EMT1H

List of products
WO81
WO71
FR51A
MS99
MS99S
MS61A-RA
QDP33
EMD8A
EMD7
EMT1
EMTGP1
EMT1H
EMT6
EMP5A
EMRT1
HWS15A
Accessories
Application
Precautions
Maintenance

Type examination pass No. CML 19JPN2072X

RoHS

Intrinsically safe micro differential pressure transmitter

Explosion-proof performance	Ex ia ⅡC T4 Ga

Intrinsically safe refers to a model with a structure designed in consideration of the necessary safety factors so that combustible gas will not be ignited because of an electric spark generated under normal conditions or in the event of an accident or temperature rise, whose explosion-proof safety has been verified through tests or by other means by an official organization.

EMT1H
(Manostar transmitter + safety barrier)

<Main application fields>
- General factory management equipment
- Negative pressure for dust collector/differential pressure of air conditioners
- Filter pressure loss management
- Precision machine manufacturing line
- Building air-conditioning control equipment

<Usage>
- Detection of clogging of air filter
- Room pressure measurement in a clean room
- Measurement of clogging of bug filter
- Measurement of dynamic pressure at ventilation/exhaust device

*(Refer to pages 114 to 117)

Product code

Pressure range code

EMT1H	A	0	FM	D	100	(Example)

Range		Maximum value (for ± range, provide "±" as well)
Unit	D	Pa
	E	kPa
Base	FV	For vinyl pipe
	FM	For metallic pipe
Output	0	Two-wire type 4–20 mA DC
External shape	A	For indoor drip-proof

◆When making an inquiry or placing an order, specify the above product code.
◆The above product code is for the set of micro differential pressure transmitter and safety barrier.
◆When you use this product for airflow rate/airflow speed measurements, we need to obtain the specifications of the pressure detection side.
Fill out the airflow rate/airflow speed specification document preparation sheet on page 15, and inform us of the data.

EMT1H

System specifications

Model	EMT1H
Configuration	Manostar transmitter EMT1H + safety barrier MTL7787+
Explosion-proof type	Intrinsically safe structure
Target gas	Ex ia IIC T4 Ga
Intrinsically safe circuit	Conditions for wiring in the section between EMT1H and safety barrier (MTL7787+) Capacitance (CC): 0.05 μF or lower　Wiring resistance: 10 Ω or lower Inductance (Lc): 2.00 mH or lower　Cross section area of electric wire conductor: 0.5 to 2.5 mm^2

EMT1H

Pressure unit	Pa, kPa	**Durable vibration**	5 to 10 Hz, amplitude of 10 mm, 10 to 50 Hz, acceleration of 39 m/s^2 (two hours each for three axial directions)
Pressure measurement method	Differential pressure method		
Measured gas	Air and noncorrosive gas (liquid cannot be measured)	**Durable impact**	100 m/s^2 (six times each for three axial directions)
Pressure-receiving element	Diaphragm (silicone rubber)	**Compatible pipe**	• Vinyl pipe or rubber pipe (inner diameter of 6 mm) ……Compatible with base for vinyl pipe • Metallic pipe (outer diameter of 6 ± 0.1 mm) ……Compatible with base for metallic pipe • Hard tube (outer diameter 6 × inner diameter 4 mm) ……Separately sold inner sleeve set (XIN 6 × 4; refer to page 111) is necessary for the base for metallic pipe.
Exterior material	Aluminum die casting　Painting on exterior (paint color: gray)		
Instrument body withstanding pressure	500 kPa (refer to page 118)		
Mounting orientation	Horizontal (inclination angle of within ± 5°)		
Electric signal conversion method	Variable inductance		
Insulation resistance	Between power terminal and grounding terminal: 20 MΩ or higher (500 V DC megger)	**Mass**	Approx. 1100 g
Withstand voltage	Between power terminal and grounding terminal: 500 V AC, 50/60 Hz, for one minute, 1 mA or lower		
Operating ambient temperature	0°C to 40°C (no freezing allowed)		
Operating ambient humidity	90% RH or below (no condensation allowed)		

MTL7787＋

Intrinsically safe circuit maximum voltage	28 V	**Non-intrinsically safe circuit Tolerable voltage**	250 V AC, 50/60 Hz, 250 V DC
Intrinsically safe circuit maximum current	93 mA		
Intrinsically safe circuit maximum power	0.65 W		
Mass	Approx. 140 g		

Pressure range code	Pressure range	Accuracy (at 20°C)	Temperature characteristics (zero + span) at 0°C to 40°C	Withstanding pressure of pressure-receiving element	Output and transmission method
D 10	0–10 Pa	±2% FS	±0.2% FS/°C	10 kPa	Two-wire type: Output signal of 4 to 20 mA DC (load resistance of 250 Ω or lower *1) Power voltage of 24 V DC ± 10% (ripple of 0.2 V P-P or lower) *1 Resistance value of connectable load when combined with the supplied safety barrier
D 15	0–15 Pa				
D 20	0–20 Pa				
D 30	0–30 Pa				
D 50	0–50 Pa	±1% FS	±0.1% FS/°C		
D 75	0–75 Pa				
D 100	0–100 Pa				
D 150	0–150 Pa				
D 200	0–200 Pa				
D 300	0–300 Pa				
D 500	0–500 Pa				
D 750	0–750 Pa				
D1000	0–1000 Pa				
E 1	0–1 kPa				
E 2	0–2 kPa			40 kPa	
E 3	0–3 kPa				
E 5	0–5 kPa				
E 10	0–10 kPa				
E 20	0–20 kPa				
E 30	0–30 kPa			100 kPa	
E 50	0–50 kPa				
E 100	0–100 kPa			150 kPa	
D＋－ 10	−10 to +10 Pa	±2% FS	±0.2% FS/°C	10 kPa	
D＋－ 20	−20 to +20 Pa				
D＋－ 30	−30 to +30 Pa				
D＋－ 50	−50 to +50 Pa	±1% FS	±0.1% FS/°C		
D＋－100	−100 to +100 Pa				

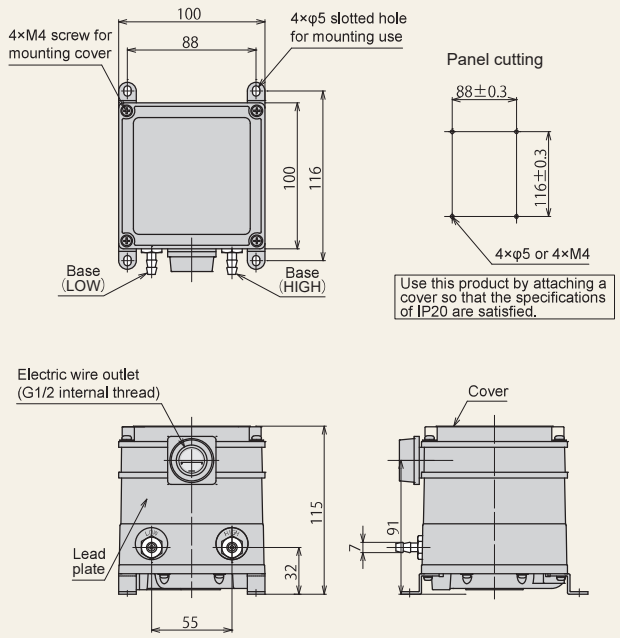
◆Use of this product in a mounting orientation other than horizontal orientation is impossible.

◆For the use environment, refer to page 118.

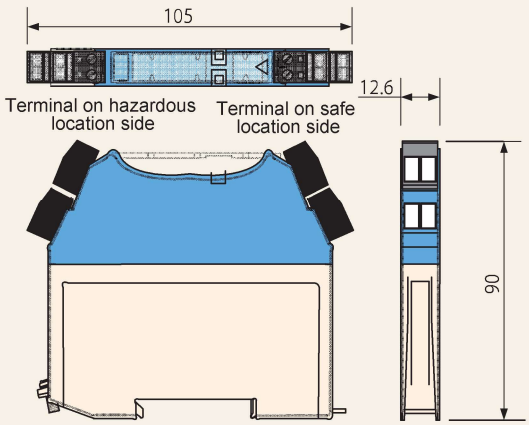
EMT1H

External dimension drawing

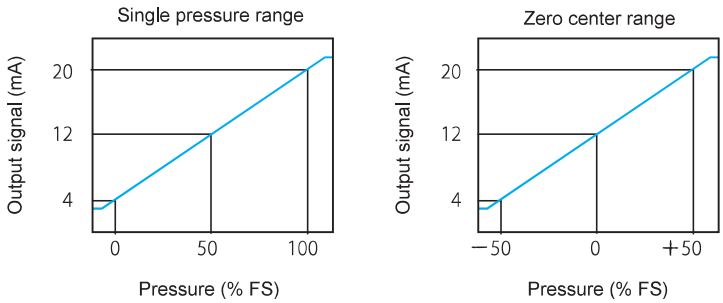
EMT1H (for vinyl pipe)



MTL7787+



Transmission output diagram (pressure-output signal)



Terminal connection diagram

When used in combination with the supplied safety barrier and our receiving instrument

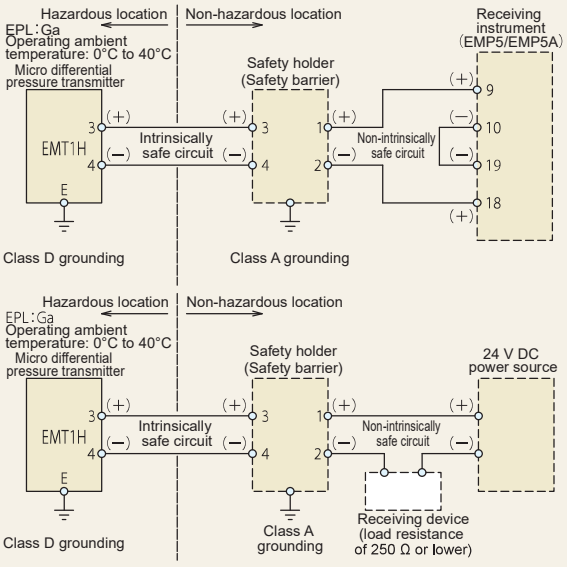
Because our receiving instrument has a built-in DC power circuit for micro differential pressure transmitter, a separately installed DC power source is not necessary.

*When using EMP5, an input resistance of 50 Ω is necessary between 18 and 19.

When used in combination with the supplied safety barrier and external 24 V DC power source

- Use a 24 V DC power source that has a constant voltage and a ripple of 0.2 V P-P or lower.
- Connect the DV terminal of the DC power source to the grounding terminal of the barrier as much as possible.
- The load resistance must be 250 Ω or lower.

◆For details of combination of the micro differential pressure transmitter with our receiving instrument, adjustment meter, or other device, refer to page 113.



Caution

Terminal screw tightening torque: 1.0 to 1.3 N·m
Do not tighten to a torque that exceeds the specified value because doing so breaks the instrument body.

EMT1H

Warning

Notes on use

- Never change the constituting parts and the circuit.
  This instrument has an intrinsically safe structure. The intrinsically safe structure has a higher reliability compared to other explosion-proof structures, but failure to follow the preconditions for the explosion-proof structure significantly decreases the reliability and makes it impossible to maintain the explosion-proof performance. When using this instrument, be sure to observe the following precautions.
  For details of explosion-proof properties, refer to the following reference documents.

Reference documents

- Recommended Practices for Explosion-protected Electrical Installations in General Industries JNIOSH-TR-46-1: 2015, published by the Technology Institution of Industrial Safety
- Recommended Practices for Explosion-protected Electrical Installations in General Industries JNIOSH-TR-46-6: 2015, published by the Technology Institution of Industrial Safety
- USERS' GUIDELINES for Installations for Explosive Atmospheres in General Industry JNIOSH-TR-NO.44, published by the Technology Institution of Industrial Safety
- Be sure to house the safety barrier in a container with a totally closed structure, and place it at a non-hazardous location.

Grounding

- Solely conduct grounding of the safety barrier in accordance with the Class A grounding work.
- Conduct grounding of the micro differential pressure transmitter body in accordance with the Class D grounding work.
- In actual grounding work, refer to "Recommended Practices for Explosion-Protected Electrical Installations in General Industries."

Wiring

The electric circuit of this instrument has restricted capacitances and inductances so as not to accumulate energy, which could serve as an ignition source. However, because the capacitance and inductance generated in the wiring (intrinsically safe circuit) from the instrument to the safety barrier vary depending on the installation environment, they need to be restricted to the tolerance value or lower by the user.

Conditions for wiring in the section between EMT1H and safety barrier (MTL7787+)

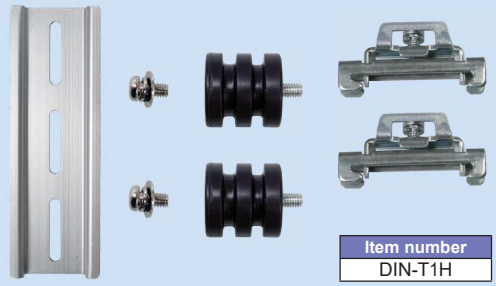
Capacitance (Cc): 0.05 μF or lower
Inductance (Lc): 2.00 mH or lower
Wiring resistance: 10 Ω or lower
Cross section area of electric wire conductor: 0.5 to 2.5 mm^2

*Because it is difficult to adjust a wiring cable after it has been wired, we recommend that you actually measure the capacitance and inductance of the cable to be used in advance to obtain the approximate conditions for the cable, and then conduct the work.

- Conduct wiring as per terminal connection diagram, and after the wiring, be sure to make sure that there is no wrong wiring.
- For wiring and piping, use highly reliable parts.
- Concerning wiring, refer to "USERS' GUIDELINES for Installations for Explosive Atmospheres in General Industry NIOSH-TR-NO.44" as it provides detailed explanations in accordance with the installation environment.

EMT1H accessories

DIN rail set for safety barrier



Item number
DIN-T1H

Use this DIN rail set to solely conduct grounding of the attached safety barrier in accordance with the Class A grounding work. It is possible to install up to five safety barriers.

Metallic cable gland (made of ZDC or FCD)

Non-compliant with RoHS

Item number	Color of rubber bushing	Outer diameter of compatible electric wire (mm)	
		Minimum	Maximum
SC4-1T	Gray	3.5	7.0
SC4-2T	Black	6.5	9.0
SC4-3T	Red	8.5	11.0

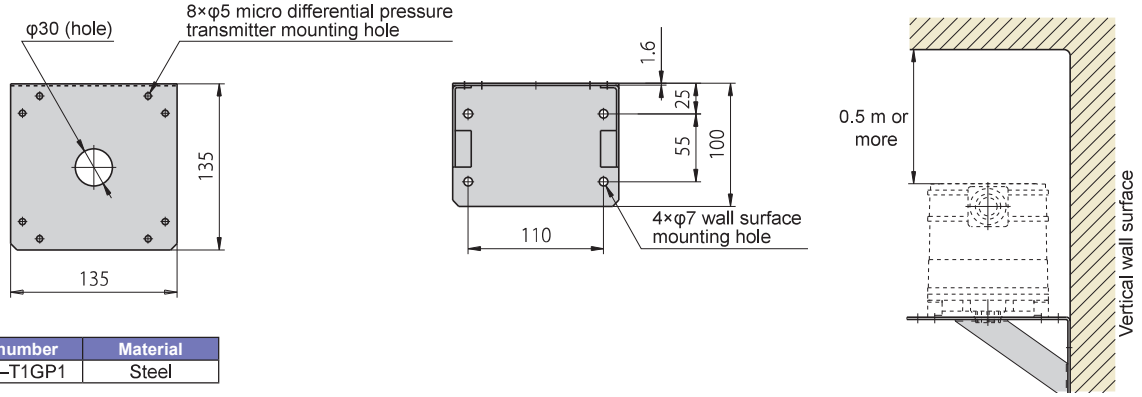
This is used when the wiring of micro differential pressure transmitter is conducted with instrumentation cables. By paying attention to the finish outer diameter of the cable to be used, select a metallic cable gland in a size that allows the rubber bushing to retain the cable outer diameter when the cap nut is tightened. Use a cable equipped with shield.

Schematic figure of mounted DIN rail

◆EMT1H accessories are shared with EMT1.

Bracket for mounting on vertical wall surface (horizontal mounting)

*Mounting screw is not included.



Item number	Material
BRKT–T1GP1	Steel

*For quality improvement or for another reason, part of the specifications may be subject to change without prior notice.

Warranty

Warranty period

The warranty period for our product is one (1) year from delivery to the location specified by the orderer who makes a direct transaction with us.

Scope of warranty

If any failure or defect attributable to us becomes clear during the above warranty period, we will repair the product or supply a substitute product free of charge. However, even during the warranty period, we will exclude the product from the scope of the warranty if the failure or defect corresponds to any of the following:

(1) The failure or defect was caused by an unreasonable condition, environment, handling, or usage not mentioned in the instruction manual, specifications, and our product catalog.
(2) The failure or defect was caused by a factor other than our product.
(3) The failure or defect was caused by a modification or repair conducted by a party other than us.
(4) The failure or defect was caused by an event that could not be foreseen at the scientific and technical levels at the time of product shipment from us.
(5) The failure or defect was caused by an external factor not attributable to us, such as acts of God and disasters.

Please note that the warranty mentioned here means the warranty for our individual product, and damage provoked by a failure or defect of the product is excluded from the scope of the warranty.

*This warranty is valid only in Japan.

Application and usage

Our products are designed and manufactured as general-purpose instruments for general industries.
Therefore, our products are not intended for the following uses, and our products used in such a manner are outside the scope of application.

(1) Equipment that is anticipated to greatly affect lives and properties, such as nuclear power generation, aviation, railways, marine vessels, vehicles, and medical devices
(2) Utilities that include electricity, gas, and service water
(3) Use in outdoor locations and under similar conditions or environments other than those stipulated in the instruction manual
(4) Usage to which considerable safety consideration and attention equivalent to (1) and (2) above need to be given

Service

Scope of service

Because the product price does not include service expenses, such as the dispatch of engineers, we will separately charge for the expenses in the following cases:

(1) Instruction for installation and adjustment and a witnessed test run
(2) Maintenance inspection, adjustments, and repairs
(3) Technical guidance and technical education
(4) Witnessed inspections of products at our factory

<<Note>> The product specifications and information in this catalog are subject to change without prior notice for product improvement or other reasons.

●For order placement, contact

General agent **Manostar Co., Ltd.**

1-2-3 Nishishiriike-cho, Nagata-ku, Kobe City, Hyogo 653-0031
TEL. +81-78-621-7000 FAX. +81-78-621-7788

Manufacturer **Yamamoto Electric Works Co., Ltd.**

1-2-3 Nishishiriike-cho, Nagata-ku, Kobe City, Hyogo 653-0031
TEL. +81-78-631-6000 FAX. +81-78-631-6020

SEPTEMBER 2021 YAMAMOTO ELECTRIC WORKS CO., LTD., JAPAN