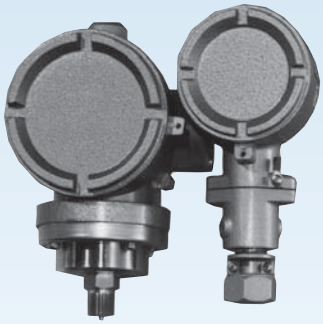
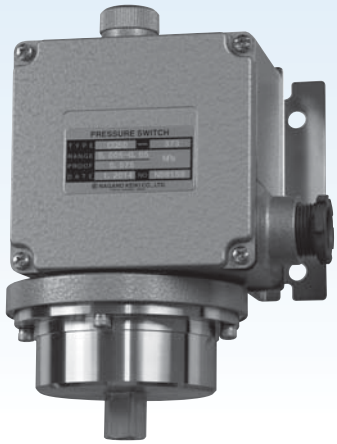
CQ50 Pressure Switch
CD50 Explosion-proof Construction Pressure Switch





Outline

In this pressure switch, the force applied to the bellows is balanced with the range spring through the rod, and its move directly functions the microswitch, making the switch open and close.

Features

- With the application of a Bellebille spring, this pressure switch demonstrates excellent vibration resistance and durability. (Double snap action mechanism) This mechanism has been applied to the one contact type of CD50.
- Pressure switch CQ50 has been designed to minimize the dead-band.
- An aluminum die-cast case is applied to pressure switch CD50, realizing a switch with light weight.

Range of recommended pressure setting

CQ50 Upper limit type: (10%max.P.+Dead band)～90%max.P.
Lower limit type: 10%max.P.～(90%max.P.−Dead band)
Compound: %max.P. → %F.S.

CD50 Upper limit type: (20%max.P.+Dead band)～90%max.P.
Lower limit type: 20%max.P.～(90%max.P.−Dead band)

＊When selecting pressure switches, Please select a pressure range with normal operation pressure within 30 to 65% of full span to get full performance. Also check whether wetted parts material could be used for gases or liquids to be measured.

Specifications 1

Item	Description
Model	CQ50: Drip-proof construction CD50: Explosion-proof construction (d2G4)
Fluid	Gas or Liquid (No freezing)
Operating environment	CQ50: Places where there are no inflammable liquids or gases which may cause ignition or explosion under normal conditions. CD50: Hazardous area (Refer to the explanation column of the explosion-proof construction for details.)
Mounting	CQ50: Panel mounting CD50: Panel mounting, 2B pipe mounting
Connection	G3/8B, G1/2B, Rc1/4, Rc1/2, R3/8, R1/2, 1/4NPT, 3/8NPT, 1/2NPT Please contact us about connection without the description.
Wetted parts material	Bellows: SUS316L Socket, tank: SUS316 (At 0.7MPa or less) SCS14 (At 1 to 3MPa) Gasket: PTFE
Pressure range	CQ50: 0.005 to 0.05 → 0.3 to 3 MPa -0.1 to 0 MPa, -0.1 to 0.1 MPa CD50: 0.01 to 0.05 → 0.6 to 3 MPa -0.1 to 0 MPa
Proofpressure	1.5 times the pressure range
Operating temperature	CQ50: -20 to 60 ℃ CD50: -5 to 40 ℃
Accuracy	±1%max.P. (Compound: ±1%F.S.)
Temperature cofficient	0.05%max.P./℃ (Compound: 0.05%F.S./℃)
Dead band	Specification 2 references.
Switch	Micro switch
Quantity of switch	One contact or two contacts (CQ50 is 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	CQ50: Conduit type: G3/4 female (Standard), Others Gland: JIS 20b (Standard), Others CD50: Conduit or proofpressure gasket
Case material, finishing	ADC12, gray crystal painting
Case structure	CQ50: Drip-proof type (Equivalent to IP43) CD50: Outdoor type (IP54)
Weight	CQ50: Approx. 3.5 kg CD50: Approx. 4.2 kg

Specifications 2

Electrical characteristics: (Standard specification)

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

Specifications 2

Pressure range, dead band and proofpressure:

For CQ50

Pressure range MPa	Dead band MPa		Proofpressure MPa
	1 contact	2 contacts	
-0.1～0	0.003 or less	0.0045 or less	0.15
-0.1～0.1	0.008 or less	0.0125 or less	0.15
0.005～0.05	0.0013 or less	0.002 or less	0.075
0.01～0.1	0.0025 or less	0.004 or less	0.15
0.02～0.2	0.005 or less	0.008 or less	0.3
0.04～0.4	0.01 or less	0.016 or less	0.6
0.07～0.7	0.018 or less	0.028 or less	1.05
0.1～1	0.025 or less	0.04 or less	1.5
0.15～1.5	0.038 or less	0.06 or less	2.25
0.2～2.1	0.053 or less	0.084 or less	3.15
0.3～3	0.075 or less	0.12 or less	4.5

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

For CD50

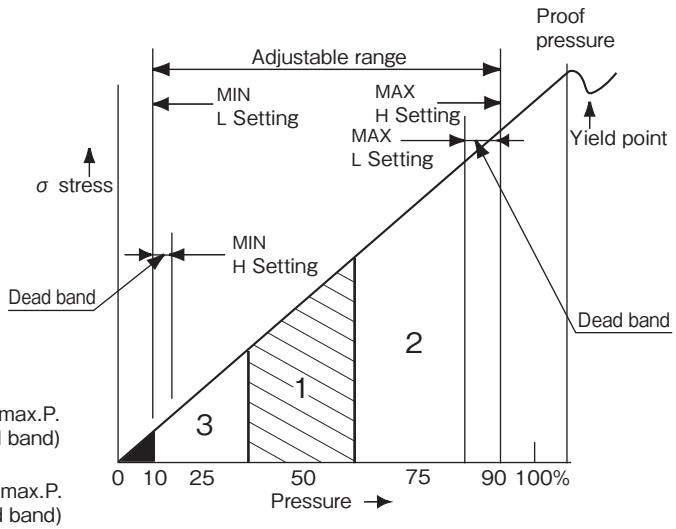
Pressure range MPa	Dead band MPa		Proofpressure MPa
	1 contact	2 contacts	
-0.1～0	0.006 or less	0.012 or less	0.15
0.01～0.05	0.003 or less	0.006 or less	0.075
0.02～0.1	0.006 or less	0.012 or less	0.15
0.04～0.2	0.012 or less	0.024 or less	0.3
0.08～0.4	0.024 or less	0.048 or less	0.6
0.12～0.6	0.036 or less	0.072 or less	0.9
0.14～0.7	0.042 or less	0.084 or less	1.05
0.2～1	0.06 or less	0.12 or less	1.5
0.4～2	0.12 or less	0.24 or less	3.0
0.6～3	0.18 or less	0.36 or less	4.5

Note) A set difference between H side and L side is 24 to 60%max.P. 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

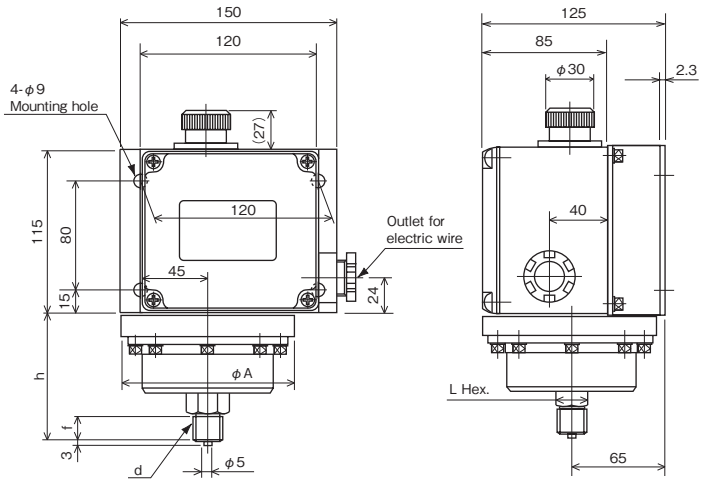
CQ50 Upper limit type: (10%max.P.+Dead band)～90%max.P.
Lower limit type: 10%max.P.～(90%max.P.−Dead band)
Compound: %max.P. → %F.S.

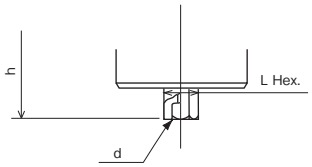
CD50 Upper limit type: (20%max.P.+Dead band)～90%max.P.
Lower limit type: 20%max.P.～(90%max.P.−Dead band)

Dimensions

Unit: mm

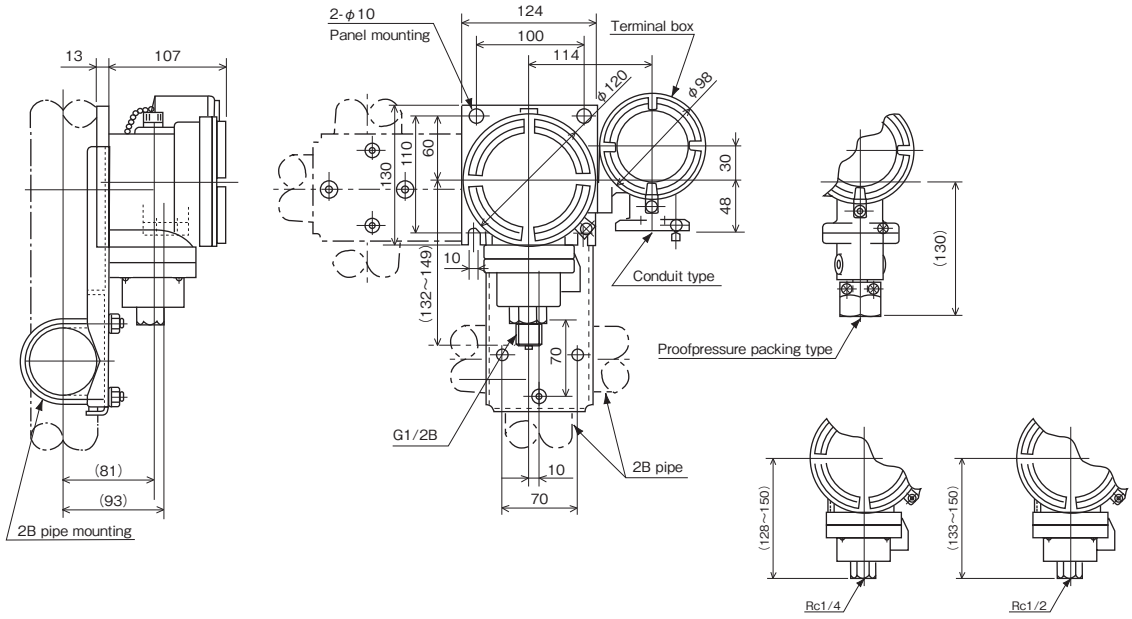
CQ50





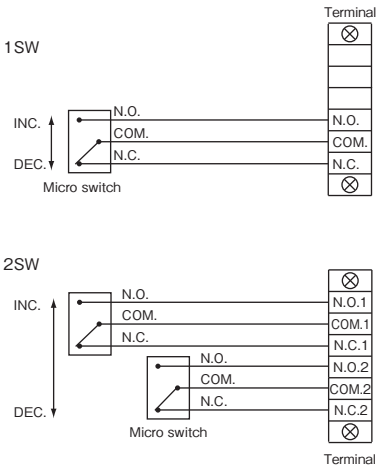
Pressure range	d	h	f	L Hex.	φA
-0.1～0 -0.1～0.1 (CQ50)	G3/8B, R3/8, 3/8NPT	(91)	18	19	90
	G1/2B, R1/2, 1/2NPT	(93)	20	24	
	Rc1/4	(78)	—	19	
0.005～0.05	G3/8B, R3/8, 3/8NPT	(83)	18	19	120
	G1/2B, R1/2, 1/2NPT	(85)	20	24	
	Rc1/4	(76)	—	19	
0.01～0.1	G3/8B, R3/8, 3/8NPT	(78)	18	19	100
	G1/2B, R1/2, 1/2NPT	(80)	20	24	
	Rc1/4	(71)	—	19	
0.02～0.2	G3/8B, R3/8, 3/8NPT	(78)	18	19	90
	G1/2B, R1/2, 1/2NPT	(80)	20	24	
	Rc1/4	(71)	—	19	
0.04～0.4	G3/8B, R3/8, 3/8NPT	(83)	18	19	75
	G1/2B, R1/2, 1/2NPT	(85)	20	24	
	Rc1/4	(76)	—	19	
0.07～0.7	G3/8B, R3/8, 3/8NPT	(85)	18	19	
	G1/2B, R1/2, 1/2NPT	(87)	20	24	
	Rc1/4	(78)	—	19	
0.1～1 ↓ 0.3～3	G3/8B, R3/8, 3/8NPT	(68)	18	30	
	G1/2B, R1/2, 1/2NPT	(70)	20	30	
	Rc1/4	(71)	—	30	

CD50

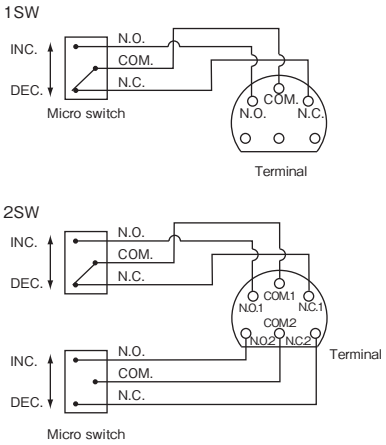


Wiring

CQ50



CD50



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

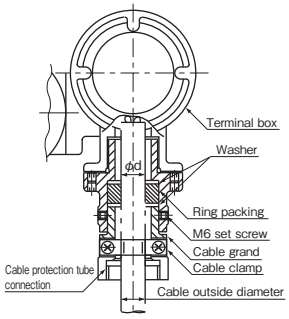
Registered model for labor ministry inspection and approval number:(CD50)

Registered model for labor ministry inspection: CD50-1, CD50-2 Approval number for labor ministry inspection: 1 contact No.T25229 2 contact 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

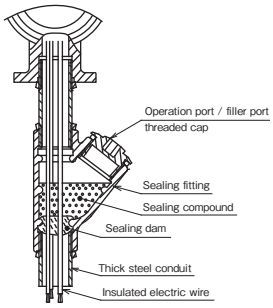
Proofpressure packing type

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	

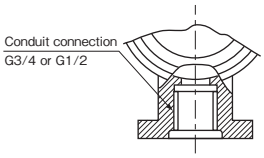


When wiring cable, select the proofpressure packing type and when performing metal conduit wiring with insulated electric wire, select the conduit proof pressure threads type.

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

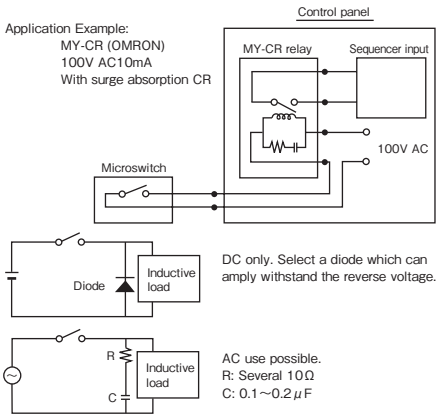


When performing conduit wiring, the terminal box and conduit connection section must be sealed as shown at the left.

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 0	—			3	—							×	×	×	×	×	
Pressure Switch		①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

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	Bellows: SUS316L Socket, tank: SUS316, SCS14 Gascket: PTFE		
④ Pressure range (MPa)	1	-0.1～0, -0.1～0.1		
	2	0.005～0.05		
	3	0.01～0.1, 0.02～0.2, 0.04～0.4		
	4	0.07～0.7, 0.1～1, 0.15～1.5, 0.2～2.1, 0.3～3		
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: (10%max.P.+Dead band)～90%max.P.
Lower limit type: 10%max.P.～(90%max.P.−Dead band)
Compound: %max.P. → %F.S.

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 0	—	①	②	3	—	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Explosion-proof Construction Pressure Switch												×	×	×	×	×	

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
K	1/4NPT
M	1/2NPT
	Others

③ Wetted parts materials

3	Bellows: SUS316L Socket, tank: SUS316, SCS14 Gascket: PTFE

④ Pressure range (MPa)

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

1	-0.1～0
2	0.01～0.05
3	0.02～0.1, 0.04～0.2, 0.08～0.4, 0.12～0.6, 0.14～0.7
4	0.2～1, 0.4～2, 0.6～3

⑤ Type of contacts

A	H: Upper limit type with 1 contact
B	L: Lower limit type with 1 contact
C	HL: Upper & lower limit type with 2 contacts
D	2H: Upper limit type with 2 contacts
E	2L: 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: (20%max.P.+Dead band)～90%max.P.
Lower limit type: 20%max.P.～(90%max.P.−Dead band)

Manufacturing range
・Setting system: External adjustment type, with setting lock
・Note) A set difference between H side and L side is 60%max.P. or less for two contact type.

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