

SH · SD

Diaphragm-seal Pressure Transmitters for High Temperature

Outline

This is a pressure transmitter that uses filled liquid as the pressure transmission media between the receiving part and the sensor part. It is used to measure the pressure of materials melted under a high temperature and to measure the pressure of high viscosity fluid at normal temperature, and is widely used in the synthetic chemical, synthetic fiber, and plastic industries.

Features

- Pressure transmitters for the temperature ranges of 0 to 330°C and 0 to 400°C (8 DIA. Diaphragm only are available), pressure measurement under a wide range of temperature conditions is possible.
- Even when the output correction is required for the temperature change of the detection end, zero adjustment is easy. (KJ16 type is not available.)
- Because this is a sealed type pressure transmitter and the measuring fluid does not enter directly into the element (Detection diaphragm), the pressure of high viscosity measuring fluid can be measured.
- The charged liquid (Mercury or NKS instrument oil X3) can be selected according to the application.



Features

NEW

<p>KH28 Pressure Transmitter</p> <p>This is a pressure transmitter that converts the pressure into 4 to 20mA DC electric signal by using the pressure detection part with semiconductor strain gauge and internal electronic circuits and then transmits it.</p>	<p>KJ16 Pressure Transmitter</p> <p>This intrinsically safe explosion-proof construction pressure transmitter of 2 wire system (Explosion class: Exia IIC T4) uses a semiconductor strain gauge type pressure sensor and built-in electronic circuit to convert pressure to 4 to 20mA DC electric signal and to transmit this signal.</p>	<p>KH75 Pressure Transmitter</p> <p>This is a semiconductor strain gauge type high precision converter that converts the change in pressure sensed by a strain gauge into an electric signal. Because it is equipped with an indicator (electric type), it is easy to check pressure in the field.</p>	<p>KH31 Pressure Transmitter</p> <p>Displacement of the element by the filled liquid is extracted as change in inductance and is converted into a signal proportional to the measured amount, and then the converted signal is transmitted. Because it is equipped with an indicator (mechanical type), it is easy to check pressure in the field. A pressure transmitter with pressure resistant explosion proof construction (d2G4) is also available (Model: KD31).</p>

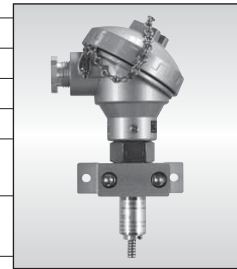
Specification of pressure receiver

Item	Description
Fluid	Gas, liquid
Operating condition	Under the normal condition, where there is no inflammable gas or liquid which cause the ignition or explosion. Use products with an explosion proof construction at hazardous sites.
Installation system	Thread type (Teaper seat, gasket seat) * By diaphragm diameter, taper seat only or gasket seat only Flange mounting type
Filled liquid	Mercury: Wide manufacturing pressure range. Especially applicable to low pressure applications. X3: Harmless oil of a stable product quality. Applicable where mercury cannot be used. (NKS instrument oil)
Diaphragm diameter	φ8 to φ37 (X3 filled: φ18, φ23.6 only, KH31: φ15 to 37)
Connection	G1/4B, 1/2-20UNF, G3/8B, G1/2B, G3/4B, G1B, Flange
Wetted parts materials	SUS316, SUS316L, or Hastelloy C-276 or equivalent
Detecting element	With protection (φ18, φ23.6), without protection
Allowable temperature range (Detecting element)	0 to 330°C, 0 to 400°C (The pressure transmitter with the diaphragm diameter φ8 only can be manufactured optionally.)
Allowable temperature range (Circuit)	Indicating part
Pressure range	Mercury: 0 to 0.6 → 0 to 70MPa X3: 0 to 10 → 0 to 50MPa (KH31: 0 to 1.5 → 0 to 50MPa)
Maximum allowable pressure	120%F.S.

Specification [Pressure Transmitter (KH28)]

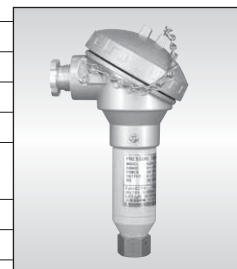
NEW

Item	Description
Output accuracy	±0.75%F.S., ±1.5%F.S. or ±2.0%F.S. (Depending on diaphragm diameter and pressure range)
Temperature coefficient	Circuit: ±0.1%F.S./°C (Zero, span), Detecting element ±0.005MPa/°C
Power source	24V DC±10%
Output	4 to 20mA DC
Load resistance	500Ω maximum
Transmission system	2 wire system
Outlet for electric wire (Gland)	JIS F 8801 15b (Standard), 15a, 15c
Case material, finishing	Terminal box: ADC12 Radiation fin: A5056BD
Protection	Equivalent to IP52
Maximum lead length	2m to 10m (Depending on diaphragm diameter and filled liquid)
Allowable temperature range (Circuit)	0 to 70°C (No freezing or condensation)



Specification [Intrinsically Safe Explosion-Proof Construction Pressure Transmitter (KJ16)]

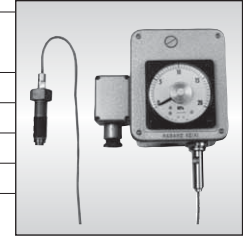
Item	Description
Output accuracy	±0.75%F.S., ±1.5%F.S. or ±2.0%F.S. (Depending on diaphragm diameter and pressure range)
Temperature coefficient	Circuit: ±0.1%F.S./°C (Zero, span), Detecting element ±0.005MPa/°C
Power source	24V DC±10%
Output	4 to 20mA DC
Load resistance	500Ω maximum
Transmission system	2 wire system
Outlet for electric wire (Gland)	JIS F 8801 15b (Standard), 15a, 15c
Case material, finishing	Terminal box: ADC12
Protection	Equivalent to IP52
Maximum lead length	2m to 10m (Depending on diaphragm diameter and filled liquid)
Allowable temperature range (Circuit)	0 to 60°C (No freezing or condensation)



Note) Safety barrier, please prepare it separately.

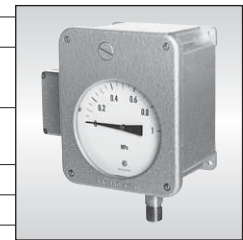
Specification [Pressure Transmitter with Display Function (KH75)]

Item	Description
Output accuracy	±0.75%F.S., ±1.5%F.S. or ±2.0%F.S. (Depending on pressure range)
Indication accuracy	±1.0%F.S.
Temperature coefficient	Detecting element: ±0.005MPa/°C Circuit: ±0.1%F.S./°C
Power source	24V DC±10%
Output	4 to 20mA DC
Load resistance	450Ω maximum
Transmission system	2 wire system
Outlet for electric wire (Gland)	JIS F 8801 20b
Scale angle	270°
Case material, finishing	ADC12, Gray crystal paint Plating
Protection	Indoor use
Maximum lead length	2m to 10m (Depending on diaphragm diameter and filled liquid)
Allowable temperature range (Circuit)	0 to 60°C (No freezing or condensation)



Specification [Pressure Transmitter with Display Function (KH31)]

Item	Description
Output accuracy	±1.5%F.S. (SD_: Within to 20 to 80%F.S.)
Indication accuracy	±1.5%F.S. (SD_: Within to 20 to 80%F.S.)
Temperature coefficient	Detecting element: ±0.005MPa/°C Circuit: ±0.2%F.S./°C
Outlet for electric wire (Gland)	JIS F 8801 20b
Scale angle	180°
Case material, finishing	ADC12, Gray crystal paint Plating
Protection	IP54
Maximum lead length	3m to 10m (Depending on diaphragm diameter)
Allowable temperature range (Circuit)	0 to 45°C (No freezing or condensation)



* The indicator with a mechanical structure also functions as a pressure gauge at the time of loss of power.

Electrical characteristics:

Power source	Output	Load resistance	Transmission system	
24V DC±10%	4 to 20mA DC	400Ω maximum	2 wire system	
100V AC±10% 110V AC±10% 200V AC±10% 220V AC±10%	Current output	0 to 5mA DC	4 wire system	
		0 to 10mA DC		2kΩ maximum
		0 to 20mA DC		1kΩ maximum
	4 to 20mA DC	500Ω maximum		
Voltage output	0 to 5mV DC	1kΩ minimum		
	↓ 0 to 10V DC	↓ 1MΩ minimum		

Specification (Mercury)

Filled liquid: Mercury

Model (Indicating part)	Diaphragm diameter	Connection	Pressure range MPa	Output accuracy (%F.S.)	Maximum lead length*(m)	Model (Pressure receiver)
KH75	φ 8	G1/4B or 1/2-20UNF	0 to 10, 0 to 15	±2.0	2	SH14
			0 to 20→0 to 70	±1.5		
	φ 10	G3/8B or G1/2B	0 to 10, 0 to 15	±2.0	10	SH23
			0 to 20→0 to 70	±1.5		
	φ 18	G3/4B	0 to 5→0 to 70	±0.75	10	SH41
	φ 23.6	G1B	0 to 5→0 to 35			SH51
φ 37	Flange	0 to 0.6, 0 to 1	±1.5	5	SH7□	
		0 to 1.5→0 to 5		10		
KH28 KJ16	φ 8	G1/4B or 1/2-20UNF	0 to 10	±2.0	2	SH14
			0 to 20→0 to 70	±1.5		
	φ 10	G3/8B or G1/2B	0 to 10	±2.0	10	SH23
			0 to 20→0 to 70	±1.5		
	φ 18	G3/4B	0 to 5→0 to 70	±0.75	10	SH41
	φ 23.6	G1B	0 to 5→0 to 35			SH51
φ 37	Flange	0 to 1	±1.5	5	SH7□	
		0 to 2→0 to 5		10		
KH31	φ 18	G3/4B	0 to 15→0 to 70	±1.5	10	SH41
	φ 23.6	G1B	0 to 5→0 to 35			SH51
	φ 37	Flange	0 to 0.6, 0 to 1		3	SH7□
			0 to 1.5→0 to 5			

*Please specify of the lead length separately. (1m Interval)

Specification (X3)

Filled liquid: X3 (NKS instrument oil)

Model (Indicating part)	Diaphragm diameter	Connection	Pressure range MPa	Output accuracy (%F.S.)	Maximum lead length*(m)	Model (Pressure receiver)
KH75	φ 18	G3/4B	0 to 25→0 to 50	±1.5	3	SD41
	φ 23.6	G1B	0 to 10→0 to 35			SD51
KH28 KJ16	φ 18	G3/4B	0 to 35→0 to 50	±1.5	3	SD41
	φ 23.6	G1B	0 to 10→0 to 35			SD51
KH31	φ 15	G3/4B	0 to 35→0 to 50	±1.5 (Within to 20 to 80%F.S.)	3	SD31
	φ 18	G3/4B	0 to 15→0 to 50			SD41
	φ 23.6	G1B	0 to 10→0 to 35			SD51
	φ 37	Flange	0 to 1.5→0 to 10			SD7□

*Please specify of the lead length separately. (1m Interval)

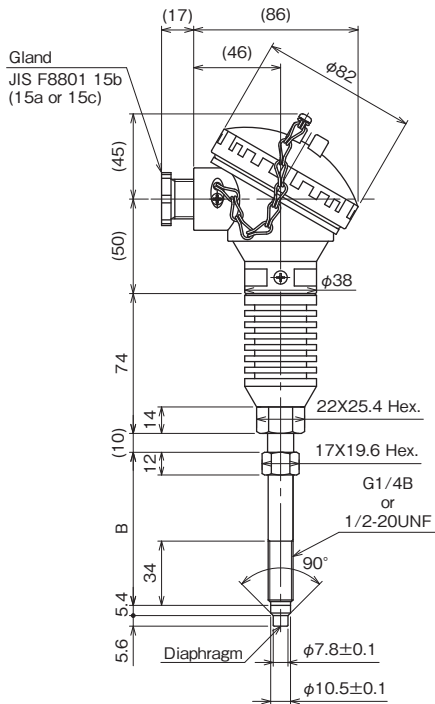
Dimensions 1

Direct type

Unit: mm

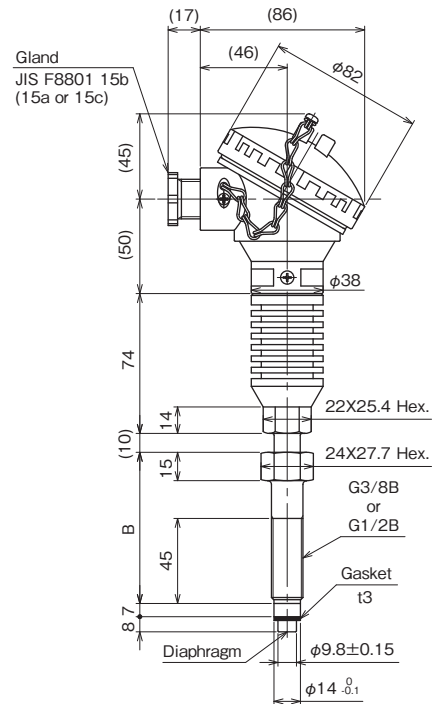
KH28

φ8 (Teaper seat)



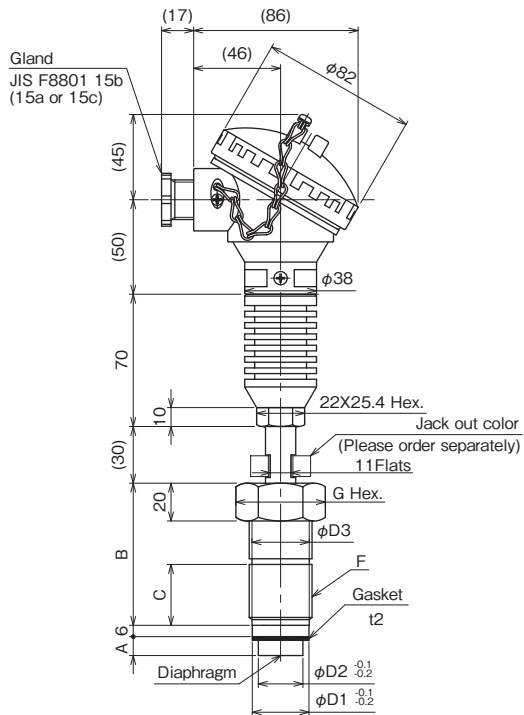
B=80 to 450 (10mm Intervals)

φ10 (Gasket seat)

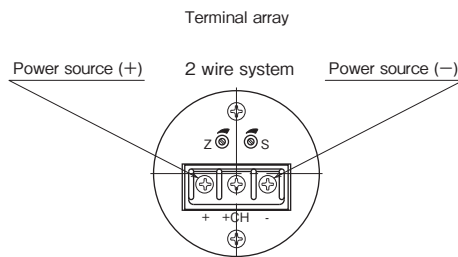


B=80 to 450 (10mm Intervals)

φ18, φ23.6 (Gasket seat)



Protector
(Selectable whether to use or not)

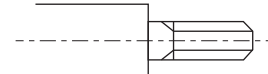


Diaphragm diameter	D1	D2	F	D3	G
18	18	24	G3/4B	23.5 (When there is screw filed processing)	36×41.6
23.6	23.6	30	G1B	29.5 (When there is screw filed processing)	41×47.3

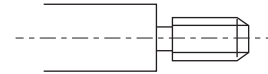
* A size=10 to 30mm (5mm Intervals)
B size=55, 80 to 450mm (10mm Intervals)
C=45 (B=55: C=25)

Screw filed processing

When there is no screw filed processing



When there is screw filed processing



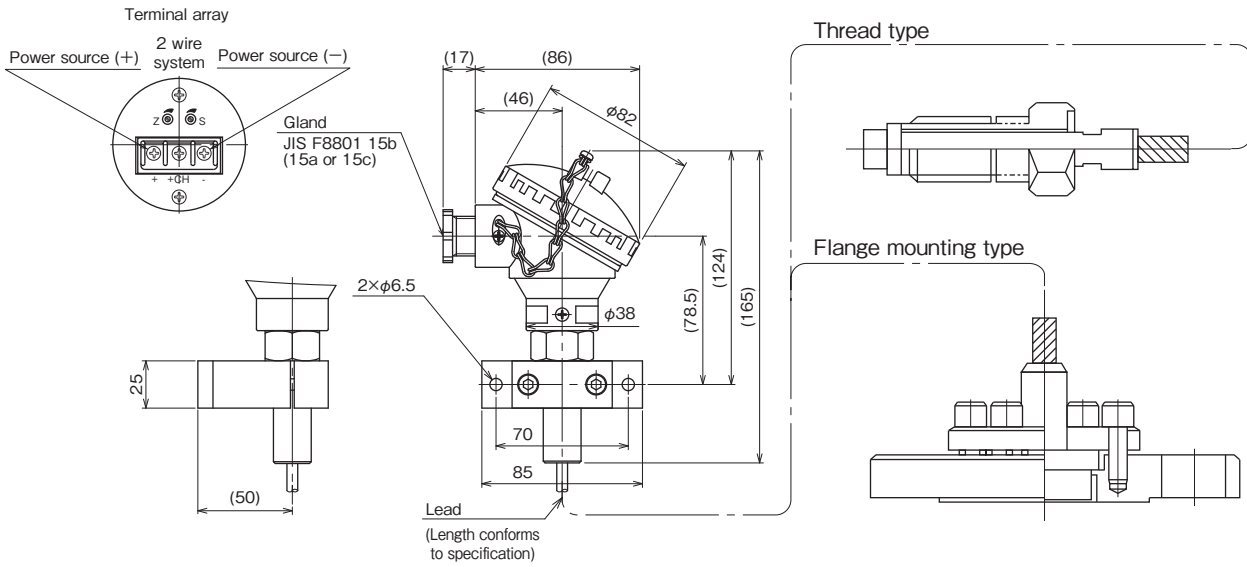
When ordering, please specify the lengths A and B separately.

Dimensions 2

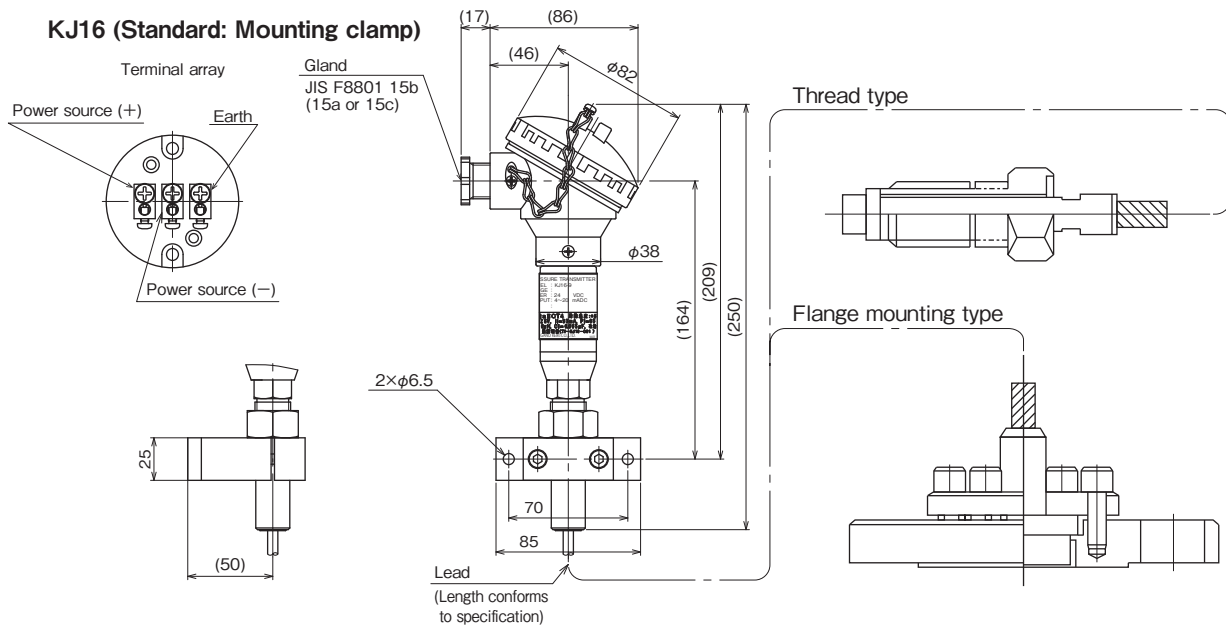
Remote type

Unit: mm

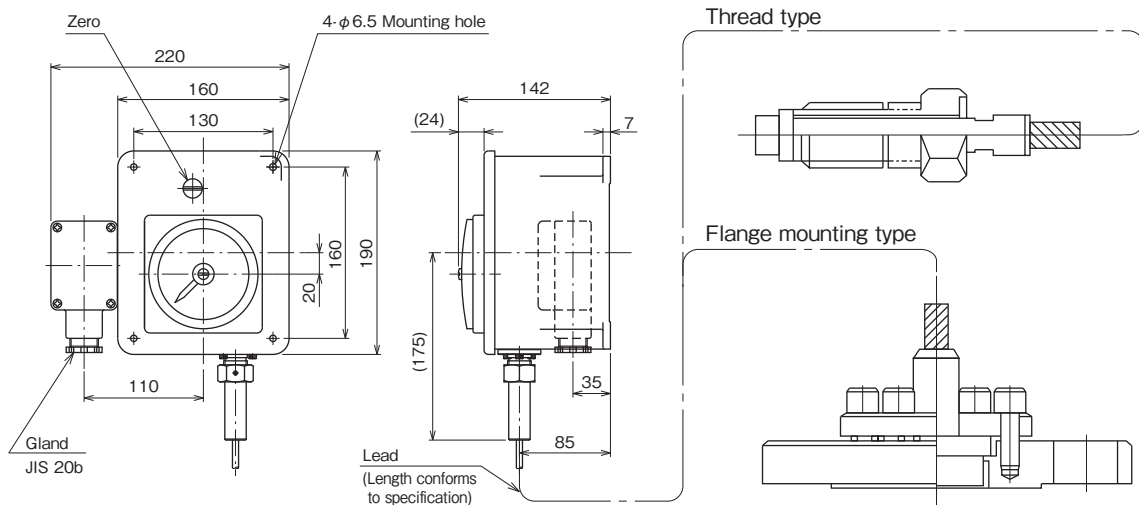
KH28 (Standard: Mounting clamp)



KJ16 (Standard: Mounting clamp)



KH75

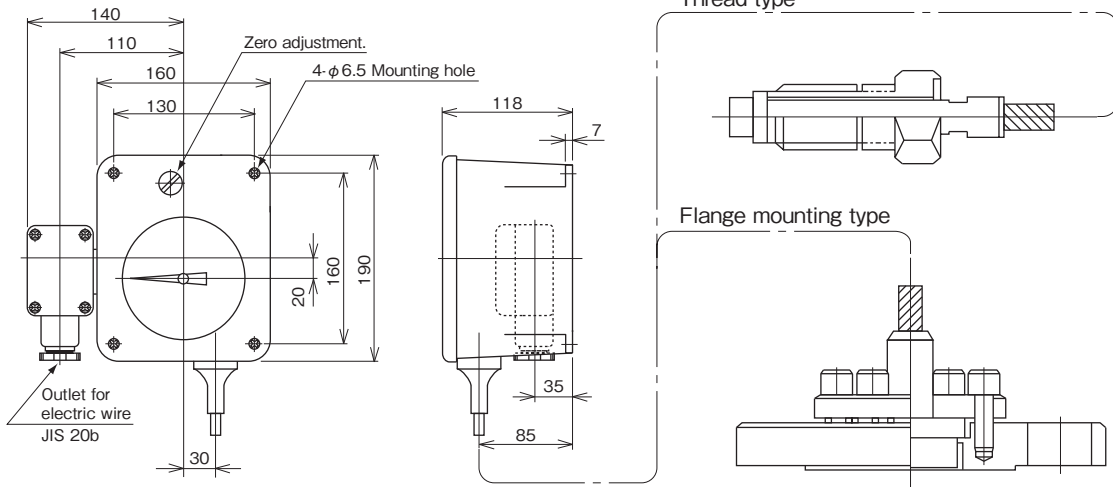


Dimensions 3

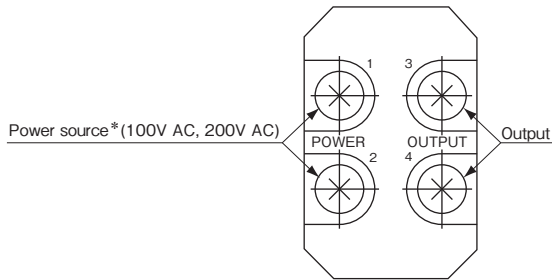
Remote type

Unit: mm

KH31



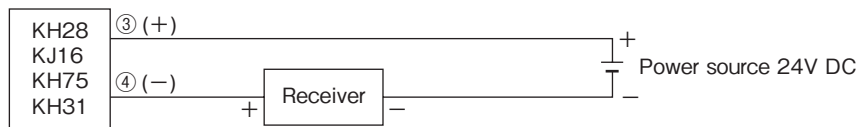
Terminal array (KH75/KH31 Common)



*KH31 Only use. Please refer to wiring.

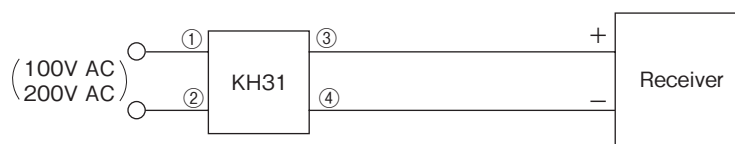
Wiring

2 wire system



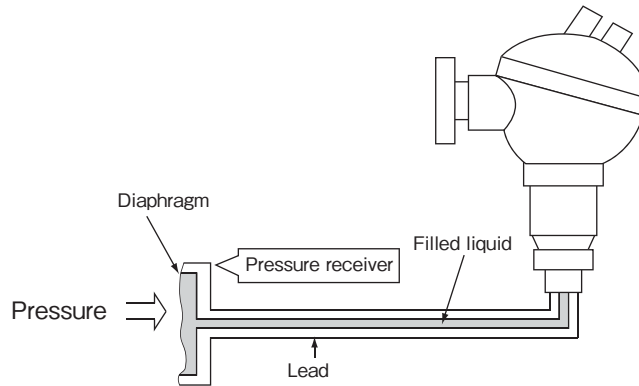
Note: KJ16 is intrinsically safe explosion-proof construction pressure transmitter. When using, please prepare the safety barrier.

4 wire system



Construction and principle

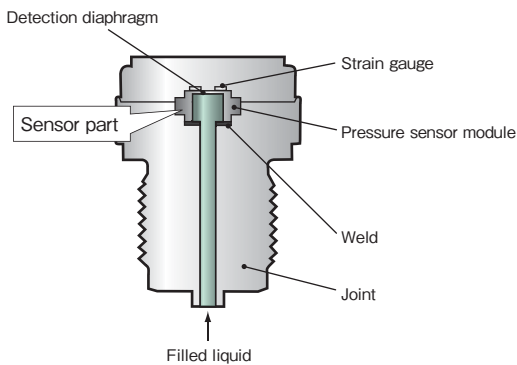
The filled liquid in the diaphragm type receiving part is charged up to the detection diaphragm or Bourdon tube as a sensing part. The pressure is transmitted to the sensing part through this filled liquid.



The maximum lead length depends on the filled liquid, pressure range, and diaphragm diameter. Check the specifications.

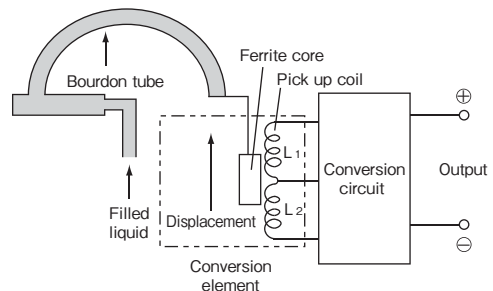
Strain gauge type (KH28/KJ16/KH75)

The pressure transmitted through the filled liquid generates a strain on the detection diaphragm. This strain is sensed by a strain gauge installed on the diaphragm and converted into an electric signal proportional to the pressure change and then transmitted.



Differential inductance method (KH31)

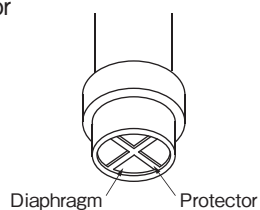
The principle of converting displacement into a DC signal regards the displacement of a Bourdon tube as change in inductance. The conversion element is made up from a pickup coil and a ferrite core. High-frequency voltage is applied to the pickup coil. The high-frequency voltage ratio of L1 and L2 changes according to the displacement in the core. This change is extracted as an output signal proportional to pressure changes.



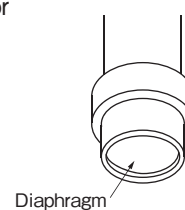
Detecting element

Protector is used to protect the diaphragm. ($\phi 15$, $\phi 18$, $\phi 23.6$)

With protector



Without protector



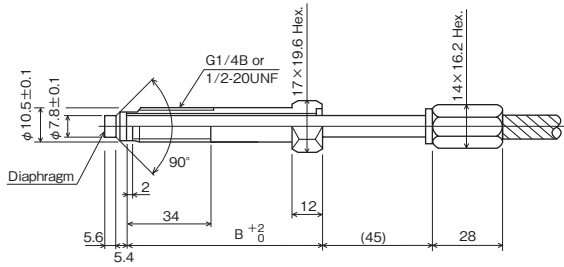
Pressure receiver dimensions 1

Unit: mm

Thread type

φ8 SH14

(Indicating part: KH28, KJ16, KH75)

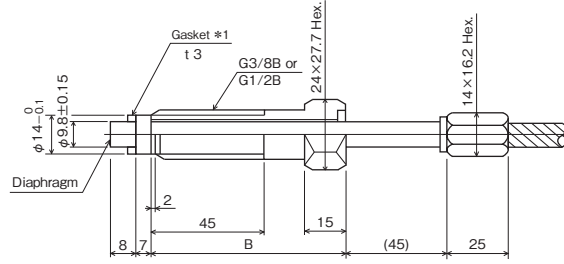


* B dimensions=80 to 450mm (10mm Intervals)

(Teaper seat)

φ10 SH23

(Indicating part: KH28, KJ16, KH75)



* 1 Material: Aluminum

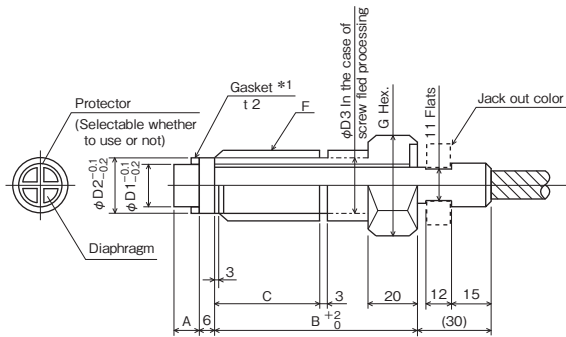
* B dimensions=80 to 450mm (10mm Intervals)

(Gasket seat)

When ordering, please specify the lengths B separately.

φ15, φ18, φ23.6 SH41, SH51, SD31, SD41, SD51

(Indicating part: KH28, KJ16, KH31, KH75)



Diaphragm diameter	D1	D2	F	D3	G
15 (KH31 only)	15	24	G3/4B	23.5	36 × 41.6
18	18	24	G3/4B	23.5	36 × 41.6
23.6	23.6	30	G1B	29.5	41 × 47.3

* A size=10 to 30mm (5mm Intervals)

B size=55, 80 to 450mm (10mm Intervals)

C=45 (B=55, C=25)

* 1 Material: Aluminum

(Gasket seat)

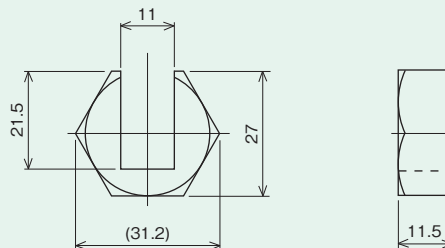
When ordering, please specify the lengths A and B separately.

Recommended parts

Jack out color (SH41, SH51, SD31, SD41, SD51):

When the detection end is pulled out from the mounting hole, it may not be able to pull out because the measuring fluid is firmly fixed. In such a case, it can be pulled out without difficulty by inserting the jack out collar and then turning the mounting screws.

* When ordering, please specify separately.



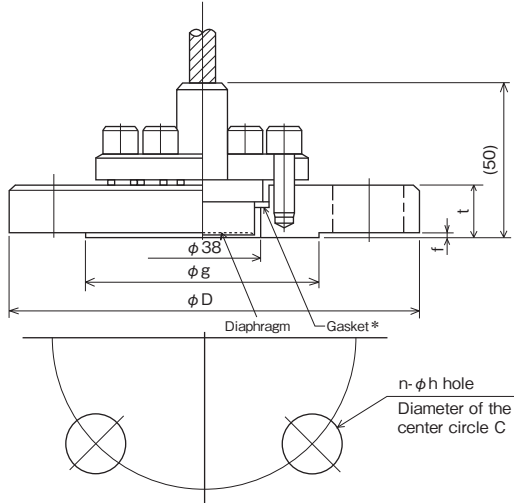
Pressure receiver dimensions 2

Unit: mm

Flange mounting type

φ37 SH7_, SD7_

(Indicating part: KH28, KJ16, KH31, KH75)



Flange standard	D	t	f	g	c	n	h
JIS 10K32A RF	135	16	2	76	100	4	19
40A RF	140	16	2	81	105	4	19
50A RF	155	16	2	96	120	4	19
JIS 20K32A RF	135	18	2	76	100	4	19
40A RF	140	18	2	81	105	4	19
50A RF	155	18	2	96	120	8	19
JIS 30K32A RF	140	22	2	80	105	4	19
40A RF	160	22	2	90	120	4	23
50A RF	165	22	2	105	130	8	19
JIS 40K32A RF	140	24	2	80	105	4	19
40A RF	160	24	2	90	120	4	23
50A RF	165	26	2	105	130	8	19
JIS 63K32A RF (KH31 only)	150	30	2	80	110	4	23
40A RF (KH31 only)	175	32	2	90	130	4	25
50A RF (KH31 only)	185	34	2	105	145	8	23

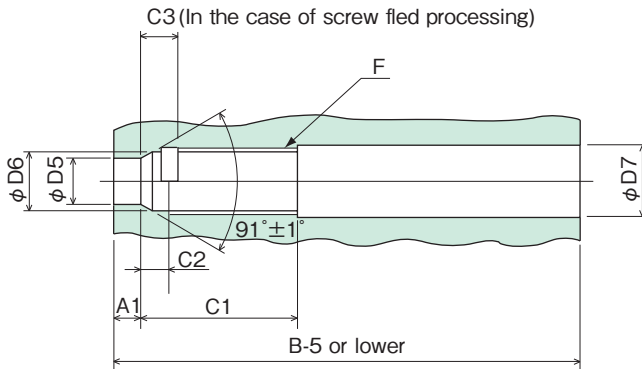
* Material: Aluminum

Mounting 1

Unit: mm

Teaper seat:

(Recommended mounting hole)



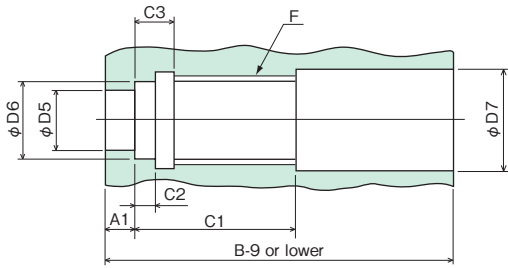
Diaphragm diameter	F	D5	D6	D7	A1	C1	C2	C3
8	G1/4B	$7.93^{+0.05}_0$	$11.5^{+0.3}_0$	13.6 or higher	6.4 or higher	35^{+3}_0	6 or lower	9 or lower
8	1/2-20UNF	$7.93^{+0.05}_0$	$11.3^{+0.3}_0$	13.1 or higher	6.4 or higher	35^{+3}_0	6 or lower	9 or lower

Mounting 2

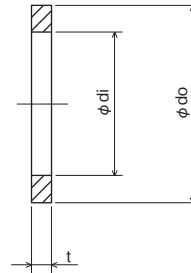
Unit: mm

Gasket seat:

(Recommended mounting hole)



(Recommended gasket dimension)



Diaphragm diameter	di	do	t
10	10.2±0.2	13.8±0.1	3.0±0.1
15	15.5±0.2	23.5±0.2	2.0±0.1
18	18.5±0.2	23.5±0.2	2.0±0.1
23.6	24.0±0.2	29.5±0.2	2.0±0.1

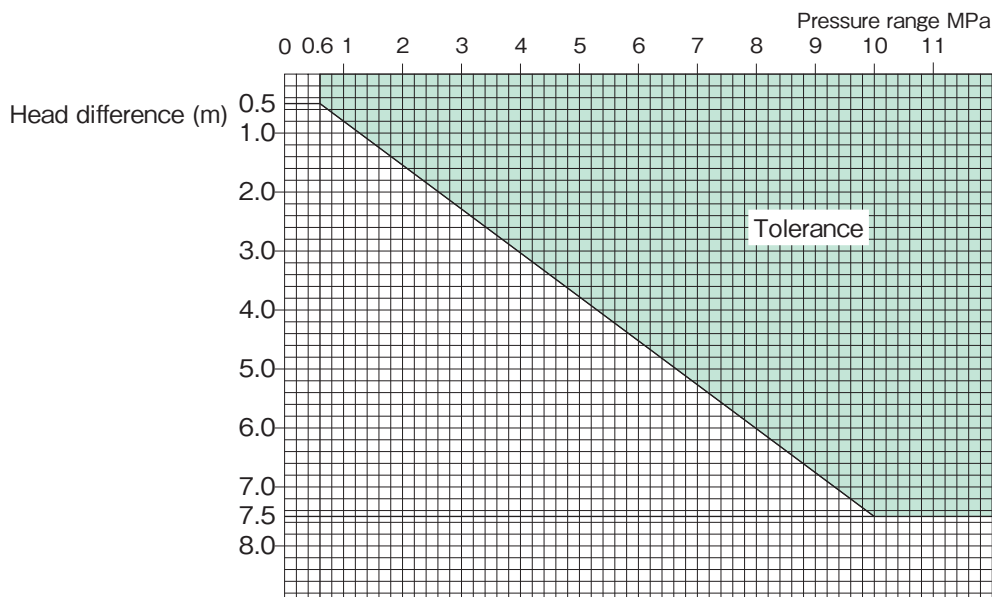
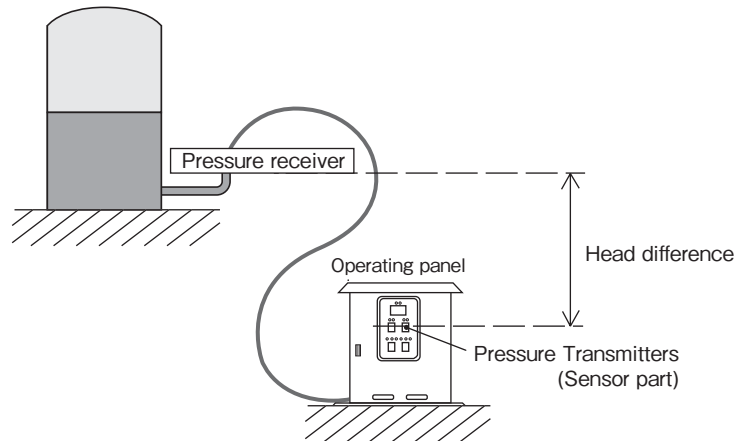
Standard material: Aluminum

Diaphragm diameter	F	D5	D6	D7	A1 *	C1	C2 *	C3
10	G3/8B	10.0 ^{+0.1} ₀	14.1 ^{+0.3} ₀	17.2 or higher	5.8 or higher	45 ⁺⁶ ₀	5 or higher	14 or lower
10	G1/2B	10.0 ^{+0.1} ₀	14.1 ^{+0.3} ₀	21.5 or higher	5.8 or higher	45 ⁺⁶ ₀	5 or higher	14 or lower
15	G3/4B	15.0 ^{+0.1} ₀	24.1 ^{+0.3} ₀	27.0 or higher	A-1 or higher	c ⁺⁶ ₀	4 or higher	11 or lower
18	G3/4B	18.0 ^{+0.1} ₀	24.1 ^{+0.3} ₀	27.0 or higher	A-1 or higher	c ⁺⁶ ₀	4 or higher	11 or lower
23.6	G1B	23.6 ^{+0.1} ₀	30.1 ^{+0.3} ₀	33.8 or higher	A-1 or higher	c ⁺⁶ ₀	4 or higher	11 or lower

* Please note that the above dimensions change depending on the gasket size.
The above dimensions are the values when the recommended gasket is used.

Head difference

Because the specific gravity of mercury is high, if the head difference between the sensing part and the receiving part is large, a large load is applied to the diaphragm or pressure element and cause trouble. The allowable range of the head difference is shown in the chart below. If there is a head difference, please inform us when ordering, so we will ship the product after the adjustment.



Note: Mounting type of the sensor higher than the sensing part is, as a rule, unsuitable.

Filled liquid: X3

Model number configuration

Please specify for ordering the model number and each specs.

Model

Diaphragm-seal Pressure Transmitters for High Temperature

Model number		Selective spec.		Additional spec. (Option)			
Thread type	3 1	Diaphragm diameter	φ 15	Connection	G3/4B	Pressure range	0 to 35, 50MPa (KH31 only)
	4 1	Diaphragm diameter	φ 18	Connection	G3/4B	Pressure range	0 to 15, 20MPa (KH31 only) 0 to 25, 35, 50MPa
	5 1	Diaphragm diameter	φ 23.6	Connection	G1 B	Pressure range	0 to 10, 15, 20, 25, 35MPa
① Connection		6	G3/4B				
		8	G1 B				
② Protector		1	With protector, No screw fled processing				
		2	Without protector, No screw fled processing				
		3	With protector, Screw fled processing				
		4	Without protector, Screw fled processing				
③ Wetted parts material		3	SUS316				
		4	SUS316L				
		8	Hastelloy® C-276 or equivalent (Note 1)				
④ Diaphragm material		3	SUS316				
		4	SUS316L				
		8	Hastelloy® C-276 or equivalent (Note 1)				
⑤ Pressure receiver A dimensions		X	Please specify a length between 10 to 30mm in 5mm intervals.				
⑥ Pressure receiver B dimensions		X	Please specify a length between 55 or 80 to 450mm in 10mm intervals.				
⑦ Option		0	Nil				
		1	With jack out color				
⑧ Treatment		0	Nil				
		1	Use no oil				
		2	Use no water				
		3	Use no oil and water				
⑨⑩⑪⑫ Indicating part *1		KH28	Pressure Transmitter	When ordering, please specify the pressure range and units separately.			
		KJ16	Pressure Transmitter				
		KH31	Pressure Transmitter				
		KH75	Pressure Transmitter				
⑭ Construction and temperature of detecting element		1	Direct type				
		2	Remote type For remote type, please specify the lead length and kind.				
⑮ Document		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, strength calculation, attended inspection				

* When ordering, please specify the lead length and A and B lengths for screw mounting.

Note 1: Remote type only available.

Maximum lead length 3m

Filled liquid: X3

*1 For Indicating part, please select from the Filled liquid: X3 specification.
Model configuration of the Indicating part is ⑨, ⑩, ⑪ and ⑫.
Please also specify the model number configuration of the Indicating part.
【Note】 Production specification range is different from mercury-enclosed type.

* Specify by code "X" if there is no applicable specification.

Filled liquid: X3

Model number configuration

Please specify for ordering the model number and each specs.

Model

S	D	7	—	1	—	X	X	0	K	H	3	1	X	2				
				①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Diaphragm-seal Pressure Transmitters for High Temperature

Model number		Selective spec.		Additional spec. (Option)	
Flange mounting type	1	Diaphragm diameter φ37	Connection flange		0 to 1.5, 2, 2.5, 3.5, 5, 7, 10MPa
	3		JIS 10K		
	4		JIS 20K		
	5		JIS 30K		
	B		JIS 40K		
		JIS 63K			
① Connection flange nominal diameter		4	32A		
		5	40A		
		6	50A		
② Flange seat		1	RF		
③ Wetted parts material		3	SUS316		
		4	SUS316L		
④ Diaphragm material		3	SUS316		
		4	SUS316L		
⑤ Pressure receiver A dimensions		X			
⑥ Pressure receiver B dimensions		X			
⑦ Option		0	Nil		
⑧ Treatment		0	Nil		
		1	Use no oil		
		2	Use no water		
		3	Use no oil and water		
⑨⑩⑪⑫ Indicating part *1		KH31	Pressure Transmitter, Remote type		
⑭ Construction and temperature of detecting element		2	Remote type Please specify the lead length and kind.		
⑮ Document		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, strength calculation, attended inspection		

* When ordering, please specify of the lead length.

Maximum lead length 3m

Filled liquid: X3

* 1 For Indicating part, please select from the Filled liquid: X3 specification.
Model configuration of the Indicating part is ⑨, ⑩, ⑪ and ⑫.
Please also specify the model number configuration of the indicating part.
【Note】 Production specification range is different from mercury-enclosed type.

* Specify by code "X" if there is no applicable specification.

Filled liquid: X3 Indicating part

Model number configuration

Please specify for ordering the model number and each specs.

Model																																		
K H 2 8	—	X		9	—	0	1	1	0	×	×	×	×	×																				
Pressure Transmitter		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮																		
Model number					Selective spec.					Additional spec. (Option)																								
① Model	X	For high temperature diaphragm-seal																																
② Type	1	Direct (Flange type cannot be manufactured)																																
	2	Remote (With mounting clamp)																																
③ Body	9	Terminal box type (Large), Standard																																
Please specify applicable range code as well as pressure range and engineering unit.	④ Pressure range (MPa)	N	0 to 10			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">⑧</td> <td style="width: 5%; text-align: center;">⑨</td> <td style="width: 10%;">⑧ Outlet for electric wire</td> <td style="width: 10%;">⑨ Cable kind</td> </tr> <tr> <td colspan="4" style="text-align: center;">Terminal box (Large) (Without attached cable)</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">0</td> <td>JIS 15a</td> <td style="text-align: center;">—</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td>JIS 15b</td> <td style="text-align: center;">—</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">0</td> <td>JIS 15c</td> <td style="text-align: center;">—</td> </tr> </table>									⑧	⑨	⑧ Outlet for electric wire	⑨ Cable kind	Terminal box (Large) (Without attached cable)				3	0	JIS 15a	—	4	0	JIS 15b	—	5	0	JIS 15c	—
	⑧	⑨	⑧ Outlet for electric wire	⑨ Cable kind																														
	Terminal box (Large) (Without attached cable)																																	
	3	0	JIS 15a	—																														
4	0	JIS 15b	—																															
5	0	JIS 15c	—																															
		Q	0 to 20																															
		R	0 to 35																															
		S	0 to 50																															
⑤ Accuracy	0	Standard (±1.5%F.S.)																																
⑥ Power source	1	24V DC ±10%																																
⑦ Output	1	4 to 20mA DC (2 wire system)																																
⑧ Outlet for electric wire																																		
⑨ Cable kind																																		
⑮ Document	0	Nil																																
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate																																

It is combined with SD model number of the receiving part.

Filled liquid: X3

* Specify by code "X" if there is no applicable specification.

Filled liquid: X3 **Indicating part**

Model number configuration

Please specify for ordering the model number and each specs.

Model
K J 1 6 — **X 2 9** — **0 1 1** **0** × × × × ×

Intrinsically Safe Explosion-Proof Construction Pressure Transmitter

Model number		Selective spec.	Additional spec. (Option)	
① Model	X	For high temperature diaphragm-seal		
② Type	2	Remote (With mounting clamp)		
③ Body	9	Terminal box type (Large), Standard		
④ Pressure range (MPa)	N	0 to 10	φ 23.6 (Accuracy ±1.5%F.S.) only	
	Q	0 to 20		
	R	0 to 35	φ 18, φ 23.6 (Accuracy ±1.5%F.S.) only	
	S	0 to 50	φ 18 (Accuracy ±1.5%F.S.) only	
⑤ Accuracy	0	Standard (±1.5%F.S.)		
⑥ Power source	1	24V DC ±10%		
⑦ Output	1	4 to 20mA DC (2 wire system)		
⑧ Outlet for electric wire ⑨ Cable kind	⑧	⑨	⑧ Outlet for electric wire	⑨ Cable kind
	Terminal box (Large) (Without attached cable)			
	3	0	JIS 15a	—
	4	0	JIS 15b	—
5	0	JIS 15c	—	
⑩ Document	0	Nil		
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate		

Please specify applicable range code as well as pressure range and engineering unit.

It is combined with SD model number of the receiving part.

Filled liquid: X3

* Specify by code "X" if there is no applicable specification.

Filled liquid: X3 **Indicating part**

Model number configuration

Please specify for ordering the model number and each specs.

Model																		
K H 3 1				X 2 1			0		×	×	×	×	×	×				
Pressure Transmitters				①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Model number				Selective spec.				Additional spec. (Option)										
Please specify applicable range code as well as pressure range and engineering unit.				④ Pressure range (MPa)		3		0 to 10, 15, 20, 25, 35 (φ 23.6, SD51)										
				4		0 to 15, 20, 25, 35, 50 (φ 18, SD41)												
				⑤ Accuracy		0		±1.5%F.S. (Within to 20 to 80%F.S.)										
				⑥ Power source		1		24V DC 2 wire system										
						2		100V AC 4 wire system										
						3		110V AC 4 wire system										
						4		200V AC 4 wire system										
						5		220V AC 4 wire system										
				⑦ Output		1		4 to 20mA DC 2 wire system, 4 wire system										
						2		0 to 5mA DC 4 wire system										
						3		0 to 10mA DC 4 wire system										
						4		0 to 20mA DC 4 wire system										
						7		0 to 10V DC 4 wire system										
						H		0 to 5mV DC 4 wire system										
				⑧ Outlet for electric wire		7		JIS 20b										
								Others										
				⑮ Document		0		Nil										
						1		Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate										

It is combined with SD model number of the receiving part.

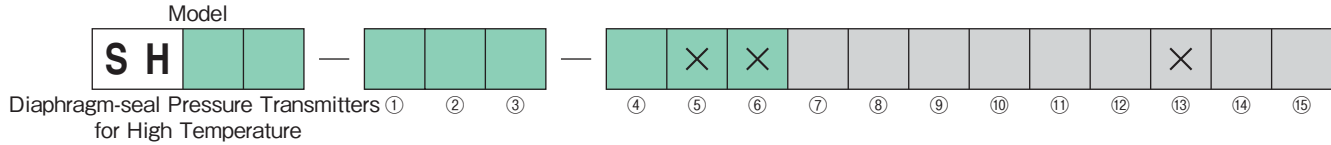
Filled liquid: X3

* Specify by code "X" if there is no applicable specification.

Filled liquid: Mercury

Model number configuration

Please specify for ordering the model number and each specs.



Model		Selective spec.	Additional spec. (Option)
Thread type	1 4	Diaphragm diameter	Pressure receiver sheet
	2 3	φ 8	Teaper seat with temperature compensating function
	4 1	φ 10	Gasket seat with temperature compensating function
	5 1	φ 18	Gasket seat
		φ 23.6	Gasket seat
			Connection
			G1/4B or 1/2-20UNF KH31 is not available
			G3/8B or G1/2B KH31 is not available
			G3/4B
			G1B

① Connection	2	G1/4B	SH14 only
	3	G3/8B	SH23 only
	4	G1/2B	SH23 only
	6	G3/4B	SH41 only
	8	G1 B	SH51 only
	Y	1/2-20UNF	SH14 only

② Protector	1	With protector Except for φ 8 and φ 10	
	2	Without protector	
	3	With protector, Screw fled processing Except for φ 8 and φ 10	
	4	Without protector, Screw fled processing Except for φ 8 and φ 10	

③ Wetted parts material	3	SUS316	
	4	SUS316L	
	8	Hastelloy® C-276 or equivalent (Note 1)	

④ Diaphragm material	3	SUS316	
	4	SUS316L	
	8	Hastelloy® C-276 or equivalent (Note 1)	

⑤ Pressure receiver A dimensions	×	Please specify a length between 10 to 30mm in 5mm intervals. Except for φ 8 and φ 10	
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⑥ Pressure receiver B dimensions	×	Please specify a length between 55 or 80 to 450mm in 10mm intervals. (But φ 8 and φ 10, please specify a length between 80 to 450mm in 10mm intervals.)	
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⑦ Option	0	Nil	
	1	With jack out color (SH41 and SH51 only)	

⑧ Treatment	0	Nil	
	1	Use no oil	
	2	Use no water	
	3	Use no oil and water	

⑨⑩⑪⑫ Indicating part * 1	KH28	Pressure Transmitter	When ordering, please specify the pressure range and units separately.
	KJ16	Pressure Transmitter	
	KH31	Pressure Transmitter	
	KH75	Pressure Transmitter	

⑭ Construction and temperature of detecting element	1	Direct type (KH28 only)	
	2	Remote type Please specify of the lead length and lead kind. Temperature of detecting element 0 to 330°C standard	
	3	Remote type φ 8 Temperature of detecting element 0 to 400°C	

⑮ Document	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, strength calculation, attended inspection	

* When ordering, please specify the lead length and A and B lengths for screw mounting.

Note 1: When the material of wetted parts is Hastelloy C-276 or equivalent, only the remote measuring type up to 50MPa is also available.

Filled liquid: Mercury

* 1 For Indicating part, please select from the Filled liquid: Mercury specification.
Model configuration of the Indicating part is ⑨, ⑩, ⑪ and ⑫.
Please also specify the model number configuration of the Indicating part.
【Note】 Production specification range is different from Filled liquid X3 specification.

* Specify by code "X" if there is no applicable specification.

Filled liquid: Mercury

Model number configuration

Please specify for ordering the model number and each specs.

Model

S	H	7	—	1	—	X	X	0					X	2					
				①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Diaphragm-seal Pressure Transmitters for High Temperature

Model number		Selective spec.		Additional spec. (Option)	
Flange mounting type	1	Diaphragm diameter φ37	Connection flange		
	3		JIS 10K		
	4		JIS 20K		
	5		JIS 30K		
			JIS 40K		
① Connection flange nominal diameter	4	32A			
	5	40A			
	6	50A			
② Flange seat	1	RF			
③ Wetted parts material	3	SUS316			
	4	SUS316L			
④ Diaphragm material	3	SUS316			
	4	SUS316L			
⑤ Pressure receiver A dimensions			X		
⑥ Pressure receiver B dimensions			X		
⑦ Option		0	Nil		
⑧ Treatment	0	Nil			
	1	Use no oil			
	2	Use no water			
	3	Use no oil and water			
⑨⑩⑪⑫ Indicating part * 1		KH28	Pressure Transmitter, Remote type		
		KJ16	Pressure Transmitter, Remote type		
		KH31	Pressure Transmitter, Remote type		
		KH75	Pressure Transmitter, Remote type		
⑭ Construction and temperature of detecting element		2	Remote type Please specify of the lead length and lead kind.		
⑮ Document		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, strength calculation, attended inspection		

* When ordering, please specify of the lead length.

Filled liquid: Mercury

* 1 For Indicating part, please select from the Filled liquid: Mercury specification.
Model configuration of the Indicating part is ⑨, ⑩, ⑪ and ⑫.
Please also specify the model number configuration of the Indicating part.
【Note】 Production specification range is different from Filled liquid X3 specification.

* Specify by code "X" if there is no applicable specification.

Filled liquid: Mercury **Indicating part**

Model number configuration

Please specify for ordering the model number and each specs.

Model														
K H 2 8			X	9	0	1	1	0	×	×	×	×	×	×
Pressure Transmitter			①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
Model number					Selective spec.					Additional spec. (Option)				
① Model		X		For high temperature diaphragm-seal										
② Type		1		Direct (Flange type cannot be manufactured)										
		2		Remote 0 to 330°C (With mounting clamp)										
		3		Remote 0 to 400°C (With mounting clamp, φ8 only)										
③ Body		9		Terminal box type (Large) Standard										
Please specify applicable range code as well as pressure range and engineering unit.		④ Pressure range (MPa)		G		0 to 1		φ37 (Accuracy, ±1.5%F.S.)						
				J		0 to 2								
				K		0 to 3.5								
				L		0 to 5		φ18, φ23.6 (Accuracy ±0.75%F.S.), φ37 (Accuracy ±1.5%F.S.) only						
				N		0 to 10		φ8, φ10 (Accuracy ±2.0%F.S.), φ18, φ23.6 (Accuracy ±0.75%F.S.) only						
				Q		0 to 20		φ8, φ10 (Accuracy ±1.5%F.S.), φ18, φ23.6 (Accuracy ±0.75%F.S.) only						
				R		0 to 35		φ8, φ10 (Accuracy ±1.5%F.S.), φ18, φ23.6 (Accuracy ±0.75%F.S.) only						
				S		0 to 50		φ8, φ10 (Accuracy ±1.5%F.S.), φ18 (Accuracy ±0.75%F.S.) only						
T		0 to 70		φ18 (Accuracy ±0.75%F.S.) only										
⑤ Accuracy		0		Standard										
⑥ Power source		1		24V DC ±10%										
⑦ Output		1		4 to 20mA DC (2 wire system)										
⑧ Outlet for electric wire ⑨ Cable kind		⑧		⑨		⑧ Outlet for electric wire		⑨ Cable kind						
		Terminal box (Large) (Without attached cable)												
		3		0		JIS 15a		—						
		4		0		JIS 15b		—						
		5		0		JIS 15c		—						
⑩		0		Nil										
⑪		1		Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate										

It is combined with SD model number of the receiving part.

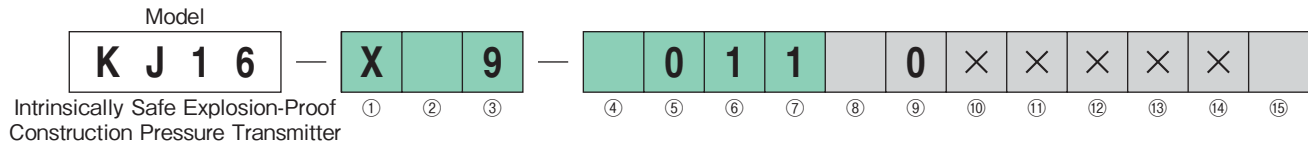
Filled liquid: Mercury

* Specify by code "X" if there is no applicable specification.

Filled liquid: Mercury **Indicating part**

Model number configuration

Please specify for ordering the model number and each specs.



Model number		Selective spec.		Additional spec. (Option)	
① Model	X	For high temperature diaphragm-seal			
② Type	2	Remote 0 to 330°C (With mounting clamp)			
	3	Remote 0 to 400°C (With mounting clamp, φ8 only)			
③ Body	9	Terminal box type (Large) Standard			
④ Pressure range (MPa)	G	0 to 1	φ37 (Accuracy ±1.5%F.S.)		
	J	0 to 2			
	K	0 to 3.5	φ18, φ23.6 (Accuracy ±0.75%F.S.), φ37 (Accuracy ±1.5%F.S.) only		
	L	0 to 5			
	N	0 to 10	φ8, φ10 (Accuracy ±2.0%F.S.), φ18, φ23.6 (Accuracy ±0.75%F.S.) only		
	Q	0 to 20	φ8, φ10 (Accuracy ±1.5%F.S.), φ18, φ23.6 (Accuracy ±0.75%F.S.) only		
	R	0 to 35	φ8, φ10 (Accuracy ±1.5%F.S.), φ18 (Accuracy ±0.75%F.S.) only		
	S	0 to 50			
T	0 to 70				
⑤ Accuracy	0	Standard			
⑥ Power source	1	24V DC ±10%			
⑦ Output	1	4 to 20mA DC (2 wire system)			
⑧ Outlet for electric wire ⑨ Cable kind	⑧	⑨	⑧ Outlet for electric wire	⑨ Cable kind	
	Terminal box (Large) (Without attached cable)				
	3	0	JIS 15a	——	
	4	0	JIS 15b	——	
	5	0	JIS 15c	——	
⑮ Document	0	Nil			
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate			

Please specify applicable range code as well as pressure range and engineering unit.

It is combined with SD model number of the receiving part.

Filled liquid: Mercury

* Specify by code "X" if there is no applicable specification.

Filled liquid: Mercury **Indicating part**

Model number configuration

Please specify for ordering the model number and each specs.

Model																						
K H 3 1	—			X	2	1	—			0	×	×	×	×	×	×	×	×	×			
Pressure Transmitter	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮							
Model number				Selective spec.					Additional spec. (Option)													
Please specify applicable range code as well as pressure range and engineering unit.				④ Pressure range (MPa)																		
				1	0 to 0.6, 1, 1.5, 2, 2.5, 3.5, 5 (φ37, SH71)																	
							2	0 to 5, 7, 10, 15, 20, 25, 35 (φ23.6, SH51)														
							5	0 to 15, 20, 25, 35, 50, 70 (φ18, SH41)														
				⑤ Accuracy			0	±1.5%F.S.														
				⑥ Power source			1	24V DC		2 wire system												
2	100V AC		4 wire system																			
3	110V AC		4 wire system																			
4	200V AC		4 wire system																			
5	220V AC		4 wire system																			
⑦ Output				1	4 to 20mA DC		2 wire system, 4 wire system															
				2	0 to 5mA DC		4 wire system															
				3	0 to 10mA DC		4 wire system															
				4	0 to 20mA DC		4 wire system															
				7	0 to 10V DC		4 wire system															
				H	0 to 5mV DC		4 wire system															
⑧ Outlet for electric wire							7	JIS 20b														
									Others													
⑮ Document							0	Nil														
							1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, test report (1 pc 1 copy), inspection / traceability certificate														

It is combined with SD model number of the receiving part.

Filled liquid: Mercury

* Specify by code "X" if there is no applicable specification.