



PD meter dedicated for gas measurement

GAS OVAL

MODELS : GAL50, 52, 53, 55, 56

GENERAL SPECIFICATION

GS.No.GBB318E-9

■ GENERAL

As a precision flowmeter for gas measurement, this meter has the same construction of the OVAL general-purpose PD flowmeter for liquids, field proven for accuracy and performance.

Specifically designed and built for gas service, it has a precision-machined measuring chamber.

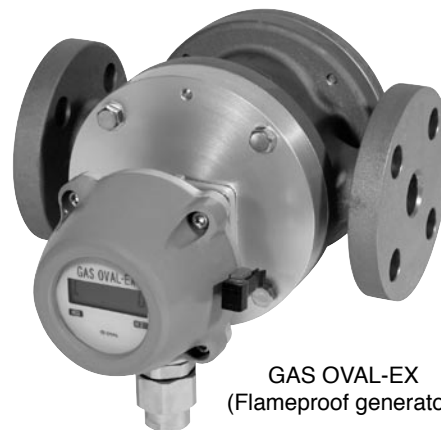
Ideally suited for metering gases in general, including air, CO₂, and nitrogen.

■ FEATURES

1. A high degree of accuracy, thanks to its PD design with oval rotors.
2. With ball bearings that provide support for the rotors, it can measure with low pressure differential.
3. Equipped with a multifunction electronic register (with LCD display), it comes in battery powered (dedicated to local indication), externally powered (pulse generator built in), explosionproof and non-explosionproof type, etc.
4. By selecting the electronic register with output capability, you can build a telemetering system that best meets your needs.
5. To ensure safety in telemetering, flameproof generators are available.
6. When combined with OVAL flow computer, continuous density meter or other associated equipment, mass flow measurement of gases or equivalent flowrate measurement under standard conditions can also be achieved.



GAS OVAL-5G



GAS OVAL-EX
(Flameproof generator)

■ METER BODY SPECIFICATIONS

Item		Description
Nominal Size		15, 20, 25, 40mm
Metered fluids		Air, Nitrogen, CO ₂ , City Gas, LPG, etc. *
Linearity		±1% of RD or ±1% of FS
Max. operating pressure		0.97MPa
Hydrostatic test pressure		1.47MPa
Operating temp. range		-10 to +60°C (Explosionproof model: -10 to +50°C) Display operating range: -10 to +60°C
Process connection		Flanged connections (Flange Rating JIS 10K FF)
Material	Body	Aluminum (Anodized)
	Rotors	Special resin
Finish		Meter body: 2.5G 8/2

*: Not serviceable for gases that come under high pressure gas safety law, corrosive gas, and oxygen.

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сайт: www.oval.nt-rt.ru || почта: oxv@nt-rt.ru

■ GENERAL SPECIFICATIONS

Item	Description	
	GAS OVAL-EX	GAS OVAL-5G
Display	① Accumulated total flow (8-digit) ② Instantaneous flow rate, L/h (mode: b1) ③ Instantaneous flow rate, L/min (mode: b2) ④ Resettable total flow (zero start/zero resettable, mode: C) (7-digit)	
Function	① Low battery alarm (Low battery indicator “  ” flickers below 3.0V) ② 7-segment LCD with 10mm-high characters	① Low battery alarm (Low battery indicator “  ” flickers below 3.0V) ② 7-segment LCD with 14mm-high characters (background color: orange) ③ Flow indicator (10-segment) ④ Simulated output: set any accumulated total or instantaneous flow rate for simulated outputs (unfactored, factored, and analog) ⑤ Protection against erroneous wire connection
Display orientation	Rotatable in 90° steps	Adjustable in 15° steps (upward 90°, horizontal, downward 75°) (Rotation of front display unavailable)
Register accuracy	Total flow: ±1 count, Instantaneous flow rate: within ±1% of full scale	
Flow detection	Magnetic sensor detects alternating magnetic fields. Response frequency 200Hz max.	
Pulse output	Output type: Open collector pulse Capacity: Max. 20mA/30V Type: Unfactored, factored Factored pulse width: 1ms, 50ms, 100ms, 250ms Unfactored pulse width: 2ms (fixed)	Output type: Open drain (equivalent of open collector pulse) Capacity: Max. 20mA/30V Type: Unfactored, factored Factored pulse width: 1ms, 50ms, 100ms, 250ms (※2) Unfactored pulse width: 2ms (fixed)
Analog output	—	4 to 20mADC Load resistance: see Section 5 “Acceptable Load Resistance Range”
Alarm output	—	Output type: Open drain (equivalent of open collector pulse) Capacity: Max. 20mA/30V Type: Up to 2 points (“High alarm instant flow rate” or “Low alarm instant flow rate” can be set with any value for each output point)
Cable	Pressure-resistant packing or conduit connection for the cable	1 meter of vinyl-sheathed, 4-conductor cable furnished as standard (individual elements 0.25mm ² , ϕ6.3 O.D.) (Not furnished with models without pulse generator)
Transmission distance	Max.1km (when CVVS: 1.25 to 2.0mm ² cable is used)	Max.1km (when CVVS: 1.25 to 2.0mm ² cable is used) If using both analog output and pulse/alarm output, the transmission distance is 100m max. (when CVVS: 1.25 to 2.0mm ² cable is used)
Power source	Dedicated battery pack or external power source	
	Battery pack: Lithium battery: 3.6VDC 5400mAh Battery life: 8 years (varies with operating conditions) Storage life: 10 years	
	External power source: 12 to 50VDC±10% Current capacity: Pulse output; 10mA or more (※3)	External power source: 12 to 50VDC±10% Current capacity: Pulse output; 10mA or more (※3) Analog output; 30mA or more
Material	AC2A-T6	
Finish	Housing: 2.5G8/2 Cover: 2.58G5/6	
Explosionproof configuration	TIIS	CE: Non-explosionproof
	NEPSI	
	ATEX	
Enclosure protection class	IP66	
Operating temperature	-10 to +60°C (no condensing)	

※1: Flameproof rating while powered by an external source; intrinsic safety rating when power is switched from an external source to the internal battery power.

※2: Adjustable with button operation within the range of 1 to 999ms in 1ms increments. Shown above are default settings.

※3: Display functions and pulse output functions can be used just with the dedicated battery pack without an external power source.

■ FACTORED PULSE WIDTH SELECTOR TABLES

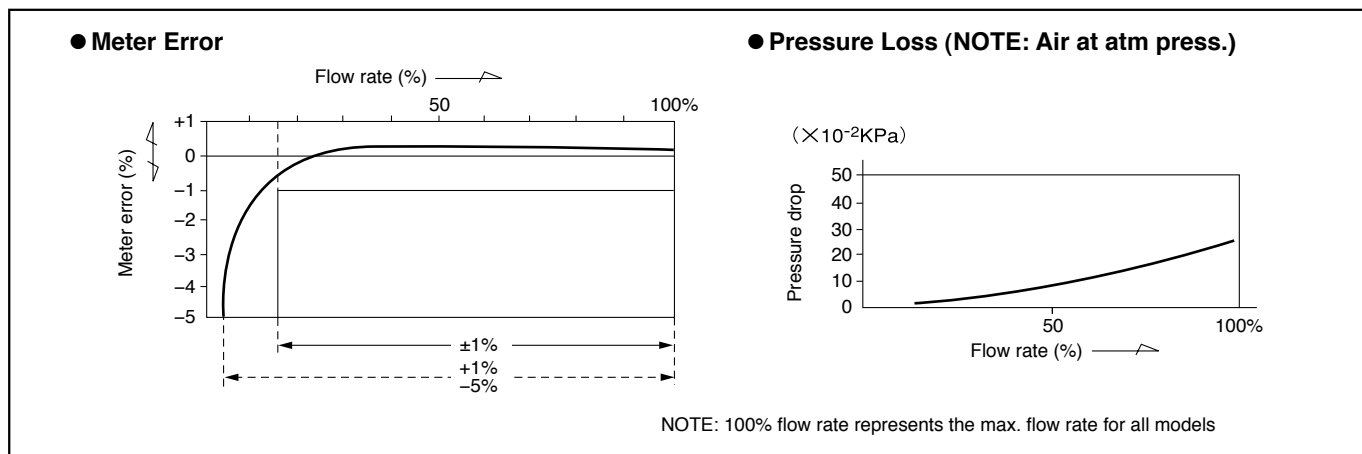
 : Option

Model	Totalizer Units L (m ³)	Factored Pulse		Factored Pulse Width				Unfactored Output Pulse		Max. Flowrate m ³ /h
		Unit L (mL)	Max. frequency Hz	1ms	50ms	100ms	250ms	Nom. Meter Factor mL/P	Max. frequency Hz	
50	0.01	(10)	33.3	○	—	—	—	7.908	42.15	1.2
	0.1	(100)	3.33	○	○	○	—			
	1	1	0.333	○	○	○	○			
52	0.1	(100)	8.3	○	○	—	—	19.328	43.12	3
	1	1	0.83	○	○	○	○			
	(0.01)	10	0.083	○	○	○	○			
53	0.1	(100)	15.3	○	—	—	—	35.03	43.61	5.5
	1	1	1.53	○	○	○	○			
	(0.01)	10	0.153	○	○	○	○			
55	0.1	(100)	27.8	○	—	—	—	69.21	40.14	10
	1	1	2.78	○	○	○	—			
	(0.01)	10	0.278	○	○	○	○			
56	1	1	5.6	○	○	—	—	149.31	37.21	20
	(0.01)	10	0.56	○	○	○	○			
	(0.1)	100	0.056	○	○	○	○			

■ FLOW RANGES

Model	Accuracy		+1 -5 % of RD	±1% of RD	±1% of FS
	Nom. Size mm				
GAL50	15		75 to 1200 L/h	180 to 1200 L/h	75 to 1200 L/h
GAL52	20		190 to 3000 L/h	450 to 3000 L/h	190 to 3000 L/h
GAL53	20		320 to 5500 L/h	750 to 5500 L/h	320 to 5500 L/h
GAL55	25		650 to 10000 L/h	1.5 to 10 m³/h	650 to 10000 L/h
GAL56	40		1.3 to 20 m³/h	3 to 20 m³/h	1.3 to 20 m³/h

■ METER ERRORS AND PRESSURE LOSSES



■ PRODUCT CODE EXPLANATION

Item	Code No.													Description
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	
Model	G	A	L											GAS OVAL
Meter Size				5	0									Nominal size 15mm
				5	2									Nominal size 20mm
				5	3									Nominal size 20mm
				5	5									Nominal size 25mm
				5	6									Nominal size 40mm (*1)
Material				L										Meter body: Aluminum alloy Rotors: Special resin
Process connection						3	-							JIS 10K FF flanged
Register								E	X					GAS OVAL-EX (Explosionproof for outdoors)
								5	G					GAS OVAL-5G (Non-explosionproof for indoors)
Explosionproof configuration										0	-			Non-explosionproof
										1	-			TIIS /Battery powered: Exia IIB T4, External power: Exd IIB T4 / Exia IIB T4
										2	-			ATEX/Battery powered: II2G Exib IIB T4, External power: II2G Exd IIB T4
										7	-			NEPSI/External power: Exd IIB T4
Pulse Generator										0	0			No output capability (Local display only)
										3	0			Factored pulse (pulse width 1ms), +Unfactored pulse (*2)
										5	0			Factored pulse (pulse width 50ms), +Unfactored pulse (*2)
										6	0			Factored pulse (pulse width 100ms), +Unfactored pulse (*2)
										7	0			Factored pulse (pulse width 250ms), +Unfactored pulse (*2)
										3	1			Factored pulse (pulse width 1ms), +Unfactored pulse (*2) +Analog output or Analog output only (*3) (*4)
										5	1			Factored pulse (pulse width 50ms), +Unfactored pulse (*2) +Analog output
										6	1			Factored pulse (pulse width 100ms), +Unfactored pulse (*2) +Analog output
										7	1			Factored pulse (pulse width 250ms), +Unfactored pulse (*2) +Analog output
Version code													A	(Always "A")

*1: Ratings for Meter Size 56

When used for flammable gas in a European Union member nation, select Register: EX with ATEX explosionproof type regardless of whether explosionproof structure is required or not.

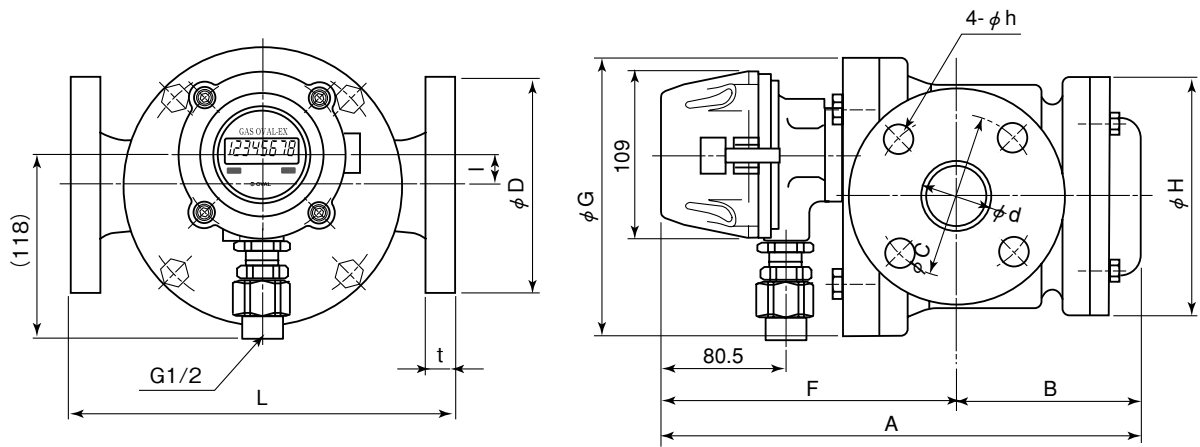
*2: Unfactored pulse width is fixed at 2ms.

*3: If using analog output only, "Factored pulse (1ms) + Unfactored pulse (2ms) + Analog output" will be the specification. Wire analog output lines (2 lines of the power wire) and leave the ends of pulse output (SIG.1 and SIG.2) cables open (not connected).

*4: Available only with the 5G register.

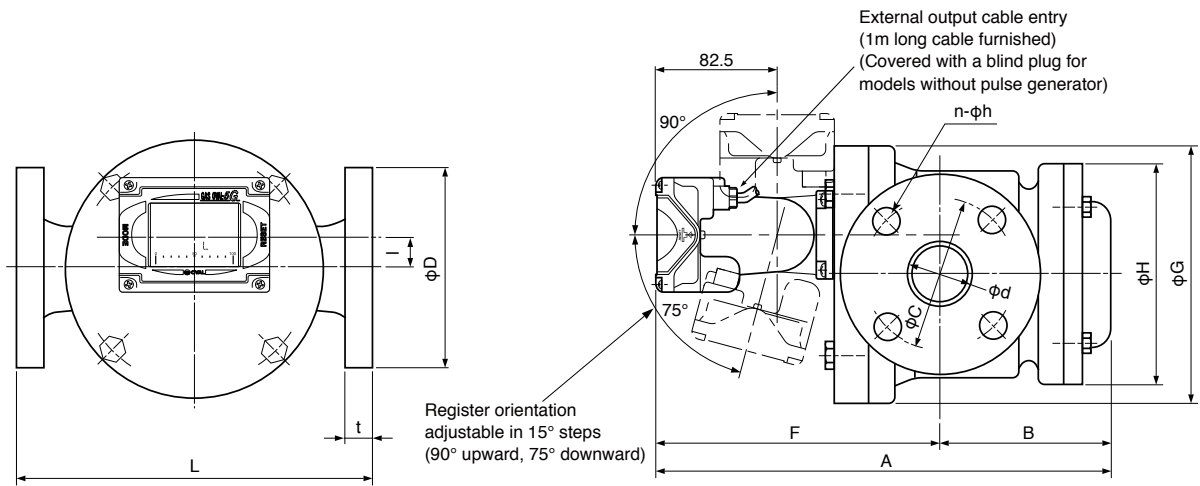
OUTLINE DIMENSIONS
(Unit in mm)

● GAS OVAL-EX



Meter size	L	d	D	t	C	h	A	B	F	G	H	I	Approx. Weight (kg)
50	150	15	95	16	70	15	214.5	57	157.5	100	100	6.0	3.3
52	200	20	100	18	75	15	225.5	63	162.5	120	120	10.0	4.2
53	200	20	100	18	75	15	250.5	75.5	175	120	120	10.0	4.6
55	230	25	125	18	90	19	269.5	90	179.5	155	155	14.5	7.4
56	250	40	140	20	105	19	304.5	117	187.5	180	155	20.5	10.2

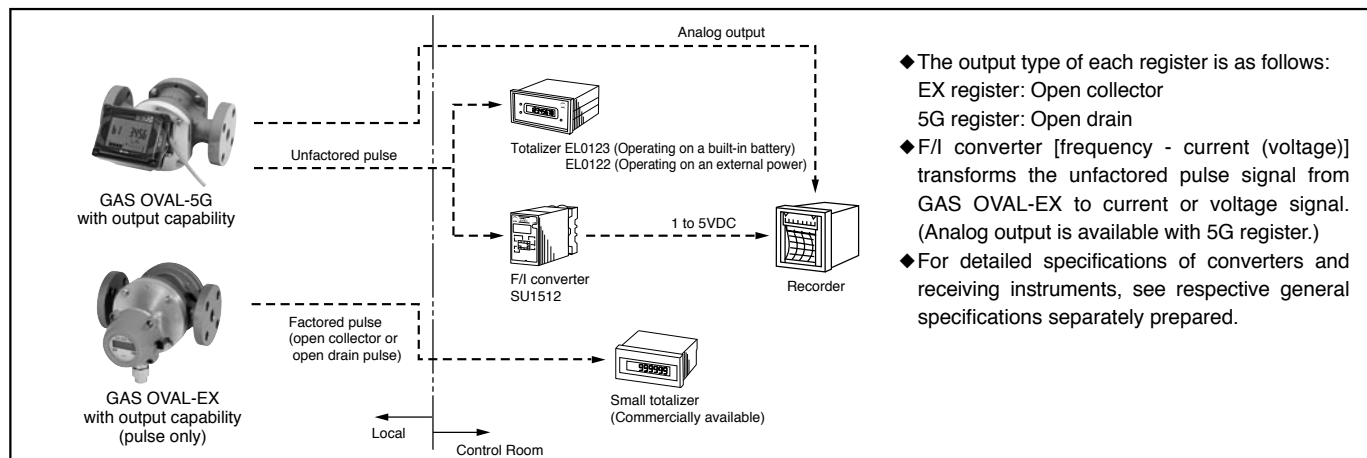
● GAS OVAL-5G



Meter size	L	d	D	t	C	h	A	B	F	G	H	I	Approx. Weight (kg)
50	150	15	95	16	70	15	219.5	57	162.5	100	100	6.0	2.2
52	200	20	100	18	75	15	230.5	63	167.5	120	120	10.0	3.1
53	200	20	100	18	75	15	255.5	75.5	180	120	120	10.0	3.5
55	230	25	125	18	90	19	274.5	90	186.5	155	155	14.5	6.3
56	250	40	140	20	105	19	309.5	117	192.5	180	155	20.5	9.1

REMOTE FLOW MEASUREMENT WITH GAS OVAL

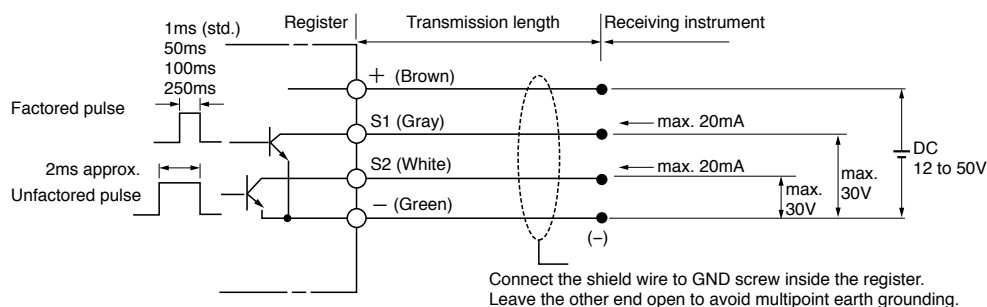
The GAS OVAL with external output capability allows the operator to control the flow from a remote location.



WIRING DIAGRAM

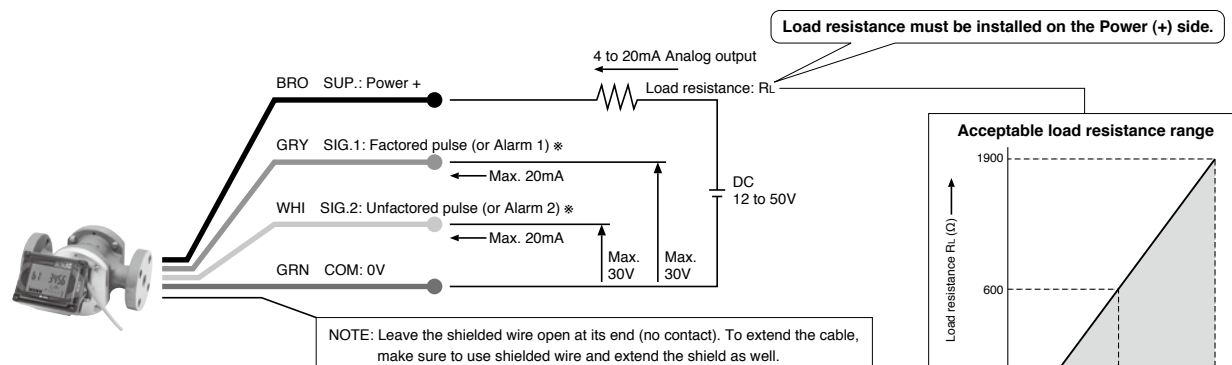
① Pulse output type...Product code: GAL □□ L3 – □ 0A for example

NOTE: Shown in brackets () are the colors of 5G counter lead wires.



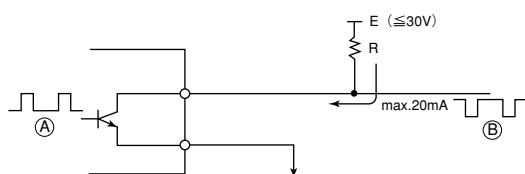
* The figure above represents open collector output, but the same specifications apply to the open drain type.

② Pulse output + analog output type...Product code: GAL □□ L3 – 5G0 – □ 1A for example



*: SIG.1 and SIG.2 can generate pulses without external power source supplied to SUP line.
 (Pulses will be generated by built-in battery. Battery life is 8 years approximately.)
 ·For analog output only specification, leave the ends of SIG.1 and SIG.2 cables open since they will not be used.
 ·Alarm output is an optional specification.

For reference purpose, an arrangement to convert open collector (or open drain) pulse into voltage pulse is shown.



NOTE: Select load resistance value R such that the current flowing into the transistor (or MOS-FET) is held below 20mA in relation with E. Waveform (A) and (B) are inverted to each other.

Precautions

- Both factored pulse and unfactored pulse output is of open collector (open drain for 5G register) output. Use by connecting a load on the part of receiving instrument so as the rate to be held within 30VDC, 20mA max.
- Exercise care to avoid exceeding the rating or incorrect wiring connections with regard to polarities that could result in damage to the register.
- Depending on the type of cable, select either unfactored or factored pulses.

STRAINER

To prevent damage to the flowmeter from foreign solids and insure long life, use a strainer immediately upstream of the meter.

Specification

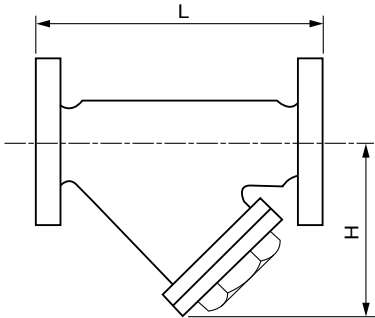
Item		Specification
Nominal Size		15, 20, 25, 40mm
Max. Operating Pres.		0.97MPa
Test Pressure		1.47MPa
Flange Type		JIS 10K FF
Materials	Body	Copper Alloy (BC6)
	Net	SUS 304 (Mesh 100 or 200)
Finish		Munsell 7.5G 7/2.5

Outline Dimensions

Flange Type JIS 10K FF

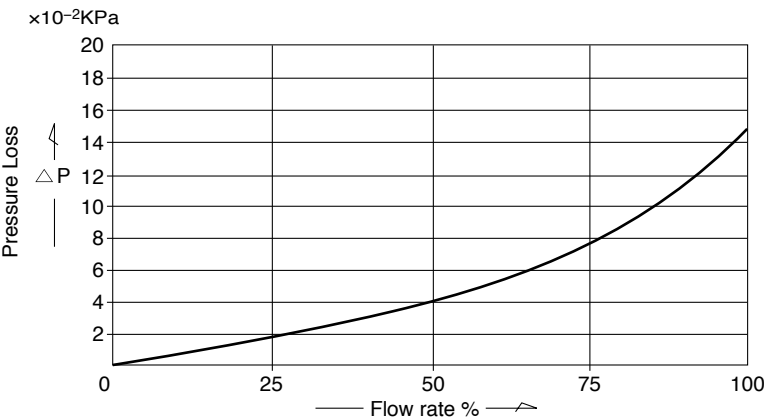
Material Dimension Nom. Size mm	BC6			Net Mesh
	L mm	H (approx.) mm	Weight kg	
15	125	60	1.4	200
20	125	60	3.1	100
25	125	66	4.7	100
40	180	95	7.4	100

In case of BC6 material



Besides the strainers shown here, a temporary type for removing relatively large solids, etc. are also available. Consult the factory.

Pressure Losses



Air at room temperature
under atmospheric pressure

● Model Code Number

Item	Code No.								Description	
	①	②	③	—	④	⑤	⑥	⑦		⑧
Model	Y	F	1	—						Strainer
Application					1					For GAS OVAL
Nominal size					0	3				15mm or Rc1/2 (Applicable to GAS OVAL Model 50)
					0	4				20mm or Rc3/4 (Applicable to GAS OVAL Models 52, 53)
					0	5				25mm or Rc1 (Applicable to GAS OVAL Model 55)
					0	7				40mm or Rc1/2 (Applicable to GAS OVAL Model 56)
Material						A				Body: Copper alloy (BC6), Net: Stainless steel (SUS304)
Piping Connection						1				Flange type, JIS 10KFF

■ When making inquiries, please advise the following:

- Applied Fluid: _____
 Specific gravity: _____
 Operating temperature (°C) _____ min. _____ normal _____ max.
 Operating Pressure (MPa) _____ min. _____ normal _____ max.
- Flowrate: _____ min. _____ normal _____ max. ☐ L/h, ☐ m³/h
- Connection: Nom. size _____ mm
- Receiving Instrument Model, Spec., Power Supply, Input Spec., Output Spec., etc.
- Strainer
 Connection: Nom. size _____ mm, Materials: ☐ BC6
 Net Mesh: ☐ 100, ☐ 200

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