# ARLM-70



# ANTENNA RADAR LEVEL METER "AMANDA"

Designed for reliable level measurement of various liquids and pasty substances





- · Non-contact antenna radar level meter
- Display of values on OLED or LCD display
- Measuring range up to 8 m or 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 vapors



TECHNICAL SPECIFICATIONS         work environment       explosion-free area         supply voltage       18 34 V DC         current 4 20 mA       with HART* communication (limit values 3,9 20,5 mA)         current consumption       4 20 mA / max. 22 mA         basic measurement accuracy       3 mm (distance 1 m 8 m or 1 m 20 m)         current output error       max. 80 μA         resolution       0,1 mm         maximum range       8 m or 20 m         dead zone       30 cm         Adjustable measuring range (SPAN)       min. 200 mm         function principle       FMCW         operating temperature range       -30 +70 °C         maximum operating overpressure       2 bar         measuring frequency       25 GHz (K-Band)         measurement sensitivity       3 levels         damping       1 99 sec         status signaling (echo dropout)       adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=22 V U=20 V R=80 Ω R=90 Ω         protection class       IP 67         recommended ca	TECHNICAL SP	ECIEICATION	ue.
supply voltage  18 34 V DC  current 4 20 mA with HART® communication (limit values 3,9 20,5 mA)  current consumption  4 20 mA / max. 22 mA  3 mm (distance 1 m 8 m or 1 m 20 m)  current output error  max. 80 μA  resolution  0,1 mm  maximum range  8 m or 20 m  4 dead zone  30 cm  Adjustable measuring range (SPAN)  function principle  operating temperature range  reasuring frequency  25 GHz (K-Band)  measurement sensitivity  3 levels  damping  1 99 sec  adjustable  status signaling (echo dropout)  3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing"  protection class  1P 67  recommended cable  18 34 V DC  current 4 20 mA with HART® communication (limit values 3,9 20,5 mA)  3 mm (distance 1 m 8 m or 20 m  adjustable FMCW  3 levels  3 levels  3 levels  4 mA; 20 mA; 22 mA; NO CHANGE  4 mA; 20 mA; 22 mA; NO CHANGE  4 maximum load  1		ECIFICATION	
output type       current 4 20 mA with HART® communication (limit values 3,9 20,5 mA)         current consumption       4 20 mA / max. 22 mA         basic measurement accuracy       3 mm (distance 1 m 8 m or 1 m 20 m)         current output error       max. 80 μA         resolution       0,1 mm         maximum range       8 m or 20 m         dead zone       30 cm         Adjustable measuring range (SPAN)       min. 200 mm         function principle       FMCW         operating temperature range       -30 +70 °C         maximum operating overpressure       2 bar         measuring frequency       25 GHz (K-Band)         measurement sensitivity       3 levels         damping       1 99 sec         status signaling (echo dropout)       3/5 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V R=180 Ω R=90 Ω         protection class       IP 67         PVC 2x0,75 mm² with a diameter of 6-8 mm       a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm			'
basic measurement accuracy  current output error  max. 80 μA  resolution  0,1 mm  maximum range  8 m or 20 m  dead zone  Adjustable measuring range (SPAN)  function principle  operating temperature range  reasuring frequency  measuring frequency  function grinciple  measuring frequency  25 GHz (K-Band)  measurement sensitivity  damping  1 99 sec  status signaling (echo dropout)  separation capacity  "power leads - housing"  protection class  IP 67  recommended cable  3 mm (distance 1 m 8 m or 1 m 8 m or 1 m m 20 m)  a max. 80 μA  The min and sup μΑ  The min and sup μα  and companies			current 4 20 mA with HART® communication
current output error max. 80 μA  resolution 0,1 mm  maximum range 8 m or 20 m  dead zone 30 cm  Adjustable measuring range (SPAN) min. 200 mm  function principle FMCW  operating temperature range -30 +70 °C  maximum operating overpressure 2 bar  measuring frequency 25 GHz (K-Band)  measurement sensitivity 3 levels  damping 1 99 sec  status signaling (echo dropout) 375 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing" 2 nF / 500 V AC  maximum load resistance at U=22 V U=20 V R=180 Ω R=90 Ω  protection class IP 67  recommended cable lighted 3 Nm  tightening torque of the cable gland 3 Nm	current consumption		4 20 mA / max. 22 mA
resolution 0,1 mm  maximum range 8 m or 20 m  dead zone 30 cm  Adjustable measuring range (SPAN) min. 200 mm  function principle FMCW  operating temperature range -30 +70 °C  maximum operating overpressure 2 bar  measuring frequency 25 GHz (K-Band)  measurement sensitivity 3 levels  damping 1 99 sec  status signaling (echo dropout) adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply separation capacity "power leads - housing" 2 nF / 500 V AC  maximum load resistance at U=24V U=22 V U=20 V R=180 Ω R=90 Ω  protection class IP 67  recommended cable lighted 3 Nm	basic measurement accuracy		1
maximum range       8 m or 20 m         dead zone       30 cm         Adjustable measuring range (SPAN)       min. 200 mm         function principle       FMCW         operating temperature range       -30 +70 °C         maximum operating overpressure       2 bar         measuring frequency       25 GHz (K-Band)         measurement sensitivity       3 levels         damping       1 99 sec         status signaling (echo dropout)       adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=20 V         U=20 V       R=180 Ω R=90 Ω         protection class       IP 67         recommended cable       PVC 2x0,75 mm² with a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm	current output error		max. 80 μA
dead zone  Adjustable measuring range (SPAN)  function principle  operating temperature range  reasuring frequency  measurement sensitivity  damping  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing"  maximum load resistance at  U=24V U=20 V U=20 V U=20 V  protection class  recommended cable  tightening torque of the cable gland  30 cm  min. 200 mm min. 200 mm min. 200 mm  fMCW  FMCW  adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  20 sec  2 nF / 500 V AC  R=270 \( \Omega \text{*} R=180 \( \Omega R=90 \( \Omega \text{*} \)  protection class  IP 67  PVC 2x0,75 mm² with a diameter of 6-8 mm  tightening torque of the cable gland  3 Nm	resolution		0,1 mm
Adjustable measuring range (SPAN)min. 200 mmfunction principleFMCWoperating temperature range-30 +70 °Cmaximum operating overpressure2 barmeasuring frequency25 GHz (K-Band)measurement sensitivity3 levelsdamping1 99 secstatus signaling (echo dropout)adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGEthe time of the first measurement from the start of the power supply20 secseparation capacity "power leads - housing"2 nF / 500 V ACmaximum load resistance atU=24V U=20 VR=270 Ω* R=180 Ω R=90 Ωprotection classIP 67recommended cablePVC 2x0,75 mm² with a diameter of 6-8 mmtightening torque of the cable gland3 Nm	maximum range		8 m or 20 m
function principle  operating temperature range  available status signaling (echo dropout)  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing"  maximum load resistance at  U=24V U=22 V U=20 V U=20 V  protection class  recommended cable  tightening torque of the cable gland  FMCW  30 +70 °C  available 30 +70 °C  20 kR-Band)  1 99 sec  adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  20 sec  2 nF / 500 V AC  R=270 Ω* R=180 Ω R=90 Ω  PVC 2x0,75 mm² with a diameter of 6-8 mm  tightening torque of the cable gland  3 Nm	dead zone		30 cm
operating temperature range  -30 +70 °C  maximum operating overpressure  2 bar  measuring frequency  25 GHz (K-Band)  measurement sensitivity  3 levels  damping  1 99 sec  adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing"  20 sec  maximum load resistance at  U=24V U=22 V U=20 V Protection class  IP 67  recommended cable  tightening torque of the cable gland  3 Nm	Adjustable measuring range (SPAN)		min. 200 mm
maximum operating overpressure       2 bar         measuring frequency       25 GHz (K-Band)         measurement sensitivity       3 levels         damping       1 99 sec         status signaling (echo dropout)       adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=20 V       R=270 Ω* R=180 Ω R=90 Ω         protection class       IP 67         recommended cable       PVC 2x0,75 mm² with a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm	function principle		FMCW
measuring frequency       25 GHz (K-Band)         measurement sensitivity       3 levels         damping       1 99 sec         adjustable       3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=20 V         U=20 V       R=180 Ω R=90 Ω         protection class       IP 67         recommended cable       PVC 2x0,75 mm² with a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm	operating temperature range		-30 +70 °C
measurement sensitivity       3 levels         damping       1 99 sec         status signaling (echo dropout)       adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=20 V       R=270 Ω* R=180 Ω R=90 Ω         protection class       IP 67         recommended cable       PVC 2x0,75 mm² with a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm	maximum operating overpressure		2 bar
damping       1 99 sec         status signaling (echo dropout)       adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE         the time of the first measurement from the start of the power supply       20 sec         separation capacity "power leads - housing"       2 nF / 500 V AC         maximum load resistance at       U=24V U=22 V U=20 V       R=270 Ω* R=180 Ω R=90 Ω         protection class       IP 67         recommended cable       PVC 2x0,75 mm² with a diameter of 6-8 mm         tightening torque of the cable gland       3 Nm	measuring frequency		25 GHz (K-Band)
status signaling (echo dropout)  adjustable 3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing"  2 nF / 500 V AC  maximum load resistance at  U=24V U=22 V U=20 V R=180 Ω R=90 Ω  protection class  IP 67  recommended cable  tightening torque of the cable gland  3 Nm	measurement sensitiv	ity	3 levels
status signaling (echo dropout)  3,75 mA; 4 mA; 20 mA; 22 mA; NO CHANGE  the time of the first measurement from the start of the power supply  separation capacity "power leads - housing" $\begin{array}{c} 2 \text{ nF} / 500 \text{ V AC} \\ \\ \text{maximum load} \\ \text{resistance at} \end{array} \qquad \begin{array}{c} U=24V \\ U=22 \text{ V} \\ U=20 \text{ V} \end{array} \qquad \begin{array}{c} R=270 \ \Omega^* \\ R=180 \ \Omega \\ R=90 \ \Omega \\ \\ \end{array}$ protection class $\begin{array}{c} \text{IP 67} \\ \\ \text{PVC 2x0,75 mm}^2 \text{ with a diameter of 6-8 mm} \\ \\ \text{tightening torque of the cable gland} \end{array} \qquad 3 \text{ Nm}$	damping		1 99 sec
the start of the power supply	status signaling (echo dropout)		3,75 mA; 4 mA; 20 mA; 22 mA;
$\begin{array}{llllllllllllllllllllllllllllllllllll$			20 sec
maximum load resistance at $U=22 \text{ V}$ $U=20 \text{ V}$ $U=$			2 nF / 500 V AC
recommended cable  PVC 2x0,75 mm² with a diameter of 6-8 mm  tightening torque of the cable gland  3 Nm		U=22 V	R=180 Ω
tightening torque of the cable gland 3 Nm	protection class		IP 67
	recommended cable		The state of the s
weight approx. 0,5 kg	tightening torque of the cable gland		3 Nm
	weight		approx. 0,5 kg

<sup>\*</sup>Including HART® 250  $\Omega$  resistor

# **BASIC FEATURES AND USE**

Non-contact radar level meters with an antenna are suitable for continuous level measurement at medium and longer distances. They can be used both in various closed tanks, containers, in semi-open sumps, and in open space. Their use is suitable where their advantages are fully applied:

- 1. non-contact measurement
- 2. the independence of the measurement from the temperature and pressure of the atmosphere above the surface
- 3. the possibility of measuring even in a vacuum
- 4. the possibility of measuring even in aggressive vapors
- 5. the measurement is independent of the medium parameters

The ARLM-70 "Amanda" radar level gauge works on the FMCW (frequency modulated continuous wave) principle with a frequency of 25 GHz (K-Band).

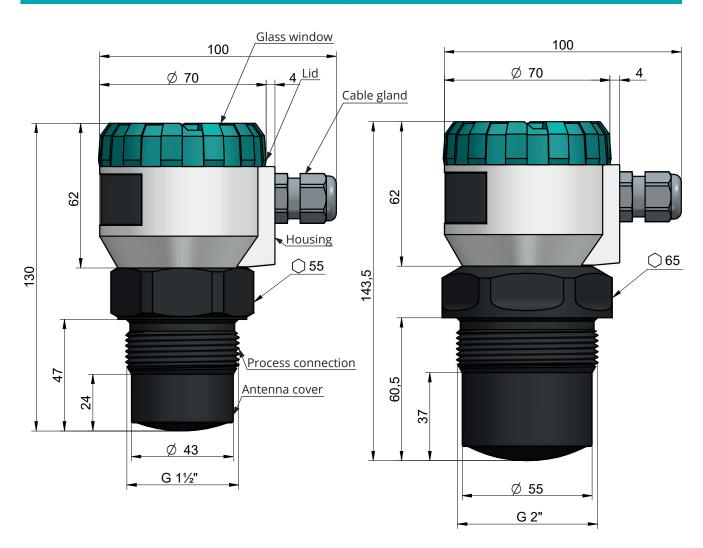
The level meter is equipped with a compact covered funnel antenna. The antenna cover prevents dirt, vapors and gases from entering the antenna.

The ARLM-70 is intended for measuring the level of liquid and pasty substances.

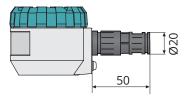
The level meter with two-wire connection with a current output of  $4 \dots 20$  mA with HART® communication. The measuring range is within  $0.3 \dots 8$  m or  $0.3 \dots 20$  m.

# **DIMENSIONS**

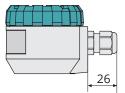
ARLM-70-08 ARLM-70-20



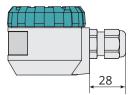
#### **CABLE GLAND DESIGN**



variant "H1" with protective conductor



variant "B1" with cable gland M16



variant "B2" with cable gland M20

# **TECHNICAL SPECIFICATIONS**

TECHNICAL SPECIFICATIONS - DISPLAY MODULE				
Type of display		matrix OLED, LCD		
Resolution		128 x 64 pixels		
Height of digits / Number of display digits of measured values		9 mm / 5 digits		
Colour of display	OLED LCD	yellow black with white background light		
Type of buttons		low lift membrane		
Ambient temperature range	OLED LCD	-30 +70 °C -20 +70 °C		
Weight		46 g		

OLED- suitable for indoor and low-light applications.

LCD – suitable for outdoor applications particularly with direct sunlight.

USED MATERIALS				
parts of the sensor	variants	standard material		
Lid	ARLM-70N	aluminium alloy with powder coating		
Glass window	all types	polycarbonate		
Housing	ARLM-70N	aluminium alloy with powder coating		
Process connection	all types	plastic material PP		
Cable gland	ARLM-70N	plastic - polyamide		

# **INSTALLATION AND OPERATION**

The level meters are mounted in a vertical position in a suitable flange in the upper lid of the tank, or into the hole using the fixing nut. The tightening torque needs to be selected taking into account the gasket used and the working overpressure in the tank.

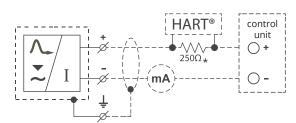
The place for installation must be chosen so that the electromagnetic wave (transmitted by the level gauge) is not affected by nearby objects (reinforcements, ladders, stirrers, etc.) or by the flow of the liquid being filled. The level gauge can be placed in a pipe extension that has a length smaller than the diameter.

If the level meter has not yet been installed, it must be stored in an intact condition with the cap tightened and the sealing plug in the cable gland.

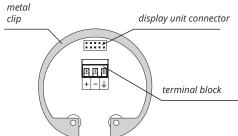
The level meter does not require any operator to operate. During operation, the operator of the technological unit is informed about the height of the measured substance level using a display module or a follow-up device.

# **ELECTRICAL CONNECTION**

When using the M16 socket, the level meter is connected to the follow-up (evaluation) device with a suitable cable with an external diameter of 6 - 8 mm via screw terminals located under the display module. Recommended core cross-section for the current version is 2 x 0,5 ... 0,75 mm<sup>2</sup>. The positive pole (+U) is connected to the (+) terminal, the negative pole (0 V) to the (-) terminal and the shield (only for shielded cables) is connected to the ( $\perp$ ).



\* In the possible use of HART® communication Wiring diagram of the level meter with current output ARLM-70



Inside view of screw terminals of the level meter with current output ARLM-70

## SETTING ELEMENTS

Settings are performed using 3 buttons located on the display module DM-70. All the settings are available in the menu of the level meter.

#### Button ok



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

### Button 😝

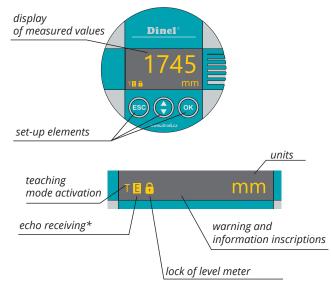


- Move in the menu
- Change of values

### Button ESC

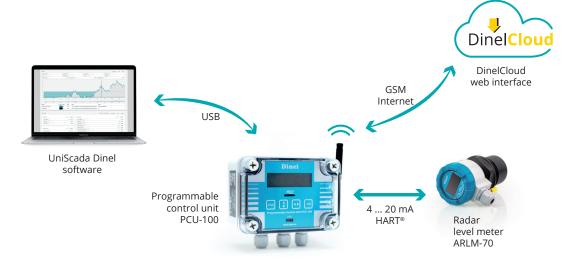


- Cancelling of carried out changes
- Shift one level up



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

# **CONNECTION TO PCU-100**

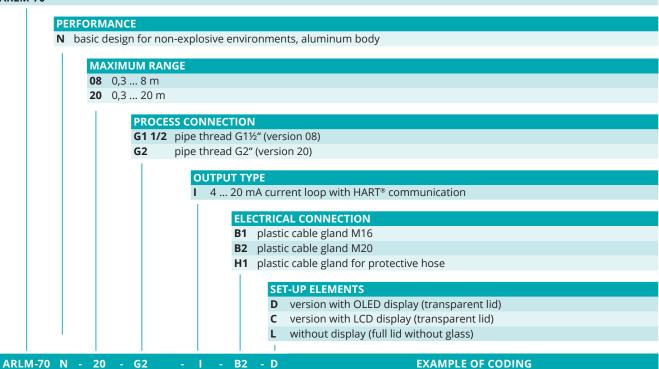


# **CONNECTION TO UHC-01**



# **ORDER CODE**

ARLM-70



ARLM-70-dat-5/6

## **ACCESSORIES** included 1x O-ring EPDM in the price VKD Telescopic bracket at extra cost universal convertor from USB to HART® UHC-01 at extra cost display unit at extra cost DM-70 PUM-G1½ fixing nut plastic at extra cost PUM-G2 extension cable for display at extra cost PK-70-1 NN-G1½ ON-G11/2 stainless steel or steel welding flange at extra cost NN-G2 ON-G2 protective hose (for type of cable outlet H1) at extra cost OH-13

Further information can be found in the ARLM-70 manual on our website www.dinel.cz
The manufacturer reserves the right to change the specifications and appearance of the product without prior notice.

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