

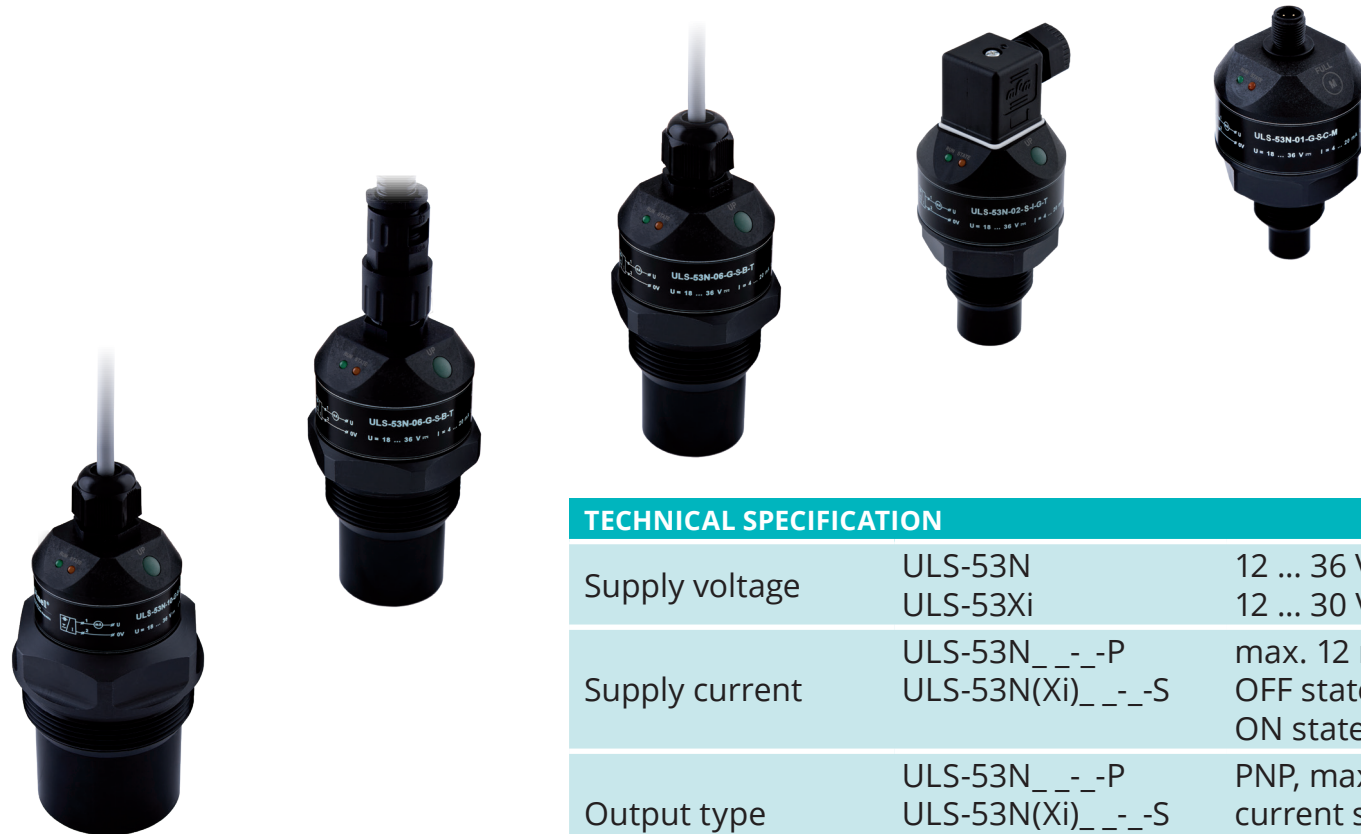
LIMIT LEVEL SENSORS



ULTRASONIC LEVEL SENSORS ULS-53



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



TECHNICAL SPECIFICATION		
Supply voltage	ULS-53N	12 ... 36 V DC
	ULS-53Xi	12 ... 30 V DC
Supply current	ULS-53N_ _ _ -P	max. 12 mA
	ULS-53N(Xi)_ _ _ -S	OFF state 4 mA / ON state 20 mA
Output type	ULS-53N_ _ _ -P	PNP, max. 300 mA
	ULS-53N(Xi)_ _ _ -S	current switch 4 mA/20 mA
Temperature error		max. 0,04 %/K
Ambient temperature range	ULS-53N_ -01, 02, 06	-30 ... +60 °C
	ULS-53N_ -10, 20	-30 ... +70 °C

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



HIGH-FREQUENCY LEVEL SENSORS RFLS-35



- **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.)
- Unique „Medium window“ material type differentiation function
- Replacement of a vibrating level sensor
- Direct mounting into tanks, vessels, sumps, pipes or funnels and containers
- Xi version for usage in explosive areas and extended version for higher pipes or thick tank walls
- Settings using the magnetic pen
- Universal design for all types of fluids (electrically conductive and non-conductive)
- High stability at high sensitivity (possible to use for substances with $\epsilon_r \geq 1.5$)
- The version with PD output now also has a diagnostic function



TECHNICAL SPECIFICATION

Supply voltage	7 ... 34 V DC
Output type	PNP; NPN; NAMUR
Switching current	max. 300 mA
Ambient temperature range	-40 ... +80 °C
Process temperature range	-40 ... +105 °C
Maximum overpressure (for temperature +85 °C)	100 bar

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



HIGH-FREQUENCY LEVEL SENSORS RFLS-28



- **Designed for reliable limit sensing of the level height of wide-ranging liquids, mash and pasty materials - vertical (varianty RG a RN)**
- RG, RN - Installation with or without the tubular extender TN-28 in tanks, containers, sumps or funnels and containers
- NEW variants FG and FN are for direct side mounting
- Resistant to adhesion of viscous and adhering media (ketchups, yoghurts, spreads, syrups, creams, pastes, cleaning agents, etc.)
- Unique material type resolution function „Medium window“ (the sensor is sensitive only to the set medium and does not react to substances with lower and higher permittivity)
- Adjustment with a magnetic pen or by means of a setting wire (PD variant)
- High stability at high sensitivity (can be used for substances with $\epsilon \geq 1.5$)
- The version with PD output now also has a diagnostic function



with protective crown



variants with rear thread RG



magnetic pen for setting



New variant with front thread FG



tubular extender TN-28



TECHNICAL SPECIFICATION

Supply voltage	7 ... 34 V DC
Output type	PNP
Switching current	max. 300 mA
Process temperature range	-40 ... +105 °C
Maximum overpressure (for temperature +85 °C)	100 bar

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

USES OF HIGH-FREQUENCY LEVEL SENSORS RFLS-28/35



- **Construction and manufacturing industry:** detection of foundry sand in the hopper (RFLS-35N-1B)
- **Agricultural and food technology:** detection of slurries (ketchup, mayonnaise, mustard) in a packaging machine for filling bags (RFLS-35N-1B), level detection in a container during cheese production (RFLS-35N-1V)
- **Water purification and treatment:** detection of oil and sludge (not air and water) in the waste sump of the pumping station (RFLS-35N-1V)
- **Chemical substances in various technologies:** color detection in a stainless steel container (RFLS-35Xi-1E), detection of chemical substances (hexylene glycol, sulfur, mercury, mercuric sulfide) during the process of converting mercury to solidified mercuric sulfide (RFLS-35N-2), isopropyl alcohol detection at room temperature (RFLS-28N-1E)
- **Transportation technology:** detection of the state of hydraulic fluid and diesel in monorail suspension transport in mines (RFLS-35XiM-1V)



HIGH-FREQUENCY LEVEL SENSORS RFLS-53



- **For reliable limit level sensing of loose, lumpy and extruded materials (e.g. pellets, chips, cereals)**
- It responds to the mass of the material and ignores deposits and material residues on the measuring part
- It can replace mechanical rotary level switches or standard capacitive level switches
- The sensor is available in several versions with different types of outputs and electrical connections
- The RFLS-53 fully replaces the older CLS-53, its electrical connection is different for the 230 VAC version (3 wires)



magnetic pen for setting

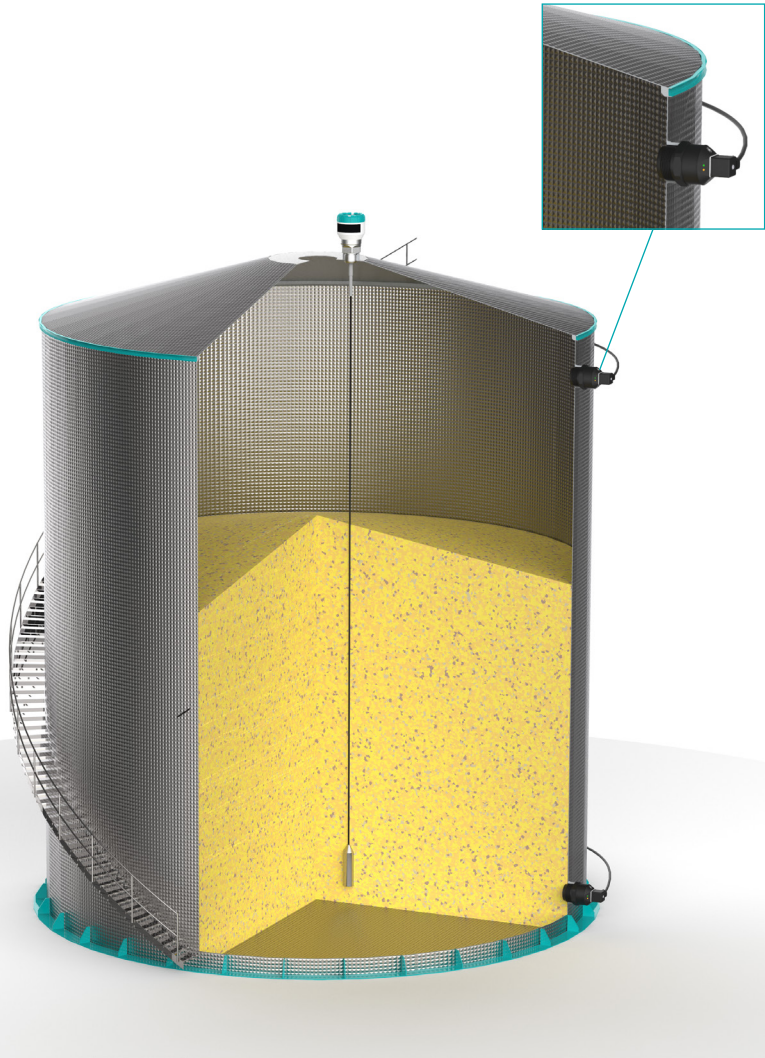
TECHNICAL SPECIFICATION

Supply voltage	RFLS-53N_-P	7 ... 34 V DC
	RFLS-53N_-RE	95 ... 230 V AC
	RFLS-53N_-SSR	95 ... 230 V AC
Output type		PNP - open collector
		RE - mechanical relay
		SSR - solid state relay
Switching current	RFLS-53N_-P	max. 300 mA
	RFLS-53N_-RE	1 A
	RFLS-53N_-SSR	max. 130 mA
Ambient temperature range		-20 ... +60 °C

For demanding applications to indicate bulk/solids powder, dust and hygroscopic materials



USES OF HIGH-FREQUENCY LEVEL SENSORS RFLS-53



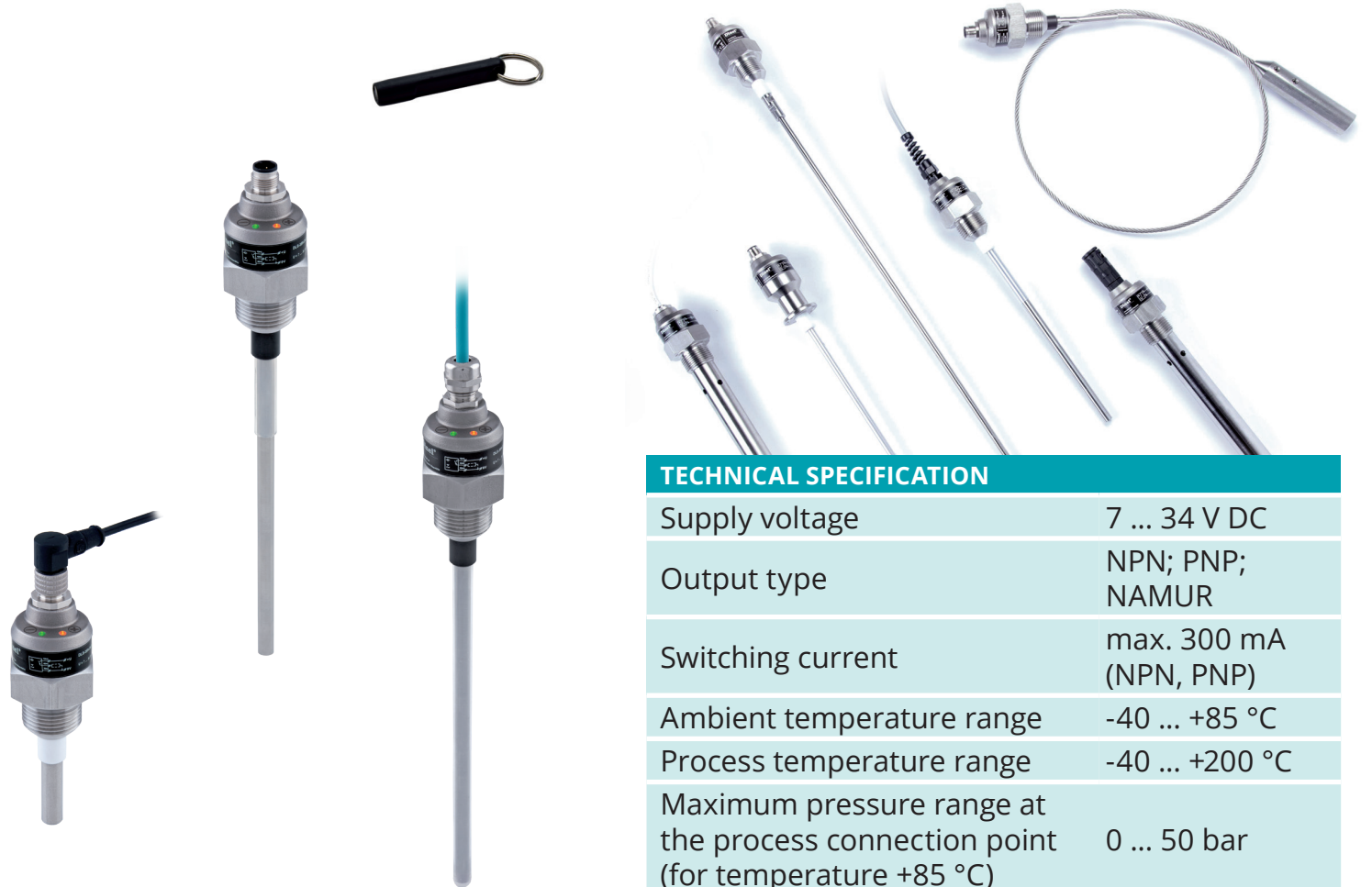
- **Construction and manufacturing industry:**
detection of sawdust in the hopper of the pellet machine
- **Agricultural and food technologies:**
detection of grain condition in silo or hopper
- **Technical security of buildings:**
detection of the fuel level (pellets, wood chips or coal) in the boiler hopper



CAPACITIVE LEVEL SENSORS DLS-35



- **Direct mounting into various containers, silos, vessels, tanks, filling inlets, reservoirs, etc.**
- Increased resistance to electromagnetic interference
- Xi version for usage in explosive areas
- Simple sensitivity setting 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 a gland for protective hoses
- Material of housing and electrode from stainless steel
- High stability at high sensitivity (can be used for material with min. $\epsilon_r = 1,3$)
- Special variant DLS-35NT-25 with resistance to hot steam



TECHNICAL SPECIFICATION

Supply voltage	7 ... 34 V DC
Output type	NPN; PNP; NAMUR
Switching current	max. 300 mA (NPN, PNP)
Ambient temperature range	-40 ... +85 °C
Process temperature range	-40 ... +200 °C
Maximum pressure range at the process connection point (for temperature +85 °C)	0 ... 50 bar

Universal sensors for limit level sensing of liquids, bulk solids and powders



CAPACITIVE LEVEL SENSORS DLS-27



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



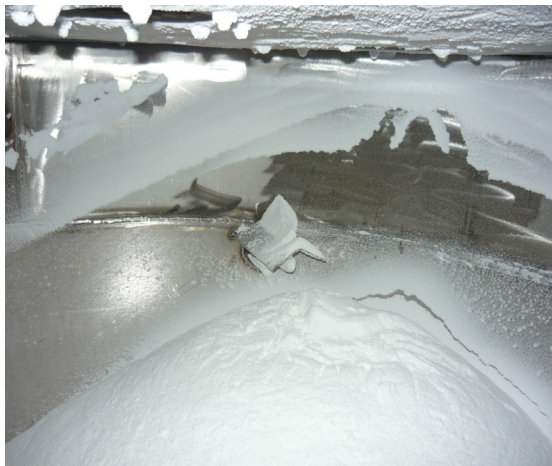
TECHNICAL SPECIFICATION

Supply voltage	7 ... 36 V DC
Output type	NPN; PNP; NAMUR
Switching current	max. 300 mA (NPN, PNP)
Ambient temperature range	-40 ... +80 °C
Process temperature range	-40 ... +200 °C
Maximum pressure range at the process connection point (for temperature +85 °C)	0 ... 20 bar

Universal sensors for limit level sensing of liquids, bulk solids and powders



USES OF CAPACITIVE LEVEL SENSORS DLS-27/35



- **Construction and manufacturing industry:** detection of limestone in the silo during the production of screed plaster (DLS-35N-30), powder detection (Sorbacal) in the silo in the technology of cleaning dangerous flue gases (DLS-35N-20), detection of sawdust in wood processing technology (DLS-27Xd-20)
- **Agricultural and food technologies:** detection of flour in mill stools (DLS-27Xi-30), detection of crushed fruit in the hopper during the production of gourmet salad (DLS-27N-20), detection of the height of chopped wood, chips in the fuel tank for smokehouses (DLS-27N-10)
- **Water purification and treatment:** powder detection in the flocculation station to prepare the sludge thickening solution (DLS-35N-10)
- **Chemical substances in various technologies:** detection of chemical substances during the conversion process of mercury to solidified mercury sulfide (DLS-35NT-25), detection of powder material in plastic production technology (DLS-27Xd-10)
- **Petrochemical industry:** diesel and gasoline detection in underground reservoirs in the Czech Republic (DLS-27Xi-30)
- **Transport technology:** detection of hydraulic fluid and diesel in single-track suspended transport in mines (DLS-35XiM-21), sand detection in rail vehicle sandblasting technology (DLS-35N-10)



CAPACITIVE LEVEL SENSORS CLS-23



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



TECHNICAL SPECIFICATION

Supply voltage	6 ... 30 V DC
Output type	PNP; S; NAMUR
Switching current	max. 40 mA (PNP 100 mA)
Ambient temperature range	-25 ... +80 °C
Process temperature range	-30 ... +150 °C
Maximum pressure range at the process connection point (for temperature +85°C)	0 ... 60 bar

Miniature capacitive level sensor for sensing various types of liquids.



SUBMERSIBLE LEVEL SENSOR CLS-23S



- **Installation by hanging on a cable in tanks, 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

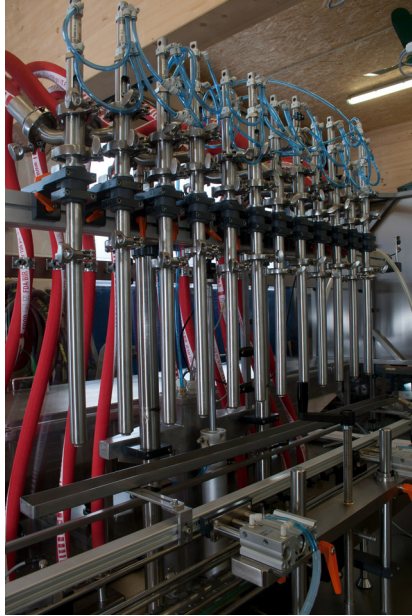


TECHNICAL SPECIFICATION	
Supply voltage	6 ... 30 V DC
Output type	S (elektronický spínač)
Current consumption	0,6 mA
Switching current	max. 40 mA
Ambient temperature range	-20 ... +80 °C
Protective class	IP68

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



USES OF CAPACITIVE LEVEL SENSORS CLS-23



- **Agricultural and food technology:**
level detection in filling machines for filling food products (ketchup, fruit concentrate, etc.) (CLS-23NT-21)
- **Water purification and treatment:**
detection of water in underground tanks, reserve for fire system (CLS-23S-11),
level detection in sludge dewatering technology (CLS-23Xi-21),
detection of the level in the tank of treated/ untreated water in the heating industry (CLS-23N-20)
- **Chemical substances in various technologies:**
detection of chemical substances in the production of washing and cleaning products (CLS-23Xi-21),
detection of oil level in the gearbox of the escalator driving motor (CLS-23N-20)
- **Petrochemical and energy industry:**
oil level detection in transformers (CLS-23N-30),
detection of engine oil in cogeneration units (CLS-23N-10)



THRU-WALL LEVEL SENSOR FLD-32 „FLEXI WATCH“



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



TECHNICAL SPECIFICATION

Supply voltage	6 ... 30 V DC	
Output type	S (current switch)	
Switching current	max. 40 mA	
Ambient temperature range	-20 ... +70 °C	
Maximum vessel wall thickness	el. conductive liquids	8 mm
	el. non-conductive liquids	3 mm
Diameter of the container for mounting the sensor	min. 300 mm	

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



THRU-WALL LEVEL SENSOR GPLS-25



- 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



TECHNICAL SPECIFICATION

Supply voltage	6 ... 30 V DC	
Output type	PNP ; S (current switch)	
Switching current	PNP output „S“ output	max. 100 mA 3,3 mA / 40 mA (min./max.)
Maximum vessel's wall thickness	el. conductive liquids el.non-conductive liquids with $\epsilon_r < 10^*$	8 mm 3 mm
Ambient temperature range	-20 ... +80 °C	
Diameter of the gauge-pipes for mounting the sensor	15 ... 50 mm	

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



USES OF THRU-WALL LEVEL SENSOR FLD-32 AND GPLS-25



- **Water purification and treatment:**
detection of water in the collection tank of the cooling box, vacuum technology (FLD-32N),
detection of sodium chlorite, HCl in the scanned container in the technology of the water treatment plant (FLD-32N),
detection of the level of rainwater in a plastic IBC container through the wall,
- **Technical security of buildings:**
detection of water level in the glass level indicator of the metal tank of the fire system (GPLS-25N)
- **Chemicals in different technologies:**
color height detection in IBC containers
- **Petrochemical and energy industry:**
limit detection on the oil mark of the overflow tank that collects diesel from leaks in the test of injection systems (GPLS-25N)



CAPACITIVE PROXIMITY SWITCH CPS-24



- **Detection of the presence of liquid in the inter-shell space of double-shell tanks.**
- Also suitable for detecting the position, movement or approach of objects
- Adjustable sensitivity
- Material of housing and nut from stainless steel
- Output type NPN, PNP, NAMUR
- Xi version for usage in explosive areas
- LED state indication



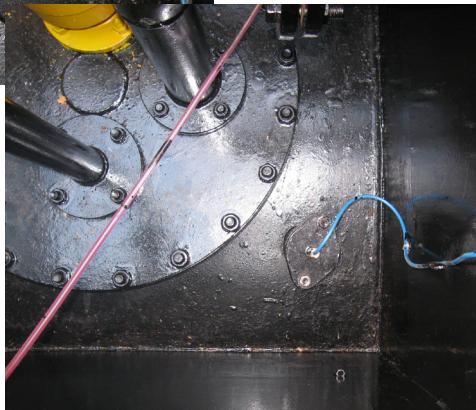
TECHNICKÉ PARAMETRY

napájecí napětí	7 ... 36 V DC
typ výstupu	NPN ; PNP ; NAMUR
spínaný proud	max. 200 mA (NPN, PNP),
rozsah pracovních teplot okolí	-20 ... +70°C
snímací vzdálenost (citlivost)	0 ... 10 mm

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



USES OF CAPACITIVE PROXIMITY SWITCH CPS-24



- **Water purification and treatment:**
level detection in sludge dewatering technology (CPS-24N),
detection of sodium chlorite through the wall of a glass level indicator in WWTP technology (CPS-24Xi)
- **Chemical substances in various technologies:**
detection of the presence of oil on the water surface in pipeline interception stations (CPS-24Xi)
- **Petrochemical industry:** measurement of fuel leakage in the intermediate shell of the filling station tank (CPS-24Xi),
detection of diesel leakage into the collection tank of the diesel unit (CPS-24N),
detection of engine oil leakage in the collection tank of the cogeneration unit (CPS-24N)
- **Technical security of buildings:**
condensate detection in boiler room technology (CPS-24N),
detection of oil/water leakage in sump (CPS-24N)



HOW TO FIND THE SUITABLE LIMIT LEVEL SENSOR FOR THE APPLICATION?



- **What substance is to be measured?**
- solid, or liquid or mushy
- **What are the more specific properties of the measured substance?**
- see Application table
- **How should the sensor be installed?**
- from above into the thread, from above on the cable, from the side into the thread, from the side through the wall
- **If it is to be installed from above, what will be the distance to the surface and what is the material of the tank?**
- **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	LIMIT LEVEL SENSING							
	DLS-35 DLS-27 from side	DLS-35 DLS-27 from above	RFLS-53 from side	ULS-53 from above	GPLS-25 FLD-32 through wall	RFLS-35 RFLS-28 from side	RFLS-28 from above	
SOLID								
dust - fraction up to 0.1 mm	••	••	•	-	-	-	-	
loose material - fraction up to 10 mm	•• ⁶⁾	••	••	•	•	-	-	
piece material - fraction over 10 mm (up to 60 mm)	-	• ⁷⁾	•	••	-	-	-	
changing (DK ⁶⁾ , 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	••	••	-	-	-	-	-	
LIQUIDS AND SLURRIES								
liquid ⁷⁾	•	••	-	••	••	••	••	
paste-like substance ⁸⁾	-	••	-	••	•	••	••	
hygienic applications	•	••	-	•	••	••	••	
hygienic applications with sanitation	•	•	-	-	••	•	•	
changing DK ⁶⁾	•	•	-	••	-	•	•	
changing density	•	•	-	••	••	••	••	
sticking + el. conductive (strong alkalis)	-	•	-	•	••	••	••	
aggressive inorganic acids	-	•	-	•	••	•	•	
non-fuming diluted chemicals	•	••	-	••	••	••	••	
organic solvents	••	••	-	-	••	••	••	
very small tanks	••	•	-	-	••	••	••	
very volatile	••	••	-	-	••	••	-	
foam on the surface	•	•	-	•	••	••	••	
combustibles	••	••	-	•	•	••	-	
liquid gases	•	•	-	-	-	•	•	