



MIST M1A Instruction Manual

Programmable Transmitter
with 4-20mA or Voltage output
CSA/UL Approved



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DISCLAIMER

Intempco guarantees that its products are free from defects in material and workmanship. This warranty is valid for a period of one year from the date of purchase, and covers the components of the products which are non-moving and not subject to normal wear. This warranty does not cover products which are modified or altered. Moreover, it does not cover electrical cables which are cut during installation.

The above stated warranty becomes null and void if anyone, other than service personnel authorized by Intempco, attempts to repair a defective product. Intempco's only obligation under this warranty is to repair or replace, at Intempco's option, products that are found, upon Intempco's examination, to be defective. Intempco shall have no obligation for consequential damages to personal or real property, or for injury to any person.

Prior to unpacking and installation, please read the operating instructions and follow them carefully. These units are to be installed, used and serviced only by individuals who are familiar with the operating instructions and the applicable regulations for operational safety and accident prevention.

The unit is constructed using the most up to date production equipment and complies with the safety requirements of the local guidelines. The manufacturer cannot be held responsible for damage caused by misuse or incorrect installation. The installation conditions and connection values indicated in the operating instructions must be followed.



Do not attempt to repair, modify, or disassemble the MIST sensor™; any unauthorized modification or alteration to the sensor may cause injury or risk of electrocution. Please contact Intempco for any problem or issue.



Use a correct power supply rating; it must match the designated power rating shown in the specifications section of this document and the label on the MIST sensor™. Using the wrong power supply, either underpowered or overpowered, can cause damage to parts of the MIST sensor™ and risk injury or electrocution.

PRODUCT OVERVIEW

General Description

The key feature that make these sensors innovative is that they are the world's first ever temperature sensors that have a built-in and fully programmable microprocessor-based transmitter. Intempco's patented MIST Temperature Sensors™ are designed for optimum accuracy, performance, and for ease of installation: The sensors are factory configured and calibrated, all that is needed is a simple power connection and you are ready to go. Models can be ordered with 2-wire 4-20mA output, or 3-wire voltage output (0-5, 1-5 or 0/10 VDC). Calibration and re-scaling can be easily done with the optional Programming Kit.

Control of Units

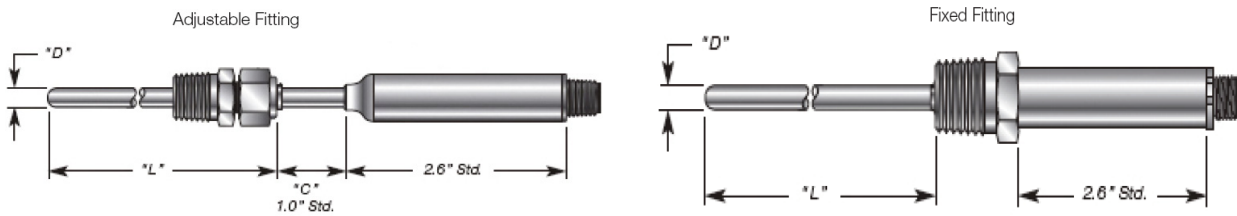
The units are calibrated and checked before shipment and shipped in good conditions. If you detect a visible defect on the unit, we recommend that you carefully check the packing material. In the event of a

defect, please immediately notify the mail service/freight forwarder, as they are responsible for shipping damage.

Mechanical Information

The following figures show the standard, and general dimensions for selected M1A MIST™. The lengths, probe diameters, and process fittings can be chosen in the custom builder found in the datasheet for the M1A MIST™.

Note: An M12 extension cable can be ordered separately. The following basic mechanical layouts are shown without the extension cable.

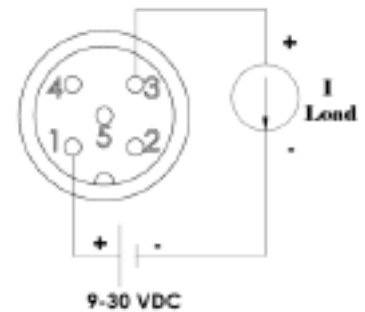


INSTALLATION

Electrical Installation (2 wire 4-20mA loop powered outputs)

Voltage supply is 9-30 VDC

1. Make sure that the power supply is turned off.
2. Connect Pin 1(V+) to the positive terminal of the power supply.
3. Connect Pin 3(V-) to the negative terminal of the power supply.
4. Turn on the power supply.



Note: Load is in series in the negative side of the loop.



MIST M1A Series

USA Patent No. 7,223,014
CDN Patent No. 2,561,570

CAN/CSA-C22.2 No. 61010-1:12 / UL 61010-1

MODEL: M1A1-10-LP-D-S-040-N10-0-H-MC-B2-0-N-A TYPE 4X, IP66/IP67

Vin: 9-30 V
Iout: 4-20mA

Loop Powered: Pin1(+), Pin3(-)

Calib. Only: Pin2(Tx), Pin4(Rx)

Range: 0/100°C S/N: 0000001

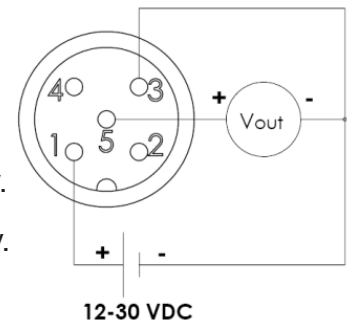


Sample tag 4-20mA output

Electrical Installation (3 wire voltage outputs)

Voltage supply is 12-30 VDC. Figure 4.2

1. Make sure that the power supply is turned off.
2. Connect Pin 1(V+) to the positive terminal of the power supply.
3. Connect Pin 3(V-) to the negative terminal of the power supply.
4. Connect Pin 5(Vout) to a measuring instrument.



Note: The (-) of the measuring instrument and (-) of the power supply must be common.



Sample tag Voltage output

Intempco M12 Cables, when supplied with the MIST sensors, are labeled with the PIN out and wire color code. MISTs with 4-20mA outputs are supplied with a micro female 5 position 4 conductor cable. MISTs with voltage outputs are supplied with a micro female 5 position 5 conductor cable.

Wires from Pin 2(Tx) and Pin 4(Rx) are only for communication via the Pkit. When wires from Pin 2 and Pin 4 are not used, they should be isolated from any other wires. They can either be shorted together and isolated, or separately isolated.

Mechanical Installation Requirements

There are no restrictions on the orientation of the probe installation location, but if there is a requirement for the pipe to be self draining the seating should be angled such that it will drain properly.

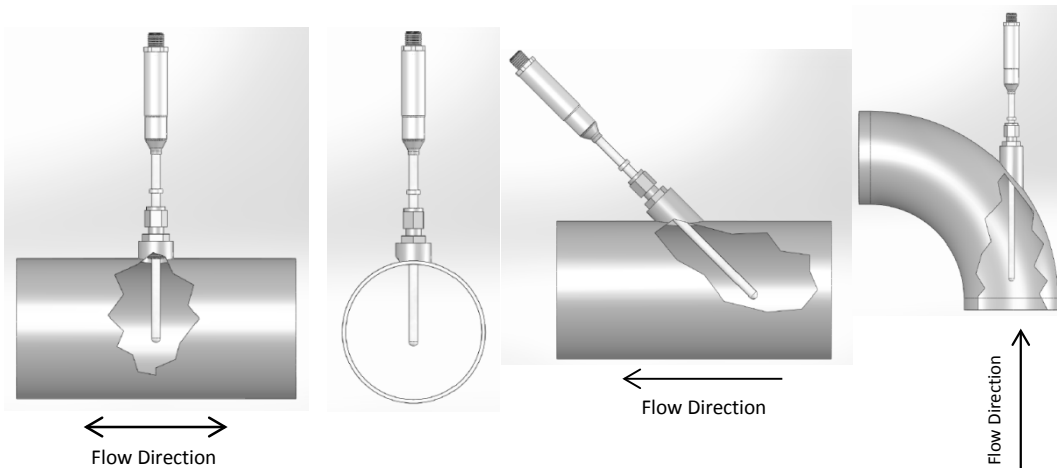
The probe should be centered in the process flow no matter what the orientation. Angled inserts should have the probe pointing into the direction of flow as shown. The following figures illustrate typical installations with flow directions.

It is up to the installer to follow local codes and guidelines for installation of the process fitting. In general, Fixed NPT connections should be hand tightened and then turned only 1-1/2 turns further with an appropriate wrench. This value may change according to what type of sealant is used on the pipe threads, and also what material the connection is made of.

Do not use the MIST Body to tighten the probe into the mounting location. Doing so may damage the probe. Use only the Hex portion of process connection fitting.

Compression fitting nuts should be hand tightened, then turned 1-1/4 turns further. This ensures proper seating of the ferruls and proper sealing to the probe.

If there are flammable or explosive fluids or gasses present at the site of installation ensure that proper grounding procedures are taken. Unwrapping a probe from bubble wrap or other packaging can impart a static charge on the probe which may discharge upon insertion into the mounting location.



Re-scaling and Re-calibrating the MIST Temperature Sensors

For re-scaling and re-calibration of the MIST™ Temperature: Please refer to the software MIST™ manual, which can be found online at www.intempco.com. Optional MIST PKITs are available for communication with the MIST™ sensors, Pkits are purchased separately if required.

Cleaning the MIST sensor

1. Make sure that the power supply is turned off.
2. Connection cable (if present) can be left attached to the unit and cleaned with the unit. The cable can also be disconnected and cleaned separately.
3. A soft cloth with warm soapy water can be used to clean the outside surface of the MIST sensor and /or cable. Wipe clean with a wet cloth and dry out the unit with a dry cloth or simply let air dry.
4. The units are hermetically seal and will not be damaged if liquid enters the connector area, make sure to blow out any water from the connector and that the connector is dry before reconnecting.

APPROVALS, ELECTRICAL SPECIFICATIONS AND MECHANICAL PROPERTIES

Approvals

CSA c/us: CAN/CSA-C22.2 No. 61010-1 :12 / UL 61010-1 (3rd edition)

Electrical Specifications:

Sensing Element	RTD, Type Pt100 DIN/EN 60751 Class A
Sensor Current	<0.25mA
Sensor Temperature Ranges	See Box1 code for standard ranges Field re-scalable between or -50 °C to 200 °C or -200°C to 600°C depending on model selected
Outputs	4-20mA loop powered, 2-wire, linear to temperature 0-5 VDC, 1-5 VDC, 0-10 VDC all 3-wire, linear to temperature
Minimum Input Impedance	1000 Ohm (of measuring device, for voltage output)
Power Supply	9-30 VDC, polarity protected (4-20 mA output) 12-30 VDC, polarity protected (Voltage output)
Supply Effect	0.001%/V
Maximum Loop Resistance	$[(V_{supply} - 7V)/20mA]$ ohms (for 4-20mA output only)
Maximum Current Draw	10 mA (Voltage output only)
Accuracy	$\pm(.25^{\circ}C + 0.40\%$ of span) with one-point calibration $\pm(.10^{\circ}C + 0.10\%$ of span) with optional two-point calibration
Sensor Open Circuit	Upscale 24mA or Downscale 2.5mA (for 4-20 mA output only)
Warm-up	30 seconds
RFI Effect	1% or less typical
Isolation	500 VDC , sensor housing to all output Pins
Temp. Effects	$\pm 0.001\%$ of Span/ $^{\circ}C$ deviation from 25°C
Long Term Drift	$\leq 0.1\%$ FS/Year

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the INTEMPCO Customer Service Department. Before returning any product(s) to INTEMPCO, purchaser must obtain an authorized return (RMA) number from INTEMPCO customer service department (in order to avoid processing delays). The assigned RMA number should then be marked on the outside of the return package and on any correspondence. The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

Warranty Returns

Please have the following information available before contacting INTEMPCO:

- Purchase Order number under which the product was purchased,
- Model and serial number of the product under warranty, and
- Repair instructions and/or specific problems relative to the product.

Non-Warranty Repairs

Consult INTEMPCO for current repair charges. Have the following information available before contacting INTEMPCO:

- Purchase Order number to cover the cost of the repair,
- Model and serial number of product, and
- Repair instructions and/or specific problems relative to the product.

INTEMPCO's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

WARRANTY/DISCLAIMER

INTEMPCO Controls, Ltd. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. INTEMPCO Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that INTEMPCO's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. INTEMPCO's Customer Service Department will issue a Return Merchandise Authorized (RMA) number immediately upon phone or written request. Upon examination by INTEMPCO, if the unit is found to be defective, it will be repaired or replaced at no charge. INTEMPCO's warranty does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This warranty is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of INTEMPCO's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

INTEMPCO is pleased to offer suggestions on the use of its various products. However, INTEMPCO neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by INTEMPCO, either verbal or written. INTEMPCO warrants only that the parts manufactured by it will be as specified and free of defects. INTEMPCO makes no other warranties or representations of any kind whatsoever, express or implied, except that of title, and all implied warranties including any warranty of merchantability and fitness for a particular purpose are hereby disclaimed. Limitation of Liability: The remedies of purchaser set forth herein are exclusive, and the total liability of INTEMPCO with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall INTEMPCO be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by INTEMPCO is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, on humans, or misused in any way, INTEMPCO assumes no responsibility as set forth in our basic WARRANTY / DISCLAIMER language, and, additionally, purchaser will indemnify INTEMPCO and hold INTEMPCO harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

It is the policy of INTEMPCO to comply with all worldwide safety and EMC/EMI regulations that apply. INTEMPCO is constantly pursuing certification of its products to the European New Approach Directives. INTEMPCO will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but INTEMPCO Controls, Ltd. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.