

Excellent Vortex Flowmeter INSERTION Type BATTERY POWERED EX DELTA II PAF5 TYPE

GENERAL SPECIFICATION GS.No.GBD607E-2

GENERAL

The battery-powered EX DELTA II is a dedicated on site monitor with a wide variety of applications as a universal vortex flowmeter. It has been designed to be simple to use on the built-in battery alone.

The display monitors integrated value or instantaneous flow and is switchable externally. A remote display unit is also available that allows the display to be installed up to 50m away from several dispersed sensors. This flowmeter is in preparation of a fixed type and a hot-tap type.

■ FEATURES

- 1. Offers high accuracy measurement over a wide flowrange.
- 2. Applicable for flow measurement of gas, liquid and steam.
- 3. The sensor, completely isolated from wetted parts, has along service life.
- 4. Absence of any moving parts means that dust and mist in the medium being measured are less likely to pose a problem.
- 5. Battery powered, it requires no electrical installation from an external power source. [Uses five 3.6V lithium-metal battery packs. Good for 7 years on a 24 hours a day continuous operation (model integral with preamplifier), or 4 years (model with separately mounted preamplifier) basis.
- 6. Totalizer flow (cumulative and resettable) and instantaneous flow rate can be monitored by digital display.



- 7. Water proof (IP65/67) and intrinsically safety (Ex d IIB+H₂T4) construction are the most suitable to local flow monitoring sensor.
- 8. The separate type is able to monitor up to 50m away from several dispersed sensors.

GENERAL SPECIFICATIONS Transmitter

lte	em	Descr	iption								
Mounting Type		Fixed Type	Hot-tap Type								
Nominal Size to I	be applied	200, 250, 300, 400, 500, 600, 800, 1000, 1500, 2000mm	400, 500, 600, 800, 1000, 1500, 2000mm								
Nominal Size of t	the Probe	50mm									
Mounting Flange	•	100mm (4")									
Pressure Rating		JIS10K, AS	ME/JPI150								
Standard Insertio	on Depth	Nominal Size of Piping: D<500mm D≥500mm	n; 0.5D D=Inner Dia.of Piping (mm) n; 0.2D								
Fluid to be Meter	red	Liquids (Water. Hot Water. Chen Gases (Oxygen. Nitrogen. Carbo Steam (Saturated Steam. Super	Liquids (Water. Hot Water. Chemical Liquids) Gases (Oxygen. Nitrogen. Carbon Dioxide. Compressed Air. etc.) Steam (Saturated Steam. Super Heated Steam)								
Flow range		See flow range table P3, P4, P5									
Velocity Range		Air (Atm. press Wate	.): 12 to 50m/s sr: 0.6 to 6m/s								
Operating Tem. F	Range (%1)	-10 to -	-10 to +300°C								
Maximum Operat	ting Pres (※2)	Depends on flange rating									
Accuracy		Within ±2% of FS									
Meter Body		SUS304									
waterials	Bluff Body	SUS304									
Installation		Horizontal or Vertical	Horizontal								
*1 : Operating tem	perature range depe	nds on condition of the fluid to be measured									

*2 : Accuracy shall be guaranteed only for the specified actual nominal size.

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• Transmitter specifications

Item	Description								
Mounting	Flowmeter integral type Separated type (2B (50A) pipe stand), Distance between detector and transmitter: Maximum 50 m								
Directives and Standards	EMC EN 61326-1; FCC 47 CFR part 15 (applicable to integral type only) RoHS EN 50581								
Explosionproof configuration	Flameproof configuration Meter integral type: detector for separated type: Ex d IIB + H2T4 Transmitter for separated type (single): Ex d IIC T6 Gb								
Waterproof configuration	JIS C 0920 (IEC IP66/67), Seal: silicon								
Ambient Temperature	Explosionproof: -20 to + 40 °C, 50 °C, 60 °C (see explosionproof specifications (integral and separated types)) Non-explosionproof: -40 to + 70 °C								
Ambient Humidity	5 to 100% RH. There should be no dew condensation in the housing.								
Body Material	Aluminum die-cast								
Housing Painting	Polyurethane coating (ISO 12944 compliance with category C4-M)								
Painting	Body: Munsell 10B8/4, Cover (front and back): Munsell 2.5PB4/10								
Display	 Size: upper row 10.5 mm, lower row 7 mm, display rotation by an optical switch (1) Resettable counter in 8 digits, (7 digits for integers + decimal) (2) Totalizing counter in 8 digits (3) Instantaneous flow rate (selectable from /day, /h, /min, /sec) (4) Instantaneous flow rate bar graph Low battery alarm (), switch operation (), alarms, key lock (), with back light 								
Power Supply	Dedicated battery: 3.6 V lithium-metal battery TL-5930/F made by TADIRAN Transmitter integral type: 24h 7 years continuous Transmitter separated type: 24h 4 years continuous The battery life varies according to the setting, configuration and operating environment.								
Dimensions	W112×H133×D148mm (excluding protrusions)								
Data Protection	All settings are saved in EEPROM. For each total back up. Data retention: 10 years or more. Parameter settings can be saved with a password.								
Weight	Approx. 1.9 kg (including pressure-proof packing: 2.0 kg)								
Connection (For separated type only)	Wire connection port: M25 female screws Transmission distance: maximum 50 m Cable: 1.25mm ² or more, 3 core shielded wire, finished outer diameter: Non-explosionproof: \$\$13mm or less Explosionproof: \$\$8.5 to 11mm Connection terminal block: cross recessed machine screws M3 Pressure-tight packing: • Transmitter side: KXB-25, 16 ORES or ORE • Detector side: KXY-16 (common to PA25)								

■ EXPLOSIONPROOF TEMPERATURE SPECIFICATIONS (INTEGRAL TYPE)

Sensor type	Ambient temperature Measured fluid temperature	Explosionproof configuration	Explosionproof temperature class
Insertion type sensor	−20°C to +60°C −196°C to +130°C	Ex d IIB+H2T4	Τ4

■ EXPLOSIONPROOF TEMPERATURE SPECIFICATIONS (SEPARATED TYPE)

Sensor type	Ambient temperature Measured fluid temperature	Explosionproof configuration	Explosionproof temperature class
Common to all sensors Transmitter for separated type	–20°C to +55°C –	Ex d IIC T6 Gb	Т6
Insertion type sensor	−20°C to +60°C −196°C to +130°C	Ex d IIB+H2T4	T4

• Ambient Temperature Range

If the fluid temperature exceed 125°C, the allowable ambient temperature range reduces as shown in the diagram below.



Nominal Meter Factor

Nominal Size of Piping mm (inch)	Nominal Meter Factor L/p
200 (8)	2.42
250 (10)	3.89
300 (12)	5.75
400 (16)	10.7
500 (20)	18.9
600 (24)	27.7
800 (30)	49.2
1000 (40)	76.9
1500 (60)	173
2000 (80)	309

■ FLOW RANGE

Table A, B, C, E are given value calculated from a nominal bore size. In order to determine flow range for actual piping bore size, correction should be made according to the following equation.

 $Q = Q_0 \times (D/D_0)^2$[A]

Q : Flow rate based on actual bore size. D : Actual bore size. Qo: Flow rate based on nominal bore size. Do: Nominal bore size.

• Flow Range for Liquid in General

Select the minimum flow rate from Table A (based on specific gravity) or Table B (based on viscosity), whichever is greater.

	Table A	: Calculated	value fi	rom s	pecific	gravity
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Table A: Calcu	able A: Calculated value from specific gravity												
			Minimum Flow Rate										
Nominal Size	Sp.Gr.	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1,2	waximum			
mm (inch)	(m/s)	0.90	0.82	0.76	0.71	0.67	0.64	0.61	0.58	6			
200 (8″)	102	93	86	80	76	72	69	66	678			
250 (10″)	158	145	134	125	118	112	107	102	1060			
300 (12″)	228	208	193	180	170	161	154	147	1520			
400 (16″)	405	370	342	320	302	287	273	262	2710			
500 (20″)	633	578	535	500	472	447	427	409	4240			
600 (24″)	911	831	770	720	679	644	614	588	6100			
800 (32″)	1620	1480	1370	1280	1210	1150	1100	1050	10800			
1000 (40″)	2530	2310	2140	2000	1890	1790	1710	1640	16900			
1500 (60″)	5690	5200	4810	4500	4250	4030	3840	3680	38100			
2000 (80″)	10200	9240	8550	8000	7540	7160	6820	6530	67800			

Table B: Calculated value from viscosity

Kinematia VI		Minimum Flow Rate										
Nominal Size	nm²∕s)	1	2	3	5	10	15	20	25	30	40	
mm (inch)	' (m/s)	0.13	0.26	0.39	0.65	1.30	1.95	2.60	3.25	3.90	5.20	
200 (8″)				45	74	147	221	294	368	441	589	
250 (10")				69	115	230	345	460	575	690	919	
300 (12″)				100	166	331	497	662	827	993	1330	
400 (16″)				177	294	589	883	1180	1470	1770	2360	
500 (20″)				276	460	919	1380	1840	2300	2760	3680	
600 (24″)				397	662	1330	1990	2650	3310	3970	5300	
800 (32″)				706	1180	2360	3530	4710	5890	7060	9410	
1000 (40″)				1110	1840	3680	5520	7360	9190	11100	14700	
1500 (60″)				2490	4140	8270	12400	16600	20700	24900	33100	
2000 (80″)				4410	7360	14700	22100	29400	36800	44100	58900	

, determine on the basis of specific gravity (Table A). ·In the shadowed area

Unit: m³/h

• Flow Range for General Gases

In this table, flow rates are specified in [actual] base. Therefore, in case of [normal] base, make it sure to convert the flow rate to [actual] condition and determine the flow range and the nominal diameter based on this table.

		Don-tt	Minimum Flow Rate (m ³ /h)										Maximum Flow	
	Nominal Size	Velocit	0.38	0.7	1.2	2.0	3.6	6	11	19	34	(60)	Rate (m ³ /h)	
	mm (inch)	elocity m/s	20.3	15.0	11.8	10.0	8.2	6.9	5.7	4.7	3.9	3.2	50	
	200 (8")		2300	1690	1330	1130	923	778	636	530	437	362	5650	
	250 (10")		3590	2640	2080	1760	1450	1220	994	828	682	565	8830	
	300 (12")		5160	3810	3000	2530	2080	1750	1430	1200	982	813	12700	
	400 (16")		9180	6760	5330	4490	3690	3120	2550	2120	1750	1450	22600	
Table C	500 (20")		14400	10600	8320	7020	5770	4870	3980	3320	2730	2260	35300	
	600 (24")		20700	15200	12000	10100	8310	7010	5730	4770	3930	3250	50800	
	800 (32")		36700	27100	21300	18000	14800	12500	10200	8480	6990	5780	90400	
	1000 (40″)		57400	42300	33300	28100	23100	19500	15900	13300	10900	9030	141000	
	1500 (60 [″])	129000	95100	74900	63200	51900	43800	35800	29800	24600	20400	318000		
	2000 (80″)		230000	169000	133000	113000	92300	77800	63600	53000	43700	36200	565000	
	Type of Gases	Density kg/m ³	Gas Pressure (MPa (gauge)) at 20°C (Ref.) Viscosit of Gas											
	Acetylene	1.175	_	_	0	0.08	0.23	0.55	0.9	1.65	_	_	0.00943 (mPa·s)	
	Argon	1.785	_	_	_	0.02	0.12	0.26	0.55	1.05	2	_	0.0209	
	Ammonia	0.771	_	0	0.07	0.21	0.42	0.75	1.45	_	_	_	0.0092	
	Carbon Monoxide	1.250	_	_	0	0.07	0.21	0.42	0.85	1.55	_	_	0.0166	
	Ethane	1.357	_	_	0	0.06	0.18	0.37	0.8	1.4		_	0.0085	
	Ethylene	1.264	_	_	0	0.07	0.21	0.42	0.85	1.55	_	_	0.0097	
٥	Air	1.293	_	_	0	0.07	0.2	0.4	0.85	1.5	_	_	0.017	
ole	Oxygen	1.429	-	_	0	0.05	0.1.	0.35	0.75	1.35	_	—	0.0192	
Tal	Hydrogen	0.0899	0.35	0.73	1.33	—	_	—	_	_	_	_	0.0084	
	Carbon Dioxide	1.977	—	—	_	0.01	0.1	0.23	0.5	0.95	1.7	—	0.0138	
	Nitrogen	1.251	—	—	_	0.07	0.21	0.42	0.85	1.55		—	0.0166	
	City Gas	0.802	—	0	0.06	0.17	0.38	0.7	1.4	_	_	—	0.01	
	Natural Gas	0.828	—	0	0.06	0.16	0.37	0.68	1.35	—		—	0.0107	
	Freon-12	5.533	—	—	—	-	0	0.02	0.12	0.27	0.56	1.1	0.0127	
	Propane	2.020	—	—	—	0.01	0.09	0.22	0.49	0.9	1.7	—	0.0075	
	Butane	2.703	—	—	—	0	0.04	0.14	0.34	0.65	1.2	—	0.0069	
	Methane	0.717	_	0	0.08	0.2	0.44	0.8	1.55	_	_	_	0.0103	

• How to Determine the Minimum Flow Rate

Find a value D, follow the same column upwards and find a value intersecting the desired diameter in Table C for the minimum flow rate.

Example :

Find the minimum flow rate where fluid: air, temp.: 20°C, pressure: 0.5MPa (gauge), and actual bore size: 477.8mm. Minimum flow rates at 0.4MPa and 0.85MPa of air with respect to a bore of 500mm in Table D are 4870 m³/h and 3980 m³/h, respectively, from Table C. The minimum flow rate at 0.5MPa can therefore be determined by proportion and formula [A] as follows:

Q mm = {3980 +
$$\frac{0.85-0.5}{0.85-0.4}$$
 × (4870-3980)} $\left(\frac{477.8}{500}\right)^2$
≒ 4300m³/h

It can also be determined by calculating the actual density. Actual density ρ of air at 20°C and 0.5MPa is

$$\rho = 1.293 \times \frac{273.15}{273.15+20} \times \frac{0.101325+0.5}{0.101325} \doteqdot 7.15 \text{ kg/m}^3$$

From Table C, the minimum flow rate at a density of $6kg/m^3$ and bore of 500 mm is 4870 m³/h; at a density of $11kg/m^3$, it should be 3980 m³/h. The minimum flow rate at a density of $7.15kg/m^3$ and bore of 477.8mm therefore can be found by proportion and formula [A] as follows:

Q min = {3980 +
$$\frac{11-7.15}{11-6}$$
 + (4870-3980)} × $\left(\frac{477.8}{500}\right)^2$
= 4300 m³/h

Flow Range for Saturated Steam

Table E

Table E																						Unit: t/h
N.B.S *	200 (8″)		250	250 (10″)		(12″)	400	(16″)	500	(20″)	600	(24″)	800	(32″)	1000	(40″)	1500	(60″)	2000	(80″)	Temp.	Density
Press. MPa(gauge)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	°C	kg/m ³
0.049	1.32	4.89	2.06	7.64	2.96	11.0	5.26	19.5	8.22	30.5	11.9	44.0	21.1	78.2	32.9	122	74.0	275	132	489	111.4	0.8653
0.098	1.50	6.37	2.35	9.94	3.38	14.3	6.00	25.4	9.38	39.7	13.5	57.3	24.0	101	37.5	159	87.4	358	150	636	120.1	1.126
0.196	1.97	9.26	3.07	14.4	4.42	20.8	7.86	37.0	12.3	57.8	17.7	83.3	31.5	148	49.2	231	111	521	197	926	133.3	1.638
0.294	2.35	12.1	3.67	18.9	5.29	27.2	9.39	48.4	14.7	75.6	21.2	108	37.6	193	58.7	302	132	680	235	1210	143.2	2.140
0.392	2.70	14.9	4.22	23.2	6.07	33.5	10.8	59.6	16.9	93.1	24.3	134	43.2	238	67.5	372	152	838	270	1490	151.4	2.635
0.490	3.03	17.6	4.73	27.6	6.81	39.7	12.1	70.7	18.9	110	27.2	159	48.4	282	75.6	442	170	994	303	1760	158.3	3.127
0.588	3.33	20.4	5.21	31.9	7.50	45.9	13.4	81.7	20.9	127	30.0	183	53.3	327	83.3	511	188	1140	333	2040	164.4	3.615
0.686	3.62	23.1	5.66	36.2	8.15	52.1	14.5	92.7	22.7	144	32.6	208	58.0	370	90.6	579	204	1300	362	2310	169.8	4.099
0.785	3.90	25.9	6.10	40.4	8.78	58.2	15.6	103	24.4	161	35.1	233	62.4	414	97.5	647	220	1450	390	2590	174.7	4.581
0.883	4.17	28.6	6.52	44.7	9.38	64.4	16.7	114	26.1	178	37.6	257	66.7	458	105	715	235	1610	417	2860	179.2	5.064
0.981	4.44	31.4	6.93	49.0	9.98	70.6	17.8	125	27.7	196	39.9	282	71.0	502	111	785	250	1760	444	3140	183.3	5.553
1.08	4.69	34.1	7.32	53.3	10.6	76.7	18.8	136	29.3	213	42.2	307	75.0	545	118	852	264	1910	469	3410	187.2	6.033
1.18	4.93	36.8	7.70	57.5	11.1	82.8	19.8	147	30.8	230	44.4	331	78.9	588	124	920	278	2070	493	3680	190.8	6.509
		-																				

*N.B.S.=Nominal Size

Flow Range for Superheated Steam

The flow range for superheated steam is determined by first finding the correction factors "a" and "b" for the minimum flow rate and maximum flow rates from the table below and then multiplying the applicable connection diameter and pressure readings in the flow range table of saturated steam by those correction factors.

Table F:



Example:

Measurement of super heated steam of pressure 0.1MPa (gauge) and temperature 160°C in actual bore size 477.8mm.

From table E, minimum flow rate and maximum flow rate for 0.1MPa steam with nominal bore size 500mm are determined as 9.38t/h and 39.7t/h.

Correction factor "a" is determined as 0.93 from Fig. 1 and Correction factor "b" is determined as 0.9 from Fig. 2 and consulting from Table E and formula [A].

Minimum flow rate

Q min = 9.38 × 0.93 ×
$$\left(\frac{477.8}{500}\right)^2 \doteq 8 \text{ t/h}$$

Maximum flow rate

Q max =
$$3.97 \times 0.9 \times \left(\frac{477.8}{500}\right)^2 \approx 32 \text{ t/h}$$

PRESSURE LOSS



OUTLINE DIMENSIONS (Unit: mm)



OUTLINE DIMENSIONS (Unit: mm)

• Hot-tap Type

Nominal Size to be applied: 400 to 2000mm





■ INSTALLATION CONDITIONS

1. TYPICAL PIPING INSTRUCTIONS

It is generally required that the flow pattern of a fluid flowing in and out of an vortex flowmeter be as uniform as possible for accurate metering performance. For this, the standard piping instructions are shown in the following table.

(1) Use an OVAL flow straightener or provide a specified straight pipe (ISO-5167 compliant).

No.		Piping Arrangement	Straight Pipe Length (L) D: nominal diameter	Remarks
1	OVAL's flow-	Flow Honey Vane L	8D	For Honey Vanes L, consult OVAL.
	straightener	Flow Straightener	12D	Refer to GS/GCF001. (Applicable to meter size up to 24")
2	Reducer		15D Minimum	A concentric reducer is upstream of the meter.
			23D Minimum	An elbow is upstream of the meter.
3	Elbow		25D Minimum	Two elbows are upstream of the meter.
			40D Minimum	Two elbows are vertically upstream of the meter.
4	Fully open gate valve		15D Minimum	A full-open gate valve is upstream of the meter.
5	Partially open gate valve	Partially L Open Flow	50D Minimum	A partially open gate valve, sharp orifice or something that markedly disturbs the flow pattern is upstream of the meter.

*: "D" denotes pipeline diameter, not probe bore.

*: A short pipe section, 5D or longer is provided downsteam of the meter.

*: For pressure detection, provide the probe downstream of the flowmeter (see figure below). To avoid disturbances in the flow, temperature detection should be made downstream of the flowmeter and, at the same time, upstream of the control valve.



Mounting Neck:



Non-full pipe

The fluid cannot be measured properly if there is an air space in the pipe. Make sure to confirm the pipe insdie is filled up with the fluid to be measured.

In case of piping condition that frequently causes non-full status, install an air release valve, for example.

Work stage and lifting gear

Set up the work stage for maintenance and inspection. In case of hot tap type, use of lifting gear is recommended for smooth installation.

Pulsation

Installing this flowmeter in a line where a roots-blower, compressor, etc. that produce pulsating pressures are used as blowers could subject the meter to the effects of pulsation.

If such is the case, consult factory.

The value of allowable fluctuating pressure shall be given according to the following equation.

$$N < 7.2 \rho V^2$$
 (Pa)

where N: Fluctuating press. (Pa)

- ρ : Density of liquid to be measured (kg/m³)
- V: Minimum velocity (m/s)

Thermal Insulation

If it is desired to thermally insulate the pipe line, simple laggings (without mortar finished) are suggested to facilitate servicing. This arrangement will permit taking off flowmeter connecting bolts without destroying the lagging.

■ PRODUCT CODE EXPLANATION



Main code

(1	2		3 Model		17	-
V	X	: :	S EX DELTA II Insertion Type Fixed Type		(18)	Transmitter
V	X		H EX DELTA II Insertion Type Hot-tap Ty	ре	F	PAF5 Battery drive, no output signal
4) (5		6 Probe Nominal Size		(19)	Transmitter configuration
0	5	; []	0 50mm (2")		1	Integrally mounted
(7) -	-			2	Separately mounted *3
(8) F	lui	d category		20	Display
Γ	L	iqu	iid		1	w/Totalizer · digital indicator
G	G	àas	;		21	Output
s	S	Sati	urated Steam Select G:Gas if specifying	temperature, viscosity, and density.	N	No external output
ĸ	S	Sup	erheated Steam Select G:Gas if specifyi	ng viscosity and density.	22	Communication protocol
9) T	en	np. category		Ν	Non
2	s	Star	ndard (180°C and lower)		23	Version code
3	F	ligł	n temp. (300°C and lower)		С	Version: C
1	N	laj	or Parts Material		24	-
	S	SUS	6304 equivalent		25	Special
Z	S	spe	cial		0	Standard
T			Process connection %1		Z	Special (special inner diameter, face-to-face dimension, etc.)
J	1	,	JIS10K RF (100mm) *2			
J	2	2 .	JIS20K RF (100mm) (Designed on PO iss	sued)		
J	3	; ,	JIS30K RF (100mm) (Designed on PO iss	sued)		
F	1		JPI150 RF (4") *2			
F	3	; ,	JPI300 RF (4") (Designed on PO iss	ued)		
A	. 1	7	ASME150 RF (4")			
A	3	; ,	ASME300 RF (4") (Designed on PO iss	ued)		
Z	9		Special			
Œ) -	-				
14	E	хp	losionproof			
0	Ν	lon	explosionproof			
1	Т	'IIS	(PAF5)			
Æ	E	X-	proof temp. class			
0	Ν	lon	explosionproof			
4	Т	em	ip. class: T4			
1	F	leg	ulations			
0	S	Star	ndard			
G	- (/	ligi Apj	n Pressure Gas Safety Act ww/ proved product) (De	(Material test certificate esigned on PO issued)		
F	- (ligi Ind	n Pressure Gas Safety Act ***/ ividual test) (De	Material test certificate esigned on PO issued)		
J	⊢ ((ligi Co	n Pressure Gas Safety Act **// mpletion inspection) (De	Material test certificate esigned on PO issued)		
L	(àas Sul	Business Act *// www. bject to specific welding procedure) (De	Material test certificate esigned on PO issued)		
N	G	as	Business Act (De	Material test certificate esigned on PO issued)		
C	E (\$	lec Sul	ctricity Business Act *// w// oject to specific welding procedure) (De	Material test certificate esigned on PO issued)		
F	E	lec	ctricity Business Act *w/	Material test certificate esigned on PO issued)		
Т	F	ire	Service Act *w/ (De	Material test certificate esigned on PO issued)		

F w/Material test certificate

*1: ASME Flange serration complies with ASME B 16.5–2003.
 *2: Flange sizes other than 100mm (4") are special specification. Hot-tap type is designed on PO issued.

*3: In separately mounted configuration, explosionproof symbol for transmitter is always Ex d IIC T6 Gb, regardless of sensor specification.

■ PRODUCT CODE EXPLANATION



Additional code

Header's Nominal Size *Must choose										
Р	S	А	200mm Fixed Type							
Ρ	S	В	250mm Fixed Type							
Ρ	S	С	300mm Fixed Type							
Ρ	S	D	350mm Fixed Type							
Ρ	S	Е	400mm Fixed Type, Hot-tap Type							
Ρ	S	F	450mm Fixed Type, Hot-tap Type							
Ρ	S	G	500mm Fixed Type, Hot-tap Type							
Ρ	S	Н	550mm Fixed Type, Hot-tap Type							
Ρ	S	J	600mm Fixed Type, Hot-tap Type							
Ρ	S	κ	650mm Fixed Type, Hot-tap Type							
Ρ	S	L	700mm Fixed Type, Hot-tap Type							
Ρ	S	М	750mm Fixed Type, Hot-tap Type							
Ρ	S	Ν	800mm Fixed Type, Hot-tap Type							
Ρ	S	Ρ	850mm Fixed Type, Hot-tap Type							
Ρ	S	Q	900mm Fixed Type, Hot-tap Type							
Ρ	S	R	950mm Fixed Type, Hot-tap Type							
Ρ	S	S	1000mm Fixed Type, Hot-tap Type							
Ρ	S	Т	1050 to 1300mm Fixed Type							
Ρ	S	9	Special							
Mo	oun	ting	g Neck *Must choose							
Ρ	Ν	1	Height of mounting neck: 100mm; nozzle nominal size (connecting flange size): 100mm (4") as standard							
Ρ	Ν	2	Height of mounting neck: 100mm; nozzle nominal size (connecting flange size): special							
Ρ	Ν	3	Height of mounting neck: special; nozzle nominal size (connecting flange size): 100mm (4")							
Ρ	Ν	4	Height of mounting neck: special; nozzle nominal size (connecting flange size): special							
Pr	ess	ure	e-tight packing gland							
J	F	0	Non							
J	F	1	Cable O.D.: \$\phi 8.5\$ to 10.0							
J	F	2	Cable O.D.: 010.1 to 11.0							
Са	iteg	jory	/ of High Pressure Gas							
Н	Ρ	0	Other than High Pressure Gas							
Н	Ρ	1	Toxic gas and flammable gas							
Н	Р	2	Toxic gas							
Н	Ρ	3	Flammable gas							
Н	Ρ	4	Other than toxic or flammable gas							
Ac	cu	racy	y							
F	2	0	±2.00% FS FS: rated maximum flow rate							
Sp	eci	al t	est (instrumental error)							
А	0	1	Dry calibration (w/Certificate) Witnessed accuracy test not applicable							
Fle	ow	dire	ection *Must choose (See figures on the right.)							
F	R	0	Right to left							
F	L	0	Left to right							
F	U	0	Top to Bottom: LCD type A Separate type: electric conduit at the bottom							
F	D	0	Bottom to Top: LCD type A Separate type: electric conduit at the bottom							
F	U	1	Top to Bottom: LCD type B Separate type: electric conduit at the top (indoor use only)							
F	D	1	Bottom to Top: LCD type B Separate type: electric conduit at the top (indoor use only)							
De	esig	nat	ted special paint on body							
В	С	0	Corrosion proof							
В	А	0	Salinity and acid tolerance 120°C and lower							
В	Х	0	Customer designation Special							
CI	Cleansing									
Т	W	0	Oil free and Water free treatment Hot-tap Type is special							
Т	W	1	Oil free and Water free treatment equivalent							

*1: Need not choose the item when required to implement in Japan law and regulation. Only for items other than the legal requirement, customer can choose as special requirement.

Document									
D	S	J	SPEC. & DWG (Approval Drawing) (Japanese)						
D	S	Е	SPEC. & DWG (Approval Drawing) (English)						
D	R	0	Re-submission of SPEC. & DWG						
D	С	J	Final DWG (Japanese)	Final DWG (Japanese)					
D	С	Е	Final DWG (English)						
D	Ρ	J	Strength Calculation sheet (Japanese)						
D	Ρ	Е	Strength Calculation sheet (English) Unavailable for the Japan law compliant						
S	Т	J	Pressure test report (Japanese)						
S	Т	Е	Pressure test report (English)						
S	А	J	Airtight test report (Japanese)						
S	А	Е	Airtight test report (English)						
D	D	J	Dimensional check record (Japanese)						
D	D	Е	Dimensional check record (English)						
S	Р	J	Penetrant test report (Japanese) Welded part of	pressure resistant vessel *1					
S	Р	Е	Penetrant test report (English) Welded part of	pressure resistant vessel *1					
S	М	J	Magnetic particle inspection (Japanese) Welded part of	pressure resistant vessel *1					
S	М	Е	Magnetic particle inspection (English) Welded part of	pressure resistant vessel *1					
S	R	J	Radiographic inspection report (Japanese) Welded part of	pressure resistant vessel *1					
S	R	Е	Radiographic inspection report (English) Welded part of	pressure resistant vessel *1					
S	U	J	Ultrasonic inspection (Japanese) Welded part of	pressure resistant vessel *1					
S	U	Е	Ultrasonic inspection (English) Welded part of	pressure resistant vessel *1					
S	Х	J	PMI test report (Japanese) *1						
S	Х	Е	PMI test report (English) *1						
S	S	J	Impact test report (Japanese) *1						
S	S	Е	Impact test report (English) *1						
D	Υ	J	WPS/PQR (Japanese)						
D	Υ	Е	WPS/PQR (English)						
D	9	J	Photo (Japanese)						
D	9	Е	Photo (English)						
D	Т	J	Inspection procedure (Japanese)						
D	Т	Е	Inspection procedure (English)						
Wi	itne	ss	s Test						

V 1 0 Required



Standard mounting position for the integral and the separated types



Figure: Flow and LCD directions (both type A and B can be installed outdoors)

■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

Fill in the blanks. Tick the boxes \Box that apply.

Item	Description							
1. Fluid to be metered								
2. Flow Range	Maximum	Normal	Minimum	m³/h [normal]	m³/h [actual]	🗌 kg/h		
3. Temperature range	Maximum	Normal	Minimum	_°C				
4. Pressure range	Maximum	Normal	Minimum	🗌 MPa [gauge]				
5. Density or Sp. Gr.	Density	_ 🗌 kg/m³ [norm	al] , 🗌 kg/m³ [actual]	Sp. Gr				
6. Viscosity		_ □ mPa·s, □ i	mm²/s	at°C				
7. Actual inner Dia. of mainline pipe	Nominal size		mm Actual inner Dia	à	_mm			
8. Type of mounting	Fixed Type	🗌 Hot-tap Type	•					
9. Flow straightening device:	 Required (straightener and down stream pipe) Not required (Please prepare the straightening pipe of specific length, bore and sch. no.) 							
10. Compensation	Temperature and Pressure Pressure Temperature							
11. Compensation Range	Temp	to°C	Pressureto	MPa [ga	uge]			
12. Compensation Ref.	Ref. temp	0°	Press. ref	🗌 MPa [gauge]				
13. Compression coefficient: (in case of gas measurement)	Z (service conditions) = Zo (standard conditions) =							
14. Transmitter	Type: Integral configuration, Separate configuration Explosionproof configuration: Non-explosionproof, Intrinsically safe							
15. Explosionproof construction	 Not requeste Requested 	d						
16. Miscellaneous								

The specification as of August, 2019 is stated in this GS Sheet. Specifications and design are subject to change without notice.

Sales Representative:

