

EMT1H

Type examination pass No. CML 19JPN2072X

RoHS

Intrinsically safe fine 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)

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Maintenance

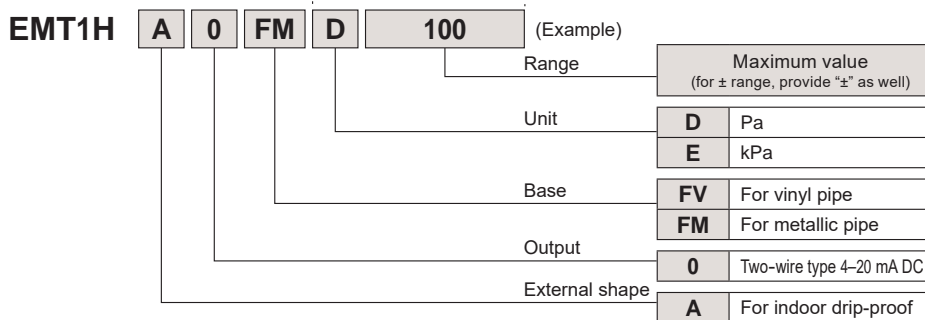
<Main application fields>

- 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

Product code



- ◆ When making an inquiry or placing an order, specify the above product code.
- ◆ The above product code is for the set of fine 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.

*(Refer to pages 114 to 117)

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	Durable impact	100 m/s ² (six times each for three axial directions)				
Measured gas	Air and noncorrosive gas (liquid cannot be measured)	Compatible pipe	<ul style="list-style-type: none"> Vinyl pipe or rubber pipe (inner diameter of 6 mm) <ul style="list-style-type: none">Compatible with base for vinyl pipe Metallic pipe (outer diameter of 6 ± 0.1 mm) <ul style="list-style-type: none">Compatible with base for metallic pipe Hard tube (outer diameter 6 × inner diameter 4 mm) <ul style="list-style-type: none">Separately sold inner sleeve set (XIN 6 × 4; refer to page 111) is necessary for the base for metallic pipe. 				
Pressure-receiving element	Diaphragm (silicone rubber)	Mass	Approx. 1100 g				
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)						
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 D 15 D 20 D 30	0–10 Pa 0–15 Pa 0–20 Pa 0–30 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)		
D 50 D 75 D 100 D 150 D 200 D 300 D 500 D 750 D1000	0–50 Pa 0–75 Pa 0–100 Pa 0–150 Pa 0–200 Pa 0–300 Pa 0–500 Pa 0–750 Pa 0–1000 Pa						
E 1	0–1 kPa	±1% FS	±0.1% FS/°C			40 kPa	*1 Resistance value of connectable load when combined with the supplied safety barrier
E 2 E 3 E 5 E 10 E 20	0–2 kPa 0–3 kPa 0–5 kPa 0–10 kPa 0–20 kPa						
E 30 E 50	0–30 kPa 0–50 kPa						
E 100	0–100 kPa						
D+ – 10 D+ – 20 D+ – 30	–10 to +10 Pa –20 to +20 Pa –30 to +30 Pa						
D+ – 50 D+ – 100	–50 to +50 Pa –100 to +100 Pa	±1% FS	±0.1% FS/°C				

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

◆ For the use environment, refer to page 118.

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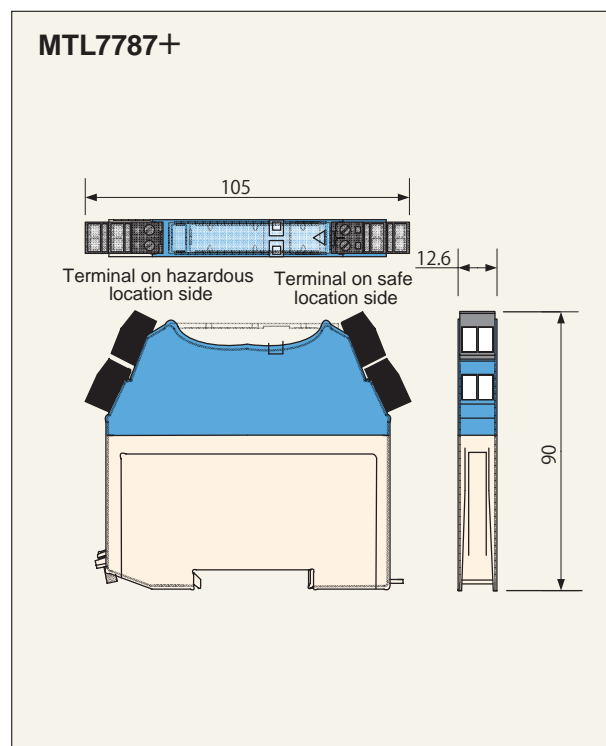
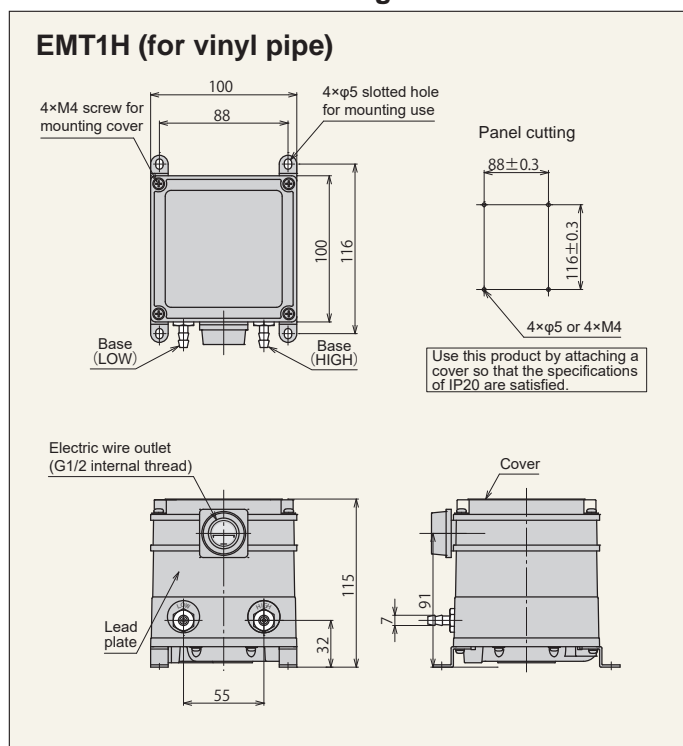
Accessories

Application

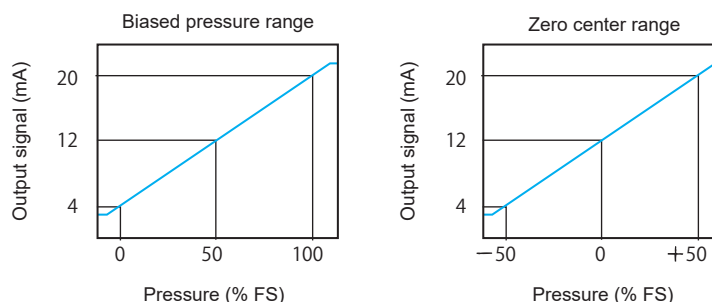
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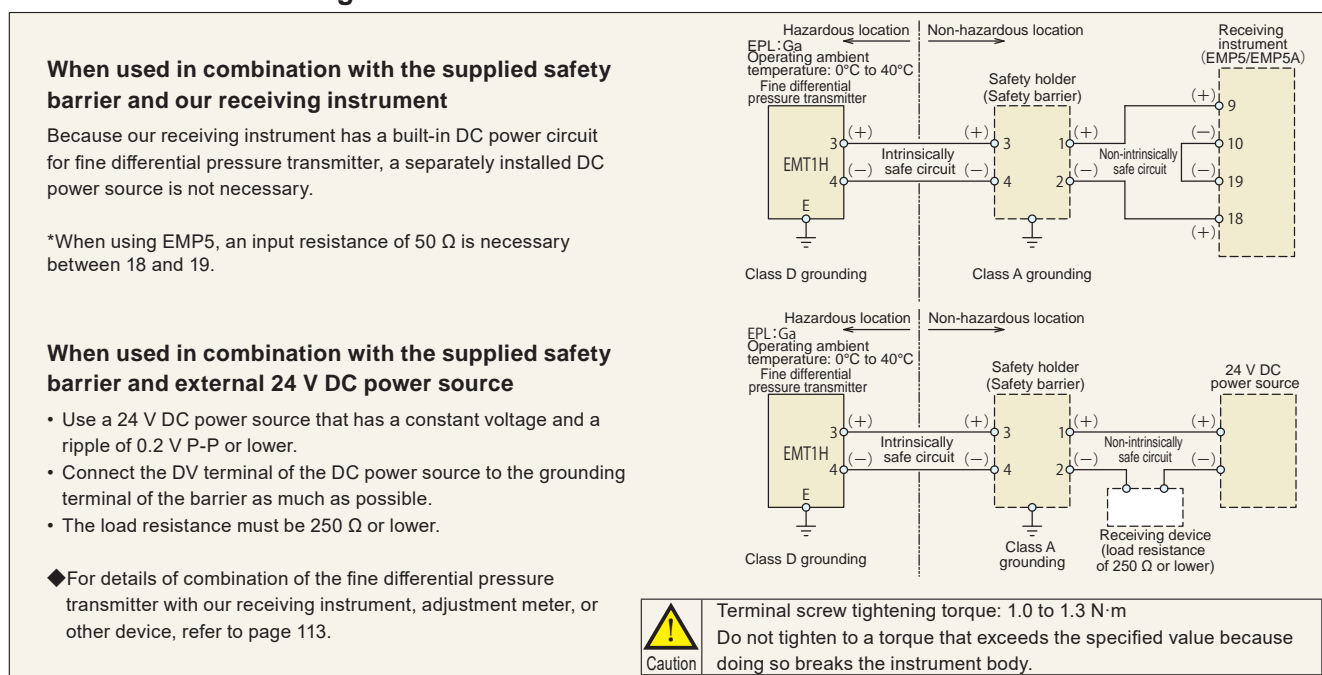
External dimension drawing



Transmission output diagram (pressure-output signal)



Terminal connection diagram



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.

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 JNIOHS-TR-46-1: 2015, published by the Technology Institution of Industrial Safety
- Recommended Practices for Explosion-protected Electrical Installations in General Industries JNIOHS-TR-46-6: 2015, published by the Technology Institution of Industrial Safety
- USERS' GUIDELINES for Installations for Explosive Atmospheres in General Industry JNIOHS-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 fine 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 μ F 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 mm²

*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.



Warning

EMT1H accessories

DIN rail set for safety barrier		Metallic cable gland (made of ZDC or FCD)																				
<p>Item number DIN-T1H</p>		<p>Non-compliant with RoHS</p> <table border="1"> <thead> <tr> <th rowspan="2">Item number</th> <th rowspan="2">Color of rubber bushing</th> <th colspan="2">Outer diameter of compatible electric wire (mm)</th> </tr> <tr> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>SC4-1T</td> <td>Gray</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>SC4-2T</td> <td>Black</td> <td>6.5</td> <td>9.0</td> </tr> <tr> <td>SC4-3T</td> <td>Red</td> <td>8.5</td> <td>11.0</td> </tr> </tbody> </table>			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
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<p>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.</p>		<p>This is used when the wiring of fine 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.</p>																				

Schematic figure of mounted DIN rail



◆EMT1H accessories are shared with EMT1.

Bracket for mounting on vertical wall surface (horizontal mounting)

<p>8$\times$$\phi$5 fine differential pressure transmitter mounting hole</p> <p>ϕ30 (hole)</p> <p>135</p> <p>135</p> <p>1.6</p> <p>25</p> <p>55</p> <p>100</p> <p>110</p> <p>4$\times$$\phi$7 wall surface mounting hole</p>		<p>*Mounting screw is not included.</p> <p>0.5 m or more</p> <p>Vertical wall surface</p>
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 Shop Co., Ltd.**

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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
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