

JM_2 • _7

Pressure Switch with Electric Contact (Micro Switch Type)



Overview

This pressure switch with electric contacts incorporates mechanical switch function. ON/OFF electrical switch action utilizes Buzzer, Bell, Pilot lamp warning system and motor, pump and control valve process control.

Features

- Direct control of device possible with large switching current
- Accurate switch action possible with independent pressure sensing element
- Micro switch assures stable snap action switching
- Larger setting dial than Pressure Gauge with Electric Contact (JM□1•□6) to enable detailed setting

Recommended pressure setting range

Upper limit: (10%F.S. + deadband) to 90%F.S.
Lower limit: 10%F.S. to (90%F.S. - deadband)
%F.S. refers max.P. for receiver range.

*To maximize performance, select full scale pressure range to indicate normal operating pressure which comes to 30 to 65% of full scale. Recommended switch operating setting range is 25 to 75% of full scale.

Specifications 1

Item	Description								
Media	<p>φ 150 ······Gases or liquids (Non-freezing)</p> <p>φ 200 ······Gases</p>								
Operating environment	Install in location where no gases or liquids may exist that have the potential to become flammable or ignitable under normal operating condition								
Size	<p>φ 150 (Model: JM22 · 27)</p> <p>φ 200 (Model: JM32 · 37)</p>								
Type	<p>Stem ·····  B type (Mounting hole)</p> <p>Panel ·····  D type (Mounting clamp · Mounting hole)</p>								
Connection	<p>G3/8B, G1/2B, R3/8, R1/2, 3/8NPT, 1/2NPT, Rc1/4 (For JM27 receiver only)</p> <p>*Consult us for other nonstandard connections.</p>								
Wetted parts	<table border="0"> <tr> <td>General type</td> <td>Corrosion resistant type</td> </tr> <tr> <td>Socket CAC203</td> <td>Socket SCS14 SUS316 for JM37</td> </tr> <tr> <td>Bourdon tube (φ 150) C5191T, C6872T or SUS316 (Varies depending on pressure ranges)</td> <td>Bourdon tube (φ 150) SUS316</td> </tr> <tr> <td>Bellows (φ 200) C5212R</td> <td>Bellows (φ 200) SUS316L</td> </tr> </table>	General type	Corrosion resistant type	Socket CAC203	Socket SCS14 SUS316 for JM37	Bourdon tube (φ 150) C5191T, C6872T or SUS316 (Varies depending on pressure ranges)	Bourdon tube (φ 150) SUS316	Bellows (φ 200) C5212R	Bellows (φ 200) SUS316L
General type	Corrosion resistant type								
Socket CAC203	Socket SCS14 SUS316 for JM37								
Bourdon tube (φ 150) C5191T, C6872T or SUS316 (Varies depending on pressure ranges)	Bourdon tube (φ 150) SUS316								
Bellows (φ 200) C5212R	Bellows (φ 200) SUS316L								
Pressure range	<p>0 to 5kPa→0 to 100MPa</p> <p>-5 to 0kPa→-0.1 to 2MPa</p> <p>20 to 100kPa (Receiver)</p> <p>*Refer to Specification 2 for more detail.</p>								
Operating temperature range	-5 to 40°C								
Setting accuracy	Within ±3%F.S. (Receiver range: Within ±3%max.P.)								
Switch accuracy	Within ±1%F.S. (Receiver range: Within ±1%max.P.)								
Deadband	Specifications 2								
Switch	Micro switch								
Number of contacts	One contact or two contacts								
Setting method	<p>Internally adjustable</p> <p>*External adjustable type also available. (Option)</p>								
Electrical wire outlet	<p>Conduit type G3/4 female (Standard), Others</p> <p>Gland JIS 20b (Standard), Others</p>								
Case material · finish	ADC12 or AC7A · Black								
Enclosure rating	Drip-proof type (Equivalent to IP43)								
Weight	Approx. 1.4kg to 9.5kg								

Specifications 2

Electrical rating: (Standard)

	Rating		Withstand voltage	Insulation resistance
	Resistance load	Inductive load		
125V AC	15 A	15 A	1500V AC Between terminal and case 1 minute	500V DC 100MΩ and above Between terminal and case
250V AC	15 A	15 A		
30V DC	2 A	1 A		
125V DC	0.5 A	0.05 A		
· Inductive load: Power factor 0.4 and above (AC) Time constant 7ms and below (DC)				

Specifications 3

How to select effective operating pressure range

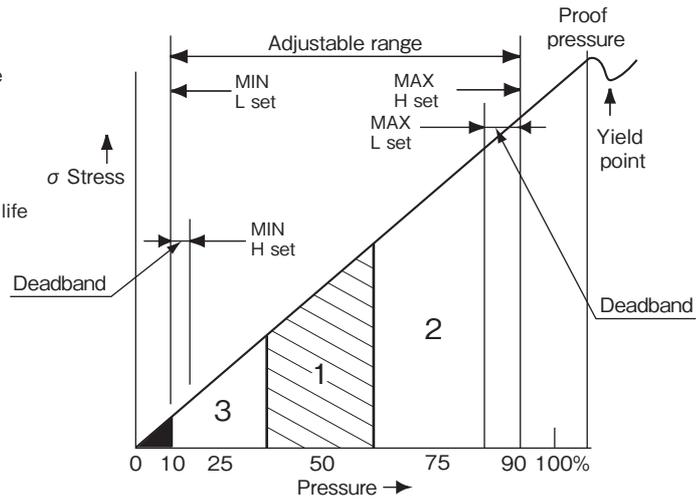
- Set value is accurate and stable: 30% F.S. and above
- Maintain long life: 65%F.S. and below
- Set value is accurate maintaining long life (ideal): 30 to 65% of adjustable range

In the right figure

- Range 1. Effective range both for accuracy and long life
- Range 2. Effective range for maintaining accuracy
- Range 3. Effective range for maintaining long life

Recommended pressure setting range

- Upper limit: (10%F.S.+deadband) to 90%F.S.
- Lower limit: 10%F.S. to (90%F.S.-deadband)
- %F.S. refers max.P. for receiver range.
- Select rated pressure range considering that switch operating point at $\pm 5\%$ F.S. around zero is likely to become unstable.



Minimum scale :

Size	Pressure sensing element	Pressure range	Minimum scale for switch setting dial	Deadband % F.S.
φ150	 Bourdon tube type	20 to 100kPa	0.005MPa	15
		0 to 0.1MPa	0.005	
		to 0.2	0.01	10
		to 0.3	0.02	
		to 0.4	0.02	8
		to 0.6	0.05	
		to 1	0.05	6
		to 1.5	0.1	
		to 2	0.1	
		to 2.5	0.1	
		to 3.5	0.2	
		to 5	0.2	
		to 7	0.5	
		to 10	0.5	
		to 15	1	
		to 25	1	
		to 35	2	
		to 50*	2	
		to 70*	5	
		to 100*	5	
		-0.1 to 0 MPa	0.005	15
		to 0.1	0.01	
		to 0.2	0.02	10
		to 0.3	0.02	
to 0.4	0.02	8		
to 0.6	0.05			
to 1	0.05	6		
to 1.5	0.1			
to 2	0.1			

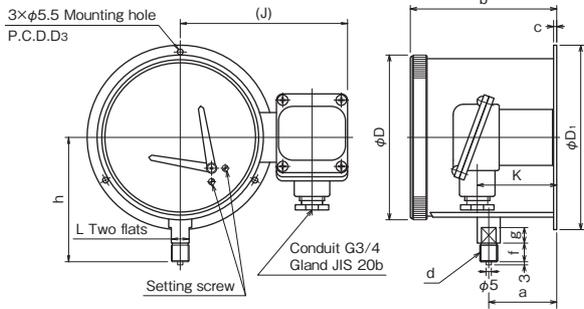
* Corrosion resistant use only

Size	Pressure sensing element	Pressure range	Minimum scale for switch setting dial	Deadband % F.S.
φ200 Low pressure range	 Bellows type	0 to 5kPa	0.2kPa	10
		to 7	0.5	
		to 10	0.5	
		to 15	1	
		to 20	1	8
		to 30	2	
		to 40	2	
		to 50	2	
to 70	5			

Dimensions

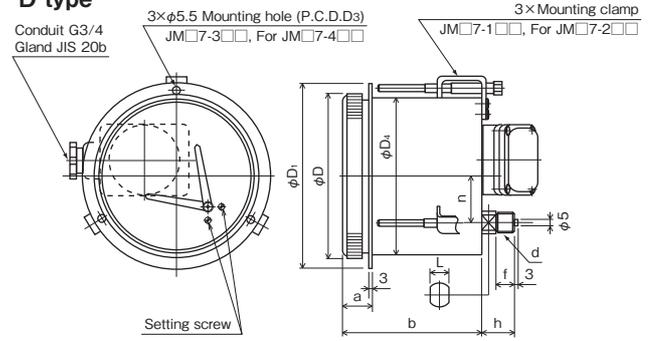
Unit: mm

B type

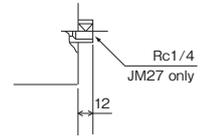


JM□2-□□□

D type



JM□7-□□□



Model number	D	D ₁	D ₃	a	b	c	J	K	d	f	g	h	L
JM22-□□□	159	178	165	65	140	3	159	76	G3/8B	18	15	120	17
									G1/2B	20		122	
JM32-□□□	210	235	220	108	166	3	179	99	G3/8B	18	12	150	17
									G1/2B	20		152	

Model number	D	D ₁	D ₃	D ₄	a	b	n	d	f	h	L
JM27-□□□	159	178	165	152	26	129.5	45	G3/8B	18	30	17
								G1/2B	20	32	
JM37-□□□	210	235	220	203	27	166	45	G3/8B	18	32	14
								G1/2B	20	34	

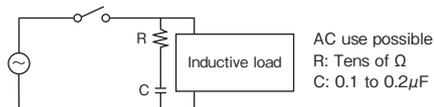
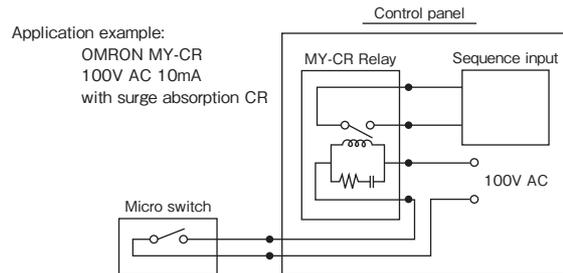
Attention

1. As for sequencer input

The contact resistance of micro switch increases as time passes especially in short period for use in atmosphere including Si with SiO₂ accumulation as switch operates. Ensure the use in clean and well-ventilated atmosphere. When the pressure switch is used as sequencer input as controller, input it through 100V AC relay because of failure for the reason.

2. Insertion of contact protection circuit

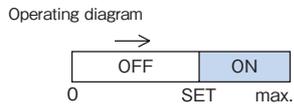
Insert protection circuit to protect contact with inductive load switching circuit. When using relay, specify contact protection circuit built-in type.



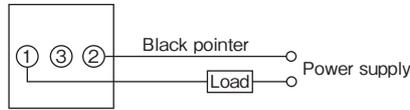
Switch action and wiring

1. Upper limit H

*When pressure goes up and reaches at set point, switch operates and turn circuit ON.

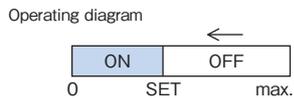


Wiring diagram

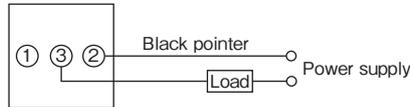


2. Lower limit L

*When pressure goes down and reaches at set point, switch operates and turn circuit ON.

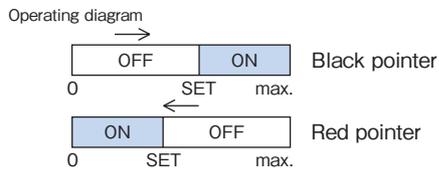


Wiring diagram

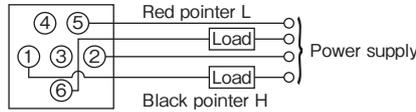


3. Upper and lower limit with two contacts HL

Independently operates with combination of upper and lower limit.

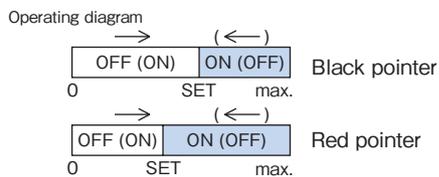


Wiring diagram

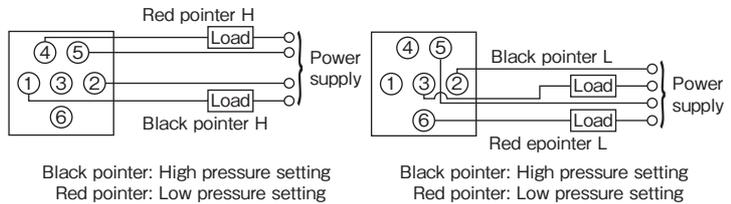


4. Upper limit with two contacts (2H)

Independently operates with combination of two upper limits.

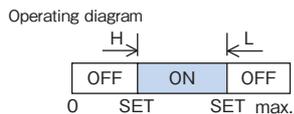


Wiring diagram

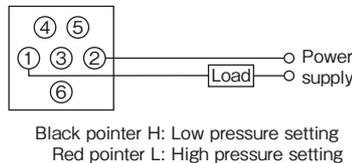


5. Center setting type with two contacts HLR

Upper and lower limit type connected with series system when two contacts are ON the circuit is also turned on.



Wiring diagram



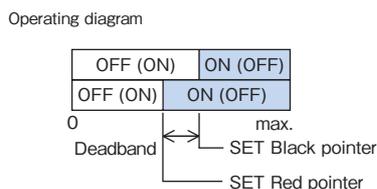
6. Special upper limit type (Special lower limit type) with two contacts SH (SL)

Upper and lower limit (HL) with combination of keep relay generating difference of operating point

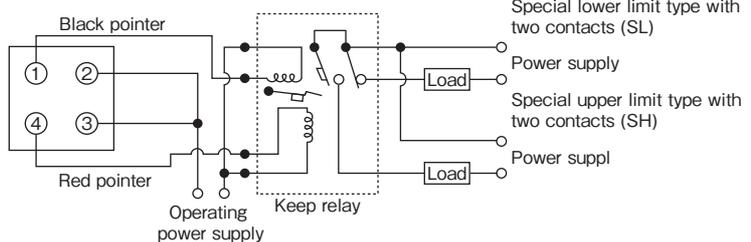
(deadband) when pressure increased / decreased.

Keep relay: Option (Accessory)

Specify operating power supply voltage and power supply voltage.



Wiring diagram



Model number configuration

Please specify for ordering the model number and each specs.

Model



Pressure Switch with Electric Contact (Micro Switch Type) (φ 150)

Model number		Product specifications	Additional specifications (Optional)
Mounting	2	Stem	
	7	Panel	
① Type	1	B type (Mounting hole) One contact	D type (Mounting clamp) One contact
	2	B type (Mounting hole) Two contacts	D type (Mounting clamp) Two contacts
	3	_____	D type (Mounting hole) One contact
	4	_____	D type (Mounting hole) Two contacts
② Connection	3	G3/8B	M 1/2NPT
	4	G1/2B	T Rc1/4 (N/A for JM27 receiver range)
	G	R3/8	7 Rc1/4 (JM27 receiver range only)
	H	R1/2	Others
	L	3/8NPT	
③ Wetted parts	1	General use (Available up to 35MPa range) Socket: CAC203 Bourdon tube: C5191T, C6872T or SUS316	
	3	Corrosion resistant Socket: SCS14 Bourdon tube: SUS316	
④ Pressure range (MPa)	1	20 to 100kPa Receiver	
	2	-0.1 to 0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2 Compound range, -0.1 to 0	
	3	0 to 0.1, 0.2, 0.3, 0.4, 0.6, 1, 1.5, 2, 2.5, 3.5	
	4	0 to 5, 7, 10	
	5	0 to 15, 25, 35	
	6	0 to 50, 70	
	7	0 to 100	
⑤ Contact	A	H: Upper limit with one contact	
	B	L: Lower limit with one contact	
	C	HL: Upper and lower limit with two contacts	
	D	2H: Upper limit with two contacts	
	E	2L: Lower limit with two contacts	
	Q	HLR: Center setting type	
	R	SH: Special upper limit (When keep relay is in use)	
	S	SL: Special lower limit (When keep relay is in use)	
	Others		
⑥ Switch	0	Standard	
	1	Ultra high sensitive type	
	3	Standard + Gold plated	
	4	Ultra high sensitive type + Gold plated	
⑦ Electrical wire outlet	Conduit type		
	C	G3/4 female (Standard)	
		Others	
	Gland type		
7	JIS 20b (Standard)		
	Others		
⑧ Window	0	Inorganic glass (Standard)	
	1	Organic glass	
	2	Tempered glass	
	3	Non-glare coated glass	
	6	Non-frost coated glass	
	7	Plugged external adjustment	
	8	Knob external adjustment	
		Others	
	9		
⑨ Treatment	0	Not required	
	1	Use no oil	
	2	Use no water	
⑩ Other additional spec.	3	Use no oil & water	
	0	Not required	
	1	Custom dial	
⑮ Documents	0	Not required	
	1	Required (Documents available upon request) Datasheet (Drawing / Specifications) Instruction manual Inspection procedure Mill test report Calibration test report (One-part one sheet) Inspection / Traceability certificate dialstrength calculation attended inspection	

Please specify pressure range and unit of measure along with corresponding ordering code.

[Scope of manufacturing]
 • Setting accuracy: ±3%F.S.
 • Switch accuracy: ±1%F.S.
 • Treatment: Available up to 50MPa range (Use no water available up to 70MPa)

Recommended pressure setting range
 Upper limit: (10%F.S. + deadband) to 90%F.S.
 Lower limit: 10%F.S. to (90%F.S. - deadband)
 %F.S. refers max.P. for receiver range.

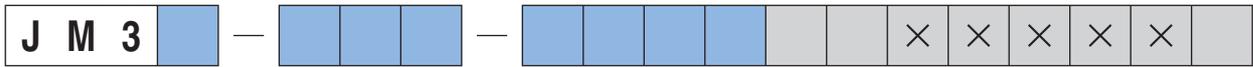
○ As setting scale on dial includes setting error, ensure the use of master gauge and reference pressure gauge to maintain accurate setting.

* Specify code "X" to refer N/A

Model number configuration

Please specify for ordering the model number and each specs.

Model



Pressure Switch with Electric Contact (Micro Switch Type) (φ200)

Model number		Product specifications	Additional specifications (Optional)
Mounting	2	Stem	
	7	Panel	
① Type	Stem		Panel
	1	B type (Mounting hole) One contact	D type (Mounting clamp) One contact
	2	B type (Mounting hole) Two contacts	D type (Mounting clamp) Two contacts
	3	—————	D type (Mounting hole) One contact
② Two contacts	3	G3/8B	
	4	G1/2B	
	G	R3/8	
	H	R1/2	
	L	3/8NPT	
	M	1/2NPT	
③ Wetted parts	1	General use	Socket: CAC203 Bellows: C5212R
	3	Corrosion resistant	Socket: SCS14 (JM32), SUS316 (JM37) Bellows: SUS316L
④ Pressure range (kPa)	1	0 to 5, 7, 10, 15, 20, 30, 40, 50, 70	
	2	-5 to 0, -7, -10, -15, -20, -30, -40, -50, -70	
	9	Compound range	
⑤ Contact	A	H: Upper limit with one contact	
	B	L: Upper and lower limit with two contacts	
	C	HL: Upper and lower limit with two contacts	
	D	2H: Upper limit with two contacts	
	E	2L: Lower limit with two contacts	
	Q	HLR: Center setting type	
	R	SH: Special upper limit (When keep relay is in use)	
	S	SL: Special lower limit (When keep relay is in use)	
⑥ Switch	0	Standard	
	1	Ultra high sensitive type	
	3	Standard + Gold plated	
	4	Ultra high sensitive type + Gold plated	
⑦ Electrical wire outlet	Conduit type		
	C	G3/4 female (Standard)	
		Others	
⑧ Window	Gland type		
	7	JIS 20b (Standard)	
⑨ Treatment	Others		
	0	Inorganic glass (Standard)	
	1	Organic glass	
	2	Tempered glass	
	3	Non-glare coated glass	
	6	Non-frost coated glass	
	7	Plugged external adjustment	
	9	Others	
	⑩ Other additional spec.	0	Not required
1		Custom dial	
⑪ Documents	0	Not required	
	1	Required (Documents available upon request) Datasheet (Drawing / Specifications) Instruction manual Inspection procedure Mill test report Calibration test report (One-part one sheet) Inspection / Traceability certificate dial strength calculation attended inspection	

Please specify pressure range and unit of measure along with corresponding ordering code.

[Scope of manufacturing]
 • Setting accuracy: ±3%F.S.
 • Switch accuracy: ±1%F.S.

Recommended pressure setting range
 Upper limit: (10%F.S. + deadband) to 90%F.S.
 Lower limit: 10%F.S. to (90%F.S. - deadband)
 %F.S. refers max.P. for receiver range.

○ As setting scale on dial includes setting error, ensure the use of master gauge and reference pressure gauge to maintain accurate setting.

* Specify code "X" to refer N/A