Dinel®

industrial electronics

PRODUCT OVERVIEW

Dinel®
industrial electronics

www.dinel.cz

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ABOUT US

The company Dinel, s. r. o. was founded in 1995, after transformation from the 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 fulfil various requirements in wide range of branches, e.g. water and waste water processing, agricultural technology and food industry, plastic materials technology, chemical industry, petroleum and gas filling stations, in 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.

24

YEARS
ON MARKET

19

YEARS
OF ISO 9001
CERTIFICATION

30

EMPLOYEES

17

YEARS OF
ATEX CERTIFICATION

60

EXPORT
COUNTRIES

38

DISTRIBUTORS
WORLDWIDE

DEVELOPMENT

Our engineers in the development department prepare new products and enrich the existing ones with new functions or they go in for 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 for the purpose of testing their functions.

TECHNICAL SUPPORT

The team of technicians carry out advisory services, help solve the problems remotely or provide 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 permanent repairability of all our products any time after warranty period which we provide for 3 years.

HISTORY

1995	–	Company was established.
1997	–	Production of universal capacitive level sensor DLS-27 was started.
2000	–	Our Quality Management System was certified according to ISO 9001 standard.
2001	–	As a first Czech firm we placed on the market a compact ultrasonic level meter with 4 ... 20 mA output.
2002	–	The requirements of directive 94/9/EC for non-explosive equipment were implemented and ATEX certificate was achieved.
2003	–	New variants of ultrasonic level meters ULM and new types of supply and switching units PSU, DSU, LCU, TDU.w
2005	–	Removal to new building, installing new technology, introduced new isolating repeater IRU.
2007	–	New version of capacitive level meter CLM-36N-40 for continuous measurement of aggressive liquids, new stabilized SPSU with continuous load indication
2008	–	Worldwide unique flexible level sensor FLD-48 “Meduse”. New capacitive level switch CLS–53 for bulky-solid and loose materials, new line of ultrasonic level meters ULM–53.
2010	–	Ultrasonic level meters ULM–70 with matrix OLED display, advanced signal processing and current output with HART®. Membership in HART Communication Foundation.
2011	–	New capacitive level switch CLS–23 for sensing of various types of liquids, stainless steel submersible hydrostatic level meter HLM–25S, multifunctional display unit MGU–800, switching units CDSU–522.
2012	–	Submersible level sensor CLS–23S for level detection in wells or boreholes, capacitive level meter CLM–40 for level measurement of diesel fuel in trucks, building machines etc.
2013	–	Radar level meter GRLM–70 “Miranda”, electromagnetic flow meter EFM–115.
2014	–	Flow control unit FCU-400, new software applications Basic SCADA systems.
2015	–	New capacitive level meters DLM-35 and capacitive level switch DLS-35, innovation of ultrasonic level meter ULM-53 and innovation of capacitive level meter CLM-40, new type of hydrostatic level meter HLM-25C.
2016	–	New High-frequency level sensors RFLS-35, removal to new building.
2017	–	New hydrostatic level meters HLM-35, thermal flow switch TFS-35.
2018	–	New display and recording unit - data logger PCU-100, a new type of the high-frequency level sensor RFLS-35 (TriClamp) and PTFE sensing electrode.
2019	–	We will introduce a new capacitative level meter with settings carried out by CLM-70 display and also a new version of the flexible level sensor FLD with high-frequency technology.

CERTIFICATES

Certificate CQS (ISO)

Certificate IQNet

Quality Assurance Notification

CERTIFICATE for contact with drinking water

CERTIFICATE for contact with foodstuffs

HART Communication Foundation

LEGEND

	Interesting / unique product
	Additional information to 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

Radar level meter GRLM –70 “Miranda”

Suited to continuous level measurement of various liquids, mashes, bulk solids and powders.

- Radar level meter with guided wave (TDR).
- Universal use, direct mounting into containers, silos, vessels, reservoirs, etc.
- Stainless steel rod or rope electrode.
- Measuring range up to 40 m.
- Xi, XiT versions for usage in explosive areas, or Xd, XdT versions for usage in flammable dusts areas.
- Linear measurement also in non-conductive and in variously shaped tanks.
- Immediate view of the measured values on OLED or LCD display units.
- Simple installation and settings.
- Arbitrary selection between metric and imperial units.
- Easy manual setting by removable display-module DM–70.
- Current output (4 ... 20 mA) with HART® protocol or output RS–485 Modbus.
- Optional connection using a cable gland, or a cable gland for protective hose.

Technical specification

Supply voltage	ULM-70N(NT) ULM-70Xi(XiT) ULM-70Xd(XdT)	18 ... 36 V DC 18 ... 30 V DC 18 ... 33 V DC
Output type (var. “I”)		4 ... 20 mA (2-wire), HART®
Output type RS–485 (var. „M“)		protocol Modbus RTU
Basic error	for range 2,0 - 40 m	+/- 2 mm
Resolution		0,1 mm
Ambient temperature range		-30 °C ... +70 °C
Process temperature range		-40 °C ... +200 °C
Process connection		Thread G1” ; NPT 1”; TriClamp Ø 50,5
Process pressure (for temperature +85 °C)	for GRLM-70N-10 (00, 20, 30, 33, 34, 35) for GRLM-70N-11 (12, 13) for GRLM-70N-32	0 ... 100 bar 0 ... 25 bar 0 ... 5 bar
Protection class		IP67

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

Device classification

GRLM–70N	Performance for non-explosive area (BNV)
GRLM–70NT	High temperature performance for non-explosive areas BNV
GRLM–70Xi(XiT)	Ex II 1/2 G Ex ia IIB T6 Ga/Gb
GRLM–70Xd(XdT)	Ex II 1/2D Ex ta/tb IIIC T75 °C...T300 °C Da/Db

VARIANTS OF SENSORS

GRLM–70–00

Without electrode, the electrode is made by customer (only variant 10 or 30) and connected to the electrode junction by M8 thread.

GRLM–70–10

Uncoated stainless steel rod electrode, for level measurement liquids and bulk solid materials (water, water solutions, emulsion, oils, diesel, flour, sand, granulates, etc.). Maximum electrode length 8 m.

GRLM–70–11

Fully coated bar electrode (PFA) with enhanced resistance to diffusion of vapours and gases. Maximum electrode length 2 m.

GRLM–70–12

Fully coated stainless steel rod electrode (FEP Teflon®), for level measurement of aggressive liquids and drinks. Maximum electrode length 2 m.

GRLM–70–13

Semi-coated stainless steel rod electrode (FEP Teflon®), for level measurement of liquids in area, where it could condense steam on the electrode. Maximum electrode length 8 m.

GRLM–70–20

Uncoated stainless steel rod electrode with reference tube, for accurate level measurement of liquids in cramped spaces. Maximum electrode length 3 m.

GRLM–70–30

Uncoated stainless steel rope electrode and weight, for level measurement of liquids and bulk solid materials (water, grains, sand, flour, cement, etc.) in higher silos, vessels, reservoirs. Maximum electrode length 40 m.

GRLM–70–32

Fully coated stainless steel rope electrode (FEP Teflon®) and coated weight, for level measurement of aggressive liquids and very pure liquids. Maximum electrode length 12 m.

GRLM–70–33

Uncoated stainless steel rope electrode with anchorage, for level measurement of bulk solid materials (grains, flour, cement, etc.) in higher silos, vessels. Maximum electrode length 40 m.

GRLM–70–34

Coated stainless steel rope electrode and weight (the rope has polyamide coating, the weight is uncoated), for surface level measurement of sticky bulk solids. Maximum electrode length 40 m.

GRLM–70–35

Fully coated stainless steel rope electrode (Polyamide) with uncoated anchorage, for level measurement of adhesive bulk solids (flour, cement, etc.). Maximum electrode length 40 m.

Ultrasonic level meters 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.
- Quick view measured values on the display.
- D-Logic system for advanced intelligent signal processing.
- Easy adjustment without measured material.
- Mapping of false reflections.
- Arbitrary choice of metric or imperial displayed measuring units.
- Xi version for usage in explosive areas.
- Option normal or inverted mode (for distance measurement).
- Easy manual setting by removable display module DM–70.
- Current output (4 ... 20 mA) with HART® protocol or output RS–485 Modbus.
- Choice of electric connection via cable glands, or protective conductor.
- While used with horn adapter can be measured difficult media (foamy levels, loose materials, etc.).

Technical specification

Supply voltage	ULM-70N ULM-70Xi	18 ... 36 V DC 18 ... 30 V DC
Output type (var. "I")		4 ... 20 mA (2-wire), HART®
Output type RS–485 (var. „M")		protocol Modbus RTU
Accuracy (from full measured range)		0,15 %
Temperature error		max. 0,04 % /K
Sensitivity		3 steps (low – medium – high)
Ambient temperature range		-30 °C ... +70 °C
Protection class		IP67

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

Device classification

ULM–70N	Performance for non-explosive areas (BNV)
ULM–70Xi–02, 06	II 1/2G Ex ia IIB T5 Ga/Gb
ULM–70Xi–10	II 1/2G Ex ia IIA T5 Ga/Gb
ULM–70Xi–20	II 2G Ex ia IIA T5 Gb

VARIANTS OF SENSORS

ULM–70–02

Measuring range from 0.15 m to 2 m, plastic transmitter, process connection with thread G 1”.

ULM–70–06

Measuring range from 0.25 m to 6 m, plastic transmitter, process connection with thread G 1 ½”.

ULM–70–10

Measuring range from 0.4 m to 10 m, plastic transmitter, processconnection with thread G 2 ¼“.

ULM–70–20

Measuring range from 0.5 m to 20 m, plastic transmitter, process connection with aluminium alloy flange.

Ultrasonic level meters 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 protective conductor.
- Reception of reflected ultrasonic signal from level can be improved using horn adapter.

Technical specification

Supply voltage	ULM-53N ULM-53Xi	18 ... 36 V DC 18 ... 30 V DC
Output type (var. "I")		4 ... 20 mA (2 -wire)
Output type (var. "U")		0 ... 10 V (3 -wire)
Output type RS–485 (var. „M")		protocol Modbus RTU
Basic error (from full measured 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		-30 °C ... +70 °C
Protection class*	ULM-53_-__-_-_-T 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
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.

Device classification

ULM–53N	Performance for non-explosive area (BNV)
ULM–53Xi–01, 02, 06	II 1/2G Ex ia IIB T5 Ga/Gb
ULM–53Xi–10	II 1/2G Ex ia IIA T5 Ga/Gb
ULM–53Xi–20	II 2G Ex ia IIA T5 Gb

VARIANTS OF SENSORS

ULM–53–01

Measuring range from 0,1 m to 1 m, plastic transmitter and plastic body, process connection with thread G ¾ ".

ULM–53–02

Measuring range from 0.2 m to 2 m, plastic transmitter and plastic body, process connection with thread G 1".

ULM–53–06

Measuring range from 0.2 m to 6 m, plastic transmitter and plastic body, process connection with thread G 1 ½".

ULM–53–10

Measuring range from 0.4 m to 10 m, plastic transmitter and plastic body, process connection with thread G 2 ¼".

ULM–53–20

Measuring range from 0.5 m to 20 m, plastic transmitter and plastic body, process connection with aluminium alloy flange.

Capacitive level meters CLM-70

Designed for continuous level measurement of liquids, bulk solids and powders in all kinds of industry.

- A wide range of applications, direct installation in storage silos, sumps, etc.
- Variants with rope, bar or co-axial electrodes.
- Variants with uncoated electrodes for aggressive or electrically conductive media.
- Current output 4 to 20 mA with HART® protocol.
- 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.

Technical specifications	
Supply voltage	18 ... 36 V DC
Type of output ("I" variant)	4 ... 20 mA (2-wire), HART®
Current output resolution	10uA
Measuring range from	0 to 3000 pF
Resolution	0.01 pF for capacities from 0 to 300 pF 0.1 pF for capacities from 300 to 3000 pF
Temperature error (For temperature range from -30 to 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
Recommended cable	PVC 2x0.75 mm2, shielded
Ambient temperature range	-30 °C ... +70 °C
Protection class	IP67

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

VARIANTS OF LEVEL METERS

CLM-70N-00

Without electrode, the customer will make the electrode by himself (types 10 or 30 only) and attaches it to electrode holder using the M8 threaded connection.

CLM-70N-10

Uncoated stainless steel bar electrode, for surface level measurement of electrically non-conductive liquids (oils, diesel fuel, petrol) and bulk solids (flour, sand, cement, granulated plastic materials, etc.). Maximum electrode length 8 m.

CLM-70N-11

Fully coated stainless steel bar electrode (PFA) with enhanced resistance to diffusion of vapours and gases. For surface level measurement of water and other electrically conductive liquids in food processing and chemical industries. It can be used temporarily for high-temperature applications (e.g. sanitization with hot steam), or for volatile aggressive liquids, etc. Maximum electrode length 2 m.

CLM-70N-12

Fully coated stainless steel bar electrode (FEP), suitable for surface level measurement of water and other electrically conductive liquids. Suitable also for impure liquids in metallic tanks, concrete sumps, etc. Maximum electrode length 2 m.

CLM-70N-13

Semi-coated stainless steel bar electrode (FEP), for surface level measurement of electrically non-conductive liquids in the environment where partial condensation of vapours on the electrode may occur. Maximum electrode length 8 m.

CLM-70N-20

Uncoated stainless steel bar electrode with reference pipe, for surface level measurement of unpolluted and electrically non-conductive liquids (oils, diesel fuel, petrol). Maximum electrode length 3 m.

CLM-70N-22

Fully coated stainless steel bar electrode (FEP) with reference tube, for surface level measurement of clean electrically conductive liquids (e.g.in plastic and glass tanks) and for higher measuring accuracy. Maximum electrode length 3 m.

CLM-70N-30

Uncoated stainless steel rope electrode and weight, for surface level measurement of bulk-solids (sand, flour, cement, etc.) Possibility to cut the rope short. Maximum electrode length 20 m.

CLM-70N-31

Uncoated stainless steel rope electrode and coated dynamic anchor, for measurement of bulk solids in taller silos.

CLM-70N-32

Fully coated stainless st. rope electrode and weight (rope insulation FEP, weight insulation PTFE), designed for surface level measurement of electrically conductive and non-conductive liquids. Maximum electrode length 12 m.

CLM-70N-61

Two fully coated bar electrodes (FEP insulation of electrodes, head PTFE), for surface level measurement of aggressive liquids. Maximum electrode length 2 m.

Capacitive level meters 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.
- Simple sensitivity setting by means of magnetic pen.
- LED state and function indication.
- Wide choice of electric connection via connectors, cable glands, or protective conductor.
- Material of housing and electrodes from stainless steel.

Technical specification

Supply voltage	current output (var. „I“) voltage output (var. „U“)	9 ... 34 V DC 12 ... 34 V DC
Output type (var. “I”)		4 ... 20 mA (2 - wire)
Output type (var. “U”)		0 ... 10 V (3 -wire)
Accuracy (from full measured range)		1%
Ambient temperature range		-40 ... +85°C
Temperature range on electrode		-40 ... +200°C
Process connection		Thread M27x2 ; M30x1,5 ; G1, G ¾“;NPT¾; TriClamp ø34, ø50,5)
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.

Device classification

DLM–35N	Performance for non-explosive area (BNV)
DLM–35NT / XiT	High temperature performance for non-explosive areas BNV / Ex
DLM–35Xi	Ⓔx II 1G Ex ia IIB T4 Ga ; Ⓔx II 1D Ex ia IIIC T120 °C Da
DLM–35XiT	Ⓔx II 1/2G Ex ia IIB T4 Ga/Gb ; Ⓔx II 1/2D Ex ia IIIC T120 °C Da/Db
DLM–35XiM, XiMT	Ⓔx I M1 Ex ia I Ma

VARIANTS OF LEVEL METERS

DLM–35–20

With uncoated rod electrode for level measurement of non-conductive liquids (oils, diesel, benzine) and bulk-solid materials (flour, sand, cement, plastic granulates, etc.). Maximum electrode length up to 2 m.

DLM–35–21

Isolated rod electrode (FEP Teflon®), for level measurement of water and other electrically conductive liquids. Can also be used for waste liquids in metal tanks, concrete reservoirs, etc. Maximum electrode length up to 2 m.

DLM–35–22

Isolated rod electrode (PFA Teflon®), for level measurement of water and other electrically conductive liquids in the food, pharmaceutical and chemical industries. It can be used temporarily for high-temperature applications (e.g. sanitization with hot steam), or for volatile aggressive liquids, etc. Maximum electrode length up to 2 m.

DLM–35–25

Like DLM-35-22, but higher pressure and mechanical resistance at high temperatures. Suitable for high-temperature applications (hot steam), etc.

DLM–35–30

Uncoated rod electrode for measuring the level of bulk-solid materials (cement, flour, sand, plastic granulate) and electrically non-conductive liquids (vegetable oil, diesel fuel, petrol). Maximum electrode length 3 m.

DLM–35–31

Coated rod electrode (FEP) for level measurement of water and other electrically conductive liquids. Can also be used for polluted liquids in metal tanks, concrete sumps, etc. Maximum electrode length 2 m.

DLM–35–40

Uncoated bar electrode with reference tube (co-axial electrode) for accurate surface level measurement of unpolluted, electrically non-conductive liquids (oils, diesel fuel, petrol) Measurement does not depend on tank shape and on presence of objects in close proximity to the reference tube. Maximum electrode length 1 m.

DLM–35–41

Fully coated bar electrode with reference tube (co-axial electrode) for accurate surface level measurement of unpolluted, electrically conductive liquids in plastic and glass tanks. Measurement does not depend on tank shape and on presence of objects in close proximity to the reference tube. Maximum electrode length 1 m.

DLM–35–50

With uncoated stainless steel rope electrode and uncoated weight for level measurement of bulk-solid materials (grains, sand, flour, cement, etc.). Maximum electrode length up to 6 m.

Capacitive level meters 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.
- Non-explosive and high temperature versions.
- Easy and quick connecting by connector.
- Removable inner electronic module.
- Material of housing and electrodes from stainless steel.

Technical specification		
Supply voltage	current output (var. „I“) voltage output (var. „U“)	9 ... 36 V DC 11 ... 36 V DC
Output type (var. “I”)		4 ... 20 mA (2-wire)
Output type (var. “U”)		0 ... 10 V (3-wire)
Accuracy (from full measured range)		1%
Ambient temperature range		-40 ... +85°C
Temperature range on electrode		-40 ... +200°C
Process connection		Thread M36×2 ; G 1”; TriClamp ø50,5
Protection class		IP65 / IP67

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

Device classification	
CLM–36N	Performance for non-explosive are (BNV)
CLM–36NT / XiT	High temperature performance for non-explosive areas BNV / Ex
CLM–36Xi	Ex II 1 G Ex ia IIB T5 Ga ; Ex II 1D Ex ia IIIC T83°C Da
CLM–36XiT	Ex II 1/2 Ex ia IIB T5 Ga/Gb ; Ex II 1/2D Ex ia IIIC T83°C Da/Db

VARIANTS OF SENSORS

CLM–36–10

With uncoated rod electrode for level measurement of non-conductive liquids (oils, diesel, benzine) and bulk-solid materials (flour, sand, cement, plastic granulates, etc.). Maximum electrode length up to 5 m.

CLM–36–11

Isolated rod electrode (PFA Teflon®), for level measurement of water and other electrically conductive liquids in the food, pharmaceutical and chemical industries. Isolation of electrode with higher resistance to penetration (diffusion) of gases or vapors. Suitable for high temperature applications (hot steam), volatile corrosive liquids, etc. Maximum electrode length up to 3 m.

CLM–36–12

Isolated rod electrode (FEP Teflon®), for level measurement of water and other electrically conductive liquids. Can also be used for waste liquids in metal tanks, concrete reservoirs, etc. Maximum electrode length up to 3 m.

CLM–36–20

With uncoated rod electrode and reference tube for level measurement of clean non-conductive liquids (oils, petrol, diesel). By means of reference tube the output signal does not depend on the dimension and shape of the vessel. Maximum electrode length up to 3 m.

CLM–36–22

With coated rod electrode and reference tube for level measurement of clean conductive liquids. Main use is for measurement in plastic and glass vessels and for fine measuring. Maximum electrode length up to 3 m.

CLM–36–30

With uncoated stainless steel rope electrode and uncoated weight for level measurement of bulk-solid materials (grains, sand, flour, cement, etc.). Maximum electrode length up to 20 m.

CLM–36–31

With uncoated stainless steel rope electrode and uncoated weight with addition dynamic anchorage. For level measurement of bulk-solid materials (grains, sand, flour, cement, etc.) in higher silos. Maximum electrode length up to 20 m.

CLM–36–32

With fully coated rope electrode for level measurement of electrically conductive and non-conductive liquids. Maximum electrode length up to 12 m.

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 into tank through the flange or by means Thread G1“.
- Arbitrary electrode length (max. 1 m).
- Material of housing and rod electrode from stainless steel.
- Simple sensitivity setting by means of magnetic pen.
- Possibility of shortening the measuring electrode.

Technical specification

Supply voltage	current output (var. „I“, var. „CAN“) voltage output (var. „U“)	9 ... 30 V DC 12 ... 30 V DC
Output type (var. “I”)		4 ... 20 mA (2-wire)
Output type (var. “U”)		0 ... 10 V (3-wire)
Output type (var. „CAN“)		CAN bus (SAE j 1939 (4-wire))
Accuracy (from full measured range)		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.

CLM–40N-40

With uncoated rod electrode and reference tube, level meter with setting by means of magnetic pen, possibility of shortening the measuring electrode. Electrode length from 0,1 m to 1 m.

Submersible hydrostatic level meters HLM

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

CE

- Stainless steel submersible probe.
- Version with stainless steel sensor (for rain, drinking, or river water) or version with 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.
- Over voltage protection inside probe.

VARIANTS OF SENSORS

HLM–25S

Stainless steel sensor, measuring range from 1 to 100 m H_2O, arbitrary measurement ranges (customer configurable in 10 cm step). Probe diameter 25 mm. Current (4 ... 20 mA) or voltage (0 ... 10 V) output, Suitable for rain, drinking, or river water, certificate for contact with drinking water.

HLM–25C

Ceramic sensor, measuring range from 1 to 100 m H_2O, arbitrary measurement ranges (customer configurable in 10 cm step). Probe diameter 25 mm. Current (4 ... 20 mA) output. Suitable for clean, lightly soiled, or sludge water.

HLM–16N

Stainless steel sensor, measuring range from 1 m to 100 m H_2O, predefined measurement ranges. Probe diameter 16 mm. Current (4 ... 20 mA) output. Suitable for clean, lightly soiled, or sludge water.

Technical specification

Supply voltage	HLM-25S HLM-25C HLM-16N	12 ... 36 V DC 12 ... 34 V DC 10 ... 30 V DC
Output type		4 ... 20 mA (2-wire)
Output type (HLM-25S,HLM-25-C)		0 ... 10 V (3-wire)
Maximum measurement range		100 m
Accuracy (from full measured range)		0,5%
Ambient temperature range		-20°C ... +70°C
Protection class		IP68

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

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.

Hydrostatic level meters HLM-35

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

- Threaded process connection - G ¾" or M27.
- Intended for various liquids (water, oil, coolants, water solutions, etc.).
- Arbitrary measurement ranges of water column heights up to 100 m (H_2O).
- Atmospheric pressure compensation using a cable capillary or a valve.
- Current or voltage output.
- Simple installation requiring no settings.
- LED indication.

Technical specification		
supply voltage		12 ... 34 V DC
Output type (var "I")		4 ... 20 mA (2-wire)
Output type (var "U")		0 ... 10 V (3-wire)
Maximum measurement range		100 m (H_2O)
Basic accuracy (from total range)		0,4%
Ambient temperature range		-20°C ... +70°C
Process connection		thread M27x2; G ¾"
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.

VARIANTS OF SENSORS

HLM-35N-CV

Measuring range 1 ... 100 m H_2O, arbitrary standard measuring range (customer configurable in 10 cm steps). Current (4 ... 20 mA) or voltage (0 ... 10 V) output. Measuring transducer with a ceramic membrane. Pressure compensation via a valve with waterproof membrane.

HLM-35N-CK

Measuring range 1 ... 100 m H_2O, arbitrary standard measuring range (customer configurable in 10 cm steps). Current (4 ... 20 mA) or voltage (0 ... 10 V) output. Measuring transducer with a ceramic membrane. Pressure compensation via capillary.

HLM-35N-SV

Measuring range 1 ... 100 m H_2O, standard measuring ranges arbitrary (custom-adjustable in 10 cm increments). Current (4 ... 20 mA) or voltage (0 ... 10 V) outputs. Sensor with stainless steel transducer diaphragm. Pressure equalizing with valve.

HLM-35N-SK

Measuring range 1 ... 100 m H_2O, standard measuring ranges arbitrary (custom-adjustable in 10 cm increments). Current (4 ... 20 mA) or voltage (0 ... 10 V) outputs. Sensor with stainless steel transducer diaphragm. Pressure equalizing with capillary tube.

LIMIT LEVEL SENSORS

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 protective conductor.
- Additional horn adapter improve measurement of problematic media (foamy levels, loose materials, etc.).

Technical specification

Supply voltage	ULS-53N ULS-53Xi	18 ... 36 V DC 18 ... 30 V DC
Output type		PNP ; S (2-wire current switch)
Supply current	ULS-53N_ _-_-P ULS-53N(Xi)_ _-_-S	max. 12 mA OFF state 4 mA / ON state 20 mA
Switching current	ULS-53N_ _-_-P ULS-53N(Xi)_ _-_-S	max. 300 mA current switch 4 mA / 20 mA
Temperature error		max. 0,04% /K
Ambient temperature range		-30°C ... +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 (MP8)
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.

Device classification

ULS–53N	Performance for non-explosive areas (BNV)
ULS–53Xi–01, 02, 06	II 1/2G Ex ia IIB T5 Ga/Gb
ULS–53Xi–10	II 1/2G Ex ia IIA T5 Ga/Gb
ULS–53Xi–20	II 2G Ex ia IIA T5 Gb

VARIANTS OF SENSORS

ULS–53–01

Adjustable sensing range from 0.1 m to 1 m, plastic transmitter and plastic body, mechanical connection with thread G ¾ ".

ULS–53–02

Adjustable sensing range from 0.2 m to 2 m, plastic transmitter and plastic body, mechanical connection with thread G 1".

ULS–53–06

Adjustable sensing range from 0.2 m to 6 m, plastic transmitter and plastic body, mechanical connection with thread G 1 ½".

ULS–53–10

Adjustable sensing range from 0.4 m to 10 m, plastic transmitter and plastic body, mechanical connection with thread G 2 ¼".

ULS–53–20

Adjustable sensing range from 0.5 m to 20 m, plastic transmitter and plastic body, aluminium alloy flange.

High-frequency limit level sensors RFLS–35

High-frequency limit level sensor with elimination of buildups 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, yoghurt, spreads, syrups, creams, pastes, cleaning agents, alkalis, etc.).
- Replacement of a vibrating level sensor.
- Direct mounting into tanks, vessels, sumps, pipes or funnels and containers.
- 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 $\varepsilon_r \geq 1.5$).

Technical specification

Supply voltage		7 ... 34 V DC
Output type		PNP ; NAMUR
Switching current		max. 300 mA
Ambient temperature range		-40 ... +80°C
Maximum overpressure		100 bar
Process connection		thread G ½" ; G ¾" ; M27x2 Triclamp ø34; ø50,5
Protection class	RFLS-35_-_ _-C-_-_	IP67
	RFLS-35_-_ _ A(B,D,H,V)-_-_	IP68

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

Device classification

RFLS–35N	Performance for non-explosive are (BNV)
RFLS–35Xi	Ex II 1G Ex ia IIB T5 Ga
RFLS–35XiM	Ex I M1 Ex ia I Ma

VARIANTS OF SENSORS

RFLS–35–1B

Insulated electrode (mat. PEEK) with sealing O-ring NBR, for sensing various fluids, mashed and paste-like materials, appropriate also for fuel, oil or methanol, use from minimum temperature of -40°C.

RFLS–35–1E

Insulated electrode (mat. PEEK) with sealing O-ring EPDM, for sensing various fluids, mashed and pastelike materials, appropriate also for acids, bases or alcohol, ammonia, acetone, chlorine, from minimum temperature of -40°C.

RFLS–35–1V

Insulated electrode (mat. PEEK) with sealing O-ring (FKM), for sensing various fluids, mashed and pastelike materials, appropriate also for fuel, oil, acids, bases or asphalt, tar, toluene, use from minimum temperature of -20°C.

RFLS–35–2

Fully coated electrode (mat. PTFE) without O-ring, for sensing of various liquids, pulpy and pasty materials, especially suitable for aggressive liquids, application from a minimum temperature of -40 °C.

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-Cl received the TEST CERTIFICATE from ITC and it complies with hygienic requirements for products designed for contact with foodstuffs and meals.

Capacitive level sensors DLS–35

For limit level sensing of liquids, bulk solids and powders.

- Direct mounting into various containers, silos, vessels, tanks, filling inlets, reservoirs, etc.
- Increased resistance to electromagnetic interference.
- Simple sensitivity setting by means of 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 protective conductor.
- Material of housing and electrode from stainless steel.
- High stability at high sensitivity (can be used for material with min. ε_r = 1,3).

Technical specification		
Supply voltage		7 ... 34 V DC
Output type		NPN ; PNP ; NAMUR
Ambient temperature range		-40 ... +85°C
Temperature range on electrode		-40 ... +200°C
Process connection		thread G1“; G ¾“; M27x2 ; M30x1,5 ; NPT¾; TriClamp (ø34, ø50,5)
Protection class	DLS-35_-__-C-_-_	IP67
	DLS-35_-__-A(B,D,V,H)-_-	IP68

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

Device classification	
DLS–35N	Performance for non-explosive are (BNV)
DLS–35NT / XiT	High temperature performance for non-explosive areas BNV / Ex
DLS–35Xi	Ⓔx II 1G Ex ia IIB T6 Ga ; Ⓔx II 1D Ex ia IIIC T80°C Da
DLS–35XiT	Ⓔx II 1/2G Ex ia IIB T6 Ga/Gb ; Ⓔx II 1/2D Ex ia IIIC T80°C Da/Db
DLS–35XiM, XiMT	Ⓔx I M1 Ex ia I Ma

VARIANTS OF SENSORS

DLS–35–10

Uncoated short bar electrode, for sensing of unsticky bulk solids (sand, sugar) and electrically conductive liquids (petroleum products, oils) Side installation. Electrode length 50 mm or 100 mm.

DLS–35–13

Like DLM-35-10, but higher pressure and mechanical resistance.

DLS–35–20

Semi-coated bar electrode, for sensing of moderately sticky bulk solids (cement, flour) and electrically non-conductive liquids. Installation from side, angle-wise, or from above. Electrode length 0.1 m ... 2 m.

DLS–35–21

Fully coated bar electrode (FEP insulation), for sensing of electrically conductive liquids (aqueous solutions, water), sticky and aggressive substances. Installation from side or from above. Electrode length 0.1 m ... 2 m.

DLS–35–22

Fully coated bar electrode (PFA insulation) with enhanced resistance to diffusion of vapours and gases. For surface level measurement of water and other electrically conductive liquids in food processing and chemical industries. It can be used temporarily for high-temperature applications (e.g. sanitization with hot steam), or for volatile aggressive liquids, etc. installation from side or from above. Electrode length 0.1 m ... 2 m.

DLS–35–25

Like DLM-35-22, but higher pressure and mechanical resistance at high temperatures. Suitable for high-temperature applications (hot steam), etc.

DLS–35–30

Uncoated dismountable rod electrode, for sensing of bulk solids or electrically conductive and non-conductive liquids Installation in vertical position from above, or angle-wise. Electrode length 0.1 m ... 3 m.

DLS–35–31

Fully coated rod electrode (FEP insulation), for sensing of electrically conductive and aggressive liquids (water, chemicals). Installation from above. Electrode length 0.1 m ... 3 m.

DLS–35–40

Uncoated stainless steel rod electrode with reference tube, for sensing non-conductive liquids (petroleum products, oil) in nonconductive tanks. Vertical mounting. Maximum electrode length up to 1 m.

DLS–35–41

Fully coated bar electrode (FEP insulation) with reference tube, for sensing of electrically conductive liquids in non-conductive tanks. Installation from above. Maximum electrode length 1 m.

DLS–35–50

Uncoated rope electrode and weight, for general application in deeper storage bins (sensing of bulk solids, e.g. sand, gravel, cement) or sumps (sensing of liquids). Installation from above. Maximum electrode length 6 m.

Capacitive level sensors DLS–27

For limit level sensing of liquids, bulk solids and powders.

- Direct mounting into various containers, silos, vessels, tanks, filling inlets, reservoirs, etc.
- Xi versions for usage in explosive areas.
- Sensitivity and hysteresis fluently adjustable.
- LED state indication.
- Material of housing and electrode from stainless steel.

Technical specification	
Supply voltage	7 ... 36 V DC
Output type	NPN ; PNP ; NAMUR
Ambient temperature range	-20 ... +80°C
Temperature range on electrode	-30 ... +200°C
Process connection	thread M27x2 ; M30x1,5 ; G ¾" ; TriClamp ø34
Protection class	IP67

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

Device classification	
DLS–27N	Performance for non-explosive areas (BNV)
DLS–27NT / XiT	High temperature performance for non-explosive areas BNV / Ex
DLS–27Xd	II 1D Ex tD A20 T77°C IP6X
DLS–27Xi	II 1G Ex ia IIB T6 Ga ; II 1D Ex ia IIIC T76°C Da
DLS–27XiT	II 1/2G Ex ia IIB T6 Ga/Gb ; II 1/2D Ex ia IIIC T76°C Da/Db
DLS–27XiM, XiMT	I M2 Ex ia I Mb

VARIANTS OF SENSORS

DLS–27–10

Uncoated short bar electrode for sensing non-adhesive bulk-solid (powder) materials (sand, sugar) and electrically nonconductive liquids (oils, diesel, petrol). Horizontal mounting. Electrode length 50 mm or 100 mm.

DLS–27–11

Fully coated short bar electrode for sensing electrically conductive liquids (water). Assembly into a side wall of vessel or into a pipe. Electrode length 30 mm.

DLS–27–20

Semi-coated rod electrode for sensing light-bulk solid or powder materials (plastic granulates, flour, cement) and non-conductive liquids (plant oils). Horizontal, slant or vertical mounting. Maximum electrode length up to 1 m.

DLS–27–21

Fully coated rod electrode (FEP Teflon®), for sensing electrically conductive liquids (water solutions, water), adhesive and aggressive materials. Horizontal or vertical mounting. Maximum electrode length up to 1 m.

DLS–27–22

Isolated rod electrode for level measurement of water and other electrically conductive liquids in the food, pharmaceutical and chemical industries. Isolation of electrode from PFA material with higher resistance to penetration (diffusion) of gases or vapors. Suitable for high temperature applications (hot steam), volatile corrosive liquids, etc. Horizontal or vertical mounting. Maximum electrode length up to 1 m.

DLS–27–30

Dismountable rod uncoated electrode for sensing bulk-solid (powder) materials and conductive or non-conductive liquids. Mounting from the top (vertically) or slant from the side. Maximum electrode length up to 3 m.

DLS–27–31

Fully coated rod electrode for sensing aggressive electrically conductive liquids (water, solutions of chemicals). Vertical mounting. Maximum electrode length up to 2 m.

DLS–27–40

Uncoated stainless steel rope electrode and weight for general purpose in deeper silos (bulk-solid and powder materials sensing – sand, gravel, cement) or hoppers (liquids sensing). Vertical mounting. Maximum electrode length up to 6 m.

Capacitive level sensors CLS–23

Miniature capacitive level sensor for sensing various types of liquids.

- Detection of various types electrical conductive or non-conductive liquids (water, water solution, cooling liquids, oil, ets.).
- Simple sensitivity setting by means of magnetic pen.
- Direct mounting into various containers, vessels, tanks, etc.
- LED state indication.
- High temperature performance.

Technical specification	
Supply voltage	6 ... 30 V DC
Output type	PNP ; S ; NAMUR
Switching current	max. 40 mA (PNP 100 mA)
Ambient temperature range	-20 ... +80°C
Temperature range on electrode	-30 ... +150°C
Process connection	thread M18x1,5; M20x1,5; NPT½; G ½"; G 3/8"
Protection class	IP68

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

Device classification	
CLS–23N	Performance for non-explosive areas (BNV)
CLS–23E, CLS–23NT	High temperature performance for non-explosive areas BNV
CLS–23Xi	Ex II 1/2G Ex ia IIC T6 Ga/Gb; Ex II 1G Ex ia IIB T6 Ga
CLS–23XiT	High temperature performance for Ex Ex II 1/2G Ex ia IIB T6 Ga/Gb

VARIANTS OF SENSORS

CLS–23–10

Uncoated short bar electrode, for sensing of electrically non-conductive liquids (mineral and plant oils, resins, etc.). Mounting in horizontal position. Electrode length 30 mm.

CLS–23–11

Insulated (coated) short bar electrode, for non-aggressive electrically conductive liquid sensing (water, water solutions). The insulation is made from polypropylene. Electrode length 30 mm.

CLS–23–12

Insulated (coated) short bar electrode, for moderately aggressive electrically conductive liquid sensing (chemicals, water, moderately aggressive water solutions). Higher temperature resistance than variant "11". Electrode length 30 mm.

CLS–23–20

Partly insulated rod electrode, 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). Maximum electrode length up to 1 m.

CLS–23–21

Fully insulated rod electrode, for 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). Maximum electrode length up to 1 m.

CLS–23–30

Uncoated removable rod electrode, 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). Maximum electrode length up to 1 m.

Submersible level sensor CLS–23S

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

- Stainless steel removable protective basket preventing mechanical damage of 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.

Technical specification	
Supply voltage	6 ... 30 V DC
Output type	S (2-wire current switch)
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.

Capacitive level switch CLS–53

Detection of bulk-solids, fragmental, extruded or powder materials.

- Limit level sensing of various bulk-solid materials (pellets, wooden chips, granulates, cereals) in metal or plastic hoppers, containers and silos.
- Simple sensitivity setting by means of magnetic pen.
- LED state indication.
- Can be connected directly in series with contractor or relay or to binary input of PLC.

FEATURES OF VARIANTS

CLS–53N–SAC

2-wire connection with electronic current switch directly connected to the relay circuit. Supply voltage up to 230 V AC/DC.

CLS–53N–P (N)

3 -wire connection with NPN or PNP output for connected to Dinel supply and switching units or binary input of PLC. Output type PNP type terminals (variant „P“) or NPN (variant „N“).

Technical specification

Supply voltage	CLS–53N–SAC	20 ... 250 V AC/DC
	CLS–53N–P (N)	7 ... 36 V DC
Output type		SAC ; NPN ; PNP
Switching current	CLS–53N–SAC	max. 0,3 A
	CLS–53N–P (N)	max. 0,2 A
Ambient temperature range		-20 ... +60°C
Process connection		thread G 1 ½"
Protection class		IP65/IP67

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

Flexible level sensor FLD–48 „Meduse“

For limit level sensing of liquids in non-conductive plastic or glass vessels, plastic cans, pools, etc.

CE

- Miniature performance in flexible housing, possibility of placing at curved surface.
- The system of electrodes eliminates adhesion of rests of liquids (drops) on innner side of the vessel.
- Simple self-adhesive fixation, power supply from a loop.
- Loop powered, LED state indication.
- Configuration and adjustment by means of third “programming” wire.

The first industrial capacitive level sensor with flexible housing design on the market.

Technical specification	
Supply voltage	6 ... 30 V DC
Output type	S (2-wire current switch)
Switching current	max. 40 mA
Ambient temperature range	-10 ... +60°C
Maximum vessel’s wall thickness	8 mm
Vessel’s diameter for sensor’s fixation	min. 200 mm
Protection class	IP67

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

Thru-wall level switches 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 by means of magnetic pen.
- Types with fixed cable or with a connector.
- PNP or S (electronic switch) type terminal.

FEATURES OF VARIANTS

GPLS–25N–0

Prismatic (refracted) electrode, 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.

GPLS–25N–1

Planar electrode, 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.

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 electrically non-conductive liquids s ε, < 10[1)]	8 mm 3 mm
Ambient temperature range		-20 ... +80 °C
Protection class		IP67

[1)] ε, see relative permittivity table
More detailed informations can be found in the datasheet of the product

Capacitive proximity switches 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 housing and nut from stainless steel.
- Xi version for usage in explosive areas.
- LED state indication.

Technical specification	
Supply voltage	7 ... 36 V DC
Output type	NPN ; PNP ; NAMUR
Switching current	max. 200 mA (only var. „N“)
Ambient temperature range	-20 ... +70°C
Sensing distance (Sensitivity)	0 ... 10 mm
Process connection	thread M24x1
Protection class	IP67

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

Device classification	
CPS–24N	Performance for non-explosive areas (BNV)
CPS–24Xi	II 1G Ex ia IIC T6 Ga

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 with a relay output and power supply voltage of 230 V and 24 V AC/DC.
- Float guiding rods of any length (max. 2.5 m).

Technical specification

Range of ambient operational temperatures [1]		-20 ... +60 °C
Range of the sensed medium densities		800 ... 950 kg/m³
Minimum layer thickness of medium for detection	on water level in empty reservoir	5 mm 25 mm
Cable		PUR 3x0,14 mm³ (brown: + pole, white: - pole, green: not used)
Float weight (board + 4 floats + CPS-24Xi sensor)		600 g
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.

Conductive probes CNP–18

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

- Medium temperature up to 130 °C.
- Simple mounting, connection by cable or contact screw.
- Material of housing and electrode from stainless steel.
- Functionality of the probes are provided by unit CDSU–522.

FEATURES OF VARIANTS

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. electrode length 3 m.

CNP–18F–30
Removable rod electrode, installation from above (shorter electrodes also from the side). Bolt clamp, maximum electrode length 3 m.

Technical specification	
Temperature at housing	max. 130°C
Maximum pressure (for temperature 25°C)	4 MPa (40 bar)
Process connection	thread M18x1,5; G 3/8“; G ½“
Protection class	IP67

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

Designed for configuration with level control relay CDSU-522 (see page 49).

FLOW METERS

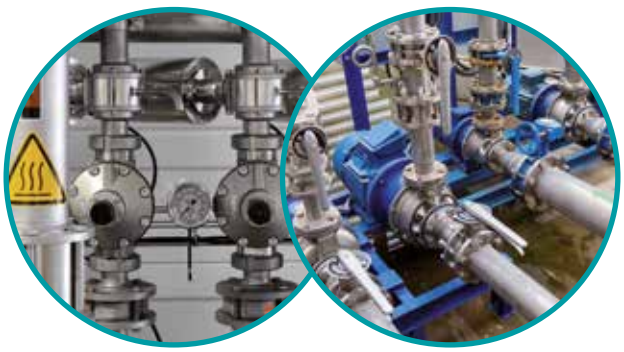
Thermal flow sensor TFS-35

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

- 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.
- Settings by means of magnetic pen.
- Stainless steel housing.

Technical parameters		
Supply voltage		12 ... 34 V DC
Output type	TFS–35_–_ _- _- PFPT TFS–35_–_ _- _- IFPT(F)	2x PNP 1x PNP, 1x 4 ... 20mA
Switching current		max. 300 mA
Maximum residual voltage in ON state		max. 1,5 V
Temperature output - switching points		15 °C; 30 °C; 45 °C; 60 °C; 75 °C
Flow rate range (for water)		1 až 150 cm / s
Ambient temperature range		-20 ... +80°C
Maximum overpressure		100 bar
Process connection		thread G ½"
Protection class	TFS–35_–_ _- _- _ _ _ _- C-L _ _ TFS–35_–_ _- _- _ _ _ _-A(B,V,H)-L_ _	IP 67 IP 68

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



Electromagnetic flow meter EFM–115

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

- Positive and negative flow measurement in tubes from DN 15 – 200 mm, flanged type.
- Bi-directional total flow measurement, flow direction indication.
- Robust and resistant cover of sensor and transmitter.
- Compact and remote version of electronics available.
- Manual set up of outputs, high-speed signal processing.
- Measurement data recording.

VARIANTS OF UNITS

EFM-115-0
Flow meter without communication.

EFM-115-M
Flow meter with communication RS 485 / Modbus RTU.

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
Binary outputs	up to 4 relays (250 V AC/3A)
Communication output	RS 485 (galvanically separated) or RS 232 / Modbus RTU
Medium conductivity	≥ 5 µS/cm, for demi water ≥ 20 µS/cm
Measurement accuracy	0.3 % of reading
Maximum Pressure	standard 1,6 MPa
Ambient temperature	-20° C ... +50°C
Control unit dimension	180 x ⌀ 115 mm
Process connection	DIN flange
Protection class	IP67
Liner type	Hard rubber
Material of sensing electrode	Stainless steel AISI 316L

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 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.

VARIANTS OF UNITS

FCU-400-0
Unit without web server, without current output.

FCU-400-W
Unit with web server.

FCU-400-I
Unit with current output.

Technical specifications

Casing - material	ABS
Housing dimensions	160 x 166 x 106 mm
Protection class	IP65
Ambient temperature range	-30 °C ... +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 / 100mA 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	Us = 24 V DC / Imax. 120 mA
Display type	Matrix OLED display 128 x 64 dots
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	820g

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

EVALUATION & SWITCHING UNITS

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 OF UNITS

DSU–1222

Dual channel supply and switching unit, selectable types of connected sensors on front panel. DIN 35 mm rail mounting.

DSU–1222–W

Regulation and supply unit for low and high level control by means of two limit level sensors with two or three-wire connection. Wall mounted case.

DSU–2422–P (N)

Dual channel supply and switching unit for supply and evaluation sensors with NPN or PNP output. DIN 35 mm rail mounting.

SDSU–1222–W

Regulation and supply unit for low and high level control by means of two limit level sensors connection (third wire programmable sensors FLD-48 ''Meduse''). Wall mounted case.

SSU–1211

Single-channel unit, type of connected limit sensor (PNP, NPN) can be selected using a jumper on the clamps. DIN 35 mm rail mounting.

LCU–1221

Regulating unit for automatic level regulation between a minimum and maximum state using two limit level sensors. DIN 35 mm rail mounting.

LCU–1232

Regulating unit for automatic level regulation between a minimum and maximum state using two limit level sensors. Option to connect a third limit sensor for an ALARM function. DIN 35 mm rail mounting.

TDU–1211

Timing regulation and supply unit for level regulation by means of one limit level sensor and time set in margins 1 second to 100 minutes. DIN 35 mm rail mounting.

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 OF UNITS

CDSU–522
DIN 35 mm rail mounting. Continuous sensitivity adjustment.

CDSU–522–W
Wall mounted case (possible to locate in an outdoor environment). Pontinuous sensitivity adjustment and time delay set up.

Intrinsically safe supply units

For energizing and state-detection of NAMUR sensors in explosive area.

- 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 located the connected sensor in hazardous environments zone 0.
- Mounting on DIN rail 35 mm, power supply 230 V AC or 24 V DC.

Device classification	
for all variants	Ⓔx II (1) G [Ex ia Ga] IIC; Ⓔx II (1) D [Ex ia Da] IIIC; Ⓔx I (M1) [Ex ia Ma] I

VARIANTS OF UNITS

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 repeater

For galvanic separation of current signal from transducer in explosive area to transducer in non-explosive area (BNV).

- 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.

Device classification	
for all variants	II (1) G [Ex ia Ga] IIB/IIC; II (1) D [Ex ia Da] IIIC; I (M1) [Ex ia Ma] I

VARIANTS OF UNITS

IRU–420–I
For powering and galvanic separation of current signal 4 ... 20 mA from an environment with an explosion hazard to a BNV environment.

IRU–420–H
For powering and galvanic separation of current signal 4 ... 20 mA from an environment with an explosion hazard to a BNV environment. 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 an environment with an explosion hazard to a BNV environment.

Universal stabilized power supplies

For reliable power supply for sensors in demanding industrial applications. Unlike switch-mode power supplies, they prevent mains interference in electronic circuits of measuring devices.

CE

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

VARIANTS OF UNITS

SPSU–1200–20
Stabilized power supply with indicating device2 V DC / 2,0 A.

SPSU–2400–18
Stabilized power supply with indicating device 24 V DC / 1,8 A.

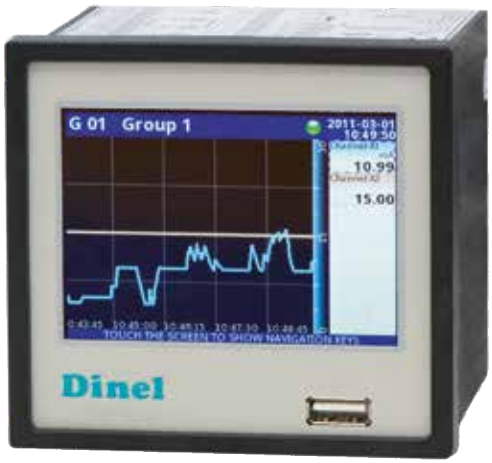
PSU–1200–S
Stabilized power supply 12 V DC / 160 mA.

PSU–2400–S
Stabilized power supply 24 V DC / 80 mA.

PSU–2400
Stabilized power supply 24 V DC / 150 mA.

DSU–2420
Dual channel stabilized power supply 2× 24 V DC / 50 mA.

DISPLAY UNITS



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, Czech menu.
- Extensive ways of data communication (RS232/485, USB, LAN).
- Evaluating and processing of the measured data on PC.
- Installation on front panel.
- Sensor power supply output 24V, load current of internal power supply max. 0,2 A.

OPTIONAL MODULES

MODUL II16

16x Current inputs (4 ... 20 mA).

MODUL IUI4 (IUI8)

4 (8) Current inputs (4 ... 20 mA) + 4 (8) Voltage inputs (0 ... 10 V)..

MODUL ID8

8 Optoisolated digital (binary) inputs.

MODUL IFI2 (IFI4)

2 (4) Current inputs for flowmeters + 2 (4) Current inputs (4 ... 20 mA).

MODUL IPI2 (IPI4)

2 (4) Pulse inputs for flowmeters + 2 (4) Current inputs (4 ... 20 mA).

MODUL ICP4

4 Universal counter inputs.

MODUL ITC4 (ITC8)

4 (8) Thermocouple sensors (TC/mV) inputs.

MODUL IRT4

4 Resistance temperature detectors (RTD) inputs.

MODUL OI2

2 Passive current outputs (4 ... 20 mA).

MODUL OR8

8 Relay outputs (1 A / 250 V).

Programmable control unit PCU–100

For display, recording and evaluation of physical values (level, flow, temperature, pressure, etc.).

CE

- Universal industrial data logger.
- One input channel – current loop 4-20 mA.
- Contains a power supply source for sensor.
- Easily readable backlit LCD display that allows display configuration, including bar graph.
- Large selection of displayed units, including userdefined ones.
- Storage of data with user-defined period onto internal continuously overwritten flash memory with 500,000-record capacity.
- Ability to export data to a microSD card manually or automatically (at intervals or when internal memory is full).
- Many transfer characteristics: linear, quadratic, radical, user-defined tables with linear approximation or conversion to volume according to specified tank parameters.
- Real-time battery backup circuit.
- Full user-defined relay output (alarm, two-position regulation).
- Optional expansion with communication modules.
- Supply voltage 85-253 V AC.

VARIANTS OF UNITS

PCU–100–D
Front panel with a graphic LCD display and a membrane keypad. The entry depending on configuration (for connecting one sensor), one relay output.

PCU–100–L
The front panel without an LCD display with status LEDs. The entry depending on configuration (for connecting one sensor), one relay output.

Programmable display units PDU

For measurement and display of physical values.

Modbus CE

- Suitable for connecting water level meters with a current or voltage output.
- 4–digit LED display.
- Up to 4 relay outputs, option of an insulated analogue 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 OF UNITS

PDU–420–W
Wall-mounted case unit with 2 relay outputs and 4-digit display, support infraredremote 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.

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, decimal point can be arbitrarily set
- Assembly between the level meter (CLM or ULM) and the connector

Basic SCADA systems

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

- Graphic visualization.
- Data recording and export to Excel.

Basic SCADA level

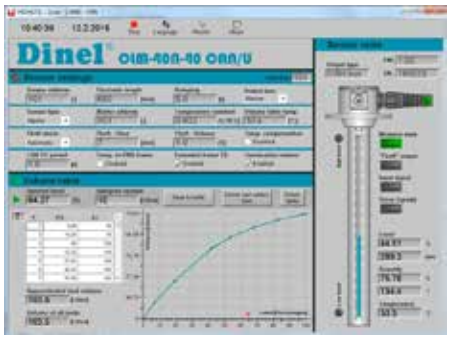
Application for communication with level meters. (ULM-53, ULM-70, GRLM-70).

Basic SCADA flow

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

Basic SCADA fuel

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



Capacitive touch sensor CTS-41

For modern method of LED lighting switching or for similar power loads.

- The touch sensor allows switching through non-conductive materials (such as wood, glass, ceramics, plasterboard, etc.)
- The sensor has no movable parts so that its service life is unlimited
- Multiple methods of installation using self-adhesive tape, glue or screws
- Power supply voltage 10 .. 28 V DC
- Sensitivity automatic control

Technical specifications	
Power 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 (material: wood)
Sensitivity	to hand contact
Ambient temperature range	-10 ... +50°C
Weight	approx. 60g

VARIANTS OF SENSORS

CTS-41-0
Capacitive touch sensor with angled terminal block.

CTS-41-1
Capacitive touch sensor with straight terminal block.

Convertor URC–485

Converter for connection of the sensor with RS 485 / Modbus outputs (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 VDC).
- Galvanic isolation (optoisolation) between an USB interface and RS-485 lines.
- Ambient temperature range: 0° C ... +50°C.

Convertor UCC–01

For connection sensor with output CAN (CLM-40) and PC with special software (Basic Scada fuel).

- Power supplyí: from USB interface (4,4 ... 5,25 VDC).
- Ambient temperature range: -40° C ... +80°C.

Horn adapters ST–G

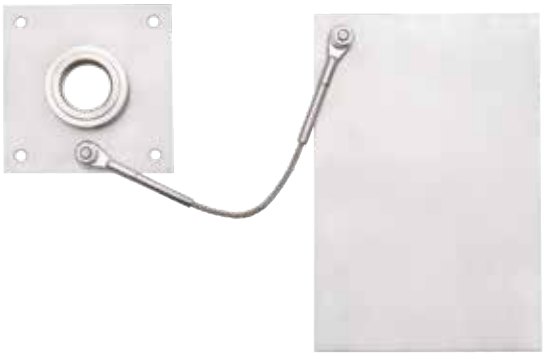
For performance improvements of ultrasonic level meters ULM and ULS.

- 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 G¾", G1", G1½" nebo G2¼".

Auxiliary plate electrode PDE

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

- Designed for capacitative sensors installed in vertical position with electrode length exceeding 300 mm.
- Stainless steel performance.
- Process connection M18x1,5 or M27x2.



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 IP 65.

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, HLM-35C and HLM-35S equipped 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 IP 65.

VARIANTS OF UNITS

NB–01
version without overvoltage protection

NB–11
version with overvoltage protection

Cable hanger KD-60

For hydrostatic level meters HLM safety cable hanging.

- Plastic performance.

Other products

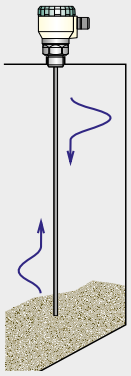
We offer a wide range of accessories.

- 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, DLx-35, ULM-53, RFLS-35 sensors.
- Miniature connectors M8 for GPLS -25 sensors.
- Distance plastic crown for CPS -24, use in-ter-coat space of double coated tanks.
- Atypical seal made of PTFE, aluminium, or other materials.

PRINCIPLES OF LEVEL AND FLOW MEASUREMENT

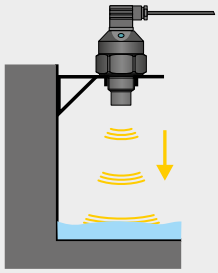
Guided wave radar level measurement

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 electrode can be created of rod or rope. The pulse propagates along the electrode in the form of 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 measures the time of flight of electromagnetic wave and appropriately sets the value of the output signal. The method is resistant against changes in the atmosphere (pressure, temperature, dust, steam) and to changes in medium parameters (change in dielectric constant, conductivity).

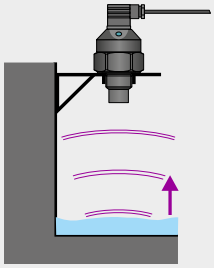


Ultrasonic level measurement

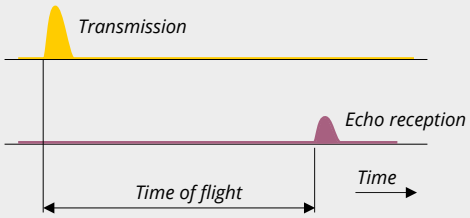
The ultrasonic level meter ULM transmits the series of ultrasonic pulses, that propagate towards the level surface. Reflected acoustic waves are received by the level meter and processed by internal processor. Then the temperature compensation is provided and the voltage signal is changed due to output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



Transmission of acoustic waves towards the level surface



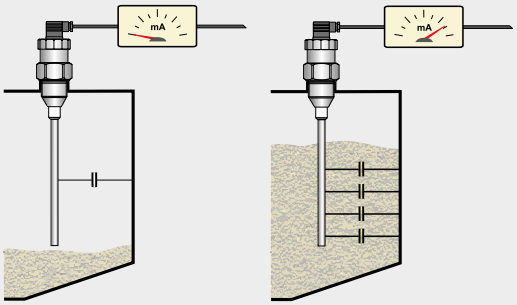
Reception of acoustic waves reflected from the level



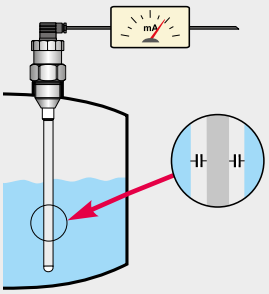
Time of flight ~ Level height
Output signal ~ Time of flight

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.

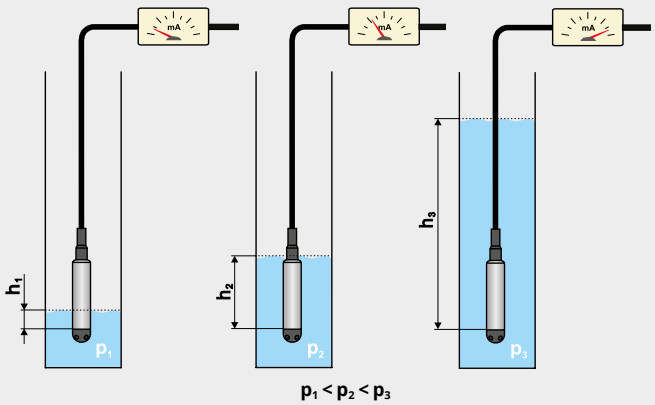
The method is resistant to any changes in the atmosphere above the surface (vacuum, pressure, vapours, dust). It is also partially resistant to the formation of foam on the surface. Method is not applicable in case of change of dielectric constant of the medium. If only conductivity of the medium changes (eg. drinking water x steam condensate) and when the sensor is used with insulated electrode, it has no effect on the output signal.

Hydrostatic level measurement

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

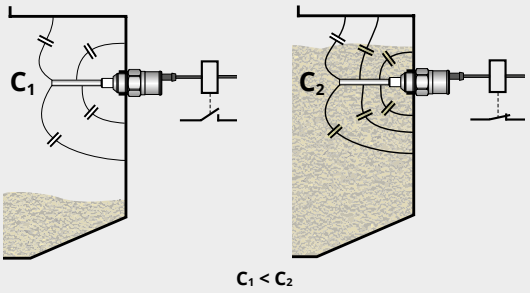
p = h . ρ . g

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.



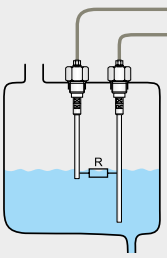
Capacitive limit level sensing

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



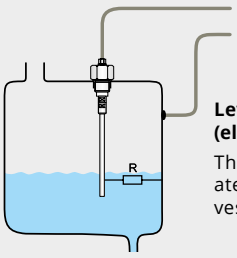
Conductive level sensing

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.

Measurement principle of the thermal flow sensor

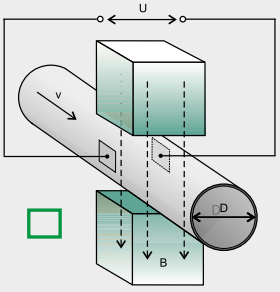
The function of thermal flow sensors is based on the measuring of the thermal dissipation to the measured medium. The sensor is internally heated to a temperature above several °C higher than the temperature of the medium. The movement of the medium draws this heat from the stem surface into the surrounding 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 an switching OFF mode - the output is switched ON when the flow rate decreases.

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. Voltage on measuring electrodes arises in the 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 . B . D

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



MAP OF APPLICATIONS

Map of Dinel level sensors applications	CONTINUOUS LEVEL METERS																	
	GRLM-70-10	GRLM-70-11, 12	GRLM-70-20	GRLM-70-30, 33	GRLM-70-32	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-35-51	CLM-70-61	CLM-40	ULM-53	ULM-70	HLM-16N HLM-25S	HLM-25C	HLM-35
AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY																		
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	••	••	••	••	••	••	••	•	•	••	••	•	•	••	••	•	•	••
WATER PROCESSING TECHNOLOGY, ENVIRONMENTAL																		
Water storage tanks	••	••	••	••	••	–	••	–	••	–	••	••	–	••	••	••	••	••
Sewage sumps	••	••	••	••	••	–	••	–	–	–	••	–	–	••	••	–	••	••
Open channels	–	–	–	–	–	–	•	–	•	–	•	–	–	••	••	–	–	–
Wells, Bores	–	–	–	–	–	–	•	–	–	–	•	–	–	•	•	••	••	–
Reservoirs, Rivers	•	•	•	•	•	–	•	–	–	–	•	–	–	••	••	•	••	•
CHEMICAL INDUSTRY																		
Alkalic liquids, Chemicals, Reagents	•	•	•	•	•	–	•	–	•	–	•	•	–	•	•	–	–	•
Bulk-solid materials – Salt, Fertilizers	••	••	–	••	••	•	–	–	–	•	–	–	–	•	•	–	–	–
Liquid detergents	••	•	••	••	•	–	•	–	•	–	•	•	–	••	••	–	–	•
Anorganic solvents, Acids	•	••	–	•	••	–	•	–	–	–	•	••	–	•	•	–	–	•
Resins	••	••	••	••	••	•	•	–	–	–	•	••	–	•	••	–	–	•
PHARMACY																		
Non-conductive fluids, Organic solvents	••	••	••	••	••	••	•	••	–	–	•	•	•	•	•	–	–	•
Clean water, De-mi water	••	••	••	••	••	–	••	–	•	–	••	••	–	•	••	••	••	••
Pasty mass	••	••	••	••	••	–	••	–	–	–	••	–	–	••	••	–	–	–
PETROCHEMICAL INDUSTRY																		
Oil, Diesel	••	••	••	••	••	••	•	••	•	•	•	–	••	•	••	–	–	••
Petrol	••	••	••	••	••	••	•	••	•	•	•	–	••	–	–	–	–	•
TRANSPORT VEHICLES, ENGINES																		
Diesel tanks	•	•	••	•	•	••	•	••	•	–	–	–	••	–	–	–	–	•
Cooling fluid in engine	•	•	••	•	•	–	••	–	••	–	–	–	–	–	–	–	–	•
Oils in engines, Compressors	•	•	••	•	•	•	•	•	•	–	–	–	••	–	–	–	–	•
HEATING																		
Water condensate tanks, Coolers	•	••	•	•	••	–	••	–	•	–	••	–	–	•	•	–	–	•
Boilers, Steam developers	•	••	•	•	••	–	•	–	•	–	•	–	–	–	–	–	–	•
Wooden pellets, Chips	••	•	–	••	•	•	–	–	–	•	–	–	–	–	•	–	–	–
Heating oil	••	••	••	••	••	••	•	••	•	•	•	–	••	••	••	•	•	••
BUILDING AND PROCESS INDUSTRY																		
Water condensate tanks, Coolers	••	•	–	••	•	•	•	–	–	••	•	–	–	–	–	–	–	–
Boilers, Steam developers	••	••	–	••	••	•	–	–	–	•	–	–	–	•	•	–	–	–
Wooden pellets, Chips	••	•	–	•	•	•	•	–	–	•	–	–	–	–	–	–	–	–
Heating oil	••	••	–	••	••	•	•	–	–	•	–	–	–	–	•	–	–	–
MACHINERY																		
Hydraulic oil	••	••	••	••	••	••	•	••	•	–	•	•	••	••	••	•	•	••
Lubricants	••	••	••	••	••	••	•	•	•	–	•	•	•	••	••	•	•	••
Cooling emulsions	••	••	••	••	••	•	••	–	••	–	••	•	–	••	••	•	•	••
PLASTIC TECHNOLOGY																		
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.

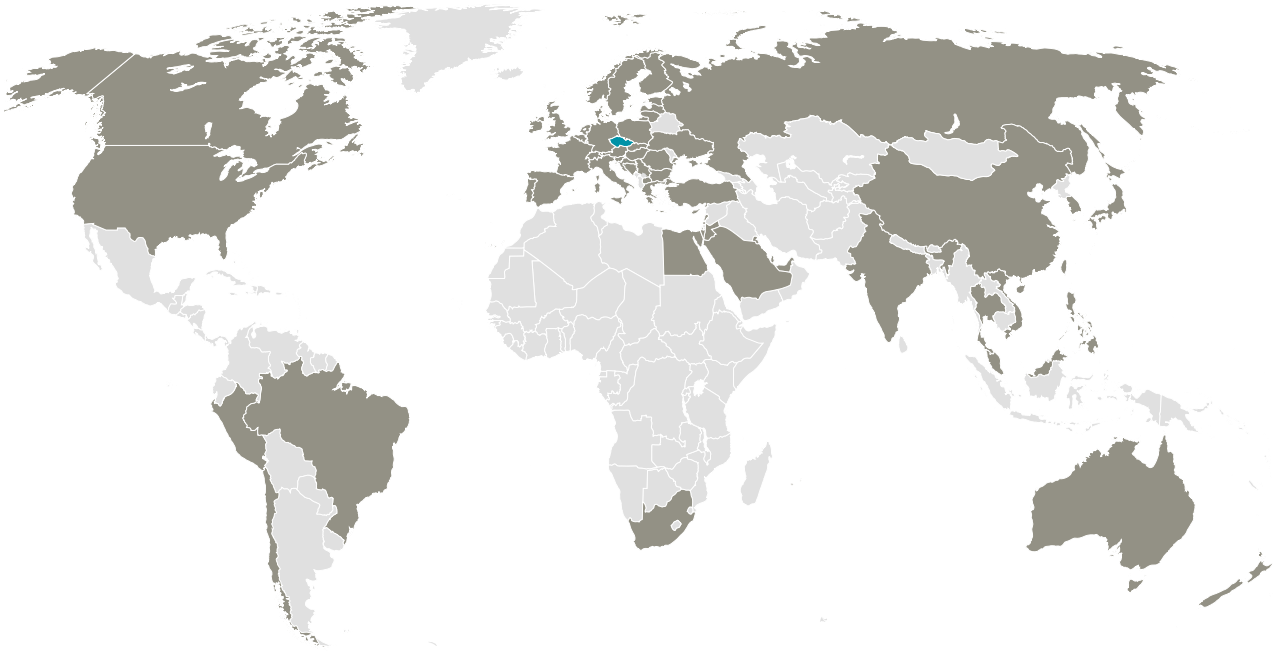
LEGEND					
••	Suitable	•	Conditionally applicable	–	Not suitable

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-35-1B	RFLS-35-1E	RFLS-35-1V	RFLS-35-2	CLS-53	CPS-24	GPLS-25 FLD-48	CNP-18
AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY															
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	•	–	•	•	••	–	••	••	–	••	••	–	•	•	–
WATER PROCESSING TECHNOLOGY, ENVIRONMENTAL															
Water storage tanks	–	••	–	•	–	••	••	•	•	•	••	–	–	••	••
Sewage sumps	–	••	–	–	–	••	••	•	•	•	••	–	–	–	•
Open channels	–	–	–	–	–	–	••	–	–	–	–	–	–	–	–
Wells, Bores	–	–	–	–	–	••	•	–	–	–	–	–	–	–	–
Dry run pump protection	–	••	–	–	–	••	–	•	•	•	•	–	–	–	•
Reservoirs, Rivers	–	–	–	–	–	–	••	–	–	–	–	–	–	–	–
Water leakage detection	•	•	–	–	••	•	–	–	–	–	–	–	••	–	•
CHEMICAL INDUSTRY															
Alkalic liquids, Chemicals, Reagents	•	••	–	–	•	••	•	•	••	••	••	–	–	•	–
Bulk-solid materials – Salt, Fertilizers	••	–	–	–	•	–	•	–	–	–	–	••	•	–	–
Liquid detergents	•	••	–	•	•	••	••	•	••	••	••	–	–	•	•
Anorganic solvents, Acids	•	•	–	–	•	•	•	–	–	•	•	–	–	••	–
Resins	•	••	–	–	•	••	•	••	••	••	••	–	–	–	–
Aggressive liquid leakage detection	•	–	–	–	•	•	–	–	–	–	–	–	•	–	–
PHARMACY															
Non-conductive fluids, Organic solvents	••	•	••	••	••	•	•	–	–	•	•	–	–	•	–
Clean water, De-mi water	•	••	–	••	•	••	•	•	•	•	•	–	–	••	•
Pasty mass	•	••	–	–	•	•	••	•	•	•	••	–	–	–	–
PETROCHEMICAL INDUSTRY															
Oil, Diesel	••	–	••	•	••	–	•	•	–	••	••	–	–	•	–
Petrol	••	–	••	•	••	–	–	•	–	••	••	–	–	–	–
Leakage detection	–	–	–	–	•	–	–	–	–	–	–	–	••	–	–
TRANSPORT VEHICLES, ENGINES															
Diesel tanks	••	•	••	•	••	•	–	•	–	••	••	–	–	–	–
Cooling fluid in engine	–	••		••	–	••	–	•	•	–	•	–	–	•	–
Oils in engines, Compressors	•	•	••	•	•	•	–	••	–	••	••	–	–	–	–
HEATING															
Water condensate tanks, Coolers	–	••	–	••	–	••	•	•	•	–	•	–	–	•	–
Boilers, Steam developers	–	•	–	•	–	•	–	–	•	–	•	–	–	–	–
Wooden pellets, Chips	•	–	–	–	•	–	–	–	–	–	–	••	–	–	–
Heating oil	••	•	••	•	••	•	••	•	–	••	••	–	–	•	–
BUILDING AND PROCESS INDUSTRY															
Cement, Powder lime, Chalk	••	–	–	–	–	–	–	–	–	–	–	••	–	–	–
Gravel	•	–	–	–	–	–	•	–	–	–	–	•	–	–	–
Liquid asphalt, Bitumen	••	•	–	–	•	•	–	–	–	••	••	–	–	–	–
Sand	••	–	–	–	–	–	–	–	–	–	–	•	–	–	–
MACHINERY															
Hydraulic oil	••	•	••	•	••	•	••	••	–	••	••	–	–	–	•
Lubricants	••	•	••	•	••	•	••	••	–	••	••	–	–	–	–
Cooling emulsions	•	••	–	••	•	••	••	•	–	••	••	–	–	•	•
PLASTIC TECHNOLOGY															
Granulates	••	•	–	–	•	–	•	–	–	–	–	••	•	–	–
Powders	••	•	–	–	•	–	–	–	–	–	–	•	•	–	–

FLOW METERS

	TFS-35	EFM-115	FCU-400
AGRICULTURE, FOOD PROCESSING, PACKING TECHNOLOGY			
drinks – water, sirup, wine, milk	••	••	–
Spirits	••	•	–
WATER PROCESSING TECHNOLOGY			
Water storage tanks	••	•	–
Sewage sumps	••	••	••
Open channels		–	••
Reservoirs, Rivers		–	•
PHARMACY			
Non-conductive fluids, Organic solvents	••	–	–
Clean water, De-mi water	••	••	–
PETROCHEMICAL INDUSTRY			
Oil, Diesel	•	–	–
Petrol	–	–	–
TRANSPORT VEHICLES, ENGINES			
Cooling fluid in engine	••	–	–
Oils in engines, Compressors	••	–	–
HEATING			
Water condensate tanks, Coolers	••	–	–
Heating oil	•	–	–
MACHINERY			
Hydraulic oil	••	–	–
Lubricants	•	–	–
Cooling emulsions	••	–	–



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