

- Radar level meters with guided wave
- Suited to continuous level measurement of various liquid, mush and bulk-solid materials.
- Universal use, direct mounting into containers, silos, vessels, reservoirs, etc.
- Stainless steel rod or rope electrode
- Level measurement of aggressive liquids, measuring range up to 40m
- Linear measurement in non-conductive and in differently shaped containers
- Quick view measured values on the display
- Simple installation and setting
- Current output (4 ... 20 mA), HART® protocol



The GRLM® radar level meters are compact measurement devices including an transmitter of microwave pulses, central processor unit and display module. 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 the instant distance to the surface level is calculated. According to the level height, the level meter output is set and the measured value is displayed on the display.

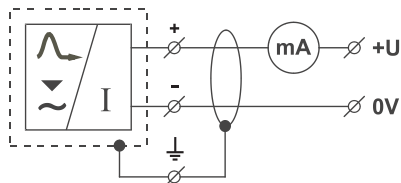
Radar level meters are resistant against changes in the atmosphere (pressure, temperature, dust, steam) and to changes in medium parameters (change in dielectric constant, conductivity).

### FEATURES OF VARIANTS

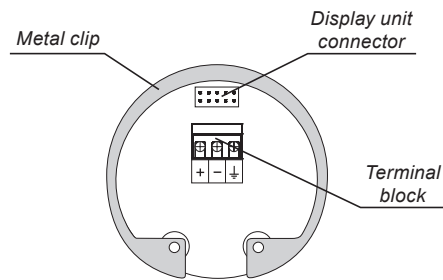
- **GRLM-70N-10**      **Uncoated stainless steel rod electrode**, for level measurement liquids and bulk solid materials (water, water solutions, oils, diesel, flour, sand, granulates, etc.). Maximum electrode length 5 m.
- **GRLM-70N-11**      **Fully coated stainless steel rod electrode (PFA Teflon®)**, for level measurement of very aggressive liquids. Maximum electrode length 2 m.
- **GRLM-70N-12**      **Fully coated stainless steel rod electrode (FEP Teflon®)**, for level measurement of aggressive liquids. Maximum electrode length 2 m.
- **GRLM-70N-30**      **Uncoated stainless steel rope electrode and weight**, for level measurement of bulk solid materials (grains, sand, flour, cement, etc.) in higher silos, vessels, reservoirs. Maximum electrode length 40 m.

## ELECTRICAL CONNECTION

The radar level meter is designed to be connected to supply unit or to controller through a cable with the outer diameter of  $6 \div 8$  mm (recommended cross-section of cores 0.5-0.75 mm<sup>2</sup>) by means of bolted clips placed under display module. Connect the plus pole (+U) to the terminal "+", the minus pole to 0V to the terminal "-" and the shielding to the terminal "⏏" (only for shielded cables).



Connection diagram of the level meter



Internal view of terminal block

The power supply can be a stabilized voltage supply unit of 18 ... 36V DC that is included in evaluation or display unit.

In case of strong electromagnetic interference (EMI), parallel supply cable with power lines, or when the cable length exceeds 30m, we recommend you to use a **shielded cable**.

Always **disconnect** the supply voltage before connecting the level meter!

## LEVEL METER SETTING

Set the level meter using 3 buttons placed on the display module. All settings are accessible in the GRLM-70 set-up mode access. For detailed information please read at the instructions manual.

### button

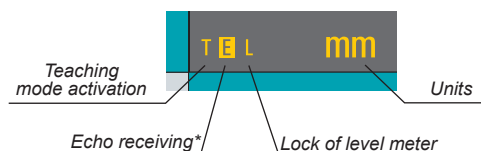
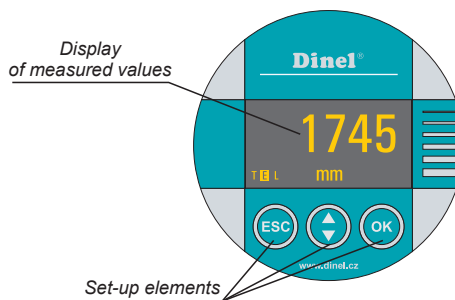
- Set-up mode access
- Confirmation of selected item in the menu
- Saving of set-up data

### button

- Move in the menu
- Change of values

### button

- Cancelling of carried out changes
- Shift one level up



\* Slow flashing while the reflected signal (echo) is received from the measured level.

## TECHNICAL SPECIFICATIONS – LEVEL METER

Supply voltage		18 ... 36 V DC
Output		4 ... 20 mA, HART®
Basic error <sup>1)</sup> (for reference reflector)	0,1 – 0,2 m 0,2 – 2,0 m 2,0 – 40 m	+/- 10 mm +/- 4 mm +/- 2 mm
Resolution		1 mm
Ambient temperature range		-30 ... +70°C
Process temperature range		-40 ... +85°C
Process pressure	GRLM-70N-10 (30) GRLM-70N-12	0 ... 100 bar 0 ... 25 bar
Maximal length of measuring electrode	GRLM-70N-10 GRLM-70N-12 GRLM-70N-30	5 m 2 m 40 m
Dead zone <sup>2)</sup>		100 mm
Protective zone around the electrode		400 mm
Maximum tensile strength of the rope electrode		1400 kg
Maximal current output load resistance (U = 24 V DC)		$R_{max} = 270 \Omega$ <sup>3)</sup>
Protection class		IP67
Process connection		screwing with thread G1"
Recommended cable		PVC 2 x 0,75 mm <sup>2</sup> (3 x 0,5 mm <sup>2</sup> )
Sensitivity		3 steps (low - medium - high)
Damping		1 .. 99 s
Warm up time		cca 60 s
Failure indication (echo loss, level in dead zone <sup>2)</sup> , internal failure)		Adjustable in modes: 3,75 mA, 22 mA, LAST <sup>4)</sup>
Weight (without electrode)		0,5 kg

1) Error is +/- 6 mm in area 200 mm from the end of the electrode or from the end of the rope without weight

2) Dead zone = Blind zone = Blocking distance

3) Including 250R resistor in case of HART connection.

4) Level meter displays last measured value.

## TECHNICAL SPECIFICATIONS – DISPLAY MODUL

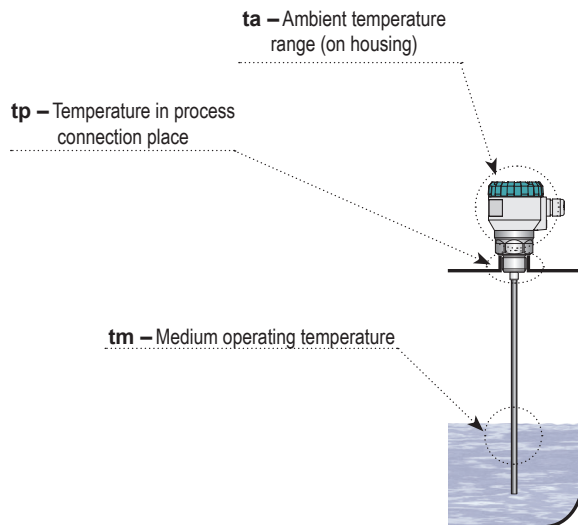
Type of display		matrix OLED
Resolution		128 x 64 pixels
Height of digits / Number of display digits of measured values		9 mm / 5 digits
Colour of display		yellow
Type of buttons		membrane
Ambient temperature range		-30 ... +70°C
Weight		46 g

## USED MATERIALS

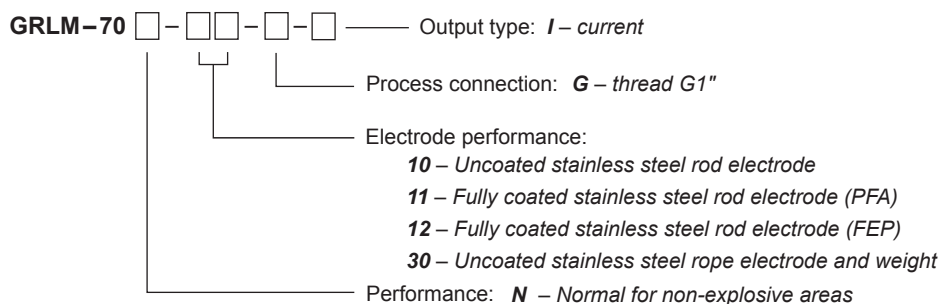
Sensor part	Variants	Standard material
Lid	All types	aluminium with powder coating
Glass	All types	polycarbonate
Body	All types	aluminium with powder coating
Housing with thread	All types	St. Steel W. Nr. 1.4571 (AISI 316 Ti)
Electrode	GRLM-70N-10 (11)	St. Steel W. Nr. 1.4571 (AISI 316 Ti)
Electrode	GRLM-70N-12	St. Steel W. Nr. 1.4301 (AISI 304)
Electrode coating	GRLM-70N-11	PFA
Electrode coating	GRLM-70N-12	FEP
Rope electrode	GRLM-70N-30	St. Steel W. Nr. 1.4404 (AISI 316 L)
Weight	GRLM-70N-30	St. Steel W. Nr. 1.4301 (AISI 304)

## TEMPERATURE AND PRESSURE DURABILITY

Variants / Performance	Temperature $t_p$	Temperature $t_m$	Temperature $t_a$	Max. operation pressure for temp. $t_p$	
				to 30°C	to 85°C
GRLM-70N-10	-40°C ... +85°C	-40°C ... +300°C	-30°C ... +70°C	15 MPa	10 MPa
GRIM-70N-11 (12)	-40°C ... +85°C	-40°C ... +200°C	-30°C ... +70°C	4 MPa	1,5 MPa
GRLM-70N-30	-40°C ... +85°C	-40°C ... +200°C	-30°C ... +70°C	15 MPa	10 MPa



## ORDER CODE



## CORRECT SPECIFICATION EXAMPLES

GRLM-70N-10-G-I  
 GRLM-70N-12-G-I

GRLM-70N-30-G-I

## ACCESSORIES

**Standard – included in the price of the level meter**

- 1 pc of Seal (asbestos free)

**Optional – for extra charge (see datasheet "Accessories")**

- Fixing St. steel nuts G1"
- Steel or Stainless steel welding flange ON-G1"
- Other seals (PTFE, Al, etc.)

## SAFETY, PROTECTION, COMPATIBILITY AND EXPLOSION PROOF

The level meter GRLM-70 is equipped with protection against reverse polarity and output current overload. Protection against dangerous contact is secured by low safety voltage that complies with EN 33 2000-4-41. Electromagnetic compatibility according to EN 55022/B, EN 61326/Z1 and EN 61000-4-2 to 6.