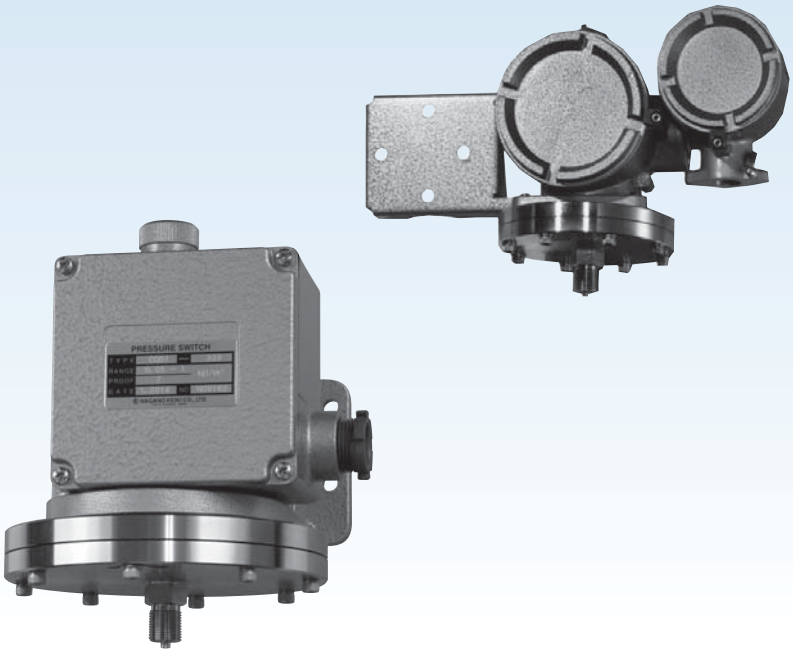
CQ51 Pressure Switch
CD51 Explosion-proof Construction Pressure Switch



Outline

This pressure switch is a lower pressure setting, high-pressure resistance switches for the case where the difference between the setting pressure and the maximum pressure is large.

Features

- The high proofpressure construction is assured.
- The material of both the body and the terminal box is aluminum die-casting, to minimize the weight. The cover is of threaded type and the removing work of the cover is easily performed.
- Setting and locking can be performed from the exterior without removing the cover.

Range of recommended pressure setting
(CQ51 and CD51 commonness)
Upper limit type: (Lowest pressure range+Dead band)～100%max.P.
Lower limit type: Lowest pressure range～(100%max.P.−Dead band)

＊Also check whether wetted parts material could be used for gases or liquids to be measured.

Specifications 1

Item	Description
Model	CQ51: Drip-proof construction CD51: Explosion-proof construction (d2G4)
Fluid	Gas or Liquid (No freezing)
Operating environment	CQ51: Places where there are no inflammable liquids or gases which may cause ignition or explosion under normal conditions. CD51: Hazardous area (Refer to the explanation column of the explosion-proof construction for details.)
Mounting	CQ51: Panel mounting CD51: 2B pipe mounting
Connection	G3/8B, G1/2B, Rc1/4, R3/8, R1/2, 1/2NPT, 3/8NPT Please contact us about connection without the description.
Wetted parts material	Diaphragm: SUS316 Socket, flange: SUS316 Gasket: NBR
Pressure range	0.005 to 0.1 → 0.04 to 0.4 MPa
Max. operating pressure	CQ51: 0.7 to 2.1 MPa CD51: 1 to 3.5 MPa (Depends on pressure range)
Proofpressure	1 to 4.5 MPa (CQ51) (Depends on pressure range)
Operating temperature	CQ51: -20 to 60 ℃ CD51: -5 to 40 ℃
Accuracy	±1%max.P.
Temperature cofficient	0.05%max.P./℃
Dead band	Specification 2 references.
Switch	Micro switch
Quantity of switch	One contact or two contacts (Two points of contact are simultaneous operation.)
Setting system	External adjustment type, with setting lock (The set adjustment axis is locked at the set value specification.)
Outlet for electric wire	CQ51: Conduit type: G3/4 female (Standard), Others Gland: JIS 20b (Standard), Others CD51: Conduit or proofpressure gasket
Case material, finishing	ADC12, gray crystal painting
Case structure	CQ51: Drip-proof type (IP43) CD51: Outdoor type (IP54)
Weight	CQ51: Approx. 7.7 kg CD51: Approx. 7 kg

Specifications 2

Electrical characteristics: (Standard specification)

Rating			Withstand voltage	Insulation resistance
	Resistance load	Inductive load		
125V AC	15 A	15 A	1500V AC Between terminals and case for 1 minute	500V DC 100MΩ or over Between terminals 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 or over (AC) Time constant 7ms or less (DC)				

Specifications 2

Pressure range, dead band, Max. operating pressure and proofpressure:

For CQ51

Pressure range MPa	Dead band MPa		Max. operating pressure MPa	Proofpressure MPa
	1 contact	2 contacts		
0.005～0.1	0.0025 or less	0.0035 or less	0.7	1
0.02～0.2	0.006 or less	0.009 or less	3	4.5
0.04～0.4	0.014 or less	0.02 or less	2.1	3.5

Note) It becomes correspondence of the operation simultaneously for two contact type.

For CD51

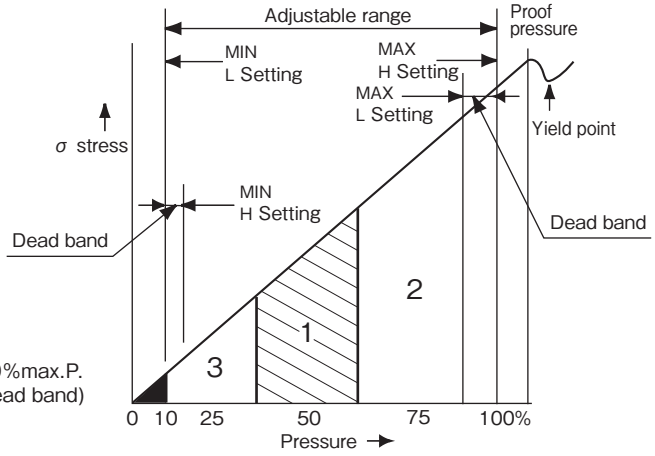
Pressure range MPa	Dead band MPa		Max. operating pressure MPa
	1 contact	2 contacts	
0.005～0.1	0.003 or less	0.0035 or less	1
0.02～0.2	0.006 or less	0.009 or less	2
0.04～0.4	0.014 or less	0.02 or less	3.5

Note) It becomes correspondence of the operation simultaneously for two contact type.

How to choose pressure

・Set value is steady, accurately: 30%max.P. or over
・Longevity is good: 65%max.P. or less
・Accuracy, Longevity is good [Ideal]:
About 30 to 65% of the adjustable ranges

In the right figure
Range 1: Selection of both accuracy and longevity
Range 2: Selection of valuing accuracy
Range 3: Selection of valuing longevity



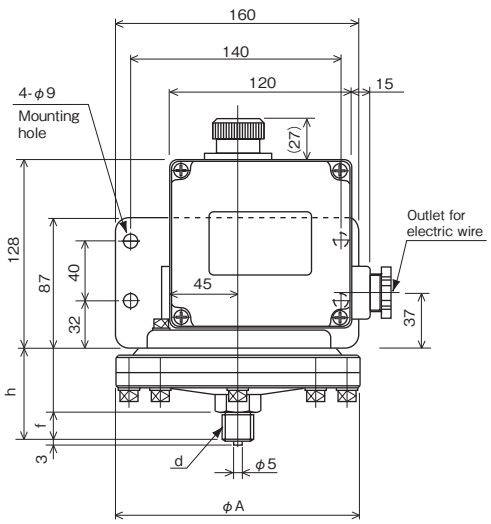
Range of recommended pressure adjustment (CQ51 and CD51 commonness)

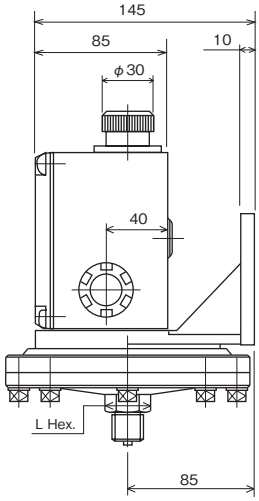
Upper limit type: (Lowest pressure range+Dead band)～100%max.P.
Lower limit type: Lowest pressure range～(100%max.P.−Dead band)

Dimensions

Unit：mm

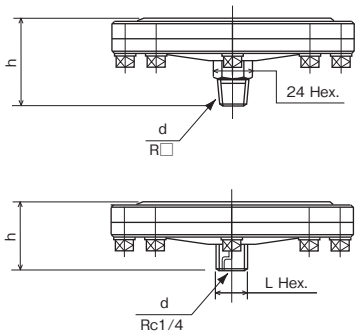
CQ51



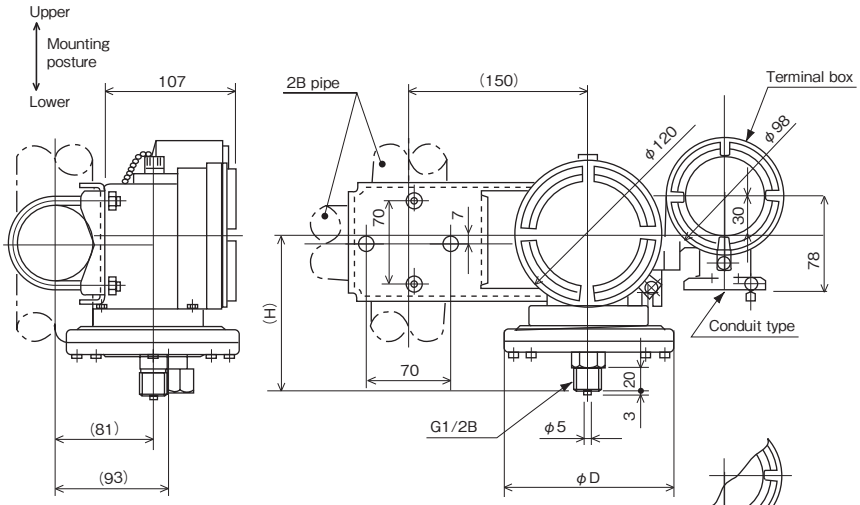


Pressure range MPa	d	h	f*	L Hex.	φA
0.005～0.1	G3/8B, R3/8, 3/8NPT	(57)	18	19	160
	G1/2B, R1/2, 1/2NPT	(59)	20	24	
	Rc1/4	(47)	——	19	
0.02～0.2	G3/8B, R3/8, 3/8NPT	(63)	18	19	150
	G1/2B, R1/2, 1/2NPT	(65)	20	24	
	Rc1/4	(53)	——	19	
0.04～0.4	G3/8B, R3/8, 3/8NPT	(59.5)	18	19	120
	G1/2B, R1/2, 1/2NPT	(61.5)	20	24	
	Rc1/4	(49.5)	——	19	

＊G□B only



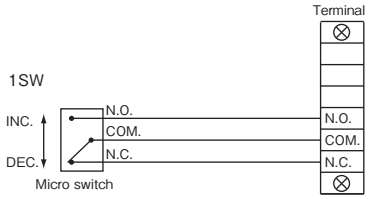
CD51

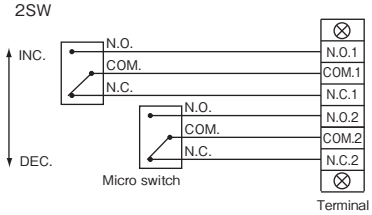


Pressure range MPa	D	H
0.005～0.1	160	132
0.02～0.2	140	132
0.04～0.4	120	136

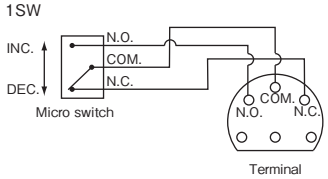
Wiring

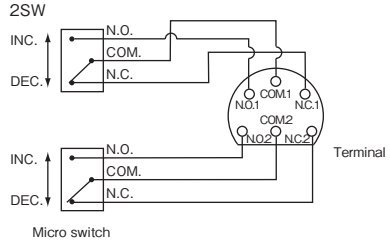
CQ51





CD51





Explosion-proof

Explosion-proof construction:
Explosion-proof construction is a totally-enclosed construction such that even if an explosive gas explodes inside the container, the container will withstand the force of the explosion and there is no danger of ignition by external explosive gases. Our pressure switches manufactured under this policy are widely used in measurement, alarm, and pressure control in factories and business offices where inflammable gases or the vapor of inflammable liquids having a flash point of 40℃ or less may exist.

Application range: d2G4
Explosion-proof construction: d
Explosion class: 2 (Minimum gap which permits flame propagation at a gap depth of 25mm is 0.4mm to 0.6mm)
Ignitability: G4 (Container with an ignition point of 135 to 200℃ and whose outside surface temperature rise limit is 70degs)
Hazardous areas: Zone 1 or Zone 2
Objective industries: Petrochemical, chemical fiber, ethylene, ethanol, methanol, dielectric products manufacturing, liquefied gas, electric furnace, pharmaceuticals, paints, ammonium sulfate, soda, other measurement medium or industries in which there is the danger of explosion.

Classification of hazardous area :

Hazardous area	Contents
Zone 0	Areas where a hazardous atmosphere is continuously present or present for a long period under ordinary circumstances
Zone 1	Areas where hazardous atmosphere is likely to occur under ordinary circumstances
Zone 2	Areas where hazardous atmosphere is likely to occur under abnormal circumstances

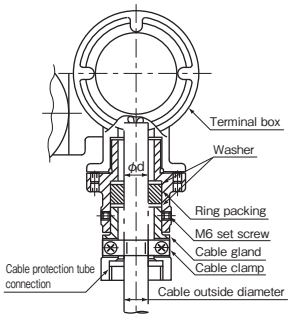
Registered model for labor ministry inspection and approval number : (CD51)

Registered model for labor ministry inspection : CD50-2 Approval number for labor ministry inspection : No.T25230	It is official approval number to represent that explosion-proof construction pressure switch conformed to explosion proof standard. It is national official approval which is examined and autorized by technology institution of industial safety.

Terminal box external lead drawing method

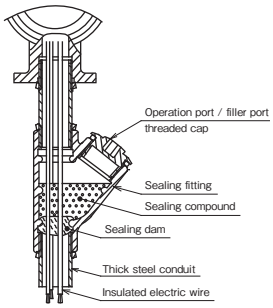
Proofpressure packing type

Gasket inside diameter (d) DIA.	Applicable cable outside diameter DIA.	Protection tube connection
10.5	9.4	G½ G¾
	9.9	
	10.1	
12	10.5	
	11.0	
	11.5	
14	11.9	G¾ G 1
	12.0	
	12.5	
	12.6	
15.5	13.1	
	13.5	
	13.6	
	14.5	
16.5	15.6	

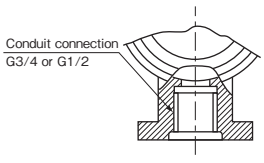


When wiring cable, select the proofpressure packing type and when performing metal conduit wiring with insulated electric wire, select the conduit proof pressure threads type.

Note) Use the 600V polyvinyl chloride insulated wire specified in JIS C 3307 or equivalent or better insulated electric wire as the conduit wiring. Do not use cable or cabtyre cable.



Conduit proofpressure threads connection type

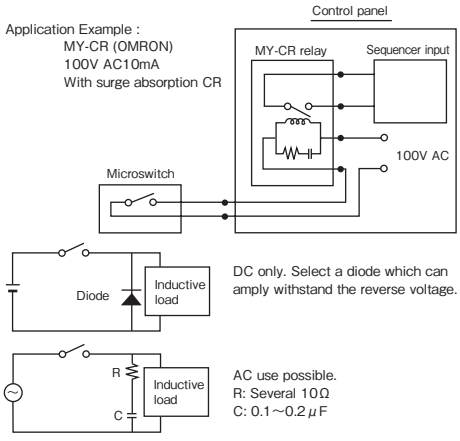


When performing conduit wiring, the terminal box and conduit connection section must be sealed as shown at the left.

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.



Model number configuration

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

Model

C Q 5 1	—	①	②	③	—	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Pressure Switch				3								×	×	×	×	×	

Model number | Selective spec. | Additional spec. (Option)

① Mounting	3	Panel mounting, Drip-proof type, 1 contact
	4	Panel mounting, Drip-proof type, 2 contacts
② Connection	3	G3/8B
	4	G1/2B
	7	Rc1/4
	M	1/2NPT
		Others
③ Wetted parts materials	3	Diaphragm: SUS316 Socket, flange: SUS316 Gasket: NBR
④ Pressure range (MPa)	1	0.005～0.1
	2	0.02～0.2
	3	0.04～0.4
⑤ Type of contacts	A	H: Upper limit type with 1 contact
	B	L: Lower limit type with 1 contact
	T	WH: Simultaneous operation upper limit type with 2 contacts
	U	WL: Simultaneous operation lower limit type with 2 contacts
		Others
⑥ Switch	0	Standard type
	3	Standard + gold plated
⑦ Outlet for electric wire		Conduit type
	C	G3/4 female (Standard)
		Others
		Gland type
	7	JIS 20b (Standard)
		Others
⑧ Treatment	0	Nil
	1	Use no oil
	2	Use no water
	3	Use no oil & water
⑨ Additional specifications	0	Nil
	1	Coating 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), inspection / traceability certificate, attended inspection

Please specify the pressure range and units separately besides selection of range code.

Range of recommended pressure setting
Upper limit type: (Lowest pressure range+Dead band)～100%max.P.
Lower limit type: Lowest pressure range～(100%max.P.－Dead band)

Manufacturing range
・Accuracy: ±1% max.P.
・Setting system: External adjustment type, with setting lock

○ Please set it compared with the master gauge and the standard pressure gauge when setting.

※Specify "X" if there is no specification item.

Model number configuration

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

Model

C D 5 1	—	①	②	③	—	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Explosion-proof Construction Pressure Switch				3								×	×	×	×	×	

Model number | Selective spec. | Additional spec. (Option)

① Mounting

1	1 contact, Panel mounting, Conduit type
2	2 contacts, Panel mounting, Conduit type
3	1 contact, Panel mounting, Proofpressure packing type
4	2 contacts, Panel mounting, Proofpressure packing type
5	1 contact, 2B pipe mounting, Conduit type
6	2 contacts, 2B pipe mounting, Conduit type
7	1 contact, 2B pipe mounting, Proofpressure packing type
8	2 contacts, 2B pipe mounting, Proofpressure packing type

② Connection

4	G1/2B
7	Rc 1/4
9	Rc 1/2
H	R1/2
M	1/2NPT
	Others

③ Wetted parts materials

3	Diaphragm: SUS316 Socket, flange: SUS316 Gasket: NBR

④ Pressure range (MPa)

1	0.005～0.1
2	0.02～0.2
3	0.04～0.4

Please specify the pressure range and units separately besides selection of range code.

⑤ Type of contacts

A	H: Upper limit type with 1 contact
B	L: Lower limit type with 1 contact
D	2H: simultaneous operation Upper limit type with 2 contacts
E	2L : simultaneous operation Lower limit type with 2 contacts
	Others

⑥ Switch

0	Standard type
1	Ultra high sensitivity type
3	Standard + gold plated
4	Ultra high sensitivity type + gold plated
	Others

⑦ Outlet for electric wire

B	Conduit type G1/2
C	Conduit type G3/4 (Standard)
D	Conduit type G1
カ	Proofpressure packing type, G3/4 ×12 (Standard)
キ	Proofpressure packing type, G3/4 ×10.5
コ	Proofpressure packing type, G3/4 ×14
	Others (With joint)

⑧ Treatment

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

⑨ Additional specifications

0	Nil
1	Coating 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), inspection / traceability certificate, attended inspection

Range of recommended pressure setting
Upper limit type: (Lowest pressure range+Dead band)～100%max.P.
Lower limit type: Lowest pressure range～(100%max.P.−Dead band)

Manufacturing range
・Setting system: External adjustment type, with setting lock

※Specify "X" if there is no specification item.