

Dinel®

industrial electronics



ABOUT US

28

YEARS
ON MARKET

21

YEARS OF
ATEX CERTIFICATION

23

YEARS
OF ISO 9001
CERTIFICATION

60

EXPORT
COUNTRIES



ABOUT US



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.

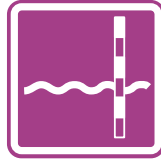
TECHNICAL SUPPORT

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 reparability of all our products any time after warranty period which we provide for 3 years.

PRODUCTS



Continuous level meters



Limit level sensors



Flow meters



Display units



Evaluation and power supply units



Pressure sensor

CONTINUOUS LEVEL METERS



RADAR LEVEL METERS ARLM-70



- **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



Technical specifications

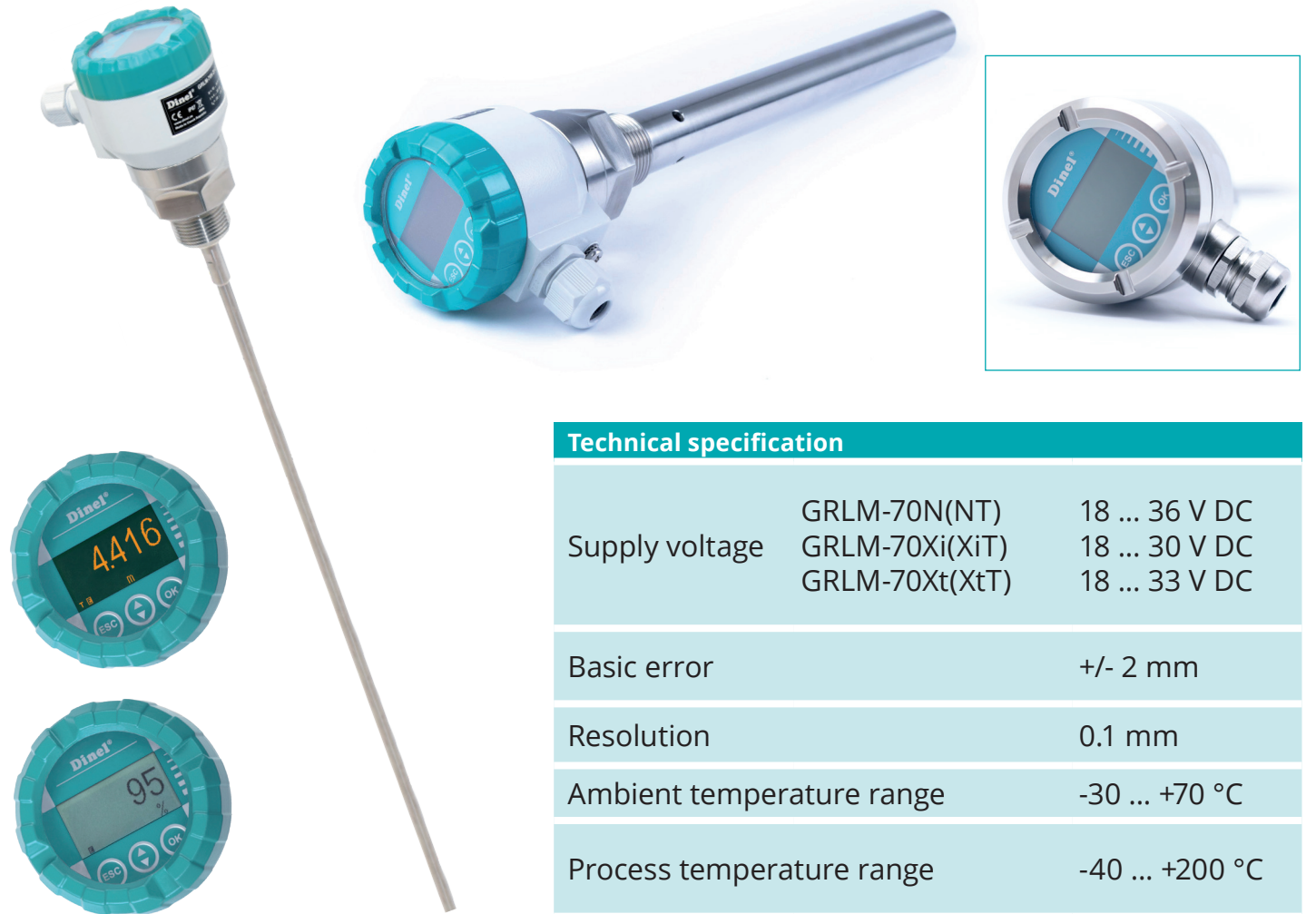
Work environment	explosion-free area
Supply voltage	18 - 36 V DC
Output type	current 4 - 20 mA with HART communication (limit values 3.9 - 20.5 mA)
Measurement error	3 mm (distance 1m to 20m) 10 mm (distance 0.3m to 1m)
Maximum range	20 m
Dead Zone	30 cm
Operating temperature range	-30 ... +70 °C
Measuring frequency	25 GHz (K-Band)

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

RADAR LEVEL METERS GRLM-70



- **Radar level meter with guided wave (TDR)**
- Universal use, direct mounting into containers, silos, vessels, reservoirs, etc.
- Stainless steel rod or rope electrode
- Xi, XiT versions for usage in explosive areas, or Xt, XtT 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 by removable display module DM-70
- Arbitrary selection between metric and imperial units
- Current output (4 ... 20 mA) with HART® protocol or output RS-485 Modbus RTU
- Optional connection using a cable gland, or a cable gland for protective hose



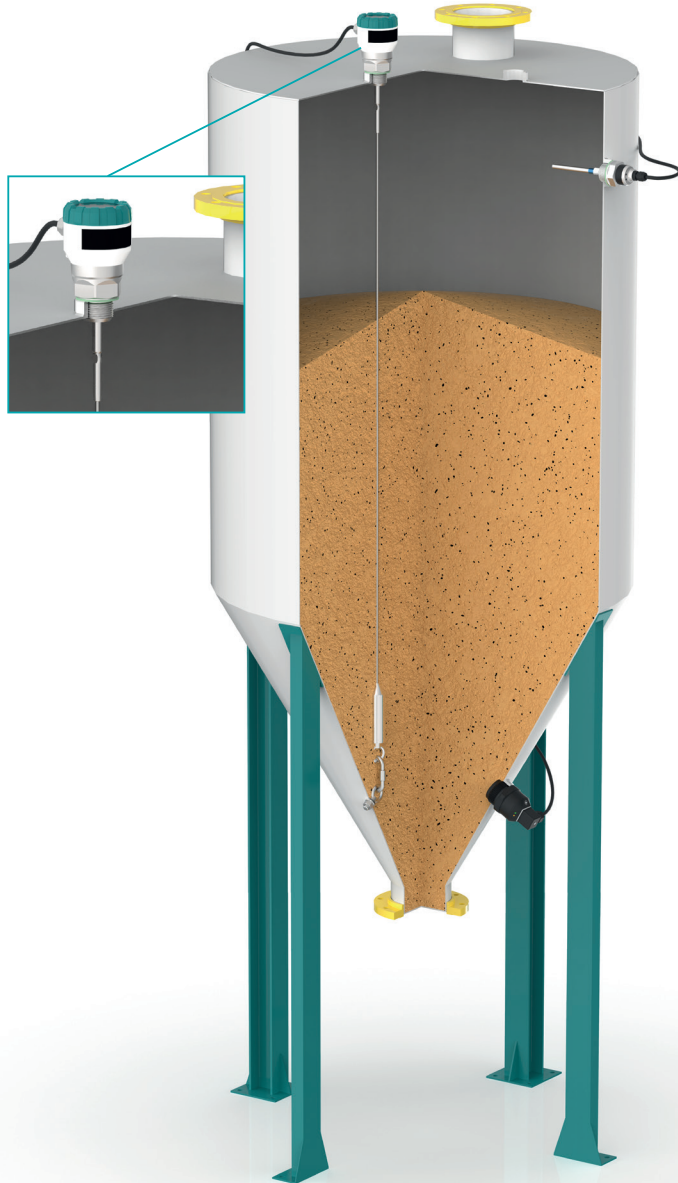
Technical specification

Supply voltage	GRLM-70N(NT)	18 ... 36 V DC
	GRLM-70Xi(XiT)	18 ... 30 V DC
	GRLM-70Xt(XtT)	18 ... 33 V DC
Basic error		+/- 2 mm
Resolution		0.1 mm
Ambient temperature range		-30 ... +70 °C
Process temperature range		-40 ... +200 °C

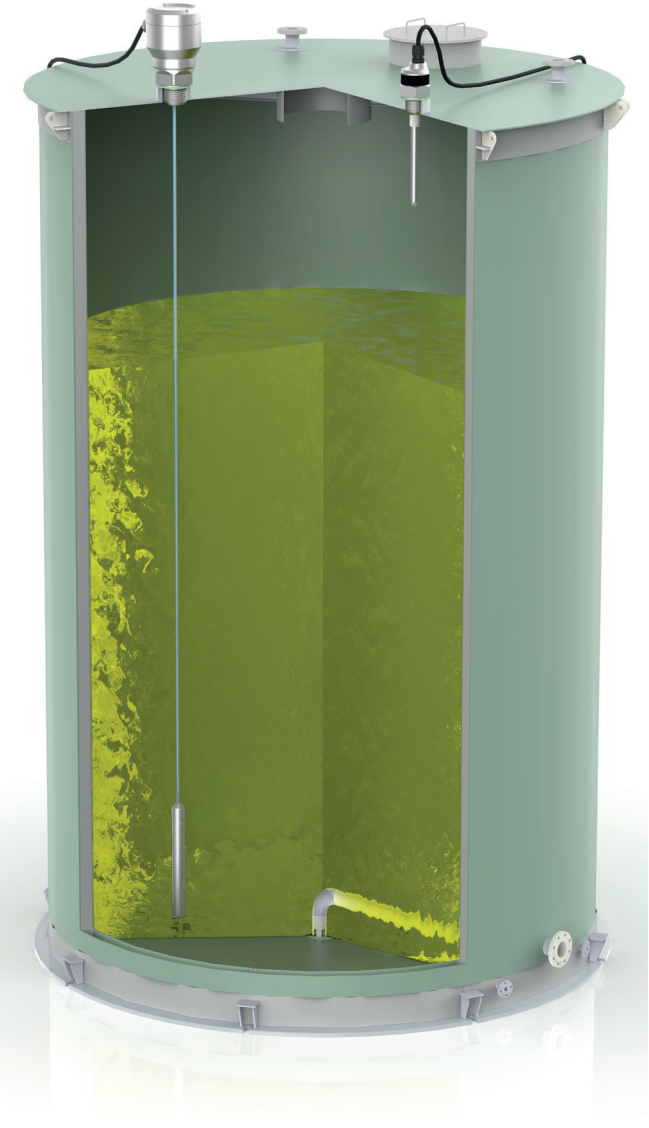
Suited to continuous level measurement of various liquids, mashes, bulk solids and powders.



USES OF RADAR LEVEL METERS GRLM-70



- **Construction and manufacturing industry:** level measurement of cement, fly ash, sand and gravel, kaolin, bentonite and sandstone in silo (GRLM-70N-34/35/37)
- **Agricultural and food technology:** measuring the level of grain, rapeseed, malt, flour, and feed mixture in the silo (GRLM-70Xd-30/33/34/36), measuring the heated liquid fat in the reservoir (GRLM-70NT-33)
- **Water purification and treatment:** measurement of flocculant, calcium hydroxide, ferric sulfate (GRLM-70N-10), water measurement in a plastic tank in hydroponic growing technology (GRLM-70N-20)
- **Chemical substances in various technologies:** measuring the level of glycerol, methanol, lecithin, nitric acid (GRLM-70Xi-10), ammonia measurement in brewery cooling technology (GRLM-70N-10), measurement of chemical substances (hexylene glycol, sulfur, mercury, mercuric sulfide) during the mercury conversion process (GRLM-70NT-11), measurement of glycol, HCl 31%, phosphoric acid 75%, NaOH 50% in plastic tanks during the production of cleaning products (GRLM-70N-32)
- **Petrochemical industry:** liquefied natural gas level measurement (GRLM-70Xi-20)



ULTRASONIC LEVEL METERS ULM-70



- **Intelligent ultrasonic level meter with advanced digital signal processing**
- Immediate view of the measured values on OLED or LCD display units
- Xi version for usage in explosive areas
- Easy adjustment without measured material
- Elimination of false reflections
- Arbitrary choice of metric or imperial displayed measuring units
- Level meter is suitable for tanks with mixers
- Current output (4 ... 20 mA) with HART® protocol or output RS-485 Modbus RTU
- While used with horn adapter can be measured difficult media (foamy levels, loose materials, etc.)
- Telescopic bracket for mounting of ultrasonic level meters in outdoor applications

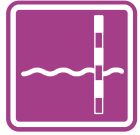


Technical specification		
Supply voltage	ULM-70N	18 ... 36 V DC
	ULM-70Xi	18 ... 30 V DC
Accuracy (within the total range)		0.15 %
Temperature error		max. 0.04 %/K
Ambient temperature range	ULM-70_-02, 06	-30 ... +70 °C
	ULM-70_-10, 20	-30 ... +60 °C
Maximal operating overpressure		0.1 MPa

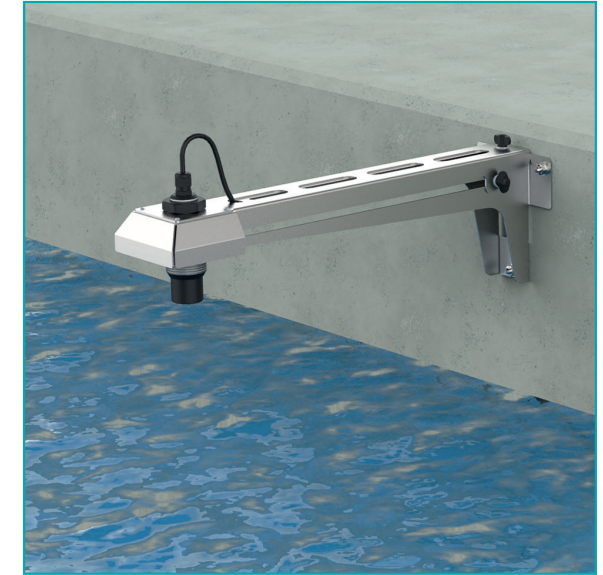
For continuous non-contact level measurement of various liquids, mashies, pasty materials and bulk solids in closed or open vessels, sumps, reservoirs etc.



ULTRASONIC LEVEL METERS ULM-54



- **Intelligent ultrasonic level meter with advanced digital signal processing**
- Remote installation and communication via HART® protocol
- Variable installation thanks to the possibility of connection via lower or upper thread
- 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 of ultrasonic level meters in outdoor applications.



Technical specification

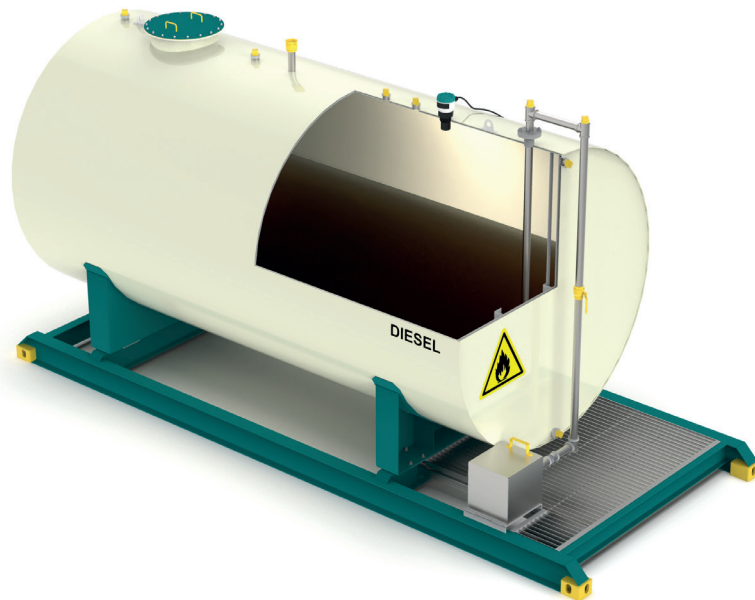
Supply voltage	ULM-54N	18 ... 36 V DC
Accuracy (within the total range)		0.15 %
Temperature error		max. 0.04 %/K
Ambient temperature range	ULM-70_-02, 06 ULM-70_-10, 20	-30 ... +70 °C -30 ... +60 °C
Maximal operating overpressure		0.1 MPa

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

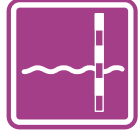
USES OF ULTRASONIC LEVEL METERS ULM-70/54



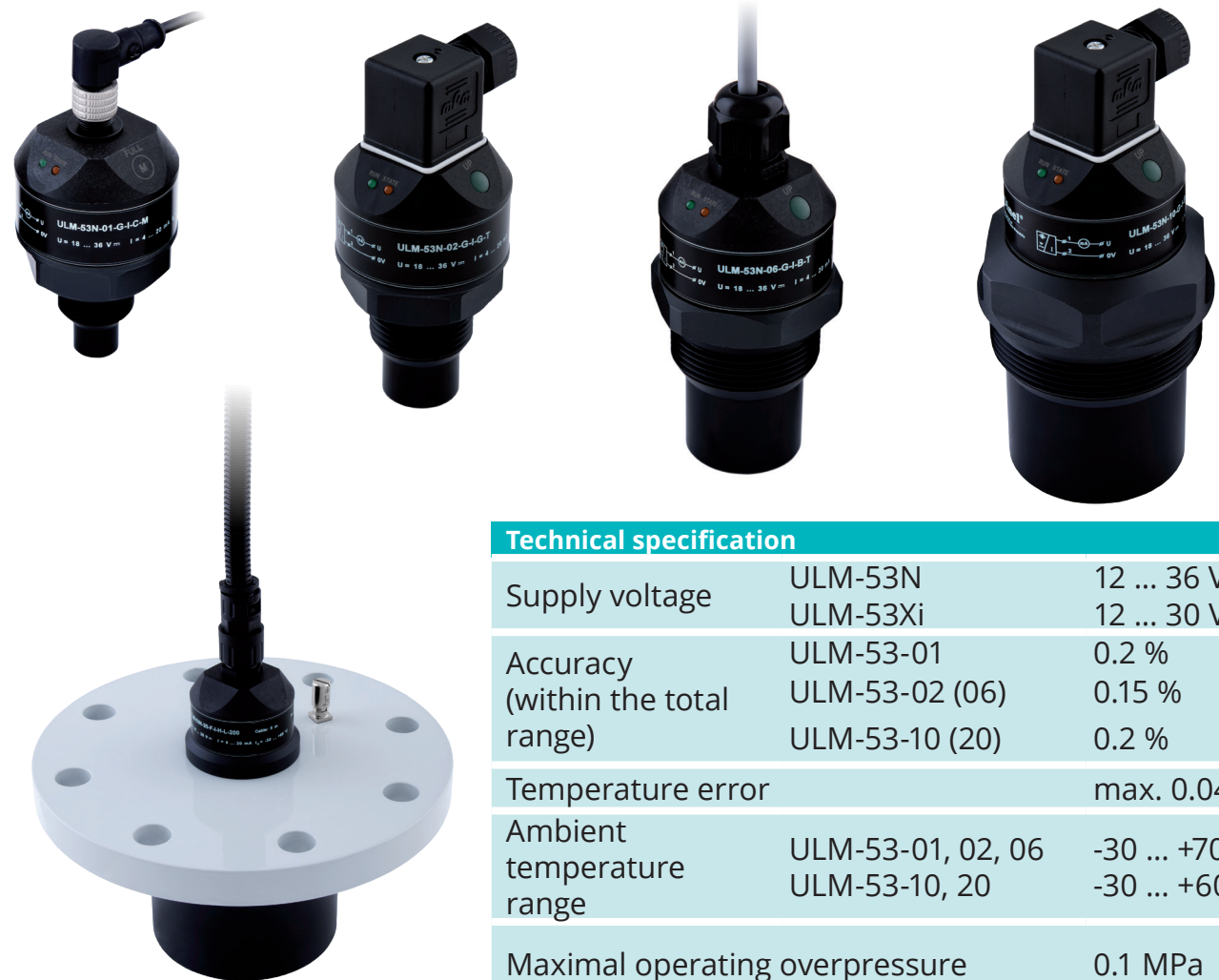
- **Construction and manufacturing industry:** measuring the level of sand and gravel in steel tanks in the concrete plant
- **Agricultural and food technology:** measuring the height of food oil, yogurt, mayonnaise or ketchup in stainless steel containers
- **Water purification and treatment:** measurement of water flow in measuring channels at the outlet of the WWTP, measurement of the height at the level of waste pits with hazardous waste, levels of sewage, rainwater, underground water in plastic tanks, sludge water in a concrete pit, or iron sulfate at the WWTP
- **Chemical substances in technologies:** measuring the level of chemical substances in the production of washing and cleaning products, the level of paints in a stainless steel tank
- **Petrochemical industry:** measuring the level of diesel, oil in fuel tanks
- **Various departments:** measurement of the height of the snow cover on the roof of the building, measurement of the level of unusable municipal waste in the reservoir of a multi-fuel boiler for the production of electricity and heat



ULTRASONIC LEVEL METERS ULM-53



- **Ultrasonic level meter in a compact design for measuring liquids**
- 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
- High degree of protection IP68
- Telescopic bracket for mounting of ultrasonic level meters in outdoor applications.



Technical specification		
Supply voltage	ULM-53N	12 ... 36 V DC
	ULM-53Xi	12 ... 30 V DC
Accuracy (within the total range)	ULM-53-01	0.2 %
	ULM-53-02 (06)	0.15 %
	ULM-53-10 (20)	0.2 %
Temperature error		max. 0.04 %/K
Ambient temperature range	ULM-53-01, 02, 06	-30 ... +70 °C
	ULM-53-10, 20	-30 ... +60 °C
Maximal operating overpressure		0.1 MPa

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



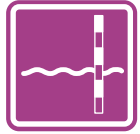
USES OF ULTRASONIC LEVEL METERS ULM-53



- **Agricultural and food technology:** oil level measurement in fiberglass tanks
- **Water purification and treatment:** measurement of water flow in measuring channels at the outlet of the WWTP, measurement of rainwater and groundwater levels in plastic tanks, measurement of seepage/flow of water through a dam in a measuring overflow
- **Chemical substances in different technologies:** measuring the level of the regenerating agent in a stainless steel container
- **Petrochemical industry:** level measurement of diesel and oil in metal tanks



CAPACITIVE LEVEL METERS CLM-70



- **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 specification		
Supply voltage	18 ... 36 V DC	
Current output resolution	10 uA	
Measuring range from	0 ... 3000 pF	
Resolution	for capacities from 0 to 300 pF	0.01 pF
	for capacities from 300 to 3000 pF	0.1 pF
Non-linearity (electronics)	max. 1 %	
Maximum slew rate	<1 sec (0 ... 100 %)	
Ambient temperature range	-30 ... +70 °C	
Process temperature range	-40 ... +200 °C	
Maximal pressure range in process connection	0 ... 100 bar	

For continuous level measurement of liquids, bulk solids and powders in all kinds of industries.

CAPACITIVE LEVEL METERS DLM-35



- **Suitable for smaller measuring range, 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
- Current output, voltage output
- 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 protective conductor
- Material of housing and electrodes from stainless steel



Technical specification		
Supply voltage	current output	9 ... 34 V DC
	voltage output	12 ... 34 V DC
Accuracy (from full measured range)		max. 1 %
Ambient temperature range		-40 ... +85 °C
Process temperature range		-40 ... +200 °C
Maximal pressure range in process connection (for temperature +85 °C)		0 ... 25 bar

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



CAPACITIVE LEVEL METERS CLM-36



- **Wide range of uses, 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
- Current output, voltage output
- Easy and quick connecting by connector
- Removable inner electronic module
- Material of housing and electrodes from stainless steel



Technical specification		
Supply voltage	current output	9 ... 36 V DC
	voltage output	16 ... 36 V DC
Accuracy (from full measured range)		max. 1 %
Ambient temperature range		-40 ... +85 °C
Process temperature range		-40 ... +200 °C
Maximal pressure range in process connection (for temperature +85 °C)		0 ... 25 bar

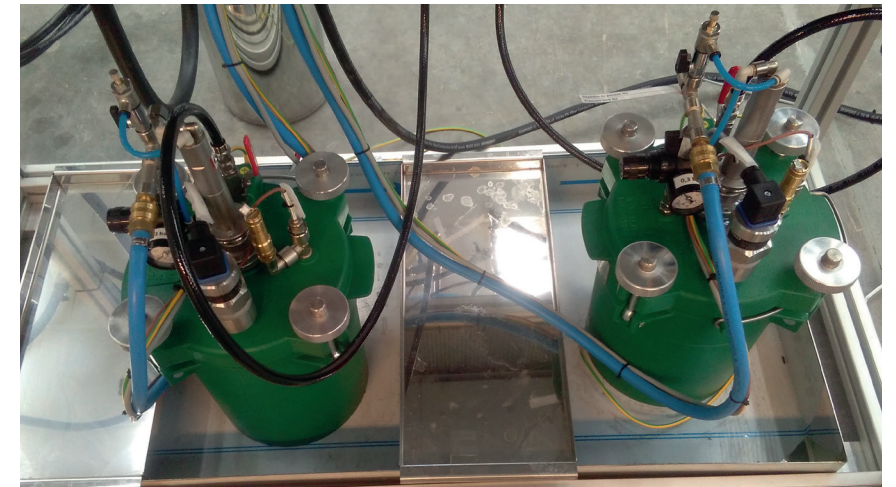
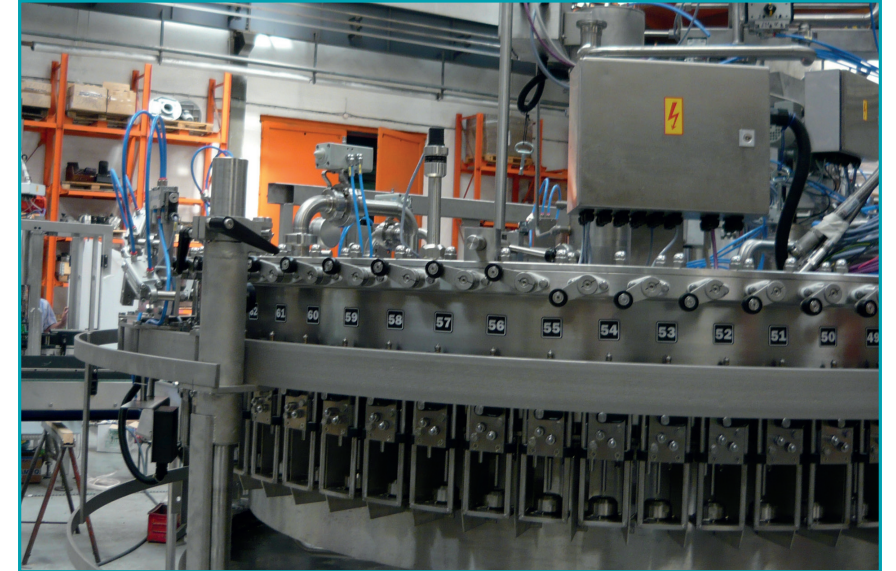
For continuous level measurement of liquids, bulk solids and powders in tanks, hoppers, silos etc.



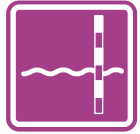
USES OF CAPACITIVE LEVEL METERS CLM A DLM



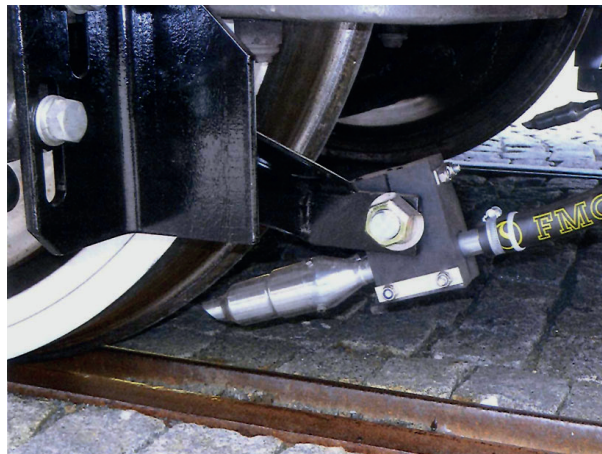
- **Construction and processing industry:** measurement of gravel in the production of industrial asphalt mixtures (CLM-36NT-10)
- **Agricultural and food technologies:** measuring the level of beverages in bottle filling machines (DLM-35N-21, CLM-36N-12), measurement of milk and cream in dairy products production technology (CLM-36N-12)
- **Chemical substances in different technologies:** measurement of ammonia in the cooling technology of the winter stadium (CLM-36N-12), measurement of hydrogen cyanide, cyanide chloride in DPG production technology (CLM-36Xi-22), color measurement in a pressure vessel (CLM-36Xi-12), measurement of potting resins and polyurethanes in the mixing bowl (DLM-35N-21), measurement of phosphoric acid in plastic containers (CLM-70N-61), measurement of isopropyl alcohol (acetone) per room. temperature and pressure up to 100 bar (CLM-70N-10), measurement of cooling liquid in the technology of the central cooling system of buildings (DLM-35N-40)



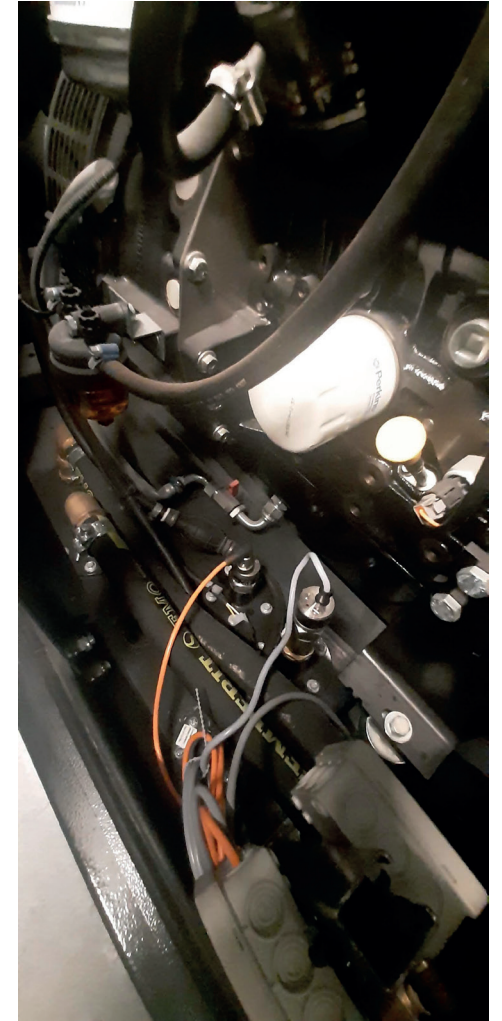
USES OF CAPACITIVE LEVEL METERS CLM A DLM



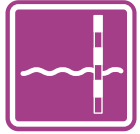
- **Petrochemical and energy industry:** measuring the height of liquid natural gas, measurement of diesel fuel, gasoline in underground tanks in the Czech Republic (CLM-36N-20), measurement of diesel fuel in the tank of a backup generator/ diesel unit (CLM-36N-20, DLM-35N-40)



- **Transport technology:** measuring the level of water and foam in the tanks of fire engines (DLM-35-21/41), hydraulic oil measurement in aviation (DLM-35N-40), sand measurement in rail vehicle sandblasting technology (DLM-35N-20)



CAPACITIVE LEVEL METERS CLM-40



- **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 from 0.1 to 1 m, 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 magnetic pen or CAN bus



Technical specification		
Supply voltage	current output	9 ... 30 V DC
	I and CAN voltage output (U)	12 ... 30 V DC
Accuracy (from full measured range)		1%
Ambient temperature range		-40 ... +85°C (CAN only to 80°C)

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

SUBMERSIBLE HYDROSTATIC LEVEL METERS HLM-16/25



- **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).
- Precise customer choice of the measurement range up to 100 m.
- Probe diameter 25 mm or 16 mm.
- Over voltage protection inside probe.

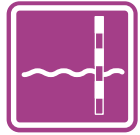


Technical specification

Supply voltage	HLM-25S (var. I)	12 ... 36 V DC
	HLM-25S (var. U)	16 ... 36 V DC
	HLM-25C	12 ... 34 V DC
	HLM-16N	10 ... 30 V DC
Maximum measurement range		100 m
Accuracy (from full measured range)		0.5 %
Ambient temperature range		-20 ... +70 °C

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

HYDROSTATIC LEVEL METERS HLM-35



- **Intended for various liquids (water, oil, coolants, water solutions, etc.)**
- Installation into the thread in the tank wall
- Arbitrary measurement ranges of water column heights up to 100 m (H₂O)
- Atmospheric pressure compensation using a cable capillary or a valve
- Current (4 ... 20 mA) or voltage (0 ... 10 V) output
- Simple installation requiring no settings
- LED indication



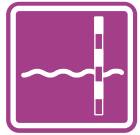
Technical specification

Supply voltage	12 ... 34 V DC
Maximum measurement range	100 m
Accuracy (from full measured range)	0.5 %
Ambient temperature range	-20 ... +70 °C

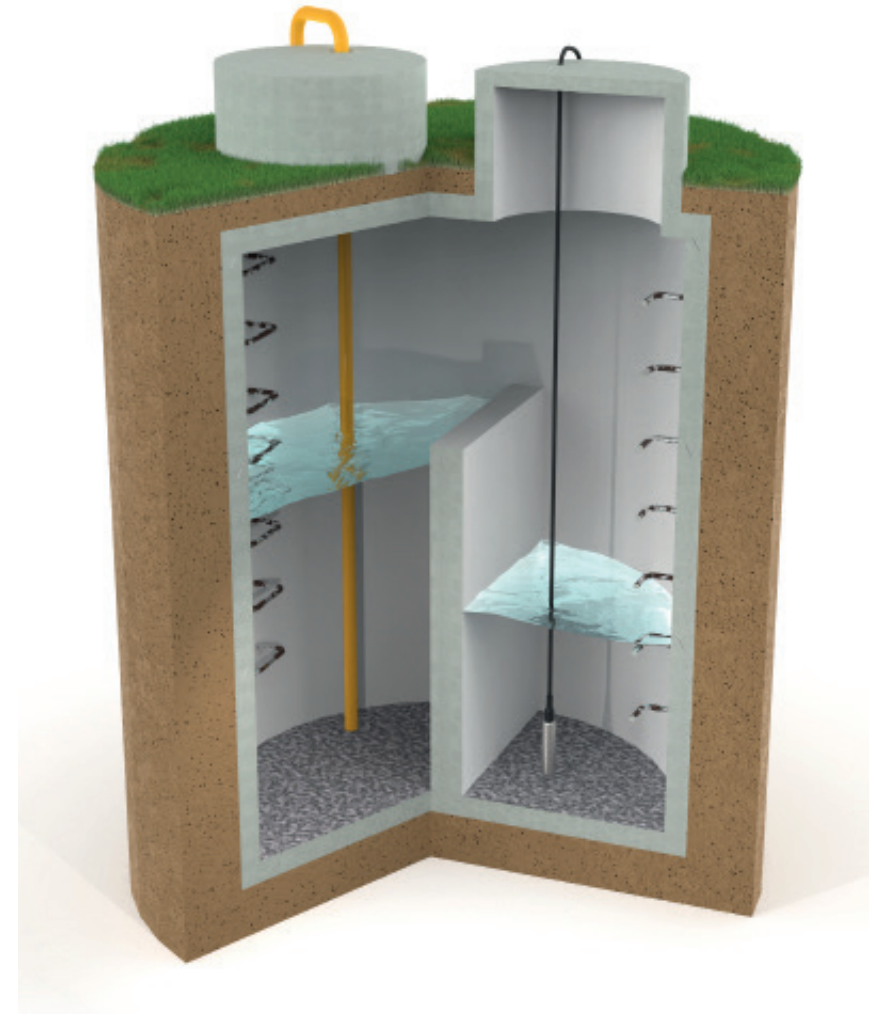
For continuous level measurement of liquids in non-pressure tanks, vessels and pipes.



USES OF HYDROSTATIC LEVEL METERS HLM



- **Water purification and treatment:**
water measurement in wells, boreholes, retention tanks and reservoirs (HLM-25S/C), water level monitoring in mobile tanks (HLM-35N-CV), measurement of treated and untreated water (HLM-25S/C),
- **Chemical substances in various technologies:**
measurement of antifreeze coolant in stainless steel tanks (HLM-35N-CV)



HOW TO FIND THE SUITABLE LEVEL METER FOR THE APPLICATION?



- **What substance will be measured?**
- solid, liquid or slurry
- **What are the more specific properties of the measured substance?**
- see Application table
- **What tank is the substance in?**
- its size, shape and tank material
- **What are the physical properties of the environment?**
- temperature and pressure in the tank
- **Are there other restrictive conditions?**
- low ceiling above the tank, non-stationary tank, vibrations, etc.

PROCESS MEDIUM FEATURES AND OTHER FACTORS	CONTINUOUS LEVEL MEASUREMENT						
	GRLM-70	ULM-53	ULM-70 ULM-54 with ST-G	CLM-36 DLM-35	CLM-70	HLM-35	HLM-25 HLM-16
SOLID							
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 (ϵ_r , 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 money, explosives	••	-	-	••	••	-	-
mechanical obstacles in the stack	•	-	••	•	•	-	-
LIQUIDS AND SLURRIES							
liquid	••	••	••	••	••	••	••
paste-like substance	••	••	••	•	•	-	-
hygienic applications	••	•	•	••	••	•	-
hygienic applications with sanitation	••	-	-	••	••	-	-
changing ϵ_r	••	••	••	-	-	•	•
changing density	••	••	••	•	•	-	-
sticking + el. conductive (strong alkalis)	••	•	••	-	-	•	-
aggressive inorganic acids	•	•	•	•	•• ⁴⁾	-	-
non-fuming diluted chemicals	••	••	••	•	•• ⁴⁾	-	-
organic solvents	••	-	-	••	••	•	-
very small tanks	-	-	-	••	•	•	•
very volatile	••	-	-	••	••	•	-
foam continuous, dense	••	•	••	••	••	••	••
foam incoherent, moulded	•	-	-	•	•	••	••
combustibles	••	•	•	••	• ⁵⁾	• ⁵⁾	-
liquid gases	••	-	-	•	•	-	-
sludge	•	••	••	•	•	-	-
barriers in the tank	••	-	••	••	••	••	••
higher pressure (above 2 bar)	••	-	-	••	••	•	•
vacuum	••	-	-	••	••	-	-

PRESSURE SENSOR PPM-35



- Pressure measurement of gaseous or liquid sub-stances
- Easy installation, long service life
- Stainless steel housing and diaphragm material
- Very good long-term stability
- Accuracy 0.5 % of the range
- Measuring range up to 100 bar
- Relative or absolute pressure measurement



Technical specifications		
Area classification (EN 60079-10-1)	non-explosive areas	
Supply voltage	12 ... 34 V DC	
Current output	4 ... 20 mA	
Permissible overload	2 x 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 (media temperature)	-20 ... +85 °C	
Operating temperature range, high temperature design (media temperature)	-20 ... 200 °C	
Max. load resistance for current output (at U = 24 V DC)	$R_{\max} = 600 \Omega$	
Protection class	PPM-35_ _ _ _ _ (C,G)	IP67
	PPM-35_ _ _ _ _ (A, B, V, H)	IP68
Cable	PVC 2 x 0.75 mm ²	
Weight	sensor	cca 190 g (according to design)
	cable (1 m)	60 g

It is designed to measure gaseous and liquid substances in almost all industries.

