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	φ150 ·····Gases or liquids (Non-freezing) φ200 ·····Gases
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	φ150 (Model: JM22・27) φ200 (Model: JM32・37)
Type	Stem····  B type (Mounting hole) Panel····  D type (Mounting clamp・Mounting hole)
Connection	G3/8B, G1/2B, R3/8, R1/2, 3/8NPT, 1/2NPT, Rc1/4 (For JM27 receiver only) ＊Consult us for other nonstandard connections.
Wetted parts	General type Socket CAC203 Bourdon tube (φ150) C5191T, C6872T or SUS316 (Varies depending on pressure ranges) Bellows (φ200) C5212R Corrosion resistant type Socket SCS14 SUS316 for JM37 Bourdon tube (φ150) SUS316 Bellows (φ200) SUS316L
Pressure range	0 to 5kPa→0 to 100MPa -5 to 0kPa→-0.1 to 2MPa 20 to 100kPa (Receiver) ＊Refer to Specification 2 for more detail.
Operating temperature range	-5 to 40℃
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	Internally adjustable ＊External adjustable type also available. (Option)
Electrical wire outlet	Conduit type G3/4 female (Standard), Others Gland JIS 20b (Standard), Others
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)

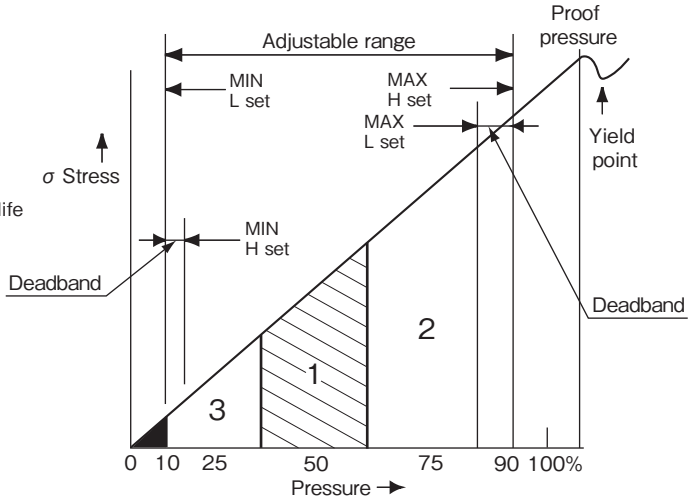
Rating			Withstand voltage	Insulation resistance
	Resistance load	Inductive load		
125V AC	15A	15A	1500V AC Between terminal and case 1 minute	500V DC 100MΩ and above Between terminal and case
250V AC	15A	15A		
30V DC	2A	1A		
125V DC	0.5A	0.05A		
・Inductive load: Power factor 0.4 and above (AC) Time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

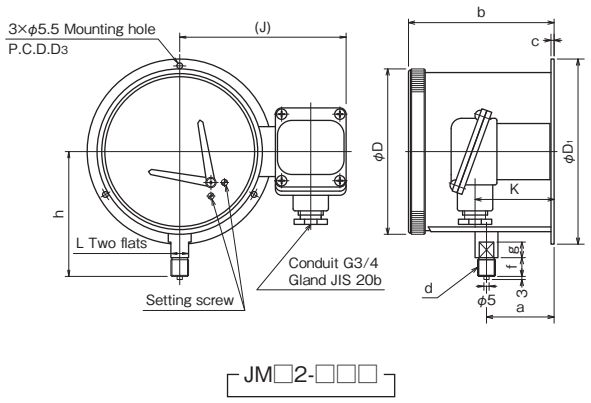
*Corrosion resistant use only

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	
		to 30	2	8
		to 40	2	
		to 50	2	
		to 70	5	

Dimensions

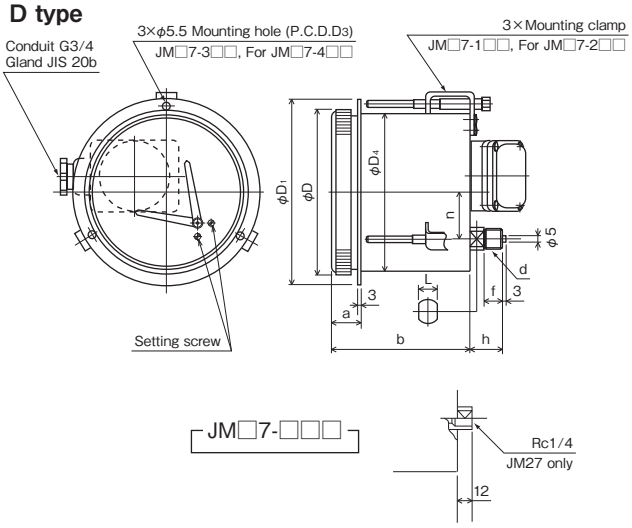
Unit: mm

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	17

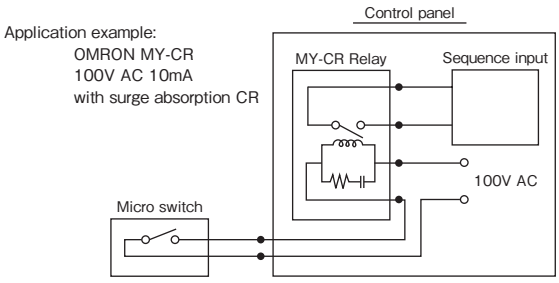
Attention

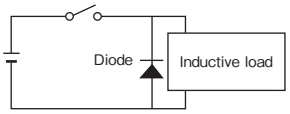
1. As for sequencer input

The contact resistance of micro switch increases as time passes especially in short period for use in atmosphere including Si with SiO_2 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.

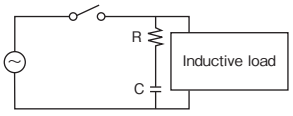
2. Insertion of contact protection circuit

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





DC only
Select a diode which can amply withstand reverse voltage.



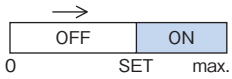
AC use possible
R: Tens of Ω
C: 0.1 to 0.2μF

Switch action and wiring

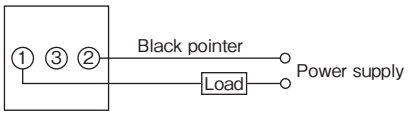
1. Upper limit H

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

Operating diagram



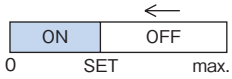
Wiring diagram



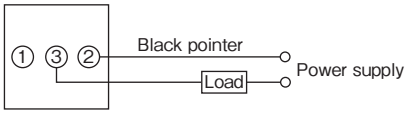
2. Lower limit L

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

Operating diagram



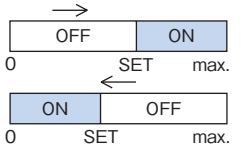
Wiring diagram



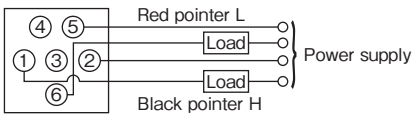
3. Upper and lower limit with two contacts HL

Independently operates with combination of upper and lower limit.

Operating diagram



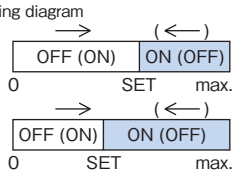
Wiring diagram



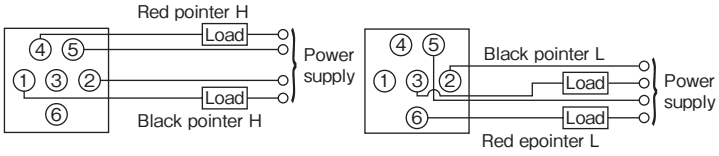
4. Uppper limit with two contacts (2H)

Independently operates with combination of two upper limits.

Operating diagram



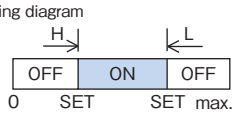
Wiring diagram



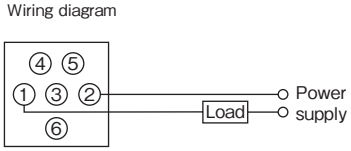
5. Center setting type with two contacts HLR

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

Operating diagram



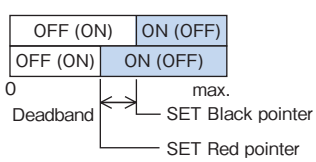
Wiring diagram



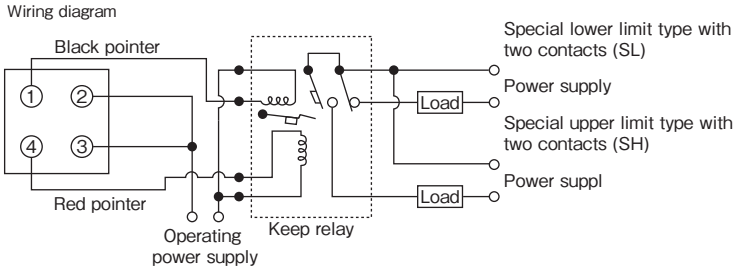
6. Special upper limit type (Special lower limit type) with two contacts SH (SL)

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.

Operating diagram



Wiring diagram



Model number configuration

Please specify for ordering the model number and each specs.

Model

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

Pressure Switch with Electric Contact (Micro Switch Type) (φ150)

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	
	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
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		
	9	Others		
⑨ Treatment	0	Not required		
	1	Use no oil		
	2	Use no water		
	3	Use no oil & water		
⑩ Other additional spec.	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

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

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
	4	————	D type (Mounting hole) Two contacts

② Two contacts		
	3	G3/8B
	4	G1/2B
	G	R3/8
	H	R1/2
		Others

③ Wetted parts				
	1	General use	Socket: CAC203	Bellows: C5212R
	3	Corrosion resistant	Socket: SCS14 (JM32), SUS316 (JM37)	Bellows: SUS316L

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

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)
	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
9	Others

⑨ Treatment	
0	Not required
1	Use no oil
2	Use no water
3	Use no oil & water

⑩ Other additional spec.	
0	Not required
1	Custom dial

「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.

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

＊Specify code "X" to refer N/A