INSTRUCTION MANUAL
MP - SERIES:

MP82700 & Mp82700-H
MP82800 & MP82800-R
MP82850
MP88700 & MP88700-H
MP88800 & MP88800-R

CONTENTS

WARRANTY

Our transmitters have a 5 year warranty.
Follow usage instruction in this manual.
In case of malfunction return to your supplier.

SPECIFICATIONS

GENERAL INTRODUCTION:
Our Microprocessor based transmitters are devided in the 2 wire headmount series Mp82000, the rail mount series Mp88000 and the 4 wire Mp87000. NOTE: The 4 wire transmitters are not discribed in this manual! All models are easily programmed via a personal computer with our "Point 'N Click" Software.

Type	headmount	railmount	2-wire	isolated	Pt100	Tc K/J/T/E	Other Tc	HART®	ATEX
Mp82700	•		•	•	•	•	•	•)	•
Mp82800	•		•		•	•			•
Mp82800-R	•		•		•				•
Mp82850	•		•		•				
Mp88700		•	•	•	•	•	•	•)	•
Mp88800		•	•		•	•			•
Mp88800-R		•	•		•				•
Mp87800		•			•	•			
Mp87700		•		•	•	•	•		

•) = HART not yet in combination with ATEX

Specifications	Mp82800 / Mp88800	Mp82700 / Mp88700
Input	RTD: Pt100	RTD: Pt100, P1500, Pt1000
	T/C: K, J, T, E	Ni100, Ni500, Ni1000, Cu10, Cu100
		T/C: K, J, T, E, L, U, R, S, B, C, D, N
		Volt & Ohm
Minimum Span	RTD: 25 K	
	T/C: 50 K	
Output	4...20 mA / 20...4 mA	4...20 mA / 20...4 mA
Linearization	On / Off	On / Off
Supply *) Polarity protected	10...40 VDC	10...40 VDC
Supply effect	0.001% / V	0.001% / V
Max. Ripple	10V PP; Min Vbat - 10 VDC	10V PP; Min Vbat - 10 VDC
Zero Drift	$\pm$ 0.01%/°C or $\pm$ 0.02°C/°C	$\pm$ 0.01%/°C or $\pm$ 0.02°C/°C
Span Drift	$\pm$ 0.005%/°C or $\pm$ 0.01°C/°C	$\pm$ 0.005%/°C or $\pm$ 0.01°C/°C
Long term Drift	$\pm$ 0.05%/year	$\pm$ 0.05%/year
Cold Junction Drift	$\pm$ 0.01 °C/°C	$\pm$ 0.01 °C/°C
Excitation Current RTD	0.1 mA	0.1 mA
Sensor Lead Resistance RTD	500 Ohm max.	500 Ohm max.
Sensor Lead Resistance Effect	0.001 °C/Ohm	0.001 °C/Ohm
Sensor Lead Resistance T/C	10,000 Ohm max.	10,000 Ohm max.
Open Circuit Detection	Upscale / Downscale	Upscale 21.7mA / Downscale 3.7mA
Load Capability	Vbat-10V / 20mA	Vbat-10V / 20mA
Start Up Time	20 sec	20 sec
Warm Up Time	5 min	5 min
Isolation	none	**1500 V** AC
Ambient Operating Temperature	-40°C...+85°C	-40°C...+85°C
Storage Temperature	-40°C...+100°C	-40°C...+100°C
Response time	3 sec	

*) NOTE: For ATEX approved equipment different power requirements may apply!

Specifications	Mp82800-R / Mp88800-R	Mp82850-R
Input	RTD: Pt100 3-wire	RTD: Pt100 3-wire
Minimum Span	25 K	25 K
Output	4...20 mA or 20...4 mA	4...20 mA or 20...4 mA
Linearization	On / Off	On
Supply *)	11...40 VDC, Polarity Protected	12...36 VDC, Polarity Protected
Supply effect	0.02% / V	0.02% / V
Max. Ripple	10V PP; Min Vbat - 11 VDC	10V PP; Min Vbat - 12 VDC
Zero Drift	$\pm$ 0.02%/°C or $\pm$ 0.02°C/°C	$\pm$ 0.02%/°C or $\pm$ 0.02°C/°C
Span Drift	$\pm$ 0.01%/°C or $\pm$ 0.01°C/°C	$\pm$ 0.01%/°C or $\pm$ 0.01°C/°C
Long term Drift	$\pm$ 0.1%/year	$\pm$ 0.1%/year
Excitation Current RTD	0.1 mA	0.1 mA
Sensor Lead Resistance RTD	500 Ohm max.	500 Ohm max.
Sensor Lead Resistance Effect	0.01 °C/Ohm	0.01 °C/Ohm
Open Circuit Detection	Upscale or Downscale	Upscale or Downscale
Load Capability	Vbat-11V / 20mA	Vbat-12V / 20mA
Start Up Time	30 sec	30 sec
Warm Up Time	5 min	5 min
Isolation	none	none
Ambient Operating Temperature	-40°C...+85°C	-30°C...+85°C
Storage Temperature	-40°C...+100°C	-40°C...+100°C

Housing Material Mp82   Zinc Alloy (ZAMAK 5) epoxy coated
Housing Dimension   43mm Dia. x 27mm H.
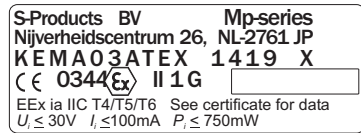Housing dimension with Read-Out   43mm Dia. x 36mm H.

ATEX

GENERAL:
The MP series is available in an intrinsically safe version
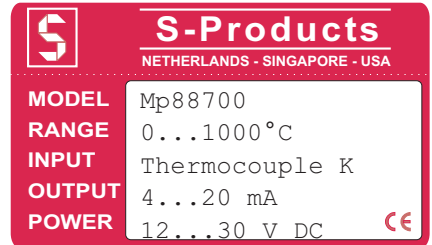and meets the requirements of the ATEX directive 94/9/EC.

MARKING:
All ATEX approved units carry the following labels:

| S-Products BV   Mp-series |
| Nijverheidscentrum 26, NL-2761 JP |
| **K E M A 0 3 A T E X   1 4 1 9   X** |
| C€ 0344 ⟨Ex⟩ II 1 G |
| EEx ia IIC T4/T5/T6 See certificate for data |
| $U_i \leq 30V$ $I_i \leq 100mA$ $P_i \leq 750mW$ |

Year of production
Serial No. i.e.:

+   (**C05200**)   **+**

General product labels

| **S-Products** |
| NETHERLANDS - SINGAPORE - USA |
| **MODEL** Mp88700 |
| **RANGE** 0...1000°C |
| **INPUT** Thermocouple K |
| **OUTPUT** 4...20 mA |
| **POWER** 12...30 V DC   C€ |

| **2-WIRE TRANSMITTER Mp 82800** |
| **INPUT** |
| **RANGE** |
| **OUTPUT 4 - 20 mA   C€** |

Certificate No.   Mp82700, Mp88700, Mp82800, Mp88800, Mp82800-R, Mp88800-R   Display
KEMA 03ATEX 1419 X

Parameters:
Connect to a Zenerbarrier with the following maximum values:

U_i = 30 V DC
I_i = 100 mA
P_i = 750 mW
L_i = 0 mH
C_i = 0 nF

C€ 0344 ⟨Ex⟩ II 1 G
EEx ia IIC
T4 (T_{amb} -40...+85°C)
T5 (T_{amb} -40...+75°C)
T6 (T_{amb} -40...+60°C)

C€ 0344 = CE marking Notified Body

⟨Ex⟩ II = Group
1 G = Category 1, Gas
ia = intrinsic safe
IIC = Hydrogen and Acetylene Gas
T1...T6: Temperature Classification

NON-HAZARDOUS AREA   HAZARDOUS AREA
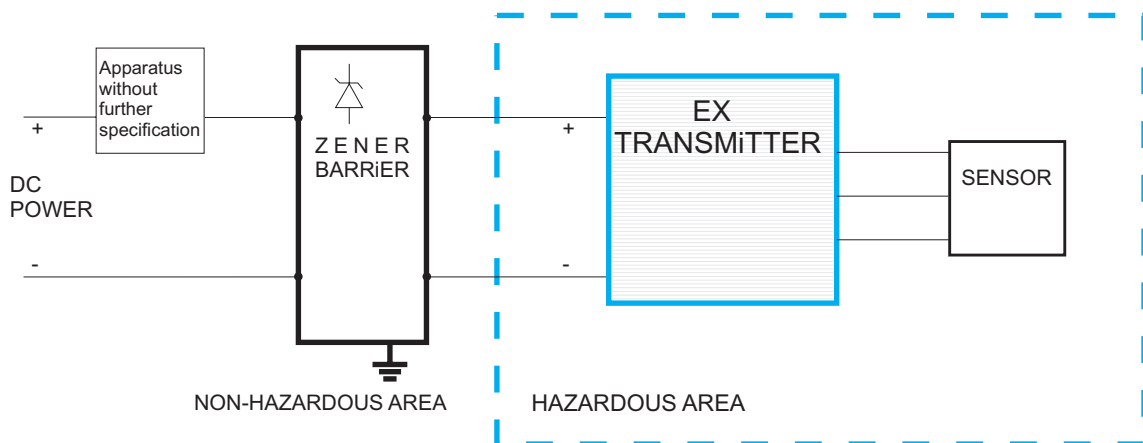
NORMATIVE REFERENCE:
The transmitters have an EC Type examination certificate issued by KEMA and have been approved
to the following standards:
EN 50014
EN 50020
EN 50284

NORMATIVE REFERENCE:

The transmitters Mp82700, Mp82800, Mp88700 and Mp88800 have an EC Type examination certificate issued by KEMA and have been approved to the following standards:

EN 50014
EN 50020
EN 50284

SPECIAL CONDITIONS FOR SAFE USE:

For electrical data and temperature data see EC-Type examination certificate
KEMA 03ATEX1419 X

INSTALLATION REQUIREMENTS

- ATEX approved equipment is only to be connected to a Zenerbarrier.

The Temperature Transmitter must be mounted in an enclosure providing a degree of ingress protection of at least IP20 per EN 60529.
This enclosure must be in conformance with Clauses 4.3 and 4.4 of EN 50284, when the Temperature Transmitter is mounted in an area where the use of category 1 G apparatus is required.
This enclosure must be in conformance with Clauses 7.3 and 8.1 of EN 50014, when the Temperature Transmitter is mounted in an area where the use of category 2 G apparatus is required.
The mentioned Clauses describe how to avoid danger of ignition due to electrostatic charges.

- All transmitters Mp82000 and Mp88000 have an ingress protection of IP20.
This requires usage in a dry, clean and well controlled environment.
Mount the Mp82000 transmitter in a (DAN) head as described below..

- It is prefered to use twisted pair, shielded cable to connect the transmitter to its power supply in order to obtain the best immunity to Electromagnetic signals.
On the power supply side connect the shield to the power supply's earthing point, on the transmitter side connect the shield to the grounded head somewhere close to the transmitter. Make sure the transmitter is firmly connected to the head.
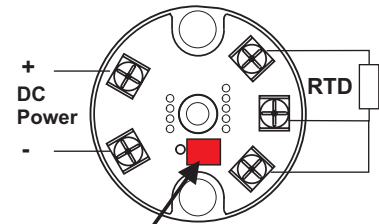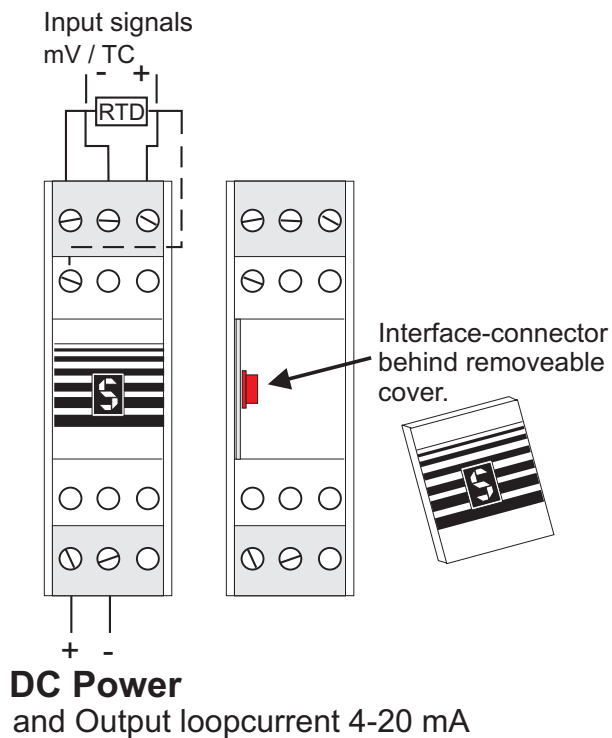
CE
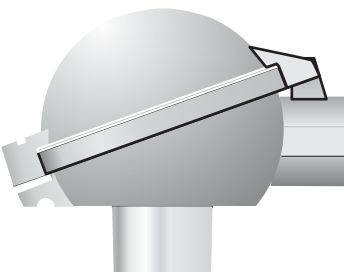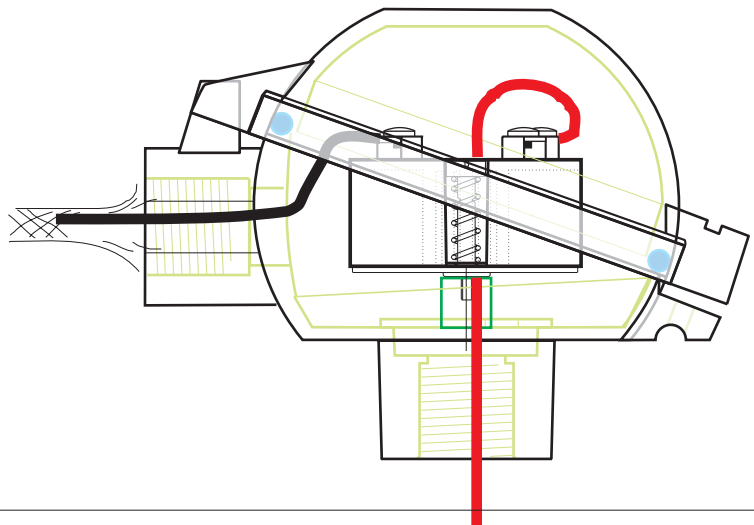
CONNECTIONS

Mp82700 (H) / Mp82800

+
**DC
Power&
4-20mA**
-

+
TC/mV
-

RTD

Mp82800-R / Mp82850-R

+
**DC
Power**
-

RTD
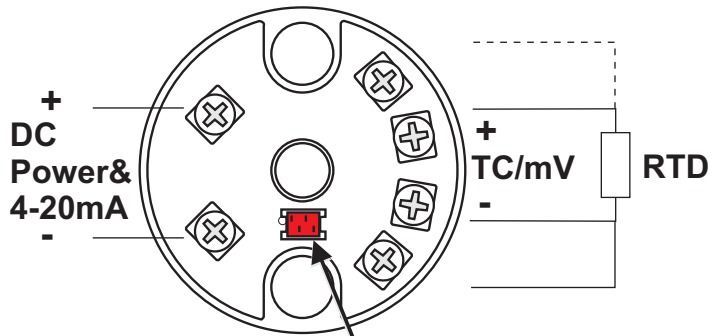
Interface-connector
also used for connecting the optional display unit.

Mp88700 (H) / Mp88800 / Mp88800-R

Input signals
mV / TC

- +

RTD

Interface-connector
behind removeable
cover.

+ -

DC Power
and Output loopcurrent 4-20 mA

General Instructions for the user
 (not required for factory calibrated transmitters)

1. Insert the CD-ROM into your computer.
The Software will start automatically.   (Or you may run SETUP.EXE)
Just follow the on-screen instructions.
Required is at least Windows 95 or NT and 1MB free space.

2. Connect the interface to the serial port of your computer.
(Usually COM1 or COM2; Default is set to COM2)
Attach the interface to the transmitter.
Start the installed S-PRO Mp - software by clicking the "S"-icon.
First click Upload to read the settings from your transmitter.
(Try again if you get a "communication error")
Select the required parameters and download these into the transmitter.

NOTE: SOME LAPTOP COMPUTERS CANNOT SUPPLY ENOUGH POWER
TO PROGRAM THE TRANSMITTER.   IN THESE CASES YOU WILL NEED
OUR ALTERNATIVE   Mp-INTERFACE   WITH BATTERY SUPPORT!

3. After programming you may connect the transmitter as shown in the connections drawing.

4. An optional display unit may be connected to the interface connector,
after connecting power and a sensor.

HART® protocol transmitters
Selecting sensor and range can be done exactly the same as described before for all
our transmitters with the MP software.

In order to use HART protocol you need a HART compatible interface and software
or a handheld terminal.
Connect with a resistor in the loop as required by HART.

The transmitters know 14 universal commands and 5 common-practice commands:
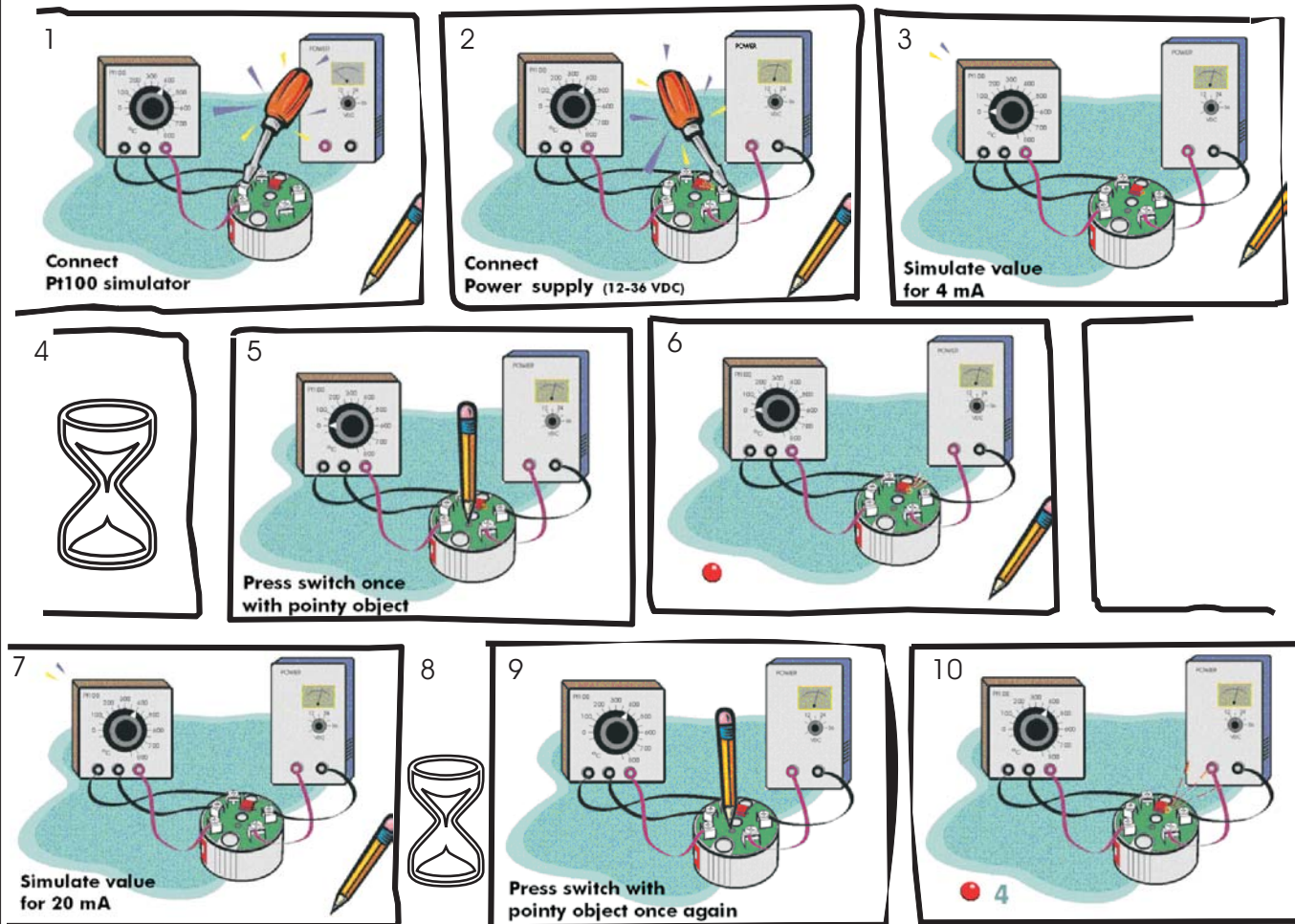
0 Read unique identifier (ID)
1 Read primary variable
2 Read current and % of range
3 Read current and 4 (2) dynamic var
6 Write polling address
11 Read unique ID associated with tag
12 Read message
13 Read tag, descriptor, date
14 Read PV sensor information
15 Read output information
16 Read final assembly number
17 Write message
18 Write tag, descriptor, date
19 Write final assembly number

34 Write damping value
35 Write range values
40 Enter/Exit fixed current mode
49 Write PV sensor
59 Write # of response preambles

Note:
It is not possible to change °C into °F
or vice versa with a HART command.

Use the S-Pro Mp software to program
the transmitter

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1 Connect Pt100 simulator

2 Connect Power supply (12-36 VDC)

3 Simulate value for 4 mA

4

5 Press switch once with pointy object

6

7 Simulate value for 20 mA

8

9 Press switch with pointy object once again

10 4

Calibration Instructions Mp82850-R

1. Connect Pt100 simulator
2. Connect power supply (12-36 VDC)
3. Simulate calibration value for 4 mA
   (i.e. upper value in case of 20-4 mA output)
4. Wait for the input to stabilize (3-5 sec)
5. Press switch with pointy object once
6. The inside light emitting diode (LED) will start to flash slowly
7. Now simulate the calibration value for 20 mA
   note: minimum span must be 25°C
8. Wait for the input to stabilize
9. Press switch with pointy object once again
10. The inside LED will flash fast four times to indicate
    the calibration has been completed

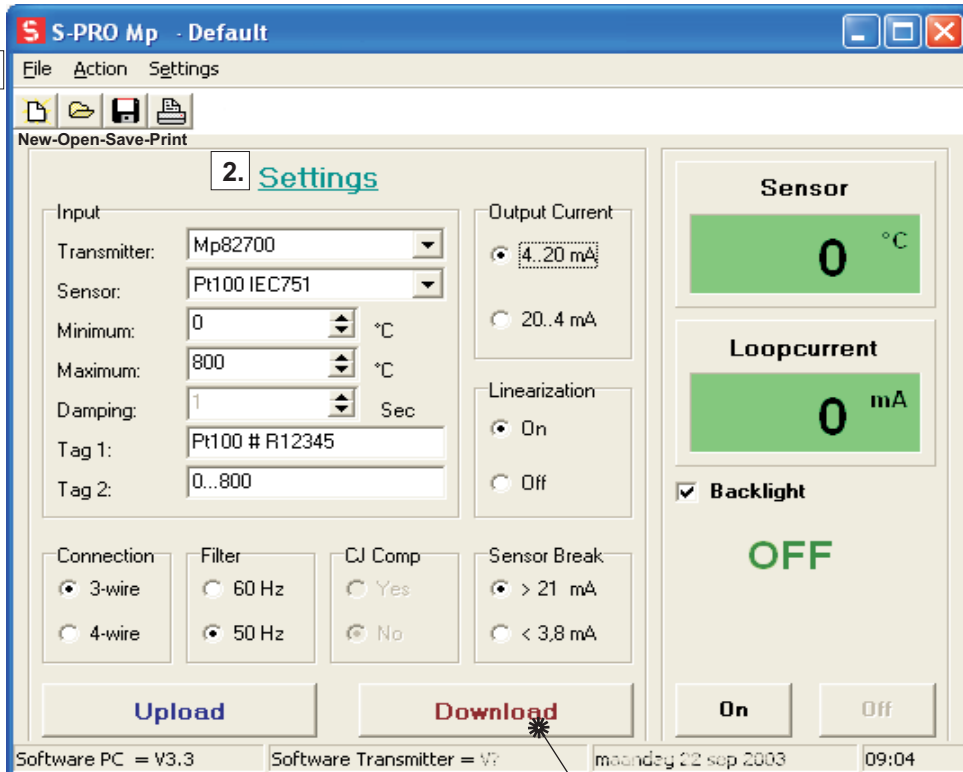Note: The red connector is to connect an optional display unit

S-PRO Mp Software
General
This program uses the basic Windows® features like Save, Print, and Exit.
We refer to the Windows Help Manual for file handling.
Without a mouse you can reach the menu-items pressing both ALT
and the underlined key. You can jump between the settings with TAB.

1.

Note that you will only get a Sensor / Loopcurrent readout on screen if the transmitter is connected to a sensor.

3. On-Screen Readout

In the Sensor display you'll see the actual input value provided the programmed sensor is connected. Loopcurrent is a calculated value.

Click On to start and Off to quit the on-screen display. You must quit before changing settings.

Upload : Read the configuration from the transmitter.
Download : Write your settings to the transmitter.

1. File - Action - Settings
It is possible to save your settings for
later use, to open a previous configuration
or to print the present configuration. Either click on File or on one of the icons.
The large Upload and Download buttons are also located under Action.
With a transmitter connected use **Upload** to find out the settings of your transmitter.
After you made the required selections use **Download** to program the transmitter.
Settings is an important menu item. Here you can select **°C** or **°F** and the **COM** port.

2. Settings
NOTE: Make sure to switch Off the on-screen readout, otherwise you can't alter the settings!
Transmitter : Select the transmittertype connected, or use Upload to find out.
Sensor : You may select the input sensor from a list. The choice is limited by the transmitter type.
        Thermocouple alloys are mentioned.
Minimum and *Maximum* : Input values for Output Current start and end.
Default are the range minimum and maximum of the selected sensor.
Damping : For Hart-protocol transmitters only, to slow down the output signal.
Tag 1 and *Tag 2* : Any comment you'd like to add. (max 16 characters)

Connection : The number of lead wires on your RTD sensor (i.e. Pt100).
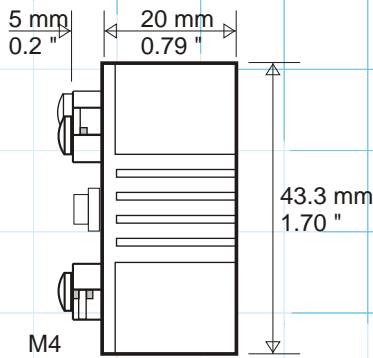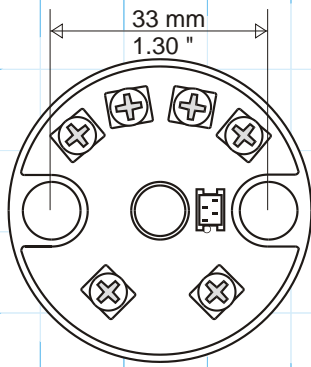*Filter* : Set to 50 Hz for Europe and 60 Hz for USA.
CJ Comp : Cold Junction Compensation for Thermocouples
Sensor Break : Fixation of the loopcurrent on sensor malfunction.

Output Current : Choose min...max = 4...20 mA or 20...4 mA (Mp87000: The 0..1V/10V/0..20mA is automatic)
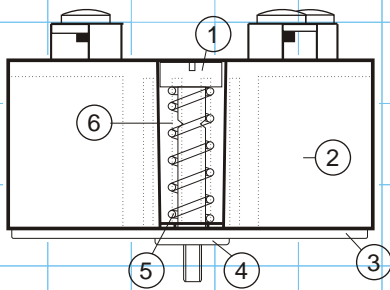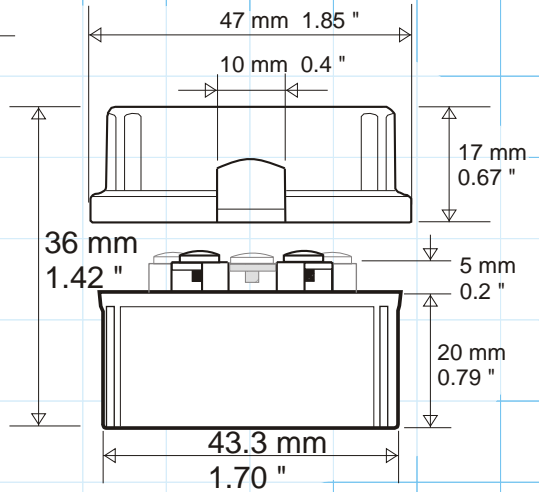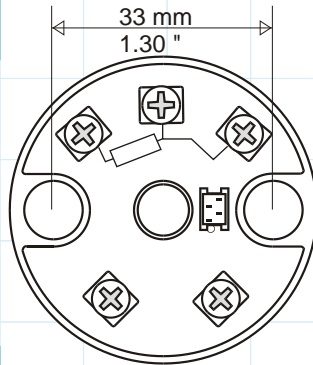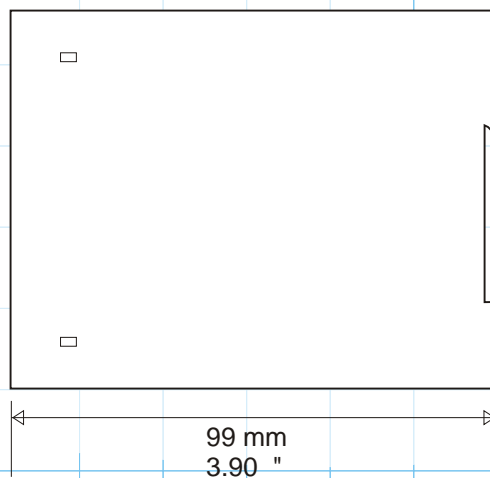*Linearization* : Select On to linearize the input curve, or Off if you require the output curve to be
        the same as the input.

Mp82700 (H)
Mp82800

Mp82800-R
Mp82850-R
(with Display)

33 mm
1.30 "

5 mm
0.2 "

20 mm
0.79 "

43.3 mm
1.70 "

M4

33 mm
1.30 "

47 mm 1.85 "

10 mm 0.4 "

17 mm
0.67 "

36 mm
1.42 "

5 mm
0.2 "

20 mm
0.79 "

43.3 mm
1.70 "

MOUNTING in CONNECTION HEAD
1. Screw M4
2. Transmitter
3. Measuring insert plate
4. Ferrule
5. Spring
6. Notch

75 mm
2.95 "

22.5 mm
0.89 "

99 mm
3.90 "

Mp88700 (H)
Mp88800 (-R)