TECHNICAL GUIDANCE

FCX-AIII Series **FKC···5**

DIFFERENTIAL PRESSURE (FLOW) TRANSMITTER

OUTLINE

The FCX–AIII differential pressure (flow) transmitter accurately measures differential pressure, liquid level, gauge pressure or flow rate and transmits a proportional 4 to 20mA signal. The transmitter utilizes a unique micromachined capacitance silicon sensor with state-of-the-art microprocessor technology to provide exceptional performance and functionality.

FEATURES

1. High accuracy up to ±0.04%
   0.065% accuracy as standard, 0.04% accuracy as option.
2. Minimum environmental influence
   The "Advanced Floating Cell" design which protects the pressure sensor against changes in temperature, static pressure, and overpressure substantially reduces total measurement error in actual field applications.
3. HART® bilingual communications protocol
   FCX–AIII series transmitter offers bilingual communications to speak both proprietary protocol and HART®. Any HART® compatible devices can communicate with FCX–AIII.
4. Application flexibility
   Various options that render the FCX–AIII suitable for almost any process applications include.
   – Full range of hazardous area approvals
   – Built-in RFI filter and lightning arrester
   – 5-digit LCD meter with engineering unit
   – Stainless steel electronics housing
   – Wide selection of materials
5. Programmable output Linearization Function
   In addition to Linear and Square Root, output signal can be freely programmable.
   (Up to 14 compensated points at approximation.)
6. Burnout current flexibility (Under Scale: 3.2 to 4.0mA, Over Scale: 20.0 to 22.5mA)
   Burnout signal level is adjustable using Model FXW Hand Held Communicator (HHC) to comply with NAMUR NE43.
7. Dry calibration without reference pressure
   Thanks to the best combination of unique construction of mechanical parts (Sensor unit) and high performance electronics circuit (Electronics unit), reliability of dry calibration without reference pressure is at equal level as wet calibration.

SPECIFICATIONS

Functional specifications

Service: Liquid, gas, or vapor

Static pressure, span, and range limit:

Type	Static pressure [MPa] {bar}	Span limit [kPa] {m bar} Min.	Span limit [kPa] {m bar} Max.	Range limit [kPa] {m bar}
FKC□11	−0.1 to + 3.2	0.1	1	+/− 1
	{−1 to + 32}	{ 1 }	{ 10 }	{+/− 10 }
FKC□22	−0.1 to + 10	0.1	6	+/− 6
	{−1 to + 100 }	{ 1 }	{ 60 }	{+/− 60 }
FKC□33	−0.1 to + 16	0.32	32	+/− 32
	{−1 to + 160 }	{ 3.2 }	{ 320 }	{+/− 320 }
FKC□35	−0.1 to + 16	1.3	130	+/− 130
	{−1 to + 160 }	{ 13 }	{ 1300 }	{+/− 1300 }
FKC□36	−0.1 to + 16	5	500	+/− 500
	{−1 to + 160 }	{ 50 }	{ 5000 }	{+/− 5000 }
FKC□38	−0.1 to + 16	30	3000	+/− 3000
	{−1 to + 160 }	{ 300 }	{ 30000 }	{+/− 30000 }
FKC□43	−0.1 to + 42	0.32	32	+/− 32
	{−1 to + 420 }	{ 3.2 }	{ 320 }	{+/− 320 }
FKC□45	−0.1 to + 42	1.3	130	+/− 130
	{−1 to + 420 }	{ 13 }	{ 1300 }	{+/− 1300 }
FKC□46	−0.1 to + 42	5	500	+/− 500
	{−1 to + 420 }	{ 50 }	{ 5000 }	{+/− 5000 }
FKC□48	−0.1 to + 30	30	3000	+/− 3000
	{−1 to + 300 }	{ 300 }	{ 30000 }	{+/− 30000 }
FKC□49	−0.1 to + 30	500	20000	{+20000, −10000}
	{−1 to + 300 }	{5000 }	{200000}	{+200000, −100000}

Remark : To minimize environmental influence, span should be greater than 1/40 of the max. span in most applications.

Important : For FKC #49. max possible overload pressure on LP side must be ≤ 100 bar. The accuracy in not guaranteed when used at negative DP.

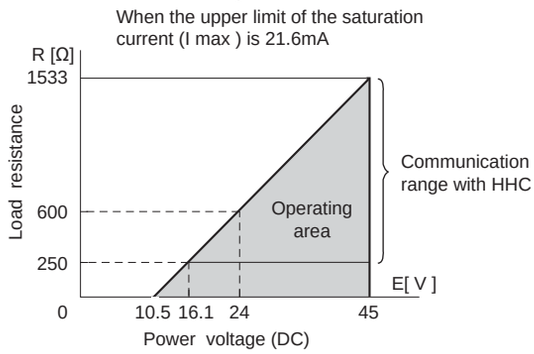
– Lower limit of static pressure (vacuum limit) ;
  Silicone fill sensor: See Fig. 1
  Fluorinated fill sensor: 66kPa abs (500mmHg abs) at temperature below 60°C
– The maximum span of each sensor can be converted to different units using factors as below.
  1MPa $=10^3$KPa=10bar=10.19716kgf/cm^2
  =145.0377psi
  1kpa=10mbar=101.9716mmH_2O=4.01463inH_2O

Over range limit: To maximum static pressure limit

Output signal: 4 to 20mA DC (linear or square root) with digital signal superimposed on the 4 to 20mA signal

Power supply: Transmitter operates on 10.5V to 45V DC at transmitter terminals.
10.5V to 32V DC for the units with optional arrester.

Load limitations: see figure below



Note) The loed resistance varies with the upper limit of the saturation current [I max]

$$R\ [\Omega] = \frac{E\ [V]-10.5}{(I_{max}\ [mA]+0.9)\times 10^{-3}}$$

Note: For communication with HHC(1) (Model: FXW), min. of 250 Ω required.

Hazardous locations: (Under an application) SEE TABLE2

Zero/span adjustment:
Zero and span are adjustable from the HHC(1). Zero and span are also adjustable externally from the adjustment screw.

Damping: Adjustable from HHC or local configurator unit with LCD display.
The time constant is adjustable between 0.06 to 32 seconds.

Zero elevation/suppression:
−100% to +100% of URL

Normal/reverse action:
Selectable from HHC(1)

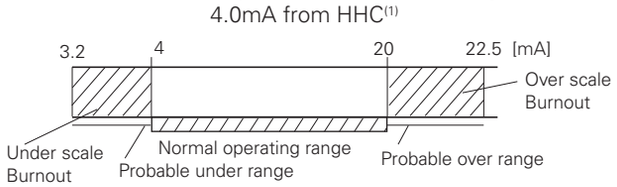
Indication: Analog indicator or 5-digit LCD meter, as specified.

Burnout direction: Selectable from HHC(1)
If self-diagnostic detect transmitter failure, the analog signal will be driven to either "Output Hold", "Output Overscale" or "Output Underscale" modes.

"Output Hold":
Output signal is hold as the value just before failure happens.

"Output Overscale":
Adjustable within the range 20.0mA to 22.5mA from HHC(1)

"Output Underscale":
Adjustable within the range 3.2mA to 4.0mA from HHC(1)



Output limits conforming to NAMUR NE43 by order.

Loop-check output:
Transmitter can be configured to provide constant signal 3.2mA through 22.5mA by HHC(1).

Temperature limit:
Ambient: −40 to +85°C
(−20 to +80°C for LCD indicator)
(−40 to +60°C for arrester option)
(−10 to +60°C for fluorinated oil filled transmitters)
For explosionproof units (flameproof or intrinsic safety), ambient temperature must be within the limits specified in each standard.
Process: −40 to +120°C for silicone fill sensor
−20 to +80°C for fluorinated oil fill sensor
Storage: −40 to +90°C

Humidity limit: 0 to 100% RH

Communication: With HHC(1) (Model FXW), following items can be remotely displayed or configured.
Note: HHC's version must be higher than 7.0 (or FXW □□□□1−□4), for FCX−AⅢ.

Local configurator with LCD display (option):
Local configurator with 3 push button and LCD display can support following items.

Items		By communication with FXW		By local configurator (with 3 push button)	
		Display	Set	Display	Set
Tag No.		v	v	v	v
Model No.		v	v	v	v
Serial No. & Software Version		v	—	v	—
Engineering unit		v	v	v	v
Range limit		v	—	v	—
Measuring range		v	v	v	v
Damping		v	v	v	v
Output mode	Linear	v	v	v	v
	Square root	v	v	v	v
Burnout direction		v	v	v	v
Calibration		v	v	v	v
Output adjust		—	v	—	v
Data		v	—	v	—
Self diagnoses		v	—	v	—
Printer (In case of FXW with printer option)		v	—	—	—
External switch lock		v	v	v	v
Transmitter display		v	v	v	v
Linearize		v	v	—	—
Rerange		v	v	v	v
Saturate current		v	v	v	v
Write protect		v	v	v	v
History – Calibration history – Ambient temperature history		 v v	 v —	 v v	 v —

Programmable output linearization function:
Output signal can be characterized with "14 points linear approximation function" from HHC(1).

(Note) (1) HHC: Hand Held Communicator

Performance specifications for linear output

Reference conditions, silicone oil fill, 316SS isolating diaphragms, 4 to 20mA analog output in linear mode.

Accuracy rating: (including linearity, hysteresis, and repeatability)

Max span 32kPa to 3000kPa model:

For spans greater than 1/10 of URL:

±0.065% of span or ±0.04% of span (15th digit: H, T)

For spans below 1/10 of URL:

$$\pm\left(0.015+0.05\,\frac{0.1\times \mathrm{URL}}{\mathrm{Span}}\right)\ \%\ \text{of span}$$

Max span 20MPa model:

For spans greater than 5Mpa: ±0.1% of span

For spans below 5MPa:

$$\pm\left(0.05+0.05\,\frac{5\mathrm{MPa}}{\mathrm{Span}}\right)\ \%\ \text{of span}$$

Max span 1kPa, 6kPa model:

For spans greater than 1/10 of URL: ±0.1% of span

For spans below 1/10 of URL:

$$\pm\left(0.05+0.05\,\frac{0.1\times \mathrm{URL}}{\mathrm{Span}}\right)\ \%\ \text{of span}$$

Stability: ±0.1% of upper range limit (URL) for 10 years for 6th digit code 3, 5, 6, 8 and 9.

Temperature effect:

Effects per 28°C change between the limits of –40°C and +85°C

Range code (6th digit in Code symbols)	Zero shift	Total effect
"1"/1kPa {10mbar} "2"/6kPa {60mbar}	$\pm\left(0.125+0.1\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %	$\pm\left(0.15+0.1\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %
"3"/32kPa {320mbar} "5"/130kPa {1300mbar} "6"/500kPa {5000mbar} "8"/3000kPa {30000mbar} "9"/20000kPa {200000mbar}	$\pm\left(0.075+0.0125\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %	$\pm\left(0.095+0.0125\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %

Static pressure effect:

Static pressure code (5th digit in Code symbols)	Zero shift (% of URL)
"1" /1kPa {10m bar} sensor "2" /6kPa {60 m bar} sensor	±0.2% / 0.2MPa {2bar} ±0.2% / 3.2MPa {32bar}
"3" "4"	±0.035% / 6.9MPa {69bar} ±0.2% / 6.9Mpa {69bar} FKC□49

Overrange effect:

Static pressure code (5th digit in Code symbols)	Zero shift (% of URL)
"1" / 1kPa {10m bar} sensor "2" / 6kPa {60m bar} sensor "3" "3" "4" "4"	±0.3% / 0.2MPa {2bar} ±0.1% / 3.2MPa {32bar} ±0.1% / 16MPa {160bar} FKC□3[5,6,8] ±0.15% / 16MPa {160bar} FKC□33 ±0.25% / 42MPa {420 bar} FKC□4[3,5,6,8] ±0.2% / 10MPa {100bar} FKC□49

Performance specifications for square root output

Accuracy rating:

Output	Span	
	over 0.1 × URL	below 0.1 × URL
50 to 100%	±0.065 %	±(0.015+0.05 × 0.1 × URL/Span)%
20 to 50%	±0.163 %	±2.5 × (0.015+0.05 × 0.1 × URL/Span)%
10 to 20%	±0.325 %	±5 × (0.015+0.05 × 0.1 × URL/Span)%

Max span 1kPa, 6kPa model:

Output	Accuracy
50 to 100%	±0.1 %
20 to 50%	±0.25%
10 to 20%	±0.5 %

Temperature effect:

Effects per 28°C change between the lim-its of –40°C and +85°C

Range code	Shift at 20% output point
"1" and "2"	$\pm\left(0.375+0.25\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %/28°C
"3" through "9"	$\pm\left(0.24+0.03125\,\frac{\mathrm{URL}}{\mathrm{Span}}\right)$ %/28°C

Low flow cut-off: Customer configurable for any point between 0 to 20% of output

Performance specifications common for both atpt modes

Supply voltage effect:

Less than 0.005% of calibrated span per 1V

Update rate: 60 msec

Step response: (without electrical damping)

Range code (6th digit in code symbols)	Time constant (at 23°C)	Dead time
"1"	0.33 s	0.12 s
"2"	0.3 s	
"3"	0.12 s	
"5" through "8"	0.08 s	

Mounting position effect:

Zero shift, less than 0.12kPa {1.2m bar} for a 10° tilt in any plane.

No effect on span.

This error can be corrected by adjusting Zero.

Dielectric strength:

500V AC, 50/60Hz 1 min., between circuit and earth.

Insulation resistance:

More than 100MΩ at 500V DC.

Internal resistance for external field indicator:

12Ω or less

Physical specifications

Electrical connections:
G1/2, 1/2-14 NPT, Pg13.5, or M20 × 1.5 conduit, as specified.

Process connections:
1/4-18 NPT or Rc1/4 on 54mm centers, as specified.
Meets DIN 19213.

Process-wetted parts material:

Material code (7th digit in "Code symbols")	Process cover	Diaphragm	Wetted sensor body	Vent/drain
V	316 stainless steel	316L stainless steel	316 stainless steel *	316 stainless steel
W	316 stainless steel	Hastelloy-C	316 stainless steel *	316 stainless steel
J	316 stainless steel	316L stainless steel +Au coating	316 stainless steel *	316 stainless steel
H	316 stainless steel	Hastelloy-C	Hastelloy-C lining	316 stainless steel
M	316 stainless steel	Monel	Monel lining	316 stainless steel
T	316 stainless steel	Tantalum	Tantalum lining	316 stainless steel

Remark: Availability of above material design depends on ranges and static pressure. Refer to "Code symbols".
* 329J3L stainless steel on FKC□11 and FKC□22.

Non-wetted parts material:
Electronics housing: Low copper die-cast aluminum alloy finished with polyester coating (standard), or 316 stainless steel, as specified.
Bolts and nuts: Cr-Mo alloy (standard), 316 stainless steel (for static pressure code "1", "2", and "3" only), or 660 stainless steel (for static pressure code "3" and "4" only). Static pressure rating for code "3" with 316 stainless steel bolts is degraded to 10MPa.
Fill fluid: Silicone oil (standard) or fluorinated oil
Mounting bracket: 304 or 316 stainless steel

Environmental protection:
IEC IP67 and NEMA 6/6P

Mounting: On 60.5mm(JIS 50A) pipe using mounting bracket, direct wall mounting, or direct process mounting.

Mass{weight}: Transmitter approximately 3.1 to 3.6kg without options.
Add; 0.5kg for mounting bracket
4.5kg for stainless steel housing option

Optional features

Indicator: A plug-in analog indicator (2.5% accuracy).
An optional 5-digit LCD meter with engineering unit is also available.

Local configurator with LCD display:
An optional 5 digits LCD meter with 3 push buttons can support items as using communication with FXW.

Arrester: A built-in arrester protects the electronics from lightning surges.
Lightning surge immunity:
4kV (1.2 × 50μs)

Oxygen service: Special cleaning procedures are followed throughout the process to maintain all process wetted parts oil-free.
The fill fluid is fluorinated oil.

Chlorine service: The fill fluid is fluorinated oil.

Degreasing: Process-wetted parts are cleaned, but the fill fluid is standard silicone oil. Not for use on oxygen or chlorine measurement.

Vacuum service: Special silicone oil and filling procedure are applied.
See Fig. 1.

Optional tag plate: An extra stainless steel tag with customer tag data is wired to the transmitter.

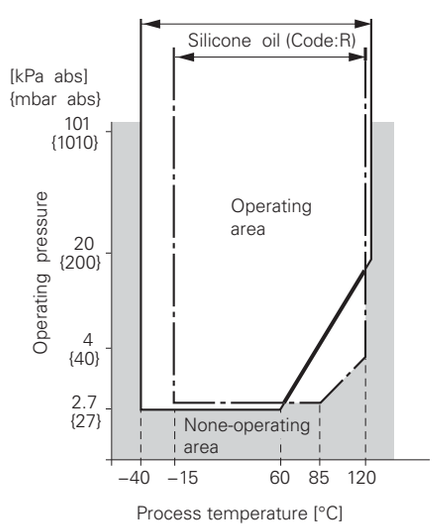


Fig. 1 Relation between process temperature and operating pressure

CODE SYMBOLS <Base model>

Digit	Description					Note	1 2 3 4 5 6 7 8	9 10 11 12 13	14 15
							F K C	5	-	-	← Digit No. of code
4	<Connection>										
	Process connection	Oval flange screw	Conduit connection	Case type							
	Rc1/4	7/16-20UNF	G1/2	T type				5			
	1/4-18NPT	7/16-20UNF	1/2-14NPT	T type				6			
	1/4-18NPT	M10 (or M12)(*1)	Pg 13.5	T type		Note 1		7			
	1/4-18NPT	M10 (or M12)(*1)	M20×1.5	T type		Note 1		8			
	1/4-18NPT	7/16-20UNF	Pg 13.5	T type				9			
	Rc1/4	7/16-20UNF	G1/2	L type				S			
	1/4-18NPT	7/16-20UNF	1/2-14NPT	L type				T			
	1/4-18NPT	M10 (or M12)(*1)	Pg 13.5	L type		Note 1		V			
	1/4-18NPT	M10 (or M12)(*1)	M20×1.5	L type		Note 1		W			
	1/4-18NPT	7/16-20UNF	Pg 13.5	L type				X			
5, 6, 7	<Span and materials>					Note 2					
	Static pressure [MPa] {bar}	Span limit (*2) [kPa] (m bar)	Process cover	Diaphragm	Wetted cell body						
	–0.1 to +3.2 {–1 to+32}	0.1…1 {1…10}	316 SS	316L SS	329J3L SS				11V		
			316 SS	Hastelloy-C	329J3L SS				11W		
			316 SS	316L SS +Au coating	329J3L SS				11J		
			316 SS	Hastelloy-C	Hastelloy-C lining				11H		
	–0.1 to+10 {–1 to 100}	0.1…6 {1…60}	316 SS	316L SS	329J3L SS				22V		
			316 SS	Hastelloy-C	329J3L SS				22W		
			316 SS	316L SS +Au coating	329J3L SS				22J		
			316 SS	Hastelloy-C	Hastelloy-C lining				22H		
	–0.1 to+16 {–1 to+160}	0.32…32 {3.2…320}	316 SS	316L SS	316 SS				33V		
			316 SS	Hastelloy-C	316 SS				33W		
			316 SS	316L SS +Au coating	316 SS				33J		
			316 SS	Hastelloy-C	Hastelloy-C lining				33H		
			316 SS	Monel	Monel lining				33M		
			316 SS	Tantalum	Tantalum lining				33T		
		1.3…130 {13…1300}	316 SS	316L SS	316 SS				35V		
			316 SS	Hastelloy-C	316 SS				35W		
			316 SS	316L SS +Au coating	316 SS				35J		
			316 SS	Hastelloy-C	Hastelloy-C lining				35H		
			316 SS	Monel	Monel lining				35M		
			316 SS	Tantalum	Tantalum lining				35T		
		5…500 {50…5000}	316 SS	316L SS	316 SS				36V		
			316 SS	Hastelloy-C	316 SS				36W		
			316 SS	316L SS +Au coating	316 SS				36J		
			316 SS	Hastelloy-C	Hastelloy-C lining				36H		
			316 SS	Monel	Monel lining				36M		
			316 SS	Tantalum	Tantalum lining				36T		
		30…3000 {300…30000}	316 SS	316L SS	316 SS				38V		
			316 SS	316L SS +Au coating	316 SS				38J		
	–0.1 to+42 {–1 to+420}	0.32…32 {3.2…320}	316 SS	316L SS	316 SS				43V		
			316 SS	Hastelloy-C	316 SS				43W		
			316 SS	316L SS +Au coating	316 SS				43J		
			316 SS	Hastelloy-C	Hastelloy-C lining				43H		
			316 SS	Monel	Monel lining				43M		
		1.3…130 {13…1300}	316 SS	316L SS	316 SS				45V		
			316 SS	Hastelloy-C	316 SS				45W		
			316 SS	316L SS +Au coating	316 SS				45J		
			316 SS	Hastelloy-C	Hastelloy-C lining				45H		
			316 SS	Monel	Monel lining				45M		
		5…500 {50…5000}	316 SS	316L SS	316 SS				46V		
			316 SS	Hastelloy-C	316 SS				46W		
			316 SS	316L SS +Au coating	316 SS				46J		
			316 SS	Hastelloy-C	Hastelloy-C lining				46H		
			316 SS	Monel	Monel lining				46M		
	–0.1 to+30 {–1 to+300}	30…3000 {300…30000}	316 SS	316L SS	316 SS				48V		
			316 SS	316L SS +Au coating	316 SS				48J		
		500…20000 {5000…200000}	316 SS	316L SS	316 SS				49V		

SS: Stainless steel

Note 1: (*1) The thread is M12, if 42MPa {420bar} static pressure is specified.

Note 2: (*2) 100: 1 turn down is possible, but should be used at the span greater than 1/40 of the maximum span for better performance.

Digit	Description			Note	1 2 3 4 5 6 7 8 / 9 10 11 12 13 - 14 15 ← Digit No. of code
					F K C 5 -
9	<Indicator and arrester>				
	Indicator	Arrester			
	None	None			A
	Analog, 0 to 100% linear scale	None			B
	Analog, 0 to 100% sq. root scale (*3)	None		Note 3	C
	Analog, custom scale	None			D
	Analog, double scale (Linear and sq. root)	None			J
	None	Yes			E
	Analog, 0 to 100% linear scale	Yes			F
	Analog, 0 to 100% sq. root scale (*3)	Yes		Note 3	G
	Analog, custom scale	Yes			H
	Analog, double scale (Linear and sq. root)	Yes			K
	Digital, 0 to 100% linear scale	None			L
	Digital, custom scale	None			P
	Digital 0 to 100% square root scale	None			M
	Digital, 0 to 100% linear scale	Yes			Q
	Digital, custom scale	Yes			S
	Digital 0 to 100% square root scale	Yes			N
	Digital, 0 to 100% linear scale (Local configurator unit with LCD display)	None			1
	Digital, custom scale (Local configurator unit with LCD display)	None			2
	Digital, 0 to 100% square root scale (Local configurator unit with LCD display)	None			3
	Digital, 0 to 100% linear scale (Local configurator unit with LCD display)	Yes			4
	Digital, custom scale (Local configurator unit with LCD display)	Yes			5
	Digital, 0 to 100% square root scale (Local configurator unit with LCD display)	Yes			6
10	<Approvals for hazardous locations>				
	None (for ordinary locations)				A
	TIIS, Flameproof (Cable gland seal) (*4)			Note 4	C
	TIIS, Intrinsic safety				G
	FM, Flameproof (or explosionproof) (*5)			Note 5	D
	FM, Intrinsic safety and nonincentive				H
	FM Combined of flameproof and intrinsic safety (*5)			Note 5	V
	ATEX Flameproof (*6)			Note 6	X
	ATEX Intrinsic safety				K
	ATEX Type n				P
	ATEX Combined of flameproof and intrinsic safety (*6)			Note 6	M
	IECEx Scheme, Flameproof (*6)			Note 6	R
	IECEx Scheme, Intrinsic safety				T
	CSA, Flameproof (or explosionproof) (*5)			Note 5	E
	CSA, Intrinsic safety and nonincentive				J
11	<Vent/ drain and mounting bracket>				
	Vent/drain	Mounting bracket	Process connection		
	Standard	None	Standard		A
	Standard	Yes, 304L stainless steel	Standard		C
	Standard	Yes, 316L stainless steel	Standard		K
	Side	None	Standard		D
	Side	Yes, 304L stainless steel	Standard		F
	Side	Yes, 316L stainless steel	Standard		L
12	<Options>				
	Extra SS tag plate	Stainless steel elec. housing			
	None	None		Note 7	Y
	Yes	None			B
	None (*7)	Yes (*8)		Note 8	C
	Yes (*7)	Yes (*8)		Note 8	E
13	<Special applications and fill fluid>				
	Treatment	Fill fluid			
	Standard	Silicone oil			Y
	Standard	Fluorinated oil			W
	Degreasing	Silicone oil			G
	Oxygen service	Fluorinated oil (7th digit code “V”, “W”, “J” only)			A
	Chlorine service	Fluorinated oil (7th digit code “H”, “T”)			D
	Vacuum service	Silicone oil for vacuum use			R

Note 3: (*3) In case of square root output mode, square root scale is not available.
Note 4: (*4) Available for 4th digit code "S".
Note 5: (*5) Available for 4th digit code "6", "T".
Note 6: (*6) Available for 4th digit code "6", "8", "T", "W".
Note 7: (*7) Customer tag number can be engraved on standard stainless steel name plate. If extra tag plate is required, select “Yes”.
Note 8: (*8) Not available for 4th digit code "5" to "9", and 10th digit code ”C”.

Digit	Description	Note	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 ← Digit No. of code
			F K C □ □ □ □ 5 - □ □ □ □ □ - □ □
14	<Gasket> <Bolt/nut> (*9),(*10) Gasket: Teflon Bolt/nut:Cr-Mo alloy hexagon socket head cap screw/carbon steel nut (M10)	Note 9,10	C
	Gasket: Teflon Bolt/nut:316 stainless steel bolt/nut (M10)		G
	Gasket: Teflon Bolt/nut:Cr-Mo alloy hexagon bolt/carbon steel nut (M12)		H
	Gasket: Teflon Bolt/nut:660 stainless steel bolt/nut (M10)		J
	Gasket: Teflon Bolt/nut:660 stainless steel bolt/nut (M12)		K
15	<Fixed code> (*9)	Note 11	*

Note 9: (*9) In case of tropical use, select stainless bolts and nuts.

Note 10: (*10) See the following table for possible combinations with 5th and 6th digits.

14th digits	Type			
	FKC*11	FKC*22	FKC*3	FKC*4
C	○	○	○	×
G	○	○	○※	×
H	×	×	×	○
J	×	×	○	×
K	×	×	×	○

※ Static pressure should be -0.1 to +10MPa (-1 to +100bar).

Note 11: (*11) In case of hazardous location type, tagplate is made by Fuji Electric Co., Ltd.

ACCESSORIES

Equalizing valves: Model FFN
Available in Carbon steel or in 316 stainless steel and in pressure rating 16MPa or 42MPa.

Hand-held communicator: Model FXW

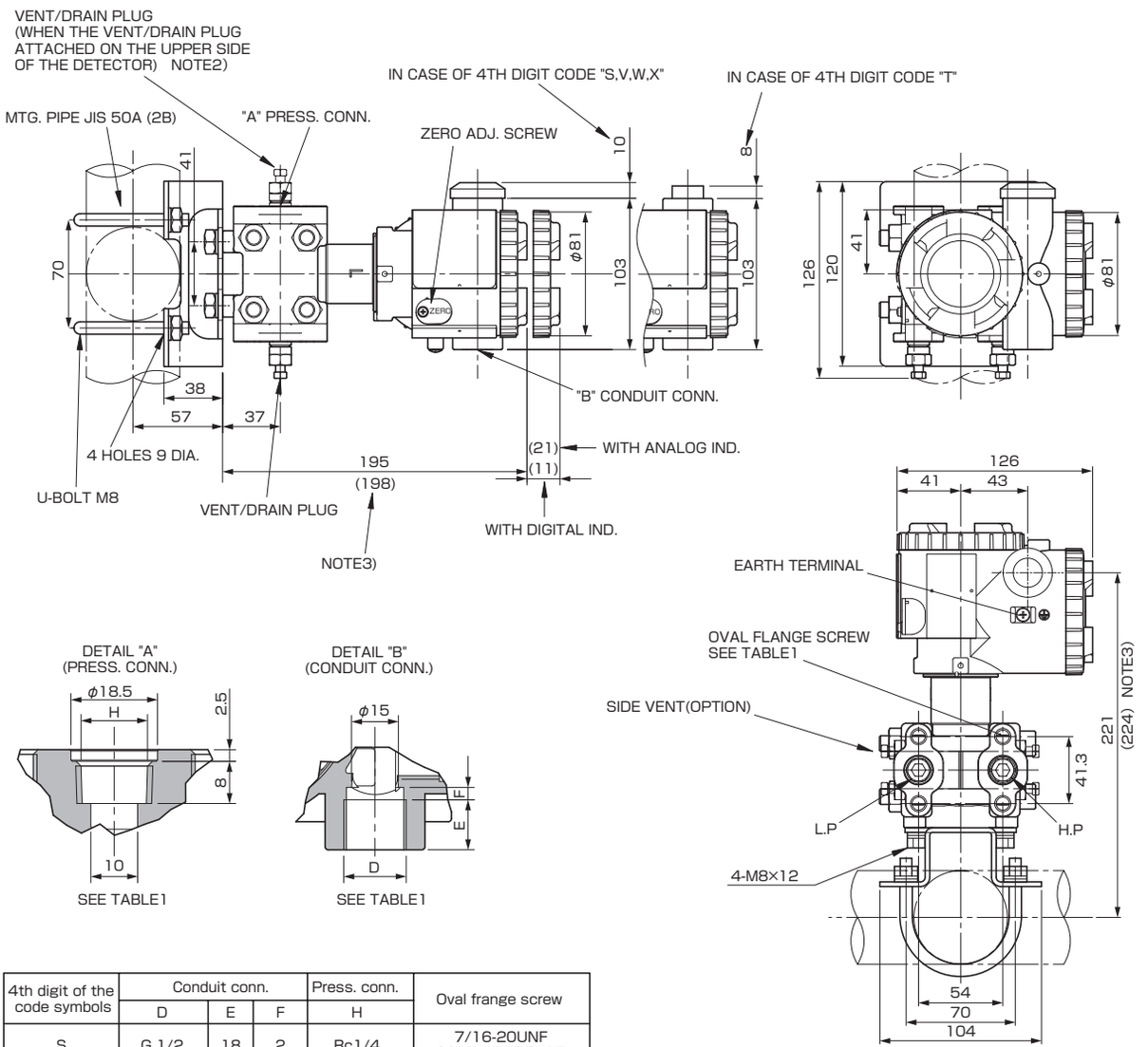
ORDERING INFORMATION

When ordering this instrument, specify:

1. CODE SYMBOLS
2. Measuring range
3. Output orientation (burnout direction) when abnormality is occurred in the transmitter.
   Hold / Overscale / Underscale
   Unless otherwise specified, output hold function is supplied.
4. Output mode (linear or square root output)
   Unless otherwise specified, output mode is linear.
5. Indication method (indicated value and unit) in case of the actual scale (code D, H, P, S on 9th digit).
6. Tag No. (up to 14 alphanumerical characters), if required.

OUTLINE DIAGRAM (Unit:mm)

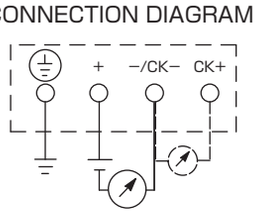
AMP. case: L type



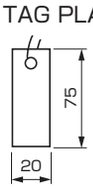
4th digit of the code symbols	Conduit conn.			Press. conn.	Oval frange screw
	D	E	F	H	
S	G 1/2	18	2	Rc1/4	7/16-20UNF SCREW DEPTH15
T	1/2-14NPT	16	4	1/4-18NPT	7/16-20UNF SCREW DEPTH15
V	Pg13.5	10.5	4.5	1/4-18NPT	M10 SCREW DEPTH15
W	M20×1.5	16	4	1/4-18NPT	M10 SCREW DEPTH15
X	Pg13.5	10.5	4.5	1/4-18NPT	7/16-20UNF SCREW DEPTH15

TABLE 1

CONNECTION DIAGRAM

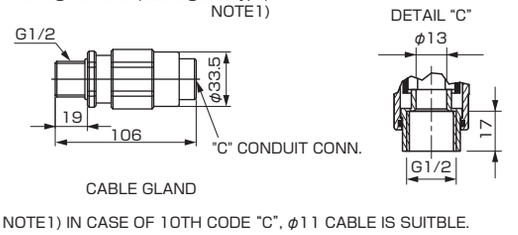


<SS TAG PLATE>



OPTION PARTS FOR FLAMEPROOF OF TIIS (JAPAN)

10th digit code C (Cable gland type)
NOTE1)

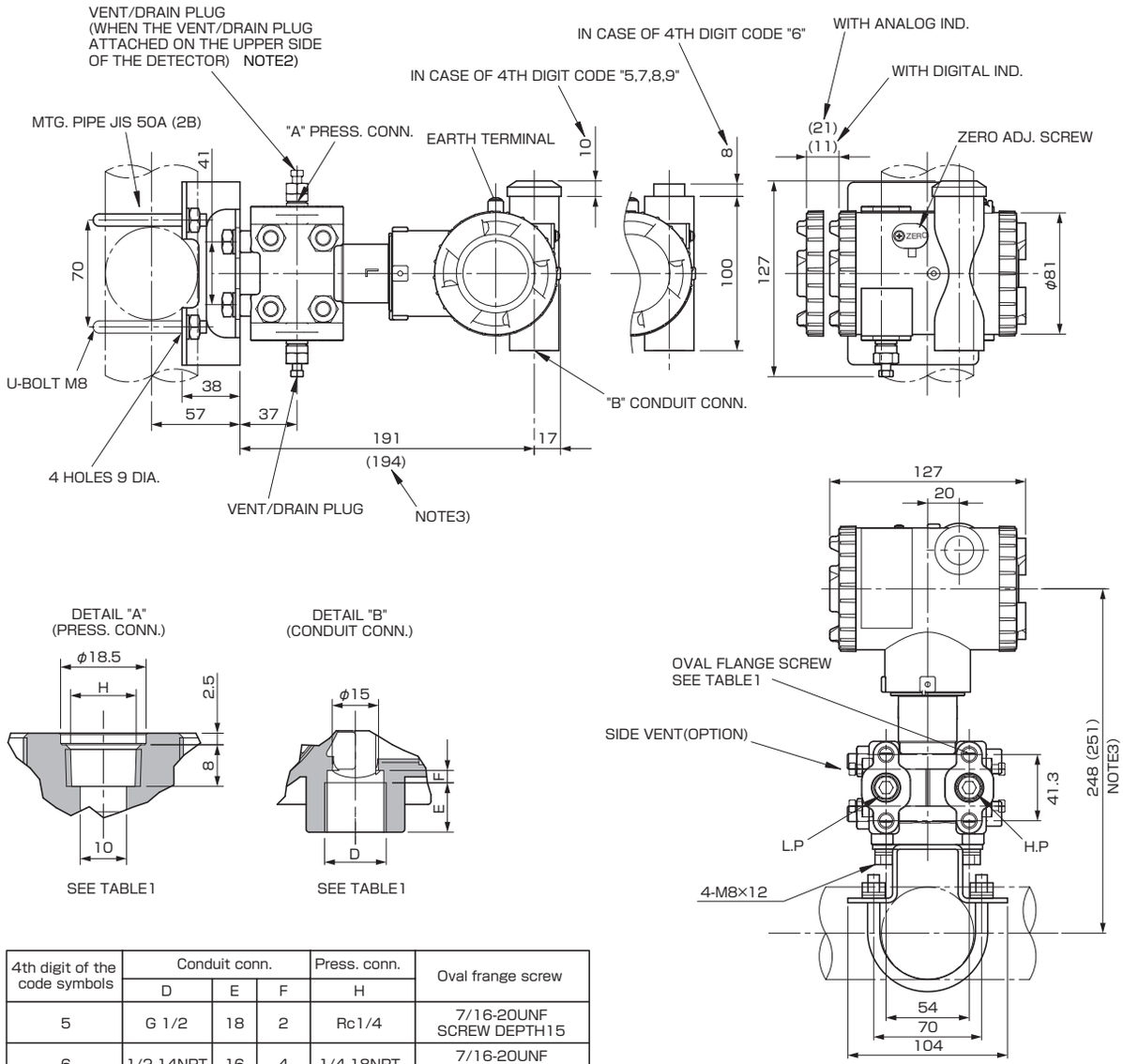


NOTE1) IN CASE OF 10TH CODE "C", φ11 CABLE IS SUITBLE.

NOTE2) THE PRESSURE CONNECTOR IS LOCATED ON THE DOWN SIDE SURFACE OF THE DETECTOR, WHEN THE VENT/DRAIN PLUG IS ATTACHED ON THE UPPER SIDE OF THE DETECTOR (WHEN THE 15ST DIGIT OF THE CODE SYMBOLS : C,P).

NOTE3) WHEN THE 7TH DIGIT OF THE CODE SYMBOLS "H,M,T"

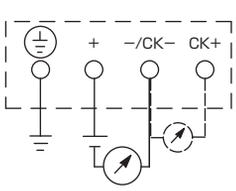
AMP. case: T type



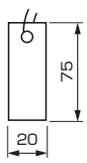
4th digit of the code symbols	Conduit conn.			Press. conn.	Oval frange screw
	D	E	F	H	
5	G 1/2	18	2	Rc1/4	7/16-20UNF SCREW DEPTH15
6	1/2-14NPT	16	4	1/4-18NPT	7/16-20UNF SCREW DEPTH15
7	Pg13.5	10.5	4.5	1/4-18NPT	M10 SCREW DEPTH15
8	M20×1.5	16	4	1/4-18NPT	M10 SCREW DEPTH15
9	Pg13.5	10.5	4.5	1/4-18NPT	7/16-20UNF SCREW DEPTH15

TABLE 1

CONNECTION DIAGRAM



<SS TAG PLATE>



NOTE2) THE PRESSURE CONNECTOR IS LOCATED ON THE DOWN SIDE SURFACE OF THE DETECTOR, WHEN THE VENT/DRAIN PLUG IS ATTACHED ON THE UPPER SIDE OF THE DETECTOR (WHEN THE 15ST DIGIT OF THE CODE SYMBOLS : C,P).
NOTE3) WHEN THE 7TH DIGIT OF THE CODE SYMBOLS "H,M,T"

TABLE 2

<table>
<tr><th>Authorities</th><th>Intrinsic safety</th></tr>
<tr><td>ATEX</td><td>Ex II 1 G
Ex ia IIC T5 Tamb = –40°C to +50°C
Ex ia IIC T4 Tamb = –40°C to +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)</td></tr>
<tr><td>Factory Mutual</td><td>Class I II III
Div.1 Groups A, B, C, D, E, F, G
T4 Entity Type 4X
<table><tr><th colspan="2">Model code</th><th rowspan="2">Tamb</th></tr><tr><th>9th digit</th><th>13th digit</th></tr><tr><td>A,B,C,D,J</td><td>Y,G,R</td><td>–40°C to +85°C</td></tr><tr><td>L,P,M,1,2,3</td><td>Y,G,R</td><td>–20°C to +80°C</td></tr><tr><td>Q,S,N,4,5,6</td><td>Y,G,R</td><td>–20°C to +60°C</td></tr><tr><td>E,F,G,H,K</td><td>Y,G,R</td><td>–40°C to +60°C</td></tr><tr><td>–</td><td>W,A,D</td><td>–10°C to +60°C</td></tr></table>Entity Parameters:
Vmax=28V, Imax=94.3mA, Pi=0.66W,
Ci=35.98nF, Li=0.694mH</td></tr>
<tr><td>CSA</td><td>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),
Ci=36nF (With Arrester), Li=0.6mH (Without analog meter),
Li=0.7mH (With analog meter)</td></tr>
<tr><td>TIIS</td><td>Ex ia IIC T4
Tamb max = +60°C
Entity Parameters:
Ui=28V, Ii=94.3mA, Pi=0.66W,
Ci=40.92nF, Li=0.694mH</td></tr>
<tr><td>IECEx Scheme</td><td>Ex ia IIC T4
Tamb = –40°C to +70°C
Ex ia IIC T5
Tamb = –40°C to +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 analog indicator)</td></tr>
</table>

<table>
<tr><th>Authorities</th><th>Flameproof</th></tr>
<tr><td>ATEX</td><td>Ex II 2 GD
Ex d IIC T6 IP66/67 T85°C
Tamb = –40°C to +65°C
Ex d IIC T5 IP66/67 T100°C
Tamb = –40°C to +85°C</td></tr>
<tr><td>Factory Mutual</td><td>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</td></tr>
<tr><td>CSA</td><td>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.</td></tr>
<tr><td>TIIS</td><td>Ex do IIB+H_2 T4
Tamb max = +60°C
Maximum process temp. = +120°C</td></tr>
<tr><td>IECEx Scheme</td><td>Ex d IIC T5 IP66/67
Tamb = –40°C to +85°C
Ex d IIC T6 IP66/67
Tamb = –40°C to +65°C</td></tr>
</table>

<table>
<tr><th>Authorities</th><th>Type n
Nonincendive</th></tr>
<tr><td>ATEX</td><td>Ex II 3 GD
EEx nL IIC T5 Tamb = –40°C to +50°C
EEx nL IIC T4 Tamb = –40°C to +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 to +50°C
EEx nAL IIC T4 Tamb = –40°C to +70°C
Specific Parameters:
Model without arrester:
Umax=42.4V, Imax=113mA, Pmax=1W
Model with arrester:
Umax=32V, Imax=113mA, Pmax=1W</td></tr>
<tr><td>Factory Mutual</td><td>Class I II III
Div.2 Groups A, B, C, D, F, G
T4 Entity Type 4X
<table><tr><th colspan="2">Model code</th><th rowspan="2">Tamb</th></tr><tr><th>9th digit</th><th>13th digit</th></tr><tr><td>A,B,C,D,J</td><td>Y,G,R</td><td>–40°C to +85°C</td></tr><tr><td>L,P,M,1,2,3</td><td>Y,G,R</td><td>–20°C to +80°C</td></tr><tr><td>Q,S,N,4,5,6</td><td>Y,G,R</td><td>–20°C to +60°C</td></tr><tr><td>E,F,G,H,K</td><td>Y,G,R</td><td>–40°C to +60°C</td></tr><tr><td>–</td><td>W,A,D</td><td>–10°C to +60°C</td></tr></table></td></tr>
</table>

* Specification is subject to change without notice.

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