



Pulse Output Dedicated Vortex Flowmeter  
**Eggs DELTA Pulse**  
 Non explosionproof/explosionproof models

GENERAL SPECIFICATION  
 GS.No.GBD623E-8

## ■ 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 ideal for end-of-line fluid flow metering and monitoring, or energy consumption control and monitoring.

## ■ FEATURES

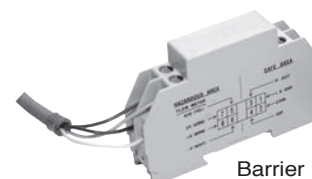
1. Meets a broad range of liquids and gases.
2. Virtually insensitive to both dust and mist.
3. Measures wet gas, too.
4. Maintenance free thanks to the absence of moving parts.
5. Combined with a barrier, the explosionproof model is intrinsically safe.



Standard



Explosionproof



Barrier

## ■ GENERAL SPECIFICATIONS

Item		Description			
Type		Standard and explosionproof			
Acceptable fluids (※1)		Liquid (coolant water, pure water) and gas (air and nitrogen)			
Nominal size		4mm	8mm	15mm	25mm
Flow range (L/min)	Liquid	0.4 to 4	1.1 to 15	2.8 to 45	8.3 to 133
	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)			
Fluid temp. range (※2)		Standard: -20 to +80°C, Explosionproof: -20 to +60°C			
Ambient temp. range		-20 to +60°C			
Max. operating pressure		0.98MPa			
Accuracy		Liquid: ±2% of full scale Gas: ±3% of full scale			
Repeatability		±0.5% of full scale or better			
Materials	Meter body	PPS resin			
	Transmitter housing	PPS resin			
	O-rings	Viton			
	Screw connections	R male: PPS resin, Rc female: SCS14A, NPT male: PPS resin			
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			
Required straight pipe length		See page 4.			
Dusttight/waterproof rating		IP65 (※3)			
Installation location		Free from rain and water with minimal temperature variation, not exposed to the sun.			
Enclosure		Non-explosionproof or explosionproof			

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

※2: Free from fluid freezing

※3: IP ratings vary according to structures.

## ■ EXPLOSIONPROOF SPECIFICATIONS (applicable to explosionproof models only)

		Flowmeter	Barrier
Explosionproof enclosure	TIIS	Exia II B T4	[Exia] II B
	ATEX	Exia II B T4 Ga/Gb	[Exia Ga] 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.	EMC : EN55011 : 1998/A1 : 1999, Group 1, Class A EN61000-6-2: 1999 ATEX : EN60079-0: 2009      *1: EN60079-0: 2012 EN60079-11: 2007      EN60079-11: 2012 EN60079-26: 2007      EN60079-26: 2012

\*1: Applicable standards vary according to structures

## ■ OUTPUT UNITS OF MEASUREMENT (default setting)

### (1) Liquid

Model	Nominal size (mm)	Nom. output pulse unit (mL/P) *	Max. flowrate (L/min)	Max. pulse output frequency (Hz)
FLP04-L1□B□	4	0.08900	4	750
FLP08-L1□B□	8	0.5406	15	460
FLP15-L1□B□	15	2.363	45	320
FLP25-L1□B□	25	12.66	133	180

### (2) Gas

Model	Nominal size (mm)	Nom. output pulse unit (mL/P) *	Max. flowrate (L/min)	Max. pulse output frequency (Hz)
FLP04-G2□B□	4	0.8900	17	320
FLP08-G2□B□	8	5.406	90	280
FLP15-G2□B□	15	23.63	283	200
FLP25-G2□B□	25	126.6	850	120

\*: 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

$$\Delta P = \Delta P_0 \times \frac{\rho}{\rho_0} \times \left( \frac{Q}{Q_0} \right)^2$$

where

- ΔP : Pressure loss [kPa]
- ΔP<sub>0</sub> : Pressure loss of a liquid or gas at the maximum flowrate (\*2 value) [kPa]
- ρ : Density of the fluid during operation [kg/m<sup>3</sup>]
- ρ<sub>0</sub> : Density of a liquid (1000kg/m<sup>3</sup>) or gas (1.2kg/m<sup>3</sup>) [kg/m<sup>3</sup>]
- Q : Flowrate during operation [L/min]
- Q<sub>0</sub> : 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

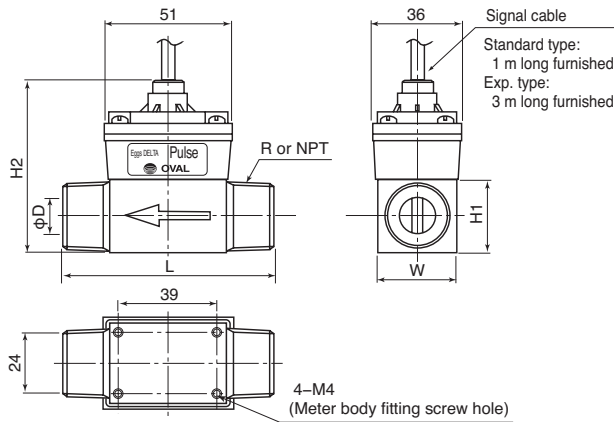
### ● Standard and explosionproof models

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										B		Always "B"
Construction											0	Non-explosionproof
											1	TIIS      Intrinsically safe enclosure: Sensor + barrier
											2	ATEX      Intrinsically safe enclosure: Sensor + barrier

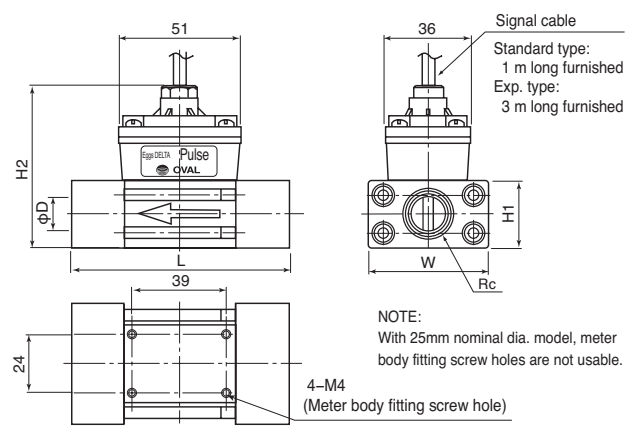
**OUTLINE DIMENSIONS (Unit in mm)**

● Standard and explosionproof models

★ R (male thread) or NPT (male thread)



★ Rc (female thread)



★ R (male thread) or NPT (male thread)

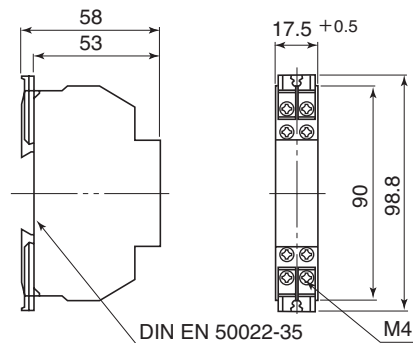
Nom. size	φD (Meter I.D.)	Process connections		L	W	H1	H2	Approx. weight (cable incl.) (g)	
		R (male thread)	NPT(male thread)					Standard	Exp. model
4	8.5	R3/8	3/8NPT	80	32	29	68	270	350
8	13	R1/2	1/2NPT	80	32	29	68	270	350
15	14	R3/4	3/4NPT	85	32	29	68	280	360
25	24.5	R1·1/4	1·1/4NPT	120	46	46	85	410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

★ Rc (female thread)

Nom. size	φD (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	10.7	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

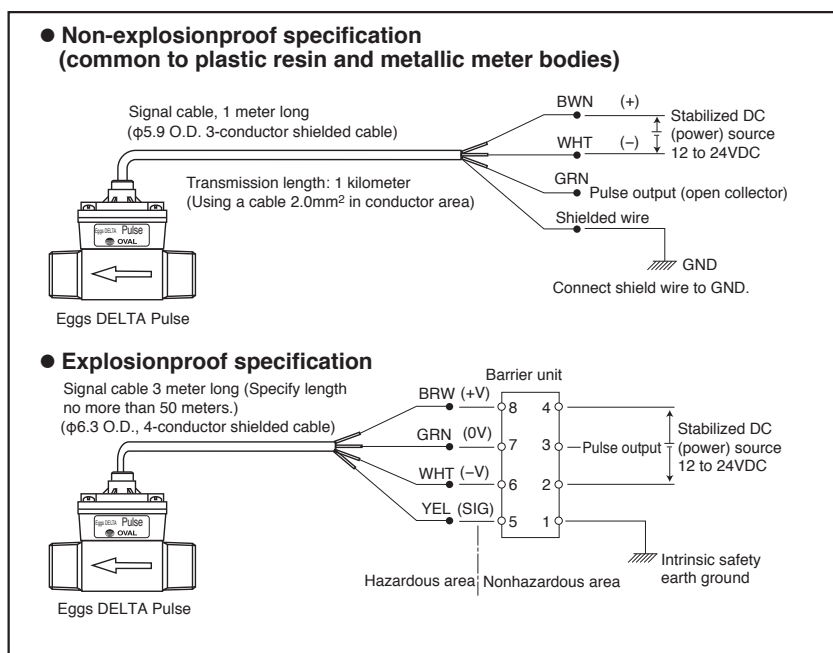
★ Barrier unit

(Coupled when explosionproof rating is chosen.)



Approx. weight : 60g

### WIRING DIAGRAMS



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

### TUBING GUIDELINES

Flow →

Horizontal run

Vertical run

Flow ↑

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

Nom. size (mm)	Allowable tightening torque (N·m)
4	12
8	20
15	20
25	50

①Secure a straight tube length 7D min. upstream of, and 3D min. downstream of, the flow monitor.  
②If 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.  
③Provide a throttle valve downstream of the flow monitor to regulate the flow.  
④For process connection, use tubes having an inside diameter larger than that of the flow monitor.

Eggs DELTA Pulse

Flow →

L1  
D  
L2

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 or more	25 or more
8 (Male thread)	13	91 or more	39 or more
8 (Female thread)	10.7	59 or more	25 or more
15	14	98 or more	42 or more
25	24.5	171 or more	73 or more

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

Sales Representative:

### 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.**