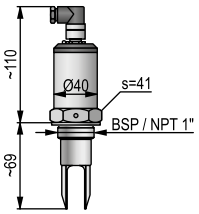
Maximum length 30 m; each started 1 m over the standard 3 m
R_ _-4_ _-9 Ex version comes with 3 m cable only



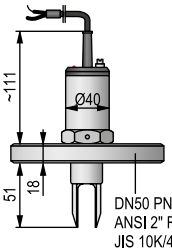
RCM / RCP-400



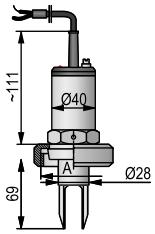
RCT / RCR-400



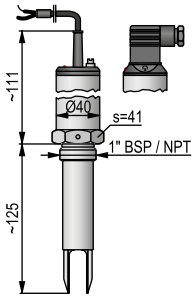
RCM / RCP-400



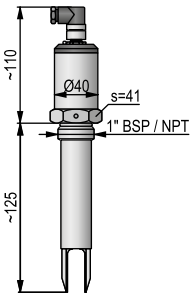
RCG-400



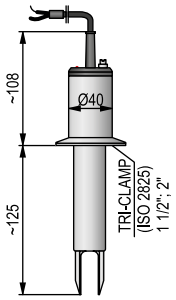
RCD-400



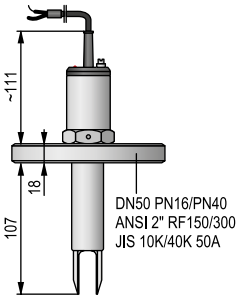
RCM / RCP-401



RCM / RCP-401



RCT / RCR-401



RCG / RCF-401

Type	RCD	RCE
Nominal size	DN 40	DN 50
A	RD 65x1/6	RD 78x1/6

NIV24
RCM-400-3
RCM-401-3

NIVOSWITCH RC/RG/RA/RE-400 with rod extended probe

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

Fork material

R □ ■ – 4 ■ ■ – ■

C		Stainless steel with tumble polishing
G	6 WEEKS!	Highly polished stainless steel
A	6 WEEKS!	PFA coated stainless steel fork (only 1" BSP or flange process connection)
E		Without function test reed

Process connection

R ■ □ – 4 ■ ■ – ■

M	1" BSP
P	1" NPT
T	1 1/2" Triclamp (ISO2852)
R	2" Triclamp (ISO2852)
D	DN 40 Pipe coupling (DIN 11851)
E	DN 50 Pipe coupling (DIN 11851)
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PFA coated stainless steel flange Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C), drilled like DIN PN16 / ANSI 150 psi	
F	DN 50 PN 16
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; each started 0.1 m
For highly polished forks (RG)	
0 2	0.2 m
n n	0.3-3 m; each started 0.1 m
For PFA coated stainless steel forks (RA)	
0 2	0.2 m
n n	0.3-3 m; each started 0.1 m

nn = 03-30 : 0.3-3 m

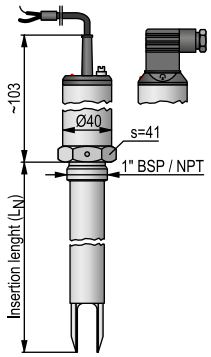
Output / Approval

R ■ ■ – 4 ■ ■ – □

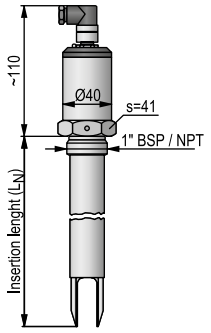
1	2-wire AC, DIN connector
2	2-wire AC, cable
3	3-wire DC, DIN connector
4	3-wire DC, cable
6	2-wire DC, DIN connector
7	2-wire DC, cable
8	2-wire DC, DIN connector / Ex ia
9	2-wire DC, cable / Ex ia
K	2-wire DC, M12 connector
L	2-wire DC, M12 connector / Ex ia
M	3-wire DC, M12 connector

Cable

Maximum length 30 m; each started 1 m 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 RF-200/RF-300 with standard probe

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
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R F ■ – □ ■ ■ – ■

2	Plastic, PBT, glass fibre reinforced (Ex version not available)
3	Aluminium (paint coated)

Probe length

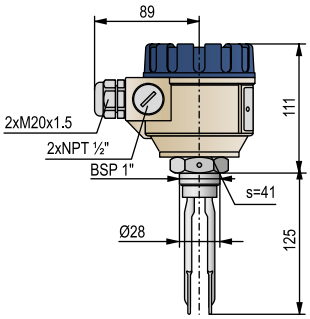
R F ■ – ■ □ □ – ■

0 1	125 mm

Output / Approval

R F ■ – ■ ■ ■ – □

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



RFM / RFP-201 / 301

NIVOSWITCH RF-200/RF-300 with rod extended probe

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

Process connection

R F □ – ■ ■ ■ – ■

M	1" BSP
P	1" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R F ■ – □ ■ ■ – ■

2	Plastic, PBT, glass fibre reinforced (Ex version not available)
3	Aluminium (paint coated)

Probe length

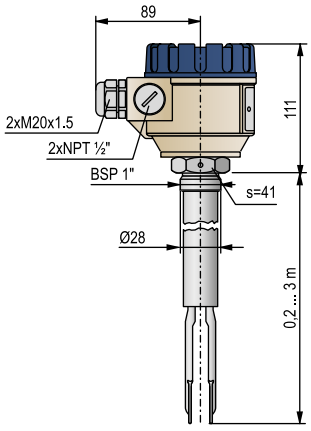
R F ■ – ■ □ □ – ■

0 2	0.2 m
n n	0.3-3 m; each started 0.1 m
nn = 03-30 : 0.3-3 m	

Output / Approval

R F ■ – ■ ■ ■ – □

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



RFM / RFP-202 – 230
RFM / RFP-302 – 330

NIVOSWITCH RC-300 with standard probe

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
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600 / 300 psi
K	JIS 40K 50A
PP flanges (max.: 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

R C ■ – 3 □ □ – ■

0 1	125 mm

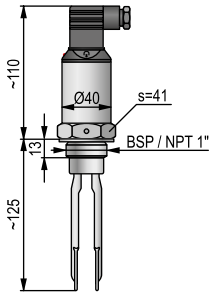
Output / Approval

R C ■ – 3 ■ ■ – □

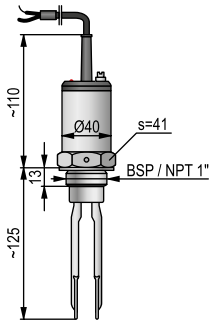
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable

Maximum length 30 m; each started 1 m over the standard 3 m



RCM / RCP-301



RCM / RCP-301

NIVOSWITCH RC-300 with rod extended probe

Mini compact vibrating fork level switch for light free flowing solids
with stainless steel rod extended probe up to 3 m

Process connection

R C □ – 3 ■ ■ – ■

M	1" BSP
P	1" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600 / 300 psi
K	JIS 40K 50A
PP flanges (max.: 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
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; each started 0.1 m
nn = 03-30 : 0.3-3 m	

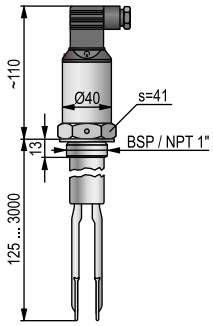
Output / Approval

R C ■ – 3 ■ ■ – □

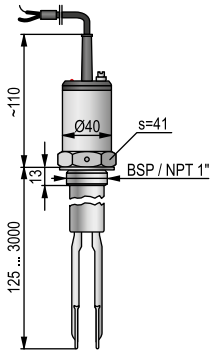
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable

Maximum length 30 m; each started 1 m over the standard 3 m



RCM / RCP-302 – 330



RCM / RCP-302 – 330

NIVOSWITCH RR-200/300 with short or standard probe

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	1 1/2" BSP
N	1 1/2" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16,5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600 / 300 psi
K	JIS 40K 50A
PP flanges (maximum 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

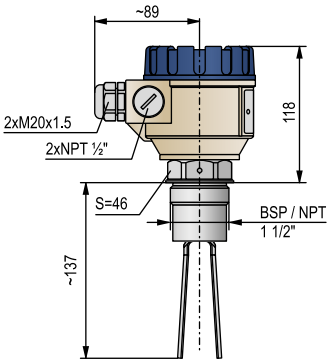
R R ■ – □■■ – ■

2	Plastic, PBT, glass fibre reinforced (Ex version not available)
3	Aluminium (paint coated)

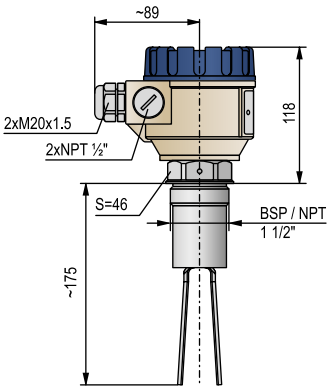
Output / Approval

R R ■ – ■■■ – □

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



RRH / RRN-201 / 301



RRH / RRN-202 / 302

NIVOSWITCH RR-200/RR-300 with rod extended probe

Compact vibrating fork level switch with welded fork for powders and granules
with stainless steel rod extended probe up to 3 m

Process connection

R R □ – ■ ■ ■ – ■

H	1 1/2" BSP
N	1 1/2" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16,5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (maximum 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Housing

R R ■ – □ ■ ■ – ■

2	Plastic, PBT, glass fibre reinforced (Ex version not available)
3	Aluminium (paint coated)

Probe length

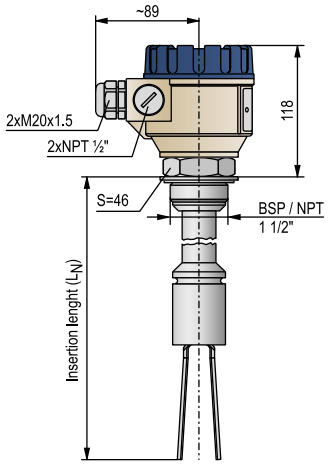
R R ■ – ■ □ □ – ■

0 3	0.3 m
n n	0.4-3 m; each started 0.1 m
nn = 04-30 : 0.4-3 m	

Output / Approval

R R ■ – ■ ■ ■ – □

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



RRH / RRN-203 – 230
RRH / RRN-303 – 330

NIVOSWITCH RL-300 with short probe or standard probe

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	1 1/2" BSP
N	1 1/2" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

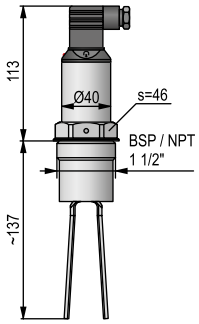
Output / Approval

R L ■ – 3 ■■ – □

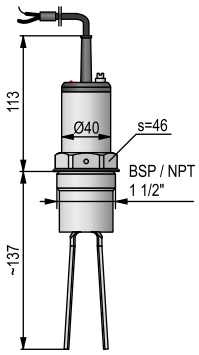
1	2-wire AC, DIN connector
2	2-wire AC, integrated cable
3	3-wire DC, DIN connector
4	3-wire DC, integrated cable
6	2 wire DC, DIN connector
7	2 wire DC, integrated cable

Cable

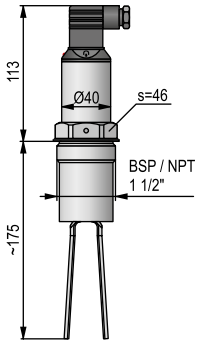
Maximum length 30 m; each started 1 m over the standard 3 m



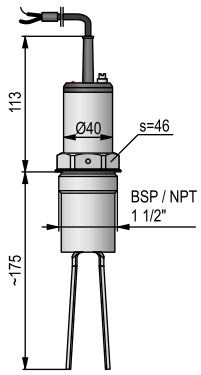
RLH / RLN-301



RLH / RLN-301



RLH / RLN-302



RLH / RLN-302

NIVOSWITCH RL-300 with rod extended probe

Mini compact vibrating fork level switch with welded fork for powders and granules with stainless steel rod extended probe up to 3 m

Process connection

R L □ – 3 ■ ■ – ■

H	1 1/2" BSP
N	1 1/2" NPT
Stainless steel flanges; not welded unless specifically ordered so Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN 50 PN 40/25
B	ANSI 2" RF 600/300 psi
K	JIS 40K 50A
PP flanges (max. 6 bar; -20°C to +90°C)	
F	DN 50 PN 16
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; each started 0.1 m
nn = 04-30 : 0.4-3 m	

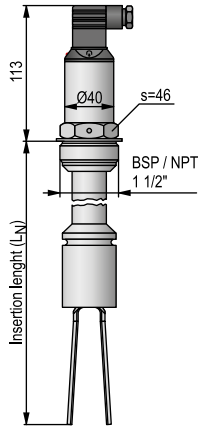
Output / Approval

R L ■ – 3 ■ ■ – □

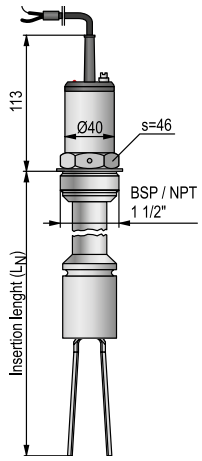
1	2-wire AC, DIN connector
2	2-wire AC, integrated cable
3	3-wire DC, DIN connector
4	3-wire DC, integrated cable
6	2 wire DC, DIN connector
7	2 wire DC, integrated cable

Cable

Maximum length 30 m; each started 1 m over the standard 3 m



RLH / RLN-303 – 330



RLH / RLN-303 – 330

UNICONT PKK-312-8 Ex

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 vibrating fork

UNICONT PK-300

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

NIVOSWITCH RP

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	1 1/2" BSP (1.4571, max. up to 6 bar medium pressure)
R P N – 1 1 2 – 0	1 1/2" NPT (1.4571, max. up to 6 bar medium pressure)

NIVOSWITCH RP

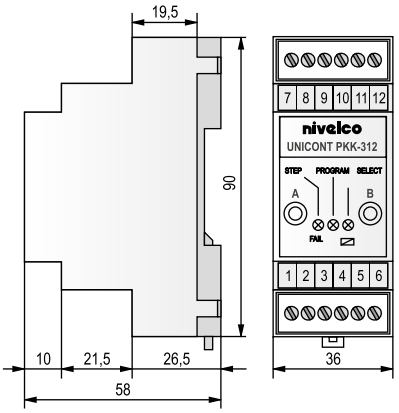
Stainless steel weld-in socket for flush mounting
for NIVOSWITCH R_M-400 type vibrating forks

Type	
R P G – 1 0 1 – 0	1" BSP
R P K – 1 0 1 – 0	1" NPT

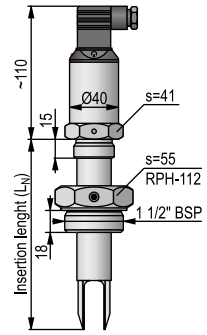
NIVOSWITCH RPS

Magnetic screwdriver for operation test of
mini compact NIVOSWITCH vibration forks

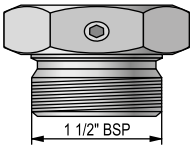
Type
R P S – 1 0 1 – 0



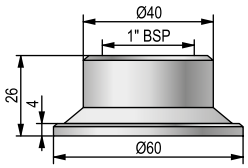
PKK-312



RCM-403 – 430 + RPH-112



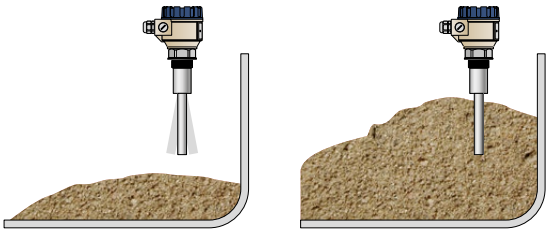
RPH-112



RPG-101

GENERAL DESCRIPTION

The **NIVOCONT R** series of 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/dm³ density. Mounted on tanks, silos or hopper bins it can control filling / emptying, or give fail-safe alarm signals. The highly polished version is recommended to use for abrasive mediums. The operation principle is based on that the electronic circuit excites a vibration in the rod probe. When the medium reaches and covers the rod, its vibration stops, when the medium leaves the rod it returns to vibrate freely. The electronics senses the change of vibration and gives output signal after a selected delay.



MAIN FEATURES

- *Extension up to 20 m*
- *Adjustable sensitivity*
- *Max. medium temperature: 160°C*
- *Universal supply voltage*
- *Dust explosion protection*
- *Fine polished probe*
- *IP67 protection*

APPLICATIONS

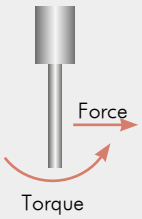
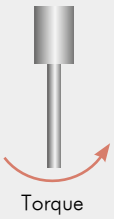
- *Powders, pellets, granulates*
- *Grains*
- *Ground products*
- *Stone-powder, chippings*
- *Cement, sand*
- *Coal, slag*

CERTIFICATIONS

- *ATEX approved (Dust Ex)*
- *IEC approved (Dust Ex)*

TYPE SELECTION

Position of the switching point (high, low) and the mounting (side, bottom, top) determines the selection of the appropriate type.

Version		Standard	Rod extended	Cable extended
High limit switch		Side mounted	Top mounted	Top mounted
Low limit switch		Side or bottom mounted		
Loadability				
Max. load	Force	500 N	–	45 kN
	Torque	100 Nm	100 Nm	–

RKH-502-5 Ex

RKR-500/600

RKK-500/600

TECHNICAL DATA

Version		Standard	Rod extended	Cable extended
Insertion length		207 mm	0.3 ... 3 m	1 ... 20 m
Material of wetted parts		1.4571		vibrating part: 1.4571 cable: PE cover
Process connection		1 1/2" BSP; 1 1/2" NPT as per order code		
Output		See: output data		
Temperature range		Standard: -30 °C...+110 °C; High temp. version [2]: -30 °C...+160 °C		-30 °C...+80 °C
		Ex version: see temperature data		
Medium pressure		max. 2.5 MPa (25 bar)		max. 0.6 MPa (6 bar)
Max. load	Force	500 N	–	45 kN
	Torque	100 Nm	100 Nm	–
Medium density [1]		min. 0.05 kg/dm^3 (granular size 10 mm)		
Response time (selectable)		< 2 sec or 5 sec ±1.5 sec		
Power supply		20...255 V AC/DC, Ex: 20...250 V AC, 20...50 V DC		
Power consumption		≤ 2.5 VA / 2 W		
Housing material		Paint coated aluminium or plastic (PBT)		
Electrical connection		2 x M20x1.5 plastic cable glands, for Ø6...12 mm cable + 2 x NPT ½ " internal thread for cable protective pipe 2 pcs. terminal blocks for 0.5...1.5 mm^2 wire cross section		
Electrical protection		Class I.		
Ingress protection		IP67		
Mass	Metal housing	1.88 kg	1.88 kg +1.4 kg/m	1.88 kg +0.6 kg/m
	Plastic housing	1.5 kg	1.5 kg +1.4 kg/m	1.5 kg +0.6 kg/m

[1] Depends on the internal friction and the granular size of the medium

OUTPUT DATA

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

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type		R□□-5□□-5 Ex
Protection type		Dust Ex
Ex marking [2]	ATEX	see: www.nivelco.com
	IEC Ex [3]	
Electrical connection		2 pcs. metal M20x1.5 cable glands for Ø 8 ... 13 mm cable

[2] Only with metal housing
[3] Need of IEC is to be specified with order

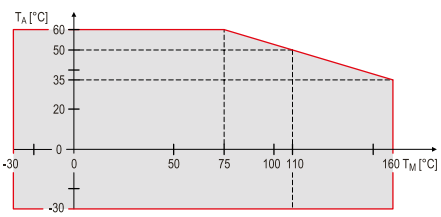
TEMPERATURE DATA

Temperature limit values for Ex versions:

Temperature data	Cable extended			Standard and rod extended				High temp.
Medium temp. (TM) Min.: –30°C	+60°C	+70°C	+80 °C[4]	+60°C	+70°C	+95°C	+110°C	+160°C
Ambient temp. (TA) 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	+85°C	+95°C	+85°C	+85°C	+95°C	+95°C	+135°C
Max. surface temp.	+85°C	+85°C	+95°C	+85°C	+85°C	+95°C	+110°C	+160°C
Temp. classes	**T90°C**		**T100°C**	**T90°C**		**T100°C**	**T115°C**	**T170°C**

[4] Medium temperature for max. 1 hour: + 95 °C

Temperature diagram



Ambient temperature (T_A) versus Medium temperature (T_M)

NIVOCONT R-500/R-600 with standard probe

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	1 1/2" BSP
N	1 1/2" NPT

Housing

R ■■ – □ 0 2 – ■

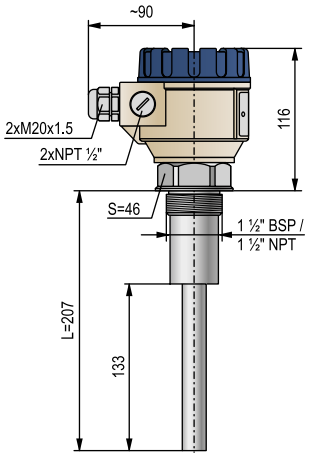
5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (High temperature and Ex version is not available)

Output / Approval

R ■■ – ■ 0 2 – □

1	SPDT, potential free relay; 250 V AC, 8 A
3	SPST, solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex tD

Need of IEC is to be specified with order



RKH / RKN-500 / 600

NIV24
RKH-502-1

NIVOCONT R-500/R-600 with rod extended probe

Vibrating rod level switch for powders and granular solids
with stainless steel rod extended probe 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	1 1/2" BSP
L	1 1/2" NPT

Housing

R ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (not available in Ex version)

Probe length

R ■■ – ■□□ – ■

n n	0.3-0.5 m
o o	0.6-3 m; each started 0.1 m

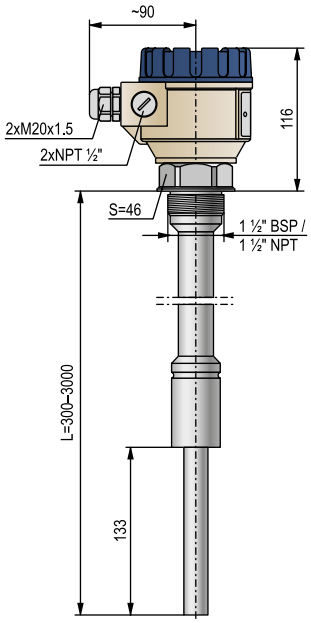
nn = 03-05 : 0.3-0.5 m
oo = 06-30 : 0.6-3 m

Output / Approval

R ■■ – ■■■ – □

1	SPDT, potential free relay; 250 V AC, 8 A
3	SPST, solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex tD

Need of IEC is to be specified with order



RKR / RKL-500 / 600

NIVOCONT R-500/R-600 with cable extended probe

Vibrating rod level switch for powders and granular solids
with PE coated stainless steel cable extended probe up to 20 m

Process connection

R K □ – ■ ■ ■ – ■

K	1 1/2" BSP
C	1 1/2" NPT

Housing

R K ■ – □ ■ ■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced (not available in Ex version)

Probe length

R K ■ – ■ □ □ – ■

0 1	1 m
n n	2-20 m; each started 1 m

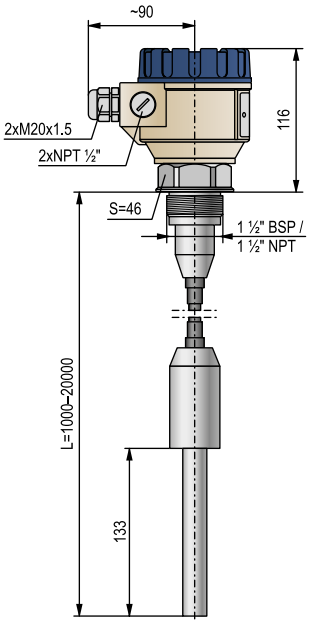
nn = 02-20 : 2-20 m

Output / Approval

R K ■ – ■ ■ ■ – □

1	SPDT, potential free relay; 250 V AC, 8 A
3	SPST, solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex tD

Need of IEC is to be specified with order



RKK / RKC-500 / 600

NIVOCONT R-500/R-600 with custom extended probe

Vibrating rod level switch for powders and granular solids
with custom rod extended probe up to 2 m

Versions

R □ ■ – ■ 0 2 – ■

K	Standard version (110°C)
H	High temperature version (160°C)

Process connection

R ■ □ – ■ 0 2 – ■

E	1 1/2" BSP
F	1 1/2" NPT

Housing

R ■ ■ – □ 0 2 – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced

Output

R ■ ■ – ■ 0 2 – □

1	SPDT, potential free relay; 250 V AC, 8 A
3	SPST, solid state output

NIVOCONT R-500/R-600 with remote-mounted electronics

Vibrating rod level switch with electronics separated from the probe
Use the order code extension below after the standard order code of the device:

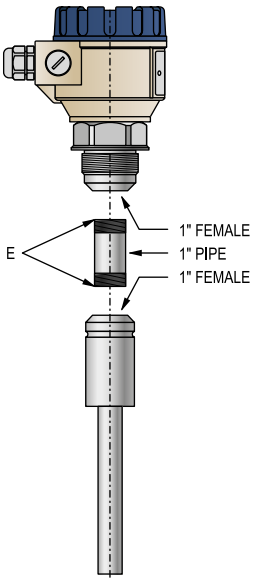
Special versions

X09 6 WEEKS!

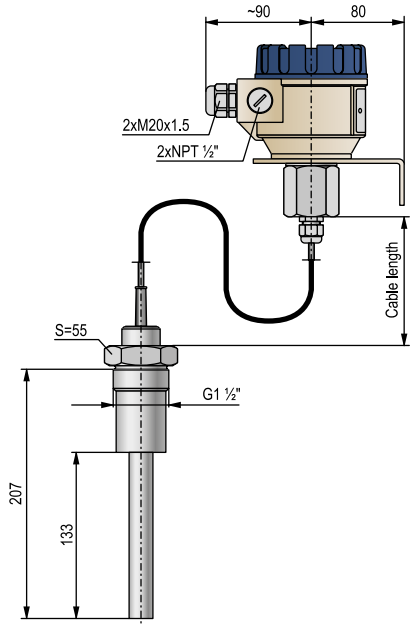
Cable extension

Max. 10 m; each started 1 m

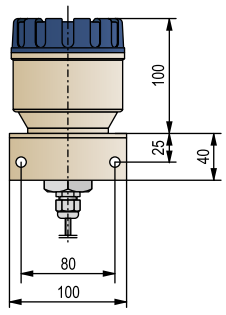
Order example:
Remote-mounted version with standard probe and 3 m cable extension: RKH-502-1-X09/3m



RKE / RKF-500 / 600



RKH-500/600-X09



RKH-500/600-X09

GENERAL DESCRIPTION

The new **NIVOROTA** rotary paddle level switch series of well-known NIVELCO design can be used for detecting the level of lumpy or powdery materials and granules. Mounted to tanks, silos and hoppers it can monitor and control level, filling and emptying of stored materials such as stone, fly ash, sand, coal, feed, beet slice, etc. A small power electric motor drives the paddle which rotates freely in the absence of the material. When the paddle is immersed by the material reaching it, the motor will be switched off the same time triggering the output contact switch. When the material level drops the paddle runs free again, the motor is reactivated and the switch returns to its original state. The new series **NIVOROTA E-700 & E-800** 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.

MAIN FEATURES

- *Level switching of free flowing solids*
- *Cable or rod extended versions up to 3 m*
- *Automatic motor shutdown*
- *High temperature version*
- *IP67 protection*
- *Dust-Ex certified version*

APPLICATIONS

- *Food industry: sunflower, sunflower cod, coffee and, cacao 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*

CERTIFICATIONS

- *ATEX approved (Dust Ex)*

TYPE SELECTION

NIVOROTA	E-700	E-800
Metal housing	■	–
Plastic housing	–	■
Single vane paddle	■	■
Multi-vane paddle	■	■
Flexible coupling	■	■
Cable extension	■	■
DC power supply	■	■
Dust Ex version	■	–
High temperature version	■	–
1" process connection	■	■
1 ½" process connection	■	■
Torque adjustment	■	■

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 corn	0.3 – 0.5
Sunflower cod	0.1 – 0.2
Feed	0.2 – 0.6
Ground paprika	0.8 – 1

(1) *Informative data*

TYPE SELECTION

For appropriate model selection the following should 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 vanes:** Specific gravity and particle size of the material provides orientation for the number of vanes. Most commonly used is the stainless steel, single vane paddle. This paddle can be passed through the respective threaded connection. For lighter materials the use of 3-vane paddle is recommended.
- **Flexible coupling:** Use if the shaft of the instrument has to be protected against falling materials. (rocks, larger lumpy materials)

EK-700
1-vane paddle with flexible coupling

EH-700
High temperature type, rod extended version

EK-700
3-vane paddle

TECHNICAL DATA

Type	NIVOROTA EK□–700/800 Normal type	NIVOROTA EH□–700 High temperature type
Insertion length	Standard: 200 mm, max. 3 m	
Paddle material, number of vanes	1.4571 stainless steel / 1, 3; as per order code	
Rotation speed	≈ 1 rotation / min.	
Material of wetted parts	1.4571 stainless steel	
Medium density (guideline value)	min. 0.1 kg / dm³	
Material of the sealing	NBR	FPM
Medium temperature	EK-700: –20 °C … +120 °C EK-800: –20 °C … +80 °C	–20 °C … +200 °C
	Ex type: See: special data for Ex certified models table	
Ambient temperature	–30 °C … +60 °C	–30 °C … +50 °C
Process pressure	max. 0.3 MPa (3 bar)	
Output	microswitch: SPDT 250 VAC, 10 A, AC1	
Paddle-rotation / shutdown indication	Bi-colour (green/red) LED	
Process connection	1", 1½", as per order code	
Power supply	24 V AC, 24 V DC, 120 V AC, 230 V AC (+10% –15%)	
Power consumption	max. 4 VA (4W)	
Electrical connection	2 x M20x1.5 plastic cable glands, for 6…12 mm cable + 2 x NPT ½ " internal thread for cable protective pipe 2 pcs. terminal blocks for 0.5…1.5 mm² wire cross section	
Electrical protection	Class I.	
Ingress protection	IP67	
Housing material	Paint coated aluminium or plastic (PBT)	Paint coated aluminium
Mass	1.7 kg, cable extension: 1.4 kg/m, counterweight: 1 kg, rod extension: 1.6 kg/m	

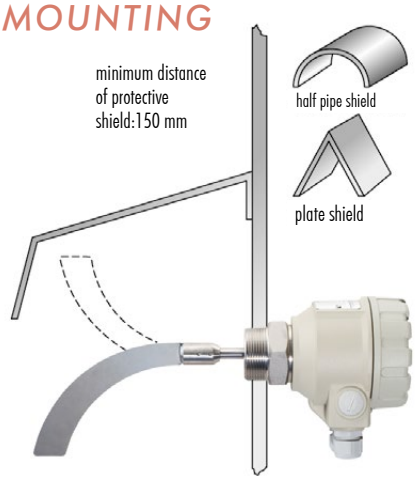
SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type	EK□ / EH□ - 7□□-□ Ex						
Protection type	Dust Ex						
Ex marking	See: www.nivelco.com						
Electrical connection	2 pcs. metal M20x1.5 cable glands for Ø 8 … 13 mm cable						
Temperature data	**Normal type**			**High temperature type**			
Temperature class	T85 °C	T100 °C	T135 °C	T85 °C	T100 °C	T135 °C	T200 °C
Medium temperature	85 °C	100 °C	120 °C	85 °C	100 °C	120 °C	200 °C
Ambient temperature	65 °C	65 °C	50 °C	65 °C	65 °C	65 °C	65 °C
Max. surface temperature	85 °C	100 °C	120 °C	85 °C	100 °C	120 °C	200 °C
Waiting time for opening the cover	30 min.	20 min.	5 min.	30 min.	20 min.	5 min.	0 min.

OPERATION MODES

Power supply	Status LED	Output microswitch	Paddle
ON	Green	5 — 4 / 6 De-Energised	Rotates
	Red	5 — 4 / 6 Energised	Does not rotate
OFF	Dark	5 — 4 / 6 De-Energised	Does not rotate

MOUNTING



Protection of Low Fail-Safe unit by shield

NIVOROTA E-700/E-800 with standard probe

Rotary paddle level switch for powders and granular solids
Standard probe length: 200 mm

Version

E □■ – ■■■ – ■

K		Standard version
H		High temperature version (only with aluminium housing)

Probe version / Paddle / Process connection

E ■□ – ■■■ – ■

A		Standard / 1-vane paddle / 1" BSPT
H		Standard / 1-vane paddle / 1 1/2" BSPT
F	*	Standard / 3-vane paddle / 1 1/2" BSPT

* Mounting plate should be ordered separately

Housing / Material of process connection

E ■■ – □■■ – ■

7	Aluminium (paint coated) / 1.4571
8	Plastic, PBT, glass fibre reinforced / 1.4571 (Ex version not available)

Insertion length

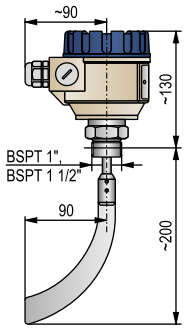
E ■■ – ■□□ – ■

0 2	Standard version 200 mm

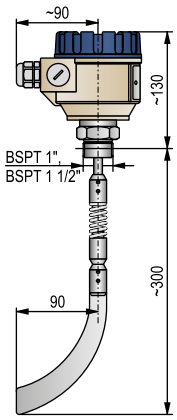
Power supply / Approval

E ■■ – ■■■ – □

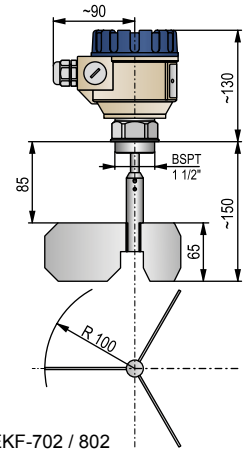
1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex 1/2D
6	120 V AC / Ex 1/2D
7	24 V AC / Ex 1/2D
8	24 V DC / Ex 1/2D



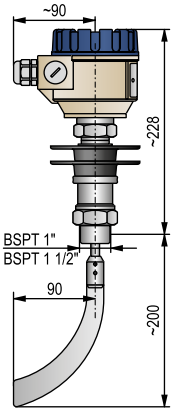
EKA / EKH-702 / 802



EKA / EKH-702 / 802 + EAS-701



EKF-702 / 802



EHA / EHH-702

NIV24
EKA-702-1
EKH-702-1

NIVOROTA E-700/E-800 with rod extended probe

Rotary paddle level switch for powders and granular solids
with stainless steel rod extended probe up to 3 m

Version

E □ R – ■■■ – ■

K	Standard version
H	High temperature version (only with aluminium housing)

Probe version / Paddle / Process connection

E ■□ – ■■■ – ■

R	With rod extension / 1-vane paddle / 1 1/2" BSPT

Housing / Material of process connection

E ■ R – □■■ – ■

7	Aluminium (paint coated) / 1.4571
8	Plastic, PBT, glass fibre reinforced / 1.4571 (Ex version not available)

Insertion length

E ■ R – ■□□ – ■

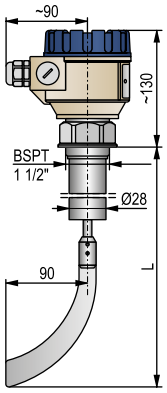
n n	0.3-3 m probe with rod extension; each started 0.1 m

nn = 03-30 : 0.3-3 m

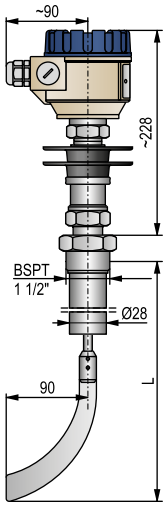
Power supply / Approval

E ■ R – ■■■ – □

1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex 1/2D
6	120 V AC / Ex 1/2D
7	24 V AC / Ex 1/2D
8	24 V DC / Ex 1/2D



EKR-703 – 730
EKR-803 – 830



EHR-703 – 730

NIVOROTA E-700/E-800 with cable extended probe

Rotary paddle level switch for powders and granular solids
with stainless steel cable extended probe up to 3 m

Version

E □■ – ■■■ – ■

K		Standard version
H		High temperature version (only with aluminium housing)

Probe version / Paddle / Process connection

E ■□ – ■■■ – ■

K		With cable extension / 1-vane paddle / 1 1/2" BSPT
L	*	With cable extension / 3-vane paddle / 1 1/2" BSPT

* Mounting plate should be ordered separately

Housing / Material of process connection

E ■■ – □■■ – ■

7	Aluminium (paint coated) / 1.4571
8	Plastic, PBT, glass fibre reinforced / 1.4571 (Ex version not available)

Insertion length

E ■■ – ■□□ – ■

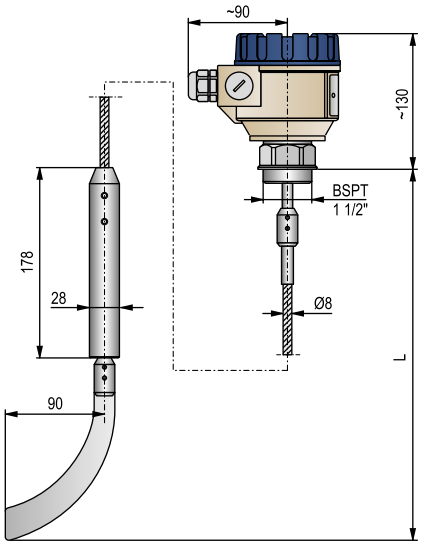
n n	1, 2 or 3 m probe with cable extension; each started 1 m

nn = 10, 20, 30 : 1, 2 or 3 m

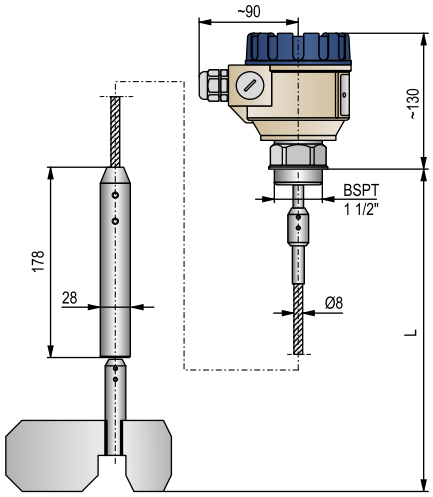
Power supply / Approval

E ■■ – ■■■ – □

1	230 V AC
2	120 V AC
3	24 V AC
4	24 V DC
5	230 V AC / Ex 1/2D
6	120 V AC / Ex 1/2D
7	24 V AC / Ex 1/2D
8	24 V DC / Ex 1/2D



EKK-710 – 730
EKK-810 – 830



EKL-710 – 730
EKL-810 – 830

NIVOROTA E-700/800 accessories to order

Mounting / Material

E A M – 7 0 □ – 0

1	1" female nut / 1.4571
2	1 1/2" female nut / 1.4571
3	Sliding sleeve for rod extended version / 1.4571
4	Mounting plate, 1" hole / 1.4571
5	Mounting plate, 1" hole / carbon steel
6	Mounting plate, 1 1/2" hole / 1.4571
7	Mounting plate, 1 1/2" hole / carbon steel

Flexible coupling

E A S – 7 0 1 – 0	Stainless steel

Adapters

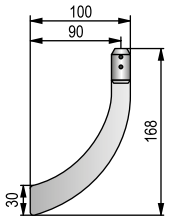
E A A – 6 0 1 – 0	1" BSP / 1 1/2" BSP (1.4571)
E A A – 6 0 2 – 0	1" BSP / 1 1/2" NPT (1.4571)
E A A – 6 0 3 – 0	1 1/2" BSP / 2" BSP (1.4571)
E A A – 6 0 9 – 0	1 1/2" BSP / 3" BSP (1.4571)
EKH-402-1M00001	1 1/2" BSP / 1 1/4" NPT (1.4571)
EKN-402-1M00002	1 1/2" BSP / 2" NPT (1.4571)

Paddles / Material

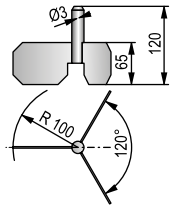
EKA-702-1M30000	1-vane / 1.4571
EKF-702-1M30000	3-vane / 1.4571

Accessories

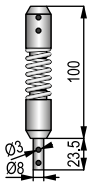
E A W – 7 0 1 – 0	Weight, 1.4571
EAM-704-0M00003	Mounting plate sealing



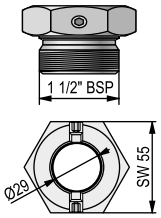
EKA-702-1M30000



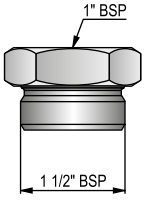
EKF-702-1M30000



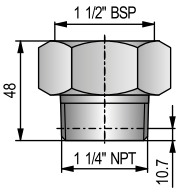
EAS-701



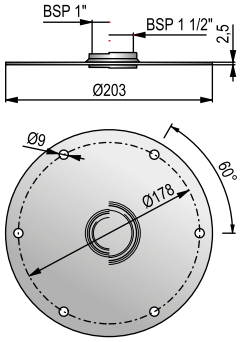
EAM-703



EAA-601



EKH-402



EAM-704 – EAM-707

GENERAL DESCRIPTION

The **NIVOCAP CK** new generation capacitance level switches operate as capacitance meters in the RF (radio-frequency) range providing great immunity to build-up. **NIVOCAP CK-100** is an excellent choice for those adhering, 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 insulations. The intelligent 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 analogue capacitance switches. The units are available only with paint coated aluminium housing, because one reference point of the measurement is the housing itself. An insulated section of the probe called the guard-ring allows that the material build-up on the probe can be ignored preventing false switching. The maximum probe length of the **NIVOCAP CK** series is 3 meter for extended rod probes and the cable extended versions available up to 10 meter probe length.
The high temperature and the Dust-Ex approved models are suitable for using in harsh environments so they can be ideal choice for power generation applications.

MAIN FEATURES

- *Intelligent electronic level switch*
- *Build-up immunity*
- *Easy calibration*
- *Selectable sensitivity*
- *Fail-safe operation mode*
- *Rod or cable extended versions*
- *Calibration with external magnet*
- *High temperature version*
- *Dust-Ex models*

APPLICATIONS

- *For adhering, sticky materials*
- *For solids with $\varepsilon_r \geq 1.5$ relative dielectric constant and liquids*
- *Pharmaceutical and food industry*
- *Power generation processes*

CERTIFICATIONS

- *ATEX approved (Dust Ex)*
- *IEC approved (Dust Ex)*

CKM-100 CMR-100 CKK-100

OPERATION, SET-UP

During the operation the electronics evaluates continuously the capacitance difference of the connected measurement probe. Until the probe is material-free, so the measured medium doesn't reach the probe, the capacitance of the measuring and the reference probe is constant compared to the housing. When the medium reaches the probe the initial capacitance value will increase.
The intelligent electronic of the device measures this capacitance change compared to a reference value recorded by the user with the calibration procedure. For this reason after installing the instrument an empty tank calibration should be performed in which the unit "learns" the basic capacitance of its environment and then this value will be considered as the initial reference capacitance value.
The units can be calibrated by an external magnet without removing the housing cover since in Dust-Ex environment the housing cover is not allowed to remove when the unit is energized, but the unit needs to be energized for performing the calibration. The sensitivity of the unit can be selected by a push button from 4 ranges and further fine tuning can be done with a potentiometer within the selected range.

CALIBRATION

The instrument should be calibrated after the installation. The calibration procedure contribute that after the installation the capacitance change occurring in the tank will be learned by the electronics and considered as initial reference capacitance value. The calibration starts by pressing the CAL button or contacting the external magnet to the marked point on the housing for 5 seconds. If the unit is installed in hazardous (Dust Ex) environment where the housing cover is not allowed to remove when the unit is energized, the calibration can be done without removing the housing cover by a magnet. The supplied permanent magnetic screw allows performing the calibration procedure through the aluminium housing. This case the status LED will blink blue during the calibration. All the other configuration settings (Sensitivity range selection, Sensitivity fine adjustment, Delay adjustment, Fail-safe operation mode selection and switching the Magnetic Calibration switch to ON state) should be carried out outside the hazardous environment (e.g. in the control room) before mounting the instrument. The calibration can be performed multiple times.

SENSITIVITY SETTINGS

Sensitivity (range)	Capacitance value	εr	Typical measured medium
1 ● ○ ○ ○	18 pF	> 7.0	wastewater, slurries, any 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

Type	Standard	Rod extended	Cable extended
Probe length	300 ... 600 mm	700 mm ... 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", 1 ½" BSP / NPT threaded connection; as per order codes		
Output	See: output data table		
Ambient temperature	-30 °C ... +65 °C		
Medium temperature	Standard: -30 °C ... +110 °C, High temperature type: -30 °C ... +235 °C		-25 °C ... +90 °C
Process pressure	16 bar (1.6 MPa) / 25 °C (max. 25 bar is available on special request)		
Response time (selectable)	0.15 - 15 sec		
Sensitivity	Coarse settings: Selectable 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	Min. 1.5		
Power supply	20 – 255 V AC or 20 – 50 V DC		
Power consumption	≤ 2.5 VA / 2 W		
Housing material	Paint coated aluminium		
Electrical connection	2 x M20x1.5 plastic cable glands, for 6...12 mm cable + 2 x NPT ½ " internal thread for cable protective pipe 2 pcs. terminal blocks for 0.5...1.5 mm² wire cross section		
Electrical protection	Class I.		
Ingress protection	IP67		
Mass	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, 8A, AC1	250 V AC, 50 V DC, 1.35 A
Output protection	–	Overvoltage, overcurrent and overload

SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type		Dust Ex						
Ex marking	ATEX	See: www.nivelco.com						
	IEC Ex [1]							
Electrical connection		2x M20 x1.5 metal cable glands for Ø 8 ... Ø 13 mm cable						
Temperature data		Cable extended			Standard, or rod extended			
		Standard type			Standard type			High temperature type
Medium 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
Maximum permissible surface temperature of the process connection		+80°C	+80°C	+90°C	+80°C	+80°C	+90°C	+95°C	+195°C
Temperature classes		T85°C		T95°C	T85°C		T95°C	T110°C	T220°C

[1] *Need of IEC Ex is to be specified with order*

NIVOCAP CK-100 with standard probe

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 / 3/4" BSP
G	Standard / 3/4" NPT
M	Standard / 1" BSP
P	Standard / 1" NPT
H	Standard / 1 1/2" BSP
N	Standard / 1 1/2" NPT

Housing

C ■ ■ – □ ■ ■ – ■

1	Aluminium (paint coated)

Probe length

C ■ ■ – 1 □ □ – ■

n n	Standard version 0.3-0.6 m

nn = 03-06 : 0.3-0.6 m

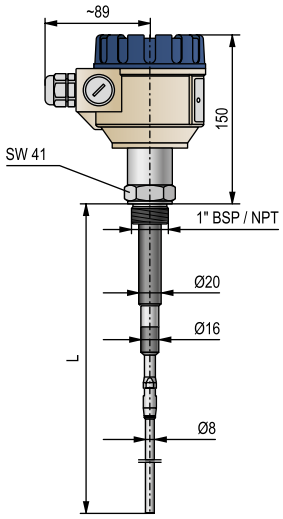
Output / Ex

C ■ ■ – 1 ■ ■ – □

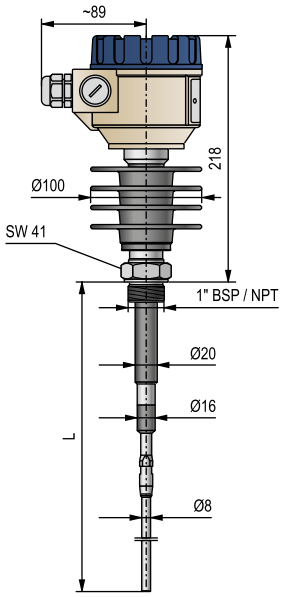
1	SPDT, potential free relay; 250 V AC, 8 A
3	Solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex ta
7	SPST, solid state output / Ex ta

Available on request (should be given 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 rod extended probe

High frequency (RF) capacitance level switch for powders and granular solids, and for liquids with stainless steel rod extended probe up to 3 m

Version

C □■ – 1 ■■ – ■

K	Standard version
M	High temperature version

Probe version / Process connection

C ■□ – 1 ■■ – ■

E	With rod extension / 3/4" BSP (max. 1.5 m)
F	With rod extension / 3/4" NPT (max. 1.5 m)
V	With rod extension / 1" BSP
Z	With rod extension / 1" NPT
R	With rod extension / 1 1/2" BSP
L	With rod extension / 1 1/2" NPT

Housing

C ■■ – □■■ – ■

1	Aluminium (paint coated)

Probe length

C ■■ – 1 □□ – ■

0 7	0,7 m
n n	0.8-3 m probe with rod extension; each started 0.1 m

nn = 08-30 : 0.8-3 m

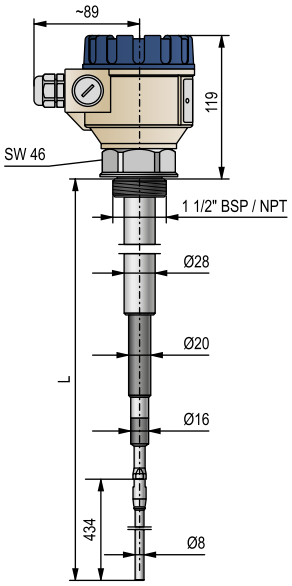
Output / Ex

C ■■ – 1 ■■ – □

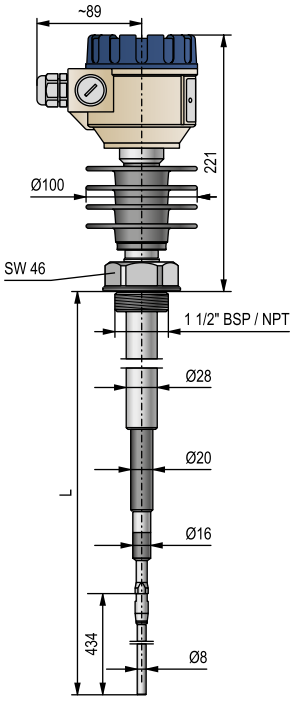
1	SPDT, potential free relay; 250 V AC, 8 A
3	Solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex ta
7	SPST, solid state output / Ex ta

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

X32	2" Triclamp (ISO 2852) process connection



CKR / CKL-107 – 130



CMR / CML-107 – 130

NIVOCAP CK-100 with cable extended probe

High frequency (RF) capacitance level switch for powders and granular solids, and for liquids with PE coated stainless steel cable extended probe up to 20 m

Version

C □ ■ – 1 ■ ■ – ■

K	Standard version

Probe version / Process connection

C K □ – 1 ■ ■ – ■

K	With cable extension / 1 1/2" BSP
C	With cable extension / 1 1/2" NPT

Housing

C K ■ – □ ■ ■ – ■

1	Aluminium (paint coated)

Probe length

C K ■ – 1 □ □ – ■

n n	1-10 m probe with cable extension; each started 0.5 m

nn = 10-A0 : 1-10 m

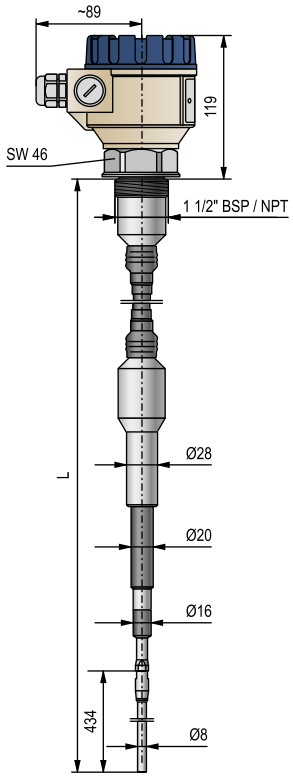
Output / Ex

C K ■ – 1 ■ ■ – □

1	SPDT, potential free relay; 250 V AC, 8 A
3	Solid state output
5	SPDT, potential free relay; 250 V AC, 8 A / Ex ta
7	SPST, solid state output / Ex ta

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

X32	2" Triclamp (ISO 2852) process connection



CKK / CKC-110 – 1A0

NOTES

GENERAL DESCRIPTION

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.**

All the three transmitters are available in compact, integrated and remote mount types.

The AnaCONT LCK mini compact conductivity transmitters provide various mounting positions making possible their use in diverse industrial applications.

pH AND ORP TRANSMITTERS

AnaCONT LEP / LER

- 2-wire pH and ORP transmitters
- Compact and integrated transmitters
- 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 protection
- Explosion-proof models

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DISSOLVED OXYGEN TRANSMITTERS

AnaCONT LED

- 2-wire DO transmitters
- Compact transmitters
- Measuring range: 0 - 20 ppm
- Replaceable probes
- Temperature compensated
- 4-20 mA + HART communication
- Power relay output
- Remote mount versions up to 10 m
- IP67 protection
- Explosion-proof models

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CONDUCTIVITY TRANSMITTERS

AnaCONT LCK

- 2-wire EC transmitters
- Mini compact type
- Measuring range:
  1 µS/cm - 2 mS/cm
- Optional plug-in
  4-digit LED display
- 4-20 mA + HART communication
- IP68 / IP65 protection

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8.24
NIVELCO
AnaCONT

GENERAL DESCRIPTION

The **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 formerly processed values.

MAIN FEATURES

- *Compact and integrated types*
- *Remote mount versions up to 10 m*
- *Measuring range: pH: 0-14 ;*
  ORP: ±1000 mV
- *Wide probe selection according to the application*
- *User friendly software, graphic display*
- *4-20 mA, HART, relay output*
- *Measurement simulation*
- *Wide range of accessories*
- *IP67 / IP68 protection*

APPLICATIONS

- *Checking of water quality*
- *Water production, Wastewater treatment*
- *Pharmaceutical industry*
- *Food and beverage industry*

CERTIFICATIONS

- *ATEX approved (Ex ia)*

LPP-100 / LPR-100
with PVDF housing

LEP-200 / LER-200
with PVDF
probe housing

Compact
LEP-100 / LER-100

Integrated
LPP-100 / LPR-100

pH, ORP electrodes

SAP-300 display

Cleaning solution

Calibration solution

MultiCONT

TECHNICAL DATA

General data		L□P – pH transmitter	L□R – ORP transmitter
Measuring values		Range: 0...14pH Reserve: ±2pH Resolution: 0.01pH (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 msec, on the display (refreshing rate): 1 sec	
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, galvanic isolation, input impedance: >10^{12} Ω, connection: SN6	
Power supply / Power consumption		12...36 V DC / 48 mW...720 mW, galvanic isolated, protection against surge transients	
Output	Analogue	4–20 mA, (3.9–20.5 mA), Rtmax = 1200 Ω galvanic isolated, protection against surge transients	
	Relay	SPDT - 30 V DC, 1A DC	
	Display	SAP-300 LCD graphic display, units of measure and bar graph (only for compact type)	
	Digital communication	4-20 mA + HART	
Medium temperature (pressure dependent) [1]		PP probe housing: -10 °C...+90 °C, PVDF probe housing: -15 °C...+100 °C	
Pressure (absolute) [1]		0.05...1 MPa (0.5...10 bar) at 25 °C	
Ambient temperature		With metal housing: -30 °C...+70 °C, with plastic housing: -25 °C...+70 °C, both with display: -20 °C...+70 °C	
Sealing		PP probe housing: EPDM, All other probe housing: FPM (Viton)	
Ingress protection		Probe housing: IP68, Electronic housing: IP67; Integrated type: IP68	
Housing material		Compact type: Paint coated aluminium or plastic PBT, Integrated type: Same as the probe housing	
Probe housing material		Polypropylene (PP), PVDF	
Electrical connection		Compact type: 2 x M20x1.5 metal cable gland for cable: Ø7...13 mm, or 2 x M20x1.5 plastic cable gland for cable: Ø6...12 mm connecting cable cross section: 0.5...1.5 mm² (shielded cable is recommended) + internal thread 2x NPT ½" cable protective pipe, Integrated type: 6 x 0.5 mm² shielded cable Ø6 mm x 5 m (up to max. 30 m cable length)	
Electrical protection		Class III. electric shock protection	

[1] *Depends on the applied probe*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Medium temperature	PP probe housing: -10...+70 °C, PVDF probe housing: -15...+80 °C
Ambient temperature	Metal housing: -30 °C...+70 °C, with display: -20 °C...+70 °C, Plastic housing: -20 °C...+70 °C

PROBE SELECTION

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

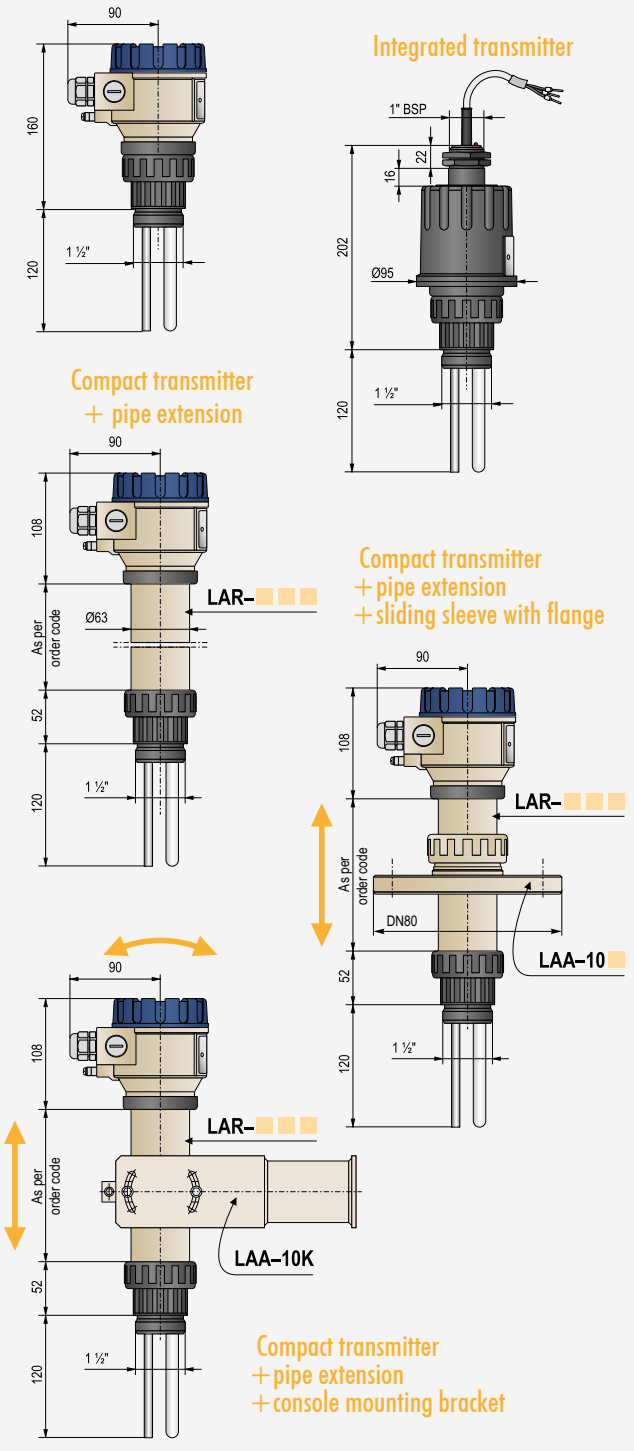
ORP Probes

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

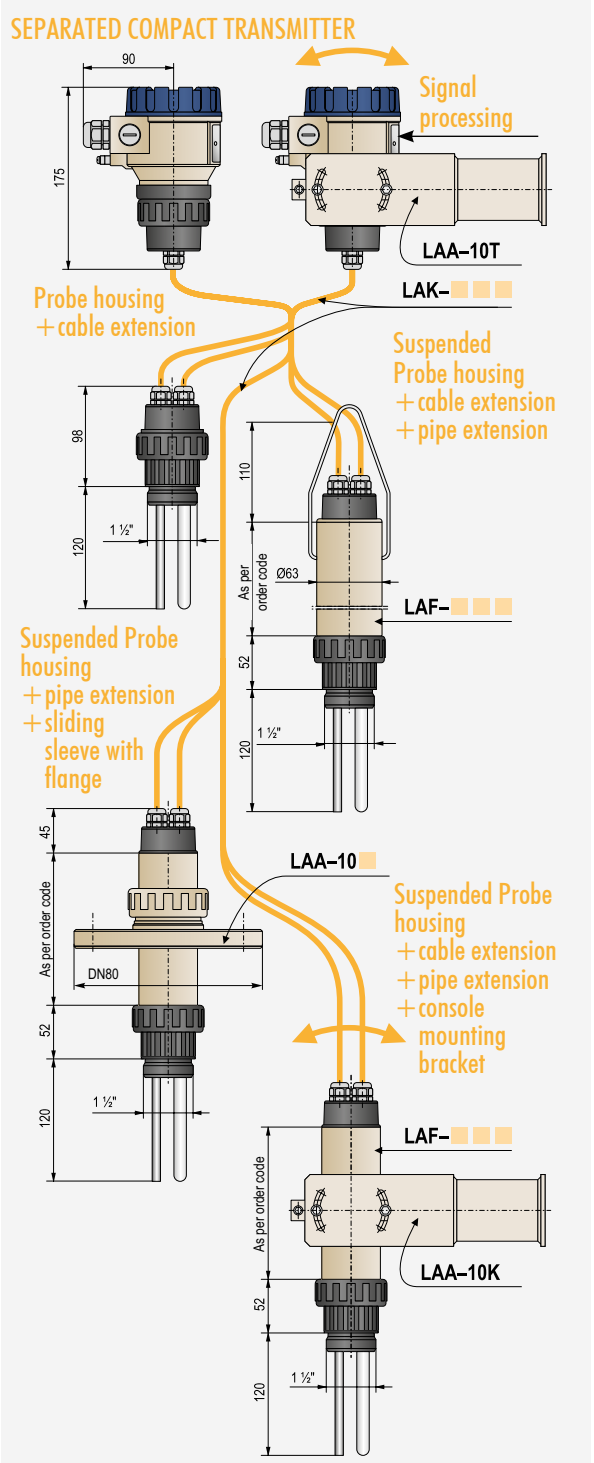
MOUNTING VERSIONS

The constructions of the sensors on the compact and integrated versions are identical, so all accessories are applicable for both types.
The applications of the special accessories make the optimal installation of the transmitters into any process easier.
By using extension pipes or extension cables the remote mount versions allow the mounting of the electronics and the electrode part at any distance from each other.

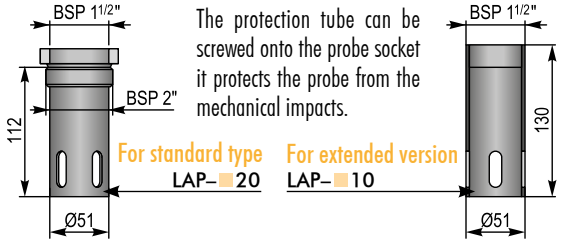
COMPACT TRANSMITTER



SEPARATED COMPACT TRANSMITTER



SENSOR PROTECTION TUBE



AnaCONT LEP/LGP-100/-200

2-wire compact liquid analytical pH transmitter with 4-20mA / 4-20mA +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, glass fibre reinforced
2	Aluminium (paint coated)

Probe: pH range / Max. pressure / Max. temperature / Medium

L ■ P – ■ □ ■ – ■

1		1-12 / 6 bar / 80°C / with solid particles
2	6 WEEKS!	1-12 / 8 bar / 80°C / clear fluid
3		1-12 / 16 bar@25°C / 6 bar@100°C / with solid particles
4	6 WEEKS!	3-14 / 6 bar@25°C / 3 bar@100°C / clear fluid
5		1-12 / 0.5 bar / 60°C / clear fluid
6		1-12 / 3 bar / 60°C / clear fluid
7		1-12 / 6 bar / 80°C / clear fluid
8	6 WEEKS!	1-12 / 3 bar / 60°C / clear fluid (horizontally mountable)

Process connection / Material

L ■ P – ■ ■ □ – ■

1	1 1/2" BSP / PP
2	1 1/2" BSP / PVDF
4	1 1/2" NPT / PP
5	1 1/2" NPT / PVDF

Output / Approval

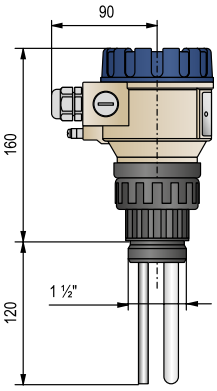
L ■ P – ■ ■ ■ – □

2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex
8	4-20 mA + HART / Ex
R	4-20 mA + Relay
H	4-20 mA + HART + Relay

Accessories to order (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A S – 3 0 3 – 0	EView2 software package
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

Further accessories to order (see AnaCONT accessories pages)



LEP-100 / 200

AnaCONT LPP-100

2-wire integrated compact liquid analytical pH transmitter with 4-20mA + HART and relay output
pH measuring range: 0-14 pH, IP68 protection

Type

L P □ – 1 ■ ■ – ■

P	Integrated compact 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	6 WEEKS!	1-12 / 8 bar / 80°C / clear fluid
3		1-12 / 16 bar@25°C / 6 bar@100°C / with solid particles
4	6 WEEKS!	3-14 / 6 bar@25°C / 3 bar@100°C / clear fluid
5		1-12 / 0.5 bar / 60°C / clear fluid
6		1-12 / 3 bar / 60°C / clear fluid
7		1-12 / 6 bar / 80°C / clear fluid
8	6 WEEKS!	1-12 / 3 bar / 60°C / clear fluid (horizontally mountable)

Process connection / Material

L P P – 1 ■ □ – ■

1	1 1/2" BSP / PP
2	1 1/2" BSP / PVDF
4	1 1/2" NPT / PP
5	1 1/2" NPT / PVDF

Output / Approval

L P P – 1 ■ ■ – □

4	4-20 mA + HART
8	4-20 mA + HART / Ex
H	4-20 mA + HART + Relay

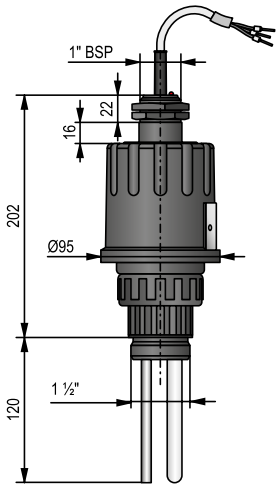
Cable

Maximum length 30 m; each started 1 m over the standard 5 m
LPP-1_ _-8 Ex version comes with 5 m cable only

Accessories to order (see relevant page for details)

S A S – 3 0 3 – 0	EView2 software package
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

Further accessories to order (see AnaCONT accessories pages)



LPP-100

AnaCONT LER/LGR-100/-200

2-wire compact liquid analytical ORP (redox potential) transmitter with 4-20mA / 4-20mA +HART and relay output; ORP measuring range: ±1000 mV, IP67/IP68 protection

Type

L ■ □ – ■ ■ ■ – ■

R	ORP transmitter

Programmer and local indicator (SAP-300)

L □ R – ■ ■ ■ – ■

E	Not included
G	Included

Housing

L ■ R – □ ■ ■ – ■

1	Plastic, PBT, glass fibre reinforced
2	Aluminium (paint coated)

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 / 100°C / with solid particles
4		150 µS/cm / 3 bar / 60°C / clear fluid
5	6 WEEKS!	150 µS/cm / 6 bar / 80°C / clear fluid
6	6 WEEKS!	150 µS/cm / 3 bar / 60°C / clear fluid (horizontally mountable)

Process connection / Material

L ■ R – ■ ■ □ – ■

1	1 1/2" BSP / PP
2	1 1/2" BSP / PVDF
4	1 1/2" NPT / PP
5	1 1/2" NPT / PVDF

Output / Approval

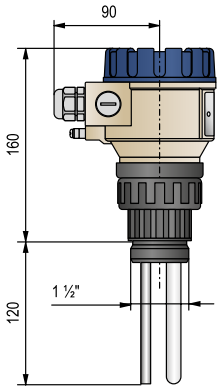
L ■ R – ■ ■ ■ – □

2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex
8	4-20 mA + HART / Ex
R	4-20 mA + Relay
H	4-20 mA + HART + Relay

Accessories to order (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A S – 3 0 3 – 0	EView2 software package
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

Further accessories to order (see AnaCONT accessories pages)



LER-100 / 200

AnaCONT LPR-100

2-wire integrated compact liquid analytical ORP (redox potential) transmitter with 4-20mA + HART and relay output; ORP measuring range: ±1000 mV, IP68 protection

Type

L P □ – 1 ■ ■ – ■

R	Integrated compact 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 / 100°C / with solid particles
4		150 µS/cm / 3 bar / 60°C / clear fluid
5	6 WEEKS!	150 µS/cm / 6 bar / 80°C / clear fluid
6	6 WEEKS!	150 µS/cm / 3 bar / 60°C / clear fluid (horizontally mountable)

Process connection / Material

L P R – 1 ■ □ – ■

1	1 1/2" BSP / PP
2	1 1/2" BSP / PVDF
4	1 1/2" NPT / PP
5	1 1/2" NPT / PVDF

Output / Approval

L P R – 1 ■ ■ – □

4	4-20 mA + HART
8	4-20 mA + HART / Ex
H	4-20 mA + HART + Relay

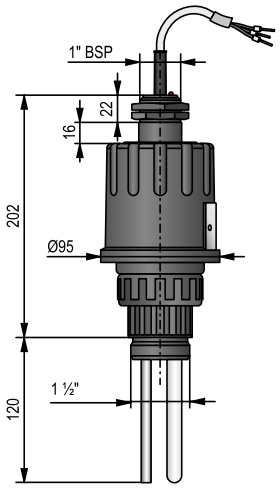
Cable

Maximum length 30 m; each started 1 m 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 S – 3 0 3 – 0	EView2 software package
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

Further accessories to order (see AnaCONT accessories pages)



LPR-100

GENERAL DESCRIPTION

The dissolved oxygen (DO) measurement gives the quantity of dissolved oxygen gas in the liquid, in ppm or mg/l values. The sensor with oxygen-permeable membrane immersed in the liquid provides an electronic signal proportional to the oxygen concentration.
The intelligent 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.

MAIN FEATURES

- *Compact DO transmitter*
- *Remote mount versions up to 10 m*
- *Measurement range: 0-20 ppm*
- *Replaceable probes*
- *Temperature compensation*
- *Graphic display*
- *4-20 mA, HART, relay output*
- *Wide range of accessories*
- *IP67 protection*
- *Ex version*

APPLICATIONS

- *Checking of water quality*
- *Wastewater treatment*
- *Pharmaceutical industry*
- *Food and beverage industry*
- *Effluent treatment*
- *Checking of aeration in potable water*
- *Pools*

CERTIFICATIONS

- *ATEX approved (Ex ia)*

Compact LED-200 with PVDF probe housing

Compact LED-100

SAT-304 HART modem

SAP-300 graphic display

PROBE SELECTION

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	max. 50°C	
	Process pressure	max. 1 bar	
	Speed of medium-flow	min. 0.05m/s	
	Material / thickness of membrane	PTFE / 125 µm	PTFE / 50 µm

TECHNICAL DATA

General data		LDD - DO transmitter
Measurement data	Range	0 – 20 ppm or 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: Galvanic isolated current input, 0.725V polarisation voltage, connection: SN6
Power supply / Power consumption		12...36 V DC / 48 mW...720 mW, galvanic isolated, protection against surge transients
Output	Analogue	4 – 20 mA, (3.9 – 20.5 mA), Rtmax = 1200 Ω galvanic isolated, protection against surge transients
	Relay	SPDT: 30 V DC, 1A DC
	Display	SAP-300 LCD graphic display, units of measure and bar graph
	Digital communication	4-20 mA + HART
Medium temperature (pressure dependent) [1]		PP probe housing: -10 °C...+90 °C, PVDF probe housing: -15 °C...+100 °C
Pressure (absolute) [1]		Max. 0.1 MPa (1 bar) at +25 °C
Ambient temperature		Aluminium housing: -30 °C...+70 °C, Plastic housing: -25 °C...+70 °C, With display: -20 °C...+70 °C
Sealing		PP probe housing: EPDM, all other probe housing: FPM (Viton)
Ingress protection		Probe housing: IP68, Electronic housing: IP67
Housing material		Plastic (PBT) or paint coated aluminium
Material of probe housing		Polypropylene (PP), PVDF
Electrical connection		2xM20x1,5 plastic cable glands for cable: Ø6...12 mm, or 2xM20x1.5 metal cable glands for cable: Ø7...13 mm wire cross section: 0.5...1.5 mm² (shielded cable is recommended), + 2 x NPT 1/2" internal thread for cable protective pipe
Electrical protection		Class III. electric shock protection

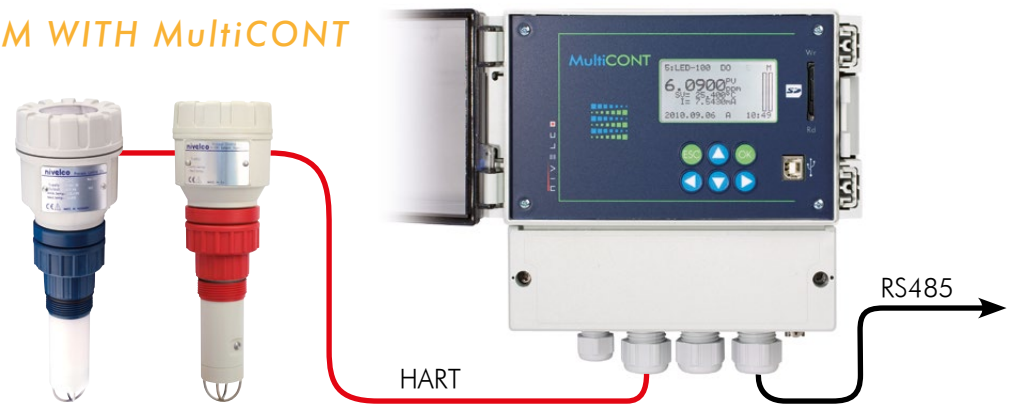
[1] *Depends on the applied probe*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type	Intrinsically safe
Ex marking	See: www.nivelco.com
Intrinsically safe data	
Medium temperature	0 °C...+50 °C
Ambient temperature	Aluminium housing: -30 °C...+70 °C, Plastic housing: -20 °C...+70 °C, With display: -20 °C...+70 °C

AnaCONT IN SYSTEM WITH MultiCONT

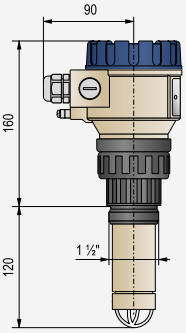
The **MultiCONT** can handle digital data from up to 15 HART transmitters for the measuring of different values (e.g. DO temperature, level, pressure). The digital (HART) information is processed, displayed and if needed it can be transmitted via RS485 communication line to a PC. Remote programming of the transmitter is also possible. Visualisation on a PC can be accomplished with **NIVISION** process visualisation software.



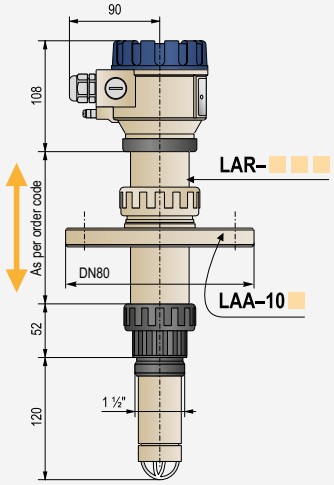
MOUNTING VERSIONS

The constructions of the sensors on the compact and integrated versions are identical, so all accessories are applicable for both types.
The applications of the special accessories make the optimal installation of the transmitters into any process easier.
By using extension pipes or extension cables the remote mount versions allow the mounting of the electronics and the sensor part at any distance from each other.

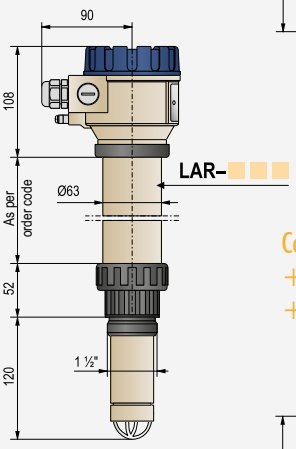
COMPACT TRANSMITTER



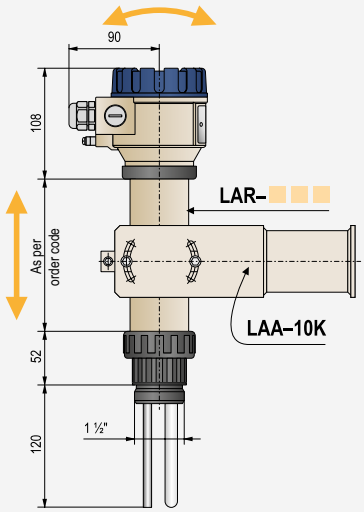
Compact transmitter
+pipe extension
+ sliding sleeve with flange



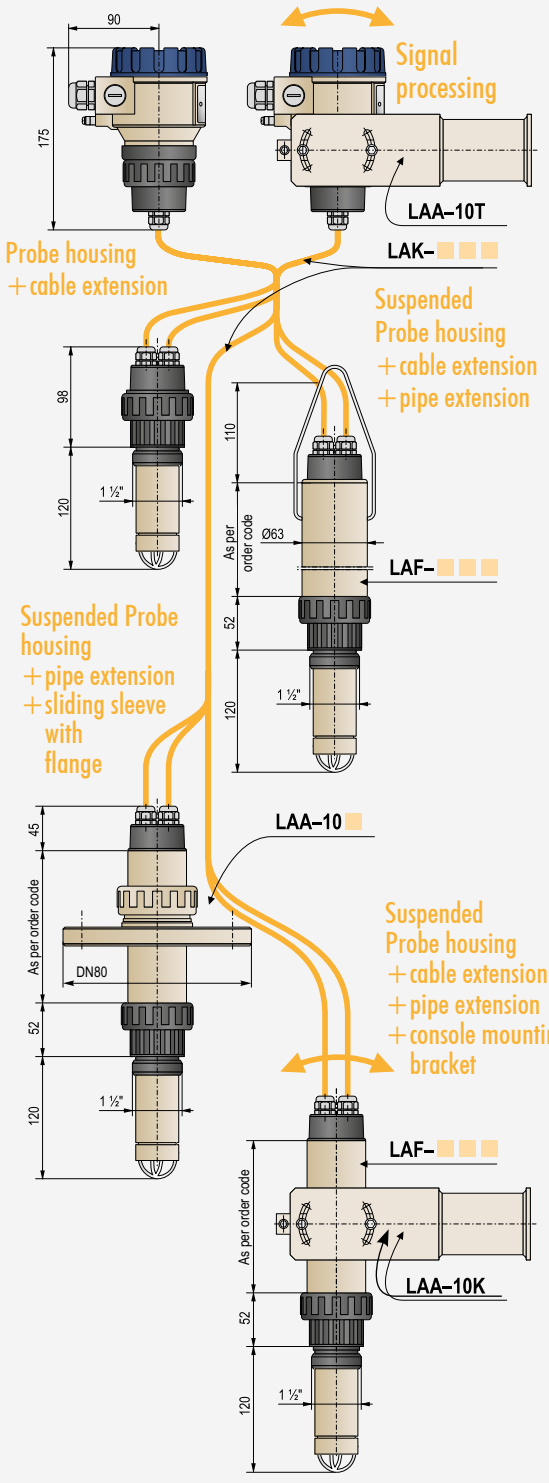
Compact transmitter
+pipe extension



Compact transmitter
+pipe extension
+console mounting bracket



SEPARATED COMPACT TRANSMITTER



AnaCONT LED/LGD-100/-200

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

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, glass fibre reinforced
2	Aluminium (paint coated)

Probe

L ■ D – ■ □ ■ – ■

2	DO1-mA-10 (10 ppm)
1	DO1-mA-20 (20 ppm)

Process connection / Material

L ■ D – ■ ■ □ – ■

1	1 1/2" BSP / PP
2	1 1/2" BSP / PVDF
4	1 1/2" NPT / PP
5	1 1/2" NPT / PVDF

Output / Approval

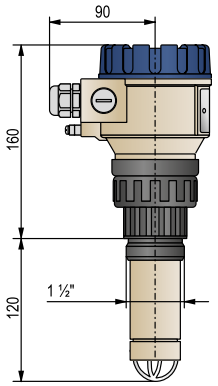
L ■ D – ■ ■ ■ – □

2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex
8	4-20 mA + HART / Ex
R	4-20 mA + Relay
H	4-20 mA + HART + Relay

Accessories to order (see relevant page for details)

S A P – 3 0 0 – 0	Graphic plug-in display module
S A S – 3 0 3 – 0	EView2 software package
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

Further accessories to order (see AnaCONT accessories pages)



LED-100 / 200

ANALYTICS

GENERAL DESCRIPTION

The **AnaCONT** 2-wire mini compact conductivity transmitters are designed to measure the conductivity of a liquid and convert the input signal to 4–20 mA output. They are suitable for measuring clean, non-crystallisable liquids. The design of the transmitter, the wide temperature range and various mounting positions make possible the use in diverse industrial applications. Two probes are immersed into the measured liquid. The distance between the probes and their surface define the cell constant (K) of the instrument. The cell constant defines the measuring range and thus the application area.

MAIN FEATURES

- *Mini compact type*
- *Application oriented measuring range selection*
- *Optional plug-in display*
- *4-20 mA, HART*
- *IP68 protection*

APPLICATIONS

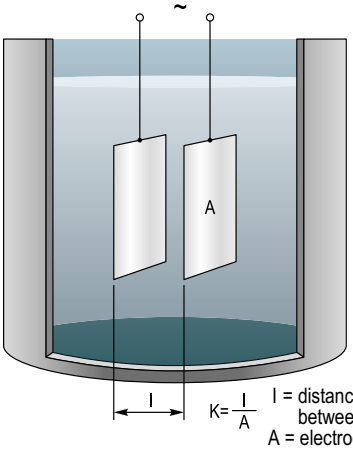
- *Water production*
- *Water processing*
- *Water purification*
- *Wastewater treatment*
- *Pharmaceutical industry*
- *Food and beverage industry*

Mini compact
LCK-21☐+PLK-501

TECHNICAL DATA

Type		AnaCONT LCK mini compact
Measurement data	Range	1 µS/cm – 20 µS/cm 10 µS/cm – 200 µS/cm 100 µS/cm – 2000 µS/cm
	Measurement error	typically 3 % ±1 digit, max. 5 %
Power supply		12-36 V DC galvanic isolated, protection against surge transients
Probe		2-electrodes , built-in
Cell constant		K=0.01, K=0.1; K=1
Output	Analogue	4 – 20 mA
	Display	Optional UNICONT PLK-501 display
	Digital communication	4-20 mA + HART
Medium temperature		-10 °C ... +70 °C
Process pressure		0-1.6 MPa (0-16 bar)
Ambient temperature		0 °C ... +70 °C
Sealing		Viton
Process connection		As per order code
Ingress protection		Probe housing: IP 68, Electronic housing: IP 65
Housing material		Stainless steel 1.4571
Probe housing material		1.4571 + PP
Electrical connection		ISO 4400 connector
Electrical protection		Class III.

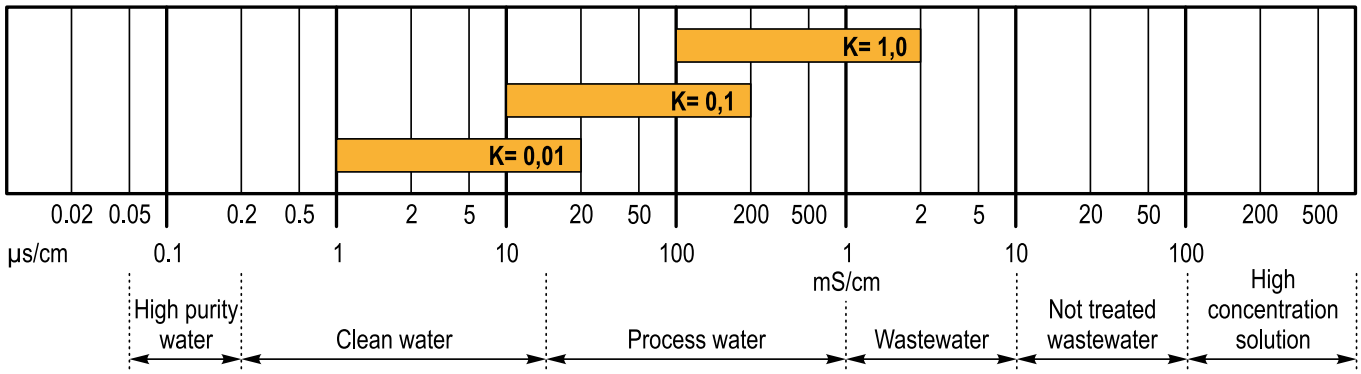
PROBE



Mini compact
LCK-21☐

Mini compact
LCK-23☐

OPERATION



AnaCONT LCK-200

2-wire mini compact liquid analytical conductivity transmitter with 4-20mA / 4-20mA +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 (3/4" version not available)

Process connection

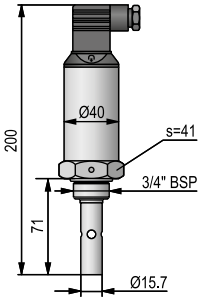
L C K – 2 ■ □ – ■	
1	3/4" BSP
2	1" BSP
T	1 1/2" Triclamp (ISO2852)
R	2" Triclamp (ISO2852)

Output

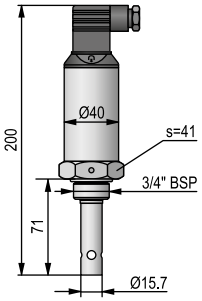
L C K – 2 ■ ■ – □	
2	4-20 mA
4	4-20 mA + HART

Accessories to order

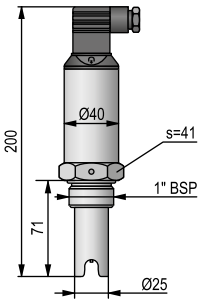
P L K – 5 0 1 – 2	Plug-in indicator
P L K – 5 0 1 – 3	Plug-in indicator with PNP output
Adapters	
N A Z – 1 0 5 – 0	3/4" BSP / 1" NPT (1.4571)



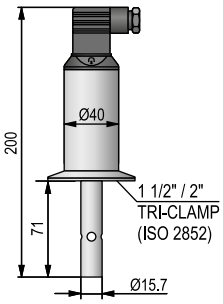
LCK-211



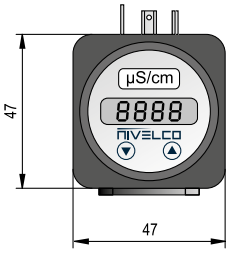
LCK-221



LCK-232



LCK-2□T/R



PLK-501

AnaCONT accessories to order

Various installations can be achieved with usage of the accessories

Material

L A R – □■■ – 0

1	PP

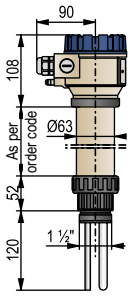
Extension length

L A R – 1 □□ – 0

n n	0.2-3 m; each started 0.1 m

nn = 02-30 : 0.2-3 m

Pipe extension = L
All cables of required length and terminals are included!



LAR-100

Material

L A F – □■■ – 0

1	PP

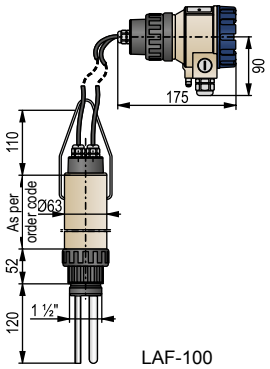
Extension length

L A F – 1 □□ – 0

n n	0.2-3 m; each started 0.1 m

nn = 02-30 : 0.2-3 m

Pipe extension = L
Attention! Cables and terminals NOT included! The cable and terminal set LAK-_ _ _ for the pipe extended version for separate mounting has to be ordered separately (L + the distance between the mounting point and the electronics)!



LAF-100

Material

L A K – □■■ – 0

1	PP

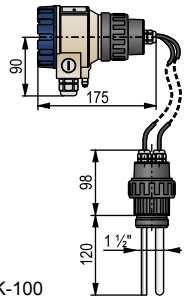
Extension length

L A K – 1 □□ – 0

n n	1-10 m cable set; each started 1 m

nn = 10-A0 : 1-10 m

Terminals are included in the cable set!



LAK-100

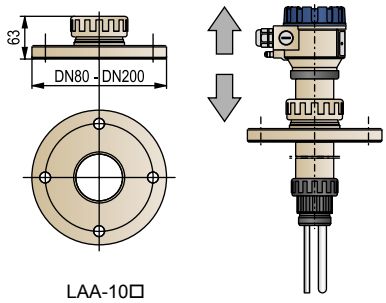
Process connection / Material

L A A – 1 0 □ – 0

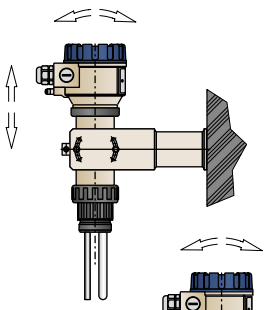
2	DN80 PN16 / PP
3	DN100 PN16 / PP
4	DN125 PN16 / PP
5	DN150 PN16 / PP
6	DN200 PN16 / PP

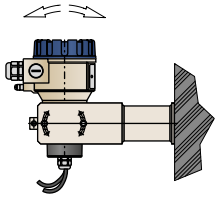
Consoles

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



LAA-10□


LAA-10K

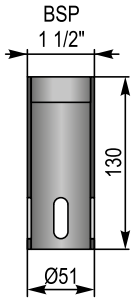

LAA-10T

Material	
L A P – ☐■ 0 – 0	
1	PP

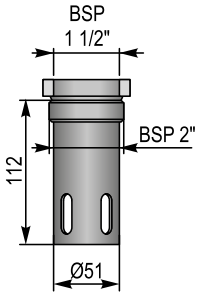
Size	
L A P – 1 ☐ 0 – 0	
1	1 1/2" internal thread for extended version
2	2" external thread for basic version

Other components, accessories	
pH probes	
4xpher112seph	1-12 / 6 bar / 80°C / with solid particles
4xphed112seph	1-12 / 8 bar / 80°C / clear fluid 6 WEEKS!
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 6 WEEKS!
4xphe1120seph	1-12 / 0.5 bar / 60°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 6 WEEKS!
Solutions for pH probes	
4vpuf4ph50mph	Buffer solution pH4 / 50 ml
4vpuf4ph250ph	Buffer solution pH4 / 250 ml
4vpuf4ph100ph	Buffer solution pH4 / 1 l
4vpuf7ph50mph	Buffer solution pH7 / 50 ml
4vpuf7ph250ph	Buffer solution pH7 / 250 ml
4vpuf7ph100ph	Buffer solution pH7 / 1 l
4vpuf10ph50ph	Buffer solution pH10 / 50 ml
4vpuf10ph25ph	Buffer solution pH10 / 250 ml
4vpuf10ph10ph	Buffer solution pH10 / 1 l
4vtarkcl 350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl 250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl 310ph	Storage solution KCl 3 mol / 1 l
4vtiszold 25ph	Cleaning solution / 250 ml
ORP probes	
4xorrherpseor	50 µS/cm / 6 bar / 80°C / with solid particles
4xorrhexpseor	500 µS/cm / 16 bar@25°C / 100°C / with solid particles
4xorrhespseor	150 µS/cm / 3 bar / 60°C / clear fluid
4xorrheppseor	150 µS/cm / 6 bar / 80°C / clear fluid 6 WEEKS!
4xorrheklseor*	150 µS/cm / 3 bar / 60°C / clear fluid 6 WEEKS!
Solutions for ORP probes	
4vpuf46550mor	Buffer solution ORP 465 mV / 50 ml
4vpuf465250or	Buffer solution ORP 465 mV / 250 ml
4vpuf465100or	Buffer solution ORP 465 mV / 1 l
4vpuf22050mor	Buffer solution ORP 220 mV / 50 ml
4vpuf220100or	Buffer solution ORP 220 mV / 1 l
4vtarkcl 350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl 250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl 310ph	Storage solution KCl 3 mol / 1 l
4vtiszold 25ph	Cleaning solution / 250 ml
DO probes	
4x085g0022ydo	085G0027 DO 10 ppm
4x085g0023ydo	085G0030 DO 20 ppm

* Horizontally mountable



LAP-110



LAP-120

GENERAL DESCRIPTION

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 is able to create 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.

OPEN CHANNEL FLOW MEASUREMENT

NIVOSONAR

- 9 different sizes, compact types of PARSHALL flumes made of plastic (PP)
- Factory calibrated dimensions
- Range: 0.28 l/s to 1850 l/s
- Level transmitter to be ordered separately: EasyTREK or EchoTREK
- 4-20 mA, HART communication
- For open channels, treated effluent sewage measurements
- Certification of measurement

page 151

GENERAL DESCRIPTION

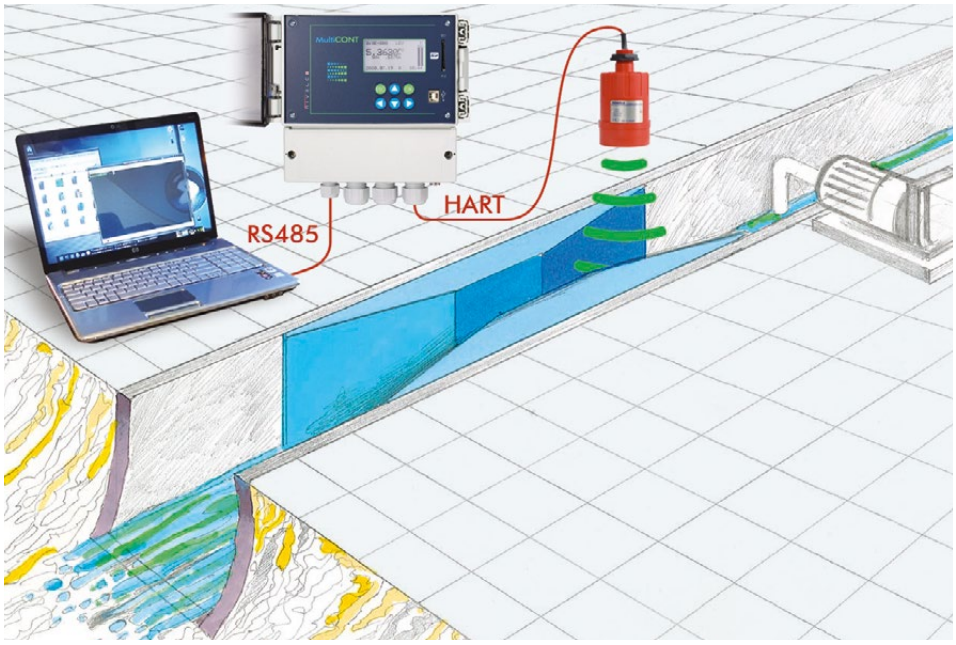
The **NIVOSONAR GPA** Parshall flume with **EasyTREK** integrated ultrasonic transmitter and **MultiCONT** process controller is able to create a complete flow-measurement system. The measuring flume is easy to install in new or existing channel structures. The **EasyTREK** integrated ultrasonic transmitter and the **MultiCONT** should be separately ordered. The **PARSHALL** flume is a rigid structure, manufactured out of polypropylene with narrow tolerances to ensure high accuracy of metering, therefore during transport and installation great care should be taken to prevent the flume from getting deformed.

APPLICATION

With the PARSHALL flume applied as a reducing element, the stagnation pressure causes the liquid level to rise. This change in level is in proportion with the velocity of the liquid and the flow rate. **EasyTREK** ultrasonic level transmitter measures the change in level and transmits measurement data via HART communication to the **MultiCONT** multichannel process controller. **EasyTREK** transmitters can be remote programmed via HART by **UNICOMM** HART-USB/RS485 modem or **MultiCONT** and data logging can be also realized besides displaying or transmitting measurement data on RS 485 line into PC.

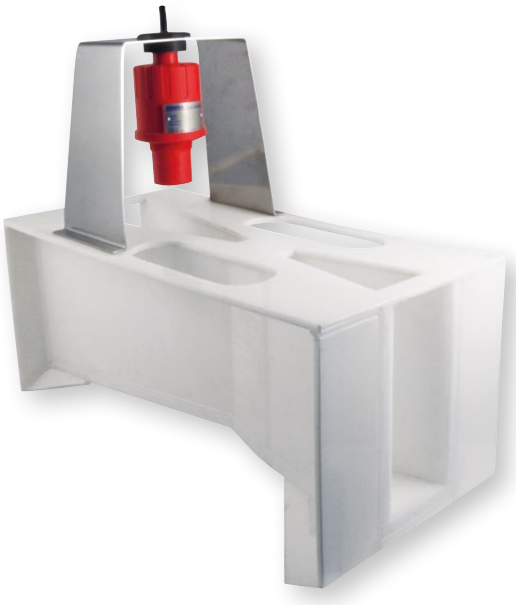
MAIN FEATURES

- *9 different sizes, compact types 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*



TECHNICAL DATA

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
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

$Q=a \cdot h^b$ [m^3/s], where h= the measured level in meters

NIVOSONAR GPA

Parshall flume for open channel flow metering through liquid level measurement
Welded construction of PP-sheets

Prices on request

Type

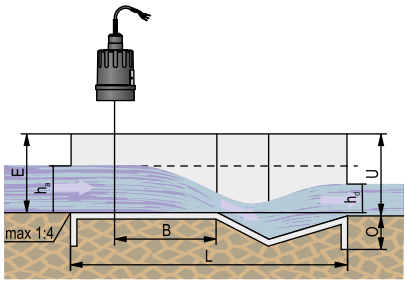
☐ P A – 1 P ■ – 0

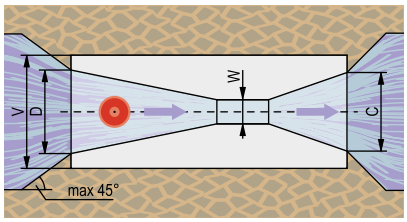
G	5 WEEKS!

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

GENERAL DESCRIPTION

The most frequently measured physical parameter in the modern process automation industry is the temperature. NIVELCO's THERMOCONT product range is designed specially for the purpose of measuring this important parameter. 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. Number of the order code variations and special types is very high, so NIVELCO is able to provide suitable solution for most applications from the wide range of THERMOCONT instruments.

The THERMOCONT product family can be divided into two major parts considering the output possibilities.

THERMOCONT T temperature sensors

THERMOCONT TT temperature transmitters

The THERMOCONT T types are the following:

- **THERMOCONT TGP - Bearing temperature sensor**
- **THERMOCONT TFP - Pt100 temperature sensor**
- **THERMOCONT TSP - Standard temperature sensor**
- **THERMOCONT TNP - Heavy duty temperature sensor**
- **THERMOCONT TXP - Temperature sensor for gases**

The THERMOCONT TT transmitters have 4-20 mA output and as an option these devices are digital HART communication capable. The temperature sensors have a robust outer protection tube which can PFA coated. The max. medium temperature of these instruments is 600°C.

MULTIPOINT TRANSMITTERS

THERMOPOINT

- 2-wire multipoint temperature transmitter
- Temperature measurement of powdered, granular solids or liquids
- Max. 15 sensors / probe
- Max. 30 m probe length
- Temperature trend monitoring
- -30°C...+125°C range
- HART communication
- Explosion-proof models

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TEMPERATURE TRANSMITTERS

THERMOCONT TT

- -50°C... +600°C range
- Plug-in display module
- 4-20 mA, HART communication
- Integral A or B class Pt 100 probe
- Probe length up to 3 m
- Stainless steel or PFA coated probes
- Heavy duty field mountable housing
- Multiple head positions
- Explosion-proof models

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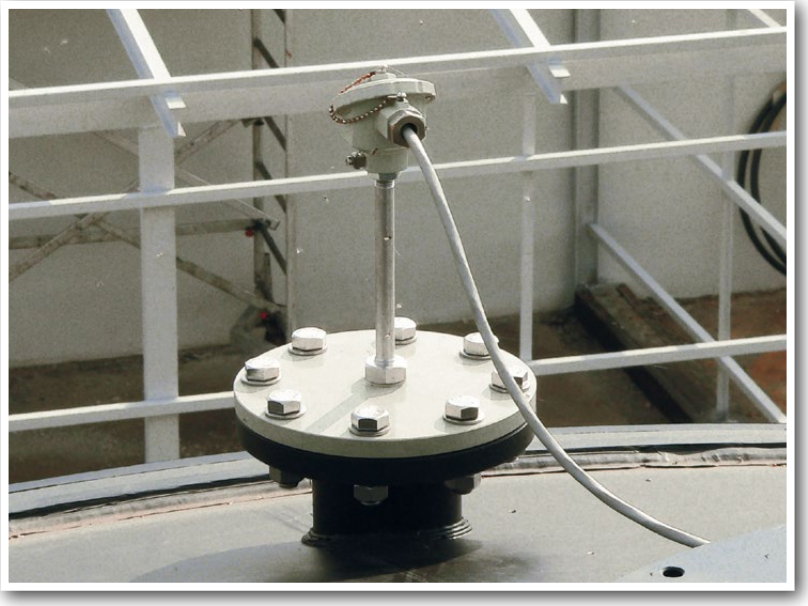
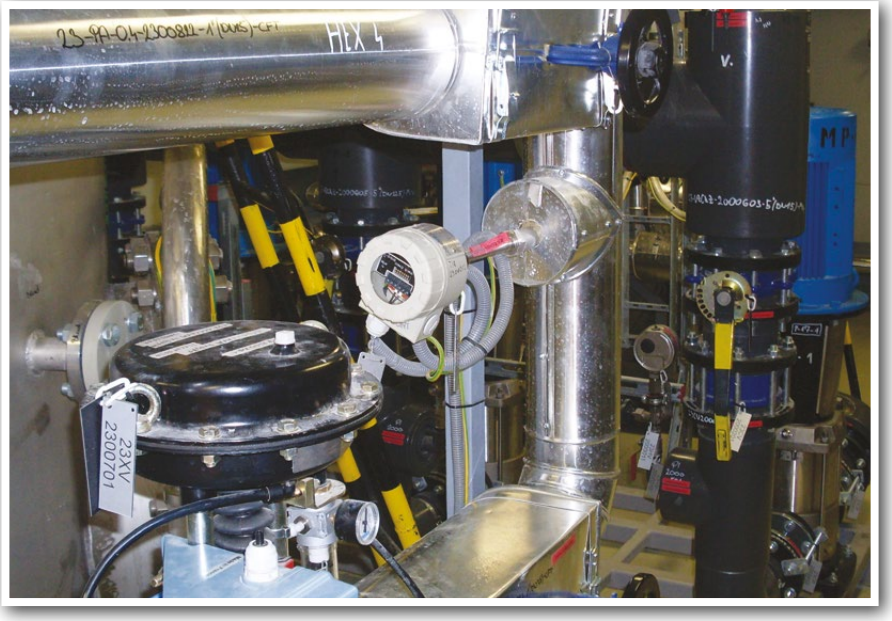
TEMPERATURE SENSORS

THERMOCONT T

- -50°C ... +600°C range
- Resistance Temperature Detectors
- A or B accuracy class
- 2- or 4-wire types
- Fast response sensor version
- Probe length up to 3 m
- Stainless steel or PFA coated probes
- Vibration-resistant version
- Temperature sensors for gases
- Explosion-proof models

page 164




23XV
2300701

GENERAL DESCRIPTION

THERMOPOINT 2-wire temperature transmitters are suitable for continuous multipoint temperature-measurement, -indication and -transmission of normal and hazardous liquids, powders or granular solids. Temperature of grain, feed stored in silos needs to be monitored for maintaining quality of the stored medium. Monitoring of the total volume of the silo is needed to provide information on accidental quality loss or appearance of germs or fungus. Eventual temperature increases will alert the operator to perform operation or recycling the medium. Temperature measurement is done by electronic temperature sensors placed at equal distances in a plastic coated stainless steel flexible tube. Each sensor sends the actual measured temperature of its environment to the transmitter head.
The 2-wire loop-operated transmitter head communicates through HART protocol with control room devices such as a **MultiCONT** or a PC, for further processing or datalogging. A salient advantage of the **MultiCONT** based system is that, if level measurement is required the system can be extended with a level transmitter. The advantage of using a multifunction system is that a new transmitter can easily be inserted into the existing loop, using the existing HART communication.

MAIN FEATURES

- *2-wire multipoint temperature transmitter*
- *Communicates with HART*
- *Max. 30 m probe length*
- *Max. 15 sensors*
- *Max 35 kN tensile force*
- *Replaceable sensors*
- *Digitally addressed sensors*
- *-30°C...+125°C medium temperature*
- *IP67 protection*
- *Ex versions*

APPLICATIONS

- *For normal and hazardous materials*
- *Temperature measurement of powdered, granular or free flowing solids*
- *For transmitting temperature data from faraway locations*
- *Grain industry*
- *Feed industry*
- *Food industry*

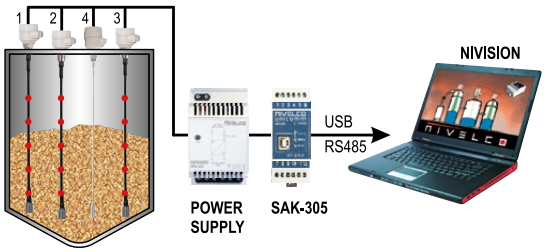
CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex iaD)*
- *ATEX approved (Dust Ex)*

SYSTEM SET-UP VARIATIONS

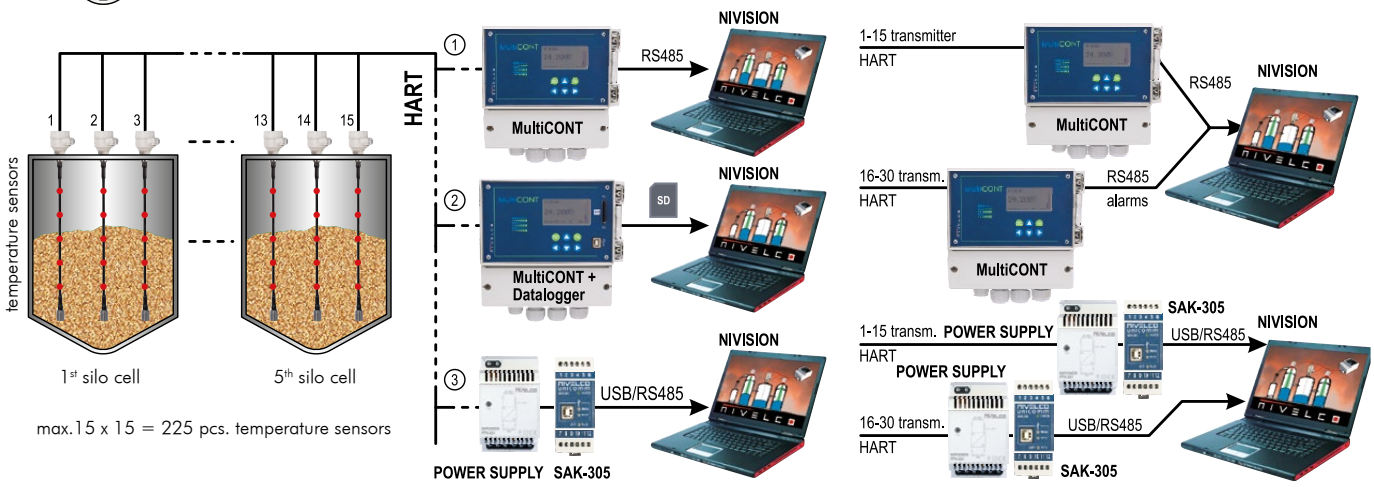
Depending on the required processing the system set up can be the following:

1. Information transmitted by the cable via HART communication are received by **MultiCONT** and re-transmitted to a PC via RS485 protocol. Relays of **MultiCONT** can serve alarm functions.
2. Same as above but a **MultiCONT** with Datalogger function stores the incoming data in an SD card. The stored data can be processed or archived in any PC.
3. HART signals are directly transferred to a PC using an **UNICOMM** HART-USB modem. Data processing can be done 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

Type		For liquids		For solids
		Rigid Probe version	Flexible Probe version	Flexible Plastic coated Probe version
Insertion length		1 m ... 4 m	2 m ... 30 m	
Number of temperature sensors		Max. 15		
Position of sensors		up to 10 m: 1 sensor at every one meter, between 11 and 30 m: 1 sensor at every two meters from the bottom positioned sensor		
Temperature range		–30 °C ... +105 °C (for max. 1 hour: 125 °C)		–30 °C ... +80 °C (for max. 1 hour: 85 °C)
Max. medium pressure		2.5 MPa (25 bar)	1.6 MPa (16 bar)	0.3 MPa (3 bar)
Resolution (digital)		0.1 °C		
Accuracy		–30 °C ... -10 °C: ±2 °C –10 °C ... +85 °C: ±0.5 °C +85 °C ... +125 °C: ±2 °C		
Measurement cycle		max. (Nx1) sec, where N is the number of sensors		
Probe	Tensile force	–		35 kN
	Dimension	Ø 12 mm	Ø 16 mm	Ø 16 mm + 1 mm coating
Material of wetted parts		1.4571 stainless steel		1.4571 stainless steel + Antistatic PE
Ambient temperature		With plastic housing: –20 °C...+65 °C; with metal housing: –30 °C...+65 °C; with SAP-300 display: –20 °C...+65 °C		
Output	Analogue	4–20 mA		
	Digital	4–20 mA + HART		
	Display	SAP-300 LCD		
Output load		Rt = (Ut -12.5V) / 0.004 A		
Power supply		Standard version: 12V....36 V DC, Ex version: 12.5 V ... 30 V DC		
Electrical protection		Class III.		
Ingress protection		IP67		
Process connection		As per order codes		
Electrical connection		M 20 x1.5 plastic cable gland, cable outer diameter: Ø 6 ...Ø12 mm, wire cross section: max.1.5 mm²		
Housing material		Paint coated aluminium cast or plastic (PBT)		
Mass		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

SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type	Intrinsically safe	Intrinsically safe and Dust Ex	Dust Ex
Ex marking	See: www.nivelco.com		
Ex electrical limit data			
Electrical connection	M 20 x 1.5 metal cable gland, cable outer diameter 7...13mm , wire cross section: 0.5...1.5 mm²		
Ambient temperature	With display: -20°C ... +60°C, Without display: see temperature limit data table	With display: -20°C ... +60°C Without display and with metal housing: -30°C ... +65°C	

TEMPERATURE LIMIT DATA IN CASE OF Ex ia MODELS

Metal housing with flexible probe			
Temperature class	T6	T5	T4
Medium temperature	-40 °C ... +80 °C	-40 °C ... +95 °C	-40 °C ... +125 °C
Ambient temperature	-30 °C ... +65 °C		
Plastic housing with flexible probe			
Temperature class	T6	T5	T4
Medium temperature	-40 °C ... +80 °C	-40 °C ... +95 °C	-40 °C ... +125 °C
Ambient temperature	-20 °C ... +65 °C		
Metal housing with plastic coated flexible probe			
Temperature class	T6	T5	
Medium temperature	-10 °C ... +80 °C	-10 °C ... +85 °C	
Ambient temperature	-30 °C ... +65 °C		

THERMOPOINT TM/TJ-500/600 with cable probe

2-wire compact multipoint temperature transmitter for liquids
with stainless steel cable probe and weight, maximum cable length: 30 m

Version

T □■ – ■■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD indicator

Process connection

T ■□ – ■■■ – ■

K	1 1/2" BSP
E	1 1/2" NPT

Housing

T ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced

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; each started 1 m
q	10-30 m; each started 1 m

p = 2-9 : 2-9 m
q = A-Z : 10-30 m

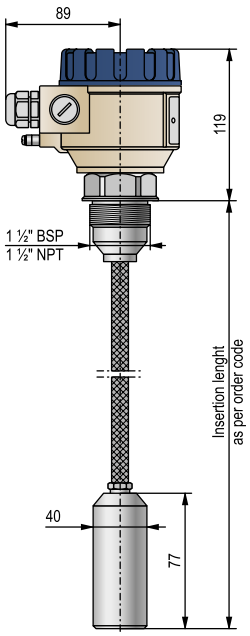
Output / Approval

T ■■ – ■■■ – □

4	HART
6	HART / Ex ia

Accessories to order (see relevant page for details)

TMK-555-4M-200-01	St. St. Counterweight (included in the unit)
SAP – 300 – 0	Graphic plug-in display module
SAT – 304 – 0	HART-USB modem
SAK – 305 – 6	HART-USB/RS485 modem / Ex ia



TMK / TME-5□2 – 5□Z
TMK / TME-6□2 – 6□Z

THERMOPOINT TM/TJ-500/600 with rod probe

2-wire compact multipoint temperature transmitter for liquids
with stainless steel rod probe, maximum probe length: 4 m

Version

T □■ – ■■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD indicator

Process connection

T ■□ – ■■■ – ■

R	1" BSP
A	1" NPT
J	M20x1.5

Housing

T ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced

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; each started 1 m

p = 1-4 : 1-4 m
** Special probe length is available on request

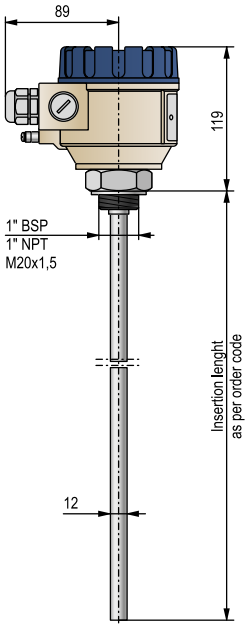
Output / Approval

T ■■ – ■■■ – □

4	HART
6	HART / Ex ia

Accessories to order (see relevant page for details)

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



TMR / TMA / TMJ-5□1 – 5□4
TMR / TMA / TMJ-6□1 – 6□4

THERMOPOINT TM/TJ-500 with coated cable probe

2-wire compact multipoint temperature transmitter for free-flowing solids
with PE coated stainless steel cable probe and weight, maximum cable length: 30 m

Version

T □■ – 5 ■■ – ■

M	Multipoint transmitter
J	Multipoint transmitter with local LCD indicator

Process connection

T ■□ – 5 ■■ – ■

H	1 1/2" BSP
C	1 1/2" NPT

Housing

T ■■ – □■■ – ■

5	Aluminium (paint coated)

Number of sensors

T ■■ – 5 □■ – ■

n	1-9; each sensor
o	10-15; each sensor

n = 1-9 : 1-9
o = A-F : 10-15

Cable length

T ■■ – 5 ■□ – ■

p	2-9 m; each started 1 m
q	10-30 m; each started 1 m

p = 2-9 : 2-9 m
q = A-Z : 10-30 m

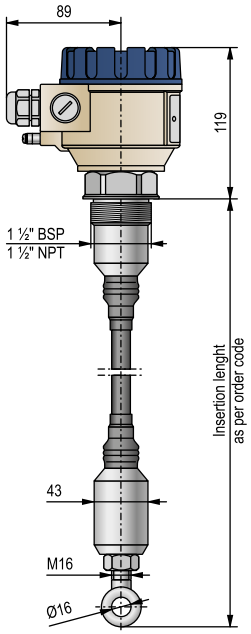
Output / Approval

T ■■ – 5 ■■ – □

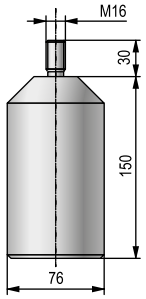
5	HART / Ex iaD
6	HART / Ex ia
8	HART / Ex tD

Accessories to order (see relevant page for details)

CTN-103-0M-400-00	St. St. Counterweight, Ø 80x150 mm
S A P – 3 0 0 – 0	Graphic plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



TMH / TMC-5□2 – 5□Z
TMH / TMC-6□2 – 6□Z



CTN-103-0M-400-00

GENERAL DESCRIPTION

THERMOCONT TT field devices incorporating Pt100 sensor are 2-wire temperature transmitter with 4–20 mA analogue output or transmitter/indicator if equipped with plug in display. Intrinsically safe version of each model is available in ordinary or flame-proof housing. The measured temperature can also be transmitted by HART communication. The **THERMOCONT TT** temperature transmitters are suitable for temperature measurement of liquids in tanks and pipes and free flowing or powdered solids, but also applicable for gases. Wall mounted versions are available for ambient temperature measurements. The PFA coated stainless steel probe makes measurement of very aggressive materials also possible. The reinforced temperature probe version is an ideal solution for meeting the requirements of the oil-, gas- and heavy chemical industries, but also a good choice when robustness of the probe is advantageous. As special version of the unit a remote transmitter is also available which can be connected to a standard Pt 100 sensor through a simple 4-wire cable.

MAIN FEATURES

- *Temperature transmitting and displaying*
- *Measurement range: from -50 °C up to +600 °C*
- *4–20 mA output*
- *HART communication*
- *Variety of head positions*
- *Stainless steel probe*
- *Plastic coated version*
- *Flameproof casing*
- *Strengthened probe version*
- *Ex versions*
- *IP65 protection*

APPLICATIONS

- *For normal and hazardous mediums*
- *For temperature metering of liquids, vapours, gases*
- *Temperature transmitting for far distances*
- *Temperature metering in tanks, tubes, furnaces or boilers*
- *Temperature metering of halls or rooms*

TBJ-500

TBW-620

TBJ-500

TVS-500 strengthened probe version

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex d)*
- *ATEX approved (Ex d ia)*

SAP-202 display

POSITION OF THE DISPLAY

Requested head position differing from standard ("A") version should be specified when placing an order

TECHNICAL DATA

Type			Standard	High temperature version	Plastic coated version	Strengthened probe version
Measurement range			-50 °C ... +200 °C T□W: -40 °C ... +70 °C	-50 °C ... +600 °C [3]	-50 °C ... +200 °C	-50 °C ... +600 °C [3]
Insertion length			As per order code, max. 3000 mm			
Process connection			As per order code			½" NPT / 1" NPT threaded
Maximum process pressure			2.5 MPa (25 bar) at +20 °C, 1.6 MPa (16 bar) at +400 °C			4 MPa (40 bar)
Material of wetted parts [2]			1.4571 stainless steel		1.4571 stainless steel + PFA / PFTE	1.4571 stainless steel
Probe			Class A or Class B Pt100 temperature sensor, as per order code			
Accuracy [1]	Output current	Class „A" Pt 100	± (0.3+ |0.0025 t |) °C	± (1.5+ |0.004 t |) °C	± (0.3+ |0.0025 t |) °C	
		Class „B" Pt 100	± (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" Pt 100	± (0.2+ |0.0025 t |) °C	± (1.5+ |0.004 t |) °C	± (0.2+ |0.0025 t |) °C	
		Class „B" Pt 100	± (0.35+ |0.0055 t |) °C	± (1.5+ |0.006 t |) °C	± (0.35+ |0.0055 t |) °C	
		Temperature error	± 0.002°C /°C			
Power supply			10 V ... 36 V DC; Ex: 12 V - 30 V DC, see: special data for Ex certified models			
Output	Analogue		4–20 mA, output limit values: 3.9 mA ... 20.5 mA			
	Digital communication		HART			
	Output load		Rt = (Us-10V) / 0.022 A, Us = power supply voltage			
	Display	type	SAP-202			
		resolution	0.1 °C	0.4 °C	0.1 °C	
Error indication			3.8 mA or 22 mA			
Ambient temperature			-40 °C ... +70 °C, with display: -25 °C ... +70 °C; see: special data for Ex certified models			
Electrical protection			Class III.			
Ingress protection			IP65			
Electrical connection			Plastic or metal cable gland: M20 x 1.5; Cable outer diameter: Ø 6...12 mm; Wire cross section: 0.25...1.5 mm² / see: special data for Ex certified models			
Housing material			Paint coated aluminium or plastic (PBT)	Paint coated aluminium	Paint coated aluminium or plastic (PBT)	Paint coated aluminium
Mass		with aluminium housing	~ 0.9kg + probe 0.5kg/m (for T □ W .... types ~ 0.9kg total)			~1.55kg + probe 0.25kg / 100 mm
		with plastic housing	~ 0.5kg + probe 0.5kg/m (for T □ W.... types ~ 0.5kg total)	-	~ 0.5kg + probe 0.5kg/m (for T □ W.... types ~ 0.5kg total)	-

[1] *t = measured temperature*
[2] *Not valid for T □ W types*
[3] *with heatsink above 200 °C*

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	T□□-5□□-□ Ex		
Protecton type	Intrinsically safe	Flameproof enclosure	Intrinsically safe with flameproof enclosure
Ex marking	See: www.nivelco.com		
Intrinsically safe data			
Ambient temperature	-40 °C ... +70 °C, with display: -25 °C ... +70 °C	-40 °C ... +70 °C, with display: -20 °C ... +70 °C	
Cable gland	Metal, M 20 x1.5, cable outer diameter: 6...12 mm	Metal, M 20 x1.5, cable outer diameter: 9...11 mm	

Temperature classes	T6	T5	T4	T3	T2	T1
Ambient temperature	+60 °C	+75 °C		+70 °C	+60 °C	+45 °C
Medium temperature	+80 °C	+95 °C	+120 °C	+190 °C	+290 °C	+440 °C

THERMOCONT TT/TB/TW/TR/TV/TL-500/-600

2-wire compact temperature indicator / transmitter for liquids, gases and free-flowing solids with A or B class 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 indicator, up to 200°C
L	Transmitter with local LCD indicator, up to 600°C
R	Transmitter with local LCD indicator, up to 200°C, PFA coated

Process connection

T ■□ – ■■■ – ■

W	With console for wall mounting
C	1/2" BSP
D	3/4" BSP
H	1/2" NPT
J	M20x1,5
L	1" Triclamp
K	1 1/2" Triclamp
N	2" Triclamp
O	DN 25 Pipe coupling (DIN 11851)
P	DN 40 Pipe coupling (DIN 11851)
R	DN 50 Pipe coupling (DIN 11851)
F	DN 50, PN 16, 1.4571 flange+PTFE lining
A	2" ANSI, 1.4571 flange+PTFE lining

Housing

T ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced

Sensor

T ■■ – ■□■ – ■

0	Without (Ex type only for Ex ia)
1	Pt100, class A
2	Pt100, class B

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 / Approval

T ■■ – ■■■ – □

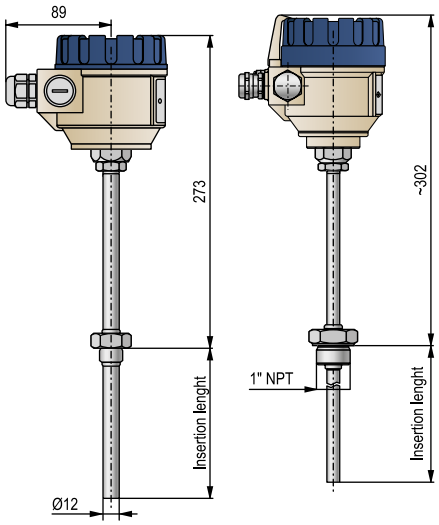
2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex ia
8	4-20 mA + HART / Ex ia
A	4-20 mA / Ex d
B	4-20 mA + HART / Ex d
C	4-20 mA / Ex d ia
D	4-20 mA + HART / Ex d ia

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

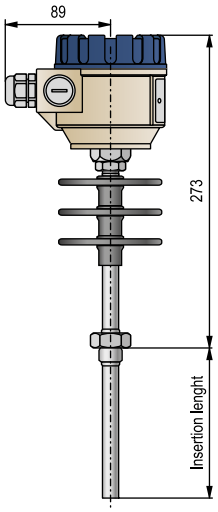
Non-standard, customized 4-20 mA output calibration

Accessories to order (see relevant page for details)

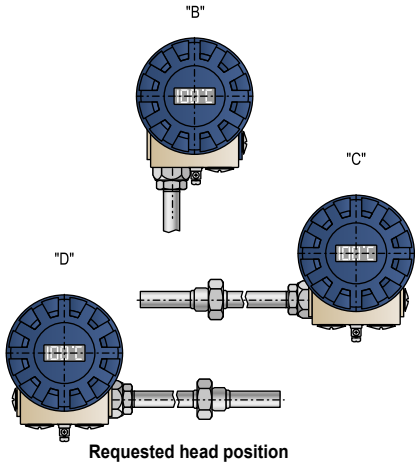
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia



TTO-500/600 TTO-500 Ex d



TVJ-500



Requested head position differing from standard ("A") version should be specified when placing an order!

THERMOCONT TT/TB/TV/TL-500/-600 with strengthened probe

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 indicator, up to 200°C
L	Transmitter with local LCD indicator, up to 600°C

Process connection

T ■□ – ■■■ – ■

S	1" NPT
Z	1/2" NPT

Housing

T ■■ – □■■ – ■

5	Aluminium (paint coated)
6	Plastic, PBT, glass fibre reinforced

Sensor

T ■■ – ■□■ – ■

1	Pt100, class A
2	Pt100, class B

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 / Approval

T ■■ – ■■■ – □

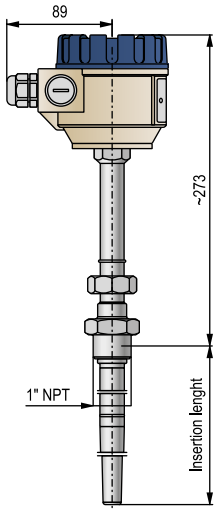
2	4-20 mA
4	4-20 mA + HART
6	4-20 mA / Ex ia
8	4-20 mA + HART / Ex ia

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

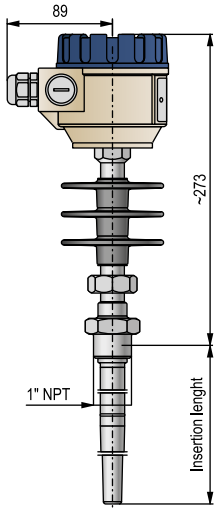
Non-standard, customized 4-20 mA output calibration

Accessories to order (see relevant page for details)

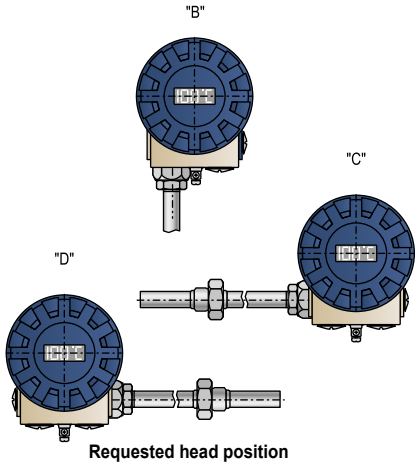
SAP – 202 – 0	Plug-in display module
SAK – 305 – 2	HART-USB/RS485 modem
SAK – 305 – 6	HART-USB/RS485 modem / Ex ia
SAT – 304 – 0	HART-USB modem



TTS-500 / 600



TVS-500



Requested head position differing from standard ("A") version should be specified when placing an order!

GENERAL DESCRIPTION

The wide range of **THERMOCONT** temperature sensors is able to cover almost all demands in the area of industrial temperature measurement. The numerous versions and multiple kinds of applicable probes make **THERMOCONT** suitable choice for all industries. PFA coated probe versions with teflon inserted steel flange are applicable for chemical and petro-chemical applications where aggressive mediums could damage 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 outer (double) tube and well, the welded flange. This type is also provides suitable solution for all applications where robust design is advantageous.
Suiting for unique technologies and industrial processes, special versions are also available along with the standard models.

MAIN FEATURES

- *Thermocouples and RTDs (Resistance Temperature Detectors)*
- *Temperature range from -50 °C up to +600 °C*
- *Multiple kinds of thermo-sensors*
- *Stainless steel probes*
- *Fast response sensor version*
- *Plastic coated version*
- *Vibration-resistant version*
- *Heavy-duty robust version*
- *Ex versions*
- *IP65 protection*

APPLICATIONS

- *Temperature metering in tanks, tubes, furnaces or boilers*
- *Can be mounted to special technological places*
- *For temperature metering of liquids, vapours, gases*
- *Temperature metering in bearings*
- *Special versions for unique applications*

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex d)*
- *ATEX approved (Ex d ia)*

TSP
standard
temperature sensor

TN
strengthened probe
version thermowell
temperature sensor

TGP
bearing
temperature sensor

TFP
temperature sensor

TPP
plastic coated Ex version
temperature sensor

TXP
temperature sensor
for gases

TECHNICAL DATA

Features	Type	THERMOCONT T temperature sensors					
		Normal	Vibration-resistant	Fast response	Plastic coated	Strengthened probe	For gases
Sensor	Accuracy class [1]	A or B accuracy class in accordance to EN 60751					A class
	Type	Single or dual		Only with single sensor	Single or dual		
	Vibration resistance	–	EN 60751.4.4.2	–		EN 60751.4.4.2	
	Grounding	Ground-independent					
	Material of inner protecting tube	A38				1.4571	PTFE
Head	Housing material	Paint coated EN AC 44100 aluminium				Paint coated EN AC 43100	
	Cable gland	M 20 x 1.5 plastic				M 20 x 1.5 metal	
	Cable	Ø 6 – 12 mm, see: special data for Ex certified models table					
	Electrical connection	Screw type terminal					
Outer protection	Material	1.4571 stainless steel			1.4571 + PFA coating	1.4571 stainless steel	
	Probe length	160 – 3000 mm				160 – 3000 mm [2]	120 – 500 mm
	Process connection	As per order codes					M33x2; 1"NPT
General data	Range	-50 °C ... +600 °C			-50 °C ... +200 °C	-50 °C ... +600 °C	-50 °C ... +150 °C
	Medium pressure	2.5 MPa (25 bar) at 20 °C 1.6 MPa (16 bar) at 400 °C			0.1 MPa (1 bar)	1"NPT- 4MPa (40bar) or pressure rating of flanges	Max. 8 MPa (80 bar)
	Time-constant	< 3 min.		< 20 sec.	4.5 min.	–	
	Ambient temperature	–20 °C...+80 °C see: special data for Ex certified models table				-40 °C ... 80 °C	-30 °C ... +80 °C
	Grounding	Outer, grounding screw on the housing					
	Electrical protection	Class III.					
	Ingress protection	IP65					IP67
	Ex marking	–	see: www.nivelco.com	–	see: www.nivelco.com		

[1] *In the standard temperature ranges (about up to 400 °C) the temperature error of „A" temperature class resistance temperature sensors is below ±1 °C, while it is max. ±2.3 °C in case of „B" temperature class temperature sensors.*
[2] *when the measured medium has high wear and erosion effect on the probe the max. probe length is limited to 1000 mm*

Features \ Type	THERMOCONT T bearing temperature sensors	THERMOCONT T temperature sensors
Operating temperature	–50 °C...+180 °C	–50 °C...+200 °C
Sensor	Pt100	
Sensor diameter	Ø 8 mm	Ø 6, Ø 8 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 codes	
Electrical connection	SHFP type silicone rubber and shield, 3x 0.75 mm²	Teflon coated, 0.25 mm² wire cross section cable
Cable protection	tinned copper-braid protective jacket	
Cable length	3 – 6 m, diameter: 7 mm	as per order codes
Insertion length	As per order codes	
Ingress protection	IP65	IP54
Electrical protection	Class III.	
Insulation resistivity	min. 10 MΩ, at 20 °C ±5 °C min. 1 MΩ at the highest value operating temperature	
Voltage-test	500 V, 50 Hz AC for 1 min., at 20 °C ±5 °C	
Mass	0.55 kg	0.05 kg
Time constant	< 20 s	
Pressure	max. 6 MPa (60 bar)	

SPECIAL DATA FOR Ex CERTIFIED MODELS

Temperature sensors			
Protection type	Intrinsically safe	Flameproof enclosure	Intrinsically safe with flameproof enclosure
Cable	Ø 7 - 10 mm	Ø 9.5 - 10 mm	Ø 7.5 - 12 mm
Temperature sensors with strengthened probe			
Cable	Ø 7.5 - 12 mm		

Temperature sensors for gases	
Protection type	Flameproof enclosure
Cable	Ø 8.5 - 16 mm

For Ex ia protection type	
Intrinsically safe limit data	see: www.nivelco.com

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
Medium temperature from -20 °C					
+85 °C	+100 °C	+135 °C	+200 °C	+300 °C	+450 °C

THERMOCONT TN/TU

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	1 1/2" 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

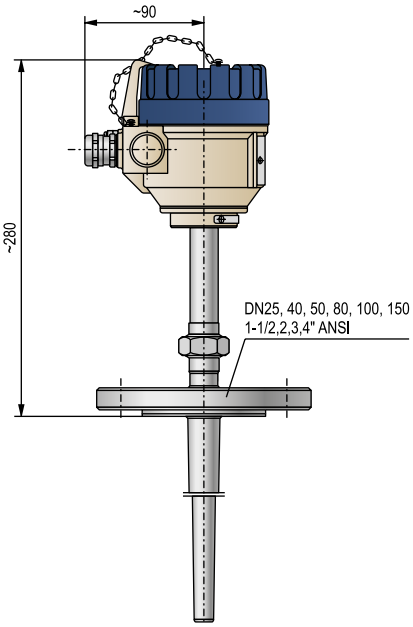
T ■■ – ■■□ – ■

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 strait	
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

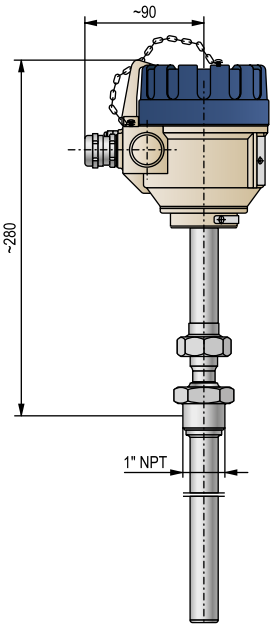
Approval

T ■■ – ■■■ – □

0	None
7	Ex ia
8	Ex d ia
9	Ex d



TNP / TNK-□□□



TUP / TUK-□□□

THERMOCONT TX

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, single, 2-wire
4	Class A, dual, 3-wire
7	Class A, single, 4-wire

Protrusion length

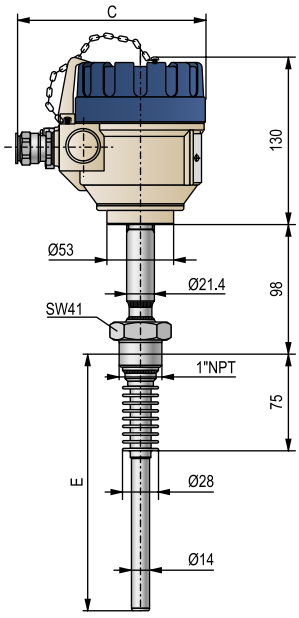
T X P – ■■□ – ■

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

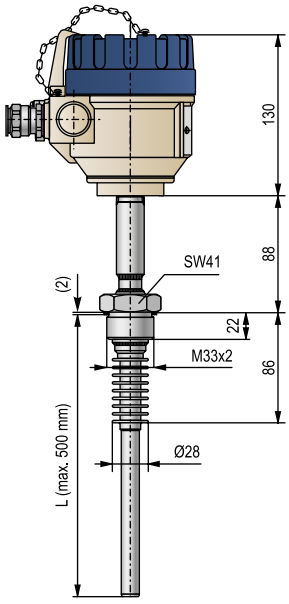
Approval

T X P – ■■■ – □

0	None
8	Ex d ia
9	Ex d



TXP-1□□



TXP-V□□

THERMOCONT TFP

Resistance thermometer (RTD) with single or dual type Pt100 temperature sensor with stainless steel protecting tube and integrated cable

Process connection

T F P – ■■■ – ■

1		Ø 6mm 1.4571
2		Ø 8mm 1.4571
3		M 12 x 1.5
4		M 8 x 1
5		Ø 6mm, fast response
6		Ø 8mm, fast response

Pt 100 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 Ø 8 mm tube diameter

Probe length

T F P – ■■■ – ■

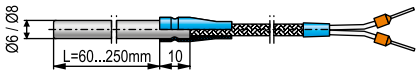
1		60 mm
2		100 mm
3		160 mm
4		250 mm
5	**	10 mm
6	**	30 mm

** only for TFP-300, TFP-400 types

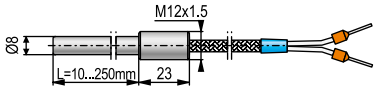
Cable length

T F P – ■■■ – ■

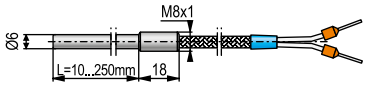
0	0,6 m
1	1 m
2	2 m
3	3 m



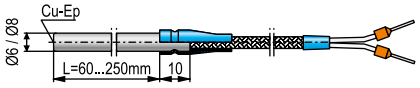
TFP-1□□, TFP-2□□



TFP-3□□



TFP-4□□



TFP-5□□, TFP-6□□

THERMOCONT TGP

Bearing resistance thermometer (RTD) with A or B class Pt100 temperature sensor with stainless steel protecting tube and integrated cable

Process connection

T G P – ■■■ – ■

1	Rimmed
2	M 20 x 1,5

Pt100 sensor

T G P – ■■■ – ■

1	Class A, 3-wire
2	Class B, 3-wire

Probe length

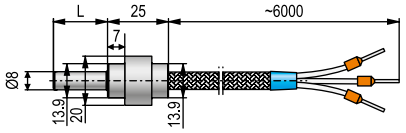
T G P – ■■■ – ■

1	30 mm
2	50 mm
3	100 mm
4	160 mm
5	380 mm

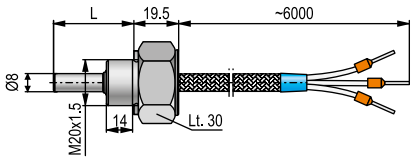
Cable length

T G P – ■■■ – ■

3	3 m
4	6 m



TGP-1□□



TGP-2□□

NIV24
TFP-121-0
TFP-121-1
TFP-121-2

THERMOCONT TS/TP

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 coated stainless steel (only with flange and M20x1,5 or 1/2" BSP process connection)

Sensor

T ■□ – ■■■ – ■

P	Pt 100
V	Pt 100 shock proof
G	Pt 100 fast-response (only Ex ia version is available)

Process connection

T ■■ – □■■ – ■

0	Flange DN 25 PN 25, 1.4571
1	M 20 x 1.5
2	1/2" BSP
3	1/2" NPT
4	3/8" BSP
5	Flange DN 40 PN 25/16, 1.0037
6	Flange DN 50 PN 25/16, 1.0037
7	Flange DN 80 PN 25/16, 1.0037
8	Flange DN 100 PN 25, 1.0037
9	Flange DN 150 PN 25, 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 ■■ – ■■□ – ■

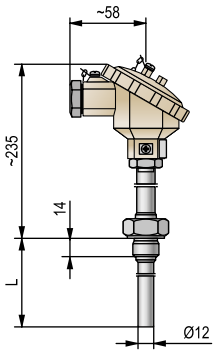
0	60 mm
1	160 mm
2	250 mm
3	400 mm
4	500 mm
5	1000 mm
6	1500 mm
7	2000 mm
8	2500 mm
9	3000 mm

Approval

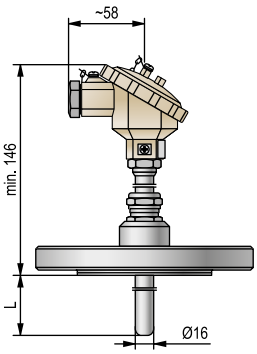
T ■■ – ■■■ – □

0	None
7	Ex ia
8	Ex d ia
9	Ex d

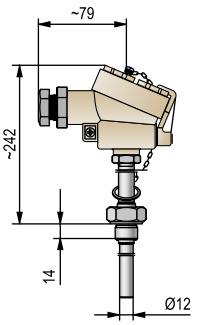
On special request: other process connections and probe lengths



TSP / TSV / TSG-□□□



TPP-□□□



TSP / TSV-□□□-8 Ex
TSP / TSV-□□□-9 Ex

NOTES

GENERAL DESCRIPTION

Another important non-electrical quantity of the industrial process automation is pressure.

The NIPRESS D mini compact type gauge / absolute pressure transmitters offer wide selection of models and provide possibility to complete almost all relative or absolute pressure measurement tasks requiring different accuracy.

Their design, high overload capability and the possibility to install the units in any physical position allows for a wide range of industrial applications.

Non-contact proximity switches are also very popular devices of the industrial process automation.

The MICROSONAR ultrasonic proximity sensors provides ideal choice for simple applications where the use of higher performance units such as EasyTREK or EchoTREK is not needed.

The MICROSONAR proximity sensors use non-contact ultrasonic principles to detect and measure the position of an object. They act as proximity switches, or transmit the measurement of the distance from sensor face to the target.

PRESSURE TRANSMITTERS

NIPRESS

- Gauge or absolute pressure transmitters
- -1 - 600 bar range
- Piezoresistive or ceramic sensor
- High accuracy: 0.25 %, or 0.5%
- Mini compact 2- or 3-wire transmitters
- Stainless steel housing
- Sanitary process connections
- 4-20 mA, 0-10 V DC output

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ULTRASONIC PROXIMITY SENSORS

MICROSONAR

- Non-contact distance metering
- Narrow 5° beam angle
- Max. 6 m measuring range
- Position, distance detection
- Local programming with magnet or cable
- 4-20 mA, 0-10 V, PNP or NPN switch output
- Short circuit and reverse polarity protection

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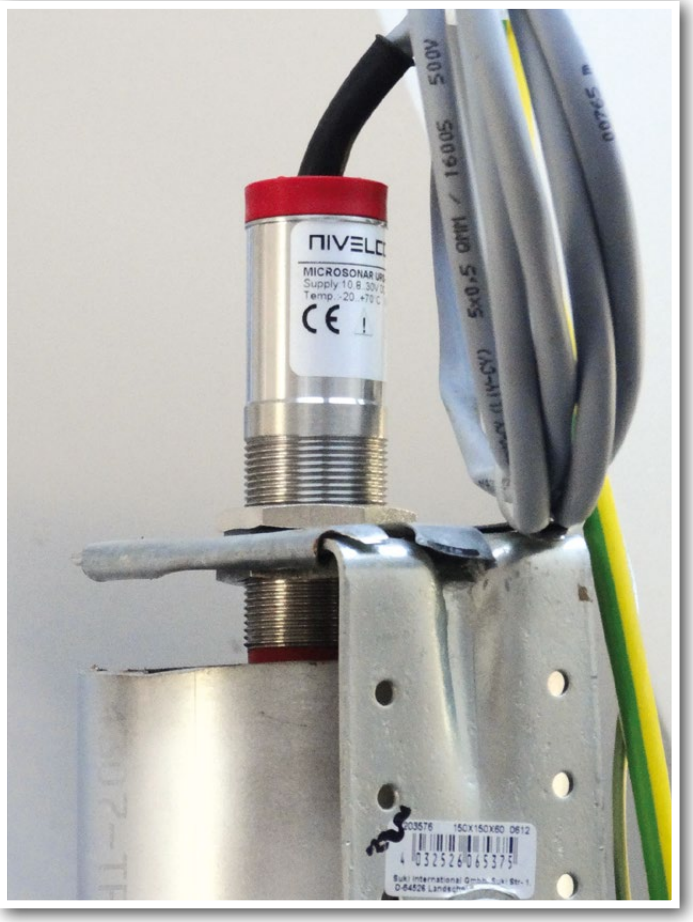

NIVELCO
MICROSONAR
CE

GENERAL DESCRIPTION

NIPRESS pressure transmitters working in 2- or 3-wire systems convert pressure (input signal) to direct current or voltage (output signal) proportional with the pressure. The wide selection of models provides possibility to complete almost all relative or absolute pressure measurement tasks requiring different accuracy. Their design, high overload capability and the possibility to install the units in any physical position allows for a wide range of industrial applications.

NIPRESS D-200 series featuring capacitance ceramics transducer is applicable to the measurement of normal or corrosive mediums such as gases, fumes or liquids but not suggested for materials tending to sedimentation, crystallisation or stiffening. These units are suitable to measure overpressure as well.

NIPRESS D-300 series with piezoresistive transducer and stainless steel diaphragm is also suitable to dynamic pressure changes. It is not recommended to liquids tending to sedimentation, crystallisation and solidification. Absolute pressure measurement is feasible at ranges over 0.1 bar. Transmitters are available for use in 2- or 3-wire systems with standard 4–20 mA or 0–10 V DC outputs.

NIPRESS D-400 series with piezoresistive or capacitive transducer behind its flush face diaphragm is especially suitable to contaminated liquids and for tanks with bottom measurement of pressure (level). The high temperature versions are able to be used in the pressure range of 0 ... 150 bar operate up to 300 °C. Absolute pressure measurement in the range of over 0.1 bar is possible.

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. Transmitters can be applied both in 2- and 3-wire systems.

All **NIPRESS** transmitters can be equipped with the loop powered, programmable, plug in display **UNICONT PLK-501** to be ordered separately.

MAIN FEATURES

- *Gauge or absolute pressure transmitters*
- *Pressure range from -1 up to 600 bar*
- *Piezoresistive or ceramic sensor*
- *Mini compact type*
- *Stainless steel housing*
- *High accuracy: 0.25% or 0.5%*
- *Standard plug type connector*
- *IP65, IP67 protection*

APPLICATIONS

- *Measuring of gases, vapours and liquids*
- *Overpressure and level measuring tasks*
- *Mounted on tanks, pipes or pressurized vessels*

NIPRESS D-200

NIPRESS D-300

NIPRESS D-400 + UNICONT PLK-501 optional display

TECHNICAL DATA

Type		NIPRESS D-200	NIPRESS D-300	NIPRESS D-400
Measurement range		-1 – 400 bar	-1 – 600 bar	-1 – 400 bar
Overload capability		As per order codes		
Accuracy		0.5 %	0.25 or 0.5% as per order codes	
Medium temperature		– 25 °C ... +125 °C		– 25 °C...+125 °C High temperature version: up to 300 °C
Ambient temperature		– 25°C ... +85 °C		
Sensing principle		Capacitance	Piezoresistive	Piezoresistive, above 40 bar: Capacitance
Material of wetted parts	Sensor	Alu. oxide ceramics Al_2O_3 (internal diaphragm)	1.4435 stainless steel (internal diaphragm)	1.4435 stainless steel (flush face diaphragm) [1]
	Sensor sealing	FKM (Viton)	FKM (Viton) [2], P > 60 bar: NBR	Threaded: FKM (Viton) [3], P > 60 bar: NBR Pipe-coupling, Tri-clamp: none
	Process connection	1.4301 stainless steel	1.4404 stainless steel	1/2" BSP or 1" BSP and P > 40 bar 1.4571 stainless steel 1" BSP connection and P ≤ 40 bar: 1.4435
	Housing	1.4404 stainless steel		
Output		4–20 mA	4–20 mA; 0...10 V DC	
Power supply		8...32 V DC	4–20 mA output: 8 – 32 V DC 0–10 V DC output: 14 – 30 V DC	
Load resistance		$R_t \leq \frac{U_1 - 8\ V}{0.02\ A}\ \Omega$	2-wire current output: $R_t \leq \frac{U_1 - 8\ V}{0.02\ A}\ \Omega$; 3-wire voltage output: $R_t > 10\ k\Omega$	
Process connection		As per order codes		
Electrical connection		Pg 9 DIN 43650	Pg 9 DIN 43650 connector [4]	
Electrical protection		Class III.		
Ingress protection		IP65	IP65 / IP67 (integrated cable version)	
Mass		~ 0.14 kg		~ 0.5 kg

[1] Standard pressure transmitting medium is silicon oil, food industry compatible oil is available on special request
[2] NBR, EPDM sealing (p≤160 bar) is available on special request
[3] FFKM sealing is available on special order
[4] Integrated cable version is available on special request

NIPRESS D-200

2-wire mini compact pressure transmitter for gauge pressure measurement
Output: 4-20 mA, Diaphragm: ceramic, Measurement range: 0-400 bar

Measuring method

D □ ■ – 2 ■ 2 – ■

R	Gauge
E	Absolute

Process connection

D ■ □ – 2 ■ 2 – ■

A	1/4" BSP according to EN837 (manometer)
C	1/2" BSP according to EN837 (manometer)
G	1/4" NPT

Range / Overpressure

D ■ ■ – 2 □ 2 – ■

0	-1-0 bar / 3 bar (only with 1% accuracy)
5	0-1 bar / 3 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 / 650 bar

Accuracy

D ■ ■ – 2 ■ □ – ■

2	0.5%

Output

D ■ ■ – 2 ■ 2 – □

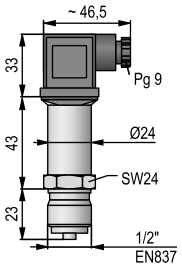
2	4-20 mA
3	0-10 V

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

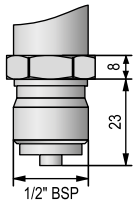
EPDM sealing
M12x1 (4-pin) electronic connection, plastic
Oil and grease-free version
Oxygen application (max. 25 bar, FKM sealing)

Accessories to order

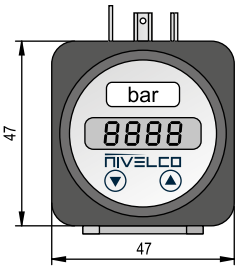
P L K – 5 0 1 – 2	Plug-in indicator
P L K – 5 0 1 – 3	Plug-in indicator with PNP output



DRC-2□2



1/2" BSP EN837



PLK-501

NIV24
DRC-252-2
DRC-272-2
DRC-292-2
DRC-2A2-2
DRC-2B2-2

SENSORS

NIPRESS D-300

2- /3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4-20 mA or 0-10 V, Diaphragm: stainless steel, Measurement range: -1 - 600 bar

Measuring method

D □■ – 3 ■■ – ■

R	Gauge
E	Absolute (p ≥ 0,4 bar)

Process connection

D ■□ – 3 ■■ – ■

A	1/4" BSP
C	1/2" BSP
G	1/4" NPT (max. 40 bar)
H	1/2" NPT

Range / Overpressure

D ■■ – 3 □■ – ■

0	-1-0 bar / 3 bar
1	0-0.1 bar / 0.5 bar
R	0-0.16 bar / 0.5 bar
2	0-0.25 bar / 1 bar
3	0-0.4 bar / 1 bar
4	0-0.6 bar / 3 bar
5	0-1 bar / 3 bar
6	0-1.6 bar / 6 bar
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 / 100 bar
D	0-40 bar / 100 bar
E	0-60 bar / 140 bar
F	0-100 bar / 340 bar
G	0-160 bar / 340 bar
H	0-250 bar / 600 bar
J	0-400 bar / 600 bar
K	0-600 bar / 1000 bar

Accuracy

D ■■ – 3 ■□ – ■

1	0.25% (p ≥ 0.4 bar)
2	0.5%
4	0.1% (not in combination with SIL)

Output / Approval

D ■■ – 3 ■■ – □

2	4-20 mA
3	0-10 V
6	4-20 mA / Ex ia
C	4-20 mA, SIL2
D	4-20 mA, SIL2 / Ex ia

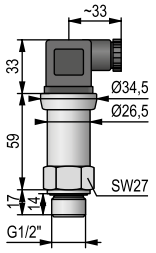
Available on request (should be given in the text of the order)

EPDM, FKM, NBR sealing
M12x1 (4-pin) electronic connection, metal
Integrated cable version (IP68), +3.8 EUR/m, PVC cable

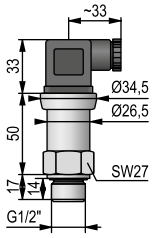
Accessories to order*

P L K – 5 0 1 – 2	Plug-in indicator
P L K – 5 0 1 – 3	Plug-in indicator with PNP output

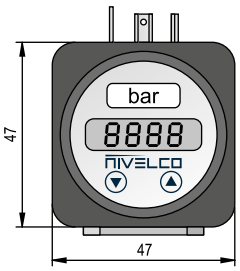
* Only for 2-wire version



DR□-3□□, DE□-3□□
P=<40 bar



DR□-3□□, DE□-3□□
P=>40 bar



PLK-501

NIV24
DRC-3A2-2
DRC-3B2-2

NIPRESS D-400

2- /3-wire mini compact pressure transmitter for absolute and gauge pressure measurement
Output: 4-20 mA or 0-10 V, Diaphragm: stainless steel flush, Measurement range: -1 - 400 bar

Measuring method

D □■ – 4■■ – ■

R	Gauge up to 125°C
E	Absolute up to 70°C (above 0.6 bar only)
H	Gauge up to 150°C (up to 150 bar only)
J	Gauge up to 200°C (up to 70 bar), up to 300°C (between 70-150 bar only)

Process connection

D ■□ – 4■■ – ■

B	1/2" BSP (p ≥ 1 bar)
C	1/2" BSP (sensor: 1.4404) max. 125°C, -0.3-40 bar; without media separator
D	3/4" BSP (over 0.6 bar)
E	1" BSP (over 0.25 bar)
F	1 1/2" BSP
T	3/4" Triclamp (1-40 bar)
L	1" Triclamp (0.6-40 bar)
M	1 1/2" Triclamp (0.4-40 bar)
N	2" Triclamp (0.25-40 bar)
O	DN 25 Pipe coupling (DIN 11851) 0.6-40 bar
P	DN 40 Pipe coupling (DIN 11851) 0.4-40 bar
R	DN 50 Pipe coupling (DIN 11851) 0.25-40 bar
V	VARIVENT DN 40/50

Range / Overpressure

D ■■ – 4□■ – ■

0	-1-0 bar / 3 bar
1	0-0.1 bar / 0.5 bar
R	0-0.16 bar / 0.5 bar
2	0-0.25 bar / 1 bar
3	0-0.4 bar / 1 bar
4	0-0.6 bar / 3 bar
5	0-1 bar / 3 bar
6	0-1.6 bar / 6 bar
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

Accuracy

D ■■ – 4■□ – ■

1	0.25% (0.4 bar ≤ p ≤ 40 bar)
2	0.5%

Output / Approval

D ■■ – 4■■ – □

2	4-20 mA
3	0-10 V
6	4-20 mA / Ex ia
C	4-20 mA, SIL2
D	4-20 mA, SIL2 / Ex ia

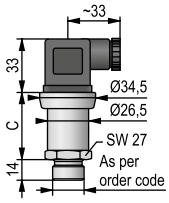
Available on request (should be given in the text of the order)

Filled with food compatible oil (not available for D_C-_ _ _-_)
FFKM sealing
M12x1 (4-pin) electronic connection, metal
Integrated cable version (IP68), +3.8 EUR/m, PVC cable

Accessories to order*

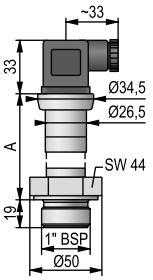
PLK-5012	Plug-in indicator
PLK-5013	Plug-in indicator with PNP output

* Only for 2-wire version



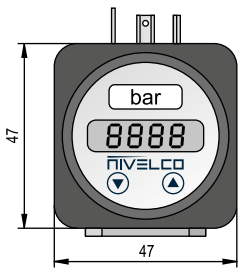
DRC-4□□, DEC-4□□

Pressure	P ≤ 40 bar	P > 40 bar
C	45	59



D□E-4□□

Type	DRE/DEE	DHE	DJE
A	61.5	82.5	132.5



PLK-501

SENSORS

GENERAL DESCRIPTION

MICROSONAR proximity sensors use non-contact ultrasonic principles to detect and measure the position of an object. They act as proximity switches, or transmit the measurement of the distance from sensor face to the target. For transmitter models the output signal is either 4–20 mA or 0–10 V, which can be assigned to any part of the nominal range. Switching points of the proximity switch option can be set to any point within the range.

MAIN FEATURES

- *Non-contacting sensor*
- *Analogue or switch output*
- *Narrow beam angle*
- *2 measuring ranges (1 m, or 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*

APPLICATIONS

- *Sensing distance of objects*
- *Proximity sensing and switching*
- *For small transport vehicles, trolleys, fork-lifts*
- *For packaging equipments*
- *For positioning equipments*

UTP-211

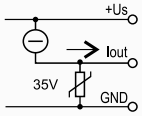
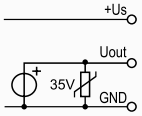
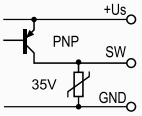
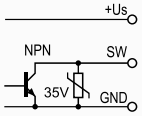
URS-213

URP-263

TECHNICAL DATA

General data		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	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					
Power supply		10.8 ... 30 V DC					
Consumption Us = 12 V		< 55 mA	< 41 mA	< 31 mA (1)	< 54 mA	< 40 mA	< 30 mA (1)
Consumption Us = 24 V		< 63 mA	< 49 mA	< 39 mA (1)	< 61 mA	< 47 mA	< 37 mA (1)
Input protection		Reverse polarity, transient surge, ESD					
Integrated cable		Shielded cable with PVC coating L = 3 m					
Cable core		4 x 0.5 mm²					
Electrical protection		Class III.					
Ingress protection		U□S – 21□: IP67, U□P – 21□: IP68			IP68		
Process connection		U□S-21□: M30x1.5 U□P-21□: G1"			to be fixed on flat surface by 4 screws		
Housing material		U□S: Stainless steel with PP covering U□P: PP housing			PP housing moulded with resin		
Mass		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 (Us > 13 V)	–	–
Load resistance	≤ 500 Ω (Us > 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*

SENSORS

MICROSONAR U-200

Programmable ultrasonic proximity switches with PNP or NPN output
or ultrasonic transmitters with 4-20 mA or 0-10 V output for object sensing

Type

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

U ■□ – 2 ■■ – 4

P	Plastic (PP), IP68
S	Stainless steel, IP67

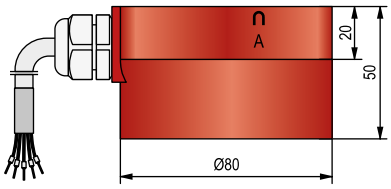
Output

U ■■ – 2 ■□ – 4

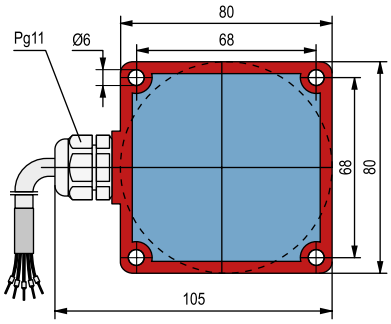
1	4-20 mA (only with UT_)
2	0-10 V (only with UT_)
3	PNP (only with UR_)
4	NPN (only with UR_)

Cable

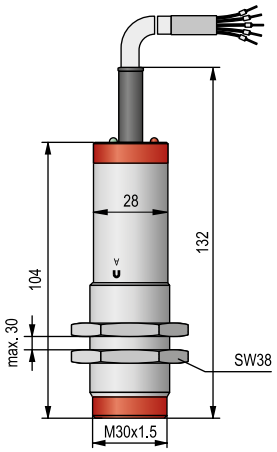
Maximum length 30 m; each started 1 m over the standard 3 m



U□P-2□□



U□P-2□□



U□S-21□

SENSORS

GENERAL DESCRIPTION

The wide 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 process controller units, universal displays, loop displays, interface and other expanding modules, time relays, etc.

The UNICONT PGK intrinsically safe isolator power supply modules provides intrinsically safe power for 2-wire transmitters operating in hazardous locations and ensure galvanic insulation between input and output. The special feature of the unit is its high accuracy signal conversion.

The UNICOMM SAK-305 communication modules are able to communicate between the HART-capable field transmitters and the process controller PC-s or PLC-s, via USB or RS485 communication line.

MULTICHANNEL PROCESS CONTROLLERS

MultiCONT

- 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
- Explosion-proof models

page 183

UNIVERSAL INTERFACE MODULES

UNICONT PJK

- MultiCONT expanding module
- RS485 communication
- Output variations:
  – 2x current outputs
  – 2x relay outputs (250 V AC, 8 A)
  – 1x current output and 1x relay
- DIN rail mountable
- Provides galvanic isolation
- Level controlling and limit level indication

page 186

CURRENT CONTROLLED SWITCHES

UNICONT PKK

- 4–20 mA input
- DIN rail mountable
- Can power 2-wire transmitters
- Galvanic isolation
- Power relay (SPDT) output
- Switching amplifier for vibrating forks
- Wire state monitoring
- Explosion-proof models

page 187

LOOP INDICATORS

UNICONT PD

- 4–20 mA loop operated
- Operation without external power supply
- 6-digit plug-in LCD display
- 20 mm digit height
- Universal field indicator for any transmitters
- 4-20 mA / HART converter version
- Stainless steel flameproof housing
- Explosion-proof models

page 189

UNIVERSAL CONTROLLERS

UNICONT PM

- Dual line 4-digit LED display
- Pt 100, Ni100, J, K, S type. sensor, 4-20 mA or 0-10 V input
- Up to 3 power relays
- ON-OFF, PD or PID control
- Auto tuning
- Transmitter power supply
- Heating / cooling control

page 192

EX ISOLATOR POWER SUPPLY

UNICONT PGK

- 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
- Explosion-proof models

page 196

UNIVERSAL PUMP CONTROL SYSTEM

UNICONT PSW

- Low cost automatic pump control system
- Ultrasonic level measurement
- 0.4 - 3m measurement range
- Programmable pump cycling
- Controlling of one-phase pumps
- Incorporated circuit breaker
- IP68 protected sensor

page 197

POWER SUPPLY

NIPOWER

- Output voltage: 12 / 24 V DC
- Output current: 2500 mA / 1250 mA
- Stabilized DC output
- Switching-mode power supply
- Short-circuit protection
- Overload protection
- Overvoltage protection
- DIN rail mountable

page 198

TIME RELAY

NITIME

- 2 and 10 function types
- Wide time range: from 0.1 sec ... 100 days
- Small size
- Universal power supply voltage
- DIN rail mountable
- Relay output

page 199

HART MODEM

UNICOMM

- HART - USB/RS485 modem
- DIN rail mountable version
- Test clip connector version
- No need for power supply
- Galvanic isolation
- Explosion-proof models

page 200

PROCESS VISUALIZATION SOFTWARE

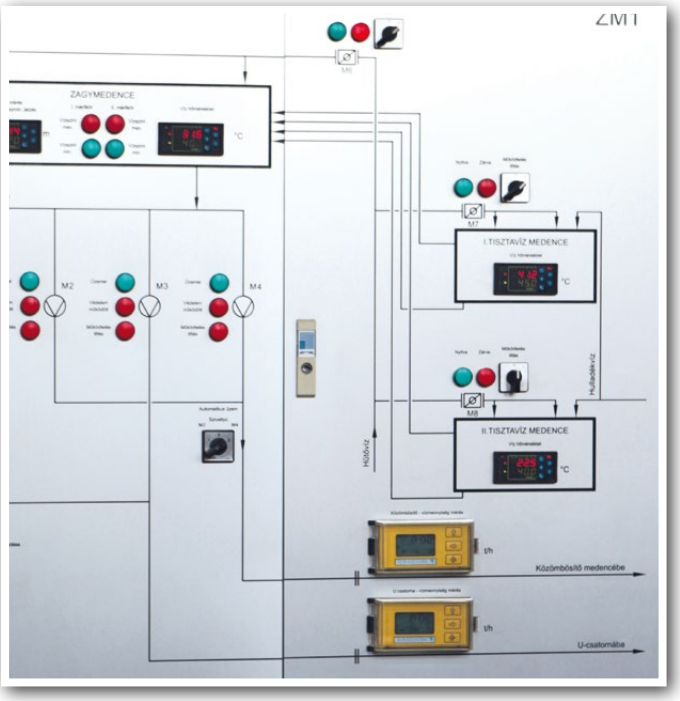
NIVISION

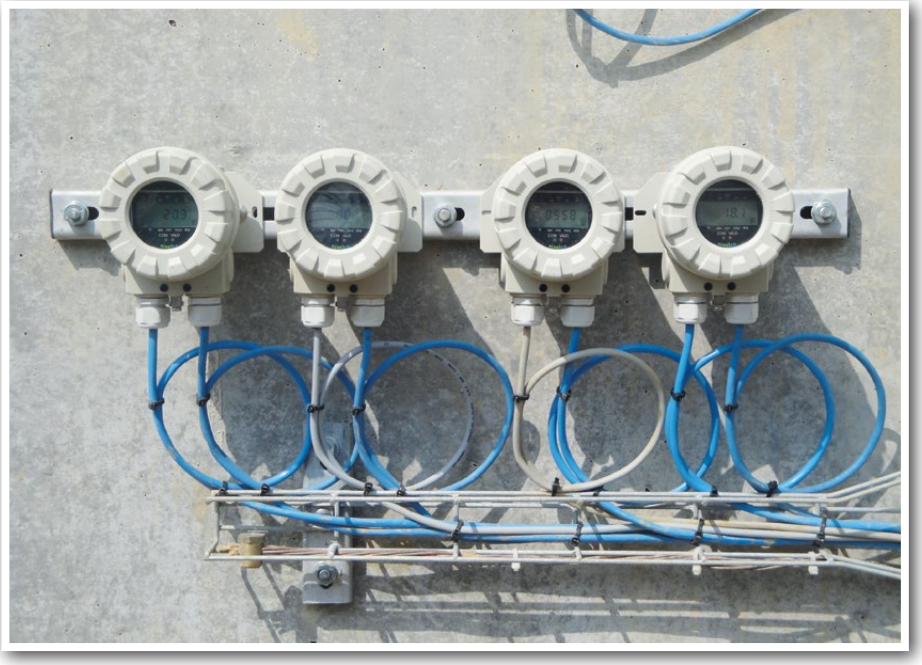
- Online monitoring of measured values
- Tank configuration
- Transmitter configuration
- Real-time trend analysis
- Data logging
- Database handling
- Archiving
- Tank-farm visualization

page 201


HIGH LEVEL
W1
WASTE SOLVENT
W2
WASTE SOLVENT
W3
WASTE SOLVENT
C1
CLEAN SOLVENT
C2
CLEAN SOLVENT
C3
CLEAN SOLVENT

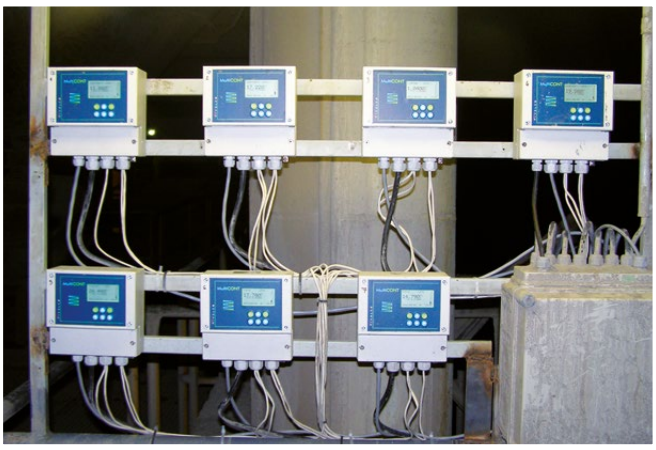

NIVELCO
UNICONT
PGX-101


ZAGYMEDENCE
I.TISZTAVÍZ MEDENCE
II.TISZTAVÍZ MEDENCE
M2
M3
M4
M7
M8
Közömbösítő medencébe
U-csatornába

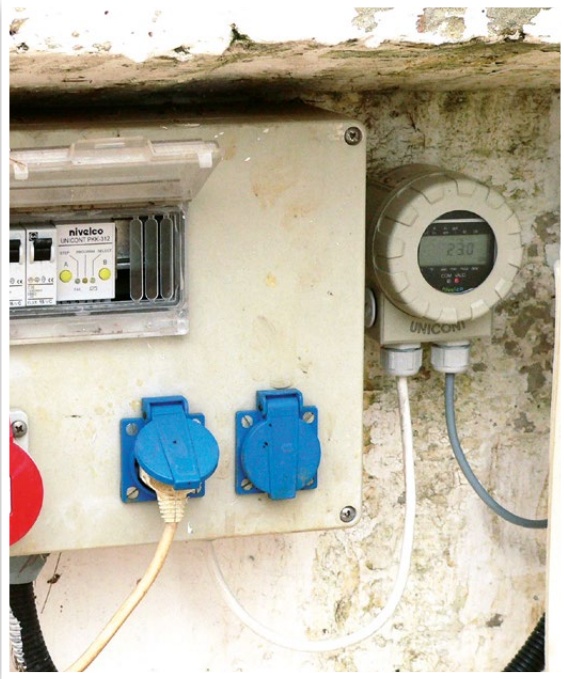



MultiCONT
MultiCONT
MultiCONT
A.
R.
C.
M.


UNICONT PKK-312




ADAM



GENERAL DESCRIPTION

The **MultiCONT** unit is a universal interface between **NIVELCO**'s HART-capable intelligent level transmitters and the other elements of the process control system like the PC-s , PLC-s, displays and the actuators. Besides its role as an interface, the **MultiCONT** ensures the powering of the 2-wire transmitters while being capable of complex control tasks. The MultiCONT unit supports communication with a maximum of 15 standard or 4 Ex ia certified NIVELCO's HART-capable 2- and / or 4-wire transmitters. If **MultiCONT** is used with **NIVELCO's MicroTREK** or **PiloTREK** microwave level transmitters the maximum number of transmitters in a loop should not exceed 6 pcs. for normal transmitters and 2 pcs. for Ex version transmitters. If a system contains more transmitters than one **MultiCONT** can handle, further **MultiCONT** units can be wired in series via an RS485 line. Remote programming of the transmitters and downloading of the parameters and measured data is possible using the **MultiCONT**. The various outputs such as 4–20 mA, relays and digital outputs can be controlled using measured values and new values calculated from the measured values. The internal current outputs (max. 2 pcs.) of the **MultiCONT** can transfer and even modify information supplied by the transmitters. The built-in relays (max. 5 pcs.) can be freely programmed and assigned to the transmitters. If a system contains more transmitters than one **MultiCONT** can handle, further **MultiCONT** units can be organised in chain via RS485 interface. The large dot-matrix display allows visualisation of a wide range of informative display functions. One special feature is the "Echo-Map" visualisation when communicating with **NIVELCO's EchoTREK** and **EasyTREK** transmitters.

MAIN FEATURES

- *As a Universal Process Controller provides for a flexible solution for commissioning a process control system consisting of any HART-based intelligent (level, temperature or pressure) transmitters*
- *Galvanically isolated 4–20 mA outputs for transmitters*
- *1 to 15 (standard) or 1 to 4 (Ex ia) channels*
- *Highly informative large display*
- *Ex ia model is available*
- *Simple 6-button programming*
- *Trend logging into internal memory or SD memory card*
- *USB connector for downloading data from internal FLASH memory*
- *Expanding with Universal Interface Modules via RS 485 line*
- *Echo Map for EchoTREK and EasyTREK ultrasonic transmitters*

MultiCONT
PRD-200

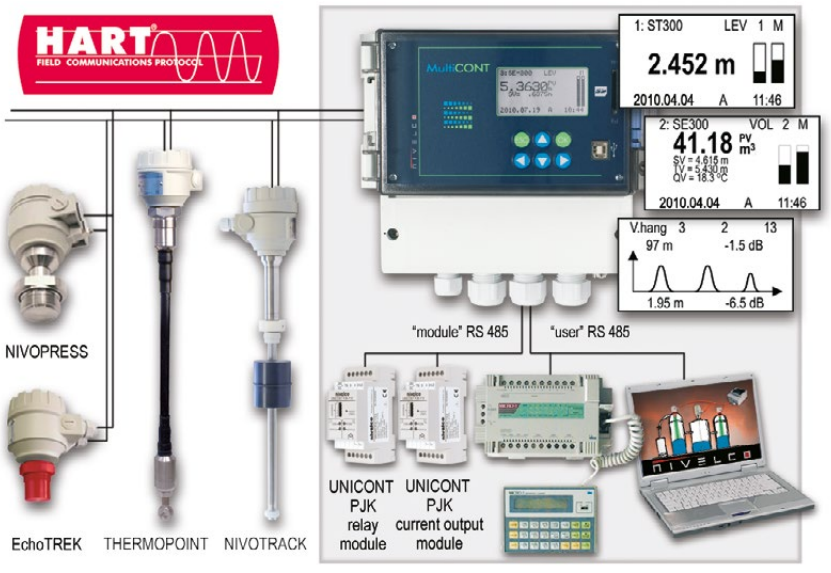
APPLICATIONS

- *Remote programming, displaying of transmitters*
- *Power supply for 2-wire transmitters*
- *Process controller for HART capable transmitters*
- *Displaying measurement data Numerical and in bargraph mode*
- *Data transmission on RS 485 line (with HART or MODBUS protocol)*
- *Simple datalogging*
- *Trend logging or logging of flow measurement*

CERTIFICATIONS

- *ATEX approved [Ex ia]*
- *ATEX approved [Ex ia D]*
- *IEC approved [Ex ia]*

TYPICAL NETWORK CONTROLLED BY MultiCONT



TECHNICAL DATA

Type		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
Power supply voltage for transmitters		30 V DC / 60 mA (Ex version: 25 V DC / 22 mA)
Graphic display		128 x 64 dot-matrix
Relay		Max. 5 pcs, SPDT 250 V AC, AC1, 5 A
Analogue output		Max. 2 pcs, galvanically isolated 4–20 mA, Max. load: 500 Ω, with overvoltage protection
Number of powered transmitters		Max. 15 pcs standard, or max. 4 pcs Ex
RS 485 interface	"user"	Galvanically isolated, HART and MODBUS protocol
	"module"	Galvanically isolated, HART protocol
Logger unit		Capacity: FLASH = 65000 entries; SD card = depends on the card! (max. 2 GB)
Housing material		Polycarbonate (PC)
Mounting		Wall mountable
Ambient temperature		-20 °C … +50 °C
Ingress protection		IP65
Electrical protection		Class I. / III.
Mass		0.9 kg
Special data for Ex certified models		
Ex marking	ATEX	See: www.nivelco.com
	IEC Ex [1]	
Intrinsically safe data		
Power supply voltage for transmitters		25 V DC / 22 mA
Ambient temperature		-20 °C … +50 °C

[1] *Need of IEC is to be specified with order*

SPECIAL FEATURES

Trend logging (optional)

Onboard logging capable versions of **MultiCONT** are able to store measurement values and three additional parameters of the connected transmitters in a measurement system into the internal FLASH memory or an SD memory card. The two modes, time-controlled and event-controlled logging modes can be used. Monitoring the average, minimum and maximum value or highest values of the flow can be used only for NIVELCO manufactured transmitters used in flow-metering mode. Content of the internal memory is retrievable through USB port, within the capacity of 65000 entries. Maximum capacity of the applicable SD card is 2 GB.

NIVISION (optional) Process Visualisation Software

RS 485 capable versions of **MultiCONT** are able to communicate with NIVELCO's **NIVISION** process visualization software to indicate parameters of a process control system graphically on a process controller PC. The process, the measured values or any further processed values can be visualized also in tabular form with **NIVISION**. The **NIVISION** performs data logging, trend monitoring, database handling and various other tasks in addition to a basic visualization. The software is sold as a custom-tailored product.

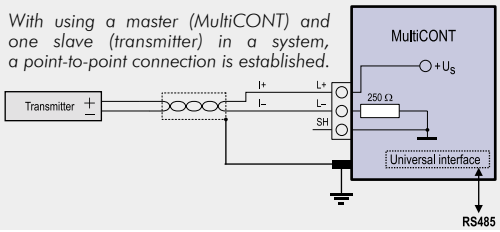
OUTPUT TYPE SELECTION

Outputs	Only display (without relay)	No. of relays				
		1 pc.	2 pcs.	3 pcs.	4 pcs.	5 pcs.
Only display (w.o. RS 485 or current output)	■	■	■	■	■	■
RS 485 Interface	■	■	■	■	■	■
1x 4-20 mA output	■	■	■	■	■	
2x 4-20 mA output	■	■	■	■	■	
RS 485 + 1x 4-20 mA analogue output	■	■	■	■	■	
RS 485 + 2x 4-20 mA analogue outputs	■	■	■	■	■	

COMMUNICATION BETWEEN MultiCONT AND TRANSMITTERS

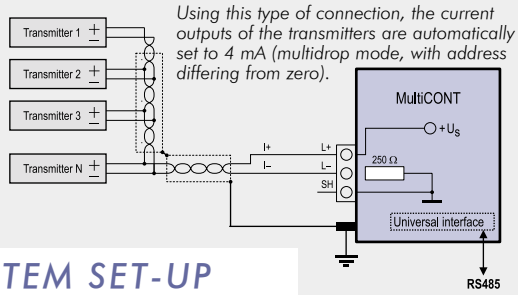
Point-To-Point connection

With using a master (MultiCONT) and one slave (transmitter) in a system, a point-to-point connection is established.



Multipoint connection (Multidrop). Multiple slaves connected in parallel

Using this type of connection, the current outputs of the transmitters are automatically set to 4 mA (multidrop mode, with address differing from zero).



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

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

Version

P ■□ – 2 ■■ – ■

W	IP65 Enclosure
C	IP65 Enclosure, transparent cover
D	IP65 Enclosure, transparent cover, logger

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
Y	Display, RS485, 2 current output and 4 relays

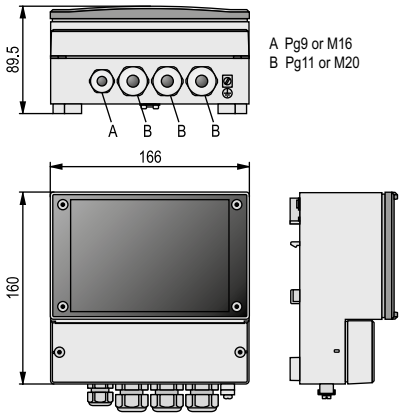
* Other output configurations on request

Power supply / Approval

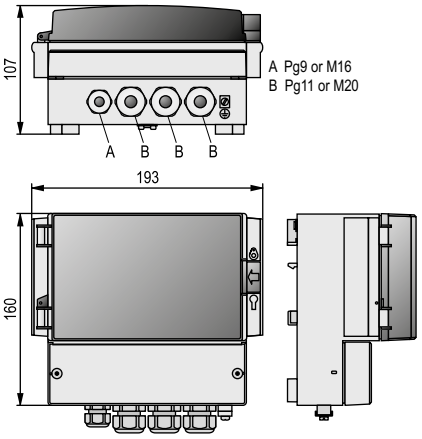
P ■■ – 2 ■■ – □

1	85-255 V AC
2	11.4-28 V AC and 11.4-40 V DC
5	85-255 V AC / Ex (max. 4 channels)
6	11.4-28 V AC and 11.4-40 V DC / Ex (max.4 channels)

Note: Please check relevant page for the prices of UNICONT PJK
Need of IEC is to be specified with order



PEW-2□□



PEC-2□□

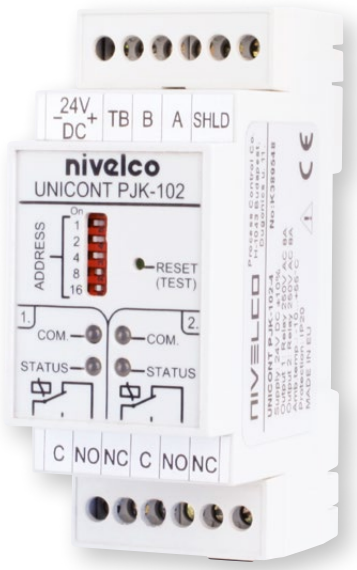
GENERAL DESCRIPTION

The **UNICONT PJK** series is a universal interface module that can be controlled via RS485 line, and (depending on type) provides relay(s) and/or 4–20 mA current output(s). The DIP switch in the front panel of the module is for setting the address.

The Universal Interface Modules can be a 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 essential solution if the number of relays or current outputs of the **MultiCONT** is not enough in a system. The device can be used also as a peripheral unit for PLC or PC controlled process control systems communicating via MODBUS protocol. The sum of relays in the **UNICONT PJK-100** extension modules and the **MultiCONT** must not exceed 64, and the sum of analogue 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 maximal number of these modules may be 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 is only for setting the address.



PJK-102

MAIN FEATURES

- *RS 485 interface*
- *MODBUS or HART communication protocol*
- *Output:*
  2 current or 2 relay output
  For mixed systems
  (with current and relay output)
- *DIN rail mountable*

APPLICATIONS

- *Universal Interface Module*
  - *For PLC process control systems*
  - *For automated process control systems operating on RS485*
- *Expanding module for MultiCONT*

TECHNICAL DATA

Type	PJK-1□□-4
Power supply	24 V DC ±10%
Power consumption	10 mA + N_{relay} x 11 mA + $N_{current\ generator}$ x 25 mA)±10%
Ambient temperature	– 20 °C … + 50 °C
Electrical connection	max. 2.5 mm² twisted, or max. 4 mm² solid wire
Electrical protection	Class III.
Mechanical connection	EN 60715 rail
Ingress protection	IP20
Mass	0.11 kg

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 mA … 21.999 mA	
	Error indication	–		≤ 3.6 mA, or ≥ 22 mA	
	Resolution	–		14 bit	
	Accuracy	–		40 µA	
	Temperature dependence	–		max. 15 µA / 10 °C	

GENERAL DESCRIPTION

UNICONT PKK-312 series is a 4–20 mA current controlled limit switch featuring galvanic isolation also available as an intrinsically safe unit. 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 with the set (taught) value and the state of the galvanically isolated relay changes in accordance with the comparison mode programmed.
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 energised or de-energised 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 doing any programming the galvanic isolated limit switch is able to perform relay switching signal based on the monitoring of the vibrating fork's output current changes between the freely vibrating and the immersed states.

PKK-312

MAIN FEATURES

- *4–20 mA input*
- *Relay output*
- *Rail mountable*
- *Intrinsically safe Associated Apparatus*

APPLICATIONS

- *Galvanic isolated limit switch*
- *Power supply for transmitters*
- *Cable state monitoring*

CERTIFICATIONS

- *ATEX approved [Ex ia]*
- *ATEX approved [Ex ia D]*

TECHNICAL DATA

Type		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
Output	Relay	1 x SPDT
	Rating	250 V AC, 8 A, AC1
Electrical connection		max. 2.5 mm² twisted, or max 4 mm² solid wire
Mechanical connection		EN 60715 rail
Ingress protection		IP20
Mass		≈ 0.21 kg

Type	Standard version				Ex version			
	PKK-312-1	PKK-312-2	PKK-312-3	PKK-312-4	PKK-312-5 Ex	PKK-312-6 Ex	PKK-312-7 Ex	PKK-312-8 Ex
Power supply (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	–				See: www.nivelco.com			
Intrinsically safe data	–							
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	–10 °C ... +55 °C							

UNICONT PJK-100

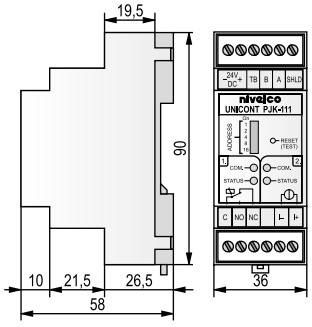
DIN-rail mountable universal interface module that can be controlled via RS485 line
and provides relay(s) and/or 4-20 mA current output(s)

Type	
P J K – 1 0 2 – 4	with 2xSPDT relay output
P J K – 1 1 0 – 4	with 1x4-20mA current output
P J K – 1 1 1 – 4	with 1 x 4-20mA current output and 1xSPDT relay output
P J K – 1 2 0 – 4	with 2x4-20mA current output

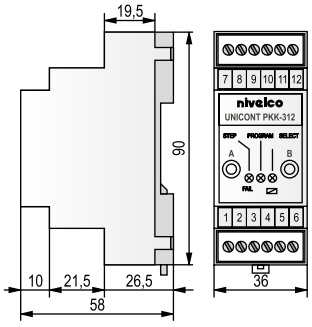
UNICONT PK-300

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 – 5	230 V AC / Ex
P K K – 3 1 2 – 6	110 V AC / Ex
P K K – 3 1 2 – 7	24 V AC/DC / Ex ia
P K K – 3 1 2 – 8	24 V DC / Ex vibrating fork



PJK-111



PKK-312

NIV24
PKK-312-1
PKK-312-8 Ex

GENERAL DESCRIPTION

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 indication of temperature, pressure, level, etc. values 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 additional power supply. Besides displaying the loop current or the process values, these units convert input current to HART signals and so enable devices that have analogue outputs only to be integrated into HART multidrop systems. Robust enclosure makes applications under harsh conditions also possible. The **UNICONT PDF-600** series with flameproof (Ex d approved) stainless steel housing meets the special requirements of certain industry segments, such as Food and Beverage, Marine, Oil and Gas.

MAIN FEATURES

- *4–20 mA input*
- *2-wire loop indicator*
- *3-wire 4–20 mA + HART transmitter*
- *Wall mountable*
- *Scalable display*
- *IP67 protection*
- *Ex version*

APPLICATIONS

- *General indicator*
- *Suitable for 4–20 mA transmitters*
- *4–20 mA – HART converter*
- *Displaying level, volume, temperature, pressure, etc.*

CERTIFICATIONS

- *ATEX approved (Ex ia)*
- *ATEX approved (Ex d)*
- *ATEX approved (Ex d+ia)*

UNICONT PDF-400 Ex with flameproof aluminium housing

UNICONT PDF-500 with plastic housing

UNICONT PDF-600 Ex with flameproof stainless steel housing

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 INDICATORS UNICONT PLK

GENERAL DESCRIPTION

The **UNICONT PLK-501** type plug-in displays with 4 digit LED indicator can be connected to the 2-wire transmitters with its ISO 4400 connector (such as **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.

MAIN FEATURES

- *4 - 20 mA input*
- *4-digit LED indicator*
- *Rotatable display*
- *Operation without external power*
- *PNP switch output*
- *IP65 protection*

PLK-501

APPLICATIONS

- *Mountable between standard ISO 4400 connectors*
- *For 2-wire transmitters with 4-20 mA output*

TECHNICAL DATA

Type	Standard PDF-401-2 PDF-501-2	Ex version PDF-401-6 Ex PDF-401-A Ex PDF-401-C Ex PDF-601-A Ex	Standard with HART output P□F-401-4 P□F-501-4	Ex version with HART output P□F-401-8 Ex P□F-401-B Ex P□F-401-D Ex P□F-601-B Ex
Powering	2-wire		3-wire	
Measured value (input signal)	4-20 mA current loop			
Measurement range	3.6 - 22 mA		0 - 22 mA	
Output	4-20 mA current loop		4-20 mA and/or HART for 4–20 mA current limit values: 3.9-20.5 mA terminal resistor for HART: Rtmin = 250 Ω	
Power supply	-		10V – 36 V DC	
Display	SAP-202 display, Range of displayed value: -9999 …+29999			
Accuracy	± 0.1 % if displayed value is >10000; ±0.2% if displayed value is <10000			
Temperature error	± 0.05 % / 10°K			
Voltage drop	< 1.6 V		< 1 V	
Overvoltage capability	50 mA			
Damping time	Selectable: 3 s, 5 s, 10 s or 20 s			
Ambient temperature	Standard: -40°C …+70°C, with display: -25°C …+70°C; Ex type: see Special data for Ex certified models table			
Electrical connection	Standard: M20x1.5 cable gland, cable diameter: Ø 6...12 mm; Ex type: see Special data for Ex certified models table			
Electrical protection	Class III			
Ingress protection	IP67			
Housing	Paint coated aluminium or plastic PBT	Paint coated aluminium or stainless steel	Paint coated aluminium or plastic PBT	Paint coated aluminium or stainless steel
Mass	With aluminium housing: ≈0.9 kg			
	With plastic housing: ≈0.55 kg	With st. steel housing: ≈2.5 kg	With plastic housing: ≈0.55 kg	With st. steel housing: ≈2.5 kg

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	PDF-401-6 Ex PDF-501-6 Ex	P□F-401-8 Ex P□F-501-8 Ex	P□F-401-D Ex	PDF-401-C Ex	PDF-401-A Ex / P□F-401-B Ex PDF-601-A Ex / P□F-601-B Ex
Protection type	Intrinsically safe		Intrinsically safe with flameproof enclosure		Flameproof enclosure
Ex marking Intrinsically safe limit data	See: www.nivelco.com				
Electrical connection	PDF-500: Plastic M20 x1,5 cable glands, cable: Ø 6…12 mm PDF-400: Metal M20 x1,5 cable glands, cable: Ø 7…13 mm		Metal M20 x1,5 cable glands for Ø 8…12 mm cable		
	Shielded twisted cable with 0.25 … 1.5 mm² wire cross section				
Ambient temperature	–25 °C…+70 °C	– 40 °C…+70 °C, with display: – 25 °C…+70 °C		– 25 °C…+70 °C	

SYSTEM COMPONENTS

PLUG-IN LOOP INDICATORS UNICONT PLK

TECHNICAL DATA

Type	PLK-501-2, PLK-501-3
Input	4 – 20 mA
Output	PNP open collector switch, max. rating: 125 mA
Display	4-digit LED with 7.6 mm height
Ambient temperature	0 °C … +70 °C
Setting range	-1999 … +9999
Delay	0.3 … 30 s
Electrical protection	Class III.
Ingress protection	IP65
Electrical connection	ISO 4400 connector
Housing	Plastic
Mass	≈ 0.1 kg

UNICONT PDF/PTF-400/500/600

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	Aluminium (paint coated)
5	Plastic, PBT, glass fibre reinforced
6	Stainless steel (only Exd version)

Output / Approval

P ■ F – ■ 0 1 – □

2	-
4	4-20 mA + HART
6	- / Ex ia
8	4-20 mA + HART / Ex ia
A	- / Ex d
B	4-20 mA + HART / Ex d
C	- / Ex d + ia
D	4-20 mA + HART / Ex d + ia

Accessories to order (see relevant page for details)

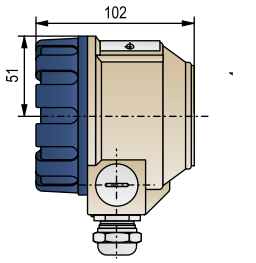
S A P – 2 0 2 – 0	Plug-in display module
S A T – 3 0 4 – 0	HART-USB modem
S A K – 3 0 5 – 2	HART-USB/RS485 modem
S A K – 3 0 5 – 6	HART-USB/RS485 modem / Ex ia

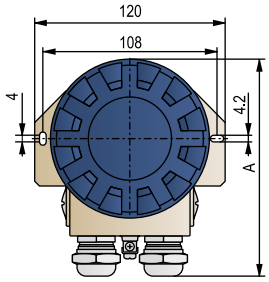
UNICONT PLK-501

2-wire plug-in loop indicator can be inserted between connectors
according to DIN43650, input: 4-20 mA, output: 4-20 mA

Type

P L K – 5 0 1 – 2	Plug-in indicator
P L K – 5 0 1 – 3	Plug-in indicator with PNP output





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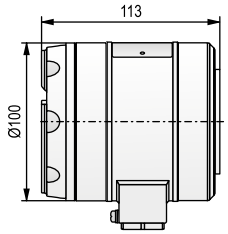

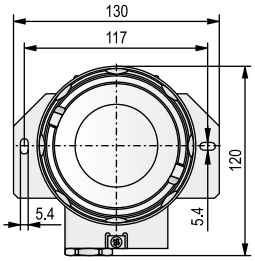

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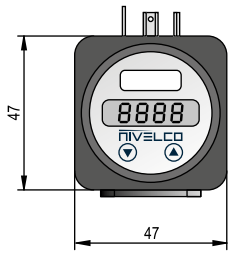
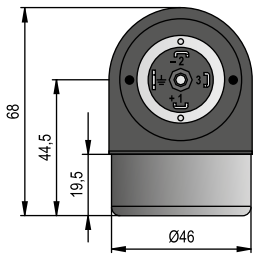




PLK-501

GENERAL DESCRIPTION

The **UNICONT PM-300** is a universal, one or two-channel process controller with relay and analogue outputs and PID algorithm supporting versatile functions. It can be used from standard to extraordinary temperature control (cooling, heating) tasks. Beside the usual inputs, practically all generally used temperature sensors can be connected. Due to its auto tuning feature the controller can successfully handled by technicians unaccustomed to the process control. The dual 4-digit lighting displays allow viewing even from greater distances. The UNICONT PM-300 is highly accurate and easy to handle, thus suitable for applications as panel instrument both in laboratory and industrial process control applications.

MAIN FEATURES

- *Programmable inputs*
- *4 digit LED display*
- *High ratings relay contacts or analogue output*
- *4-20 mA output*
- *ON/OFF, PD or PID control algorithm*
- *Auto tuning feature*
- *Relay outputs up to 4 pcs*
- *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

Type		UNICONT PMM–300	
Universal Inputs		Thermocouples: K, J, T, E, L, U, N, R, S, B, M, A, C, Resistive thermal devices (RTD): Pt 100, JPt 100, Pt500, JPt500, Pt 1000, JPt 1000, Cu 100, Ni 100, 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 pcs)	SPDT 250 V AC 5A AC11	
	Alarm relays (2 pcs)	SPST (NO or NC programmable) 30V DC/250V AC 3A AC11	
	Solid state relay (SSR) drivers (2 pcs)	12V DC, 15 mA	
	Current outputs (2 pcs)	0/4–20 mA DC (max. load: 600 Ω), galvanically isolated shot circuit protected, programmable	
	Supply for transmitters	24V DC, 100 mA, shot circuit protected	
	RS485 MODBUS	Bit rate: 600-38400 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 sec	1 sec
	Derivate time (D)	0 – 4095 sec	1 sec
	Cycle time(T)	0 – 255 sec	1 sec
	Dead band	0 – 255	in PV resolution
	Hysteresis	0 – 255	in PV resolution
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		Ext. temperature sensor to be connected to terminal block. The function can be disabled	
Wire resistance compensation		3-wire, automatic	
Ambient humidity		Max. 85% (relative) non condensing	
Ambient temperature		Operational: 0°C...+55°C, Storage: –20°C...+60°C	
Power supply		85 ... 265V AC, 50/60 Hz, 8VA, 120 V 375 V DC 8 VA 16-32 V DC, 8W, 13-30V AC, 8VA	
Electrical connection		Plug-in terminal blocks (recommended wire cross section: 0.5 - 2.5 mm^2)	
Electrical protection		Class II.	
Ingress protection		Front: IP65, Back: IP20	
Memory protection		Data stored in EEPROM	
Dimensions		101.5 x 48 x 156 mm	
Mass		0.3 kg	

UNICONT PM-300

Universal panel controller and display unit with 4-20 mA analogue, relay, RS485, Ut supply
Universal inputs, PID control algorithm, auto tuning (AT) function, size: 96x48 mm

Version

P M □ – 3 ■ ■ – ■	
M	Standard

Inputs

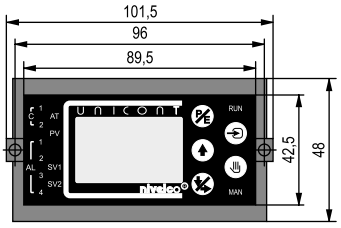
P M M – 3 □ ■ – ■	
1	Universal input (IN1)
2	Two universal inputs (IN1, IN2)
3	Universal input (IN1), 32-point Linearisation
4	Two universal inputs (IN1, IN2), 32-point Linearisation

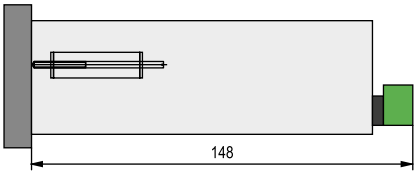
Output

P M M – 3 ■ □ – ■	
1	Current output, 2 relays
2	2 current outputs, 2 relays, power supply for transmitters
3	Current output, 4 relays
4	2 current outputs, 4 relays, RS485, power supply for transmitters

Power supply

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

GENERAL DESCRIPTION

The **UNICONT PM-400 and -500** series universal controllers are 1/16 DIN (48x48 mm) process controllers with relay and analogue outputs or PID algorithm supporting versatile functions. The universal analogue PID-controllers can be used with a Pt-100 resistance thermometer and with different thermocouples for temperature measurement, control as well as processing the signals of transmitters with 4–20 mA and 0–5 V DC or 0–10 V DC output. The output signal of the controller can be a relay, continuous 4–20 mA process current signal or SSR-driver. Additional alarm relay provides for limit monitoring. The unit is microprocessor based, has an auto-tuning software, automatic and its PID controller is able to find the optimum of the P-I-D constants. **PMM-500** series are able to communicate on RS485 line and also able to provide power supply for transmitters. The large bi-coloured display provides easy reading even from far distance.

MAIN FEATURES

- *Universal input*
- *4–20 mA output, relay outputs*
- *SSR driver output*
- *RS485 communication*
- *ON-OFF and PID control*
- *Power supply for transmitters*
- *Auto tuning (AT) feature*
- *48x48 mm front panel*

APPLICATIONS

- *Temperature display*
- *Switching, control tasks*
- *Cooling / heating control*
- *Alarm indication*

PMG-400

PMM-500

TECHNICAL DATA

Type		PMG-41☐	
Input	RTDs (3-wire., automatic wire-resistance comp.)	Pt 100 (–199.9 °C ... +199.9 °C or 0 °C ... +500 °C) R wire: max. 5 Ω	
	Thermocouples (automatic cold junction compensation)	K(–100 °C ... +1100°C); J(0°C ... +800°C)	
		R(0°C ... +1700°C); E (0°C ... +800°C)	
		T(–200°C ... +400°C); S (0°C ... +1700°C)	
		N(0°C ... +1300°C); W (0°C ... +2300°C)	
	Voltage	1–5 V DC; 0 ... 10 V DC	
	Current	4–20 mA DC / 250 Ω	
Control, Output	PID	Proportional band (P)	0 ... 100%
		Integral time (I)	0 ... 3600 sec
		Derivate time (D)	0 ... 3600 sec
		Cycle time(T)	1 ... 120 sec
	Type of output	Relay	SPDT 250 V AC, 3 A, AC11
		SSR driver	12 V DC ±3 V, max 30 mA
		Current	4–20 mA DC (max. load: 600 Ω)
Alarm output		SPST (NO or NC programmable) 250 V AC, 1 A, AC11	
Accuracy of setting and displaying		±0.3% ±1 digit of full range or ±3 °C	
Display	PV (primary value)	red, 4 digits, 7 segments, digit height: 11 mm	
	SV (secondary value)	green, 4 digits, 7 segments, digit height: 7 mm	
Power supply		100 ... 240 V AC 50/60 Hz, max. 5 VA, Operational voltage: 90% ... 110%	
Ingress protection		Front: IP65, Back: IP20	
Electrical protection		Class II.	
Ambient temperature		Operational: -10 °C ... +50 °C, Storage: -20 °C ... +60 °C	
Ambient humidity		35% ... 85% (relative) non condensing	
Dimensions		48 x 48 x 107 mm (front panel cut-out: $45.5^{+0,5}$ x $45.5^{+0,5}$ mm)	
Mass		0.15 kg	

Type		PMM-51☐
Input	RTDs (3-wire., automatic wire-resistance compensation)	Pt100 (–199 °C ... +800 °C)
	Thermocouples (automatic cold junction compensation)	J, T, K, L, N, B, R, S, C, PtRh thermocouples (-240 °C ... +2320 °C)
	Voltage	0–5 V DC; 0 - 10 V DC, 2 – 10 V DC /min. 500 Ω
	Current	4–20 mA DC, 0–20 mA DC / max. 500 Ω
Control	Proportional band (P)	0.5 – 999.9%
	Integral time (I)	1 – 6000 sec
	Derivate time (D)	0 – 6000 sec
	Cycle time (T)	0.5 – 512 sec
Output	Relay	240 V AC, 2 A, AC11, SPDT
	SSR driver	0–10 V DC, max 20 mA
	RS485	Modbus RTU, 1200 – 19200 bps
	Analogue	4–20 mA DC (max. load: 500 Ω)
	Supply for transmitters	24 V DC, 22 mA (19 V DC – 28 V DC)
Display	PV (primary value)	red, 4 digits, 7 segments, digit height: 10 mm
	SV (secondary value)	green, 4 digits, 7 segments, digit height: 8 mm
Power supply		20 - 48 V AC / 22 - 65 V DC, 100 - 240 V AC, max. 5 W / 7 VA
Ingress protection		Front: IP66, Back: IP20
Electrical protection		Class II.
Ambient temperature		Operational: 0 °C ... +55 °C, Storage: -20 °C ... +80 °C
Ambient humidity		20% ... 85% (relative) non condensing
Dimensions		48 x 48 x 110 mm 48 x 48 x 110 mm (front panel cut-out: $45^{+0.5}_{+0.2}$ x $45^{+0.5}_{+0.2}$ mm)
Mass		0.25 kg

UNICONT PMG-400

Universal panel controller and display unit with 4-20 mA analogue, relay, SSR output
1 universal input, PID and ON/OFF control, size: 48x48 mm

Inputs

P M G – 4 □ ■ – 1

1	Universal input (IN1)

Output

P M G – 4 1 □ – 1

1	2 relays
2	1 relay, 1 solid state driver
3	1 relay and 4-20 mA

UNICONT PM-500

Universal panel controller and display unit with 4-20 mA analogue, relay, SSR, RS485, Ut supply
1 universal input, PID control algorithm, auto tuning (AT) function, size: 48x48 mm

Output

P M M – 5 1 □ – ■

1	R1, R2 relays, analogue output
2	R1, R2 relays, Ut
3	R1 relay, analogue output, Ut
4	R1, R2, R3 relays
5	SSR1, SSR2 solid state driver, analogue output
6	SSR1, SSR2 solid state driver, Ut
7	SSR1 solid state driver, analogue output, Ut
8	SSR1 solid state driver, R1 relay, analogue output
A	R1, R2 relays, analogue output, RS485
B	R1, R2 relays, Ut, RS485
C	R1 relay, analogue output, Ut, RS485
D	R1, R2, R3 relays, RS485
E	SSR1, SSR2 solid state driver, analogue output, RS485
F	SSR1, SSR2 solid state driver, Ut, RS485
G	SSR1 solid state driver, analogue output, Ut, RS485
H	SSR1 solid state driver, R1 relay, analogue output, RS485

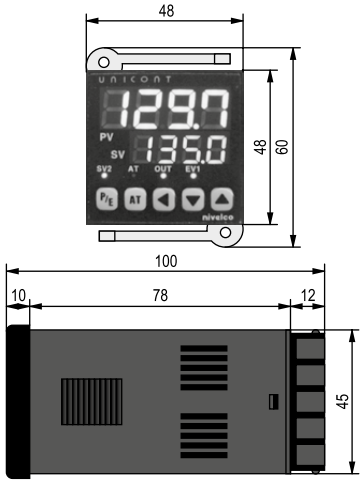
Power supply

P M M – 5 1 ■ – □

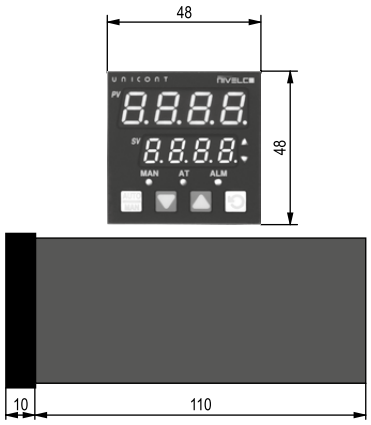
1	100-240 V AC
2	20-48 V AC / 22-65 V DC

Accessories to order

P A M – 5 0 0 – 0	Front panel adapter from 96x48 mm to 48x48 mm anodized aluminium



PMG-41□



PMM-51□

NIV24
PMG-411-1
PMG-412-1
PMG-413-1

GENERAL DESCRIPTION

The **UNICONT PGK-301** intrinsically safe isolator and power supply modules are suitable for providing power supply for transmitters operating in hazardous applications, isolating the input, output and supply voltage galvanically. Moreover the device perform high accuracy signal transmission with 4-20 mA or HART communication between Ex and non-Ex areas. The **UNICONT PGK-301** intrinsically safe isolators perform signal transmission to the non-Ex Zone with microprocessor controlled digital signal processing, which provides transmission accuracy up to 1 μA. This is a special demand in case of certified, high precision (for example magnetostrictive) transmitters. If fast conversion speed is necessary, the high speed types are the ideal choices. The number of connectable transmitters is determined by the intrinsically safe limit data.

MAIN 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*

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*

CERTIFICATIONS

- *ATEX approved [Ex ia]*
- *IEC approved [Ex ia]*

PGK-301

TECHNICAL DATA

Type		High precision		High speed	
		PGK-301-A Ex	PGK-301-B Ex	PGK-301-C Ex	PGK-301-D Ex
Input		4–20 mA			
Out-put	Normal operation	4–20 mA			
	Current error	3.6 mA: I_{IN}=3.6 mA or I_{IN} > 24 mA			
Protection		Input, output, power supply: 125 mA fuse			
Loop resistance		300–1000 Ω / 24 V DC			
Communication		–	HART	–	HART
Power supply		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			
Transmission accuracy (at 20 °C)		1 μA + 0,01% reading error (typically max. 2.5 μA)		8 μA + 0,1% reading error (typically max. 2.5 μA)	
Response time		100 msec		5 msec	
Temperature dependence		< 1 μA/ °C			
Ambient temperature		– 20 °C...+ 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			
Mass		0.25 kg			

SPECIAL DATA FOR Ex CERTIFIED MODELS

Protection type		Intrinsically safe
Ex marking	ATEX	See: www.nivelco.com
	IEC Ex [1]	
Intrinsically safe data		

[1] *Need of IEC is to be specified with order*

UNICONT PGK-301

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

Need of IEC is to be specified with order

NIV24
PGK-301-A, PGK-301-B

SYSTEM COMPONENTS

GENERAL DESCRIPTION

The low-cost **UNICONT PSW** pump control unit is designed for fully automatic level control of small domestic or communal sewage shafts, sumps or wetwells. 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. By 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 useful in case of infrequent usage or low water consumption. The optional **NIVOFLOAT NLP** type float level switches may be used for additional dry-run or overfill protection if safety is a priority. The system can be turned on or off by a single-pole Miniature Circuit Breaker or a Motor Protection Switch.

MAIN FEATURES

- *Cost-saving*
- *Maintenance-free*
- *Fully automatic pump control*
- *Ultrasonic level measurement*
- *0.3-3 m measurement range*
- *Programmable pump cycling*
- *IP68 / IP65 protection*
- *Optional dry-run or overfill protection*

APPLICATIONS

- *Domestic sewage shafts, wetwells*
- *Sumps*
- *Tanks, flood storage*
- *Drainage sumps, pools*

TECHNICAL DATA

Type		UNICONT PSW–1□□–1
Power supply		230 V AC ±10%
Protection	Miniature Circuit Breaker	CLS 4-C10 / 2 10 A bipolar
	Motor Protection Switch	Z-MS2P-10 6.2-10A
Output		1-1 piece of NO relay, 250 V AC, 8A, 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 pcs. plastic cable glands, terminal: max. 4 mm² wire cross section
	Electrical protection	Class I.
	Mechanical connection	wall mountable
	Ingress protection	IP65
	Ambient temperature	–25 °C ... +45 °C
	Mass	~2 kg
Level transmitter	Range	0.3 – 3 m
	Operation principle	ultrasonic
	Housing material	PP
	Medium tempereature	-25 °C ... +60 °C
	Process connection	1" BSP
	Cable	3 m shielded, PVC insulation
	Power supply	24 V DC
	Ingress protection	IP68

[1] *Programmed at the manufacturer; can be modified freely in 0.4-3 m range*
[2] *Accessory, to be ordered separately*

UNICONT PSW-100

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

Power supply

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

Maximum length 30 m; each started 1 m over the standard 3 m

Ultrasonic transmitter

Control unit

GENERAL DESCRIPTION

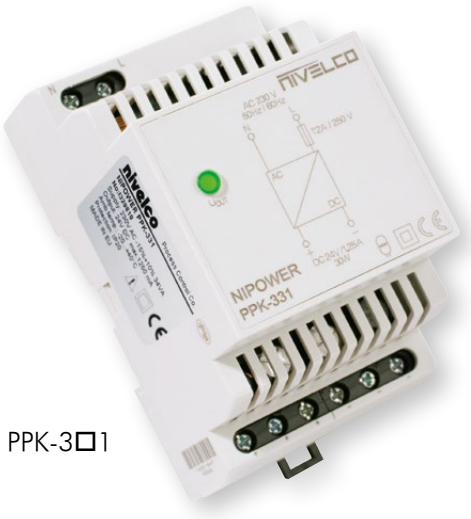
The rail mountable **NIPOWER** switching-mode power supply modules provide 12 V or 24 V stabilized DC output for low power consumption devices.

MAIN FEATURES

- *Stabilized DC output*
- *Switching-mode power supply*
- *DIN rail mountable*
- *Short-circuit protection*
- *Overload protection*
- *Overvoltage protection*

APPLICATIONS

- *For any transmitters*
- *Power supply for sensors*
- *For inductive, capacitive proximity switches*
- *For infrared sensors*
- *Ultrasonic Proximity sensors*



PPK-3□1

TECHNICAL DATA

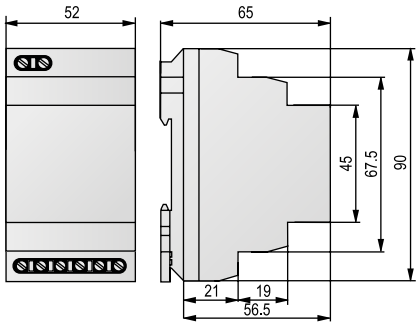
Type	PPK-321	PPK-331
Power supply voltage (U_{IN})	100 – 250 V AC / 50-60 Hz -15%; +10%	
Output voltage (U_{OUT})	12.2 V DC ±2%	24.2 V DC ±2%
Output current [1]	2500 mA	1250 mA
Consumption without load	max. 5 V A	
Consumption with maximum load	max. 78 V A	
Overload capability	max. 120%	
Efficiency	> 75%	
Fuse	T2A / 250 V	
Protection against	short-circuit, overload, overvoltage	
Output voltage indicator	green LED	
Ripple on the output without load	80 mV	
Ripple on the output with maximum load	20 mV	
Delay on switching ON	max. 0.5 sec	
Delay on switching ON after overload	max. 0.5 sec	
Operating temperature	–20°C … +40°C	
Electrical strength between input and output	4 kV	
Electrical connection	terminal, wire cross section: max. 2.5 mm²	
Electrical protection	Class II.	
Mechanical connection	EN 60715 rail	
Ingress protection	IP20	
Mass	136 g	

[1] *Correct air-flow is needed to prevent overheating*

NIPOWER PPK-300

DIN-rail mountable power supply unit
Power supply: 230 V AC, output voltage: 12V DC or 24 VDC

Type	
P P K – 3 2 1 – 1	12 V DC / max. 2.5 A
P P K – 3 3 1 – 1	24 V DC / max. 1.25 A



PPK-3□1

NIV24
PPK-321-1
PPK-331-1

SYSTEM COMPONENTS

GENERAL DESCRIPTION

NITIME time relays are suitable for all kinds of timing tasks of technological equipments. Microprocessor controlled operation, many 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 or motors.

MAIN FEATURES

- *2- and 10-function types*
- *Wide time range*
- *Small size*
- *Universal power supply voltage*
- *DIN rail mountable*
- *Relay output*
- *IP20 protection*

APPLICATIONS

- *Process controlling of repeated tasks*
- *Timed cycling of pumps or compressors*
- *Timing of technologic equipments*
- *Sequential control*

JEL-121 JEL-111

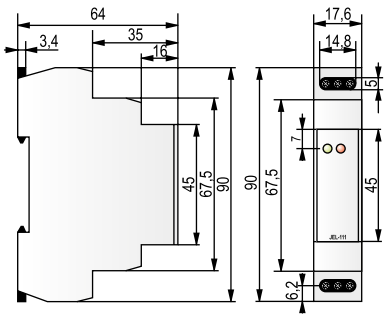
TECHNICAL DATA

Type		JEL-111	JEL-121
Number of functions		10	2
Time ranges		0.1 sec … 10 day	0.1 sec … 100 day
Time setting		rotary switch and potentiometer	
Reset time		max. 150 msec	
Time deviation		5%	
Repeat accuracy		0.2%	
Temperature coefficient		0.01% / °C	
Supply voltage		12-240V AC/DC	
Power consumption		0.7–3 VA AC / 0.5–1.7 W DC	
Output	Relay	1 x SPDT	
	Rated current	16 A AC1	
	Inrush current	30 A (< 3 sec)	
	Output indication	multifunction LED	
	Switching voltage	250V AC (AC1) / 24V 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 mm^2 wire cross section	
Electrical protection		Class II.	
Mechanical connection		EN 60715 rail	
Ingress protection		IP20	
Ambient temperature		–20°C … +55°C	
Mass		90 g	70 g

NITIME

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



JEL-1□1

NIV24
JEL-111-1
JEL-121-1

SYSTEM COMPONENTS

GENERAL DESCRIPTION

The **UNICOMM** interface modules are able to establish communication line between HART-capable field devices and process controller computer. 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 into the USB input of a PC, the modem does not need external power supply. The **UNICOMM SAK-305** modules can be connected into 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 external power supply. The Ex versions can be connected to transmitters placed in hazardous areas.

MAIN FEATURES

- *Transferring measurement data to PC*
- *Connecting field transmitters to the, USB or RS485 input of a PC*
- *DIN rail mountable version*
- *No need for power supply*
- *Galvanic isolation*
- *IP20 protection*

APPLICATIONS

- *Communication interface (modem) between HART-capable transmitters and PC*
- *Minimal system configuration: Windows XP, USB port*

CERTIFICATIONS

- *ATEX approved [Ex ia]*

SAK-305

SAT-304

TECHNICAL DATA

Type		SAT – 304	SAK – 305
Input		HART	
Output		USB	USB / RS485 (HART over RS485)
Power supply		Supplied from USB	Supplied from USB / 24V DC (10-30 V) nominal voltage
Current consumption		< 100 mA	USB: current consumption < 60 mA RS485: power consumption < 1.5 W
Ambient temperature		–25°C … + 55°C	–20°C … + 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.	
Ex marking		–	See: www.nivelco.com
Mass		0.1 kg	

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	UNICOMM SAK-305-6 Ex
Protection type	Intrinsically safe
Intrinsically safe data	See: www.nivelco.com

SYSTEM COMPONENTS

UNICOMM SAT-304

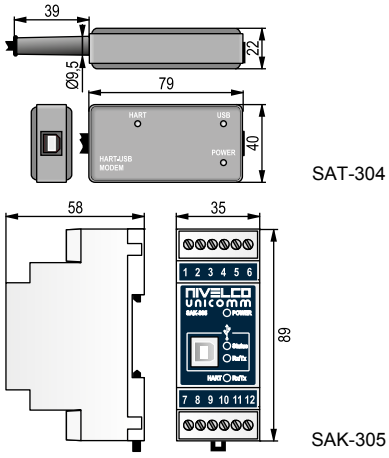
HART-USB communication modem for transmitters with HART output
USB 1.1 "B" connector and test clip

Type	
S A T – 3 0 4 – 0	HART-USB modem

UNICOMM SAK-305

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



SAT-304

SAK-305

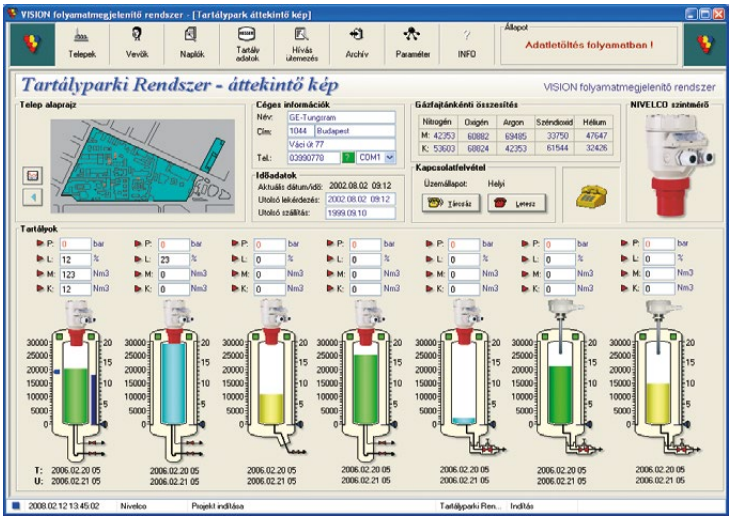
NIV24
SAT-304

GENERAL DESCRIPTION

NIVISION is a **VISION X9** based process visualization software which uses the XSDL (**E**xtensible **S**tructure **D**eclaration **L**anguage) programming and configuring language. NIVISION can visualize a process control system built with **NIVELCO** instruments on a PC. The instruments can either be intelligent transmitters with analogue output or digital communication, or different 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 an ordinary internet browser. It is a perfect solution for small and medium sized process control systems where setting up a **SCADA** system is too expensive.

MAIN FEATURES

- *Tank configuration*
- *Transmitter configuration*
- *Tank-farm visualization*
- *Displaying of measured values*
- *Displaying of limit values*
- *Trend monitoring*
- *Data logging*
- *Database handling*
- *Archiving*
- *Other log functions (alarms)*
- *Remote connection (LAN or Internet)*

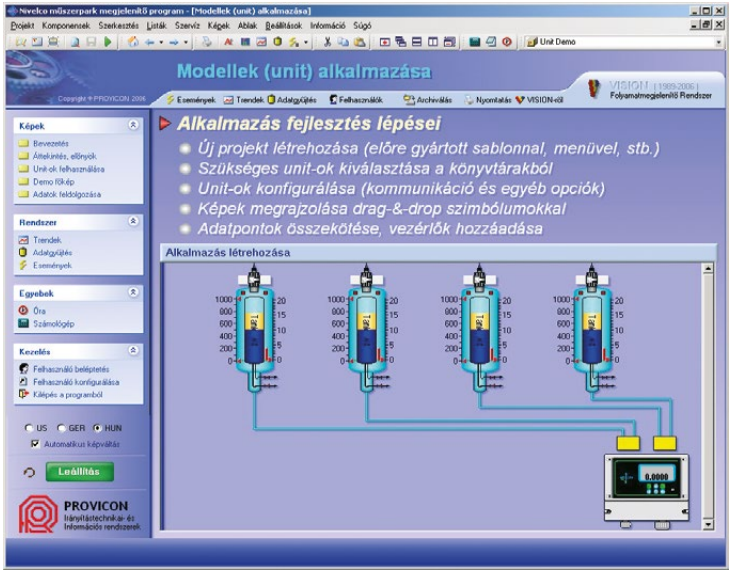


APPLICATIONS

The steps of customizing **NIVISION** to 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 makes the required programming. The developer system 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 so called "**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
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)

MAIN INFORMATION

This Product Catalogue is valid from the **15th of January 2017** and on that date all prior Product Catalogues loose validity.
NIVELCO reserves the right to make any changes.
The illustrations of the products in this Product Catalogue are only informative.
A final check of specifications in the data sheets, user's and programming manuals is recommended.

DELIVERY

Concerning delivery time models are assigned to four different groups:

Normal delivery:

- Standard products are usually manufactured within three weeks and shipped on the fourth week.*
- For non-standard products marked with „ 6 WEEKS! ", a shipping delay of up to 6 weeks is to be counted with.

Fast delivery:

- Units ordered under the NIVEX service are shipped within 5 working days from receiving the order if the order is accepted. Before ordering products with the NIVEX marking (in capital letters), availability of the relevant products in the required quantity has to be checked and confirmed by the Order Desk of NIVELCO. The NIVEX service is surcharged by 5% of list price.
- 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 next day of the order for a maximum of 5 pieces. The NIV24 service is surcharged by 5% of list price.

WARRANTY

3 years warranty for all NIVELCO products. **

ORDER CODES AND ARTICLE NUMBERS

All **order codes** for complete instruments have 7 characters (with some exceptions for special constructions that have 7 characters + "X…"). Order codes can be found in this Product Catalogue, coloured brochures, User's and Programming Manuals and in other marketing documents on our website. **Article numbers** can be found in our Order Confirmations, Offers and Invoices. **Article numbers** have 8 characters and they are constructed as 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 but not to the technical content.
e.g.
order code: SGP-380-4
article number: SGP3804M

INSPECTION AND CLEANING CHARGES

A 25.00 EUR inspection fee is applied when a returned unit is found faultless.
We charge 25.00 EUR for cleaning a unit that is returned to us dirty and/or without a signed properly filled Defective Equipment Handling Form.

APPROVALS

http://www.nivelco.com/site.php?upar=SHOW_QUALITY&lang=en

* 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

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