

# Dinel<sup>®</sup>

industrial electronics

## PRODUCT OVERVIEW 2024



WATER  
MANAGEMENT



ENERGY  
HEATING



MACHINERY  
TRANSPORT



AGRICULTURE  
TECHNOLOGY



BEVERAGE INDUSTRY  
PHARMACY



# Dinel<sup>®</sup>

industrial electronics

[www.dinel.cz](http://www.dinel.cz)



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# CERTIFICATES

Certificate CQS (ISO)



Certificate IQNet



Quality Assurance Notification



CERTIFICATE for contact with drinking water



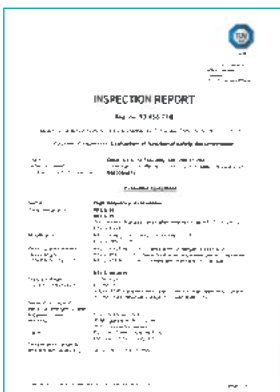
CERTIFICATE for contact with foodstuffs



HART Communication Foundation



Certificate SIL CLS-23



Certificate SIL RFLS-35/28



# ABOUT US

The company Dinel, s. r. o. was founded in 1995, after transformation from a small private firm, which produced capacitive sensors since 1991.

Nowadays Dinel, s. r. o. is one of the most influential producers of level and flow measurement systems in the Czech Republic with big annual increases of sales and strong innovative potential.

Our level meters, limit level sensors, and flowmeters fulfill various requirements in a wide range of branches, e.g. water and wastewater processing, agricultural technology and food industry, plastic materials technology, chemical industry, petroleum and gas filling stations, heating and cooling technology, building materials processing technology, packaging technology, in transport vehicles, etc. Besides that, our power supplies, display, and control units are very frequently used in various control and measuring systems.



29

YEARS  
ON MARKET

24

YEARS  
OF ISO 9001  
CERTIFICATION

38

EMPLOYEES

22

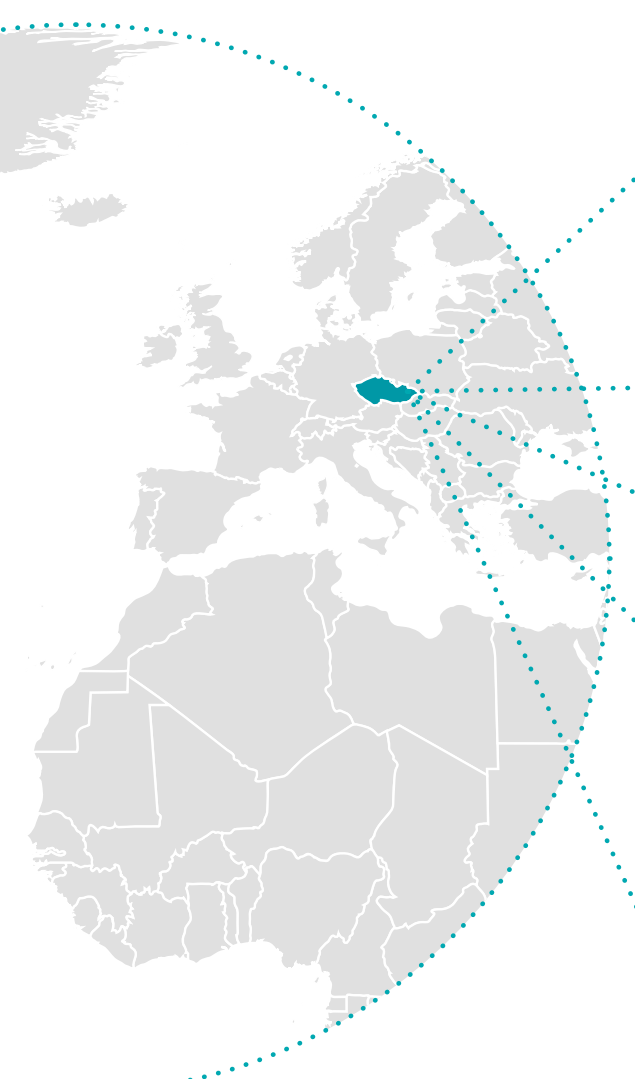
YEARS  
OF ATEX  
CERTIFICATION

60

EXPORT  
COUNTRIES

45

DISTRIBUTORS  
WORLDWIDE



## DEVELOPMENT

Our engineers in the development department prepare new products and improve and update the existing ones with new functions or adjust them to specific customer requirements.

## PRODUCTION

Thanks to our own production, we are able to offer not only standard devices, but also prepare the products according to the individual wishes of our customers.

## SALES

All the products can be bought directly from us or it is possible to make use of our distributors in our country and abroad. We offer the possibility to lend standard products to test their functions.

## TECHNICAL SUPPORT

The team of technicians carries out advisory services, helps solve the problems remotely, or provides the service staff with professional training.

## SERVICING AND REPAIRS

At the request of our customers, we provide service for all of our products at the place of installation. We guarantee the permanent reparability of all our products any time after the warranty period which we provide for 3 years.

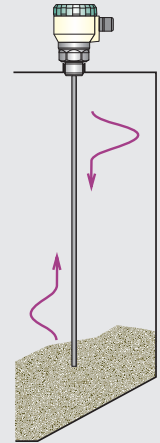


# CONTINUOUS LEVEL METERS

## PRINCIPLE OF CONTINUOUS LEVEL MEASUREMENT

### Guided wave radar level measurement

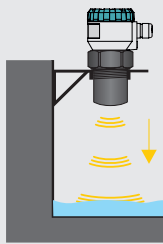
The function principle of the impulse radar (microwave) level meter is TDR (Time Domain Reflectometry). The electronics transmits very short electrical pulses (0.5 ns), which are linked to a one-wire transmission line (measuring electrode). Measuring electrodes can be created on a rod or rope. The pulse propagates along the electrode in the form of an electromagnetic wave toward the level surface, where it is partly reflected, and the reflected component is returned to the receiving module of the electronics. The electronics measure the time of flight of electromagnetic waves and appropriately set the value of the output signal. The method is resistant to changes in the atmosphere (pressure, temperature, dust, steam) and changes in medium parameters (change in dielectric constant, conductivity).



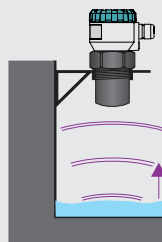
### GRLM-70

### Principle of antenna level meter measurement

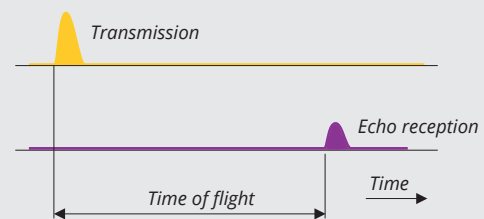
The electronics of the level gauge transmit electromagnetic waves in the microwave band via an antenna. These waves are reflected from the surface and received again by the same antenna. The microwaves propagate through space at a finite speed. The time between transmission and reception of the signal is therefore proportional to the distance of the level from the level gauge antenna. This time is evaluated by the electronics and converted into an output signal. The method is almost independent of the properties of the environment above the level of the substance being measured (dust, dirt, temperature, vapors, gases, flow, etc.) and can be used for measurements in a vacuum. At the same time, it is resistant to changes in the parameters of the medium itself (changes in relative permittivity).



Transmission of acoustic waves towards the level surface



Reception of acoustic waves reflected from the level



Time of flight ~ Level height  
Output signal ~ Time of flight

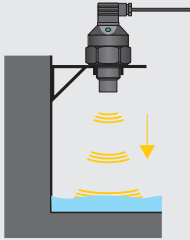
### ARLM-70

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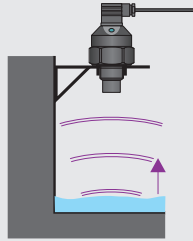


## Ultrasonic level measurement

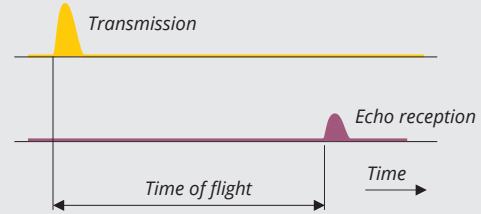
The ultrasonic level meter ULM transmits the series of ultrasonic pulses, that propagate towards the level surface. Reflected acoustic waves are received by the level meter and processed by the internal processor. Then the temperature compensation is provided and the voltage signal is changed due to the output current or voltage. The method is resistant to changes in the medium parameters (changes in dielectric constant, and conductivity). In the case of harsh conditions in the atmosphere above the level (foaming, heavy turbulence rapid air flow, strong evaporation) the method can be used only after advance testing. In the case of vacuum, the method is not applicable.



Transmission of acoustic waves towards the level surface



Reception of acoustic waves reflected from the level

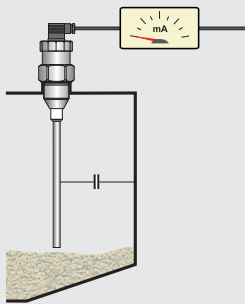


Time of flight ~ Level height  
Output signal ~ Time of flight

## ULM-53, ULM-54, ULM-70

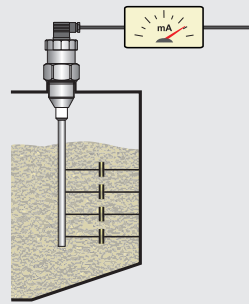
## Capacitive level measurement

The increase of the level causes bigger immersion of the measuring electrode and thereby increases its capacity. According to the measured capacity is set the output of the level meter.



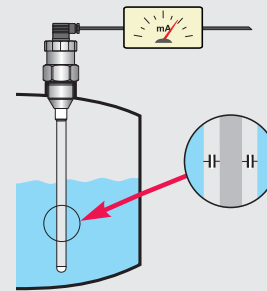
### Measurement of electrically non-conductive materials:

The capacitor is made by electrode of the sensor and the wall. The dielectric is done by air or the material.



### Measurement of electrically conductive materials:

The capacitor is made by electrode of the sensor and the material (the wall). Dielectric is done by the insulation of the electrode.



The method is resistant to any changes in the atmosphere above the surface (vacuum, pressure, vapors, dust). It is also partially resistant to the formation of foam on the surface. The method is not applicable in the case of a change of dielectric constant of the medium. If only the conductivity of the medium changes (eg. drinking water x steam condensate) and when the sensor is used with the insulated electrode, it does not affect the output signal.

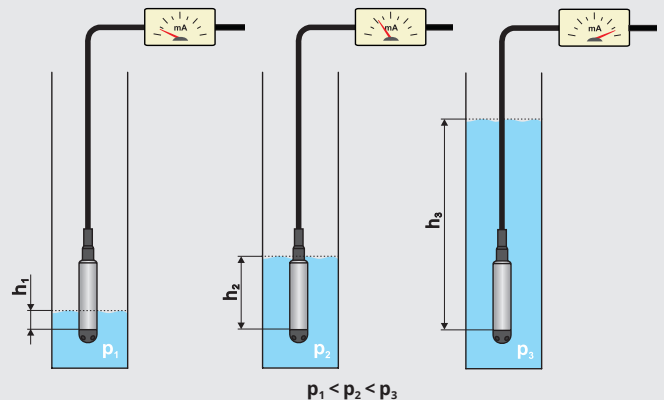
## CLM-36, CLM-40, CLM-70, DLM-35

## Hydrostatic level measurement

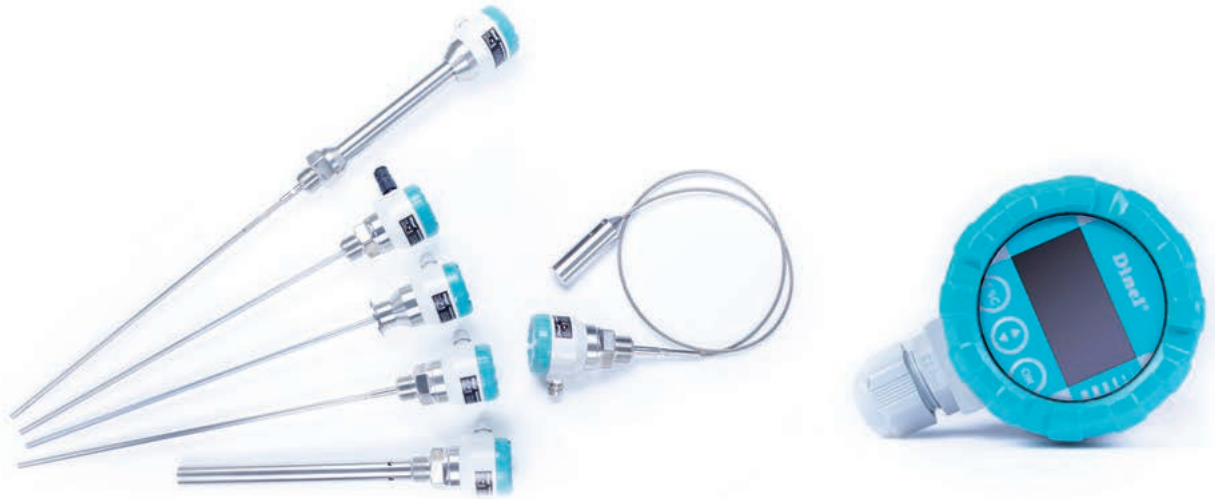
The principle of level measurement is taken from the direct dependence of hydrostatic pressure ( $p$ ) on the height of the water column ( $h$ ) where the constants of proportionality are the density ( $\rho$ ) and the gravitation acceleration ( $g$ ).

$$p = h \cdot \rho \cdot g$$

The method is resistant to the formation of foam on the level surface. The method is directly dependent on the density (specific gravity) of the liquid. When the liquid density is changing it is necessary to make an additional correction of the output.



## HLM-16/25N, HLM-25C, HLM-25S, HLM-35

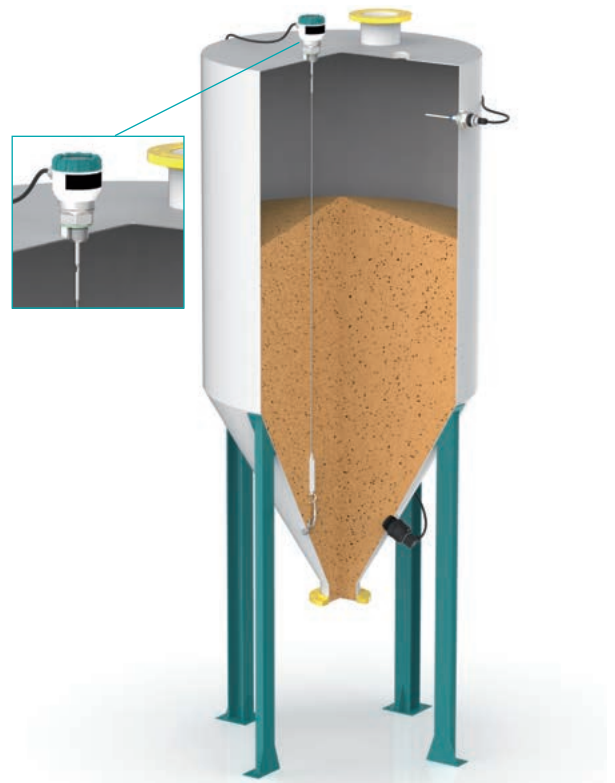


## Radar level meter GRLM-70 "Miranda"

For reliable level measurement of various liquids, bulk materials, slurries and pasty materials in storage tanks, silos, tanks, sumps, etc.



- Radar level meter with guided wave (TDR)
- Stainless steel rod or rope electrode
- Xi, XiT versions for usage in explosive areas, or Xt, XtT versions for usage in flammable dust areas
- Linear measurement also in non-conductive and in variously shaped tanks
- Linear measurement even in non-conductive and differently shaped vessels
- Measurement of the interface between two different media and measurement of the media layer thickness
- Simple installation and settings by removable display module DM-70 with OLED or LCD display
- Arbitrary selection between metric and imperial units
- Current output (4 ... 20 mA) with HART® protocol or output RS-485 Modbus RTU
- All stainless steel design suitable for food processing and pharmaceutical industry



example of using type GRLM-70\_-33



type of electrode 33 and 35

type of electrode 36 and 37



stainless steel design suitable for the food and pharmaceutical industries



## VARIANTS

code	type of electrode	length of electrode
GRLM-70_-00	<b>without electrode</b>	-
GRLM-70_-10	<b>uncoated stainless steel rod electrode</b> for liquids and bulk solid materials (water solutions, emulsion, oils, diesel, flour, sand, granulates, etc.)	0,5 ... 8 m
GRLM-70_-11	<b>coated (PFA) rod electrode</b> for aggressive and very pure liquids	0,5 ... 2 m
GRLM-70_-12	<b>coated (FEP) stainless steel rod electrode</b> , for aggressive liquids and drinks	0,5 ... 2 m
GRLM-70_-13	<b>semi-coated (FEP) stainless steel rod electrode</b> for liquids in area, where it could condense steam on the electrode	0,5 ... 8 m
GRLM-70_-20	<b>uncoated stainless steel rod electrode with reference tube</b> for accurate level measurement of liquids in cramped spaces	0,5 ... 3 m
<b>NEW</b> GRLM-70_-24	<b>uncoated stainless steel rod electrode with reference tube (coaxial)</b> , for measurement of the interface between two different liquid media.	0,5 ... 3 m
GRLM-70_-30	<b>uncoated stainless steel rope electrode and weight</b> for liquids and bulk solid materials (water, grains, sand, flour, cement, etc.) in higher silos, vessels, reservoirs	1 ... 40 m
GRLM-70_-32	<b>coated (FEP) stainless steel rope electrode and coated weight</b> , for aggressive and very pure liquids	1 ... 15 m
GRLM-70_-33	<b>uncoated stainless steel rope electrode with anchorage</b> for bulk solid materials (grains, flour, cement, etc.) It is recommended to anchor in storage tanks and silos for bulk solid materials up to a depth of 10 meters	1 ... 40 m
GRLM-70_-34	<b>coated (Polyamide) stainless steel rope electrode and uncoated weight</b> for liquids and adhesive bulk solids (flour, cement, etc.)	1 ... 40 m
GRLM-70_-35	<b>coated (Polyamide) stainless steel rope electrode with uncoated anchorage</b> , for adhesive bulk solids (flour, cement, etc.). Recommended in tanks deeper than 10 m	1 ... 40 m
GRLM-70_-36	<b>uncoated rope electrode without weight with rope clamps and eye ring</b> , for unsticky bulk solids (grains, sand, etc.) Recommended in tanks deeper than 10 m	1 ... 40 m
GRLM-70_-37	<b>coated (Polyamide) rope electrode without weight, with cable clamps and eye ring</b> , for sticky bulk solids (flour, cement, etc.). Recommended in tanks deeper than 10 m	1 ... 40 m

## TECHNICAL SPECIFICATION

supply voltage	GRLM-70N(NT)	18 ... 36 V DC
	GRLM-70Xi(XiT)	18 ... 30 V DC
	GRLM-70Xt(XtT)	18 ... 33 V DC
output type	GRLM-70_-_-_-I	4 ... 20 mA (2-wire), HART® protocol Modbus RTU
	GRLM-70_-_-_-M	
basic measurement accuracy (for reference reflecting surface)		+/- 2 mm
resolution		0,1 mm
ambient temperature range		-30 ... +70 °C
process temperature range		-40 ... +200 °C
process connection		thread G1" ; NPT 1"; Tri-Clamp Ø 50,5; Ø 64
process pressure range (for temperature +85 °C)	GRLM-70_-10 (00, 20, 24, 30, 33, 34, 35, 36, 37)	0 ... 100 bar
	GRLM-70_-11 (12, 13) GRLM-70_-32	0 ... 20 bar 0 ... 5 bar
protection class		IP67

More detailed informations can be found in the datasheet of the product.



example of using the all-stainless steel version GRLM-70\_-32

NEW



## Antenna radar level meter ARLM-70 "Amanda"

Designed for reliable level measurement of various liquids.



- Antenna radar level meter, works on the FMCW principle with a frequency of 25 GHz
- Display of values on OLED or LCD display
- Measuring range up to 20 m
- Current output (4 ... 20 mA) with HART® protocol
- Measurement independent of the temperature and pressure of the atmosphere above the surface
- The possibility of measuring even in aggressive vapours

### VARIANTS

code	type	measuring range
<b>NEW</b> ARLM-70N-20	basic design for non-explosive environments, aluminum body	0,3 ... 20 m

### TECHNICAL SPECIFICATIONS

supply voltage	18 ... 34 V DC	
output type	4 ... 20 mA (2-wire), HART®	
accuracy	3 mm (distance 1 m ... 20 m) 10 mm (distance 0,3 m ... 1 m)	
maximum range	20 m	
dead Zone	30 cm	
function principle	FMCW	
operating temperature range	-30 ... +70 °C	
maximum operating overpressure	2 bar	
pressure resistance	-30 ... 0 °C	max. 0,2 bar
resistance	0 ... 70 °C	max. 2 bar
measuring frequency	25 GHz (K-Band)	
measurement sensitivity	3 levels	
damping	1 ... 99 sec	
status signaling (echo dropout)	adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE	
the time of the first measurement from the start of the power supply	20 sec	
separation capacity „power leads - housing“	2 nF / 500 V AC	
maximum load resistance at	U=24V U=22V U=20V	R=270 Ω* R=180 Ω R= 90 Ω
protection class	IP 67	
recommended cable	PVC 2x0,75 mm <sup>2</sup> with a diameter of 6-8 mm	
weight	approx. 0,5 kg	

\*Including HART® 250 Ω resistor





## Ultrasonic level meter ULM-70

For continuous non-contact level measurement of various liquids, mashes, pasty materials and bulk solids in closed or open vessels, sumps, reservoirs etc.



- Immediate view of the measured values on OLED or LCD display units
- Xi version for usage in explosive areas
- D-Logic system for advanced intelligent signal processing
- Easy adjustment without measured material
- Elimination of false reflections
- Arbitrary choice of metric or imperial displayed measuring units
- The level meter is also suitable for tanks with mixers
- Option normal or inverted mode (for distance measurement)
- Current output (4 ... 20 mA) with HART® protocol or output RS-485 Modbus RTU
- Choice of electric connection via cable glands, or a cable gland for a protective hose
- While used with a horn adapter can be measured difficult media (foamy levels, loose materials, etc.)

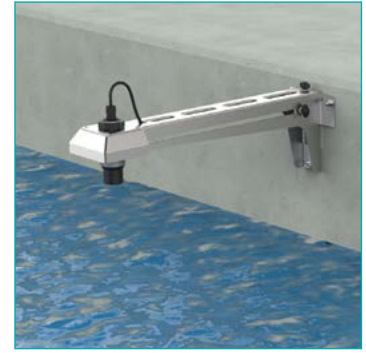
### VARIANTS

code	type	measuring range
ULM-70_-02	plastic transmitter, <b>process connection with thread G 1"</b>	0,15 ... 2 m
ULM-70_-06	plastic transmitter, <b>process connection with thread G 1 ½"</b>	0,25 ... 6 m
ULM-70_-10	plastic transmitter, <b>process connection with thread G 2 ¼"</b> . Plastic flange connection can also be selected from the accessories menu	0,4 ... 10 m
ULM-70_-20	plastic transmitter, <b>process connection with aluminium alloy flange</b>	0,5 ... 20 m

### TECHNICAL SPECIFICATION

supply voltage	ULM-70N ULM-70Xi	18 ... 36 V DC 18 ... 30 V DC
output type	type "I" type „M"	4 ... 20 mA (2-wire), HART® protocol Modbus RTU
accuracy (within the total range)		0,15 %
temperature error		max. 0,04 %/K
sensitivity		3 steps (low - medium - high)
ambient temperature range	ULM-70_-02, 06 ULM-70_-10, 20	-30 ... +70 °C -30 ... +60 °C
max. operation overpressure (on transmission surface)		1 bar
protection class		IP67

More detailed informations can be found in the datasheet of the product.



telescopic bracket VKD



## Ultrasonic level meter ULM-54

**For continuous non-contact level measurement in outdoor applications - rivers, canals, sumps. For water, waste water and slurry, pastes and bulk materials**



- Remote communication via HART® protocol
- Variable installation thanks to the possibility of connection via lower or upper thread
- Intelligent numerical signal processing with the elimination of false reflections
- Choice of connection using a standard cable gland or a gland for protective hoses
- High degree of protection IP68
- With the help of a horn adapter, it is possible to increase the reception of the reflected echo and to measure problematic media (foaming levels, loose materials, etc.)
- Telescopic bracket for mounting ultrasonic level meters in outdoor applications

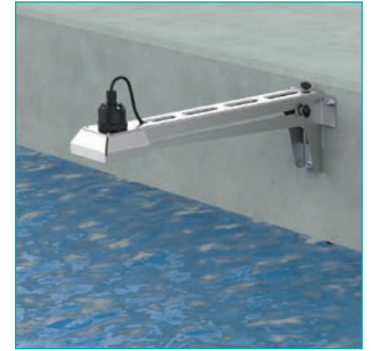
### VARIANTS

code	type	measuring range
ULM-54-02	all-plastic performance, PVDF emitter, <b>process connection via G 1" screwing</b> (upper or lower threads)	0,15 ... 2 m
ULM-54-06	all-plastic performance, PVDF emitter, <b>process connection via lower G 1½" or upper G 1" screwing</b>	0,25 ... 6 m
ULM-54-10	all-plastic performance, PVDF emitter, <b>process connection via lower G 2¼" or upper G 1" screwing.</b> Plastic flange connection can also be selected from the accessories menu	0,4 ... 10 m

### TECHNICAL SPECIFICATION

supply voltage	ULM-54N-__	18 ... 36 V DC
output type	ULM-54N-__-I	4 ... 20 mA (2-wire), HART®
accuracy (within the total range)		0,15 %
temperature error		max. 0,04 %/K
sensitivity		3 steps (low - medium - high)
ambient temperature range	ULM-54N-02, 06 ULM-54N-10	-30 ... +70 °C -30 ... +60 °C
max. operation overpressure (on transmission surface)		1 bar
protection class		IP68

More detailed informations can be found in the datasheet of the product.



telescopic bracket VKD



## Ultrasonic level meter ULM-53

For continuous non-contact level measurement of various liquids, mashes and pasty materials in closed or open vessels, sumps, reservoirs etc.



- Variants of level meter with adjustment by two buttons, or by magnetic pen
- Optical state indication
- Xi version for usage in explosive areas
- Current output, voltage output or RS-485 Modbus output
- Wide choice of electric connection via connectors, cable glands, or a gland for protective hoses
- Reception of reflected ultrasonic signal from the level can be improved using a horn adapter
- Telescopic bracket for mounting ultrasonic level meters in outdoor applications

### VARIANTS

code	type	measuring range
ULM-53_-01	plastic transmitter and plastic body, mechanical connection with <b>thread G ¾"</b>	0,1 ... 1 m
ULM-53_-02	plastic transmitter and plastic body, mechanical connection with <b>thread G 1"</b>	0,2 ... 2 m
ULM-53_-06	plastic transmitter and plastic body, mechanical connection with <b>thread G 1 ½"</b>	0,2 ... 6 m
ULM-53_-10	plastic transmitter and plastic body, mechanical connection with <b>thread G 2 ¼"</b> . Plastic flange connection can also be selected from the accessories menu	0,4 ... 10 m
ULM-53_-20	plastic transmitter and plastic body, <b>aluminium alloy flange</b>	0,5 ... 20 m

### TECHNICAL SPECIFICATION

supply voltage	ULM-53N ULM-53Xi	12 ... 36 V DC 12 ... 30 V DC
output type	type "I" type „U“ RS-485 (type „M“)	4 ... 20 mA (2-wire) 0 ... 10 V (3-wire) Modbus RTU
accuracy (within the total range)	ULM-53-01 ULM-53-02 (06) ULM-53-10 (20)	0,2 % 0,15 % 0,2 %
temperature error		max. 0,04 %/K
ambient temperature range	ULM-53-01, 02, 06 ULM-53-10, 20	-30 ... +70 °C -30 ... +60 °C
max. operation overpressure (on transmission surface)		1 bar
protection class*	ULM-53_-_-_-_-T	IP67
	ULM-53_-_-_-_-G-M(L)	IP67*
	ULM-53_-_-_-_-C-M(L)	IP67*
	ULM-53_-_-_-_-B-M(L) ULM-53_-_-_-_-H-M(L)	IP68
T - set-up elements buttons M - set-up elements magnetic pen (MP8) L - no setting, no LED G - connection method ISO connector		

\* If a special connector is used, IP68 protection can be achieved. More detailed informations can be found in the datasheet of the product.



stainless steel design suitable for the food and pharmaceutical industries

## Capacitive level meter CLM-70

For continuous level measurement of liquids, bulk solids and powders in all branch of industry



- A wide range of applications, direct installation in storage silos, sumps, etc.
- Variants with rope, bar, or co-axial electrodes
- Variants with fully coated electrodes for aggressive or electrically conductive media
- Current output 4 ... 20 mA with HART® protocol
- No dead zones
- Easy manual setting by removable display module DM-70
- Immediate view of the measured values on OLED or LCD display units
- Specific performance and electrode length are custom-made
- Copying the configuration between level meters using the display module

### VARIANTS

code	type of electrode	length of electrode
CLM-70_-00	without electrode	-
CLM-70_-10	<b>uncoated stainless steel rod electrode</b> for electrically non-conductive liquids (diesel fuel) and bulk solids (flour, cement etc.)	0,2 ... 8 m
CLM-70_-11	<b>fully coated (PFA) rod electrode</b> for water and electrically conductive liquids in food processing, pharmaceutical, and chemical industries	0,2 ... 3 m
CLM-70_-12	<b>fully coated (FEP) stainless steel rod electrode</b> suitable for impure liquids in metallic tanks, concrete sumps, etc.	0,2 ... 3 m
CLM-70_-13	<b>semi-coated (FEP) stainless steel rod electrode</b> for liquids where partial condensation of vapours on the electrode may occur	0,5 ... 8 m
CLM-70_-20	<b>uncoated stainless steel rod electrode with reference tube</b> for electrically non-conductive liquids (oil, diesel fuel, etc.)	0,2 ... 3 m
CLM-70_-22	<b>coated (FEP) stainless steel rod electrode with reference tube</b> for clean electrically conductive liquids	0,2 ... 3 m
CLM-70_-30	<b>uncoated stainless steel rope electrode</b> and weight for bulk solids	1 ... 20 m.
CLM-70_-31	<b>uncoated rope electrode and uncoated weight with addition dynamic anchorage</b> for bulk-solid materials in higher silos	1 ... 20 m
CLM-70_-32	<b>fully coated (FEP) stainless steel rope electrode and weight</b> for electrically conductive and non-conductive liquids	1 ... 15 m
CLM-70_-61	<b>two coated (PFA electrode insulation, PTFE head) stainless steel rod electrodes</b> for aggressive liquids	0,2 ... 2 m

### TECHNICAL SPECIFICATIONS

supply voltage	18 ... 36 V DC
output type (type "I")	4 ... 20 mA (2-wire), HART®
current output resolution	10 uA
measuring range from	0 ... 3000 pF
resolution	0.01 pF (for capacities 0 ... 300 pF) 0.1 pF (for capacities 300 ... 3000 pF)
temperature error (for temperature range -30 ... 70 °C)	<1 pF up to 100 pF < 1 % of the measured value
non-linearity (electronics)	max. 1 %
damping	0 ... 99 s
maximum slew rate	<1 sec (0 ... 100 %); for damping 0 sec
current output error	max. 80 uA
ambient temperature range	-30 ... +70 °C
process temperature range	-40 ... +200 °C
max. process pressure range (for temp. +85 °C)	100 bar
protection class	IP67

More detailed informations can be found in the datasheet of the product.





magnetic pen for setting



## Capacitive level meter DLM-35

For continuous level measurement of liquids, bulk solids and powders in tanks, hoppers etc.



- Direct mounting into containers, vessels, basins, reservoirs, etc.
- Possibility of linear measurements even in non-conductive and differently shaped containers

- Xi version for usage in explosive areas
- Simple sensitivity setting by means of magnetic pen
- Special variant DLM-35NT-25 with resistance to hot steam
- LED state and function indication
- Wide choice of electric connection via connectors, cable glands, or a gland for protective hoses
- Material of the housing and electrodes from stainless steel

### VARIANTS

code	type of electrode	electrode length
DLM-35_-20	<b>uncoated rod electrode</b> for bulk-solids (cement, flour, sand, plastic granulate) and electrically non-conductive liquids (oil, diesel fuel, petrol)	0,1 ... 2 m
DLM-35_-21	<b>coated (FEP) rod electrode</b> for water and other electrically conductive liquids etc.	0,1 ... 2 m
DLM-35_-22	<b>coated (PFA) rod electrode</b> , resistance to permeation (diffusion) of vapours. For water and other electrically conductive liquids in the food, pharmaceutical and chemical industries	0,1 ... 2 m
DLM-35_-25	<b>insulated (FEP) rod electrode</b> , for measuring the level of water and other electrically conductive liquids, higher pressure, and mechanical resistance at high temperatures (hot steam)	0,1 ... 2 m
DLM-35_-30	<b>uncoated demountable rod electrode</b> for bulk-solids and electrically non-conductive liquids	0,1 ... 3 m
DLM-35_-31	<b>coated (FEP) rod electrode</b> for water and electrically conductive liquids. Can also be used for polluted liquids	0,1 ... 3 m
DLM-35_-40	<b>uncoated rod electrode with reference tube (coaxial electrode)</b> for unpolluted electrically non-conductive liquids	0,1 ... 1 m
DLM-35_-41	<b>coated (FEP) rod electrode with reference tube (coaxial electrode)</b> for unpolluted electrically conductive liquids in plastic and glass tanks	0,1 ... 1 m.
DLM-35_-50	<b>uncoated rope electrode with weight</b> for bulk-solids (e.g. grains, sand, gravel, cement, etc.)	0,5 ... 6 m
DLM-35_-52	<b>fully coated (FEP) rope electrode with weight</b> for electrically conductive and non-conductive liquids	1 ... 10 m

### TECHNICAL SPECIFICATION

supply voltage	current output (type „I“) voltage output (type „U“)	9 ... 34 V DC 12 ... 34 V DC
output type	type „I“ type „U“	4 ... 20 mA (2-wire) 0 ... 10 V (3-wire)
non-linearity (electronics)		max. 1 %
ambient temperature range		-40 ... +85 °C
process temperature range		-40 ... +200 °C
medium temperature range		-40 ... +300 °C
process connection		thread M27 x 2 ; M30 x 1,5; G1, G ¾“; NPT¾“; Tri-Clamp ø34, ø50,5
process pressure range (for temp. +85 °C)	DLM-35_-20, 30 DLM-35_-21, 22, 25, 31, 40, 41 DLM-35_-50 DLM-35_-52	0 ... 25 bar 0 ... 20 bar 0 ... 1 bar 0 ... 5 bar
protection class	DLM-35_-__-C-__ DLM-35_-__-A(B,D,V,H)-__	IP67 IP68

More detailed informations can be found in the datasheet of the product.



## Capacitive level meter CLM-36

For continuous level measurement of liquids, bulk solids and powders in tanks, hoppers, silos etc.



- Direct mounting into containers, silos, vessels, basins, reservoirs, etc
- Possibility of linear measurements even in non-conductive and differently shaped containers
- Xi version for usage in explosive areas and high-temperature versions
- Easy and quick connecting by connector
- Removable inner electronic module
- Material of the housing and electrodes from stainless steel

### VARIANTS

code	type of electrode	length of electrode
CLM-36_-10	<b>uncoated rod electrode</b> for non-conductive liquids and powder or bulk-solid materials	0,2 ... 5 m
CLM-36_-11	<b>fully coated (PFA) rod electrode</b> for water and other electrically conductive liquids. Also suitable for polluted liquids in metallic storage tanks, concrete sumps, etc.	0,2 ... 3 m
CLM-36_-12	<b>fully coated (FEP) rod electrode</b> for water and other electrically conductive liquids. Also suitable for polluted liquids in metallic storage tanks, concrete sumps, etc.	0,2 ... 3 m
CLM-36_-20	<b>uncoated rod electrode with reference tube</b> for clean non-conductive liquids (oils, diesel, petrol)	0,2 ... 3 m
CLM-36_-22	<b>coated (FEP) rod electrode and reference tube</b> for clean conductive liquids in plastic and glass vessels	0,2 ... 3 m
CLM-36_-30	<b>uncoated rope electrode and uncoated weight</b> for bulk-solid materials (grains, sand, etc.)	1 ... 20 m
CLM-36_-31	<b>uncoated rope electrode and uncoated weight with addition dynamic anchorage</b> for bulk-solid materials in higher silos	1 ... 20 m
CLM-36_-32	<b>fully coated (FEP) rope electrode</b> for electrically conductive and non-conductive liquids	1 ... 15 m

### TECHNICAL SPECIFICATION

supply voltage	current output (type „I“) voltage output (type „U“)	9 ... 36 V DC 16 ... 36 V DC
output type	current output (type „I“) voltage output (type „U“)	4 ... 20 mA (2-wire) 0 ... 10 V (3-wire)
non-linearity (electronics)		max. 1 %
ambient temperature range		-40 ... +85 °C
process temperature range		-40 ... +200 °C
max. medium temperature range		-40 ... +300 °C
process connection		Thread M36 × 2; G 1"; Tri-Clamp ø50,5
process pressure range (for temp. +85 °C)	CLM-36_-10, 20, 30 CLM-36_-11, 12, 22 CLM-36_-32	0 ... 50 bar 0 ... 20 bar 0 ... 5 bar
protection class		IP65 / IP67

More detailed informations can be found in the datasheet of the product.



## Capacitive level meter CLM-40

For continuous level measurement of diesel fuel, oils and other petroleum products in trucks, building machines, locomotive engines etc.

CAN CE

- Direct mounting in tanks by means of a flange with five holes or by means of a G1 "pipe thread
- Arbitrarily long rod electrode with reference tube (range of lengths 0,1 ... 1 m, the electrode can be of any length)
- Current output, voltage output, or output for CAN bus
- Certificate of the Ministry of Transport and Communications of the Czech Republic (ATEST 8 SD)
- Very easy installation, no setup required
- Stainless steel housing, electrode, and reference tube
- Setting with a magnetic pen or CAN bus

### VARIANTS

code	type of electrode	maximum electrode length
CLM-40N-40	uncoated rod electrode and reference tube with setting by magnetic pen, possibility of shortening the measuring electrode	0,1 ... 1 m

### TECHNICAL SPECIFICATION

supply voltage	current output (type „I“)	9 ... 30 V DC
	CAN bus ( type „CAN“)	9 ... 30 V DC
	voltage output (type „U“)	12 ... 30 V DC
output type	CLM - 40N-40_-I	4 ... 20 mA (lim. values 3.9 ... 20.5 mA)
	CLM - 40N-40_-U	0 ... 10 V (lim. values 0 ... 10.2 V)
	CLM - 40N-40_-CAN	CAN SAE j1939 line (according to FMS standard)
non-linearity (electronics)		max. 1 %
ambient temperature range		-40 ... +85 °C (CAN only to 80 °C)
process connection		flange; thread G 1"
protection class		IP68

More detailed informations can be found in the datasheet of the product.

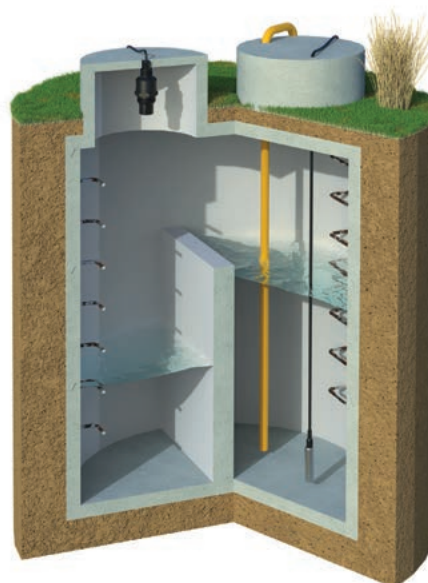


## Submersible hydrostatic level meter HLM-16/25

For level measurement of water in non-pressure reservoirs, drill holes, water wells, sumps, swimming pools etc.



- Stainless steel submersible probe
- Version with stainless steel sensor (for rain, drinking, or river water) or version with a ceramic sensor (for lightly soiled, or sludge water)
- Arbitrary measurement ranges up to 100 m
- Precise customer choice of the measurement range up to 100 m
- Probe diameter 25 mm or 16 mm
- Overvoltage protection inside the probe



example of using HLM-25C and ULM-54

The HLM level meter received the TEST CERTIFICATE from ITC and so it complies with hygienic requirements for direct and permanent contact with drinking water.

### VARIANTS

code	type	measuring range
HLM-16N	<b>stainless steel sensor, predefined measurement ranges. Probe diameter 16 mm.</b> Suitable for clean, lightly soiled, or sludge water	1 ... 100 m
HLM-25C	<b>ceramic sensor, arbitrary measurement ranges. Probe diameter 25 mm.</b> Suitable for clean, lightly soiled, or sludge water, certificate for contact with drinking water	1 ... 100 m
HLM-25S	<b>stainless steel sensor, arbitrary measurement ranges. Probe diameter 25 mm.</b> Suitable for rain, drinking, or river water	1 ... 100 m

### TECHNICAL SPECIFICATION

supply voltage	HLM-25S (type „I“)	12 ... 36 V DC
	HLM-25S (type „U“)	16 ... 36 V DC
	HLM-25C	12 ... 34 V DC
	HLM-16N	10 ... 30 V DC
output type	4 ... 20 mA (2-wire)	
output type (HLM-25S, HLM-25C)	0 ... 10 V (3-wire)	
maximum measurement range	100 m	
accuracy (from full measured range)	0,5 %	
ambient temperature range	-20 ... +70 °C	
protection class	IP68	

More detailed informations can be found in the datasheet of the product.



## Hydrostatic level meter HLM-35

For continuous level measurement of liquids in non-pressure tanks, vessels and pipes



- Installation into the thread in the tank wall
- Intended for various liquids (water, oil, coolants, water solutions, etc.)
- Arbitrary measurement ranges of water column heights up to 100 m (H<sub>2</sub>O)
- Atmospheric pressure compensation using a cable capillary or a valve
- Current (4 ... 20 mA) or voltage (0 ... 10 V) output
- LED indication
- Variants of level meter with adjustment by magnetic pen or without adjustment elements



Possibility to use as pressure gauge up to 10 bar.



### VARIANTS

code	type	measuring range
HLM-35N-CV	measuring transducer with a <b>ceramic membrane</b> . Pressure compensation via a valve with water-proof membrane	1 ... 100 m
HLM-35N-CK	measuring transducer with a <b>ceramic membrane</b> . Pressure compensation via capillary	1 ... 100 m
HLM-35N-SV	sensor with <b>stainless steel</b> transducer diaphragm. Pressure equalizing with valve	1 ... 100 m
HLM-35N-SK	sensor with <b>stainless steel</b> transducer diaphragm. Pressure equalizing with capillary tube	1 ... 100 m

### TECHNICAL SPECIFICATION

supply voltage	12 ... 34 V DC	
output type	current voltage	4 ... 20 mA (2-wire) 0 ... 10 V (3-wire)
maximum measurement range	100 m	
accuracy (from full measured range)	0,5 %	
ambient temperature range	-20 ... +70 °C	
process connection	G 3/4"	
protection class	HLM-35_ _ _ _ _ C_ _ _ _ _ HLM-35_ _ _ _ _ (A,B,V,H)- _ _ _ _	IP67 IP68

More detailed informations can be found in the datasheet of the product.

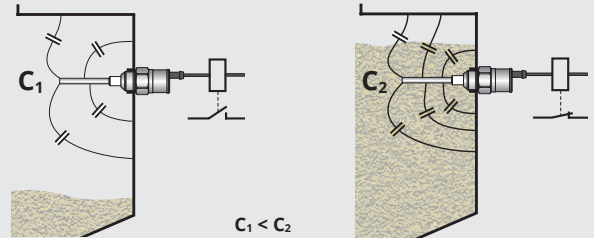


# LIMIT LEVEL SENSORS

## PRINCIPLE OF LIMIT LEVEL SENSING

### CAPACITIVE LIMIT LEVEL SENSING

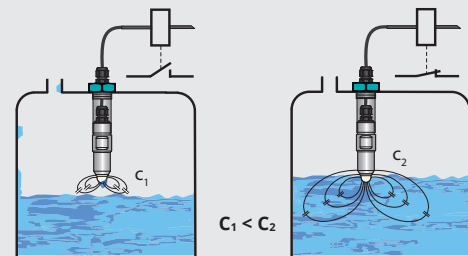
The principle is based on increasing the level of sensor electrode capacity due to its immersion into the medium. The sensor electronics evaluate the change in capacitance and perform switching of the output, which can be connected to a relay or an input of a control system.



**CLS-23, CLS-23S, CPS-24, CTS-41, DLS-27, DLS-35, FS-4**

### HIGH-FREQUENCY LEVEL SENSING

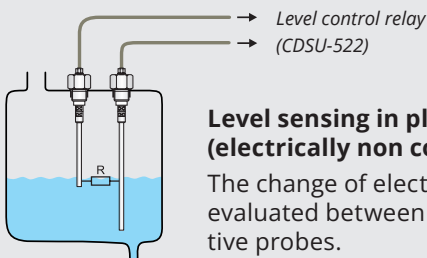
Sensors operating at high-frequencies are intended to suppress electrically conductive materials adhering to the measuring electrode of the sensor.



**FLD-32, GPLS-25, RFLS-28, RFLS-35, RFLS-53**

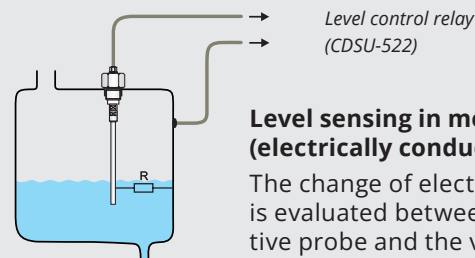
### CONDUCTIVE LEVEL SENSING

It evaluates the change of electrical resistance of the measured medium.



#### Level sensing in plastic tanks (electrically non conductive):

The change of electrical resistance is evaluated between the two conductive probes.



#### Level sensing in metal tanks (electrically conductive):

The change of electrical resistance is evaluated between the conductive probe and the vessel wall.

**CNP-18**

- Ultrasonic level sensor ULS-53 ..... 23
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- Submersible level sensor CLS-23S ..... 34
- Float system FS-4 ..... 34
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## Ultrasonic level sensor ULS-53

For limit non-contact level sensing of various liquids, mashes and pastes in closed or open tanks, vessels, sumps, reservoirs etc.



- Variants of adjustment by two buttons or by magnetic pen
- Optical state indication
- Xi version for usage in explosive areas
- Wide choice of electric connection via connectors, cable glands, or a gland for protective hoses
- Additional horn adapter improve measurement of problematic media (foamy levels, loose materials, etc.)
- PNP output and current switch output

### VARIANTS

code	type	measuring range
ULS-53-01	plastic transmitter and plastic body, mechanical connection with <b>thread G 3/4"</b>	0,1 ... 1 m
ULS-53-02	plastic transmitter and plastic body, mechanical connection with <b>thread G 1"</b>	0,2 ... 2 m
ULS-53-06	plastic transmitter and plastic body, mechanical connection with <b>thread G 1 1/2"</b>	0,2 ... 6 m
ULS-53-10	plastic transmitter and plastic body, mechanical connection with <b>thread G 2 1/4"</b> . Plastic flange connection can also be selected from the accessories menu	0,4 ... 10 m
ULS-53-20	plastic transmitter and plastic body, <b>aluminium alloy flange</b>	0,5 ... 20 m

### TECHNICAL SPECIFICATION

supply voltage	ULS-53N ULS-53Xi	12 ... 36 V DC 12 ... 30 V DC
supply current	ULS-53N_ _ _ -P ULS-53N(Xi)_ _ _ -S	max. 12 mA OFF state 4 mA / ON state 20 mA
output type	ULS-53N_ _ _ -P ULS-53N(Xi)_ _ _ -S	PNP, max. 300 mA current switch 4 mA / 20 mA
temperature error		max. 0,04 %/K
ambient temperature range	ULS-53N_-01, 02, 06 ULS-53N_-10, 20	-30 ... +60 °C -30 ... +70 °C
protection class*	ULS-53_ _ _ _ _ -T ULS-53_ _ _ _ _ -G-M(L)	IP67
	ULS-53_ _ _ _ _ -C-M(L)	IP67*
	ULS-53_ _ _ _ _ -B-M(L) ULS-53_ _ _ _ _ -H-M(L)	IP68
T - set-up elements buttons M - set-up elements magnetic pen (MP-8) L - no setting, no LED G - connection method ISO connector		C - connection method M12x1 connector B - connection method short cable gland H - connection method cable gland for protective hose

\* If a special connector is used, IP68 protection can be achieved. More detailed informations can be found in the datasheet of the product.



magnetic pen for setting



## High-frequency level sensor RFLS-35

High-frequency limit level sensor with elimination of deposits or foam on the electrode



- Designed for reliable limit sensing of the level height of wide-ranging liquids, mash, and pasty materials
- Resistant to adhesion of viscous and sticky media (ketchup, yogurt, spreads, syrups, creams, pastes, cleaning agents, alkalis, etc.)
- Unique „Medium window“ material type differentiation function
- Replacement of a vibrating level sensor
- Direct mounting into tanks, vessels, sumps, pipes or funnels, and containers
- Xi version for usage in explosive areas and extended version for higher pipes or thick tank walls
- Settings using the magnetic pen
- Universal design for all types of fluids (electrically conductive and non-conductive)
- High stability at high sensitivity (possible to use for substances with  $\epsilon_r \geq 1.5$ )
- The version with PD output now also has a diagnostic function

### VARIANTS

code	type	o-ring
RFLS-35-1B	<b>insulated (PEEK) electrode</b> , for various fluids, mashed and paste-like materials, also for fuel, oil or methanol	NBR
RFLS-35-11B	<b>insulated (PEEK) electrode extended version</b> , for various liquid, mashed and paste-like materials, also for fuel, oil or methanol	NBR
RFLS-35-1E	<b>insulated (PEEK) electrode</b> , for sensing various liquid, mashed and paste-like materials, also for acids, bases or alcohol, ammonia, acetone, chlorine	EPDM
RFLS-35-11E	<b>insulated (PEEK) electrode extended version</b> , for various liquid, mashed and paste-like materials, also for acids, bases or alcohol, ammonia, acetone, chlorine	EPDM
RFLS-35-1V	<b>insulated (PEEK) electrode</b> , for various liquid, mashed and paste-like materials, also for fuel, oil, acids, bases or asphalt, tar, toluene	FPM
RFLS-35-11V	<b>insulated (PEEK) electrode extended version</b> , for various liquid, mashed and paste-like materials, also for fuel, oil, acids, bases or asphalt, tar, toluene	FPM
RFLS-35-2	<b>insulated (PTFE) electrode without O-ring</b> , for various liquid, mashed and paste-like materials, especially suitable for aggressive liquids	-
RFLS-35-21	<b>insulated (PTFE) electrode extended version without O-ring</b> , for various liquid, mashed and paste-like materials, especially suitable for aggressive liquids	-



The first high-frequency level sensor with ultra-low power consumption allowing the performance with NAMUR output on the market.

High-frequency level sensor RFLS-35N-2-CI received the TEST CERTIFICATE from ITC and it complies with hygienic requirements for products designed for contact with foodstuffs and meals.

### TECHNICAL SPECIFICATION

supply voltage	7 ... 34 V DC
output type	NPN; PNP; NAMUR
switching current	max. 300 mA
ambient temperature range	-40 ... +80 °C
process temperature range	-40 ... +105 °C
maximum overpressure	100 bar
process connection	thread G 1/2"; G 3/4"; Tri-Clamp (ø34, ø50,5)
protection class	RFLS-35_ _ _ -C_ _ _ IP67 RFLS-35_ _ _ IP68 A(B,D,H,V)_ _ _

More detailed informations can be found in the datasheet of the product.





with protective crown

variant with rear thread RG



tubular extender TN-28



magnetic pen for setting



variant with front thread FG



## High-frequency level sensor RFLS-28

High-frequency limit level sensors with elimination of deposits and foam on the electrode  
 Variants RG and RN are for vertical mounting (with or without tubular extender TN-28)  
 Variants FG and FN are for direct side mounting



- **NEW variants FG and FN with front thread**
- **RG, RN - Installation with the tubular extender in tanks, containers, sumps, or funnels and containers**
- For reliable limit-level sensing of various liquids, slurries, and pastes
- Resistant to adhesion of viscous and adhering media (ketchup, yogurts, spreads, syrups, creams, pastes, cleaning agents, etc.)
- Unique material type resolution function „Medium window“ (the sensor is sensitive only to the set medium and does not react to substances with lower and higher permittivity)
- Can replace vibration level sensors
- Adjustment with a magnetic pen or using a setting wire (PD variant)
- Universal design for all types of liquids (electrically conductive or non-conductive)
- High stability at high sensitivity (can be used for substances with  $\epsilon_r \geq 1.5$ )
- The version with PD output now also has a diagnostic function

VARIANTS		
code	type	o-ring
RFLS-28_-1B	<b>insulated (PEEK) electrode</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for oil	NBR
RFLS-28_-10B	<b>insulated (PEEK) electrode with protective crown</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for oil	NBR
RFLS-28_-1E	<b>insulated (PEEK) electrode</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for acids or bases	EPDM
RFLS-28_-10E	<b>insulated (PEEK) electrode with protective crown</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for acids or bases	EPDM
RFLS-28_-1V	<b>insulated (PEEK) electrode</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for oil, acids, bases or asphalt and tar	FPM
RFLS-28_-10V	<b>insulated (PEEK) electrode with protective crown</b> , for sensing various liquids, mashed and paste-like materials, appropriate also for oil, acids, bases or asphalt and tar	FPM



example of using RFLS-28 with tubular extender TN-28

TECHNICAL SPECIFICATION	
supply voltage	7 ... 34 V DC
output type	PNP
max. switching current (PNP output)	max. 300 mA
process temperature range	-40 ... +105 °C
maximum overpressure	100 bar
process connection	thread G 3/4", NPT 3/4"
protection class	IP68

More detailed informations can be found in the datasheet of the product.



magnetic pen for setting

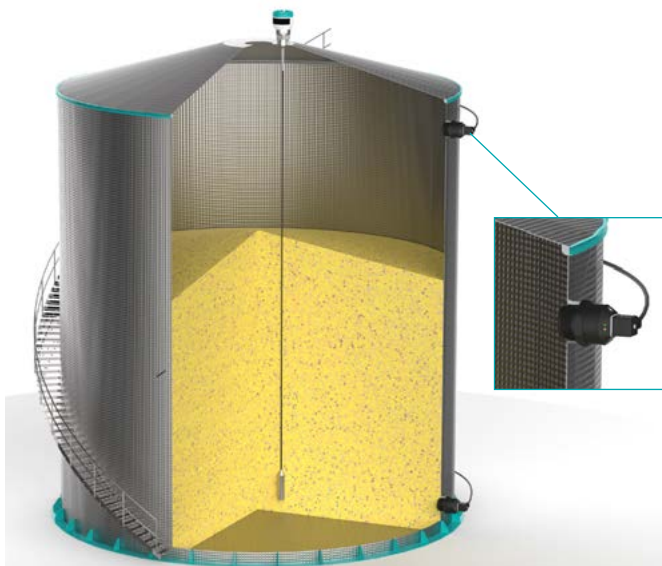


## High-frequency level sensor RFLS-53

For demanding applications to indicate bulk/solids powder, dust and hygroscopic materials and it can replace mechanical rotary level switches or standard capacitive level switches



- The RFLS-53 uses the principle of high-frequency capacitive measurement
- It responds to the mass of the material and ignores deposits and material residues on the measuring part
- The sensor is available in several versions with different types of outputs and electrical connections
- The RFLS-53 fully replaces the older CLS-53, its electrical connection is different for the 230 VAC version (3 wires)



### VARIANTS

code	type
RFLS-53N	<b>3-wire connection</b> with PNP, relay contact or solid state relay output for connected to Dinell supply and switching units or binary input of PLC

### TECHNICAL SPECIFICATION

supply voltage	RFLS-53N_-P	7 ... 34 V DC
	RFLS-53N_-RE	95 ... 230 V AC
	RFLS-53N_-SSR	95 ... 230 V AC
output type		PNP
		Relay contact SSR relay contact
switching current	RFLS-53N_-P	max. 300 mA
	RFLS-53N_-RE	1 A
	RFLS-53N_-SSR	max. 130 mA
ambient temperature range		-20 ... +60 °C
process connection		thread G 1½"
protection class		IP65

More detailed informations can be found in the datasheet of the product.



magnetic pen for setting



## Capacitive level sensor DLS-35

For limit level sensing of liquids, bulk solids and powders



### VARIANTS

code	type of electrode	el. length
DLS-35_-10	<b>uncoated short bar electrode</b> for non-adhesive bulk solids (sand, sugar) and non-conductive liquids (petroleum products, oils), horizontal mounting	50 mm or 100 mm
DLS-35_-13	like DLS-35_-10 with higher pressure resistance	50 mm or 100 mm
DLS-35_-20	<b>semi-coated rod electrode (FEP)</b> for adhesive bulk solids and non-conductive liquids, horizontal or vertical mounting	0,1 ... 2 m
DLS-35_-21	<b>fully coated (FEP) rod electrode</b> for conductive liquids (water solutions, water), adhesive and aggressive materials, horizontal or vertical mounting	0,1 ... 2 m
DLS-35_-22	<b>fully coated (PFA) rod electrode</b> with enhanced resistance to permeation (diffusion) of vapours and gases. For water and conductive liquids in the food, pharmaceutical and chemical industries. In the short term can be used for high temperature applications or for aggressive liquids. Horizontal or vertical mounting	0,1 ... 2 m
DLS-35_-25	<b>insulated (FEP) rod electrode</b> , for measuring the level of water and other electrically conductive liquids, higher pressure, and mechanical resistance at high temperatures (hot steam)	0,1 ... 2 m
DLS-35_-30	<b>uncoated demountable rod electrode</b> for bulk solids and conductive or non-conductive liquids. Vertical or horizontal slant mounting	0,1 ... 3 m
DLS-35_-31	<b>fully coated (FEP) rod electrode</b> , for aggressive conductive liquids (water, chemicals). Vertical mounting	0,1 ... 3 m
DLS-35_-40	<b>uncoated rod electrode with reference tube</b> (coaxial electrode), for non-conductive liquids (petroleum products, oil) in non-conductive tanks. Vertical mounting	max. 1 m
DLS-35_-41	<b>fully coated (FEP) rod electrode with reference tube</b> (coaxial electrode), for conductive liquids in non-conductive tanks. Vertical mounting	max. 1 m
DLS-35_-50	<b>uncoated rope electrode and weight</b> , for use in a deeper silos (bulk solids, gravel, cement) or sumps (liquids). Vertical mounting	1 ... 6 m
DLS-35_-52	<b>fully coated (FEP) rope electrode with weight</b> for electrically conductive and non-conductive liquids	1 ... 15 m

- Direct mounting into various containers, silos, vessels, tanks, filling inlets, reservoirs, etc.
- Increased resistance to electromagnetic interference
- Xi version for usage in explosive areas
- Simple sensitivity setting using magnetic pen
- Mode for quick setting of the sensor without the presence of medium
- LED state and function indication
- Wide choice of electric connection via connectors, cable glands, or a gland for protective hoses
- Material of housing and electrodes from stainless steel
- High stability at high sensitivity (can be used for material with min.  $\epsilon_r = 1,3$ )
- Special variant DLS-35NT-25 with resistance to hot steam

### TECHNICAL SPECIFICATION

supply voltage	7 ... 34 V DC	
output type	NPN; PNP; NAMUR	
switching current	max. 300 mA (NPN, PNP)	
ambient temperature range	-40 ... +85 °C	
process temperature range	-40 ... +200 °C	
max. medium temperature range	-40 ... +300 °C	
process connection	thread G1"; G 3/4"; M27 x 2; M30 x 1,5; NPT 3/4; Tri-Clamp (ø34; ø50,5)	
process pressure range (for temp. +85 °C)	DLS-35_-13	0 ... 50 bar
	DLS-35_-10, 20, 30	0 ... 25 bar
	DLS-35_-25, 21, 22, 31, 40, 41	0 ... 20 bar
	DLS-35_-50	0 ... 1 bar
protection class	DLS-35_-_-_-C_-_-	IP67
	DLS-35_-_-_-	IP68
	A(B,D,V,H)_-	

More detailed informations can be found in the datasheet of the product.



## Capacitive level sensor DLS-27

For limit level sensing of liquids, bulk solids and powders



- Direct mounting into various containers, silos, vessels, tanks, filling inlets, reservoirs, etc.
- Sensitivity and hysteresis are fluently adjustable
- LED state indication
- Fixed cable or connector connection
- Material of the housing and electrodes from stainless steel
- Xi version for usage in explosive areas, Xd for areas with the possibility of combustible dusts and, XiM for mining areas with the presence of methane gas

### VARIANTS

code	type of electrode	electrode length
DLS-27_-10	<b>uncoated short bar electrode</b> for non-adhesive bulk solids (sand, sugar) and non-conductive liquids (petroleum products, oils), horizontal mounting	50 mm or 100 mm
DLS-27_-11	<b>fully coated (PTFE) short bar electrode</b> , for conductive liquids (water). Horizontal mounting into tanks and tubes	30 mm
DLS-27_-20	<b>semi-coated (FEP) rod electrode</b> for adhesive bulk solids (cement, flour) and non-conductive liquids (plant oils). Horizontal, slant or vertical mounting	0,1 m ... 1 m
DLS-27_-21	<b>fully coated (FEP) rod electrode</b> for conductive liquids (water solutions, water), adhesive and aggressive materials, horizontal or vertical mounting	0,1 m ... 1 m
DLS-27_-22	<b>fully coated (PFA) rod electrode</b> with enhanced resistance, for sensing aggressive conductive liquids and materials. Horizontal or vertical mounting	0,1 m ... 1 m
DLS-27_-30	<b>uncoated demontable rod electrode</b> for bulk solids and conductive or non-conductive liquids. Vertical or horizontal slant mounting	0,1 m ... 3 m
DLS-27_-31	<b>fully coated (FEP) rod electrode</b> , for sensing aggressive conductive liquids (water, various chemicals). Vertical mounting	0,1 m ... 2 m
DLS-27_-40	<b>uncoated rope electrode and weight</b> , for general purpose use in deeper silos (bulk solids sensing - sand, cement) or sumps (sensing liquids). Vertical mounting	1 m ... 6 m



### TECHNICAL SPECIFICATION

supply voltage	DLS-27N DLS-27Xd	7 ... 36 V DC 7 ... 33 V DC
output type	NPN; PNP; NAMUR	
switching current	max. 200 mA (NPN, PNP)	
ambient temperature range	-20 ... +80 °C	
process temperature range	-40 ... +200 °C	
max. medium temperature range	-40 ... +300 °C	
process connection	thread M27 x 2; M30 x 1,5; G ¾"; Tri-Clamp ø34	
process pressure range (for temperature +85 °C)	0 ... 20 bar	
protection class	IP67	

More detailed informations can be found in the datasheet of the product.



magnetic pen for setting



## Capacitive level sensor CLS-23

Miniature capacitive level sensor for sensing various types of liquids



- Detection of various types of electrical conductive or non-conductive liquids (water, water solution, cooling liquids, oil, ets.)
- Xi version for usage in explosive areas
- Simple sensitivity setting using a magnetic pen
- Direct mounting into various containers, vessels, tanks, etc.
- LED state indication
- High-temperature performance
- SIL 1 according to the standard EN 61508

### VARIANTS

code	type of electrode	electrode length
CLS-23-10	<b>uncoated short bar electrode</b> , for electrically non-conductive liquids (mineral and plant oils, resins, etc.). Mounting in horizontal position	30 mm
CLS-23-11	<b>coated (PP) short bar electrode</b> , for non-aggressive electrically conductive liquid (water, water solutions)	30 mm
CLS-23-12	<b>coated (FEP) short bar electrode</b> , for moderately aggressive electrically conductive liquid (chemicals, water, moderately aggressive water solutions). Higher temperature resistance than variant "11"	30 mm
CLS-23-20	<b>semicoated rod electrode</b> , for level detection of conductive and non-conductive liquids, partially resistant to vapours (water) condensation in the sensing area. Vertical mounting; horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm)	50 mm ... 1 m
CLS-23-21	<b>coated rod electrode</b> , universal use, for level detection of conductive liquids (water, water solutions). Resistant to vapours (water) condensation in the sensing area and partially resistant to medium spraying. Vertical mounting; horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm)	50 mm ... 1 m
CLS-23-30	<b>uncoated demountable rod electrode</b> , for level detection of conductive and non-conductive liquids. Vertical and horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm)	50 mm ... 1 m

### TECHNICAL SPECIFICATION

supply voltage	6 ... 30 V DC	
output type	PNP; S; NAMUR	
switching current	PNP output „S“ output (2-wire current switch)	max. 100 mA 3,3 mA / 40 mA (min./max.)
ambient temperature range	-25 ... +80 °C	
process temperature range	-30 ... +150 °C	
max. medium temperature range	-30 ... +150 °C	
process connection	thread M18 x 1,5; M20 x 1,5; NPT 1/2; G 1/2"; G 3/8"	
process pressure range (for temp. +85 °C)	CLS-23-10, 12, 30 CLS-23-11 CLS-23-20, 21	0 ... 60 bar 0 ... 50 bar 0 ... 25 bar
protection class	IP68	

More detailed informations can be found in the datasheet of the product.



magnetic pen for setting



## Thru-wall level sensor FLD-32 "Flexi Watch"

**For limit sensing of liquid levels in non-conductive tanks (through a non-conductive wall of a vessel or pipeline)**



- Direct replacement for FLD-48 „Medusa“
- The sensor is equipped with high-frequency technology, enabling reliable function even in case of adhering to conductive media
- Miniature performance in a flexible housing, optional installation on slightly curving surfaces
- Attached using a self-adhesive layer or special fastening bands
- Configuration and setup using „programming“ cable or magnetic pen
- LED status indication



### VARIANTS

code	type	cable length
FLD-32N	for indication of the presence of (conductive or non-conductive) liquids in glass or plastic vessels	2 or 5 m

### TECHNICAL SPECIFICATION

supply voltage	6 ... 30 V DC	
output type	S (electronic switch)	
switching current	„S“ output (2-wire current switch)	3,3 mA / 40 mA (min./max.)
ambient temperature range	-20 ... +70 °C	
maximum vessel wall thickness	el. conductive liquids	8 mm
	el. non-conductive liquids with $\epsilon_r < 10^*$	3 mm
diameter of the container for mounting the sensor	min. 300 mm	
protection class	IP67	

\*)  $\epsilon_r$ , see relative permittivity table

More detailed informations can be found in the datasheet of the product.



planar electrode

prismatic electrode



magnetic pen for setting



## Thru-wall level sensor GPLS-25

For limit level indication of liquids in glass or plastic gauge-pipes, tubes or tanks



- High-frequency allows reliable operation for the adhesive and electrically conductive media
- Miniature configuration, LED state indication
- Simple sensitivity setting using magnetic pen
- Types with fixed cable or with a connector
- PNP or S (electronic switch) type terminal



### VARIANTS

code	type	electrode
GPLS-25N-0	<b>prismatic (refracted) electrode</b> , shape-adapted to be attached to the gauging pipe or other tube. The fixing of the sensor onto a pipe is provided by plastic straps	prismatic
GPLS-25N-1	<b>planar electrode</b> , suitable for installation on flat surfaces (e.g. plastic or glass tanks). The sensor can be fixed with plastic straps or by double sided adhesive layer	planar



### TECHNICAL SPECIFICATION

supply voltage	6 ... 30 V DC	
output type	PNP ; S (current switch)	
switching current	PNP output „S“ output (2-wire current switch)	max. 100 mA 3,3 mA / 40 mA (min./max.)
maximum vessel's wall (tube) thickness	electrically conductive liquids	8 mm
ambient temperature range	-20 ... +80 °C	
diameter of the gauge-pipes for mounting the sensor	15 ... 50 mm	
protection class	IP67	

More detailed informations can be found in the datasheet of the product.



## Capacitive proximity switch CPS-24

For the detection of leakage or spillage of liquids in detention sumps, or on the floor  

- Also suitable for detecting the position, movement or approach of objects
- Adjustable sensitivity
- Material of the housing and nut from stainless steel
- Output type NPN, PNP, NAMUR
- Xi version for usage in explosive areas
- LED state indication

### VARIANTS

code	type
CPS-24	for detection of proximity or motion of solid objects. It is suitable for indication of the liquid level through non-conductive walls of vessels or on non-conductive gauge-pipes. It is excellent for liquid leakage detection in collection pits or directly on floors

### TECHNICAL SPECIFICATION

supply voltage	7 ... 36 V DC
output type	NPN ; PNP ; NAMUR
switching current	max. 200 mA (NPN, PNP)
ambient temperature range	-20 ... +70 °C
sensing distance (Sensitivity)	0 ... 10 mm
process connection	thread M24 x 1
protection class	IP67

More detailed informations can be found in the datasheet of the product.







# Conductive probe CNP-18

**For direct level detection of electrically conductive liquids (water)**



- Electrical connection via cable or screw terminal
- Easy assembly, long service life
- Housing and electrode are made from stainless steel
- The probes can be connected to Dinel CDSU series evaluation units
- Designed with a short bar electrode or dismantlable rod electrode

## VARIANTS

code	type	electrode length
CNP-18N-10	short bar electrode for horizontal mounting, fixed cable	-
CNP-18F-10	short bar electrode for horizontal mounting, screw connector	-
CNP-18N-30	removable rod electrode, installation from above (shorter electrodes also from the side). Fixed cable connection	max. 3 m
CNP-18F-30	removable rod electrode, installation from above (shorter electrodes also from the side). Bolt clamp	max. 3 m

## TECHNICAL SPECIFICATION

temperature at housing	max. 130 °C
maximum pressure (for temperature 25°C)	40 bar
process connection	thread M18x1,5; G 3/8"; G 1/2"
protection class	IP67

More detailed informations can be found in the datasheet of the product.



## Submersible sensor CLS-23S

**Capacitive sensor for detection of water in bores, wells and sumps**

- Stainless steel removable protective basket preventing mechanical damage to the electrode
- Two-wire connection directly to relay circuit or to control system input (PLC)
- Maximum immersion depth 100 m
- Very easy installation without adjustment

### VARIANTS

code	type of electrode	electrode length
CLS-23S-11	<b>coated short bar electrode with stainless steel protection basket.</b> Possible submersion down to 100 m	30 mm

### TECHNICAL SPECIFICATION

supply voltage	6 ... 30 V DC	
output type	„S“ output (2-wire current switch)	3,3 mA / 40 mA (min./max.)
supply current - OFF state	0,6 mA	
switching current	max. 40 mA	
ambient temperature range	-20 ... +80 °C	
protection class	IP68	

More detailed informations can be found in the datasheet of the product.



## Float system FS-4

**For detection of leakage of petroleum and petroleum products in both empty and water filled trap reservoirs**



- The unit is intended for an assembly with CPS- 24Xi-C-RO capacitive sensor and NSSU-811 SP2 assessment unit
- Relay output and power supply voltage of 230 V and 24 V AC/DC
- Float guiding rods of any length (max. 2.5 m)

### VARIANTS

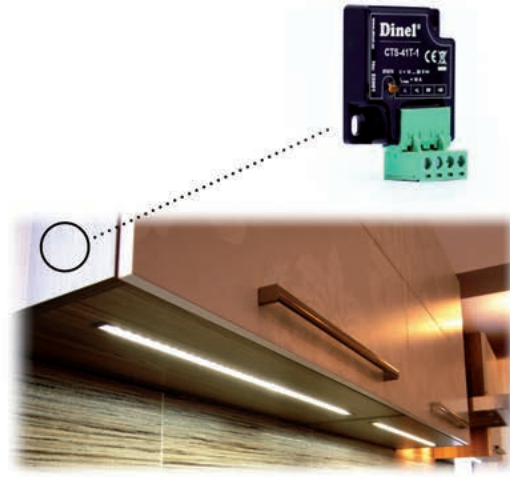
code	type	length of guiding rods
FS-4	for detection of leakage of petroleum and petroleum products in trap or protection reservoirs	0,5 ... 2,5 m

### TECHNICAL SPECIFICATION

range of ambient operational temperatures <sup>1)</sup>	-20 ... +60 °C	
range of the sensed medium densities	800 ... 950 kg/m <sup>3</sup>	
minimum layer thickness of medium for detection	on water level in empty reservoir	5 mm 25 mm
float weight (board + 4 floats + CPS-24Xi sensor)	approx. 1,6 kg	
working area	with intrinsically safe power supply unit NSSU-811-230V (24V)-R SP2, complete float system zone 1	

1) The float should be protected against freezing (see documentation of FS-4).

More detailed informations can be found in the datasheet of the product.



## Capacitive touch sensor CTS-41

For modern LED lighting switching or similar power loads



- The touch sensor allows switching over non-conductive materials (wood, glass, ceramics, plasterboard, etc.)
- The sensor has no moving parts, so it has an unlimited lifetime
- Multiple installation methods: with adhesive tape, glue, or screws
- Supply voltage 10 ... 28 V DC
- Automatic sensitivity control

### VARIANTS

code	type
CTS-41T-0	TOGGLE touch sensor - press on / press off. With an angled terminal block
CTS-41T-1	TOGGLE touch sensor - press on / press off. With direct terminal block
CTS-41S-0	SINGLE KEY touch sensor - on when zooming in / off when zooming out. With an angled terminal block
CTS-41S-1	SINGLE KEY touch sensor - on when zooming in / off when zooming out. With direct terminal block

### TECHNICAL SPECIFICATION

supply voltage	10 ... 28 V DC
supply current (OFF state)	max. 10 mA
switched current	max. 10 A (continuously)
dimensions	41 x 43 x 10 mm
covering wall maximum thickness	30 mm (wood)
sensitivity	to the hand contact
ambient temperature range	-10 ... +50 °C
weight	approx. 60 g



# PRESSURE SENSORS

NEW



## Pressure sensor PPM-35

The first universal electronic pressure gauge. It is designed to measure both gaseous and liquid substances in all industries



- Easy installation, long service life
- Stainless steel housing and diaphragm material
- Very good long-term stability
- Accuracy 0.5 % of range
- Many process and electrical connection options
- Measuring range up to 100 bar, relative and absolute pressure can be measured
- Electrical connection via fixed cable, M12 connector, or ISO connector

### VARIANTS

code	type
<b>NEW</b> PPM-35N	variant for non-explosion hazardous areas, all stainless steel, various types of process connection (G1/2, G1/4, 1/4 NPT, 1/2 NPT, Tri-Clamp 50.5 mm).
<b>NEW</b> PPM-35NT	variant for non-explosion hazardous areas, high-temperature version (up to 200°C). All stainless steel, various types of process connection (G1/2 and Tri-Clamp 50.5 mm).

### TECHNICAL SPECIFICATION

supply voltage	12 ... 34 V DC
output type	4 ... 20 mA
permissible overload	2x of range
basic accuracy (non-linearity, hysteresis, repeatability)	0,5 % of range
long-term stability	0,3 % / year
temperature error for zero and range between 0 ... +50°C	max. 0,04 % / K
temperature compensation range	0 ... +50°C
operating temperature range	-20 ... +70 °C -20 ... +200 °C (type T)
max. load resistance for current output (at U = 24 V DC)	R <sub>max</sub> = 600 Ω
protection class	PPM-35_ _ _ _ _ (C, G) IP67 PPM-35_ _ _ _ _ (A,B,V) IP68
cable	PVC 2x0,75 mm <sup>2</sup>
weight	sensor cca 190 g (by variant) cable (1 m) 60 g





# FLOW METERS

## PRINCIPLE OF FLOW SENSING

### Measurement principle of the thermal flow sensor

The function of thermal flow sensors is based on the measuring of the thermal dissipation to the measured medium. The sensor is internally heated to a temperature above several °C higher than the temperature of the medium. The movement of the medium draws this heat from the stem surface into the surrounding space (medium). The amount of heat drawn off is proportionate to the flow rate of the medium. The sensor reacts to this by changing the thermal power delivered to the sensor stem. The amount of required power then serves as information for controlling the output. The sensitivity of the sensor is primarily affected by the thermal capacity of the medium. The flow output can be configured to a switching ON mode - output is switched ON when the flow rate increases, or a switching OFF mode - the output is switched ON when the flow rate decreases. Temperature error for zero and the span in the band

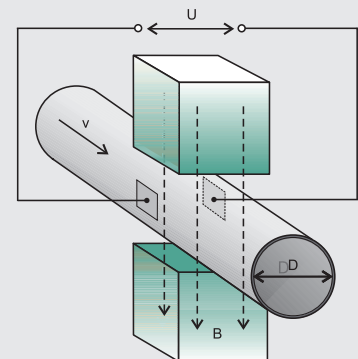
### TFS-35

### Electromagnetic flow measurement

The principle of flow measurement is taken from the Lorentz law under which the magnetic force acts on the moving charge in a magnetic field. The voltage on measuring electrodes arises as a consequence of this principle. This voltage is directly dependent on the flow velocity, the size of the magnetic induction, and the distance between the electrodes.

$$U = v \cdot B \cdot D$$

The method is resistant to changes in pressure, density, and viscosity of the liquid. The method is not suitable for measuring electrically non-conductive liquids.



### EFM-115

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magnetic pen for setting

## Thermal flow sensor TFS-35

For limit and continuous flow rate sensing of liquids and for monitoring their temperature



- These sensors are intended for installation in pipes, in which the actual flow and temperature are monitored
- Flow rate measurement is shown in a bar graph by five green LED diodes and in the same graduation it is possible to select the limit for output switching
- Can be selected either 1x current output 4...20 mA and 1x limit PNP output, or 2x limit PNP output
- Optical indication of output states (flow and temperature) by two LEDs
- Stainless steel housing
- Process connection: thread G 1/2", Tri-Clamp ø 50,5

### VARIANTS

code	type of bare	stem length
TFS-35-10	short cylindrical bare stem	20 mm
TFS-35-11	extended cylindrical bare stem	50 mm

### TECHNICAL PARAMETERS

supply voltage		12 ... 34 V DC
output	TFS-35_ _ _ -PFPT TFS-35_ _ _ -IFPT(F)	2x PNP 1x PNP, 1x 4...20 mA
maximum switching current		max. 300 mA
maximum residual voltage in ON state		1,5 V
temperature output - switching points		15 °C; 30 °C; 45 °C; 60 °C; 75 °C
flow rate range		1 ... 150 cm/s
ambient temperature range $t_a$		-20 ... +80 °C
pressure strength		100 bar
process connection		thread G 1/2", Tri-Clamp ø 50,5
protection class	TFS-35_ _ _ - _ - C-L_ _ TFS-35_ _ _ - _ - A(B,V,H)-L_ _	IP67 IP68

More detailed informations can be found in the datasheet of the product.



## Electromagnetic flow meter EFM-115

For continuous flow measurement of water and water based liquids in water treatment, chemical, food and other branch of industry



- Flanged type DN 10 - 300 mm
- Easy change from compact to remote version
- Robust and resistant cover of sensor and transmitter
- Flow direction indication
- Universal power supply
- Archiving of measured data
- Possibility of all stainless steel design for food industry

### VARIANTS

code	type	communication
EFM-115-0	flow meter without communication	-
EFM-115-M	flow meter with RS 485 / Modbus RTU	RS 485 / Modbus

### TECHNICAL SPECIFICATION

supply voltage	85 ... 260 V AC (9 ... 36 V DC)
analog output	active galvanically separated, 0 (4) ... 20 mA
frequency output	0 ... 1 kHz / 0 ... 100 % from flow rate range, galvanically separated
binary outputs	up to 4 relays (230 V AC/3A)
communication output	RS 485 (galvanically separated) / Modbus RTU (type M)
medium conductivity	≥ 5 μS/cm for demi water ≥ 20 μS/cm
measurement accuracy	0,3 % of reading
maximum pressure	standard 16 bar (optional: 25, 40 bar)
ambient temperature	-20 ... +50 °C
liner temperature resistance	rubber -5 ... +90 °C PTFE -25 ... +130 °C
measuring range	0,3 ... 12 m/s
control unit dimension	180 x ø115 mm
process connection	DIN flange
protection class	IP67
liner type	hard rubber (standard) PTFE (optional)
material of sensing electrode	standard stainless steel 17.348 (AISI 316L) optional: Hastelloy, Tantalum, Titanium, Platinum

More detailed informations can be found in the datasheet of the product.



## Flow control unit FCU-400

For measurement of immediate volume flow rate in open channels and drains. Intended for an assembly with ultrasonic level meter ULM-53 with RS485/Modbus RTU output (max. 4 sensors)



- Data recording in the internal memory with the possibility of copying on a USB flash disc
- Built-in web server, current output
- Displaying on a large OLED matrix display
- A broad choice of flow rate physical units
- Power supply voltage 230 V AC or 24 V DC
- Arbitrary conversion curve
- Designed according to TNV 25 9305

### TECHNICAL SPECIFICATIONS

casing - material	ABS
housing dimensions	160 x 166 x 106 mm
protection class	IP65
ambient temperature range	-30 ... +60 °C
power supply voltage	100 ... 240 V AC (9 ... 36 V DC)
nominal power consumption	10 VA (8 VA)
outputs	0, 2 or 4 SSR relays, max. 250 V AC / 100 mA RS 485 / Modbus RTU - Slave, galvanically isolated current output (optional) Ethernet/RJ45 (optional)
inputs	RS 485 / Modbus RTU - Master, galvanically isolated (max. 4 sensors) Binary input for user flow rate counter resetting USB
internal power supply for sensors	$U_s = 24 \text{ V DC} / I_{\text{max.}} 120 \text{ mA}$
display type	matrix OLED display 128 x 64 px
control	membrane keyboard - 4 keys
size of internal memory for data archiving	continuous archiving of average 5-minute flow rates for at least 15 month
totalizer function	2 counters of total flow quantity on each channel
motor hours function	measuring time of faultless operation and time of failure state
web server function	displaying of currently measured values and total flow quantity on all channels
language	english
weight	820 g

More detailed informations can be found in the datasheet of the product.





# EVALUATION & SWITCHING UNITS



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## Level control relay CDSU

For status evaluation of conductive level probes (e. g. CNP-18)



- Dual channel, two single relay output
- Wall-mounted case or DIN rail 35 mm mounted
- LED state indication
- Automatic level regulation function

### VARIANTS

code	description	type of mounting
CDSU-522	DIN 35 mm rail mounting. Continuous sensitivity adjustment	DIN
CDSU-522-W	wall-mounted case (possible to locate in an outdoor environment). Continuous sensitivity adjustment and time delay set up	wall



## Universal stabilized power supplies

For reliable power supply for sensors in demanding industrial applications. Unlike switch-mode power supplies, they prevent mains interferences



- Resistant to short circuits and current overloading
- Galvanic separation of output from mains power supply
- Robust design, quality terminal box
- Suited in a polycarbonate enclosure
- Installation on DIN rail 35 mm

### VARIANTS

code	type	supply voltage	max. current consumption
SPSU-1200-20	stabilized power supply with indicating device	12 V DC	2,0 A
SPSU-2400-18	stabilized power supply with indicating device	24 V DC	1,8 A
PSU-1200-S	stabilized power supply	12 V DC	160 mA
PSU-2400-S	stabilized power supply	24 V DC	80 mA



## Intrinsically safe supply units NxxU

For power supply and status detection of NAMUR sensors located in explosive areas



- Resistant to short circuits and current overloading and overvoltages
- LED status optic indication
- Relay or transistor output
- Automatic level regulation function (based on type)
- Option to locate the connected NAMUR sensor in explosive area zone 0
- Mounting on DIN rail 35 mm
- Power supply 230 V AC or 24 V DC

### VARIANTS

code	description
NSSU-811	single channel unit without additional functions for supply and state detecting of one NAMUR sensor. Transistor switch or relay contact output
NSSU-812	like NSSU-811 supplemented with an LFD system (cable fault detection), relay contact output
NDSU-822	for powering and assessing the state of two limit sensors, without supplementary functions. Transistor switch or relay contact output
NLCU-821	two-state level regulation unit using two limit sensors, relay contact output
NLCU-822	like NLCU-821 with an LFD function (cable fault detection) and protection against illogical limit sensor states arising due to malfunction or incorrect connection, relay contact output



## Isolating repeaters IRU-420

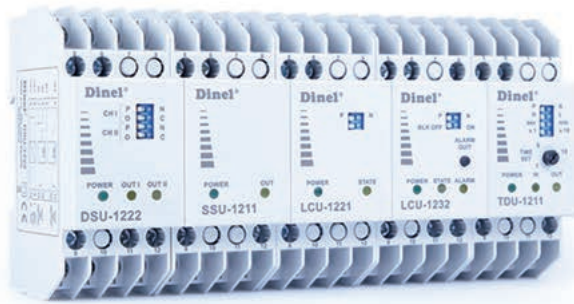
For galvanic separation of current signal from transducer in explosive area to evaluation in non-explosive area



- Galvanic separation input and output signal
- Option bi-directional transmission of communication signal HART®
- LED status optic indication
- Integrated auxiliary voltage source
- Installation on DIN rail 35 mm
- Power supply 230 V AC or 24 V DC

### VARIANTS

code	type
IRU-420-I	for powering and galvanic separation of current signal 4 ... 20 mA from explosive area to non-explosive area
IRU-420-H	for powering and galvanic separation of current signal 4 ... 20 mA from explosive area to non-explosive area. Possibility of bidirectional transmission of HART® communication signal
IRU-420-U	for powering and galvanic separation of current signal 4 ... 20 mA at 0 ... 10 V from explosive area to non-explosive area.



## Power supply and switching units

### Universal DC stabilized power supply and switching units



- Resistant to short circuits and current overloading and overvoltages
- Automatic level regulation function (based on type)
- Wall-mounted case or DIN rail 35 mm mounted
- LED status optic indication
- Option to connect Dinel limit sensors with all types of outputs

#### VARIANTS

code	description
SSU-1211 SSU-2411	single-channel universal power supply unit for powering sensors and converting their state to a power contact
DSU-1222 DSU-2422	two-channel universal power supply unit for powering sensors and converting their state to a power contact
LCU-1221	control unit designed for automatic level control between minimum and maximum level conditions using two limit level sensors. Pumping or draining function
LCU-1232	control unit designed for automatic level control between minimum and maximum state using two limit level sensors. Supplemented with an input for a third emergency sensor. Pumping or draining function
DSU-1222-W	control unit for automatic level control between minimum and maximum state using two limit level sensors. Wall-mounted design
SDSU-1222-W	control unit for automatic level control between minimum and maximum state using two limit level sensors programmable via a third wire (e.g. FLD-32 "Flexi Watch"). Wall-mounted design
TDU-1211	timing unit for level control using one limit sensor

#### NEW VARIANTS

code	description
DSU-1222-A	dual channel power supply and evaluation unit for flexiwatch sensors. Allows remote parameterization of sensor connections. Includes LC (level control) function
SSU-1212-AD	single-channel unit designed for sensors with diagnostic function (RFLS-35, RFLS-28). The diagnostic function monitors the correct function and settings of the connected sensor. Extended with a remote parametrization function. Use for safety applications
SSU-1212-D	single-channel unit designed for sensors with diagnostic function (RFLS-35, RFLS-28). The diagnostic function monitors the correct function and settings of the connected sensor. Use for safety applications
TDU-1222	timing unit for level control using one limit sensor. Supplemented by the possibility of connecting an emergency sensor



# DISPLAY UNITS



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■ SCADA system .....	50



## Programmable control unit PCU-100

For display, recording and evaluation of physical values  
Configuration of level meter using HART®



- **Universal industrial data logger, optionally with a six-digit display function (PCU-100-D)**
- **One input channel 4-20 mA current loop, optional with HART® support protocol for digital data transmission (PCU-100-\_-H)**
- Connection to PC via micro USB port, easy-to-use application (downloadable at [www.dinel.cz](http://www.dinel.cz)) for setting up the unit and the connected sensor (HART® supported version only)
- Includes power supply for the sensor (transmitter)
- Configurable LCD display, including bar graph, data storage on internal continuously overwritten FLASH memory
- FLASH memory capacity 500,000 records
- Many conversion characteristics: linear, quadratic, square root, user-defined tables with linear approximation or conversion to volume according to specified tank parameters
- Battery-backed real-time circuit

### VARIANTS

code	description
PCU-100-D	front panel with a graphic LCD display and a membrane keypad
PCU-100-L	front panel without an LCD display with status LEDs
PCU-100-_-I	PCU-100 with current input module
PCU-100-_-H	PCU-100 with current input module with HART® communication
PCU-100-_-_-I	PCU-100 with current output module
PCU-100-_-_-_-230V	PCU-100 with 230 V AC power supply

### TECHNICAL SPECIFICATIONS OF PCU-100-\_-\_-\_-230V

supply voltage	85 ... 253 V AC
rated power consumption	6 VA
output	1 × SSR relay; max. 250 V AC/100 mA
input	active current loop (4 ... 20 mA) power supply 24 V +/- 10 %, serial impedance <110 Ω
display type	graphical LCD 132 × 32 px
internal memory size	min. 500 000 records
archiving Period	user adjustable (1 sec ... 8 hours)
languages	czech, english
dimensions	110 x 80 x 65 mm
weight	320 g
housing - material	ABS / PC
protection class	IP65
ambient temperature	-25 ... +50 °C

More detailed informations can be found in the datasheet of the product.



## PCU-100 with wireless communication in stand-alone version

Transfer of measured data to Cloud storage via GSM network

Optional battery-powered version, typically for environmental and monitoring applications

- Option of the unit with GSM module for remote data management (PCU-100-\_-\_-G)
- Telemetry via GSM network with data processing capability in the Dinel Cloud application
- Optional reporting of limit states (min., max.) via SMS or e-mail

- Option of PCU-100-\_-\_-12V unit for external battery power supply BSU-1201 (remote applications without mains power)
- Shutdown mode between measurements to save battery power

### VARIANTS

code	description
PCU-100-D	front panel with a graphic LCD display and a membrane keypad
PCU-100-L	front panel without an LCD display with status LEDs
PCU-100-_-_-G	PCU-100 with communication <b>GSM</b> module
PCU-100-_-_-12V	PCU-100 with <b>battery</b> power supply

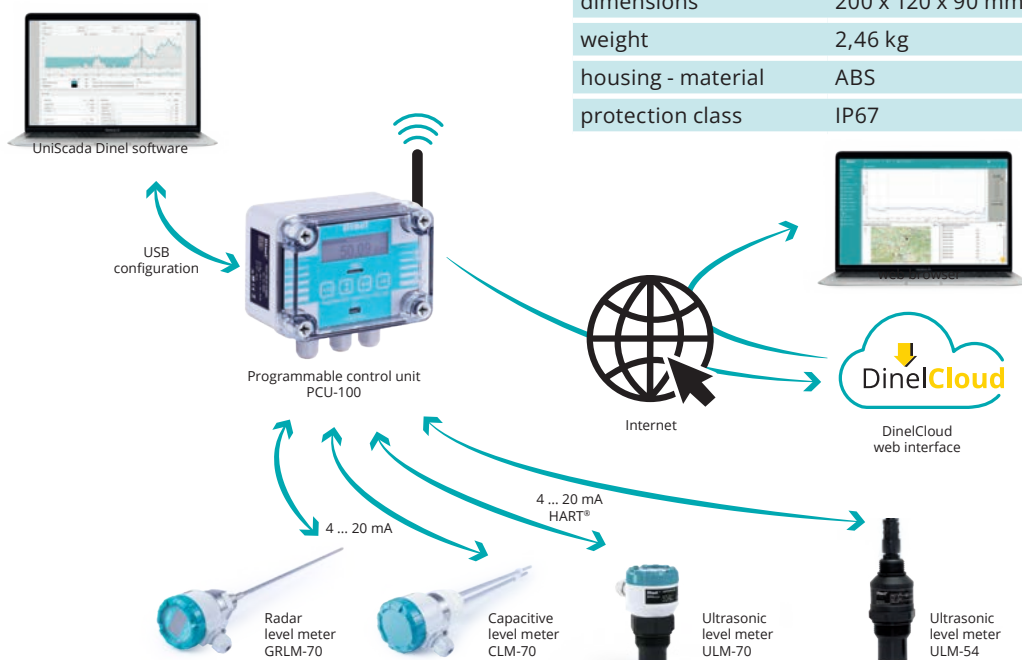
### TECHNICAL SPECIFICATIONS OF PCU-100-\_-\_-12V

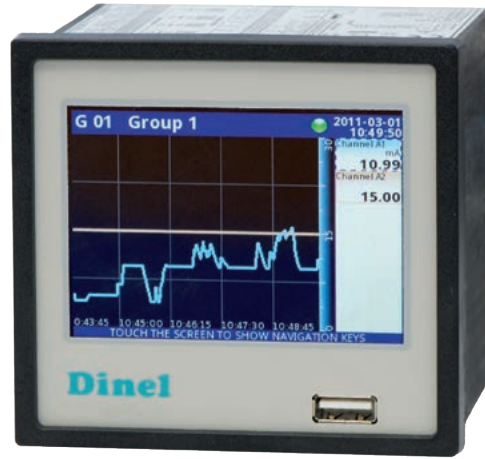
supply voltage	9...26 V DC
rated power consumption	max. 10,4 W

Other specifications are the same as for PCU-100-\_-\_-230V.

### TECHNICAL SPECIFICATIONS OF BSU-1201

nominal voltage	12 V DC
capacity	7 Ah
battery type	lead
dimensions	200 x 120 x 90 mm
weight	2,46 kg
housing - material	ABS
protection class	IP67





## Multifunction graphical unit MGU-800

For display, recording and evaluation of process instruments signals (level, flow, temperature, pressure, etc.)



- 3.5" TFT touch display (resolution 320 x 240 pixels)
- Arbitrary combination of I/O modules
- Records values to internal memory (1.5 GB)
- Various types of graphical displays, multi-language
- Extensive ways of data communication (RS232/485, USB, LAN)
- Evaluating and processing the measured data on PC
- Installation on the front panel
- Sensor power supply output 24V, load current of internal power supply max. 0,2 A

### MODULE VARIANTS

code	description
II16	16x Current inputs (4 ... 20 mA)
IUI4 (IUI8)	4 (8) Current inputs (4 ... 20 mA) + 4 (8) Voltage inputs (0 ... 10 V)
ID8	8 Optoisolated digital (binary) inputs
IFI2 (IFI4)	2 (4) Current inputs for flowmeters + 2 (4) Current inputs (4 ... 20 mA)
IPI2 (IPI4)	2 (4) Pulse inputs for flowmeters + 2 (4) Current inputs (4 ... 20 mA)
ICP4	4 Universal counter inputs
ITC4 (ITC8)	4 (8) Thermocouple sensors (TC/mV) inputs
IRT4	4 Resistance temperature detectors (RTD) inputs
OI2	2 Passive current outputs (4 ... 20 mA)
OR8	8 Relay outputs (1 A/250 V)

### TECHNICAL SPECIFICATIONS

supply voltage	24 V 230 V	19 ... 50 V DC; 16...35 V AC 85 ... 260 V AC/DC (50...60 Hz)
power supply output	24 V DC +/- 5 %/max. 200 mA	
power consumption	15 VA (max. 20 VA)	
built-in digital input	0 ... 24 V DC, galvanic instulated low state: 0...1 V, high state: 8...25 V power consumption: 7,5 mA/24 V	
display type	3,5" TFT color display, 320 x 240 px	
basic communication interface	RS-485 Modbus RTU USB port (front)	
optional communication interface	RS-485; RS-485/RS-232 Modbus RTU USB port (rear) Ethernet 10M RJ-45	
languages	czech, english, russian, german and other	
dimensions	96 x 96 x 100 mm	
weight	340 g	
housing - material	NORYL - GFN2S E1	
protection class	IP40 (optional IP54)	
ambient working temperature	0 ... +50 °C	

More detailed informations can be found in the datasheet of the product.





with remote control RCW-1



## Programmable display unit PDU

For measurement and display of physical values



- Suitable for connecting level meters or other process instruments with a current or voltage output
- 4-digit LED display
- Up to 4 relay outputs, the option of an insulated analog output
- Includes an auxiliary voltage power supply for current loop 4 ... 20 mA
- Front panel performance (IP40) or wall-mounted case (IP65)
- Communication interface RS-485 / Modbus RTU
- Power supply 230 V AC or 24 V DC

### VARIANTS

code	description
PDU-420-W	wall-mounted case unit with 2 relay outputs and 4-digit display, support infrared remote control RCW-1
PDU-420-P	front panel performance unit with 2 relay outputs and 4-digit display
PDU-421-P	front panel performance unit with 2 relay outputs and 4-digit display. Support analog output signal 4 ... 20 mA
PDU-440-P	front panel performance unit with 4 relay outputs and 4-digit display

### TECHNICAL SPECIFICATIONS

		P (panel)	W (wall mounted)
housing type	24 V	19 ... 50 V DC,	24 V DC +/- 15 %
supply voltage	230 V	16 ... 35 V AC	230 V AC +/- 10 %
		85 ... 260 V AC/DC	(50 ... 60 Hz)
power consumption	24 V	4,5 W (4,5 VA)	4,5 W
	230 V	4,5 VA	2,6 VA
power supply output	24 V DC +/- 5 % / max. 100 mA		
input	current	0/4 ... 20 mA	
	voltage	0/1 ... 5 V; 0/2...10 V	
output		2 / 4 (relay 1A/250 V AC)	2 (relay 1A/250 V AC)
		optional 0 ... 24 mA	
display range	-999 ... 9999, decimal point		
communication interface	RS-485 Modbus RTU		
dimensions	96 x 48 x 100 mm	110 x 80 x 67 mm	
weight	210 g	330 g	
housing - material	NORYL-GFN2S E1	ABS	
protection class	IP40 (from front)	IP65	
ambient working temperature	0 ... +50 °C		

More detailed informations can be found in the datasheet of the product.

# Local process indicator LDU-401

For local display of measured physical value



- For local level indication directly on the level meter
- Programming through 2 keypads programmable unit, the decimal point can be arbitrarily set
- Assembly between the level meter (CLM-36 or ULM-53) and the connector



# SCADA system

Software applications for setting of level meters that are connected to the communications loop and collection of measurement data



- Graphic visualization
- Data recording and export to Excel

## Basic SCADA level

Application for communication with level meters. (ULM-53, ULM-70, GRLM-70).

## Basic SCADA flow

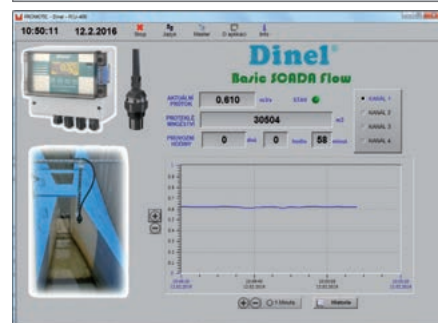
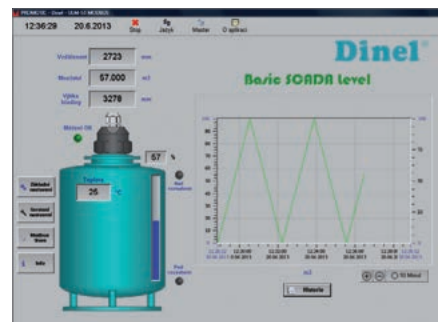
Application for communication with flow meters. (FCU-400).

## Basic SCADA fuel

Application for communication with level meters for diesel measurement (CLM-40-40).

## Uni SCADA

Applications for communication with end devices with HART® output.





# OTHER PRODUCTS

## Convertor UCC-01



**Converter for sensor connection to CAN output (CLM-40) and a PC with special software (Basic Scada fuel)**

- Power supply voltage: USB interface (4.4 ... 5.25 V DC)
- Operating temperature range: -40 ... +80 °C



## Convertor UHC-01



**Universal USB to HART® converter. Setting, reading of measured data via PC from devices supporting HART® communication protocol**

- Use with external power supply for current loop or internal power supply (24 V / 45 mA) with short circuit protection
- Integrated and switchable HART® communication resistor (250 Ω)
- Supplied with setup and diagnostic software supporting HART® protocol revision 5 and 7
- Communication signalling via LEDs
- Very compact dimensions and low weight



## Convertor URC-485



**Converter for connection of the sensor with RS 485 / Modbus (GRLM- 70, ULM- 70, ULM-53, EFM-115, FCU-400, MGU-800, PDU-4xx-P, PDU- 420- W) and PC with special software (Basic Scada level)**

- Power supply: from USB interface (4,4 ... 5,25 V DC)
- Galvanic isolation (optoisolation) between an USB interface and RS-485 lines
- Ambient temperature range: 0 ... +50 °C



# Non-hermetic junction box NB

**For termination of hydrostatic level meter cable with compensation capillary and its electrical connection with the supply cable**



- For connection of hydrostatic level meters (HLM-25C, HLM-25S, HLM-16N and HLM-35C) quipped with a cable with compensation tube
- Equipped with a valve with semipermeable membrane to equalize atmospheric pressure (non-permeable to water, permeable to air)
- Option of overvoltage protection version
- Protection class IP65



## VARIANTS

code	type
NB-01	version without overvoltage protection
NB-11	version with overvoltage protection

# HUB HB-485

**For connection more level meters ULM with unit FCU**



- Cable glands for protective hose
- Possibility of connection to 4 level meters of ULM series with output RS 485
- Plastic box with IP65





# ACCESSORIES

## Telescopic bracket VKD

**Intended for mounting of ultrasonic level meters in outdoor applications - rivers, canals, dams, or for installation in tanks with open ceilings - sumps and shafts**



- The telescopic bracket allows the level meter to be mounted in the range of 51-90 cm from the wall
- The connecting material is part of the telescopic bracket (except for the screws for fixing to the wall - it is recommended to use 3x M8 through anchor)

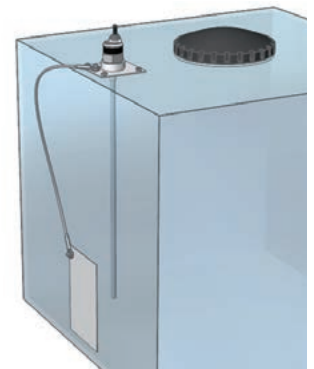
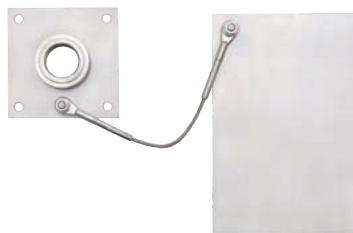


## Auxiliary plate electrode PDE

**For maximum reliability and linearity of capacitive sensors placed in non-conductive tanks**



- Designed for capacitive sensors installed in vertical position with electrode length exceeding 300 mm
- Stainless steel performance
- Process connection  
M18 x 1,5 or M27 x 2, G 3/4



## Tubular extender TN-28

**Accessories for RFLS-28 high-frequency level sensors**



- The tubular extender is used for vertical mounting of the RFLS-28 sensor in tanks, vessels and sumps
- Choice from three types of process connection: flange, G1" thread or Tri-Clamp  $\varnothing$  64 mm



# Horn adapters ST-G

For performance improvements of ultrasonic level meters ULM and ULS

CE

- Increases the radiation directivity of acoustic waves
- Improves reception of weak ECHOS (foamy or unstable level surfaces, solid materials, ...)
- Reduces the risk of false reflections
- Process connection thread G $\frac{3}{4}$ ", G1", G1 $\frac{1}{2}$ " or G2 $\frac{1}{4}$ "



# Cable hanger KD-60

For hydrostatic level meters HLM safety cable hanging

CE

- Plastic performance



# Accessories

We offer a wide range of accessories

CE

- Steel and stainless steel welding flanges
- Plastic and stainless steel fixing nuts and flanges
- Metal-plate holder for proximity switches CPS-24
- Relays and mounting sockets, cable connectors
- Display module DM-70 for GRLM-70, CLM-70, and ULM-70
- Extension cable to the display module PK-70-1 for GRLM-70, CLM-70, and ULM-70
- Miniature connectors M12 for DLS-27, CPS-24, CLS-23, DLM-35, DLS-35, HLM-35, ULM-53, ULS-53, RFLS-35 sensors
- Miniature connectors M8 for GPLS-25 sensors
- Distance plastic crown for CPS-24, use inter-coat space of double coated tanks
- Atypical seal made of PTFE, aluminium, or other materials
- Magnetic pen MP-8



# MAP OF APPLICATIONS

map of Dinel level sensors applications	CONTINUOUS LEVEL METERS																		
	GRLM-70-10	GRLM-70-11, 12	GRLM-70-20, 24	GRLM-70-30, 33	GRLM-70-32	ARLM-70	CLM-36(70)-10 DLM-35-20	CLM-36(70)-11, 12 DLM-35-21, 22	CLM-36(70)-20 DLM-35-40	CLM-36(70)-22 DLM-35-41	CLM-36(70)-30, 31 DLM-35-50	CLM-36(70)-32 DLM-35-52	CLM-70-61	CLM-40	ULM-53	ULM-70 ULM-54	HLM-16N HLM-25S	HLM-25C	HLM-35
<b>AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY</b>																			
corn, cereals, seeds	••	•	-	••	-	-	••	-	-	-	••	-	-	-	-	•	-	-	-
malt and feeding mixtures - dry	••	•	-	••	-	-	•	•	-	-	••	•	-	-	-	•	-	-	-
malt and feeding mixtures - wet	•	•	-	•	-	-	-	•	-	-	-	•	-	-	-	•	-	-	-
chocolate, fruit jam	••	••	•	•	••	••	-	••	-	-	-	••	•	-	••	••	-	-	-
beverages - water, sirup, wine, milk	••	••	•• / •	•	••	••	-	••	-	•	-	••	•	-	••	••	-	•	••
spirits	••	•	••	•	••	••	-	••	-	•	-	••	•	-	•	•	•	•	••
sugar, salt	••	•	-	•	-	-	-	••	-	-	••	••	•	-	-	••	-	-	-
powders, flour, coffee	••	•	-	•	-	-	•	-	-	-	••	-	-	-	-	-	-	-	-
plant oils	••	••	••	•	•	•	••	••	•	•	••	••	•	•	••	••	•	•	••
<b>WATER PROCESSING TECHNOLOGY, ENVIRONMENTAL</b>																			
water storage tanks	••	••	••	••	••	••	-	••	-	••	-	••	••	-	••	••	••	••	••
sewage sumps	••	••	••	••	••	••	-	••	-	-	-	••	••	-	••	••	-	••	••
open channels	-	-	-	-	-	-	-	•	-	•	-	•	-	-	••	••	-	-	-
wells, bores	-	-	-	-	-	•	-	•	-	-	-	•	-	-	•	•	••	••	-
reservoirs, rivers	•	•	•	•	•	••	-	•	-	-	-	•	-	-	••	••	•	••	•
<b>CHEMICAL INDUSTRY</b>																			
alkalic liquids, chemicals, reagents	•	•	•	•	••	••	-	•	-	•	-	•	•	-	•	•	-	-	•
bulk-solid materials - salt, fertilizers	••	••	-	••	-	-	•	-	-	-	•	-	-	-	•	•	-	-	-
liquid detergents	••	•	••	••	••	••	-	•	-	•	-	•	•	-	••	••	-	-	•
anorganic solvents, acids	•	••	-	•	••	•	-	•	-	-	-	•	••	-	•	•	-	-	•
resins	••	••	••	••	••	••	•	•	-	-	-	•	••	-	•	••	-	-	•
<b>PHARMACY</b>																			
non-conductive fluids, organic solvents	••	••	••	••	••	••	••	•	••	-	-	•	•	•	•	•	-	-	•
clean water, de-mi water	••	••	••	••	••	••	-	••	-	•	-	••	••	-	•	••	••	••	••
pasty mass	••	••	-	••	••	••	-	••	-	-	-	••	-	-	••	••	-	-	-
<b>PETROCHEMICAL INDUSTRY</b>																			
oil, diesel	••	••	••	••	••	•	••	•	••	•	•	•	-	••	•	••	-	-	••
petrol	••	••	••	••	••	-	••	•	••	•	•	•	-	••	-	-	-	-	•
<b>TRANSPORT VEHICLES, ENGINES</b>																			
diesel tanks	•	•	••	•	•	-	••	•	••	•	-	-	-	••	-	-	-	-	•
cooling fluid in engine	•	•	••	•	•	-	-	••	-	••	-	-	-	-	-	-	-	-	•
oils in engines, compressors	•	•	••	•	•	-	•	•	•	•	-	-	-	••	-	-	-	-	•
<b>HEATING</b>																			
water condensate tanks, coolers	•	••	•	•	••	••	-	••	-	•	-	••	-	-	•	•	-	-	•
boilers, steam developers	•	••	•	•	••	-	-	•	-	•	-	•	-	-	-	-	-	-	•
wooden pellets, chips	••	•	-	••	-	-	•	-	-	-	•	-	-	-	-	•	-	-	-
heating oil	••	••	••	••	••	•	••	•	••	•	•	•	-	••	••	••	•	•	••
<b>BUILDING AND PROCESS INDUSTRY</b>																			
cement, powder lime, chalk - dry	••	•	-	••	-	-	•	•	-	-	••	•	-	-	-	-	-	-	-
gravel	••	••	-	••	-	-	•	-	-	-	•	-	-	-	•	•	-	-	-
liquid asphalt, bitumen	••	•	-	•	-	-	•	•	-	-	•	-	-	-	-	-	-	-	-
sand	••	••	-	••	-	-	•	•	-	-	•	-	-	-	-	•	-	-	-
<b>MACHINERY</b>																			
hydraulic oil	••	••	••	••	•	•	••	•	••	•	-	•	•	••	••	••	•	•	••
lubricants	••	••	••	••	•	••	••	•	•	•	-	•	•	•	••	••	•	•	••
cooling emulsions	••	••	••	••	•	••	•	••	-	••	-	••	•	-	••	••	•	•	••
<b>PLASTIC TECHNOLOGY</b>																			
granulates	••	••	-	••	-	-	••	-	-	-	••	-	-	-	•	•	-	-	-
powders	••	••	-	••	-	-	••	-	-	-	••	-	-	-	-	•	-	-	-

## IMPORTANT NOTE:

This table is for orientation only. Specific type for particular application is advised to consult with the producer. Each application is influenced by many aspects.

LEGEND					
••	suitable	•	conditionally applicable	-	not suitable

## LIMIT LEVEL SENSORS

	DLS-27-10, 20, 30, 40 DLS-35-10, 20, 30, 50	DLS-27-11, 21, 22, 31 DLS-35-11, 21, 22, 31	DLS-35-40	DLS-35-41	CLS-23-10, 20, 30	CLS-23-11, 12, 21	ULS-53	RFLS-35(28)-1B, 11B	RFLS-35(28)-1E, 11E	RFLS-35(28)-1V, 11V	RFLS-35-2, 21	RFLS-53	CPS-24	GPLS-25 FLD-32	CNP-18
<b>AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY</b>															
corn, cereals, seeds	••	•	-	-	•	-	-	-	-	-	-	••	•	-	-
malt and feeding mixtures - dry	••	•	-	-	•	•	-	-	-	-	-	••	-	-	-
malt and feeding mixtures - wet	-	•	-	-	-	•	-	-	-	-	•	-	-	-	-
chocolate, fruit jam	•	••	-	-	•	••	••	••	••	••	••	-	-	-	-
beverages - water, sirup, wine, milk	-	••	-	•	-	••	••	••	••	••	••	-	-	•	••
spirits	•	••	-	••	•	••	•	••	••	-	••	-	-	-	-
sugar, salt	•	•	-	-	•	••	•	-	-	-	-	•	•	-	-
powders, flour, coffee	••	•	-	-	•	-	-	-	-	-	-	•	-	-	-
plant oils	•	-	•	•	••	-	••	••	-	••	••	-	•	•	-
<b>WATER PROCESSING TECHNOLOGY, ENVIRONMENTAL</b>															
water storage tanks	-	••	-	•	-	••	••	•	•	•	••	-	-	••	••
sewage sumps	-	••	-	-	-	••	••	•	•	•	••	-	-	-	•
open channels	-	-	-	-	-	-	••	-	-	-	-	-	-	-	-
wells, bores	-	-	-	-	-	••	•	-	-	-	-	-	-	-	-
dry run pump protection	-	••	-	-	-	••	-	•	•	•	•	-	-	-	•
reservoirs, rivers	-	-	-	-	-	-	••	-	-	-	-	-	-	-	-
water leakage detection	•	•	-	-	••	•	-	-	-	-	-	-	••	-	•
<b>CHEMICAL INDUSTRY</b>															
alkalic liquids, chemicals, reagents	•	••	-	-	•	••	•	•	••	••	••	-	-	•	-
bulk-solid materials - salt, fertilizers	••	-	-	-	•	-	•	-	-	-	-	••	•	-	-
liquid detergents	•	•	-	•	••	••	•	-	-	••	••	-	-	-	•
anorganic solvents, acids	•	•	-	-	•	•	•	-	-	•	•	-	-	••	-
resins	•	••	-	-	•	••	•	••	••	••	••	-	-	-	-
aggressive liquid leakage detection	•	-	-	-	•	•	-	-	-	-	-	-	•	-	-
<b>PHARMACY</b>															
non-conductive fluids, organic solvents	••	•	••	••	••	•	•	-	-	•	•	-	-	•	-
clean water, de-mi water	•	••	-	••	•	••	•	•	•	•	•	-	-	••	•
pasty mass	•	••	-	-	•	•	••	•	•	•	••	-	-	-	-
<b>PETROCHEMICAL INDUSTRY</b>															
oil, diesel	••	-	••	•	••	-	•	•	-	••	••	-	-	•	-
petrol	••	-	••	•	••	-	-	•	-	••	••	-	-	-	-
leakage detection	-	-	-	-	•	-	-	-	-	-	-	-	••	-	-
<b>TRANSPORT VEHICLES, ENGINES</b>															
diesel tanks	••	•	••	•	••	•	-	•	-	••	••	-	-	-	-
cooling fluid in engine	-	••	-	••	-	••	-	•	•	-	•	-	-	•	-
oils in engines, compressors	•	•	••	•	•	•	-	••	-	••	••	-	-	-	-
<b>HEATING</b>															
water condensate tanks, coolers	-	••	-	••	-	••	•	•	•	-	•	-	-	•	-
boilers, steam developers	-	•	-	•	-	•	-	-	•	-	•	-	-	-	-
wooden pellets, chips	•	-	-	-	•	-	-	-	-	-	-	••	-	-	-
heating oil	••	•	••	•	••	•	••	•	-	••	••	-	-	•	-
<b>BUILDING AND PROCESS INDUSTRY</b>															
cement, powder lime, chalk - dry	••	-	-	-	-	-	-	-	-	-	-	••	-	-	-
gravel	•	-	-	-	-	-	•	-	-	-	-	•	-	-	-
liquid asphalt, bitumen	••	•	-	-	•	•	-	-	-	••	••	-	-	-	-
sand	••	-	-	-	-	-	-	-	-	-	-	•	-	-	-
<b>MACHINERY</b>															
hydraulic oil	••	•	••	•	••	•	••	••	-	••	••	-	-	-	•
lubricants	••	•	••	•	••	•	••	••	-	••	••	-	-	-	-
cooling emulsions	•	••	-	••	•	••	••	•	-	••	••	-	-	•	-
<b>PLASTIC TECHNOLOGY</b>															
granulates	••	•	-	-	•	-	•	-	-	-	-	••	•	-	-
powders	••	•	-	-	•	-	-	-	-	-	-	•	•	-	-

## FLOW METERS

	TFS-35	EFM-115	FCU-400
<b>AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY</b>			
beverages - water, sirup, wine, milk	••	••	-
spirits	••	•	-
<b>WATER PROCESSING TECHNOLOGY</b>			
water storage tanks	••	•	-
sewage sumps	••	••	••
open channels	-	-	••
reservoirs, rivers	-	-	•
<b>PHARMACY</b>			
non-conductive fluids, organic solvents	••	-	-
clean water, de-mi water	••	••	-
<b>PETROCHEMICAL INDUSTRY</b>			
oil, diesel	•	-	-
petrol	-	-	-
<b>TRANSPORT VEHICLES, ENGINES</b>			
cooling fluid in engine	••	-	-
oils in engines, compressors	••	-	-
<b>HEATING</b>			
water condensate tanks, coolers	••	-	-
heating oil	•	-	-
<b>MACHINERY</b>			
hydraulic oil	••	-	-
lubricants	•	-	-
cooling emulsions	••	-	-



# APPLICATION TABLE

PROCESS MEDIUM FEATURES AND OTHER FACTORS	CONTINUOUS LEVEL MEASUREMENT								LEGEND
	GRLM-70	ULM-53	ULM-70 ULM-54 with horn adapter	CLM-36 DLM-35	CLM-70	HLM-35	HLM-25 HLM-16	ARLM-70	●● suitable ● conditionally applicable - not suitable 1) dielectric constant (relative permittivity) 2) $\eta$ - dynamic viscosity < 1000 [10-3 Pa.s] 3) $\eta$ - dynamic viscosity > 1000 [10-3 Pa.s] 4) variant CLM-70-61 5) certification is missing for now, otherwise yes 6) only to max. levels or protect with a shield 7) only rope electrode 8) concentration to 5 %
<b>SOLID</b>									
dust - fraction up to 0.1 mm	●●	-	-	●●	●●	-	-	-	
loose material - fraction up to 10 mm	●●	-	●	●	●	-	-	-	
piece material - fraction over 10 mm (up to 60 mm)	-	●	●●	-	-	-	-	-	
changing (DK <sup>1)</sup> , density)	●●	●	●●	-	-	-	-	-	
settled dust (up to 5 mm layer)	●●	-	●	●●	●●	-	-	-	
extreme dustiness - dust permanently in the air (layer above 5 mm)	-	-	-	●	●	-	-	-	
extremely lightweight material	-	-	●	●	●	-	-	-	
highly abrasive material (sharp stones)	-	●	●●	-	-	-	-	-	
flammable dust, explosives	●●	-	●●	●●	●●	-	-	-	
mechanical obstacles in the stack	●	-	●●	●	●	-	-	-	
<b>LIQUIDS AND SLURRIES</b>									
liquid <sup>2)</sup>	●●	●●	●●	●●	●●	●●	●●	●●	
paste-like substance <sup>3)</sup>	●●	●●	●●	●	●	-	-	●●	
hygienic applications	●●	●	●	●●	●●	●	-	●	
hygienic applications with sanitation	●●	-	-	●●	●●	-	-	●	
changing DK <sup>1)</sup>	●●	●●	●●	-	-	●	●	●●	
changing density	●●	●●	●●	●	●	-	-	●●	
sticking + el. conductive (strong alkalis)	●●	●	●●	-	-	●	-	●●	
aggressive inorganic acids	●	●	●	●	●● <sup>4)</sup>	-	-	●●	
non-fuming diluted chemicals	●●	●●	●●	●	●● <sup>4)</sup>	-	-	●●	
organic solvents	●●	-	-	●●	●●	●	-	●●	
very small tanks	-	-	-	●●	●	●	●	-	
very volatile	●●	-	-	●●	●●	●	-	●●	
foam continuous, dense	●●	-	●●	●●	●●	●●	●●	●	
foam incoherent, moulded	●	-	-	●	●	●●	●●	-	
combustibles	●●	-	●	●●	● <sup>5)</sup>	● <sup>5)</sup>	-	● <sup>5)</sup>	
liquid gases	●●	-	-	●	●	-	-	●	
sludge	●	●●	●●	●	●	-	-	●	
barriers in the tank	●●	-	●●	●●	●●	●●	●●	●	
higher pressure (above 2 bar)	●●	-	-	●●	●●	●	●	●●	
vacuum	●●	-	-	●●	●●	-	-	●●	
<b>LIMIT LEVEL SENSING</b>									
PROCESS MEDIUM FEATURES AND OTHER FACTORS	DLS-35 DLS-27 from side	DLS-35 DLS-27 from above	RFLS-53 from side	ULS-53 from above	GPLS-25 FLD-32 through wall	RFLS-35 RFLS-28-F- from side	RFLS-28-R- from above		
<b>SOLID</b>									
dust - fraction up to 0.1 mm	●●	●●	●	-	-	-	-	-	
loose material - fraction up to 10 mm	●● <sup>6)</sup>	●●	●●	●	●	-	-	-	
piece material - fraction over 10 mm (up to 60 mm)	-	● <sup>7)</sup>	●	●●	-	-	-	-	
changing (DK <sup>1)</sup> , density)	●	●	●	●●	-	-	-	-	
settled dust (up to 5 mm layer)	●●	●●	●●	-	-	-	-	-	
extreme dustiness - dust permanently in the air (layer above 5 mm)	●	●	●	-	-	-	-	-	
extremely lightweight material	●	●	-	-	-	-	-	-	
highly abrasive material (sharp stones)	-	●	-	●●	-	-	-	-	
flammable dust, explosives	●●	●●	-	-	-	-	-	-	
<b>LIQUIDS AND SLURRIES</b>									
liquid <sup>2)</sup>	●	●●	-	●●	●●	●●	●●	●●	
paste-like substance <sup>3)</sup>	-	●●	-	●●	●	●●	●●	●●	
hygienic applications	●	●●	-	●	●●	●●	●●	●●	
hygienic applications with sanitation	●	●	-	-	●●	●	●	●	
changing DK <sup>1)</sup>	●	●	-	●●	-	●	●	●●	
changing density	●	●	-	●●	●●	●●	●●	●●	
sticking + el. conductive (strong alkalis)	-	●	-	●	●●	●●	●●	●●	
aggressive inorganic acids	-	●	-	●	●●	●	●	●	
non-fuming diluted chemicals	●	●●	-	●●	●●	●●	●●	●●	
organic solvents	●●	●●	-	-	●●	●●	●●	●●	
very small tanks	●●	●●	-	-	●●	●●	●●	●●	
very volatile	●●	●●	-	-	●●	●●	-	-	
foam on the surface	●	●	-	●	●●	●●	●●	●●	
combustibles	●●	●●	-	●	●	●●	-	-	
liquid gases	●	●	-	-	-	●	●	●	

# LEGEND



Interesting fact / unique product



Additional information to the product



The conformity mark



The explosion-proof equipment mark



HART Communication protocol, HART communication protocol interface



Modbus, an open protocol for the mutual communication between various devices



CAN, the bus employed for the internal communication network and units in cars



SIL, Safety Integrity Level standard



Continuous level meters



Limit level sensors



Pressure sensors



Flow meters



Evaluation and power supply units

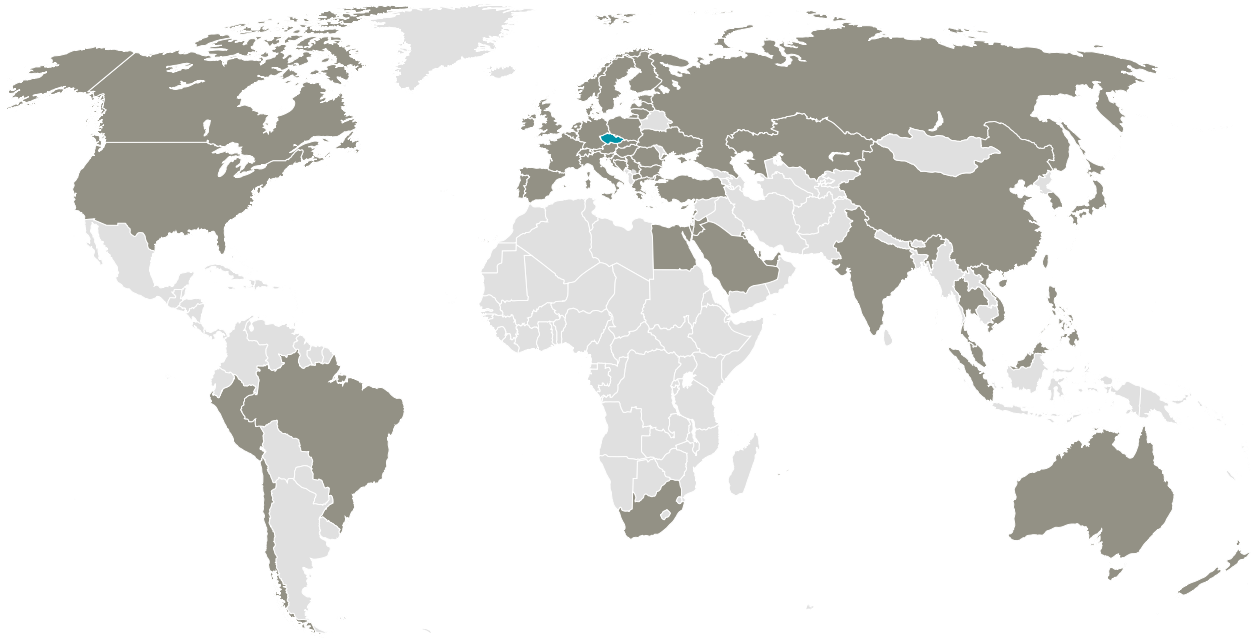


Display units



Other products and accessories





**Dinel**<sup>®</sup>  
industrial electronics



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Sensormatic srl - Via della Beverara 13 - 40131 Bologna - Italia  
Tel. +39 051 63 53 511 - [smbox@sensormatic.it](mailto:smbox@sensormatic.it) - [www.sensormatic.it](http://www.sensormatic.it)