



Puls output oriented Vortex Flowmeter
Eggs DELTA Pulse
 Non explosionproof/explosionproof models

GENERAL SPECIFICATION
 GS.No.GBD623E-3

■ GENERAL

Explosionproof Eggs DELTA is a compact, lightweight, and most inexpensive PPS plastic resin molded vortex flow monitor. Mounted to a variety of devices, for example, it is deal for end-of-line fluid flow metering and monitoring, or energy consumption control and monitoring.

■ FEATURES

1. Meets a broad range of liquids and gases.
2. Virtually insensitive to both dust and mist.
3. Measures wet gas, too.
4. Maintenance free thanks to the absence of moving parts.
5. Metallic body type (liquid-oriented) withstands up to 150°C.
6. Combined with a barrier, the explosionproof model is intrinsically safe.

■ GENERAL SPECIFICATIONS



Standard (plastic body)



Metallic body



Explosionproof (plastic body)



Barrier

Item		Description					
Type		Standard and explosionproof				Metallic meter body	
Acceptable fluids (※1)		Liquid (coolant water, pure water) and gas (air and nitrogen)				Liquid (coolant water, pure water)	
Nominal size		4mm	8mm	15mm	25mm	8mm	15mm
Flow range (L/min)	Liquid	0.4 to 4	1.1 to 15	2.8 to 45	8.3 to 133	2 to 15	6.5 to 45
	Gas	7.2 to 17	18 to 90	55 to 283	167 to 850	—	—
Process connection		R male (resin), Rc female (metal), NPT male (resin)				Rc female (metal)	
Fluid temp. range (※2)		Standard: -20 to +80°C, Explosionproof: -20 to +60°C				-20 to +80°C or -20 to +150°C	
Ambient temp. range		-20 to +60°C					
Max. operating pressure		0.98MPa					
Accuracy		±3% of full scale or better					
Repeatability		±0.5% of full scale or better					
Materials	Meter body	PPS resin				SUS304	
	Transmitter housing	PPS resin					
	O-rings	Viton					
	Screw connections	R male: PPS resin, Rc female: SCS14A, NPT male: PPS resin				SUS304	
Pressure losses (kPa)	Water	0.13 to 31	0.12 to 34.3				
	Air (atm. press.)	0.13 to 0.7	0.06 to 1.52				
Output		Flow pulse: Open collector (Capacity: 30VDC, 20mA), Pulse width: Duty ratio 1:1 approx.					
Power supply		12 to 24VDC					
Current drain		Max. 10mA					
Cable		See page 3. (For explosionproof model, specify required length no more than 50 meters.)					
Orientation		Horizontal or vertical					
Straight pipe length req'd		See page 4.					
Dusttight/waterproof rating		IP65					
Installation location		Free from rain and water with minimal temperature variation, not exposed to the sun.					
Enclosure		Non-explosionproof or explosionproof				Non-explosionproof	

※1 : For fluids not shown, consult the factory.

※2 : Free from fluid freezing

■ EXPLOSIONPROOF SPECIFICATIONS (applicable to explosionproof models only)

		Flowmeter	Barrier
Explosionproof enclosure	TIIS	Exia II BT4	[Exia] II B
	ATEX	EEExia II BT4	[EEExia] II B

※ : The barrier is to be installed in a nonhazardous location.

●Barrier specifications

Item	Description
Operating temp. range	-20 to +50°C
Major part material	Housing: Polycarbonate
Dusttight/waterproof rating	IP30

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■ APPLICABLE EU DIRECTIVES

Applicable EU Directive	E M C : 89/336/EEC, 92/31/EEC, 93/68/EEC ATEX : 94/9/EC
Applicable EN standards, etc.	E M C : EN55011 : 1998/A1 : 1999, Group 1, Class A EN61000-6-2 : 1999 ATEX : EN50014 : 1997+A1-A2 EN50020 : 2002 EN50284 : 1999

■ UNFACTORED PULSE UNITS (nominal values)

●Standard and explosionproof models

Nominal size (mm)	Pulse units (mL/P)		Frequency at max. flowrate (Hz)	
	Liquid	Gas	Liquid	Gas
4	0.0890	0.890	750	320
8	0.4408	4.408	570	350
15	2.363	23.63	320	200
25	12.66	126.6	180	120

●Metallic meter body type (liquid only)

Nominal size (mm)	Pulse units (mL/P)	Frequency at max. flowrate (Hz)
8	0.4388	570
15	2.352	320

※ : Pulse units in the tables are nominal values. Pulse unit of the product of your order may possibly differ from nominal values.

■ PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \Delta P_o \times \frac{\rho}{\rho_o} \times \left(\frac{Q}{Q_o} \right)^2$$

where

ΔP : Pressure loss [kPa]

ΔP_o : Pressure loss of a liquid or gas at the maximum flowrate
(※2 value) [kPa]

ρ : Density of the fluid during operation [kg/m³]

ρ_o : Density of a liquid (1000kg/m³) or gas (1.2kg/m³) [kg/m³]

Q : Flowrate during operation [L/min]

Q_o : Max flowrate of a liquid or gas (※1 value) [L/min]

<Example>

With 15mm size gas service Eggs DELTA Pulse, find the pressure loss at 0.5MPa, 50°C, and of air at 100L/min.

$$\Delta P = 1.52 \times \frac{6.382}{1.2} \times \left(\frac{100}{283} \right)^2$$

↓ Density at 0.5MPa and 50°C

$$= 1.01 \text{ [kPa]}$$

●Pressure loss at max. flowrate (kPa)

Nominal size (mm)	Liquid	Gas
4	31	0.7
8	34.3	1.52
15		
25		

■ PRODUCT CODE EXPLANATION

●Standard and explosionproof models

Item	Code No.										Description	
	①	②	③	④	⑤	—	⑥	⑦	⑧	⑨		⑩
Model	F	L	P									Eggs DELTA Pulse
Nominal size	0	4	—									4mm
	0	8	—									8mm
	1	5	—									15mm
	2	5	—									25mm
Acceptable fluids	L	1										Liquid service
	G	2										Gas service
Process connection	P											R (male thread) Process connection material : PPS
	S											Rc (female thread) Process connection material : SCS14A
	N											NPT (male thread) Process connection material : PPS
Version										A		
Construction	—											Non-explosionproof (※1)
	1											TIIS Intrinsically safe enclosure : Sensor + barrier
	2											ATEX Intrinsically safe enclosure : Sensor + barrier

※1 : In non-explosionproof specifications, the 10th box is left blank.

●Metallic meter body models

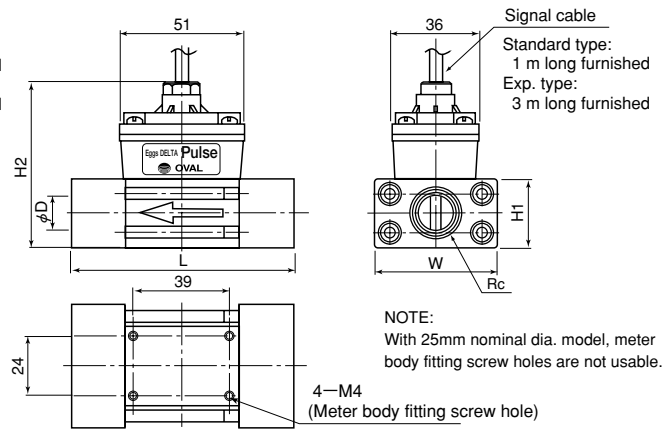
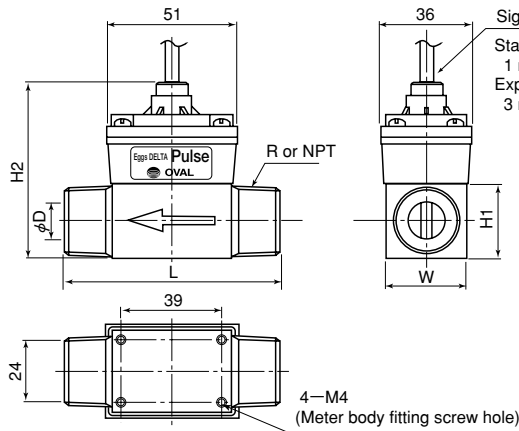
Item	Code No.									Description	
	①	②	③	④	⑤	—	⑥	⑦	⑧		⑨
Model	F	L	P								Eggs DELTA Pulse
Nominal size	0	8	—								8mm
	1	5	—								15mm
Acceptable fluids	L	1									Liquid service
Process connection	V										Rc (female thread) Fluid temp. range : -10 to +80°C
	M										Rc (female thread) Fluid temp. range : -10 to +150°C
Version										A	

■ OUTLINE DIMENSIONS (Unit in mm)

● Standard and explosionproof models

★R (male thread) or NPT (male thread)

★Rc (female thread)



NOTE:
With 25mm nominal dia. model, meter body fitting screw holes are not usable.

★R (male thread) or NPT (male thread)

Nom. size	φ D (Meter I.D.)	Process connections		L	W	H1	H2	Approx. weight (cable incl.) (g)	
		R (male thread)	NPT(male thread)					Standard	Exp. model
4	8.5	R3/8	3/8NPT	80	32	29	68	270	350
8	13	R1/2	1/2NPT	80	32	29	68	270	350
15	14	R3/4	3/4NPT	85	32	29	68	280	360
25	24.5	R1 · 1/4	1 · 1/4NPT	120	46	46	85	410	490

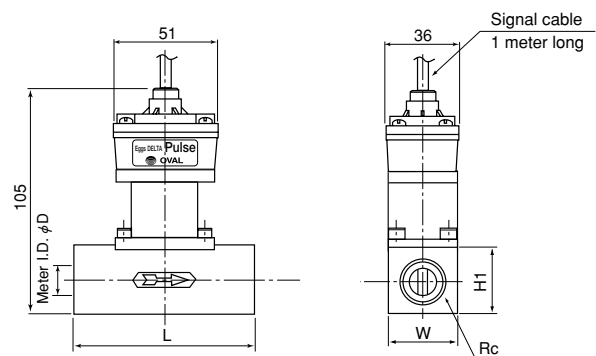
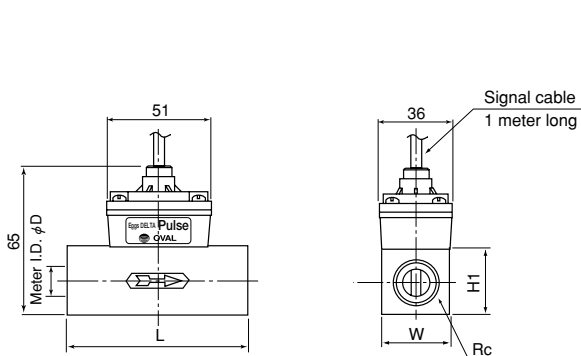
★Rc (female thread)

Nom. size	φ D (Meter I.D.)	Process connections		L	W	H1	H2	Approx. weight (cable incl.) (g)	
		Rc (female thread)						Standard	Exp. model
4	8.5	Rc1/4		91	50	29	68	650	730
8	8.5	Rc1/4		91	50	29	68	650	730
15	14	Rc1/2		91	50	29	68	650	730
25	24.5	Rc1		126	46	46	85	950	1030

● Metallic metal body models

★Max. operating temp. 80°C type

★Max. operating temp. 150°C type



★Max. operating temp. 80°C type

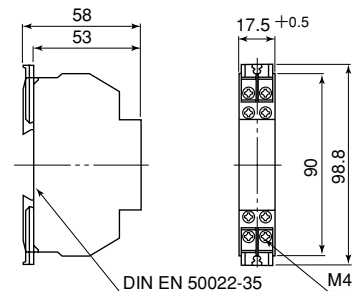
Nom. size	φ D (Meter I.D.)	Process connections		L	W	H1	Approx. weight (cable incl.) (g)
		Rc(female thread)					
8	8	Rc3/8		80	32	32	830
15	14	Rc1/2		85	32	32	800

★Max. operating temp. 150°C type

Nom. size	φ D (Meter I.D.)	Process connections		L	W	H1	Approx. weight (cable incl.) (g)
		Rc(female thread)					
8	8	Rc3/8		80	32	32	870
15	14	Rc1/2		85	32	32	840

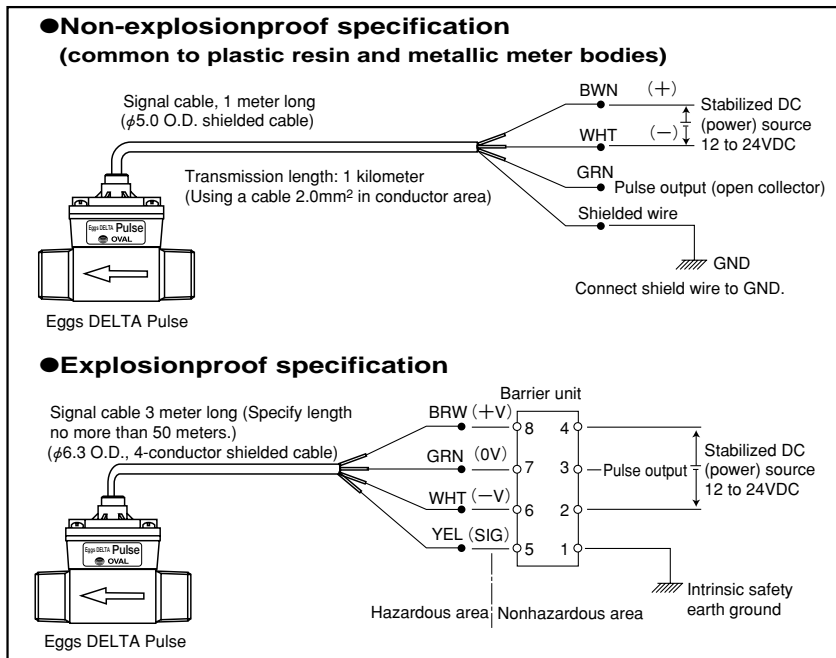
★Barrier unit

(Coupled when explosionproof rating is chosen.)



Approx. weight : 60 g

■ WIRING DIAGRAMS



CAUTION: Be sure to ground No. 1 terminal of the barrier unit to Grade A earth ground.

■ INSTALLATION LOCATION

Select an installation location that meets the following requirements

- ① Free from rainwater, moisture or oils (indoor use).
- ② Free from direct exposure to the sun.
- ③ Minimal temperature variation (within a range 0 to 60°C recommended).
- ④ Isolated from vibration and impact sources (tubing oscillation 0.2G max. recommend).
- ⑤ Easily accessible for inspections and maintenance.
- ⑥ Minimal entrapment of air bubbles. Completely filled tubing can be maintained (liquid service).
- ⑦ Fluid pressure can always be held below maximum allowable pressure of 0.98MPa.
- ⑧ Fluid freezing does not take place.

CAUTION: Non-explosionproof models are not serviceable in hazardous locations.

■ TUBING GUIDELINES

With PPS male thread, avoid forcibly tightening or excessive impact loads. Torque to the specification given below.

Nom. size (mm)	Permissible tightening torque (N·cm)
4	1960
8	1960
15	1960
25	9800

① Secure a straight tube length 7D min. upstream of, and 3D min. downstream of, the flow monitor.

② If a throttle valve or expansion tube exists, where the flow path cross section abruptly changes, upstream of the flow monitor, locate it at least 50D away from the flow monitor.

③ Provide a throttle valve downstream of the flow monitor for regulating the flow.

④ For process connection, use tubes having an inside diameter larger than that of the flow monitor.

D: Flow monitor I.D.

■ REQUIRED STRAIGHT TUBE LENGTHS

●Standard and explosionproof models

Nominal size (mm)	I.D. (D) (mm)	Upstream tube (L1) (mm)	Downstream tube (L2) (mm)
4	8.5	59 min.	25 min.
8 (PPS)	13	91 min.	39 min.
8 (SCS14A)	8.5	59 min.	25 min.
15	14	98 min.	42 min.
25	24.5	171 min.	73 min.

●Metallic meter body models

Nominal size (mm)	I.D. (D) (mm)	Upstream tube (L1) (mm)	Downstream tube (L2) (mm)
8	8	56 min.	24 min.
15	14	98 min.	42 min.

The specification as of Dec., 2010 is stated in this GS Sheet. Specifications and design are subject to change without notice.



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