



Reduced Flanged EX DELTA II

Reducer built-in meters expand measurable low flow regions !!

- Expanded the lower flowrate limit of EX DELTA II (The Lineup includes 50, 80, 100, and 150 mm connections.)
- Reduced construction costs for piping modifications
Reduction of one size in the body of the flowmeter enables reduction of the cost for modification of front and rear piping



GENERAL SPECIFICATIONS

Item		Description	
Sensor configuration		Fixed or replaceable sensor	
Body nominal diameter (connection nominal diameter) mm		40 (50), 50 (80), 80 (100), 100 (150) * Other nominal diameters are also available. Please consult the OVAL sales office or nearest representative.	
Process connection		Flange type (RF is standard.)	
Standard connection piping		Nominal wall thickness Sch. 40	
Flange rating		JIS10K, ASME/JPI 150 * Other flange standards are also available. Please consult the OVAL sales office or nearest representative.	
Operating temp. range		-30 to +460°C (Maximum operating temperature varies depending on flange standard.)	
Max. operating pressure		1.5MPa (Depends on flange standard and operating temperature. See the next page.)	
Accuracy		(1) Liquids : ±1% of reading or better or ±1% of full scale or better (2) Gases and steam (Maximum flow velocity ≤30m/s) : ±1% of reading or better or ±1% of full scale or better (3) Gases and steam (Maximum flow velocity >30m/s) : ±2% of reading or better or ±2% of full scale or better *V: Maximum flow velocity of vortex generator	
Major parts materials		Body: SCS14A, Flange: SUSF316	
Transmitter (integrally and separately mounted model)	Smart type	Display	Without display, accumulated/instantaneous
		Output	Current pulse (Factored, Unfactored), Open collector pulse (Factored, Unfactored), Analog output
		Other	Calculation (Mass flow fixed calculation, normal flow fixed calculation) HART protocol communications (Parameter change by dedicated communication kit is available.)
	Battery type	Display	Instantaneous flowrate/Accumulated flowrate/Alarm/Operation lock/Bar graph for instantaneous flowrate
		Output	None
Other		Calculation (Mass flow fixed calculation, normal flow fixed calculation)	
Configuration		Non-explosionproof or explosionproof	
Power supply	Smart type transmitter	12 to 45VDC	
	Battery type transmitter	3.6V lithium-metal battery (TL-5930/F) Battery life: 7 years (integrally mounted model) or 4 years (separately mounted model)	

Note: Other specifications follow standard EX DELTA II.

FLOW RANGES

Saturated Steam

Pressure MPa (gage)	Nominal size Accuracy	Unit: kg/h				Unit: t/h				Pressure MPa (gage)	Nominal size Accuracy	Unit: kg/h				Unit: t/h			
		40mm (50mm)		50mm (80mm)		80mm (100mm)		100mm (150mm)				40mm (50mm)		50mm (80mm)		80mm (100mm)		100mm (150mm)	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
0.05	±1%RD	29.1	130	37.2	217	0.08	0.47	0.14	0.82	0.5	±1%RD	50.8	476	83.2	793	0.19	1.74	0.32	3.01
	±2%RD		252		426		0.95		1.60		±2%RD		920		1550		3.49		5.87
	±1%FS	130	217	0.47	0.82		±1%FS	476	793		1.74	3.01							
	±2%FS	252	426	0.95	1.60		±2%FS	920	1550		3.49	5.87							
0.1	±1%RD	30	170	41	284	0.10	0.62	0.16	1.07	0.6	±1%RD	56	550	91.6	918	0.21	2.02	0.35	3.48
	±2%RD		329		556		1.24		2.10		±2%RD		1060		1790		4.04		6.79
	±1%FS	170	284	0.62	1.07		±1%FS	550	918		2.02	3.48							
	±2%FS	329	556	1.24	2.10		±2%FS	1060	1790		4.04	6.79							
0.2	±1%RD	33	248	53.9	414	0.12	0.91	0.21	1.57	0.8	±1%RD	65.6	699	108	1160	0.24	2.56	0.41	4.42
	±2%RD		480		812		1.82		3.06		±2%RD		1350		2280		5.12		8.62
	±1%FS	248	414	0.91	1.57		±1%FS	699	1160		2.56	4.42							
	±2%FS	480	812	1.82	3.06		±2%FS	1350	2280		5.12	8.62							
0.3	±1%RD	39.4	325	64.5	542	0.15	1.19	0.25	2.06	1.0	±1%RD	74.6	846	122	1410	0.27	3.10	0.46	5.36
	±2%RD		629		1060		2.38		4.01		±2%RD		1630		2760		6.20		10.40
	±1%FS	325	542	1.19	2.06		±1%FS	846	1410		3.10	5.36							
	±2%FS	629	1060	2.38	4.01		±2%FS	1630	2760		6.20	10.40							
0.4	±1%RD	45.3	401	74.2	668	0.17	1.47	0.28	2.54	1.5	±1%RD	94.8	1210	155	2020	0.35	4.44	0.59	7.68
	±2%RD		775		1310		2.94		4.94		±2%RD		2340		3960		8.89		14.90
	±1%FS	401	668	1.47	2.54		±1%FS	1210	2020		4.44	7.68							
	±2%FS	775	1310	2.94	4.94		±2%FS	2340	3960		8.89	14.90							

Gas

This flowrate range is indicated in terms of actual flowrate [actual].

If a flowrate is given under standard conditions, be sure to convert it to the actual flowrate before determining the flow range or nominal size according to this table.

Unit: m³/h

Body nominal diameter (Connection nominal diameter) mm	Viscosity kg/m ³ Accuracy	Minimum flowrate										Maximum flowrate
		0.38	0.7	1.2	2.0	3.6	6	11	19	34	(60)	
40 (50)	±1% RD	110	57	33	20	16	13	11	9	8	6	150
	±2% RD											290
	±1% FS	39	29	23	19	16	13	11	9	8	6	150
	±2% FS											290
50 (80)	±1% RD	134	73	43	31	26	22	18	15	12	10	250
	±2%RD											490
	±1% FS	63	46	37	31	26	22	18	15	12	10	250
	±2% FS											490
80 (100)	±1% RD	200	108	80	67	56	47	38	32	26	22	550
	±2% RD											1100
	±1% FS	140	101	80	67	56	47	38	32	26	22	550
	±2% FS											1100
100 (150)	±1% RD	260	174	140	115	95	80	66	55	45	37	950
	±2% RD											1850
	±1% FS	240	174	140	115	95	80	66	55	45	37	950
	±2% FS											1850

Liquid

For the minimum flowrate, take the larger value from Table A (specific gravity basis) or Table B (viscosity basis).

Table A: based on specific gravity Accuracy: ±1% of Reading Unit: m³/h

Body nominal diameter (Connection nominal diameter) mm	Sp. Gr.	Minimum flowrate							Maximum flowrate	
		0.5	0.6	0.7	0.8	0.9	1.0	1.1		1.2
40 (50)		1.7	1.6	1.4	1.4	1.3	1.3	1.2	1.1	48
50 (80)		2.8	2.5	2.3	2.2	2.1	2.0	1.9	1.8	79
80 (100)		6.0	5.5	5.1	4.7	4.6	4.6	4.6	4.6	172
100 (150)		11	11	11	11	11	11	11	11	296

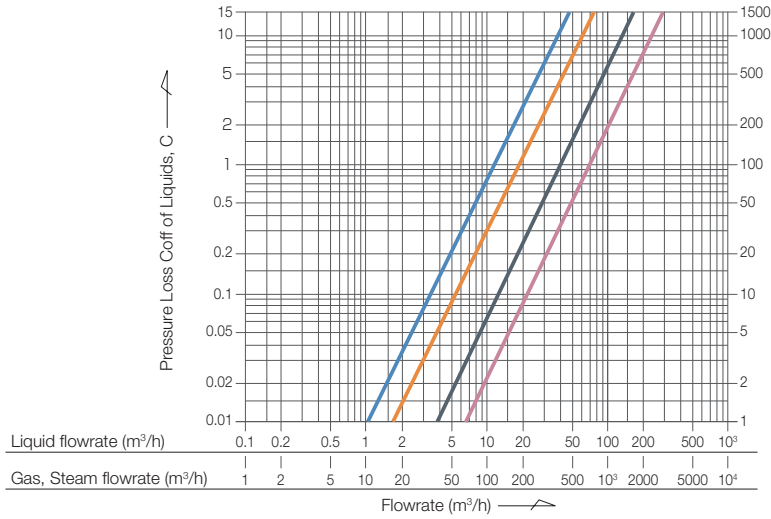
Table B: based on viscosity Unit: m³/h

Body nominal diameter (Connection nominal diameter) mm	Viscosity mm ² /s Accuracy	Minimum flowrate				
		1	2	3	5	10
40 (50)	±1% RD	2.4	4.7	7.0	12	24
	±1% FS				2.8	6.5
50 (80)	±1% RD	3.0	6.0	9.0	15	30
	±1% FS				3.6	7.1
80 (100)	±1% RD		8.9	14	23	45
	±1% FS					11
100 (150)	±1% RD		12	18	29	58
	±1% FS					14

Flange Rating and Maximum Operating Pressure

Operating Temperature	Flange Rating	JIS 10K	ASME 150 JPI 150
120°C or below		1.40 MPa	1.50 MPa
Over 120°C to 220°C		1.20 MPa	1.27 MPa
Over 220°C to 300°C		1.00 MPa	1.02 MPa
Over 300°C to 350°C		—	0.84 MPa
Over 350°C to 420°C		—	0.57 MPa
Over 420°C to 460°C		—	0.42 MPa

■ PRESSURE LOSSES



- Nominal size
 - 40mm
 - 50mm
 - 80mm
 - 100mm

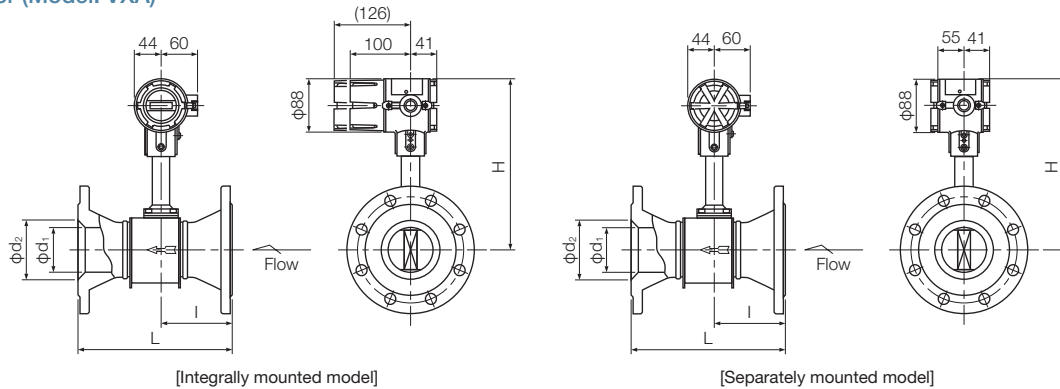
$$\Delta P = \frac{C \times \rho}{100}$$

ΔP : Pressure loss (kPa)
 ρ : Density (kg/m³)

To determine the pressure loss, find the value C at the intersecting point of flowrate (Q) and slanted line of the given meter diameter and substitute it to the formula above.

■ OUTLINE DIMENSIONS (Transmitter/Smart type)

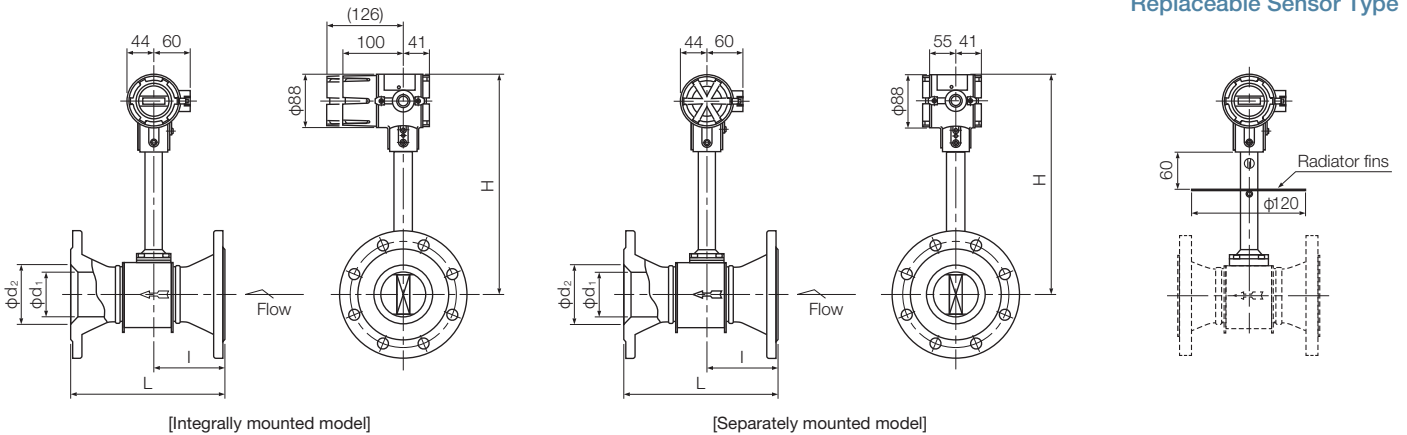
• Fixed sensor (Model: VXA)



Body nominal diameter mm (inch)	Connection nominal diameter mm (inch)	Flange rating	L	I	ϕd_1 Meter I.D (Bluff body)	ϕd_2 Connection I.D	H	Approx. Weight (kg)		
								Integrally mounted model		Separately mounted model
								No Display	w/Display	
40 (1-1/2")	50 (2")	JIS 10K	173	86.5	38.4 (37.6)	49.5	261	8.5	9	8.5
		ASME/JPI 150	204	102				9.5	9.5	9
50 (2")	80 (3")	JIS 10K	219	109.5	49.5 (48.5)	73.9	265	13	13.5	13
		ASME/JPI 150	237	118.5				16	16.5	16
80 (3")	100 (4")	JIS 10K	250	115	73.9 (72.4)	97.1	281	18	18	17.5
		ASME/JPI 150	274	127				24	24.5	24
100 (4")	150 (6")	JIS 10K	322	146.5	97.1 (95.2)	143.2	301	35.5	36	35.5
		ASME/JPI 150	340	155.5				41.5	41.5	41

• Replaceable Sensor Type (Model: VXB)

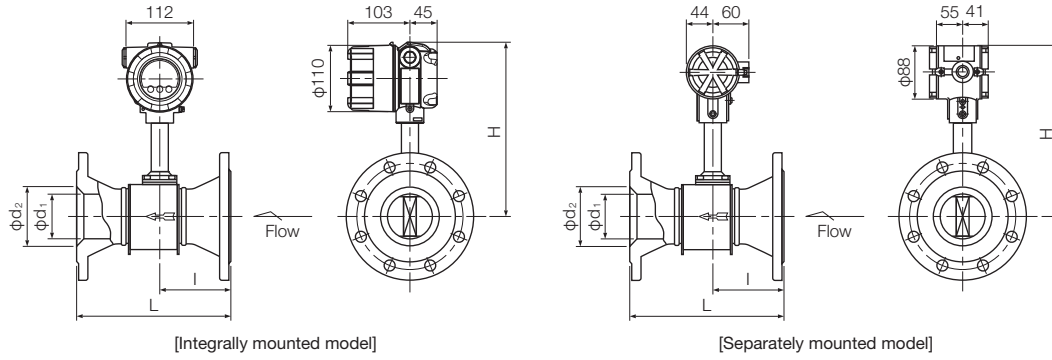
• High-temperature service Replaceable Sensor Type



Body nominal diameter mm (inch)	Connection nominal diameter mm (inch)	Flange rating	L	I	ϕd_1 Meter I.D (Bluff body)	ϕd_2 Connection I.D	H	Approx. Weight (kg)		
								Integrally mounted model		Separately mounted model
								No Display	w/Display	
40 (1-1/2")	50 (2")	JIS 10K	173	86.5	38.4 (37.6)	49.5	342	9	9.5	9
		ASME/JPI 150	204	102				10	10	9.5
50 (2")	80 (3")	JIS 10K	219	109.5	49.5 (48.5)	73.9	346	13.5	14	13.5
		ASME/JPI 150	237	118.5				16.5	17	16.5
80 (3")	100 (4")	JIS 10K	250	115	73.9 (72.4)	97.1	362	18.5	18.5	18
		ASME/JPI 150	274	127				25	25	24.5
100 (4")	150 (6")	JIS 10K	322	146.5	97.1 (95.2)	143.2	382	36.5	36.5	36
		ASME/JPI 150	340	155.5				42	42	41.5

OUTLINE DIMENSIONS (Transmitter/Battery type)

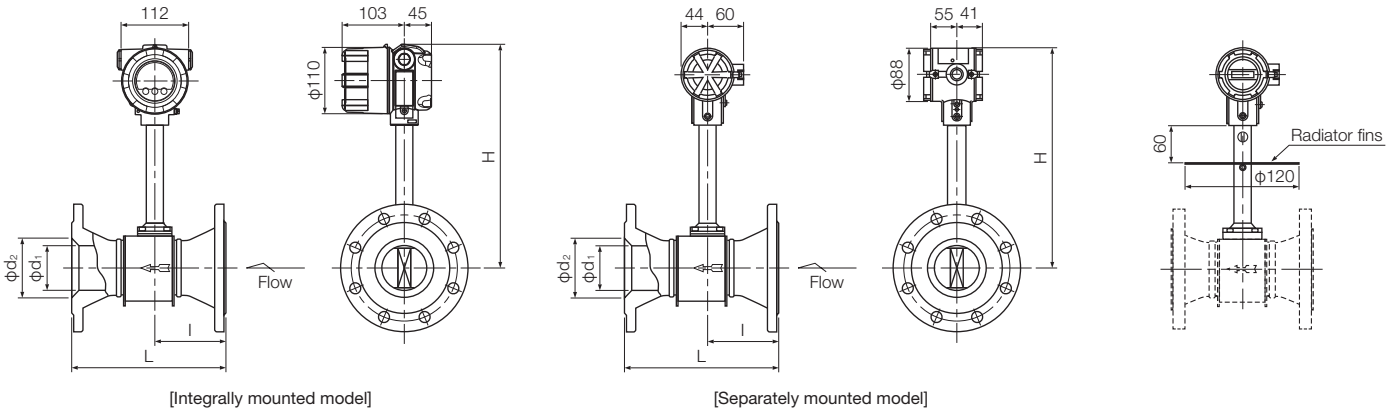
Fixed sensor (Model: VXA)



Body nominal diameter mm (inch)	Connection nominal diameter mm (inch)	Flange rating	L	I	φd ₁	φd ₂	H		Approx. Weight (kg)	
					Meter I.D (Bluff body)	Connection I.D	Integrally mounted model	Separately mounted model	Integrally mounted model	Separately mounted model
40 (1-1/2")	50 (2")	JIS 10K	173	86.5	38.4 (37.6)	49.5	284	261	9	8.5
		ASME/JPI 150	204	102	10				9	
50 (2")	80 (3")	JIS 10K	219	109.5	49.5 (48.5)	73.9	288	265	13.5	13
		ASME/JPI 150	237	118.5	16.5				16	
80 (3")	100 (4")	JIS 10K	250	115	73.9 (72.4)	97.1	304	281	18.5	17.5
		ASME/JPI 150	274	127	25				24	
100 (4")	150 (6")	JIS 10K	322	146.5	97.1 (95.2)	143.2	324	301	36.5	35.5
		ASME/JPI 150	340	155.5	42				41	

Replaceable Sensor Type (Model: VXB)

High-temperature service Replaceable Sensor Type



Body nominal diameter mm (inch)	Connection nominal diameter mm (inch)	Flange rating	L	I	φd ₁	φd ₂	H		Approx. Weight (kg)	
					Meter I.D (Bluff body)	Connection I.D	Integrally mounted model	Separately mounted model	Integrally mounted model	Separately mounted model
40 (1-1/2")	50 (2")	JIS 10K	173	86.5	38.4 (37.6)	49.5	365	342	10	9
		ASME/JPI 150	204	102	10.5				9.5	
50 (2")	80 (3")	JIS 10K	219	109.5	49.5 (48.5)	73.9	369	346	14.5	13.5
		ASME/JPI 150	237	118.5	17.5				16.5	
80 (3")	100 (4")	JIS 10K	250	115	73.9 (72.4)	97.1	385	362	19	18
		ASME/JPI 150	274	127	25.5				24.5	
100 (4")	150 (6")	JIS 10K	322	146.5	97.1 (95.2)	143.2	405	382	37	36
		ASME/JPI 150	340	155.5	42.5				41.5	

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