

## MS99S

Type examination pass No. TC22339X

RoHS

### Intrinsically safe fine differential pressure switch

**Explosion-proof performance**    **Ex ia IIC T6 Ga**

Intrinsically safe refers to a model with a structure designed in consideration of the necessary safety factor 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.

Be sure to use this instrument in combination with a safety holder (relay barrier). (Refer to page 45)



**Model MS99S**  
(Integrated base type)

#### <Main application fields>

- General factory management equipment
- Negative pressure for dust collector/differential pressure of air conditioner
- Filter pressure loss management
- Precision machine manufacturing line
- Building air conditioning control equipment

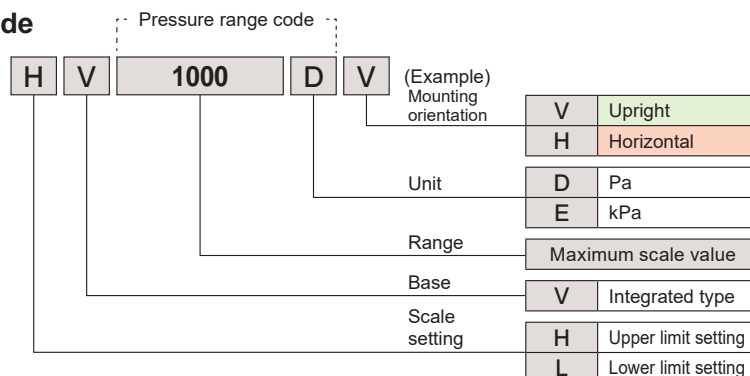
#### <Usage>

- 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

**MS99S**



◆When making an inquiry or placing an order, specify the above product code.

◆There is no intrinsically safe fine differential pressure switch of the exchangeable base type.

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Maintenance

### Specifications

Specifications	Integrated base type, for upper limit setting		Integrated base type, for lower limit setting	
	MS99SHV		MS99SLV	
<b>Pressure unit</b>	Pa, kPa	<b>Insulation resistance</b>  <b>Withstand voltage</b>  <b>Compatible pipe</b> <b>Terminal screw size</b> <b>Base polarity</b>  <b>Mass</b> <b>Accessories</b>  <b>Conforming standard</b> <b>Precautions</b>	Between terminal and case	20 MΩ or higher (500 V DC megger)
<b>Pressure measurement method</b>	Differential pressure method		Between terminal and case	1500 V AC 50/60 Hz for one minute
<b>Pressure-receiving element</b>	Diaphragm		Vinyl pipe or rubber pipe (inner diameter of 4 mm)	
<b>Contact material</b>	Silver alloy/gold plating		M4 (mountable terminal: outer diameter of φ8 or below)	
<b>Measured gas</b>	Air and noncorrosive gas (liquid cannot be measured)		Indicating high-pressure side and low-pressure side with "H" and "L" marks, respectively, at the piping connection base part.	
<b>Pressure setting method</b>	Setting by dial with scale			
<b>Mounting orientation</b>	Upright or horizontal		Approx. 190 g	
<b>Operating ambient temperature</b>	-10°C to +60°C (no freezing allowed)		Cable clamp (already installed on main body), rubber bushing (two types)	
<b>Operating ambient humidity</b>	90% RH or below (no condensation allowed)		RoHS directive	
<b>Exterior material</b>	Polycarbonate		When using this product in a combustible gas atmosphere, its structure must be intrinsically safe.	
<b>Durable vibration</b>	5 to 10 Hz, amplitude of 10 mm, 10 to 50 Hz, acceleration of 39 m/s <sup>2</sup> (two hours each for three axial directions)	When using this product, be sure to mount it by attaching the cover, cable clamp, and DIN rail mounting plate.		
<b>Durable impact</b>	100 m/s <sup>2</sup> (six times each for three axial directions)			

### Explosion-proof specifications

<b>Explosion-proof performance</b>	Intrinsically safe structure (Ex ia IIC T6 Ga)	<b>Internal inductance (Li)</b>	Ignorable value
<b>Applicable guidance</b>	Technical Guideline 2015 compliance with international standard JNIO SH-TR-46-1:2015 JNIO SH-TR-46-6:2015	<b>Internal capacitance (Ci)</b>	Ignorable value
<b>Intrinsically safe circuit tolerable voltage (Ui)</b>	14.4 V	<b>Equipment protection level (EPL)</b>	Ga
<b>Intrinsically safe circuit tolerable current (Ii)</b>	30 mA	<b>Protection level</b>	IP20
<b>Intrinsically safe circuit tolerable power (Pi)</b>	0.11 W	<b>Hazardous locations where this product can be installed*</b>	Special hazardous location Class I hazardous location Class II hazardous location

\*In all hazardous locations, positively prevent generation of spark, which could be an ignition source, due to impact or friction on this instrument.

Pressure range code	Pressure range	Mounting orientation <small>*It is necessary to specify the orientation at the time of order placement for all ranges.</small>	Scale setting accuracy (at 23°C)	Repeatability	Maximum operating pressure difference	Pressure-receiving element material	Withstanding pressures of instrument body and pressure-receiving element (Refer to page 118)
120 D	20–120 Pa	Horizontal or Upright	±5.0 Pa	±2.0 Pa	25.0 Pa	Silicone rubber	10 kPa
200 D	20–200 Pa		±9.0 Pa	±2.0 Pa	25.0 Pa		
300 D	30–300 Pa		±13.5 Pa	±3.0 Pa	30.0 Pa		
500 D	50–500 Pa		±22.5 Pa	±5.0 Pa	45.0 Pa		
1000 D	100–1000 Pa		±45 Pa	±10 Pa	70 Pa		
3 E	0.3–3 kPa		±0.135 kPa	±0.030 kPa	0.300 kPa		20 kPa
5 E	0.5–5 kPa		±0.225 kPa	±0.050 kPa	0.450 kPa		
10 E	1–10 kPa		±0.45 kPa	±0.10 kPa	0.70 kPa		
30 E	3–30 kPa		±1.35 kPa	±0.30 kPa	3.00 kPa		

◆ For an overview of the structure, refer to page 38.

◆ For contact and other materials, refer to page 42.

◆ For the use environment, refer to page 118.

### Opening/closing capability

Rated voltage	Specifications	Resistance load
12 V DC	Contact configuration SPDT (single-pole double-throw) Electric service life 100,000 times or more	30 mA

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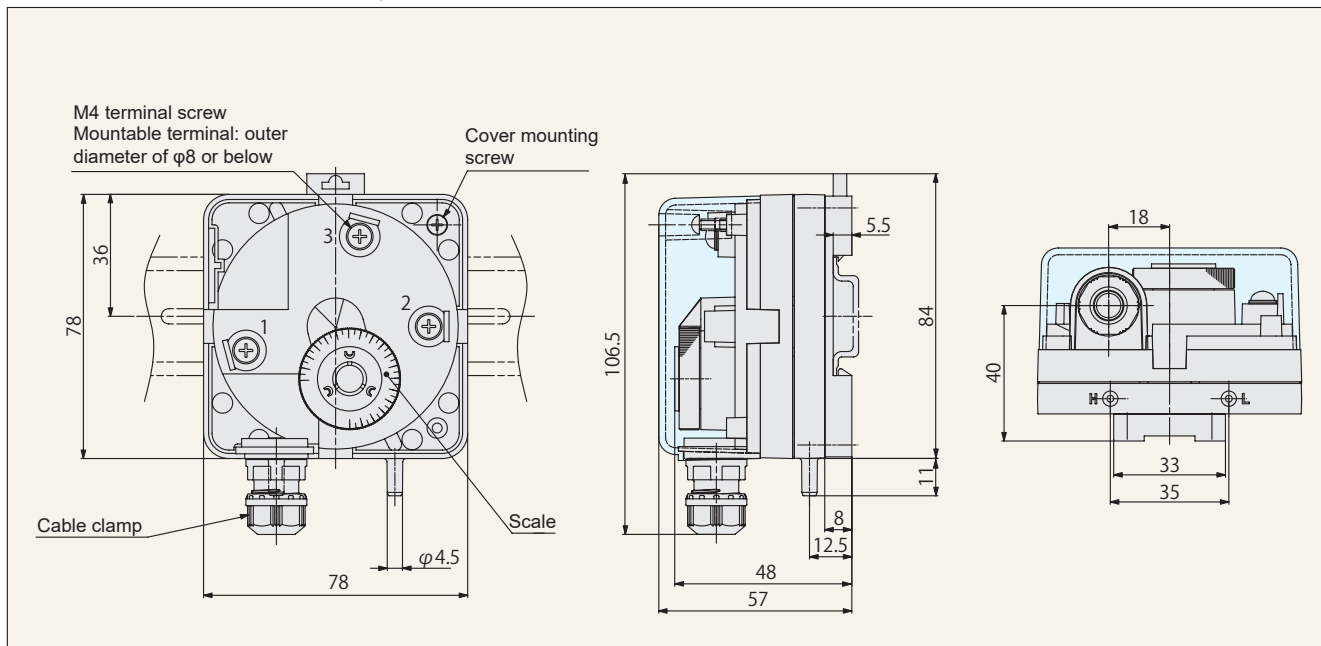
Accessories

Application

Precautions

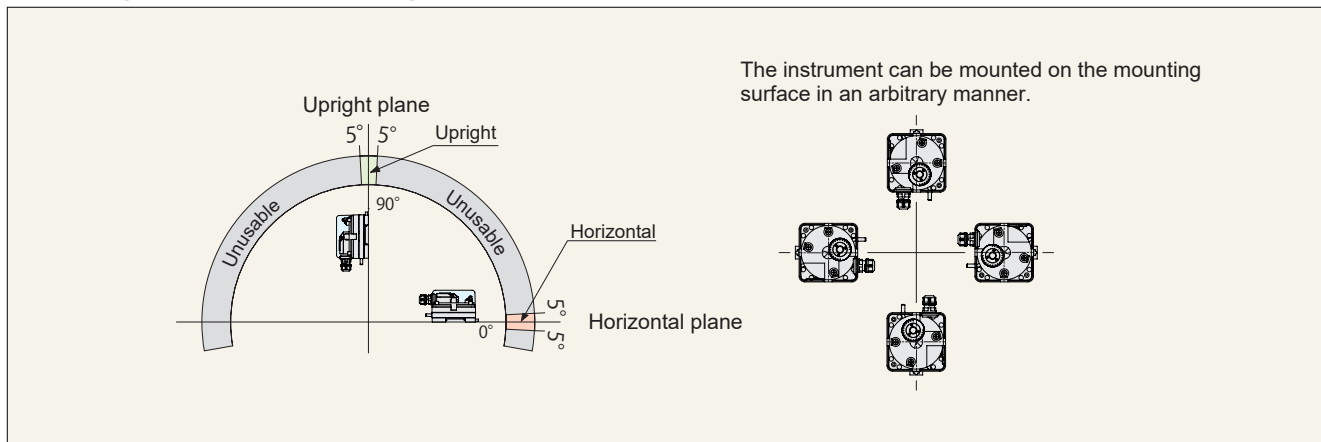
Maintenance

### External dimension drawing



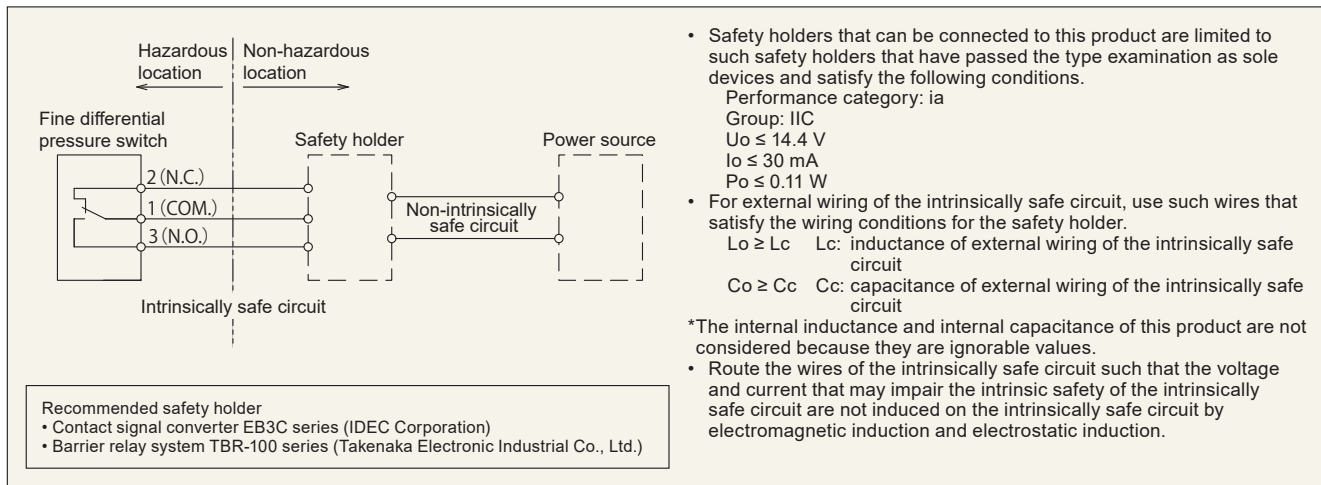
### Mounting orientation and range

It is necessary to specify the orientation at the time of order placement for all ranges.



The instrument can be mounted on the mounting surface in an arbitrary manner.

### Terminal connection part



### Accessories dedicated to MS99

RoHS

#### Cable clamp holder

(Auxiliary item)



This is already installed at the time of purchase of the instrument.

Item number	Material
ADPA-MS99	Polycarbonate

#### Cable clamp (Ohm Electric Co., Ltd.)

Mounting hole diameter:  $\phi 15$   
Mounting screw: M15 P=1

[Schematic figure of mounted cable clamp]

Only by changing the orientation of the transparent cover is it possible to change the wiring direction.



On the model MS99S, the OA-W15M-05 is equipped as standard, and rubber bushings OA-W15M-04 and OA-W15M-07 are attached as one each.

Item number	Compatible electric wire diameter	Material
OA-W15M-04	$\phi 2-4$	Nylon 66
OA-W15M-05	$\phi 3-5$	Polypropylene
OA-W15M-07	$\phi 5-7$	NBR



Caution

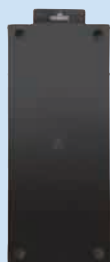
In mounting of the cable clamp to the instrument body, the supplied locknut is not used.

### Accessories dedicated to S type

RoHS

#### DIN rail mounting plate

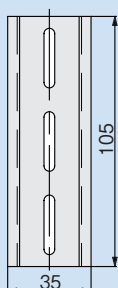
(Auxiliary item)



This is already installed at the time of purchase of the instrument.

Item number	Material
ADPL99S-DIN	Polyacetal/steel

#### DIN rail set



[Schematic figure of mounted DIN rail]



Item number	Material
DIN-99S	Aluminum/steel

## 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

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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  
TEL. +81-78-631-6000 FAX. +81-78-631-6020