Liquid Gas

OVAL

Puls output oriented Vortex Flowmeter

Eggs DELTA Pulse

Non explosionproof/explosionproof models

asit INSTRUMENTS Srl

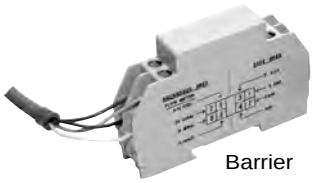
■ GENERAL

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.

Standard (plastic body)

■ 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.



Barrier

Explosionproof (plastic body)

■ 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		±3% of full scale or better			
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			
Straight pipe length req,d		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.	E M C : 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

■ 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

※ : 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

$$\Delta P = \Delta Po \times \frac{\rho}{\rho o} \times \left(\frac{Q}{Qo}\right)^2$$

where

ΔP : Pressure loss [kPa]

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

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

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

Q : Flowrate during operation [L/min]

Qo : 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.

Density at 0.5MPa and 50°C

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

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

● 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

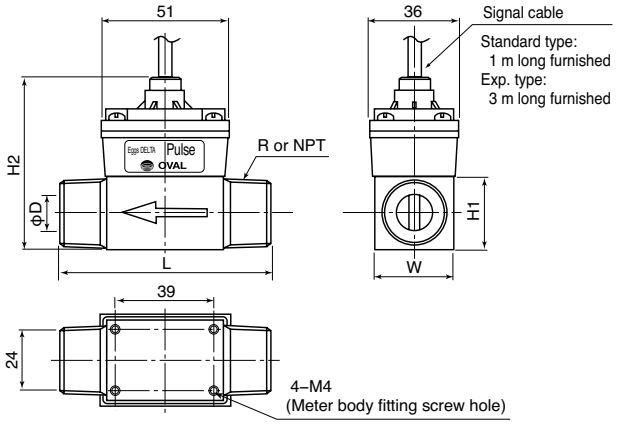
Item	Code No. ① ② ③	④ ⑤	–	⑥ ⑦	⑧	⑨	⑩	Description
Model	F L P							Eggs DELTA Pulse
Nominal size		0 4	–					4mm
		0 8	–					8mm
		1 5	–					15mm
		2 5	–					25mm
Acceptable fluids				L 1				Liquid service
				G 2				Gas service
Process connection					P			R (male thread) Process connection material : PPS
					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.

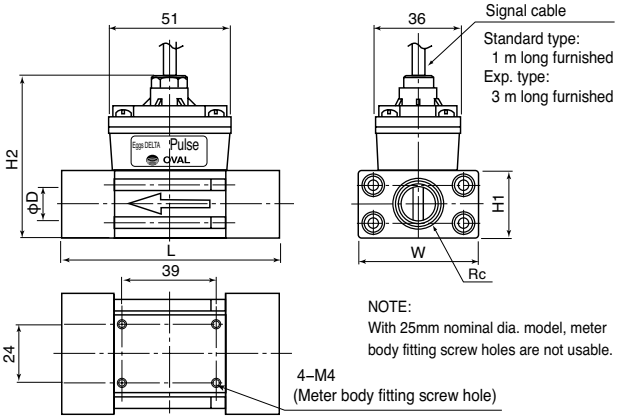
■ OUTLINE DIMENSIONS (Unit in mm)

● **Standard and explosionproof models**

★R (male thread) or NPT (male thread)



★Rc (female thread)



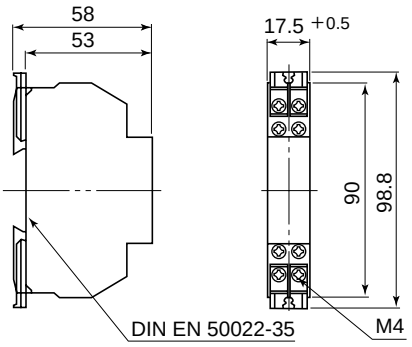
★R (male thread) or NPT (male thread)

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	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

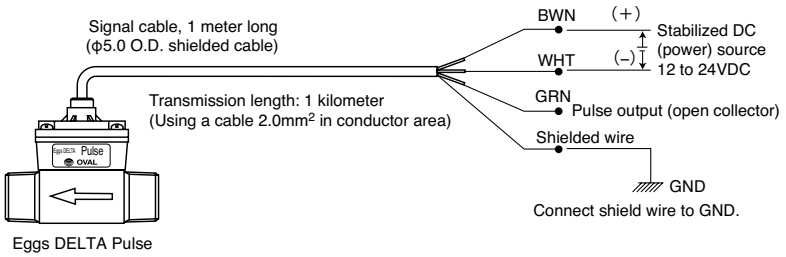
★Barrier unit
(Coupled when explosionproof rating is chosen.)



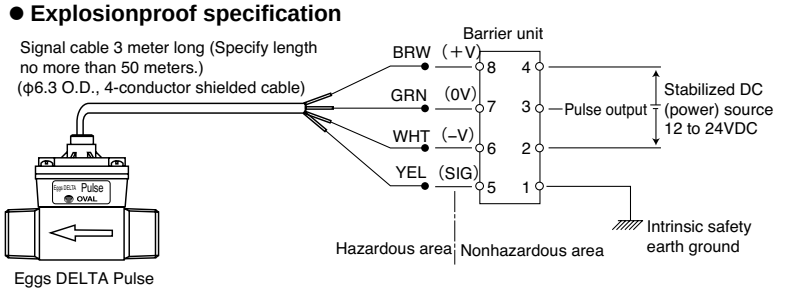
Approx. weight：60g

■ WIRING DIAGRAMS

● **Non-explosionproof specification (common to plastic resin and metallic meter bodies)**



● **Explosionproof specification**



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

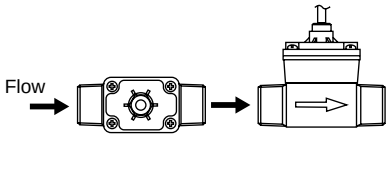
■ INSTALLATION LOCATION

Select an installation location that meets the following requirements

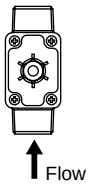
①Free from rainwater, moisture or oils (indoor use).
②Free from direct exposure to the sun.
③Minimal temperature variation (within a range 0 to 60℃ recommended).
④Isolated from vibration and impact sources (tubing oscillation 0.2G max. recommend).
⑤Easily accessible for inspections and maintenance.
⑥Minimal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

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

■ TUBING GUIDELINES



Horizontal run

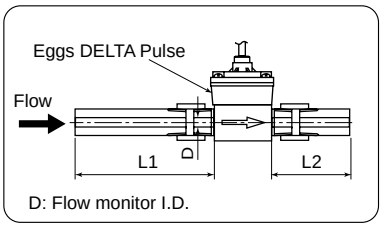


Vertical run

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

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



■ 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.

The specification as of December, 2014 is stated in this GS Sheet. Specifications and design are subject to change without notice.

Sales Representative:

GS.No.GBD623E

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