

## USER INSTRUCTIONS

# Smart HART 2-wire Transmitter



**Meso™-L**  
**Meso™-H**  
**Meso™-HX**

The manual must be read prior to adjustment and/or installation. All information subject to change without notice.

**INOR®**

[www.inor.com](http://www.inor.com), [www.inor.se](http://www.inor.se)

MEASURE OF SUCCESS



## INTRODUCTION

The MESO transmitters uses all HART\* universal commands. Among the common practice commands the following numbers are used: 34, 35, 38, 40, 41, 42, 48, 49 and 59. Several transmitters specific commands are also implemented. To be able to use all the features of the transmitter, it is recommended to use the PC-software MePRO (also distributed from INOR) + a HART modem. Most features can be reached from the HART Handheld Communicator, the AMS system and PDM system.

\*HART is registered trademark of the HART Communication Foundation.

## GENERAL INFORMATION

The transmitter is configured from a standard IBM compatible PC with the MePRO software (version 2.0 or later) and a HART compatible modem, which you connect to one of the serial ports or one of the PCMCIA slots in your PC. It is also possible to use a HART Handheld Communicator, programmed with the INOR Meso Device Description, or AMS or PDM with the INOR MESO DD.

To be able to use all the features of the transmitter, it is recommended to use MePRO. Universal and common practise commands can be read/written from a HART Handheld Communicator or by an universal PC-HART software.

## CONFIGURATION

The MESO transmitter must be powered and there must be at least 250 ohm in the current loop to communicate with the transmitter. The modem is connected over the load (BC) or over the transmitter (AB), see figure 10-12. To communicate when the transmitter is installed in field, load resistance, cable resistance and cable capacitance must be considered, see diagram 3.

For MESO-HX make sure to follow the instructions for maintaining intrinsic safety.

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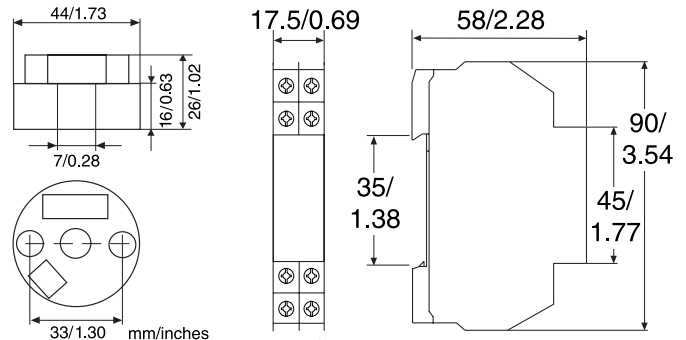
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D-63457 Hanau-Wolfgang; Germany  
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**FAX** +49 6181 582944  
**E-MAIL** inor.gmbh@t-online.de

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## DIMENSIONS



## LIMITED WARRANTY

INOR Process AB, or any other affiliated company within the Inor Group (hereinafter jointly referred to as "Inor"), hereby warrants that the Product will be free from defects in materials or workmanship for a period of five (5) years from the date of delivery ("Limited Warranty"). This Limited Warranty is limited to repair or replacement at Inor's option and is effective only for the first end-user of the Product. Upon receipt of a warranty claim, Inor shall respond within a reasonable time period as to its decision concerning:

- 1 Whether Inor acknowledges its responsibility for any asserted defect in materials or workmanship; and, if so,
- 2 the appropriate cause of action to be taken (i.e. whether a defective product should be replaced or repaired by Inor).

This Limited Warranty applies only if the Product:

- 1 is installed according to the instructions furnished by Inor;
- 2 is connected to a proper power supply;
- 3 is not misused or abused; and
- 4 there is no evidence of tampering, mishandling, neglect, accident damage, modification or repair without the approval of Inor or damage done to the Product by anyone other than Inor.

This Limited Warranty is provided by Inor and contains the only express warranty provided. **INOR SPECIFICALLY DISCLAIMS ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTEE OR REPRESENTATION AS TO SUITABILITY FOR ANY PARTICULAR PURPOSE, PERFORMANCE, QUALITY AND ABSENCE OF ANY HIDDEN DEFECTS, AND ANY REMEDY FOR BREACH OF CONTRACT, WHICH BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. EXCEPT AS PROVIDED HEREIN, INOR FURTHER DISCLAIMS ANY RESPONSIBILITY FOR LOSSES, EXPENSES, INCONVENIENCES, SPECIAL, DIRECT, SECONDARY OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THE PRODUCT.**

Products that are covered by the Limited Warranty will either be repaired or replaced at the option of Inor. Customer pays freight to Inor, and Inor will pay the return freight by post or other "normal" way of transport. If any other type of return freight is requested, customer pays the whole return cost.

## DATA (shortform)

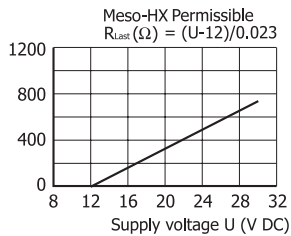
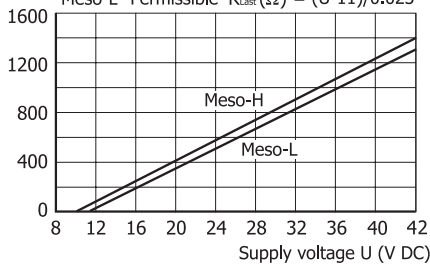
Power supply<sup>1</sup>: Meso-H 10 - 42 VDC<sup>2</sup>  
 Meso-L 11 - 42 VDC<sup>2</sup>  
 Meso-HX 12 - 30 VDC/max 100 mA/0.9W  
 approved intrinsic safe

<sup>1</sup>When communicating acc to HART the load must be more than 250 ohm.

<sup>2</sup>Supply voltage over 36V demands at least 250 ohm 's load

Meso-H Permissible  $R_{last} (\Omega) = (U-10)/0.023$

Meso-L Permissible  $R_{last} (\Omega) = (U-11)/0.023$



## Meso-HX Ex-DATA

Approval Demko 96.D.121277  
 EEx ia IIC

Output (current loop)	$U_i \leq 30$ VDC	Input (sensor)	$U_o \leq 30$ VDC
	$I_i \leq 100$ mA		$I_o \leq 100$ mA
	$P_i \leq 900$ mW		$L_o \leq 1.4$ mH
	$L_i \leq 1$ mH		$C_o \leq 65$ nF
	$C_i \leq 1$ nF		

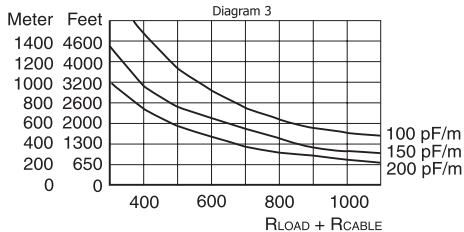
Ambient temperature: T4:  $-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$

T5:  $-40^\circ\text{C} \leq T_{amb} \leq +65^\circ\text{C}$

T6:  $-40^\circ\text{C} \leq T_{amb} \leq +50^\circ\text{C}$

**MESO-HX must be powered from an intrinsic safe power supply or zener barrier, placed outside the hazardous area. MESO-HX shall be mounted in a housing having protection IP20 or better.**

## CABLE LENGTH



To calculate maximum length of the cable, add load resistance and approximated cable resistance. In the data-sheet for the cable you get the cable capacitance/meter. Use the R value you calculated

and the cable capacitance/meter together with the diagram above to get the maximum length of the cable. For multidrop mode, use the formula below.

The cable length can also be calculated according to the formula:

$$L = \frac{65 \times 10^{-5}}{R \times C} \times \frac{(C1 + 10000)}{C}$$

Where L is in meter

R is in load resistance + cable resistance (ohm)

C is cable capacitance/m (pF/m)

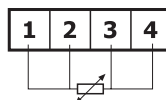
C1 is CN \*5000 pF, where CN=Number of Meso transmitters in the loop. L can also be changed to ft, if so C is given in pF/ft.

## ORDERING TABLE

Item	Part No.
Meso-H, isolated	70MEH00001
Meso-HX, isolated (CENELEC)	70MEHX0001
Meso-HX, isolated (FM)	70MEHX1001
Meso-L	70MEL00001
<b>Software and cable</b>	
MePro HART configuration kit (MePro Software+PC modem RS232)	70CFG00004
<b>Accessories</b>	
Surface mounting box	70ADA00008
Rail mounting box	70ADA00009
Head mounting kit	70ADA00012
Rail mounting kit	70ADA00013

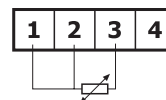
## INPUTS / OUTPUTS

Fig 1



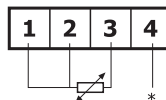
Pt100, Pt1000,  
Ni100, Ni1000  
4-sensor wires

Fig 2



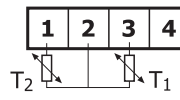
Pt100, Pt1000,  
Ni100, Ni1000  
3-sensor wires

Fig 3



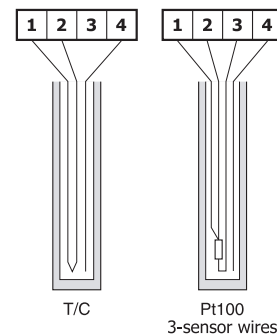
Pt100  
"SmartSense"  
3-sensor wires  
\*SmartSense-wire

Fig 4



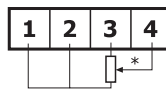
Pt100  
Diff temperature  
 $T_1 > T_2$

Fig 9.



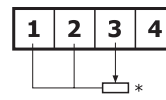
T/C Pt100  
3-sensor wires  
"SmartSense" - temperature sensor

Fig 5



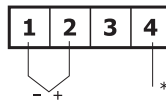
Potentiometer  
4-sensor wires  
\*Max input

Fig 6



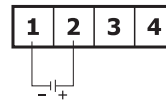
Potentiometer  
3-sensor wires  
\*Max input

Fig 7



T/C  
\*SmartSense-wire

Fig 8



mV

## CONNECTIONS

Meso-H

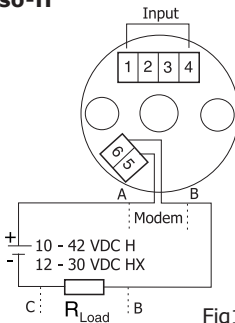


Fig10

Meso-L

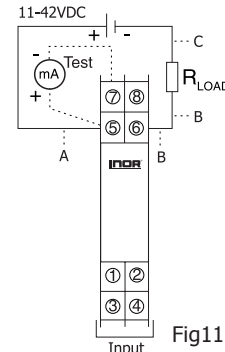


Fig11

Meso-HX

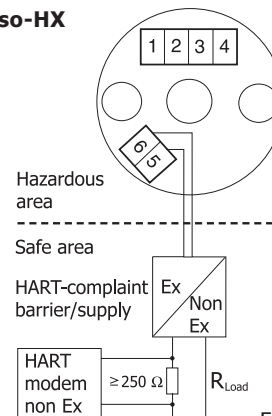


Fig12

1. Power supply, load and output signal is connected according to figure above
2. Input signal is connected according to one of the figures 1-9