REMOTE SEAL TYPE PRESSURE TRANSMITTER

DATA SHEET **FKB···5/ FDB···5**

The FCX -AIII remote seal type pressure transmitter accurately measures pressure and converts it into an output signal of 4~20mA DC. The transmitter utilizes a unique micromachined capacitance silicon sensor with state-of-the-art microprocessor tech nology to provide exceptional performance and functionality.It's small volume, light weight, good environment adaptability, and applicable to all fields. If using the hand held communicator(sold separately), it can be set and display via remote operation, without affecting the DC 4~20mA output signal of transmitter.FCX-AIII series transmitters with safety funtion have obtained the certificate of SIL certification by TÜV.

Features

1. High accuracy
   Remote seal type pressure transmitter can be carried out with high accuracy measurement in the range of 1.3 ~ 50000kPa.
   Standard accuracy: ± 0.2% Accuracy(50MPa): ± 0.2%
   High accuracy(optional): ± 0.1%
   There's no need to linear calibration when carrying out zero elevation or suppression.
2. Excellent environmental adaptaboility
   The advanced floating cell protects sensor from temperature and overpressure effect, and controls the total measurement error of the filed to the minimun.
3. Excellent operability and easy to use
   It has an excellent operability and easy to use in any application.
   - All range meet the requirements of explosion-proof.
   - 5-digit digital indiactor
   - Stainless steel AMP case
   - Built-in RFI filter and lightning arrester
   - Various anti-corrosive materials
   - Products used for high temperature and high vacuum
   - Built-in local configurator with 3 push buttons
4. The transmitter can communicate using FUJI, HART, communication protocol, and also can use FOUNDATION FIELDBUS or PROFIBUS protocol after changing the electronic circuit.

Specifications

Functional specifications

- Measured fluid: Liquid, gas, or bapor
- Measuring range:

Model	Span limit [kPa]		Range limit [kPa]		Overrange limit [MPa]
	Min.	Max.	Lower	Upper	
FKB □□1 FDB □□1	1.3	130	According to the lower range limit of fill fluid (see the right table)	130	1
FKB □□2 FDB □□2	5	500		500	1.5
FKB □□3 FDB □□3	30	3000		3000	4.5
FKB □□4 FDB □□4	100	10000		10000	15
FKB □□5 FDB □□5	500	50000		50000	75

Note: Recommended span should be greater than 1/40 of max. span.

- Operating pressure: Up to the upper range limit, but under the maximum operating pressure of flange.
- Process temperature, Lower range limit:

Fill fluid	13th digit Code	Process Temperature	Lower range limit
Fluorinated oil	W, A, D	-20 ~ 120°C	Above atmospheric pressure
Silicone oil	H	-15 ~ 315°C	
Silicone oil	J	20 ~ 350°C	
Silicone oil	Y, G	-45 ~205°C(Note)	Above 2.7kPa abs See Figure1
Silicone oil	S	-15 ~ 250°C	
Silicone oil	T	20 ~ 320°C	
Silicone oil	K	-15 ~ 200°C	Above 0.13kPa abs See Figure3
Food grade oil(Neobee)	F	-15 ~ 120°C	Above atmospheric pressure
Low temperature oil	X	-75 ~ 150°C	

Note: When using the plastic coated capillary, the temperature range is -45 ~ 120°C.

- Remote function: Refer to table 1
  Note: HHC's version must be higher than 7.0 (or FXW□□□□1-□4).
- Output signal: (1)FKB: DC4~20mA+HART protocol
  (2)FDB: FOUNDATION Fieldbus protocol or PROFIBUS-PA
- Allowable load resistance: 0 ~ 600Ω (at DC 24V)
  (Refer to figure 3) For communication with HHC, min. of 250Ω resistor is required.
- Power supply: (Refer to figure 3)

General	DC10.5 ~ 45V
Intrinsic safety	DC10.5 ~ 26V
With arrestor	DC10.5 ~ 32V

- Condition of communication line: Length: up to 2km
  (0.75 ~ 1.25mm² Using twisted pair cable when instrument control cable is more than 1km.)
  Load resistance: 250 ~ 600Ω
  (DC24V, including resistance of cable)
  Load capacitance: 0.22μF or less
  Load inductance: 3.3mH or less
  sapcing with power line: 15cm or more
  (Please avoid parallel wiring.)
  Note: Line condition of intrinsic safety and explosion-proof is different, please refer to the instruction manual.
- Saturation current: Upper limit 20.0 ~ 22.5mA(variable)
  Lower limit 3.2 ~ 4.0mA(variable)
- Damping: The time constant is adjustable from 0.06 to 32 seconds.

FKB

- Adjustment function: Zero and span are adjustable by the external adjustment screw, or by local configurator with 3 push buttons, or by HHC.
- Zero elevation/suppression: Zero can be elevated or suppressed within the range of -0.1 MPa to upper range limit.
- Normal/reverse action: Selectable from HHC or LCD unit with local adjustment function.
- Burnout direction: Output hold
  Output 20.0 ~ 22.5mA (variable)
  Output 3.2 ~ 4.0mA (variable)
  (Settable in increments of 0.1mA with HHC or local configurator unit with LCD display.)
- Explosion proof: Refer to table 8
- Ambient temperature: -40 ~ +85°C

  With arrester: -40 ~ +60°C
  Filling Fluorinated oil: -10 ~ +60°C
  Silicone oil J,T,H,S,K: -10 ~ +85°C
  Note: 1)When silicone oil is J,T, please wrap the thermal insulation material on the capillary. When silicone oil is J,K,T,H,S,K and the length of capillary is more than 7m, the optimum temperature is +55℃.
  2)The optimum operating temperature of digital indicator is -30 ~ +80°C, response is slow below -30°C.
- Storage temperature: -40～+90°C
- Weather resistance: DIN 40040 GPC
- EMC applicable standard: EN61326-1: 2006 CE

FKB

Performance specifications

Silicone oil, SUS316L diaphragms

- Accuracy rating: (including linearity, hysteresis, repeatability)
  (Standard)
  For spans greater than 1/10 of URL:
  ± 0.2%
  For spans below 1/10 of URL:
  $\pm \left(0.1+0.1\frac{0.1\times URL}{x}\right)\%$
  (Optional) (21th digit code: H,K)
  (Not available for URL is 50000kPa)
  For spans greater than 1/10 of URL:
  ± 0.1%
  For spans below 1/10 of URL:
  $\pm \left(0.05+0.05\frac{0.1\times URL}{x}\right)\%$
- Stability: Zero shift ±0.2% of upper range limit (URL) for 10 years.
- Ambient temperature effect: Changed per 28°C in the range of -40°C ~ +85°C.
  Zero shift: $\pm \left(0.35\frac{URL}{x}\right)\%$
  Total shift: $\pm \left(0.5\frac{URL}{x}\right)\%$
  (Optional) (21th digit code: J, K)
  Zero shift:
  ± 0.3%(x≥ 1/4URL)
  $\pm \left(0.1+0.2\frac{0.25\times URL}{x}\right)\%$(x<1/4URL)
  Total shift:
  ± 0.4%(x≥ 1/4URL)
  In the formual : x: SPAN
  URL: Upper range limit
  $\pm \left(0.2+0.2\frac{0.25\times URL}{x}\right)\%$(x<1/4URL)

Note: (1) It's the output change when remote flange and transmitter body at the same height and temperature.

(2) When there is temperature difference between remote flange, capillary and transmitter body, the error will increase.

- Overrange effect: Zero shift ±0.2% of URL for nominal flange pressure.
- Supply voltage effect: ± 0.005% /1V(DC 16.1 ~ 45V)
- Insulation strength: 500VAC, 50/60Hz, 1 min, between circuit and earth.
- Insulation resistance: More than 100MΩ at 500V DC, between circuit and earth.
- Update rate: 60ms
- Response time: Time constant: 0.3s
  (Capillary length: 1.5m, at 23°C)
  Dead time: approx. 0.12s

Structure and material

- Flange materials: SUS304、SUS316 or carbon steel
  But the 10, 50Mpa specification products are thread connection type(Threaded part material: carbon steel)
- Detecting unit materials:

Material code	Seal diaphragm	Other wetted parts	
V, A, B, C, D	SUS316L	SUS316	
E, N, Q, S	SUS316L	SUS304	
J ,5, 6, 7, 8	SUS316L Gold-plated	SUS316	
W	Hastelloy-C	SUS316	
H, F, G, K, L	Hastelloy-C	Hastelloy-C	Not available for 6th digit code "4,5".
M	Monel	Monel	
T, 1, 2, 3, 4	Tantalum	Tantalum	
P	Titanium	Titanium	
R	Zirconium	Zirconium	

- Amp case materials: Aluminium die casting + Polyester coating (color: silvery) or Stainless steel(SCS14A)
- Amp case cover materials: Aluminium die casting + Polyester coating (color: blue) or Stainless steel(SCS14A)
- Structure of case: Immersion protected type JIS C 0920 (Equivalent to IEC IP67, NEMA 6/6P)
- Outline dimension: According to the outline drawing.
- Weight: approx. 5~13kg
- Conduit connection: G1/2, 1/2-14NPT, M20× 1.5, Pg13.5 (Refer to the model code table for details.)
- External terminal: M3.5 Screw
- Preocess connection: According to the following standards (Refer to the model code table for details.)
  JIS standard: 10K 80A, 10K 100A
  ANSI/JPI standard: 50LB 3B, 150LB 4B, 300LB 3B, 600LB 3B
  GB/T/HG standard: PN10 DN80, PN10 DN100
  The process connection(thread connection type) used for 10Mpa and 50Mpa, using the thread of JIS G1 specification.
- Diaphragm Extension length: 0, 50, 100, 150, 200mm (according to the specified)
- Mounting method: Mounting on 50A(2B) pipe with U-bolt, detecting part mounting with flange, flange clamping method (sheet type).
- Direction of AMP unit: Amp unit can be turned clockwise or counterclockwise by 90°or 180°, relative to the direction of detecting unit.
- Length of capillary: Max 15m

  When the length is more than 7m and silicone oil is “H,J,S,T,K”, the ambient temperatureis is below +55°C.

  Wrapping material of capillary: Plastic coated or stainless steel hose

Optional specifications

- Analog indicator: Built in amplifer unit
  Class 2.5, moving-coil, movement 90°,
  0 ~ 100% evenly divided scale or actual scale
- Digital indicator: Built in amplifer unit, 5 digit LCD and unit dispaly,0 ~ 100% scale display or actual scale display. Optimum operating temperature range: -30 ~ +80°C,
- Digital indicator (with 3 push buttons): DIsplaying or setting the items of table 1 via 3 push buttons of digital indicator.
- Arrester: Built in amplifer unit
  Lightning performance: 4kV(1.2× 50μs)
- Degreasing treatment for oxygen: Filling fluorinated oil, degreasing and cleaning for wetted parts, available only for 7th digit code (material) "V,W,A,B,C,D,E,N,Q,S".
- Chlorine measurement: Filling fluorinated oil, available only for 7th digit code (material) "H,F, G,K,L,T".
- Anti-corrosive coating of detecting unit: Epoxy and polyurethane double coating
- Stainless steel tag plate: The plate can be engraved up to 14 characters (lettters and numbers)

The product conforms to the requoirments of European EMC directive "Electromagnetic Compatibility Directive2004/108/EC". The detail content is recorded in the techiacal construction file nmber TN5A0704. The applicable standards are as follows:

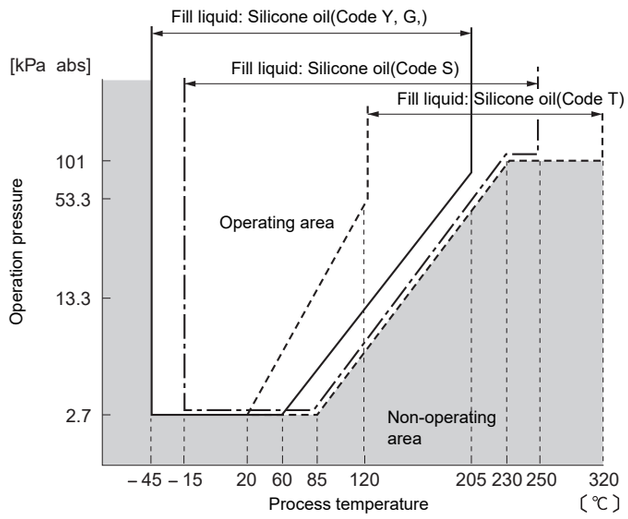
Emission list:
EN 61326-1 : 2006 Class A (Industrial location)

Frequency range	Limits	Reference standard
30 ~ 230MHz	40dB(μV/m) quasi peak, measured at 10m distance	EN55011:1998 +A1:1999 +A2:2002 (Group1 Class A)
230 ~ 1000MHz	47dB(μV/m) quasi peak, measured at 10m distance	

Immunity requirements:
EN 61326-1 : 2006 Table2 (Industrial location)

Phenomenon	Test value	Basic standard	P.C.
Electrostatic discharge	2/4kV (Contact) 2/4/8kV (Air)	IEC 61000-4-2:1995 +A1:1998+A2:2001	B
Electromagnetic field	10V/m(80 ~ 1000MHz) 3V/m(1.4 ~ 2.0GHz) 1V/m(2.0 ~ 2.7GHz) 80%AM(1kHz)	IEC 61000-4-3:2002 +A1:2002	A
Rated power frequency magnetic field	30 A/m 50/60 Hz	IEC 61000-4-8:1993 +A1:2001	A
Burst	2kV	IEC 61000-4-4:2004	B
Surge	1.2/50μs(Voltage) 8.0/20μs(Current) 0.5/1kV line to line 0.5/1/2kV line to ground	IEC 61000-4-5:1995 +A1:2001	B
Conducted RF	0.15 ~ 80MHz 3V 80%AM(1kHz)	IEC 61000-4-6:1996 +A1:2001	A

Definition of performance criteria:
A: During testing, normal performance within the specification limits.
B: During testing, temporary degradation, or less of function or performance which is self-recovering.



Note: When using the transmitter in a vacuum area, locate it lower than the flange.

Figure 1 Relation between process temperature and operating pressure

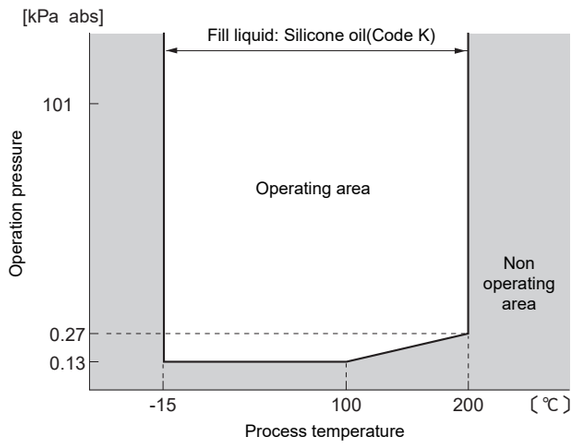
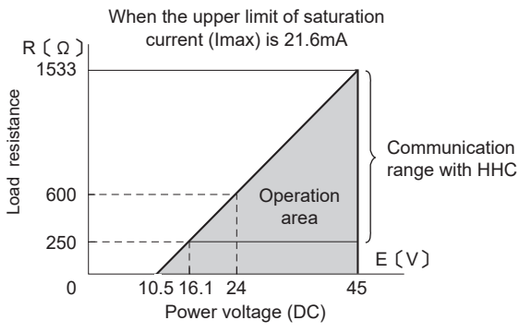


Figure 2 Relation between process temperature and operating pressure



〔Note〕The load resistance varies according to the upper limit of saturation current.

$$R〔\Omega〕 = \frac{E〔V〕- 10.5}{(Imax〔mA〕 + 0.9) \times 10^{-3}}$$

Figure 3 Operation area of power voltage and load resistance

Table1 Adjustment function

No.	Items	HHC (Model:FXW)Note1)		Local configurator (With 3 push buttons)	
		Display	Set	Dispaly	Set
1	Tag No.	○	○	○	○
2	Type	○	○	○	○
3	Serial No. & Software Version	○	—	○	—
4	Engineering unit	○	○	○	○
5	Range Limit	○	—	○	—
6	Measuring range	○	○	○	○
7	Damping	○	○	○	○
8	Output mode	○	—	○	—
9	Burnout direction	○	○	○	○
A	Zero/span calibration	○	○	○	○
B	Calibration of output circuit	—	○	—	○
C	Measured data	○	—	○	—
D	Self-diagnosis	○	—	○	—
E	Printer function	○	—	—	—
F	Lock of adj. function	○	○	○	○
G	Indication of digital indicator	○	○	○	○
H	Linzearize	○	○	—	—
I	Rerange	○	○	○	○
J	Saturation current Write protect	○	○	○	○
K		○	○	○	○
L	History -Calibration history -Temperature history	○ ○	○ —	○ ○	○ —

Nore1) The version of HHC must be higher than 7.0 when it supports FCX-AIII series transmitter(or FXW□□□□1–□4).
It can upgrade the version by changing ROM, please consult our company's windows or agency shop nearby for deatils.

Scope of delivery

Instrument body, pipe mounting bracket
(according to type selection)

Related products

・Hand held communicator (Model: FXW):
Hand held, built-in battery, setting, display
For the details, please refer to data sheet (CSDS8-47).

Ordering information

1. Model code
2. Span
3. Please select the direction of output (Notuse/OVER/UNDER) when the transmitter is fault (Burnout). If unspecified, it is Notuse.
4. If the scale of indicator is selected to actual scale (9th code: D、H、P、S), please select the items of display (digit, scale, unit , etc).
5. Please select the tag plate according to need.(up to 14 digit, consist of lettters and numbers).

Model code

Digit No.: 1 2 3 4 5 6 7 8 - 9 10 11 12 13 - 14 15 16 17 18 - 21 22

Digit	Discription			Note	Code
	Remote seal type pressure transmitter DC4~20mA+HART FOUNDATION Fieldbus and PROFIBUS				F □ B □ □ □ □ □ - □ □ □ □ □ - □ □ □ □ □ - □ □ F K B □ □ □ □ 5 - □ □ □ □ □ - □ □ □ □ □ - □ □ F D B □ □ □ □ 5 - □ □ □ □ □ - □ □ □ □ □ - □ □
4	<AMP case>				
	<Conduit conn.>	<Case type>			
	G1/2	L type			5
	1/2-14NPT	L type			6
	Pg 13.5	Ltype			7
	M20× 1.5	L type			8
	G1/2	L type			S
	1/2-14NPT	L type			T
	Pg 13.5	L type			V
	M20× 1.5	L type			W
5	<Flange materials>	<Flange standards>			
	SUS304	JIS 10K 80A			0
	SUS304	JIS 10K 100A			1
	SUS304	JIS 20K 80A			9
	SUS304	JIS 30K 80A			M
	SUS304	ANSI/JPI 150LB 3B			3
	SUS304	ANSI/JPI 150LB 4B			4
	SUS304	ANSI/JPI 300LB 3B			S
	SUS304	ANSI/JPI 600LB 3B			T
	SUS304	DIN PN16/40 DN80			6
	SUS304	DIN PN16 DN100			7
	Carbon steel	JIS 10K 80A			A
	Carbon steel	JIS 10K 100A			B
	Carbon steel	ANSI/JPI 150LB 3B			D
	Carbon steel	ANSI/JPI 150LB 4B			E
	Carbon steel	DIN PN16/40 DN80			G
	Carbon steel	DIN PN16 DN100			H
	Carbon steel	JIS G1 Thread		Note1	K
	SUS316	ANSI/JPI 150LB 3B			V
	SUS316	ANSI/JPI 150LB 4B			W
	SUS316	ANSI/JPI 300LB 3B			X
	SUS316	ANSI/JPI 300LB 4B			Y
	SUS316	ANSI/JPI 600LB 3B			U
	Chinese flange			Note28	C
	None(sheet type)	JIS80A, ANSI/JPI 3B, GB/T/HG DN80			P
	None(sheet type)	JIS100A, ANSI/JPI 4B, GB/T/HG DN100			Q
	High pressure flange(RTJ)			Note29	I
	Other flanges			Note22	Z
6	<Span limit [kPa] >				
	1.3 ……130			Note2	1
	5………500			Note2	2
	30 ……3000			Note2	3
	100……10000				4
	500……50000				5
7	<Diaphragm material>	<Other wetted parts>	<Diaphragm extension length> [mm]		
	SUS316L	SUS316	0		V
	SUS316L	SUS316	0	Note6	X
	SUS316L	SUS316	50	Note3	A
	SUS316L	SUS316	100	Note3	B
	SUS316L	SUS316	150	Note3	C
	SUS316L	SUS316	200	Note3	D
	SUS316L Gold-plated	SUS316	0		J
	SUS316L Gold-plated	SUS316	50	Note3	5
	SUS316L Gold-plated	SUS316	100	Note3	6
	SUS316L Gold-plated	SUS316	150	Note3	7
	SUS316L Gold-plated	SUS316	200	Note3	8
	SUS316L	SUS304	50	Note3	E
	SUS316L	SUS304	100	Note3	N
	SUS316L	SUS304	150	Note3	Q
	SUS316L	SUS304	200	Note3	S
	Hastelloy C	SUS316	0		W
	Hastelloy C	Hastelloy C	0		H
	Hastelloy C	Hastelloy C	50	Note3	F
	Hastelloy C	Hastelloy C	100	Note3	G
	Hastelloy C	Hastelloy C	150	Note3	K
	Hastelloy C	Hastelloy C	200	Note3	L
	Monel	Monle	0		M
	Tantalum	Tantalum	0		T
	Tantalum	Tantalum	50	Note3	1
	Tantalum	Tantalum	100	Note3	2
	Tantalum	Tantalum	150	Note3	3
	Tantalum	Tantalum	200	Note3	4
	Titanium	Titanium	0	Note4	P
	Zirconium	Zirconium	0	Note4	R
8	<Version>			Note30	5

FKB

					1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17 18	21 22 ← Digit No.
Digit	Discription			Note				
	Remote seal type pressure transmitter DC4~20mA+HART FOUNDATION Fieldbus and PROFIBUS				F B F K B 5 F D B 5	- - -	- - -	- - -
9	<Field indicator>	<Indicator scale>	<Arrester>					
	None		None			A		
	Analog	0 ~ 100% evenly divided scale	None			B		
	Analog	Actual scale	None			D		
	None		Yes			E		
	Analog	0 ~ 100% evenly divided scale	Yes			F		
	Analog	Actual scale	Yes			H		
	Digital	0 ~ 100% scale display	None			L		
	Digital	Actual scale display	None			P		
	Digital	0 ~ 100% scale display	Yes			Q		
	Digital	Actual scale display	Yes			S		
	Digital(with local adj. function)	0 ~ 100% scale display	None			1		
	Digital(with local adj. function)	Actual scale display	None			2		
	Digital(with local adj. function)	0 ~ 100% scale display	Yes			4		
	Digital(with local adj. function)	Actual scale display	Yes			5		
	None	Foundation Fieldbus	None	Note23		A		
	None	Foundation Fieldbus	Yes	Note23		E		
	Digital	Foundation Fieldbus	None	Note23		P		
	Digital	Foundation Fieldbus	Yes	Note23		S		
	None	Profibus	None	Note23		R		
	None	Profibus	Yes	Note23		V		
	Digital	Profibus	None	Note23		T		
	Digital	Profibus	Yes	Note23		W		
10	<Explosion proof specifications>							
	General Non explosion proof					A		
	TIIS (Cable gland seel) explosion proof			Note25		C		
	TIIS intrinsic safety					G		
	FM Flameproof			Note27		D		
	FM Intrinsic safety					H		
	FM Combined of flameproof and intrinsic safety			Note27		V		
	ATEX Flameproof			Note26		X		
	ATEX Intrinsic safety					K		
	ATEX Type n					P		
	ATEX Combined of flameproof and intrinsic safety			Note26		M		
	IECEx Flameproof			Note26		R		
	IECEx Intrinsic safety					T		
	CSA Flameproof			Note27		E		
	CSA Intrinsic safety					J		
	NEPSI Flameproof					F		
	NEPSI Intrinsic safety					S		
	NEPSI Combined of flameproof, intrinsic safety and dust ignition proof					U		
11	<Capillary length[m]>	<Wrapping material of capillary>						
	1.5	Plastic coated		Note5		D		
	3	Plastic coated		Note5		E		
	5	Plastic coated		Note5		L		
	6	Plastic coated		Note5		F		
	7	Plastic coated		Note5		M		
	8	Plastic coated		Note5		N		
	10	Plastic coated		Note5		P		
	12	Plastic coated		Note5		G		
	15	Plastic coated		Note5		H		
	1.5	Hose (stainless steel)				Q		
	3	Hose (stainless steel)				R		
	5	Hose (stainless steel)				S		
	6	Hose (stainless steel)				T		
	7	Hose (stainless steel)				V		
	8	Hose (stainless steel)				W		
	10	Hose (stainless steel)				X		
	12	Hose (stainless steel)				J		
	15	Hose (stainless steel)				K		
12	<Special specification>							
	Standard specification					Y		
	Stainless steel tag plate					B		
	Anti-corrosive coating of detecting unit					M		
	Anti-corrosive coating of detecting unit, SS tag plate					N		
	Anti-corrosive coating of detecting unit,SS AMP case			Note19		P		
	Anti-corrosive coating of detecting unit,SS AMP case,SS tag plate			Note19		Q		
13	<Treatment of wetted parts>	<Fill fluid>						
	Standard	Silicone oil (General)					Y	
	Standard	Fluorinated oil					W	
	Standard	Food grade oil(Neobee M20)					F	
	Degreasing	Silicone oil					G	
	Standard	Low temperature oil(Syltherm XLT, -75°C~150°C. When process temperature is -120°C~60°C, this code is "C").					X	
	Oxygen service	Fluorinated oil		Note7			A	
	Chlorine service	Fluorinated oil		Note8			D	
	Standard	Silicone oil(for high temperature: -15~315°C)		Note21			H	
	Standard	Silicone oil(for high temperature: 20~350°C)		Note9			J	

Digit	Discription		Note	1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17 18	21 22 ← Digit No.
	Remote seal type pressure transmitter DC4~20mA+HART FOUNDATION Fieldbus and PROFIBUS			F B	-	-	-
				F K B 5	-	-	-
				F D B 5	-	-	-
13	Standard	Silicone oil(High temp. and vacuum: -15~250°C)	Note10		S		
	Standard	Silicone oil(High temp. and vacuum: 20~320°C)	Note10		T		
	Standard	Silicone oil(High temp. and high vacuum: -15~200°C)	Note10		K		
14	<Teflon diaphragm>						
	None					Y	
	Yes		Note11			C	
15	<Bolt/nut materials of process cover>		Note17				
	None		Note12			Y	
	Standard(Cr-Mo hexagon socket bolt/carbon steel nut)		Note13			A	
	Cr-Mo hexagon head bolt/carbon steel nut		Note13			B	
	SUS304 Bolt/Nut		Note14			E	
	SUS630 Bolt/SUS304 Nut		Note15			F	
	SUS316 Bolt/Nut		Note14			U	
16	<Flange specifications>	<Flange materials>	Note28				
17	GB/T/HG DN80 PN10/16	Carbon steel	Note28			B 8 C	
18	GB/T/HG DN80 PN10/16	SUS304	Note28			B 8 U	
	GB/T/HG DN80 PN10/16	SUS316	Note28			B 8 W	
	GB/T/HG DN80 PN20(Class150)	Carbon steel	Note28			C 8 C	
	GB/T/HG DN80 PN20(Class150)	SUS304	Note28			C 8 U	
	GB/T/HG DN80 PN20(Class150)	SUS316	Note28			C 8 W	
	GB/T/HG DN80 PN50(Class300)	Carbon steel	Note28			D 8 C	
	GB/T/HG DN80 PN50(Class300)	SUS304	Note28			D 8 U	
	GB/T/HG DN80 PN50(Class300)	SUS316	Note28			D 8 W	
	GB/T/HG DN80 PN25/40	Carbon steel	Note28			E 8 C	
	GB/T/HG DN80 PN25/40	SUS304	Note28			E 8 U	
	GB/T/HG DN80 PN25/40	SUS316	Note28			E 8 W	
	GB/T/HG DN80 PN63	Carbon steel	Note28			F 8 C	
	GB/T/HG DN80 PN63	SUS304	Note28			F 8 U	
	GB/T/HG DN80 PN63	SUS316	Note28			F 8 W	
	GB/T/HG DN80 PN100	Carbon steel	Note28			G 8 C	
	GB/T/HG DN80 PN100	SUS304	Note28			G 8 U	
	GB/T/HG DN80 PN100	SUS316	Note28			G 8 W	
	GB/T/HG DN100 PN10/16	Carbon steel	Note28			B 0 C	
	GB/T/HG DN100 PN10/16	SUS304	Note28			B 0 U	
	GB/T/HG DN100 PN10/16	SUS316	Note28			B 0 W	
	GB/T/HG DN100 PN20(Class150)	Carbon steel	Note28			C 0 C	
	GB/T/HG DN100 PN20(Class150)	SUS304	Note28			C 0 U	
	GB/T/HG DN100 PN20(Class150)	SUS316	Note28			C 0 W	
	GB/T/HG DN100 PN50(Class300)	Carbon steel	Note28			D 0 C	
	GB/T/HG DN100 PN50(Class300)	SUS304	Note28			D 0 U	
	GB/T/HG DN100 PN50(Class300)	SUS316	Note28			D 0 W	
	GB/T/HG DN100 PN25/40	Carbon steel	Note28			E 0 C	
	GB/T/HG DN100 PN25/40	SUS304	Note28			E 0 U	
	GB/T/HG DN100 PN25/40	SUS316	Note28			E 0 W	
	GB/T/HG DN100 PN63	Carbon steel	Note28			F 0 C	
	GB/T/HG DN100 PN63	SUS304	Note28			F 0 U	
	GB/T/HG DN100 PN63	SUS316	Note28			F 0 W	
	GB/T/HG DN100 PN100	Carbon steel	Note28			G 0 C	
	GB/T/HG DN100 PN100	SUS304	Note28			G 0 U	
	GB/T/HG DN100 PN100	SUS316	Note28			G 0 W	
21	<Other>		Note16				
	None						Y
	High accuracy type						H
	Low temperature type						J
	H+J						K
	Inspection report						F
22	<Flush ring>	<Companion flange>	Note16				
	Yes	None					A
	None	Yes					B
	Yes	Yes					C

Note1) Available only for 6th digit code "4","5" and 7th digit code "V".
Note2) Not available for 5th digit code "K".
Note3) Available only for 100A,4B,DN100 flange, when 13th digit code "S,T,K".
Note4) Available only for 80A,3B,DN80flange, when 6th digit code "2,3".
Note5) Available only for 13th digit code "Y,W,G,A,D".
Note6) The ultra thick diaphragm is for the requirements of wear resistance or process condition of solid particle erosion.
Note7) Available only for 7th digit code"V,W,A,B,C,D,E,N,Q,S".
Note8) Available only for 7th digit code "H, F, G, K, L, T".
Note9) Available only for 6th digit code "1, 2, 3" and 7th digit code "V,W,A,B,C,D,E,N,Q,S,H,F,G,K,L".
Note10) Available only for 6th digit code "2, 3".In addition, only the 7th digit code"V,W,A,B,C,D" for selected objects. For details of process temperature and operating pressure, please refer to the specification section.
Note11) Available only for 80A,3B,DN80 flange. But not available for 7th digit code "A,B,C,D,E,N,Q,S,F,G,K,L" and 13th digit code "H,J,S,T,K".
The operating pressure and temperature for using teflon diaphragm:
- Atmospheric pressure~max. operating pressure of flange (not available for vacuum)
- 0~120°C

Note12) Available only for 6th digit code "1","2","3".
Note13) Available only for 6th digit code "4","5".
Note14) Available only for 6th digit code "4".
Note15) Available only for 6th digit code "5".
} In case of 6th digit code"1","2","3", the bolt is "None".
Note16) The digit is blank when not needed.
Note17) Please select SUS bolts and nuts for tropical area.
Note19) Not available for 10th digit code "C".

Note21) Available only for 7th digit code "V,W,A,B,C,D,E,B,Q,S,H,F,G,K,L".
Note22) 900LB or other standard flanges are available.
Note23) Please note when select Fieldbus or Profibus transmitter.(Under development)
Note25) Available only for 4th digit code "5,S".
Note26) Available only for 4th digit code "6,8,T,W".
Note27) Available only for 4th digit code "6, T".
Note28) Available only for 6th digit code "4".
Note28) Please specify the flange specifications at "16th,17th,18th" digit code , when 5th digit code "C"(Chinese flange) .
Note29) For details please refer to 16th to 19th digit code, RTJ flange is only available for 7th digit code "V,J".
Note30) The 8th digit code can be seleced as "S", this means that it's the transmitter with safety function. SIL2 capability for single transmitter use, SIL3 capability for dual transmitter use.

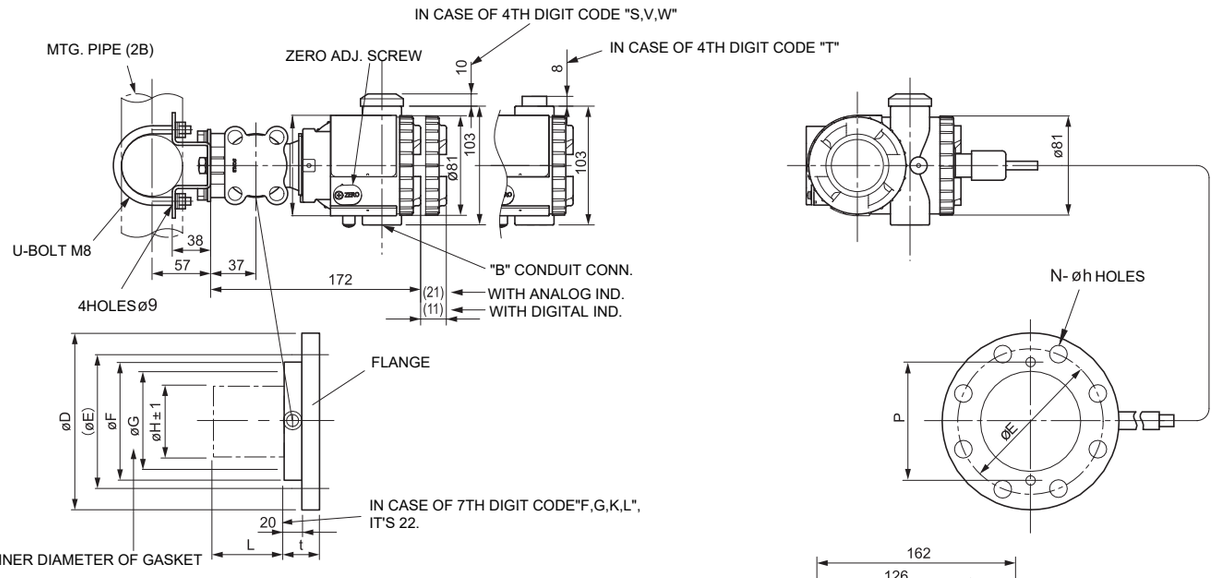
<Facing type is ring joint face(RTJ)>

Digit	Specifications		Note	1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17 18 19 20 21 ← Digit No.
16	Mounting flange			F K B		
17	<Materials>	<Specifications>				
	304 Stainless steel	ANSI/JPI 600LB 3B				6 3
		ANSI/JPI 600LB 4B				6 4
		ANSI/JPI 900LB 3B				9 3
		ANSI/JPI 900LB 4B				9 4
		ANSI/JPI 1500LB 3B				1 3
		ANSI/JPI 1500LB 4B				1 4
		ANSI/JPI 2500LB 3B				2 3
		ANSI/JPI 2500LB 4B				2 4
	316 Stainless steel	ANSI/JPI 600LB 3B				4 1
		ANSI/JPI 600LB 4B				4 2
		ANSI/JPI 900LB 3B				4 3
		ANSI/JPI 900LB 4B				4 4
		ANSI/JPI 1500LB 3B				4 5
		ANSI/JPI 1500LB 4B				4 6
		ANSI/JPI 2500LB 3B				4 7
		ANSI/JPI 2500LB 4B				4 8
	Carbon steel	ANSI/JPI 600LB 3B				5 3
		ANSI/JPI 600LB 4B				5 4
		ANSI/JPI 900LB 3B				8 3
		ANSI/JPI 900LB 4B				8 4
		ANSI/JPI 1500LB 3B				3 3
		ANSI/JPI 1500LB 4B				3 4
		ANSI/JPI 2500LB 3B				7 3
		ANSI/JPI 2500LB 4B				7 4
	Without flange (disc type)	ANSI/JPI 600LB 3B				0 1
		ANSI/JPI 600LB 4B				0 2
		ANSI/JPI 900LB 3B				0 3
		ANSI/JPI 900LB 4B				0 4
		ANSI/JPI 1500LB 3B				0 5
		ANSI/JPI 1500LB 4B				0 6
		ANSI/JPI 2500LB 3B				0 7
		ANSI/JPI 2500LB 4B				0 8
18	<Gasket(applicable for RTJ)>					
	None					Y
	Yes					A
19	<Companion flange>					
	None					Y
	Yes					A
20	<Fixed code>					Y
21	<Fixed code>					Y

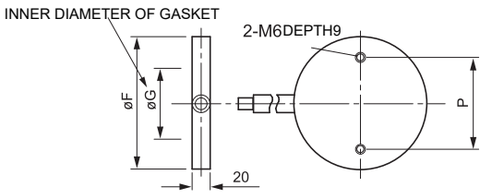
Note)When ordering the transmitters with high pressure flange and the facing type is ring joint face(RTJ), the 5th digit code is "I", and should specify the "16th, 17th, 18th, 19th" digit code.

OUTLINE DIAGRAM (Unit: mm)

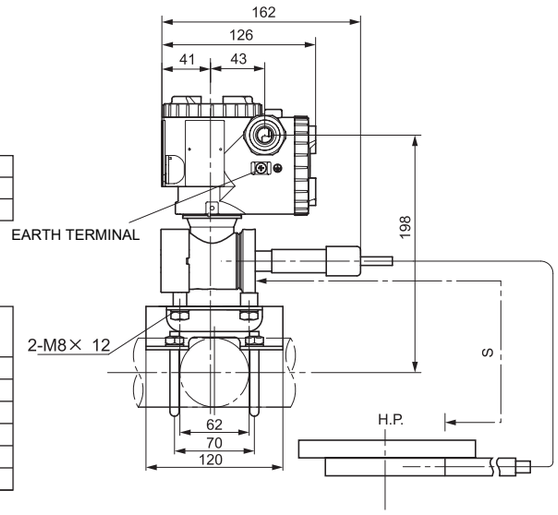
<AMP. CASE: L TYPE>WITH FLANGE



<SHEET FLANGE MOUNTING DIMENSIONS>



	P
80A, 3B, DN80	116
100A, 4B, DN100	141



5th digit code	øD	øE	øF	øG	øH±1	t	Note) P	N-øh	Flange
0, A	185	150	126	100	73	38	116	8-19	JIS-10K-80A
1, B	210	175	151	103	96	38	141	8-19	JIS-10K-100A
3, D	191	152.5	126	100	73	44	116	4-20	ANSI 150LB 3B
S	210	168	126	100	73	49	116	8-23	ANSI 300LB 3B
T	210	168	126	100	73	52	116	8-23	ANSI 600LB 3B
4, E	229	190.5	151	103	96	44	141	8-20	ANSI 150LB 4B

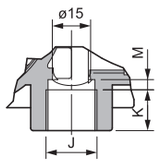
Note) In case of 7th digit code "F,G,K,L", the dimensions of "t" should all increase of 2mm.

16th to 18th digit code	øD	øE	øF	øG	øH±1	t	P	N-øh	Flange
B8C, B8U, B8W	200	160	126	100	73	40	116	8-18	GB/T / HG DN80 PN10/16
C8C, C8U, C8W	190	152.5	126	100	73	44	116	4-18	GB/T / HG DN80 PN20
E8C, E8U, E8W	200	160	126	100	73	44	116	8-18	GB/T / HG DN80 PN25/40
D8C, D8U, D8W	210	168.5	126	100	73	49	116	8-22	GB/T / HG DN80 PN50
F8C, F8U, F8W	215	170	126	100	73	48	116	8-22	GB/T / HG DN80 PN63
G8C, G8U, G8W	230	180	126	100	73	52	116	8-26	GB/T / HG DN80 PN100
B0C, B0U, B0W	220	180	151	103	96	42	141	8-18	GB/T / HG DN100 PN10/16
C0C, C0U, C0W	230	190.5	151	103	96	44	141	8-18	GB/T / HG DN100 PN20
E0C, E0U, E0W	235	190	151	103	96	44	141	8-22	GB/T / HG DN100 PN25/40
D0C, D0U, D0W	255	200	151	103	96	52	141	8-22	GB/T / HG DN100 PN50
F0C, F0U, F0W	250	200	151	103	96	50	141	8-26	GB/T / HG DN100 PN63
G0C, G0U, G0W	265	210	151	103	96	56	141	8-30	GB/T / HG DN100 PN100

4th digit code	Conduit conn.		
	J	K	M
S	G 1/2	18	2
T	1/2-14NPT	16	4
V	Pg13.5	10.5	4.5
W	M20×1.5	16	4

TABLE2

DETAIL "B"

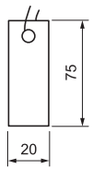


SEE TABLE2

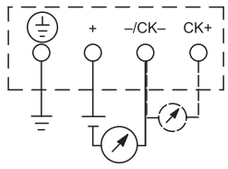
7th digit code	L	Weight(kg)
V, W, J, H, M, T, P, R	0	8.2
A, E, F	50	9.2
B, N, G	100	10.2
C, Q, K	150	10.7
D, S, L	200	11.2

11th digit code	S(m)
D, Q	1.5
E, R	3
L, S	5
F, T	6
M, V	7
N, W	8
P, X	10
G, J	12
H, K	15

<SS TAG PLATE(OPTIONAL)>

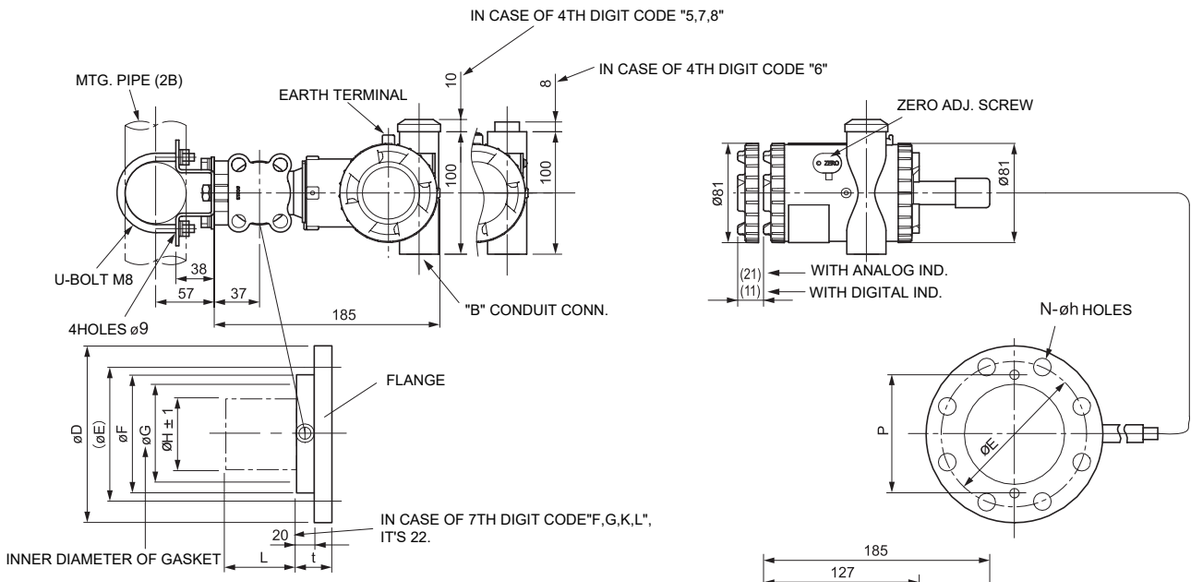


<CONNECTION DIAGRAM>

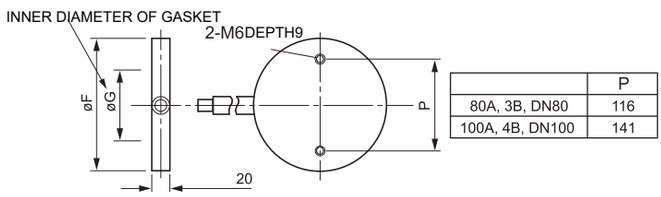


<OPTIONAL PARTS FOR FLAMEPROOF OF TIIS> (omitted)

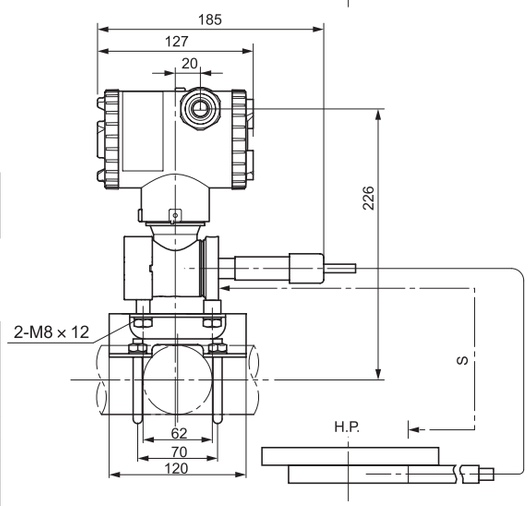
<AMP. CASE: T TYPE>WITH FLANGE



<SHEET FLANGE MOUNTING DIMENSIONS>



	P
80A, 3B, DN80	116
100A, 4B, DN100	141



5th digit code	øD	øE	øF	øG	øH±1	Note) t	P	N-øh	Flange
0, A	185	150	126	100	73	38	116	8-19	JIS-10K-80A
1, B	210	175	151	103	96	38	141	8-19	JIS-10K-100A
3, D	191	152.5	126	100	73	44	116	4-20	ANSI 150LB 3B
S	210	168	126	100	73	49	116	8-23	ANSI 300LB 3B
T	210	168	126	100	73	52	116	8-23	ANSI 600LB 3B
4, E	229	190.5	151	103	96	44	141	8-20	ANSI 150LB 4B

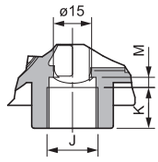
Note) In case of 7th digit code "F,G,K,L", the dimensions of "t" should all increase of 2mm.

16th to 18th digit code	øD	øE	øF	øG	øH±1	t	P	N-øh	Flange
B8C, B8U, B8W	200	160	126	100	73	40	116	8-18	GB/T / HG DN80 PN10/16
C8C, C8U, C8W	190	152.5	126	100	73	44	116	4-18	GB/T / HG DN80 PN20
E8C, E8U, E8W	200	160	126	100	73	44	116	8-18	GB/T / HG DN80 PN25/40
D8C, D8U, D8W	210	168.5	126	100	73	49	116	8-22	GB/T / HG DN80 PN50
F8C, F8U, F8W	215	170	126	100	73	48	116	8-22	GB/T / HG DN80 PN63
G8C, G8U, G8W	230	180	126	100	73	52	116	8-26	GB/T / HG DN80 PN100
B0C, B0U, B0W	220	180	151	103	96	42	141	8-18	GB/T / HG DN100 PN10/16
C0C, C0U, C0W	230	190.5	151	103	96	44	141	8-18	GB/T / HG DN100 PN20
E0C, E0U, E0W	235	190	151	103	96	44	141	8-22	GB/T / HG DN100 PN25/40
D0C, D0U, D0W	255	200	151	103	96	52	141	8-22	GB/T / HG DN100 PN50
F0C, F0U, F0W	250	200	151	103	96	50	141	8-26	GB/T / HG DN100 PN63
G0C, G0U, G0W	265	210	151	103	96	56	141	8-30	GB/T / HG DN100 PN100

4th digit code	Conduit conn.		
	J	K	M
5	G 1/2	18	2
6	1/2-14NPT	16	4
7	Pg13.5	10.5	4.5
8	M20×1.5	16	4

TABLE3

DETAIL "B"

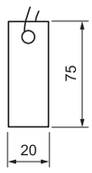


SEE TABLE3

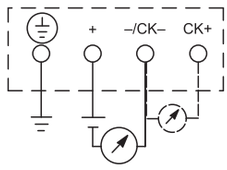
7th digit code	L	Weight(kg)
V, W, J, H, M, T, P, R	0	8.2
A, E, F	50	9.2
B, N, G	100	10.2
C, Q, K	150	10.7
D, S, L	200	11.2

11th digit code	S(m)
D, Q	1.5
E, R	3
L, S	5
F, T	6
M, V	7
N, W	8
P, X	10
G, J	12
H, K	15

<SS TAG PLATE(OPTIONAL)>

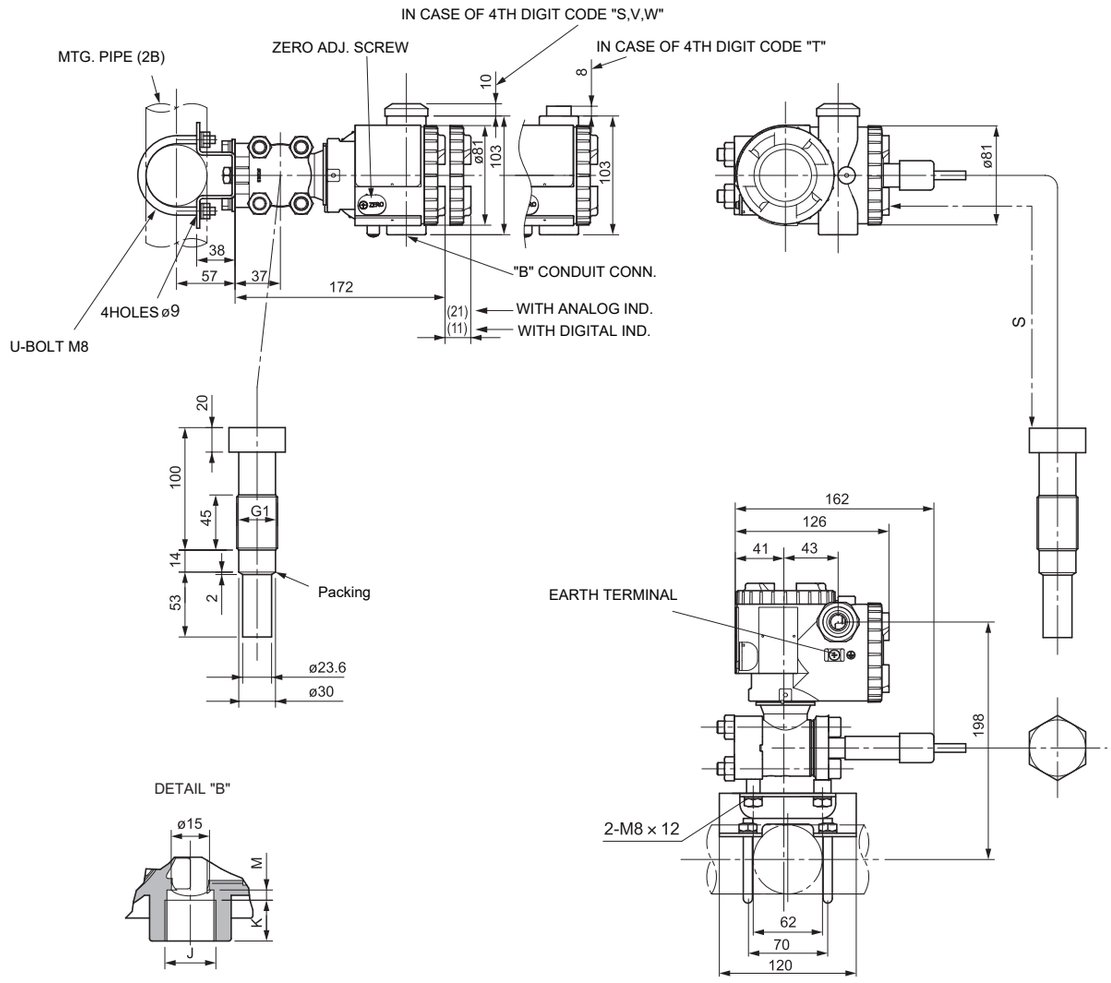


<CONNECTION DIAGRAM>



<OPTIONAL PARTS FOR FLAMEPROOF OF TIIS> (OMITTED)

<AMP. CASE: T TYPE>WITH THREAD

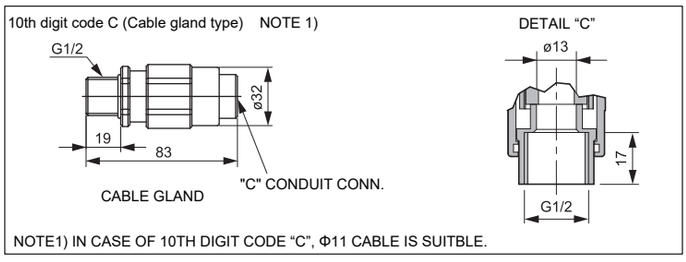


	Conduit conn.		
	J	K	M
S	G 1/2	18	2
T	1/2-14NPT	16	4
V	Pg13.5	10.5	4.5
W	M20×1.5	16	4

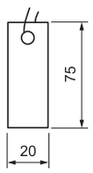
TABLE2

11th digit code	S(m)
D, Q	1.5
E, R	3
L, S	5
F, T	6
M, V	7
N, W	8
P, X	10
G, J	12
H, K	15

<OPTIONAL PARTS FOR FLAMEPROOF OF TIIS>



<SS TAG PLATE(OPTIONAL)>



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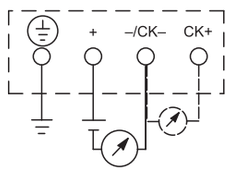
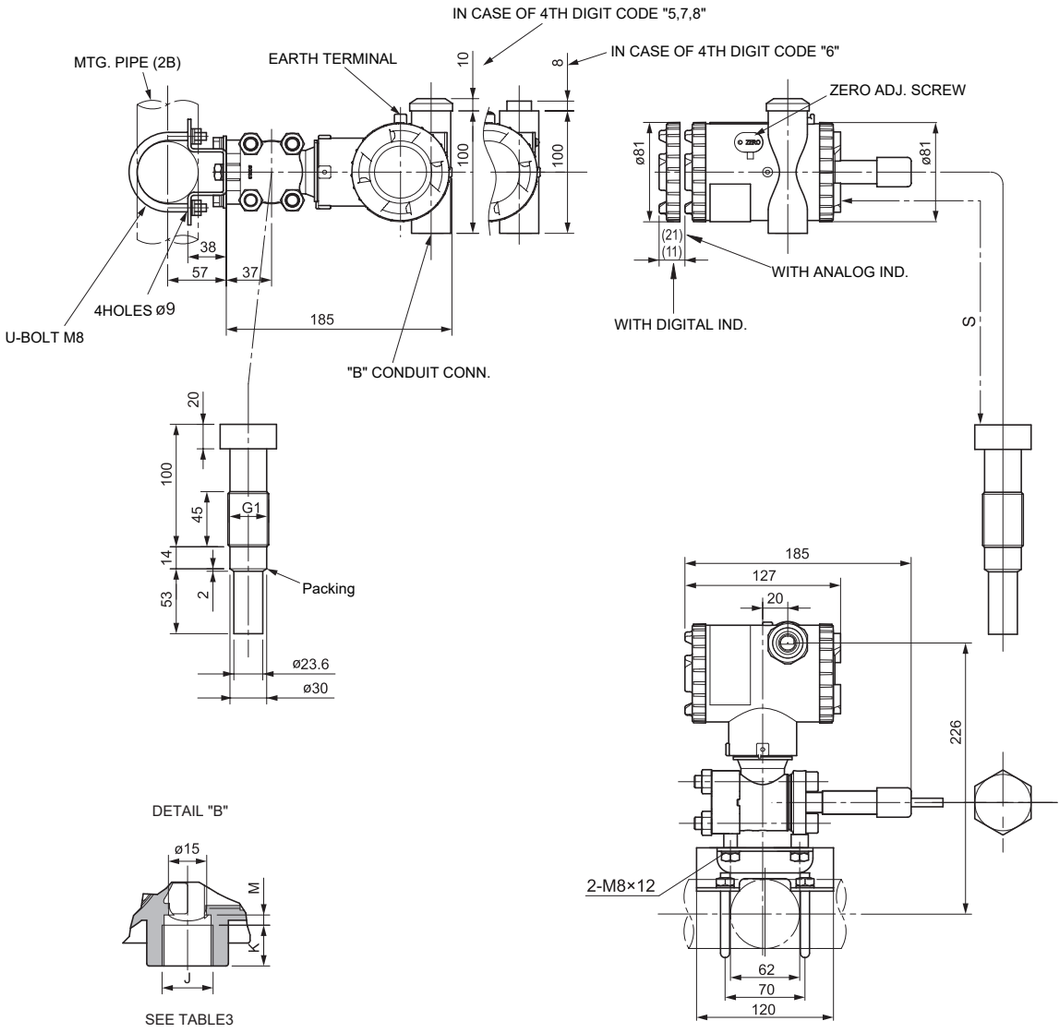


FKB

<AMP. CASE: T TYPE>WITH THREAD



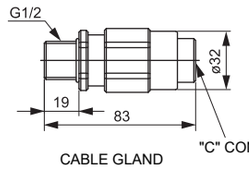
4th digit code	Conduit conn.		
	J	K	M
5	G 1/2	18	2
6	1/2-14NPT	16	4
7	Pg13.5	10.5	4.5
8	M20×1.5	16	4

TABLE3

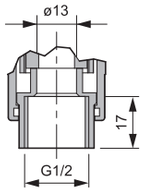
11th digit code	S(m)
D, Q	1.5
E, R	3
L, S	5
F, T	6
M, V	7
N, W	8
P, X	10
G, J	12
H, K	15

<OPTIONAL PARTS FOR FLAMEPROOF OF TIIS>

10th digit code C (Cable gland type) NOTE 1)

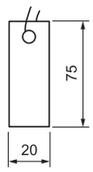


DETAIL "C"



NOTE1) IN CASE OF 10TH DIGIT CODE "C", Φ11 CABLE IS SUITBLE.

<SS TAG PLATE(OPTIONAL)>



<CONNECTION DIAGRAM>

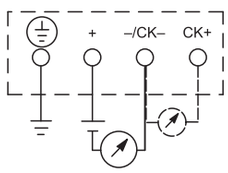


Table 4 Explosion proof

Authorities	Intrinsic safety
ATEX	Ex II 1 G Ex ia II C T5 Tamb = -40°C ~ +50°C Ex ia II C T4 Tamb = -40°C ~ +70°C Entity Parameters: Ui = 28V, Ii = 94.3mA, Pi = 0.66W Ci = 26nF(without arrester), Li = 0.6mH(without analog indicator) Ci = 36nF(with arrester), Li = 0.7mH(with analog indicator)
FM	Class I II III DIV.1 Groups A, B, C, D, E, F, G T4 Entity Type 4X Entity Parameters: Vmax = 28V, Imax = 94.3mA, Pi = 0.66W, Ci = 35.98nF, Li = 0.694mH
CSA	Class I Div.1 Groups A, B, C, D Class II Div.1 Groups E, F, G Class III Div.1 Temp code T5 Tamb max = +50°C Temp code T4 Tamb max = +70°C Entity Parameters: Vmax = 28V Imax = 94.3mA Ci = 25nF(without arrester), Li = 0.6mH(without analog indicator) Ci = 36nF(with arrester), Li = 0.7mH(with abalig indicator)
TIIS	Ex ia IIC T4 Tamb max = +60°C Entity Parameters: Ui = 28V, Ii = 94.3mA, Pi = 0.66W, Ci = 38.4nF, Li = 0.694mH
IECEx Scheme	Ex ia II C T4 Tamb = -40°C ~ +70°C Ex ia II C T5 Tamb = -40°C ~ +50°C Entity Parameters: Ui = 28V Ii = 94.3mA Pi = 0.66W Ci = 26nF(without arrester), Li = 0.6mH(without analog indicator) Ci = 36nF(with arrester), Li = 0.7mH(with abalig indicator)
NEPSI	Ex ia IIC T4 Ex d IIB+H_2T6/Ex ia IIC T4 Entity Parameters: Ui = 42.4V, Ii = 113mA, Pi = 1W, Ci = 35.98nF, Li = 0.694mH

Model		Tamb
9th digit	13th digit	
A,B,D	Y,G,N	-40°C ~ +85°C
L,P,1,2	Y,G,N	-20°C ~ +80°C
Q,S,4,5	Y,G,N	-20°C ~ +60°C
E,F,H	Y,G,N	-40°C ~ +60°C
–	W,A,D	-10°C ~ +60°C

Model		Tamb
9th digit	13th digit	
A,B,D	Y,G,N	-40°C ~ +85°C
L,P,1,2	Y,G,N	-20°C ~ +80°C
Q,S,4,5	Y,G,N	-20°C ~ +60°C
E F H	Y,G,N	-40°C ~ +60°C
–	W,A,D	-10°C ~ +60°C

Authorities	Flameproof
ATEX	Ex II 2 GD EEx d II C T6 IP66/67 T85°C Tamb = -40°C ~ +65°C EEx d II C T5 IP66/67 T100°C Tamb = -40°C ~ +85°C
FM	Class I Div.1 Groups B, C, D T6 Type 4X Class II III Div.1 Groups E, F, G T6 Type 4X Tamb max = +60°C
CSA	Class I Div.1 Groups C, D Class II Div.1 Groups E, F, G Class III Div.1 Note) “Seal Not Required” enclosure is allowed.
TIIS	Ex do IIB+H_2 T4 Tamb max = +60°C Maximum process temp. = +120°C
IECEx Scheme	Ex d II C T5 IP66/67 Tamb = -40°C ~ +85°C Ex d II C T6 IP66/67 Tamb = -40°C ~ +65°C
NEPSI	Ex d II B+H_2 T6 Tamb = -40°C ~ +60°C

Authorities	Type n Nonincendive
ATEX	Ex II3 GD EEx nL IIC T5 Tamb = -40°C ~ +50°C EEx nL IIC T4 Tamb = -40°C ~ +70°C Specific Parameters: Model without arrester: Ui=42.4V, Ii=113mA, Pi=1W, Ci=25.18nF, Li=0.694mH Model with arrester: Ui=32V, Ii=113mA, Pi=1W, Ci=35.98nF, Li=0.694mH EEx nAL IIC T5 Tamb = -40°C ~ +50°C EEx nAL IIC T4 Tamb = -40°C ~ +70°C Specific Parameters: Model without arrester: Umax=42.4V, Imax=113mA, Pmax=1W Model with arrester: Umax=32V, Imax=113mA, Pmax=1W
FM	Class I II III Div.2 Groups A、B、C、D、F、G T4 Entity Type 4X
CSA	Class I Div.2 Groups A, B, C, D Class II Div.2 Groups E, F, G Class III Div.2 Temp code T5 Tamb max = +50°C Temp code T4 Tamb max = +70°C Entity Parameters: Vmax=28V,Ci=25.18nF (without arrester), Ci=35.98nF (with arrester), Li=0.694mH

Model		Tamb
9th digit	13th digit	
A,B,D	Y,G,N	-40°C ~ +85°C
L,P,1,2	Y,G,N	-20°C ~ +80°C
Q,S,4,5	Y,G,N	-20°C ~ +60°C
E,F,H	Y,G,N	-40°C ~ +60°C
–	W,A,D	-10°C ~ +60°C

FKB