Pressure Gauges with Electric Contact (Micro Switch Type)

OUTLINE

These are pressure gauges with electric contacts that incorporate a mechanical contact mechanism into an indicator. They generate ON and OFF electric signals at the preset pressure. This signal can activate a buzzer, bell, pilot lamp, or other alarm, or control motor, pump, control valve, or other process.

FEATURES

- **Pressure can be confirmed at the measurement site.**
- **Since the switching current is large, this type is suited for direct control of equipment.**
- **Indication after switching is also accurate because the elements are independent for indication and contacts.**
- **Microswitch system assures stable switching by snap action.**
- **Indication and setting scales are separate and can be arbitrarily set.**

＊When selecting the pressure range, select it so that the working pressure is within 30 to 65% of the pressure range. The recommended pressure setting range is 20 to 80% of the pressure range. Also verify that the wetted parts material is suitable for the gas or liquid to be measured.

SPECIFICATION 1

Fluid:
100 DIA., 150 DIA.·····Gas or liquid
(However, there shall be no freezing.)
200 DIA. ·····Gas

Operating environment:
Places where there are no inflammable liquids or gases which may cause ignition or explosion under normal conditions.

Size:
100DIA. (Models: JM11, 16), 150DIA. (Models: JM21, 26), 200DIA. (Modes: JM31, 36, 41, 46)

Mounting:
Stem ····· Type B (Mounting hole)
Panel mounted type ·· Type D (Mounting clamp, Mounting hole)

Connection:
G3/8B(PF), G1/2B(PF), R3/8(PT), R1/2(PT), 3/8NPT, 1/2NPT, Rc 1/4 (PT female JM26 receiver range only)
＊For other connections, please contact us.

Wetted parts materials:
General use
Socket CAC203
JM41: C3604BD
Bourdon tube (100 DIA., 150 DIA.)
C6872T or SUS316 (Depends on the pressure range.)
Bellows (200 DIA.)
C5212R
＊Available up to 35MPa range. (100 DIA., 150 DIA.)
Corrosion-proof use
Socket SUS316
Bourdon tube (100 DIA., 150 DIA.) SUS316
Bellows (200 DIA.) SUS316L

Pressure range:
0～1.5 kPa→ 0～100 MPa
-0.1～0→ -0.1～2 MPa
20～100 kPa (Receiver)
＊For details, please refer to the Minimum Graduations table in Specifications 2.

Operating temperature:
-5～40℃

Indication accuracy:
Within ±1.5%F.S. (Receiver range ±0.75%F.S.)

Setting accuracy:
Within ±3.0%F.S.

Contact accuracy:
Within ±1%F.S.

Dead band:
Fixed. Within 6～15%F.S. (Depends on the pressure range.)

Switch:
Microswitch

Number of contacts:
1 contact or 2 contacts (JM41 and 46 are one contact only.)

Setting system:
Internal adjustment
The front cover is removed and the setting pointer of the upper limit type is moved to the set point from the high pressure side and the setting pointer of the lower limit type is moved to the set point from the low pressure side by turning the adjusting screw on the front of the gauge with a screwdriver.
＊External adjustment is also available. (Option)

Outlet for electric wire:
100DIA. ·····Gland JIS 20b (4P receptacle)
150DIA., 200DIA. ··Gland JIS 20b (6P receptacle)

Case material & finish:
ADC12 or AC7A·Black

Case construction :
Drip-proof II type or drip-proof type (IP43)

Weight:
Approx. 1.4 kg～9.5 kg

SPECIFICATION 2

Electrical characteristics:

Rating					Withstand voltage	Insulation resistance
	Resistance load		Inductive load			
	100DIA.	150DIA., 200DIA.	100DIA.	150DIA., 200DIA.		
125V AC	5A	15A	3A	15A	1500V AC Between terminals and case for 1 minute	500V DC 100MΩ or over Between terminals and case
250V AC	5A	15A	3A	15A		
125V DC	0.4A	0.5A	0.4A	0.05A		
30V DC	5A	2A	3A	1A		
Power factor 0.4 or over (AC) ＊100DIA.: 0.7 or over (AC) Time constant 7ms or less (DC)						

Minimum graduation:

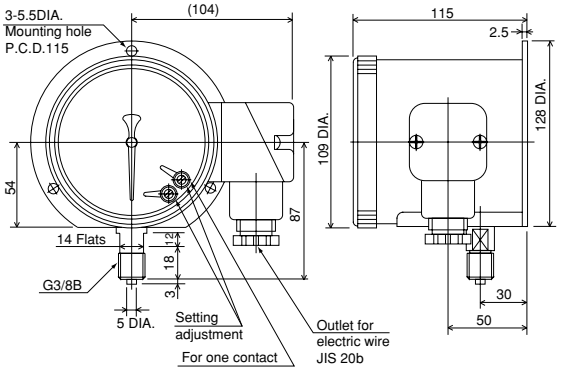
Size	Element	Pressure range	Min. indication	Min. setting scale		Dead band within % F.S.	
				100 DIA.	150 DIA.	100 DIA.	150 DIA.
100 DIA. 150 DIA.	Bourdon tube	20～100kPa				15	15
		0～0.1MPa	0.002MPa	0.01MPa	0.01MPa		
		～0.2	0.005	0.02	0.02		10
		～0.3	0.01	0.05	0.05	15	
		～0.4	0.01	0.05	0.05		8
		～0.6	0.02	0.1	0.1		
		～1	0.02	0.1	0.1		6
		～1.5	0.05	0.2	0.1	10	
		～2	0.05	0.2	0.2		
		～2.5	0.05	0.5	0.2		
		～3.5	0.1	0.5	0.5		
		～5	0.1	0.5	0.5		
		～7	0.2	1	1		
		～10	0.2	1	1		
		～15	0.5	2	1		
		～25	0.5	5	2		
		～35	1	5	5		
		～50	1	5	5		
		～70	2	10	10		
		～100	2	—	10	—	
		-0.1～0 MPa	0.002MPa	0.01	0.01	15	15
		-0.1～0.1	0.005	0.02	0.02		
		～0.2	0.01	0.05	0.05		10
		～0.3	0.01	0.05	0.05	15	
		～0.4	0.01	0.05	0.05		8
		～0.6	0.02	0.1	0.1		
		～1	0.02	0.1	0.1		6
		～1.5	0.05	0.2	0.2	10	
		～2	0.05	0.2	0.2		

Size	Element	Pressure range	Min. indication	Min. setting scale	Dead band within % F.S.
200 DIA. Low range	Bellows	0～ 5kPa	0.1 kPa	0.5kPa	10
		～7	0.2	0.5	
		～10	0.2	1	
		～15	0.5	1	
		～20	0.5	2	
		～30	1	2	8
		～40	1	5	
		～50	1	5	
		～70	2	5	
200 DIA. Medium low range	Bellows	0～1.5kPa	0.05kPa	0.1kPa	12
		～2	0.05	0.1	
		～3	0.1	0.2	
		～4	0.1	0.2	

DIMENSIONS

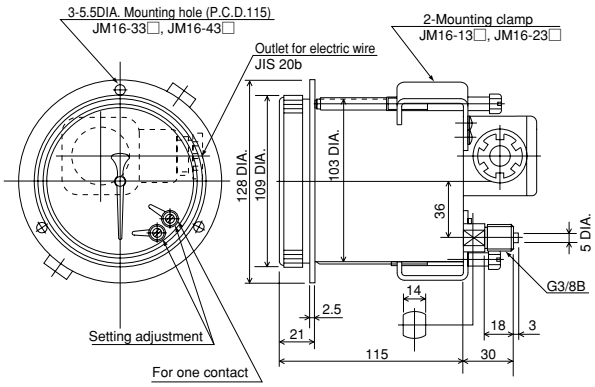
100 DIA.

Type B



JM11-□□□

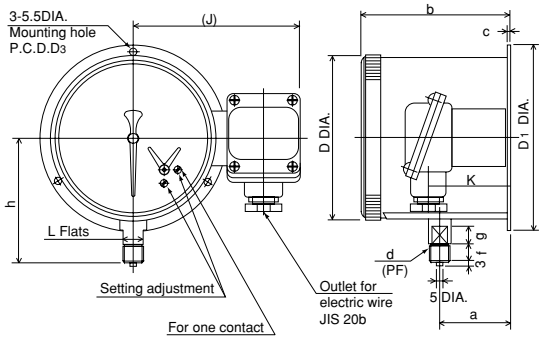
Type D



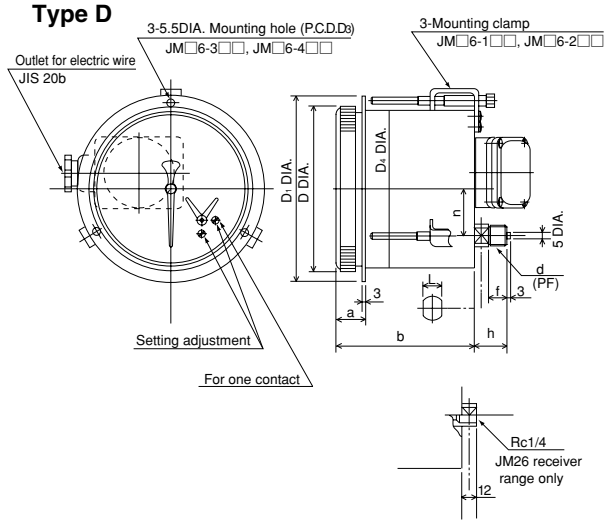
JM16-□□□

150 DIA., 200 DIA.

Type B



Type D



Model number	D	D_1	D_3	a	b	c	J	K	d	f	g	h	L
JM21-□□□	159	178	165	65	140	3	159	76	G3/8B	18	15	120	17
									G1/2B	20		122	
JM31-□□□	210	235	220	108	166	3	179	99	G3/8B	18	12	150	17
									G1/2B	20		152	17
JM41-□□□	210	235	220	135	212	5	179	163	G3/8B	18	12	150	14
									G1/2B	20		152	17

Model number	D	D_1	D_3	D_4	a	b	n	d	f	h	L
JM26-□□□	159	178	165	152	26	129.5	45	G3/8B	18	30	17
								G1/2B	20	32	17
JM36-□□□	210	235	220	203	27	166	45	G3/8B	18	32	14
								G1/2B	20	34	17
JM46-□□□	210	235	220	203	27	212	70	G3/8B	18	32	14
								G1/2B	20	34	17

REMARKS

1. As a sequencer input;

The contact resistance of the microswitch increases gradually as time passes.

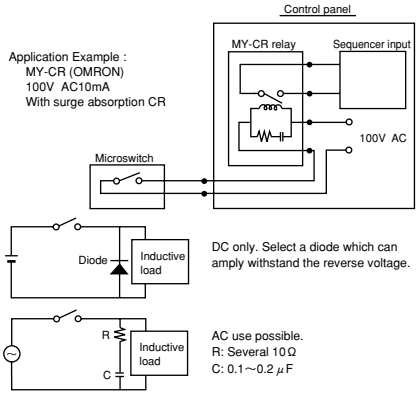
When used in an atmosphere, especially atmospheres containing Si, SiO_2 accumulates at the contact part as the switch is operated and the contact resistance increases in a short time. Therefore, use the gauge in a clean and well-ventilated atmosphere.

When the gauge is used as sequencer input for control use, input it through a 100V AC relay, because the contacts may be fail for these reasons.

2. Insertion of contact protection circuit

With an inductive load switching circuit, insert a protection circuit to protect the contacts.

When using a relay, select the type with a built-in contact protection circuit.



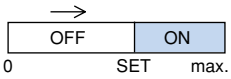
Pressure Gauges with Electric Contact (Micro Switch Type)

TYPE OF CONTACTS AND WIRING SYSTEM

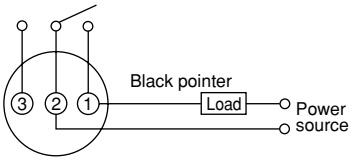
1. Upper limit type with one contact H

* When the pressure rises to the set pressure, the contacts operate and turn ON the circuit.

Operation



Wiring



Wiring ②—③ reverses ON and OFF at the set point.

Note
When using with lower limit type contacts, correct the setting by the amount of the dead band.

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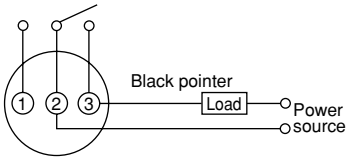
2. Lower limit type with one contact L

* When the pressure drops to the set pressure, the contacts operate and turn ON the circuit.

Operation

Wiring



Wiring ①—② reverses ON and OFF at the set point.

Note
When using with upper limit type contacts, correct the setting by the amount of the dead band.

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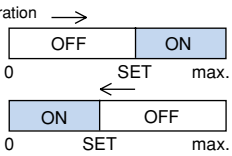
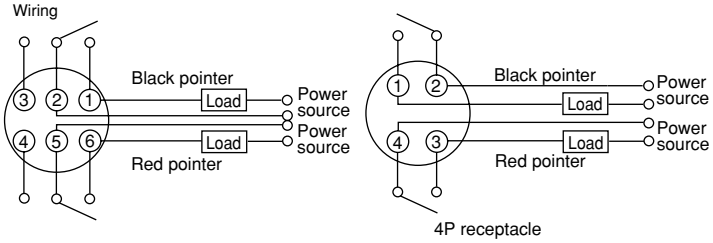
3. Upper and lower limit type with two contacts HL

This type combines the upper limit type and lower limit type. Each type operates independently.

Operation



Wiring



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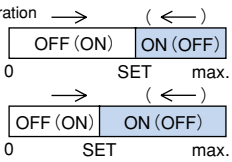
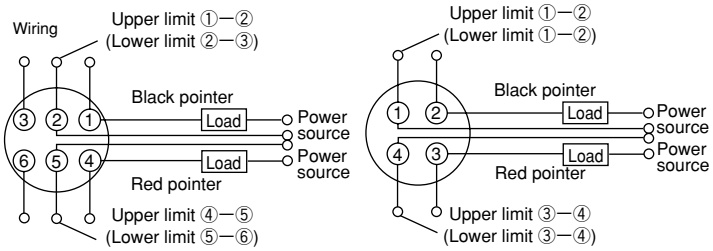
4. Upper limit type (lower limit type) with two contacts 2H (2L)

This type combines two upper limit types and two lower limit types. Each operates independently.

Operation



Wiring



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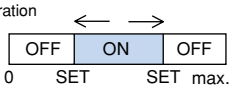
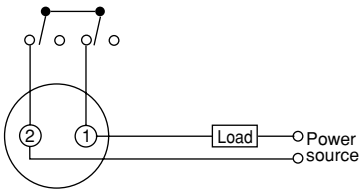
5. Center setting type with two contacts HLR

This type connects an upper limit type and a lower limit type in series. When the two contact points turn ON simultaneously, the circuit turns ON.

Operation



Wiring



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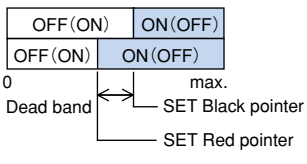
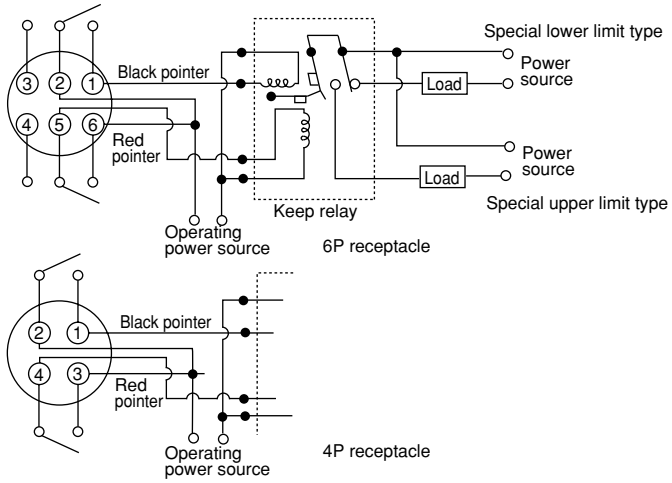
6. Special upper limit type and special lower limit type with two contacts SH, SL

This type combines the upper limit type and lower limit types. A difference (dead band) is provided at the operating point when the pressure increases and decreases.

Operation



Wiring



Model number configuration

For ordering, please specify the model number, each specs and range.

J	M	1		—				—				0	7			×	×	×	×	×	
Pressure Gauges with Electric Contact (Micro Switch Type) (100DIA. Low range)					①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Model		Selective spec.	Additional spec. (Option)

Model		
	1	Stem
	6	Panel mounted type

① Mounting		Stem	Panel mounted type
	1	Type B (Mounting hole) One contact	Type D (Mounting clamp) One contact
	2	Type B (Mounting hole) Two contacts	Type D (Mounting clamp) Two contacts
	3	————	Type D (Mounting hole) One contact
	4	————	Type D (Mounting hole) Two contacts

② Connection		
	3	G3/8B
	G	R3/8
	L	3/8NPT

③ Wetted parts materials		
	1	General use (Available up to 35MPa range) Socket: CAC203 or C3604BD Bourdon tube: C6872T or SUS316 Bellows: C5212R
	3	Corrosion-proof use Socket: SUS316 Bourdon tube: SUS316 Bellows: SUS316L

④ Pressure range (MPa) (When ordering, please specify the range and units separately.)		
	1	20～100 kPa Receiver
	2	-0.1～0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2, -0.1～0
	3	0～0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2, 2.5, 3.5
	4	0～5, 7, 10
	5	0～15, 25, 35
	6	0～50, 70

⑤ Contact		
	A	H: Upper limit type with 1 contact
	B	L: Lower limit type with 1 contact
	C	HL: Upper and lower limit type with 2 contacts
	D	2H: Upper limit type with 2 contacts
	E	2L: Lower limit type with 2 contacts
	Q	HLR: Center part setting type
	R	SH: Special upper limit type
	S	SL: Special lower limit type

⑥ Switch		
	0	Standard (JIS C4505)

⑦ Outlet for electric wire		
	7	Gland JIS 20b

⑧ Treatment		
	0	Nil
	1	Use no oil
	2	Use no water
	3	Use no oil & water

⑨ Other additional specifications		
	0	Nil
	1	Required (Please specify the desired documents separately.) External adjustment type, dial scale specification

⑮ Documents		
	0	Nil
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill sheet, test report (1 pc 1 copy), traceability certificate, inspection certificate, standard inspection report, dialstrength calculation, attended inspection

Manufacturing range
・Indication accuracy: ±1.5%F.S.
Receiver: ±0.75%F.S.
・Setting accuracy: ±3%F.S.

○Setting dial includes the setting error. Therefore, for accurate adjustment, always compare with a master gauge and base pressure gauge and set.

Specify "X" if there is no specification item.

Pressure Gauges with Electric Contact (Micro Switch Type)

Model number configuration

For ordering, please specify the model number, each specs and range.

J	M	2	□	—	①	②	③	—	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
												7			×	×	×	×	×	

Pressure Gauges with Electric Contact (Micro Switch Type) (150DIA. Low range)

Model		Selective spec.	Additional spec. (Option)
Model	1	Stem	
	6	Panel mounted type	

① Mounting		Stem	Panel mounted type
	1	Type B (Mounting hole) One contact	Type D (Mounting clamp) One contact
	2	Type B (Mounting hole) Two contacts	Type D (Mounting clamp) Two contacts
	3	————	Type D (Mounting hole) One contact
	4	————	Type D (Mounting hole) Two contacts

② Connection	
3	G3/8B
4	G1/2B
G	R3/8
H	R1/2
L	3/8NPT
M	1/2NPT
7	Rc1/4 (JM26 receiver range only)

③ Wetted parts materials	
1	General use (Available up to 35MPa range) Socket: CAC203 or C3604BD Bourdon tube: C6872T or SUS316 Bellows: C5212R
3	Corrosion-proof use Socket: SUS316 Bourdon tube: SUS316 Bellows: SUS316L

④ Pressure range (MPa) (When ordering, please specify the range and units separately.)	
1	20～100 kPa Receiver
2	-0.1～0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2, -0.1～0
3	0～0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2, 2.5, 3.5
4	0～5, 7, 10
5	0～15, 25, 35
6	0～50, 70
7	0～100

⑤ Contact	
A	H: Upper limit type with 1 contact
B	L: Lower limit type with 1 contact
C	HL: Upper and lower limit type with 2 contacts
D	2H: Upper limit type with 2 contacts
E	2L: Lower limit type with 2 contacts
Q	HLR: Center part setting type
R	SH: Special upper limit type
S	SL: Special lower limit type

⑥ Switch	
0	Standard (JIS C4505)
3	Standard + Gold plated

⑦ Outlet for electric wire	
7	Gland JIS 20b

⑧ Treatment	
0	Nil
1	Use no oil
2	Use no water
3	Use no oil & water

⑨ Other additional specifications	
0	Nil
1	Required (Please specify the desired documents separately.) External adjustment type, dial scale specification

⑮ Documents	
0	Nil
1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill sheet, test report (1 pc 1 copy), traceability certificate, inspection certificate, standard inspection report, dialstrength calculation, attended inspection

Manufacturing range
・Indication accuracy: ±1.5%F.S.
Receiver: ±0.75%F.S.
・Setting accuracy: ±3%F.S.

○Setting dial includes the setting error. Therefore, for accurate adjustment, always compare with a master gauge and base pressure gauge and set.

Specify "X" if there is no specification item.

Model number configuration

For ordering, please specify the model number, each specs and range.

J	M	3		—				—	1			7			×	×	×	×	×	
Pressure Gauges with Electric Contact (Micro Switch Type) (200DIA. Low range)					①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Model		Selective spec.	Additional spec. (Option)
Model	1	Stem	
	6	Panel mounted type	

① Mounting		Stem	Panel mounted type
	1	Type B (Mounting hole) One contact	Type D (Mounting clamp) One contact
	2	Type B (Mounting hole) Two contacts	Type D (Mounting clamp) Two contacts
	3	————	Type D(Mounting hole) One contact
	4	————	Type D (Mounting hole) Two contacts

② Connection	
3	G3/8B
4	G1/2B
G	R3/8
H	R1/2
L	3/8NPT
M	1/2NPT

③ Wetted parts materials	
1	一般用 株：CAC203又はC3604BD　ブルドン管：C6872T又はSUS316 ベローズ：C5212R
3	耐食用 株：SUS316　ブルドン管：SUS316　ベローズ：SUS316L

④ Pressure range (kPa) (When ordering, please specify the range and units separately.)	
1	0〜5, 7, 10, 15, 20, 30, 40, 50, 70

⑤ Contact	
A	H: Upper limit type with 1 contact
B	L: Lower limit type with 1 contact
C	HL: Upper and lower limit type with 2 contacts
D	2H: Upper limit type with 2 contacts
E	2L: Lower limit type with 2 contacts
Q	HLR: Center part setting type
R	SH: Special upper limit type
S	SL: Special lower limit type

⑥ Switch	
0	Standard (JIS C4505)
1	Ultra high sensitivity type
3	Standard + Gold plated

⑦ Outlet for electric wire	
7	Gland JIS 20b

⑧ Treatment	
0	Nil
1	Use no oil
2	Use no water
3	Use no oil & water

⑨ Other additional specifications		
	0	Nil
	1	Required (Please specify the desired documents separately.) External adjustment type, dial scale specification

⑮ Documents		
	0	Nil
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill sheet, test report (1 pc 1 copy), traceability certificate, inspection certificate, standard inspection report, dialstrength calculation, attended inspection

Manufacturing range
・Indication accuracy: ±1.5%F.S.
・Setting accuracy: ±3%F.S.

○Setting dial includes the setting error. Therefore, for accurate adjustment, always compare with a master gauge and base pressure gauge and set.

Specify "X" if there is no specification item.

Pressure Gauges with Electric Contact (Micro Switch Type)

Model number configuration

For ordering, please specify the model number, each specs and range.

J M 4		—				—	1			7			×	×	×	×	×	
Pressure Gauges with Electric Contact (Micro Switch Type)(200DIA. Medium low range)			①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Model		Selective spec.	Additional spec. (Option)
Model	1	Stem	
	6	Panel mounted type	

① Mounting		Stem	Panel mounted type
	1	Type B (Mounting hole) One contact	Type D (Mounting clamp) One contact
	3	————	Type D (Mounting hole) One contact

② Connection	
3	G3/8B
4	G1/2B
G	R3/8
H	R1/2
L	3/8NPT
M	1/2NPT

③ Wetted parts materials	
1	General use Socket: CAC203 or C3604BD Bourdon tube: C6872T or SUS316 Bellows: C5212R
3	Corrosion-proof use Socket: SUS316 Bourdon tube: SUS316 Bellows: SUS316L

④ Pressure range (kPa)	
1	0～1.5, 2, 3, 4

(When ordering, please specify the range and units separately.)

⑤ Contact	
A	H: Upper limit type with 1 contact
B	L: Lower limit type with 1 contact

⑥ Switch	
0	Standard (JIS C4505)
1	Ultra high sensitivity type
3	Standard + Gold plated

⑦ Outlet for electric wire	
7	Gland JIS 20b

⑧ Treatment	
0	Nil
1	Use no oil
2	Use no water
3	Use no oil & water

⑨ Other additional specifications		
	0	Nil
	1	Required (Please specify the desired documents separately.) External adjustment type, dial scale specification

⑮ Documents		
	0	Nil
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill sheet, test report (1 pc 1 copy), traceability certificate, inspection certificate, standard inspection report, dialstrength calculation, attended inspection

Manufacturing range
・Indication accuracy: ±1.5%F.S.
・Setting accuracy: ±3%F.S.

○Setting dial includes the setting error. Therefore, for accurate adjustment, always compare with a master gauge and base pressure gauge and set.

Specify "X" if there is no specification item.

NAGANO KEIKI CO., LTD.

Gets ISO 9001, ISO 14001, ISO／TS 16949 Certification

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