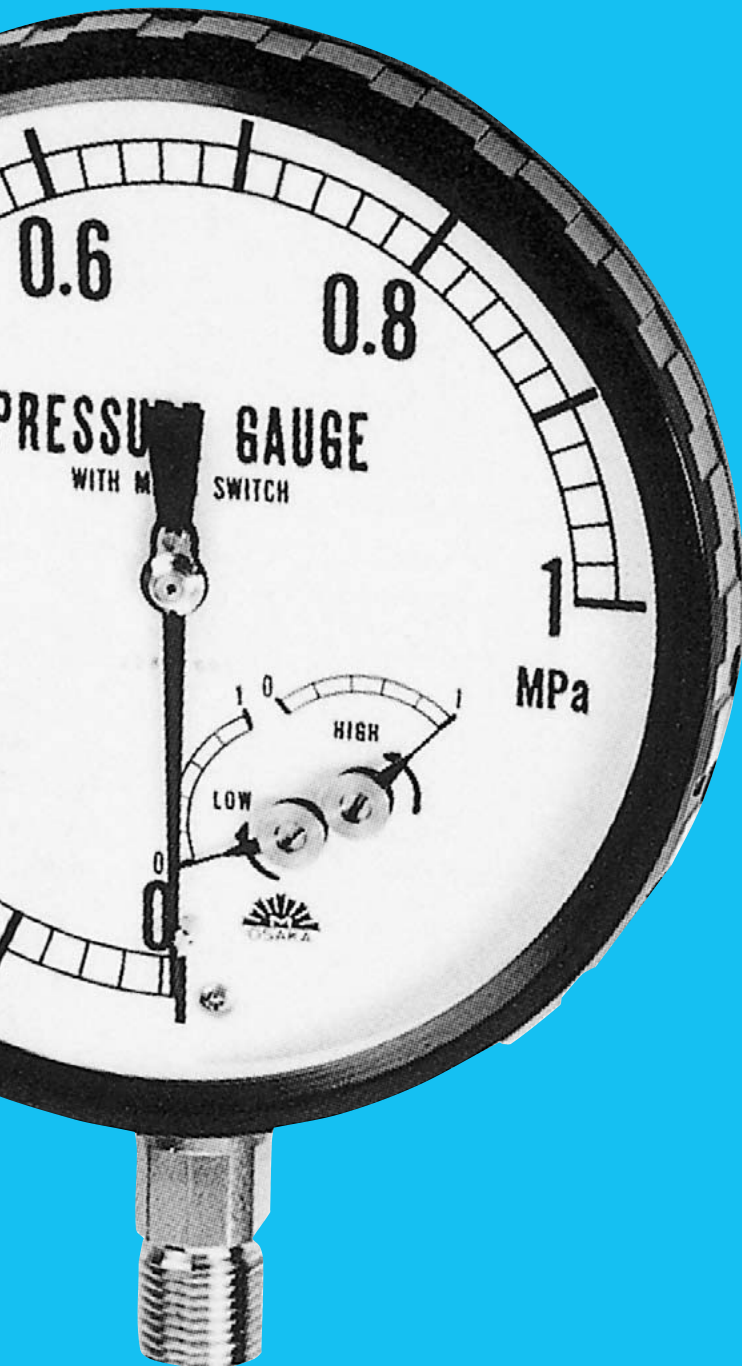


Pressure Gauges With Micro Switch
Pressure Gauges With Photoelectric Switch
Pressure Gauges With Pointer Contacts



PRESSURE GAUGES WITH ELECTRIC CONTACT



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Pressure Gauges With Micro Switch

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Pressure Gauges With Pointer Contacts

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PRESSURE GAUGES WITH MICRO SWITCH



A type



B type



D type

Description

This pressure gauge with micro switch is suitable for alarms or controls. The Bourdon-tube or the bellows front end that forms displacement according to the pressure load activates the micro switch and generates the ON-OFF electric signal.

Features

This product is applicable for the big capacity load by means of the micro switch with high electric capacity and there is no indication delay after contacts operated since the indication and contacts elements are separated. The life of micro switch is more than 500,000 times in the case of rating operation.

However, is more than 40,000 times under AC230V 5A resistance load in the case of 100φ (5,000 times in the ease of DC rating).

Application

Use for alarms and controls in chemical plants and other non explosion-proof areas. (It is necessary to combine with the barrier relay in the explosion-proof area.)

Other specifications

1. Diaphragm type except the low range pressure gauge is available.
2. For the type of contacts, 1 contact is SPDT (1ab) and 2 contacts is (2ab) contact.

When ordering

(Upper limit-Lower limit-Upper/lower limits)
(Model) (Pressure range)

(Example) 670-A481-1 1MPa Upper limit

Pressure gauge with micro switch
AT¹/₂G 150φ x 1MPa Upper limit 1 contact
Bourdon-tube material SUS316
Internal adjustment setting mechanism

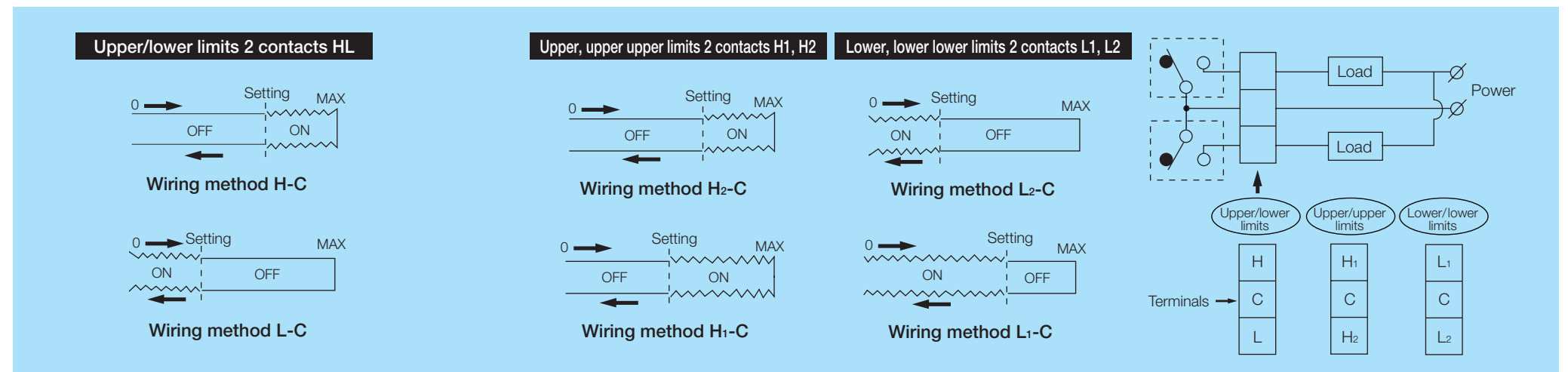
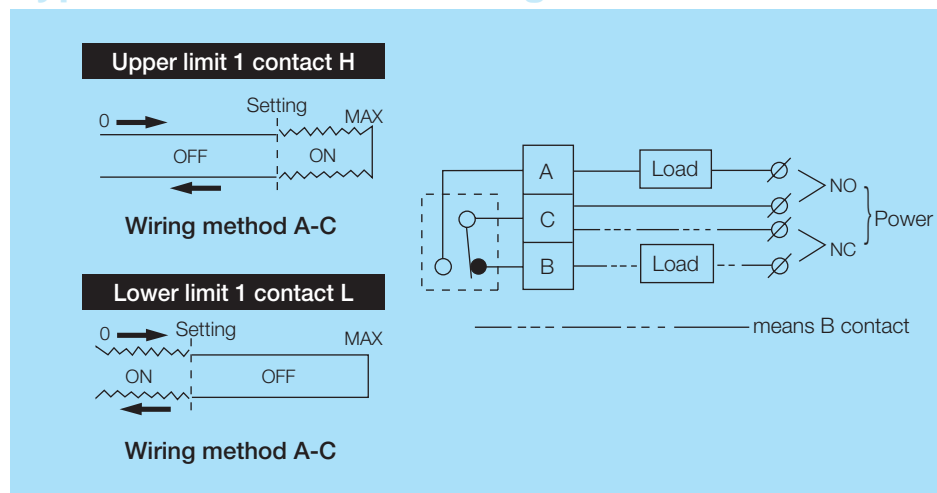
(Note) Specify upper/lower limits numbers, and upper upper limit numbers, and lower lower limit numbers in the case of 2 contacts.

Standard specifications of pressure gauges with micro switch

Item	Size	Casing	Con- nection thread	Con- nection shape	Model		Pressure range			ON/OFF differential		Accuracy			Electric characteristic			Lead cable outlet	Case		Setting method	Measure- ment object	Ambient- tempera- ture	Weight
					SUS		Vacuum	Compound	Pressure	Pressure range	% F.S.	Indication	Setting	Repeat- ability	Rating	Insulation resistance	Voltage resistance		Material & type	Finish				
					1 contact	2 contacts																		
Pressure gauges with micro switch 670 (Bourdon- tube type)	100	B mounting hole	G 3/8	T	670-B351-1	670-B351-2	MPa	MPa	MPa	Less than 0.1MPa	Within 15%	Within ±3%	Resistance load AC125V10A AC250V10A DC125V0.4A DC30V2A Inductive load AC125V10A AC250V10A DC125V0.03A DC30V1A Power factor 0.4 Time constant 7mS	More than DC500V 50MΩ	AC1500V 1 minute between case and terminals	(Waterproof terminal box)	Conduit G 1/2 female with JIS 15C gland packing or G 3/4 female without gland	ZDC drip-proof type	Internal adjustment	Gases or liquids	-5°C ± +45°C	About 1.7kg		
			R 3/8		-B751-1	-B751-2																		
			G 1/2		-B451-1	-B451-2																		
		R 1/2	-B851-1		-B851-2																			
		G 3/8	-D351-1		-D351-2																			
		R 3/8	-D751-1		-D751-2																			
	150	A	G 3/8	T	670-A381-1	670-A381-2	MPa	MPa	MPa	Less than 0.3MPa	Within 10%	±1.6% F.S. (-5~+45°C)	Resistance load AC125V10A AC250V10A DC125V0.4A DC30V2A Inductive load AC125V10A AC250V10A DC125V0.03A DC30V1A Power factor 0.4 Time constant 7mS	More than DC500V 50MΩ	AC1500V 1 minute between case and terminals	(Waterproof terminal box)	Conduit G 1/2 female with JIS 15C gland packing or G 3/4 female without gland	ADC drip-proof type	External adjustment is available by your specification.	Gases or liquids	-5°C ± +45°C	About 1.9kg		
			R 3/8		-A781-1	-A781-2																		
			G 1/2		-A481-1	-A481-2																		
		R 1/2	-A881-1		-A881-2																			
		G 3/8	-B381-1		-B381-2																			
		R 3/8	-B781-1		-B781-2																			
	D Band type fixture	G 3/8	T	-D381-1	-D381-2																			
		R 3/8		-D781-1	-D781-2																			
		G 1/2		-D481-1	-D481-2																			
		R 1/2		-D881-1	-D881-2																			
		G 3/8		-D381-1	-D381-2																			
		R 3/8		-D781-1	-D781-2																			
150	B mounting hole	G 3/8	U	671-B381-1	671-B381-2	kPa	The sum of pressure and vacuum absolute values becomes the range in the right hand table.	kPa	Within 10% F.S.	±1.6% F.S. (-5~+45°C)	Resistance load AC125V10A AC250V10A DC125V0.4A DC30V2A Inductive load AC125V10A AC250V10A DC125V0.03A DC30V1A Power factor 0.4 Time constant 7mS	More than DC500V 50MΩ	AC1500V 1 minute between case and terminals	(Waterproof terminal box)	Conduit G 1/2 female with JIS 15C gland packing or G 3/4 female without gland	ADC drip-proof type	Upper limit..... Close down to the setting value from the upper side.	Gases	-5°C ± +45°C	About 2.5kg				
		R 3/8		-B781-1	-B781-2																			
		G 1/2		-B481-1	-B481-2																			
	R 1/2	-B881-1		-B881-2																				
	G 3/8	-D381-1		-D381-2																				
	R 3/8	-D781-1		-D781-2																				
D Band type fixture	G 3/8	U	-D381-1	-D381-2																				
	R 3/8		-D781-1	-D781-2																				
	G 1/2		-D481-1	-D481-2																				
	R 1/2		-D881-1	-D881-2																				
	G 3/8		-D381-1	-D381-2																				
	R 3/8		-D781-1	-D781-2																				
Low range pressure gauges with micro switch 671 (Bellows type)	150	B mounting hole	G 3/8	U	671-B381-1	671-B381-2	kPa	The sum of pressure and vacuum absolute values becomes the range in the right hand table.	kPa	Within 10% F.S.	±1.6% F.S. (-5~+45°C)	Resistance load AC125V10A AC250V10A DC125V0.4A DC30V2A Inductive load AC125V10A AC250V10A DC125V0.03A DC30V1A Power factor 0.4 Time constant 7mS	More than DC500V 50MΩ	AC1500V 1 minute between case and terminals	(Waterproof terminal box)	Conduit G 1/2 female with JIS 15C gland packing or G 3/4 female without gland	ADC drip-proof type	Lower limit..... Close up to the setting value from the lower side.	Only gases	-5°C ± +45°C	About 2.5kg			
			R 3/8		-B781-1	-B781-2																		
			G 1/2		-B481-1	-B481-2																		
		R 1/2	-B881-1		-B881-2																			
		G 3/8	-D381-1		-D381-2																			
		R 3/8	-D781-1		-D781-2																			
D Band type fixture	G 3/8	U	-D381-1	-D381-2																				
	R 3/8		-D781-1	-D781-2																				
	G 1/2		-D481-1	-D481-2																				
	R 1/2		-D881-1	-D881-2																				
	G 3/8		-D381-1	-D381-2																				
	R 3/8		-D781-1	-D781-2																				

Note: (1) *mark means the receiver gauge. (Product for 0~0.08MPa is available.)
 (2) In the case of 1 contact, both 100 and 150 apply SPDT(1ab) contact.
 (3) Case A-type is available.
 (4) In the case of 2 contacts, both 100 and 150 apply SPDT(2ab) contact.

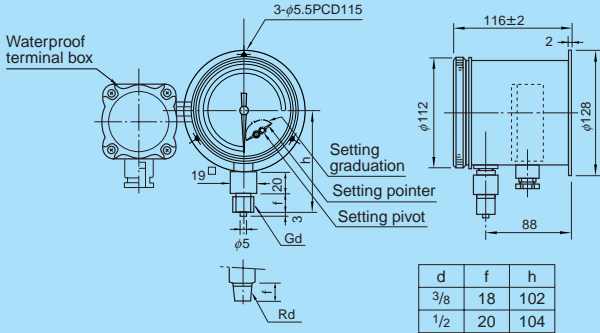
Type of contacts and wiring method



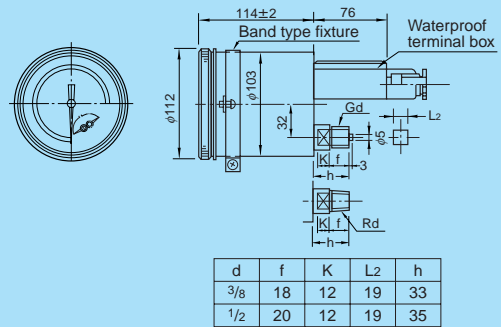
These specifications are subject to change without notice for improvement.

Pressure gauges with micro switch

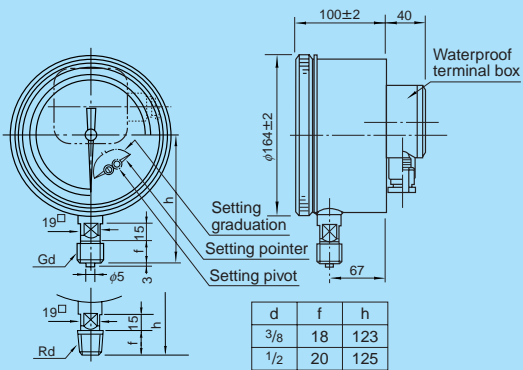
No.670 100 B type



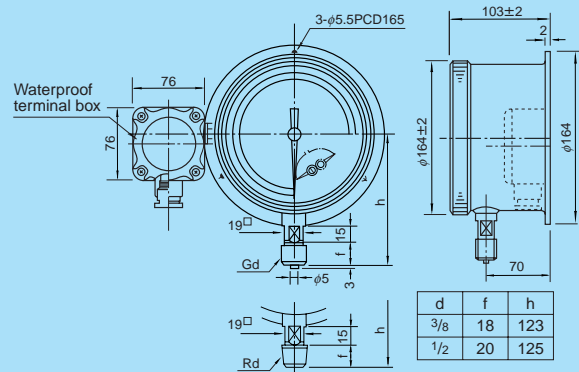
No.670 100 D type



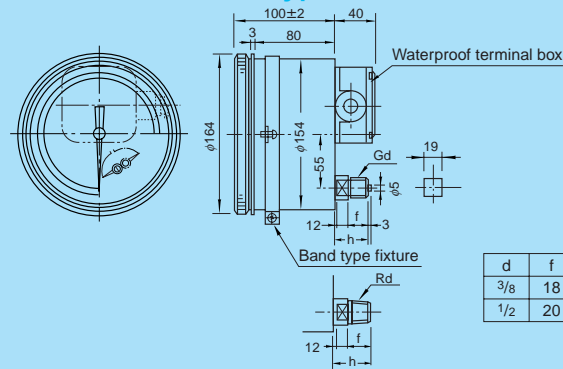
No.670 150 A type



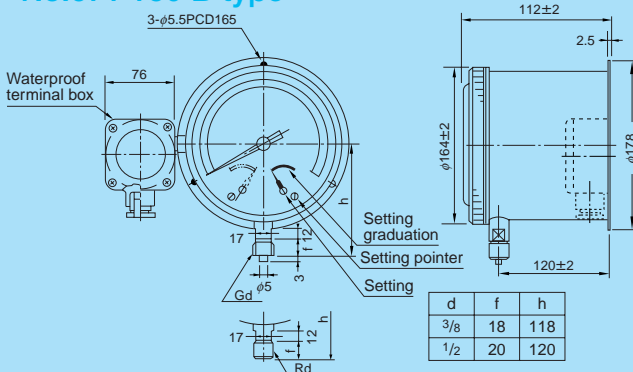
No.670 150 B type



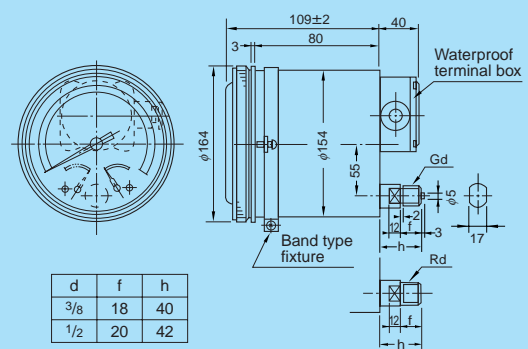
No.670 150 D type



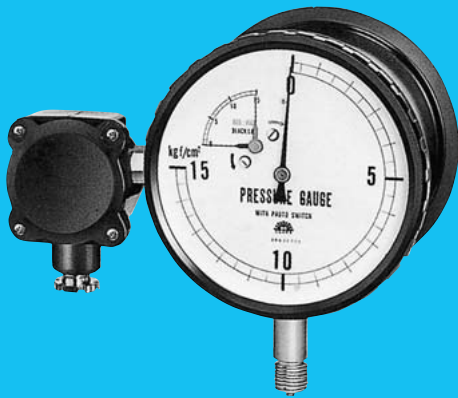
No.671 150 B type



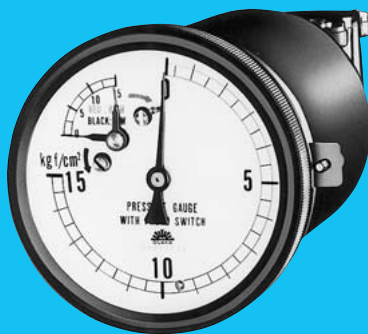
No.671 150 D type



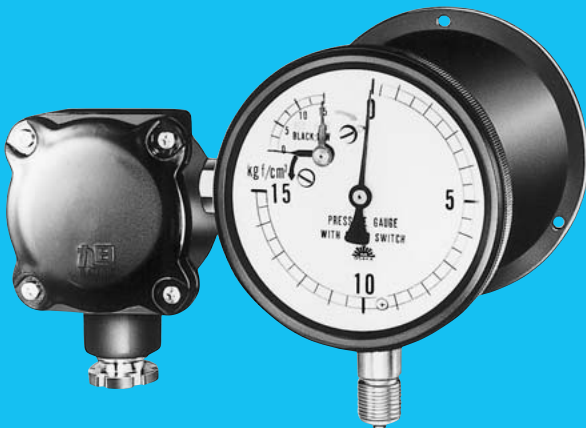
PRESSURE GAUGES WITH PHOTO-ELECTRIC SWITCH



100 B type



100 D type



150 B type

Description

This pressure gauges with photoelectric switch has the built-in photo micro sensor in which the luminous element and light receiving element are faced in a case, accordingly the structure allows the shutter plate that moves by the pressure change blocks the light emitted from the luminous element to generate the ON-OFF electric signal. This product is applicable for control and alarm systems.

Features

1. Since the switch turns ON and OFF without contact, the ON/OFF differential is smaller than the pressure gauges with micro switch, providing the accurate indication after the switch operation.
2. Extremely long life because the product turns ON and OFF without contact.

Application

Use the product when the ON/OFF differential comes into question.

Other specifications

Diaphragm type is available.

When ordering

(Upper limit-Lower limit-Upper/lower limits)
 (Model) (Pressure range) ↓
 (Example) **690-B350-2 1MPa Upper limit**
 Pressure gauge with photoelectric switch
 BU³/₈G 100 x 1MPa Upper limit 1 contact
 Bourdon-tube material BS
 (Note) Specify upper/lower limits numbers, and upper/upper limit numbers, and lower/lower limit numbers in the case of 2 contacts.

Standard specifications of pressure gauges with photoelectric switch

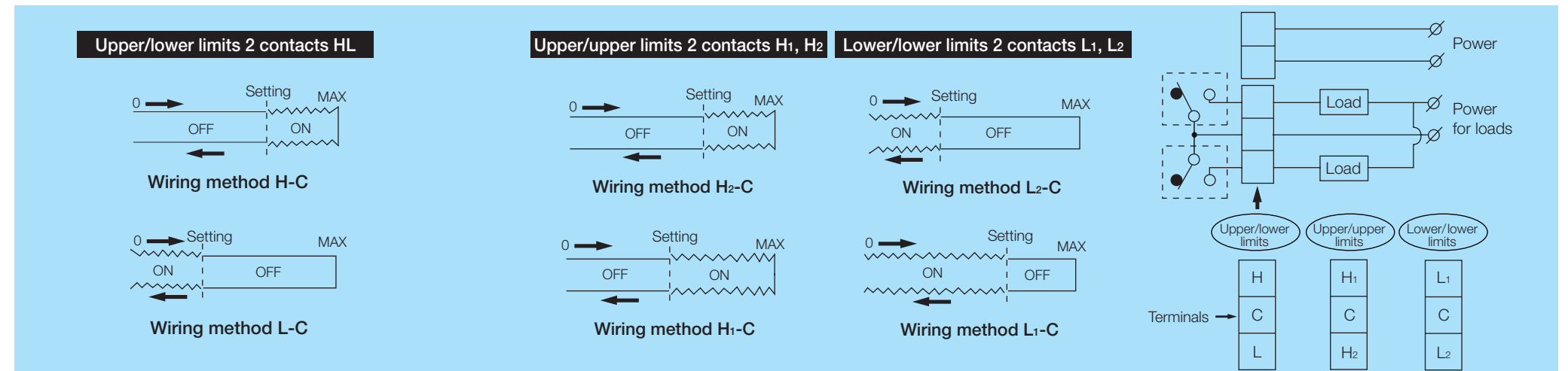
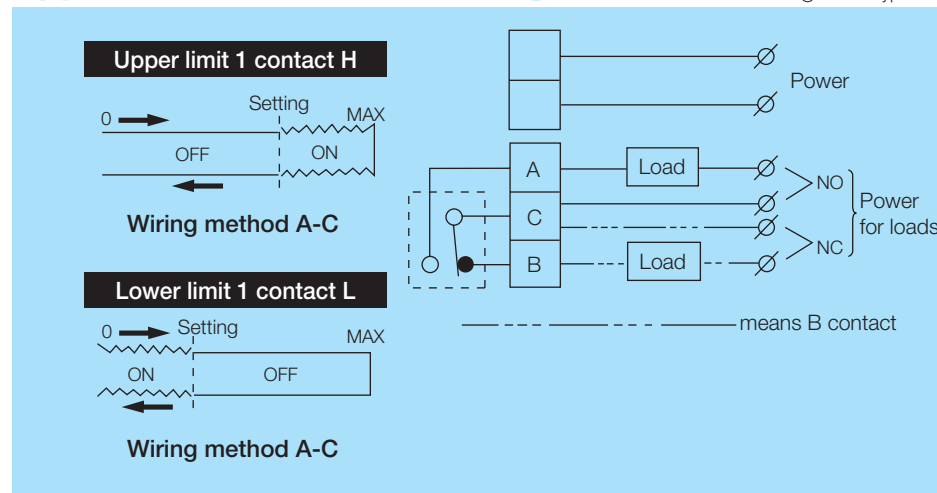
Item	Size	Casing	Con- nection thread	Con- nection shape	Model				Pressure range			ON/OFF differential	Accuracy			Electric characteristic			Power	Contact operation type	Lead cable outlet	Case		Dial angle		Setting method	Measure- ment objects	Ambient- tempera- ture	Weight
					BS		SUS		Vacuum	Compound	Pressure		Indi- cation	Setting	Repeat- ability	Rating	Insulation resistance	Voltage resistance				Material & type	Finish	Indi- cation	Setting				
					1 contact	2 contacts	1 contact	2 contacts																					
Pressure gauge with micro switch 690 (Bourdon-tube type)	100	B mounting hole	G 3/8	U	690-B350-1	690-B350-2	690-B351-1	690-B351-2	MPa -0.1~0	MPa -0.1~0.1	MPa *0.02~0.1		Within ±1.6% F.S.	Within ±2% F.S.	Within ±1% F.S.	Resistance load AC200V5A	More than 50MΩ at DC500V	AC100V for 1 minute	AC100V 110V or AC200V 220V	Holding up to the maximum graduation after contacting	(Waterproof terminal box) Conduit G 1/2 female with JIS 15C gland packing or G 3/4 female without gland packing	ADC drip-proof type	Black, semi- frosted	270°C	60°C ~ 120°C	Internal adjust- ment External adjust- ment is available by your specifi- cation.	Gases and liquids	-5°C ~ +45°C	About 2.2kg
			R 3/8	U	-B750-1	-B750-2	-B751-1	-B751-2																					
			G 1/2	U	-B450-1	-B450-2	-B451-1	-B451-2																					
		R 1/2	U	-B850-1	-B850-2	-B851-1	-B851-2																						
		G 3/8	U	-D350-1	-D350-2	-D351-1	-D351-2																						
		R 3/8	U	-D750-1	-D750-2	-D751-1	-D751-2																						
	150	B mounting hole	G 3/8	U	-B380-1	-B380-2	-B381-1	-B381-2	-0.2	0~0.1																			
			R 3/8	U	-B780-1	-B780-2	-B781-1	-B781-2	-0.3	-0.2																			
			G 1/2	U	-B480-1	-B480-2	-B481-1	-B481-2	-0.4	-0.3																			
		R 1/2	U	-B880-1	-B880-2	-B881-1	-B881-2	-0.6	-0.4																				
										-1	-0.6																		
										-1.5	-1																		

*mark means Receiver Gauge.

Note: Consult the person in charge regarding 10MPa~50MPa.
Note: Products are all relay contact output type.

Type of contacts and wiring method

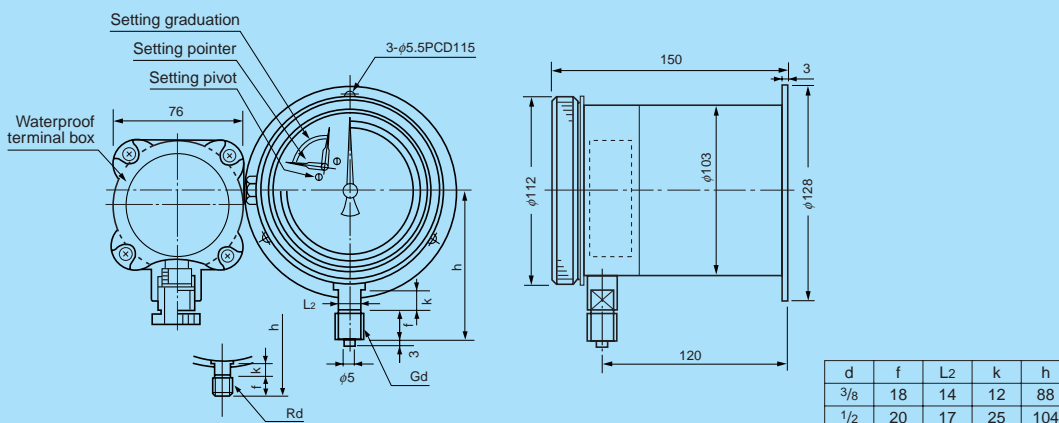
(Note) ①Connect the noted power source on to the terminal board.
②Terminals are all SPDT independent terminals.
③Case A type is available.



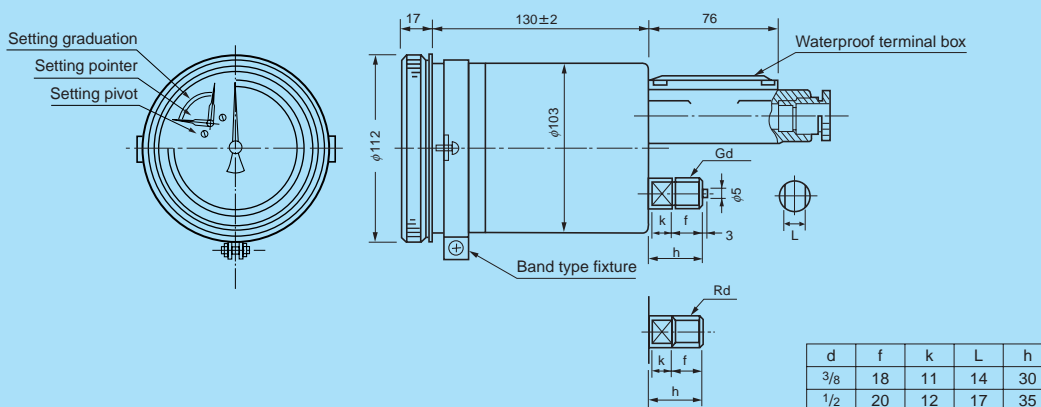
These specifications are subject to change without notice for improvement.

Pressure gauges with photoelectric switch

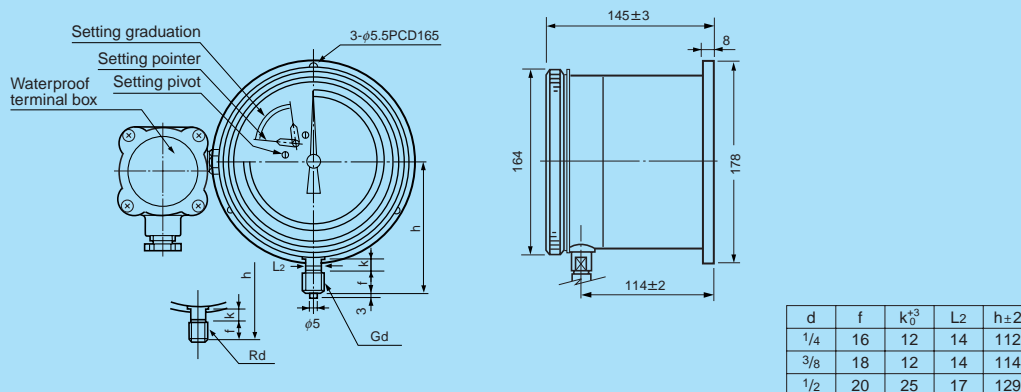
No.690 100 B type



No.690 100 D type



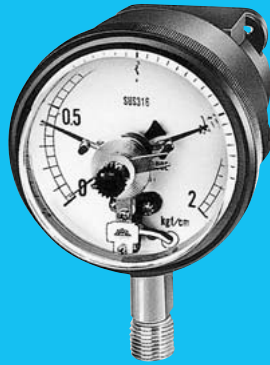
No.690 150 B type



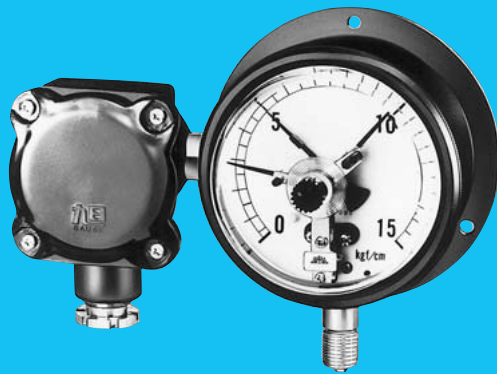
PRESSURE GAUGES WITH POINTER CONTACT POINT

PRESSURE GAUGES WITH RELAY

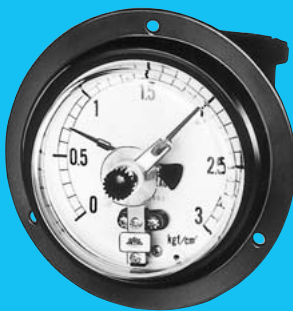
PRESSURE GAUGES WITH KEEP RELAY



100 A type



100 B type



100 D type



100 D type
(For medical instruments use)

Description

Pressure gauges with pointer contact point (Model: 643, 649)

The product has the structure that the circuit closes by contact of the pressure indication pointer and setting needle. Used for alarms such as bells, buzzers and lamp blinking.

Pressure gauges with relay (Model: 644, 647)

The relay is combined (built-in) with the pressure gauge with pointer contact to enable large capacity ON-OFF controls.

Pressure gauges with keep relay (Model: 645, 646)

The keep relay is combined (built-in) with the pressure gauge with pointer contact to enable the self hold controls.

Features

1. Precision setting is provided since the product applies the setting system by the setting pointer on the indication scale.
2. ON/OFF differential is very low in comparison with other pressure gauges with contacts.
3. Platinum-platinum is used for the contacts material.
4. Setting is variable over the entire graduation range of scale angle (270°C).

Other specifications

- (1) Diaphragm type pressure gauge is available for the pressure gauges with pointer contacts point (Model: 649), pressure gauges with relay (Model: 647) and pressure gauges with keep relay (Model: 646).
- (2) These models can be manufactured as the pressure-resistance explosion-proof type (d₂G₄).

When ordering

(Upper limit-Lower limit-Upper/lower limits)
 (Model) (Pressure range) ↓
 (Example) **690-A351-1 1MPa Upper limit**
 Pressure gauge with pointer contact point
 AU³/₈G 100 x 1MPa Upper limit 1 contact
 Bourdon-tube material SUS316

Pressure gauges with pointer contact point

Standard specifications of pressure gauges with pointer contact point (1)

Item	Size	Casing	Con- nection thread*1	Con- nection shape	Model				Pressure range			ON/OFF differential	Accuracy *7			Electric characteristics			Lead cable outlet	Case *4		Setting method	Measure- ment object	Ambient- tempera- ture	Type of contacts	Weight												
					BS		SUS*2		Vacuum	Compound	Pressure		Indication	Setting	Repeat- ability	Rating capacity	Insulation resistance	Voltage resistance		Material Type	Finish																	
					1 contact	2 contacts*6	1 contact	2 contacts*6																														
Low range pressure gauge with pointer contact 643 (Chamber type)	100	A	G 3/8	U	643-A350-1	643-A350-2	643-A351-1	643-A351-2	kPa *1 -1.5~0 *1 -2.5~ -3.5~ -5 ~ -7 ~ -10 ~ -20 ~ -25 ~ -30 ~	The sum of pressure and vacuum absolute values becomes the range in the right hand table.	kPa *1 0~1.5 *1 ~2.5 ~3.5 ~5 ~7 ~10 ~15 ~20 ~30	Within 0.3%F.S. (-5~+45°C)	±1.6% F.S.	±1.6% F.S.	±0.5% F.S.	Resistance load AC100V 0.5A AC200V 0.2A Inductive load AC100V 0.05A Power factor 0.4	More than 50MΩ at DC500V	AC1500V for 1 minute between case and terminals	Waterproof terminal box Conduit G 1/2 female with JIS 15b gland packing D type is the terminal.	ADC Drip-proof type	Adjust with a knob from outside. (Internal adjust- ment is available.)	Gases	-5°C +45°C	a contact (No)	About 0.8kg													
			B		G 3/8	-A450-1	-A450-2	-A451-1																		-A451-2												
		G 1/2			-B350-1	-B350-2	-B351-1	-B351-2																														
		D fixture	G 3/8		-B450-1	-B450-2	-B451-1	-B451-2																														
			G 1/2		-D350-1	-D350-2	-D351-1	-D351-2																														
		A	G 3/8		643-A380-1	643-A380-2	643-A381-1	643-A381-2																														
	G 1/2		-A480-1		-A480-2	-A481-1	-A481-2																															
	B	G 3/8	-B380-1		-B380-2	-B381-1	-B381-2																															
		G 1/2	-B480-1		-B480-2	-B481-1	-B481-2																															
	D fixture	G 3/8	-D380-1		-D380-2	-D381-1	-D381-2																															
		G 1/2	-D480-1		-D480-2	-D481-1	-D481-2																															
	Pressure gauge with pointer contact 649 (Bourdon- tube type)	100 General type	A		G 3/8	U	649-L350-1	649-L350-2			MPa -0.1~0								MPa -0.1~0.1 ~0.2 ~0.3 ~0.4 ~0.6 ~1 ~1.5 ~2 ~2.5	MPa *2 0.02~0.1 0~0.05 ~0.1 ~0.2 ~0.3 ~0.4 ~0.6 ~1 ~1.5 ~2 ~2.5					Within 0.3%F.S. (-5~+45°C)	±1.6% F.S.	±1.6% F.S.	±0.5% F.S.	Resistance load AC100V 0.5A AC200V 0.2A Inductive load AC100V 0.05A Power factor 0.4	More than 50MΩ at DC500V	AC1500V for 1 minute between case and terminals	Terminal	Aluminum plate General type	Adjust with a knob from outside. (Internal adjust- ment is available.)	Gases and liquids	-5°C +45°C	a contact (No)	About 0.7kg
B				G 3/8	-M350-1		-M350-2																															
			G 1/2	-M450-1	-M450-2																																	
D mounting hole			G 3/8	-N350-1	-N350-2																																	
			G 1/2	-N450-1	-N450-2																																	
100			A	G 3/8	649-A350-1		649-A350-2	649-A351-1	649-A351-2				MPa -0.1~0	MPa -0.1~0.1 ~0.2 ~0.3 ~0.4 ~0.6 ~1 ~1.5 ~2 ~2.5	MPa *2 0.02~0.1 0~0.05 ~0.1 ~0.2 ~0.3 ~0.4 ~0.6 ~1 ~1.5 ~2 ~2.5	Within 0.3%F.S. (-5~+45°C)	±1.6% F.S.	±1.6% F.S.			±0.5% F.S.	Resistance load AC100V 0.5A AC200V 0.2A Inductive load AC100V 0.05A Power factor 0.4	More than 50MΩ at DC500V	AC1500V for 1 minute between case and terminals								Waterproof terminal box Conduit G 1/2 female with JIS 15b gland packing B type is the waterproof terminal box.	ADC Drip-proof type					Adjust with a knob from outside. (Internal adjust- ment is available.)
		B		G 3/8	-A450-1		-A450-2	-A451-1	-A451-2																													
			G 1/2	-B350-1	-B350-2		-B351-1	-B351-2																														
		D *5	G 3/8	-B450-1	-B450-2		-B451-1	-B451-2																														
			G 1/2	-D350-1	-D350-2		-D351-1	-D351-2																														
		A	G 3/8	649-A380-1	649-A380-2		649-A381-1	649-A381-2																														
G 1/2			-A480-1	-A480-2	-A481-1		-A481-2																															
B		G 3/8	-B380-1	-B380-2	-B381-1		-B381-2																															
		G 1/2	-B480-1	-B480-2	-B481-1		-B481-2																															
D fixture		G 3/8	-D380-1	-D380-2	-D381-1		-D381-2																															
		G 1/2	-D480-1	-D480-2	-D481-1		-D481-2																															

Note: *1 150 only *2 Receiver gauge

(Note)

- *1. Connection screws other than the table are available.
- *2. Material SUS means that the wet part is SUS316.
- *3. When the pressure range is 0~70, 0~100 or 0~200MPa, the wet part material is SUS630.
- *4. If dust or water may enter the product, or the atmosphere is hazardous, use the drip proof type with the inner adjustment structure.
- *5. For D type installation, specify either the mounting fixture or mounting hole.
- *6. In the case of low range pressure gauge, upper/upper limit 2 points, and low/low limit 2 points are not available.
- *7. When the indication pointer passes the setting value, the accurate indication is impracticable any more because of the resistance of contact.
- *8. In the case of pressure gauge with pointer contact, avoid to use the minute load such as a sequencer.

Special notice ... Always specify in the case of application for medical appliances.

Standard specifications of pressure gauges with relay or keep relay (2)

Model	Item	Size	Case	Connection thread, shape	Pressure range	Material	Rating capacity of electric characteristics	Others	Lead cable outlet	Accuracy	Type of contacts	ON/OFF differential	Weight
644	Low range pressure gauge with relay	100	A or D, sealed type, black	G 3/8U G 1/2U	0~3.5kPa ↓ 0~30	SUS BS	Resistance AC100V 2A AC200V 2A DC 24V 5A	Insulation resistance AC500V 10MΩ	Waterproof terminal box JIS 15b with a cable gland	Indication ±1.6%F.S. Setting 1.6%F.S. Repeat- ability Within 0.3%	a contact	0.5% F.S. 0~100% F.S.	1kg
647	Pressure gauge with relay	100 150			0~0.05MPa ↓ 0~200		Inductance AC100V 5A AC200V 2A DC 24V 2A Power factor 0.4	Voltage resistance AC1500V 1 minute					
645	Low range pressure gauge with keep relay	100			0~3.5kPa ↓ 0~30		Resistance AC100V 3A AC200V 3A DC 24V 3A	Input power AC100V, AC200V, AC100V available)					
646	Pressure gauge with keep relay	100 150			0~0.05MPa ↓ 0~200		Inductance AC100V 3A AC200V 0.8A DC 24V 1.5A Power factor 0.4						

To open/close the large current circuit or make the self-hold circuit, use relays or keep relays.

Pressure gauges with pointer contact point

Type of contacts and wiring method

<p>Upper limit 1 contact H</p>	<p>Pointer contact 643, 649</p>	<p>With relay 644, 647</p>
<p>Lower limit 1 contact L</p>	<p>Pointer contact 643, 649</p>	<p>With relay 644, 647</p>
<p>Upper/lower limits 2 contacts H, L</p>	<p>Pointer contact 643, 649</p>	<p>With relay 644, 647</p>
<p>Upper/upper limits 2 contacts H1, H2</p>	<p>Pointer contact 643, 649</p>	<p>With relay 644, 647</p>
<p>Lower/lower limits 2 contacts L1, L2</p>	<p>Pointer contact 643, 649</p>	<p>With relay 644, 647</p>
<p>Up contact KH</p>	<p>Down contact KL</p>	<p>With keep relay 645, 646</p>

<p>No.649 100 A type (General type with terminals)</p>	<p>No.649 100 B type (General type waterproof terminal box)</p>	<p>No.649 100 D type (General type with terminals)</p>																																																																																
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