

USER INSTRUCTIONS

Smart HART 2-wire Transmitter



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

MEASURE OF SUCCESS



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This product should not be mixed with other kind of scrap, after usage.
It should be handled as an electronic/electric device.

MEASURE OF SUCCESS

INTRODUCTION

The MESO transmitters are Smart and universal 2-wire transmitters for temperature and other measurement applications.

MESO-H is the standard In-head transmitter and MESO-L is the DIN Rail transmitter.

MESO-HX is the Intrinsic Safe In-head version for use in Ex-applications. MESO-H, MESO-L and MESO-HX are fully HART-compatible, with communication through the HART protocol, directly on the 4-20 mA output loop.

CONFIGURATION

Configuration of the MESO transmitter is performed by using either a general hand-held HART Communicator or a PC with the Inor Windows software, MePRO 2, installed. Also Emerson AMS and Siemens PDM can be used for configuration since the MESO transmitters are integrated into them.

The MESO transmitter 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. These commands can be reached from a standard HART Handheld Communicator or a universal HART PC software and HART PC modem.

Several *Transmitter Specific Commands* are also implemented. They can be read/written by a HART Handheld Communicator with the INOR MESO DD included or via the Emerson AMS or Siemens PDM with the MESO DD included.

To address all the features in MESO including the *Customized Linearization* and the *Basic Calibration* the MePRO software must be used. The latest version of the INOR PC software MePRO can be downloaded from <http://www.inor.com>. Also a HART PC modem connected to the serial port or the USB port of the PC is needed. For connection of the HART PC modem to the transmitter see figures 10 - 12. The modem is connected over the load (B-C) or over the transmitter (A-B).

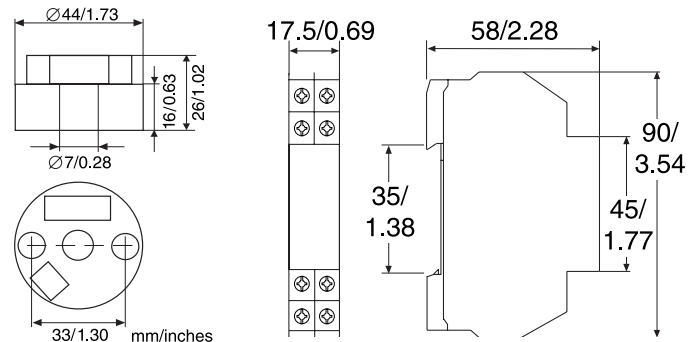
For HART communication to work properly the MESO transmitters must be powered and there must be at least 250 ohm in the current loop. To communicate with the transmitter when it is installed in the field, load resistance, cable resistance and cable capacitance must be considered. See diagram 3.



PLEASE NOTE!

For MESO-HX make sure to follow the instructions for maintaining intrinsic safety during configuration, installation and operation. When making a configuration of MESO-HX always use Ex-approved equipment, even in laboratory, to prevent damage to the protective circuits of the transmitter.

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, accidental 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.

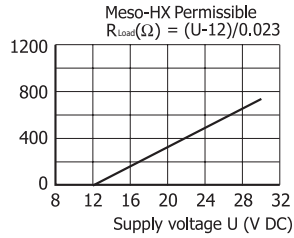
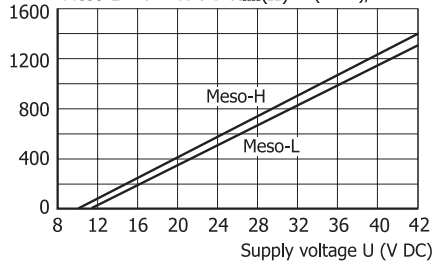
DATA (shortform)

Power supply¹⁾: Meso-H 10 - 42 VDC²⁾
 Meso-L 11 - 42 VDC²⁾
 Meso-HX 12 - 30 VDC/max 100 mA/0.9W

- ¹⁾ When communicating acc to HART the load must be more than 250 ohm.
²⁾ Supply voltage over 36V demands at least 250 ohm's load

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

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



MESO-HX Ex-DATA

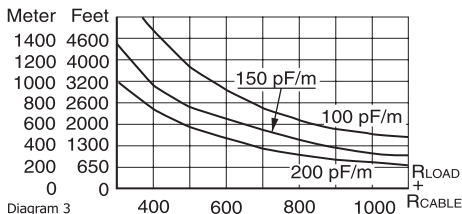
Approval Demko 03 ATEX 134077X
 II 1G Ex ia IIC T4/T5/T6
 Control Drawing 88DRW00053

Approval FM, J.I. 6D9A4.AX, CSA 2007 Certificate 1863602
 Class I, II and III, Division 1, Group A, B, C, D and G
 Control Drawing 3-7967

Output (current loop) Input (sensor) Ambient temperature:
 U_i : 30 V U_o : 30 V T4: -40 °C ≤ Tamb ≤ +85 °C
 I_i : 100 mA I_o : 25 mA T5: -40 °C ≤ Tamb ≤ +65 °C
 P_i : 900 mW P_o : 190 mW T6: -40 °C ≤ Tamb ≤ +50 °C
 L_i : 1 mH L_o : 19 mH Service temp. ≤ max ambient temp.
 C_i : 1 nF C_o : 31 nF

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

CABLE LENGTH



To calculate maximum length of the cable for reliable communication, add load resistance and approximated cable resistance. Please note that the loop resistance for reliable communication must be in the range 230 - 1100 Ohm, 250 Ohm is a commonly used value.

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:

$$L = 65 \cdot 10^6 / (R \cdot C) - (Cn \cdot 5000 + 10 \cdot 000) / C$$

Where:

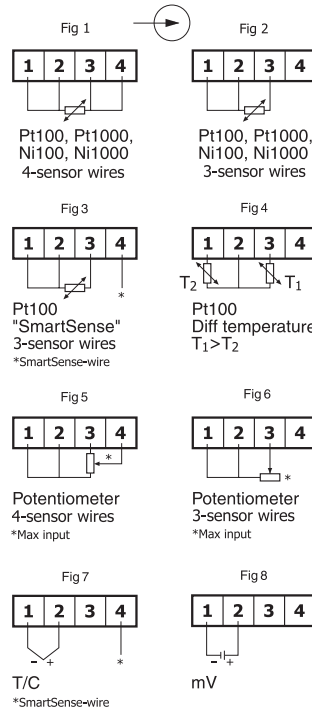
- L**: is the cable length (m)
 - R**: is load resistance (including resistance of barrier)+cable resistance (ohm)
 - C**: is cable capacitance/m (pF/m)
 - Cn**: is the number of Meso transmitters in the loop.
- L can also be changed to ft, if so C is given in pF/ft.

For Ex-version MESO-HX also the restrictions on cable capacitance Ci and inductance Li stated in the Certificates and Approval documents must be observed. Also national and regional standards and regulations must be consulted.

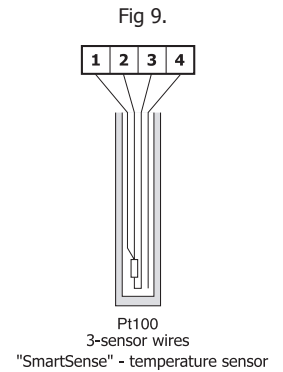
ORDERING TABLE

Item	Part No.
Meso-H, isolated	70MEH00001
Meso-HX, isolated (ATEX)	70MEHX0001
Meso-HX, isolated (FM, CSA)	70MEHX1001
Meso-L	70MEL00001
Software and cable	
HART PC modem RS232	70MEM00001
HART PC modem USB	70MEM00003
Software CD	70CDSOFT01
Accessories	
Surface mounting box	70ADA00008
Rail mounting box	70ADA00009
Head mounting kit	70ADA00012
Rail mounting kit	70ADA00013

INPUTS



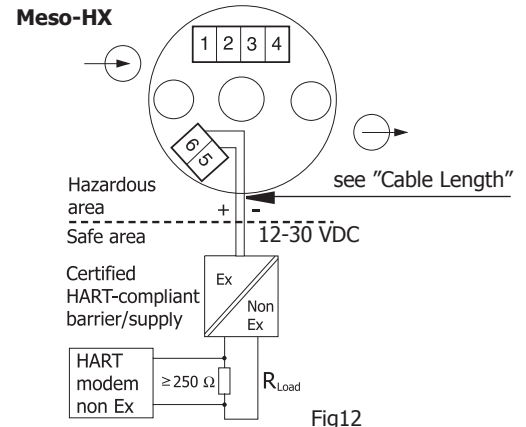
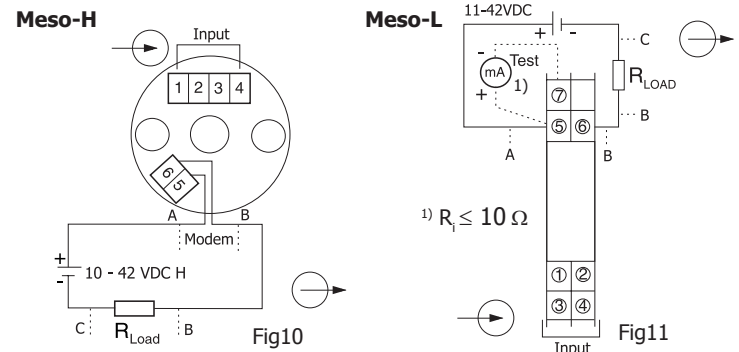
MESO-HX may only be connected to transducers complying with "Simple Apparatus" acc. to EN 60079-11:2007 § 5.7



! MESO-HX must be installed in an enclosure having an Ingress Protection suitable for the actual use but at least IP20. If MESO-HX is mounted in a housing (head) made of light metals and installed in hazardous area make sure the content of magnesium (Mg) in the light metal is less than 6%.

If MESO-HX is mounted in a housing which is isolated from ground and can be charged to an ignition capable level, then the housing shall be electrostatically grounded when installed in hazardous area.

CONNECTIONS



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