



## CQ21 Pressure Switch CD20 Explosion-Protected Construction Pressure Switch

### OUTLINE

This is a pressure switch with simple construction in which a Bourdon tube is applied to the pressure sensing element and its move directly functions the microswitch. A lot of these pressure switches have been manufactured for the warning and control of process industry, and a lot of these switches have application results in power and chemical plants.

### FEATURES

- According to the construction by which a Bourdon tube move directly functions the microswitch, the number of constituent parts is small and excellent durability is demonstrated.
  - The pressure range extends extensively from low pressure to high pressure : 0.1 MPa to 70 MPa, complying with extensive ranges.
  - This pressure switch has been developed mainly for thermal power stations, equipped with a large wiring space, assuring easy maintenance work.
- \* In case of selecting pressure gauge, choose the pressure range which can be used in between 30 ~ 65% of full scale, so that the gauge can give its full capacity.

### SPECIFICATION 1

#### Model:

CQ21 Water-proof-drip-proof construction  
CD20 Explosion-Proof (d2G4)

#### Fluid:

Gas or liquid

#### Operating condition:

##### CQ21

Under the normal condition, where there is no inflammable gas or liquid which cause the ignition or explosion.

##### CD20

Hazardous area. The details refer to explanation column of explosion-protected construction.

#### Mounting:

Panel mounting

#### Connection:

G3/8B (PF), G1/2B (PF), R3/8 (PT), R1/2 (PT), 3/8NPT,  
1/2NPT

\* For other connections, please contacts.

#### Wetted parts material:

Bourdon tube 316st.st.

Socket CQ21 YBsC3 or SCS14

CD20 316st.st.

#### Pressure range:

0 ~ 0.1 → 0 ~ 70MPa (0 ~ 1 → 0 ~ 700kgf/cm<sup>2</sup>)

-0.1 ~ 0 → -0.1 ~ 2MPa (-1 ~ 0 → -1 ~ 20kgf/cm<sup>2</sup>)

20 ~ 100kPa (0.2 ~ 1kgf/cm<sup>2</sup>)(Receiver)

#### Proof-pressure:

0.05 ~ 105MPa (0.5 ~ 1050kgf/cm<sup>2</sup>)  
(Depending on range)

#### Recommended adjustable range:

15 ~ 90% of pressure range

#### Operating temperature:

CQ21 -20 ~ 60°C

CD20 -5 ~ 40°C

#### Accuracy:

1%max.P.

#### Setting accuracy:

±3%max.P.

#### Temperature coefficient:

0.05%max.P./

#### Dead band:

0.01 ~ 3.1MPa or less (0.1 ~ 31kgf/cm<sup>2</sup>)  
(Depending on range)

#### Switch:

Micro switch

#### Number of contact:

One contact

#### Setting system:

Internal adjustment type With setting scale, with setting lock

## SPECIFICATION 2

Outlet for electric wire:

- CQ21 Gland JIS20b
- CD20 Conduit type or flame-proof packing type

Case material-finishing:

- CQ21 Aluminium alloy die casting (ADC12)-Gray
- CD20 Aluminium alloy casting (AC7A)-Gray

Construction:

- CQ21 Water-proof type(IP65)or drip-proof type(IP43)
- CD20 Outdoor type (IP54)

Weight:

- CQ21 Approx. 1.5kg
- CD20 Approx. 8kg

Electric characteristics:

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

Pressure range & dead band-proof-pressure:

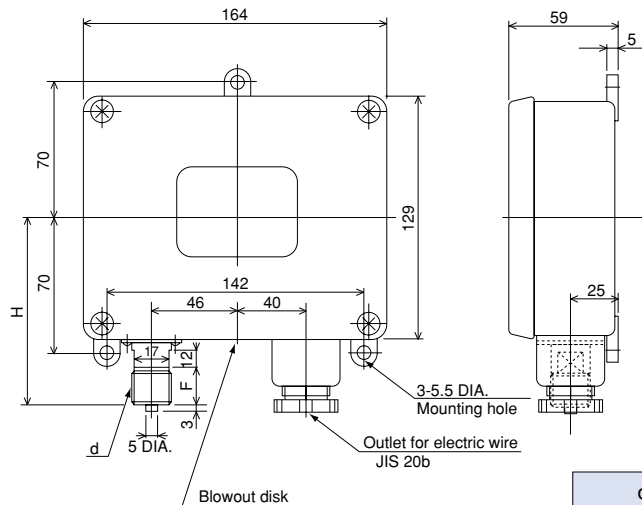
Pressure MPa(kgf/cm <sup>2</sup> )	Dead band MPa(kgf/cm <sup>2</sup> )	Proof-pressure MPa(kgf/cm <sup>2</sup> )	Approval Number for labor ministry inspection * (In case of CD20)
-0.1~0 (-1~0)	0.01 or less (0.1 or less)	0.05 (0.5)	No.21107
0~0.1 (0~1)	0.01 or less (0.1 " )	0.15 (1.5)	
~0.2 (~2)	0.016 or less (0.16 " )	0.3 (3.0)	
~0.3 (~3)	0.024 or less (0.24 " )	0.45 (4.5)	
~0.4 (~4)	0.024 or less (0.24 " )	0.6 (6.0)	
~0.6 (~6)	0.039 or less (0.39 " )	0.9 (9.0)	
~1 (~10)	0.06 or less (0.6 " )	1.5 (15.0)	No.21113
~1.5 (~15)	0.068 or less (0.68 " )	2.25 (22.5)	No.20911
~2 (~20)	0.08 or less (0.8 " )	3 (30.0)	No.20912
~2.5 (~25)	0.15 or less (1.5 " )	3.75 (37.5)	No.20913
~3.5 (~35)	0.14 or less (1.4 " )	5.25 (52.5)	No.20915
~5 (~50)	0.175 or less (1.75 " )	7.5 (75)	No.20916
~7 (~70)	0.24 or less (2.4 " )	10.5 (105)	No.20917
~10 (~100)	0.65 or less (6.5 " )	15 (150)	No.20918
~15 (~150)	0.52 or less (5.2 " )	22.5 (225)	No.20919
~25 (~250)	1.25 or less (12.5 " )	37.5 (375)	No.20921
~35 (~350)	1.05 or less (10.5 " )	52.5 (525)	No.20922
~50 (~500)	2.2 or less (22.0 " )	75 (750)	No.20923
~70 (~700)	3.1 or less (31.0 " )	105 (1050)	No.20924

\*Registered model for labor ministry inspection and approval number:

Registered model for labor ministry inspection : CQD2 Approval number for labor ministry inspection : Depending on range	It is official approval number to represent that explosion-protected construction pressure switch conformed to explosion proof standard. It is national official approval which is examined and authorized by technology institution of industrial safety.
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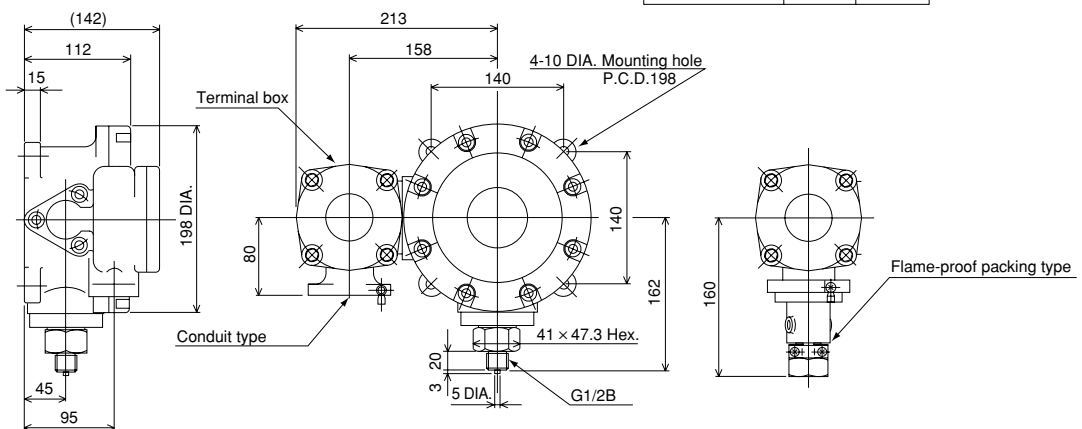
## DIMENSIONS

CQ21



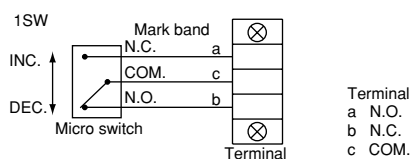
d	F	H
G3/8B	18	100
G1/2B	20	102

CD20

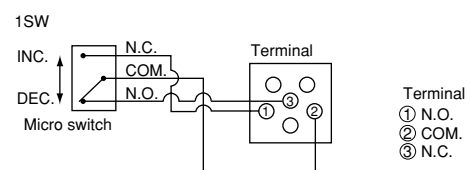


## WIRING

CQ21

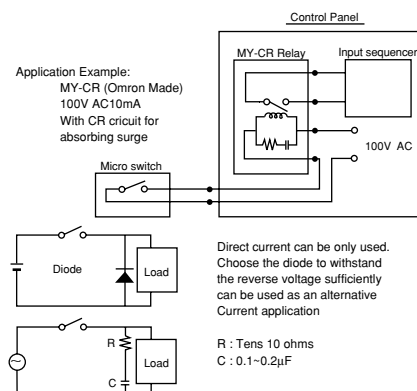


CD20



## REMARKS

- As a sequencer input;  
Use this switch gauge in the ventilated condition.  
Otherwise the following might be caused.  
The contact resistance of the microswitch increases gradually as time passes.  
For the application in the atmosphere, especially including Si, SiO<sub>2</sub> will be accumulated on the contact part as switch operated. Then the contact resistance will be increased, so that switch may be not operated.  
Therefore, above is suggested for the application condition, including Si atmosphere.  
When you use this switch gauge as sequencer input for controlling, input or connect through 100V AC Relay.
- Installation of protection circuit for contact  
In the inductive load open and close circuit, install the protection circuit to protect the contact.  
When you use the relay, choose the built-in protection circuit for the contact.



## EXPLOSION-PROOF

### Explosion-protected construction:

Explosion protected-construction is a totally enclosed construction such that even if the explosive gas explodes inside the container, the container withstands the force of the explosion and there is no danger of ignition of external explosive gases. Our pressure transmitter manufactured under this basic policy are widely used in the measurement, alarm, and control of pressure in factories and business offices where combustible gases or the vapor of combustible liquids having a flash point of 40°C or less may exist.

### Application range: d2G4

Explosion-protected construction: d

Explosion class: 2 (Minimum gap with 25mm length of patch which permits the flame propagation: 0.4mm to 0.6mm)

Ignitability: G4 (Ignition point: 135°C to 200°C, limits of temperature rise: 70 deg)

Hazardous areas: Zone 1 or zone 2

Objective industries: Petrochemical, chemical fibersynthetic resin, ethylene, 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 ignition and explosion.

### Classification of hazardous areas:

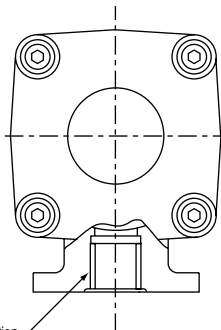
Hazardous areas	Contents
Zone 0	A place where hazardous atmosphere is continuously present or present for a long period under ordinary circumstances.
Zone 1	A place where hazardous atmosphere is likely to occur under ordinary circumstances.
Zone 2	A place where hazardous atmosphere is likely to occur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

### Approval number for labor ministry inspection:

Specification 2 Please refer to a column of pressure range and dead band withstand pressure

## METHODS OF LEADING EXTERNAL CONDUCTORS AND CABLE IN TO A TERMINAL BOX

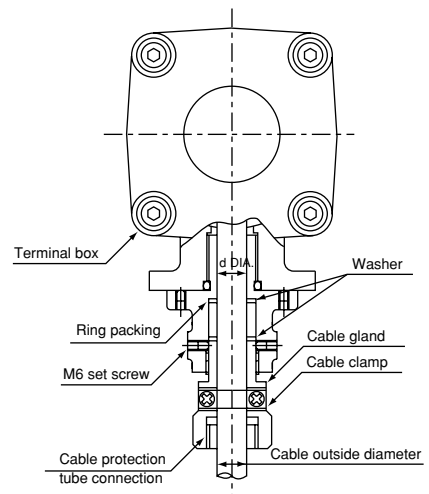
### Conduit type



Conduit tube connection  
PF3/4 or PF1/2

### Flame-proof packing type

Packing inside (d) DIA.	Application cable out side DIA.	Protection tube connection
10.5	9.4	PF <sup>1</sup> / <sub>2</sub> PF <sup>3</sup> / <sub>4</sub>
	9.9	
	10.1	
12	10.5	
	11.0	
	11.5	
14	11.9	PF <sup>3</sup> / <sub>4</sub> PF1
	12.0	
	12.5	
	12.6	
	13.1	
15.5	13.5	PF <sup>3</sup> / <sub>4</sub> PF1
	13.6	
	14.5	
	15.6	

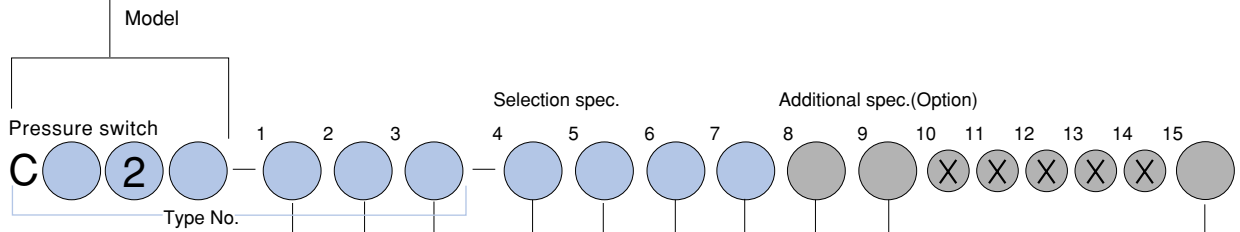


# Type No. constitution

Please specify Type No., each specification and range when ordering.

Note: For this Model, there is no applicable item for the figures X, but please specify X when ordering.

C	Q	2	1	Water-proof-drip-proof construction
C	D	2	0	Explosion-protected construction



**1 Mounting (Construction)** In case of CQ21

1	Panel mounting Water-proof type
3	Panel mounting Drip-proof type

**1 Mounting (Methods of leading external conductors and cable in to a terminal box.)** In case of CD20

1	Panel mounting Conduit type
3	Panel mounting Flame-proof packing type

**2 Connection**

3	G3/8B (CQ21 only)
4	G1/2B
G	R3/8 (CQ21 only)
H	R1/2
L	3/8NPT (CQ21 only)
M	1/2NPT

**3 Wetted parts material**

1	Socket: YBsC3 Applicable to 35MPa range of CQ21 Bourdon tube: 316st.st. Not available for CD20
3	Socket: SCS14 (CQ21) 316st.st. (CD20) Bourdon tube: 316st.st.

**4 Pressure range** (When ordering, please specify pressure range & unit.)

1	-0.1 ~ 0.1, 0.2, 0.3, 0.4, 0.6MPa -0.1 ~ 1, 1.5, 2MPa
2	-0.1 ~ 0MPa
3	20 ~ 100kPa (Receiver)
4	0 ~ 0.1, 0.2, 0.3, 0.4MPa
5	0 ~ 0.6, 1, 1.5, 2, 2.5, 3.5, 5, 7MPa
6	0 ~ 10, 15, 25, 35MPa
7	0 ~ 50, 70MPa

**5 Type of contact point**

1	H: Upper limit type with one contact
2	L: Lower limit type with one contact

**9 Other additional spec.**

0	Nil
1	Please specify your requirement Case finishing

**8 Treatment**

0	Nil
1	Use no oil
2	Use no water
3	Use no oil-water (Applicable to 25MPa range)

In case of CQ21

**7 Outlet for electric wire**

7	Gland JIS 20b
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In case of CD20

**7 Outlet for electric wire In case of conduit type**

2	PF1/2 female
3	PF3/4 female (Standard)

**7 Outlet for electric wire In case of flame-proof packing type**

0	PF1/2 female 10.5
1	PF1/2 female 12
2	PF3/4 female 10.5
3	PF3/4 female 12
4	PF3/4 female 14
5	PF3/4 female 15.5
6	PF3/4 female 16.5
7	PF1 female 14
8	PF1 female 15.5
9	PF1 female 16.5

**6 Switch**

0	Standard type
1	Ultra high sensitivity switch
2	Magnetically blowout type (CD20 only)
3	Standard+gold plated
4	Ultra high sensitivity switch+gold plated

**15 Document**

0	Nil
1	Please specify your requirement Drawing one sheet, Instruction manual, Inspection procedure, Mill sheet, Test report