

Wide Range Flowmeter for Energy Conservation Management

MASS FLOW MONITOR

GENERAL SPECIFICATION
GS.No.GBF300E-3

■ GENERAL

This monitor is a flowmeter for energy conservation management used for exactly measuring the minute flowrate of utility gasses including air and nitrogen [nominal dia. 15 mm: 10 L/min (normal) or more]. For example, by connecting this flowmeter to an air tube or a like, measuring the amount of air leakage, and converting the air leakage to the amount of money, the amount of air used and the amount of air consumed wastefully can be grasped digitally, promoting efficient accomplishment of energy-saving measures.

As a result, a condition "Low price" essential for a small-diameter flowmeter for energy-saving management has been realized.

■ FEATURES

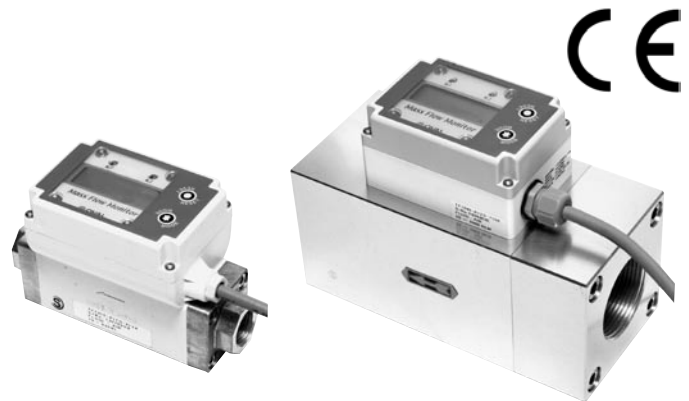
1. Unrivalled ultra-wide range [10 to 600 (nominal dia. 15 mm), 135 to 8000 (nominal dia. 50 mm) L/min (normal)] has realized range ability of "1 : 60". As the flowmeter is capable of exactly detects the flowrate from minute flow, it is best suited not only for management of usage but also for isolation of air leakage point.
2. Thermal mass flow to detect mass flowrate, requiring no compensation of temperature and pressure, measures normal flowrate (0°C, 1 atm) directly.
3. Display provides the function of "Yen converted indication" suited for energy conservation management in addition to "total", "accumulated total", "instant flowrate (hour, minute)".

■ STANDARD SPECIFICATIONS

Item	Description						
	TF1015	TF1020	TF1025	TF1040	TF1050		
Model	TF1015	TF1020	TF1025	TF1040	TF1050		
Acceptable fluids	Compressed air and nitrogen						
Nominal Size	15mm	20mm	25mm	40mm	50mm		
Flow Range (*1)	10 to 600 L/min (normal)	15 to 800 L/min (normal)	35 to 2200 L/min (normal)	85 to 5000 L/min (normal)	135 to 8000 L/min (normal)		
Connection Rating	Rc 1/2 (Internal thread)	Rc 3/4 (Internal thread)	Rc 1 (Internal thread)	Rc 1-1/2 (Internal thread)	Rc 2 (Internal thread)		
Fluid Temperature	0 to 50°C						
Ambient Temperature	0 to 50°C (Without condensation)						
Pressure Range	0 to 0.7MPa						
Accuracy	Flowrate below 40% of full scale		Flowrate of 40% or more of full scale				
	Reproducibility	0.8% of full scale	2% of reading				
	Linearity	2% of full scale	5% of reading				
	Pressure characteristics	0.12% of full scale / 0.1MPa		0.3% / 0.1MPa of reading			
	Temperature characteristics	0.1% of full scale / °C		0.2% / °C of reading			
Straight Tube Length required	Inlet: 3D or greater, Outlet: Not specified						
Major Parts Materials	Monitor body: PBT (polybutylene terephthalate)		Monitor body: A5052 (Aluminum machined, anodized)				
	Connector: ADC12 (Aluminum die cast, anodized (trivalent))	Connector: A5052 (Aluminum machined, anodized)					
	<ul style="list-style-type: none"> • Sensor: SUS 316 • Display: Mixed resin consisting of PC (polycarbonate) and PBT (polyethylene terephthalate) • Transmitter case: PBT (polybutylene terephthalate) • O-rings: Viton 						
Display	7-segment 8-digit LCD (with backlight and reading units) The display is rotatable in 90° steps. <ul style="list-style-type: none"> • Instant flowrate: m³/h (normal), L/min (normal) • Resettable total flow, accumulated total flow: m³ (normal) • Yen conversion (accumulated total, instant flowrate, resettable total) • LED x 2 places (Lights up in an alarmed condition.) 						
Output (*2)	Flow pulse (Compensation pulse, open collector output, pulse width is adjustable from 1 to 240 ms)			Pulse unit at the shipment from factory: L/P (normal)			
	Flowrate analog 4 to 20 mA, Max. load resistance 500Ω			15mm	20mm	25mm	40mm
Alarm	Alarm (2 points, open collector output)						
	<ul style="list-style-type: none"> • 2 independent set points can be chosen (settings, hysteresis, or high/low alarms) • The lowest limit of alarm can be set up. (Alarm can be lifted at around 0 flow.) 						
Response	Time constant 1.5 sec or better						
Power	(Excl. analog output 4 to 20 mA)						
Cable	See sections "Wiring Diagram" and "Cable Specifications".						
Physical Orientation	Horizontal or vertical						
Protection Grade	Non-explosionproof, indoor use, IP 65						

*1: Normal of flowrate indicates the value converted at 0°C and 1 atm. The maximum flow is limited by the internal pressure in the tubing system depending on the sensor durability. See "Maximum Service Flowrate".

*2: Optional two points can be selected for output. (For the combination, refer to the product code.)

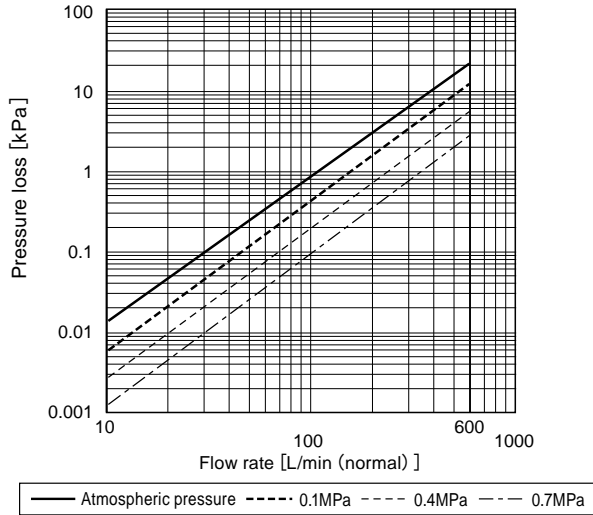


● APPLICABLE STANDARDS

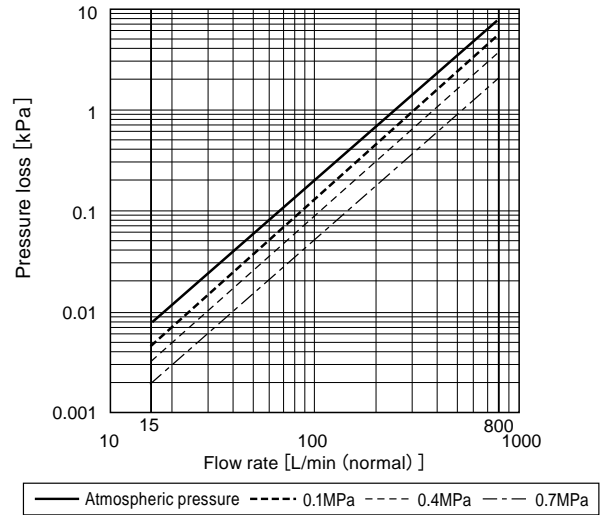
Applicable EU directives	EMC Directive : 2004/108/EC
Applicable EN standards	EMC Directive EN55011 : 2007+A2 : 2007 Group 1, Class B EN61000-6-2 : 2005

■ PRESSURE LOSSES

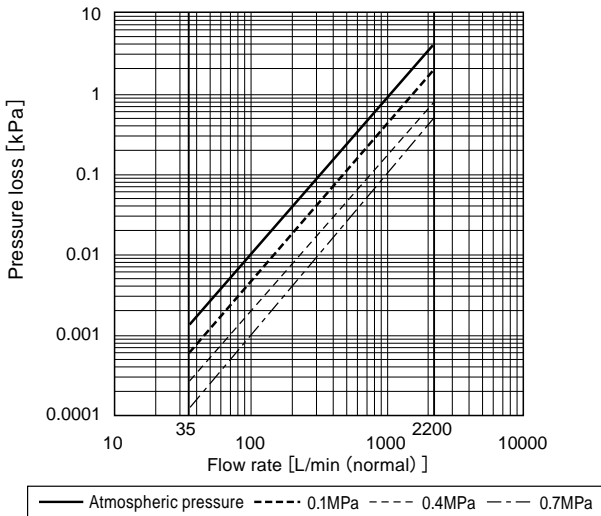
■ Nominal size : 15mm (Fluid : air)



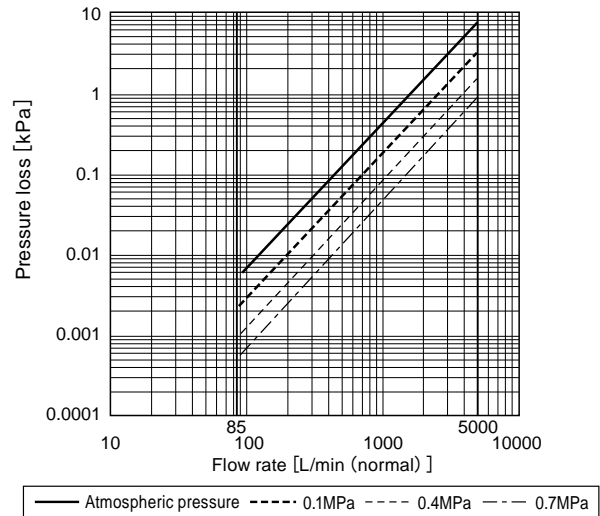
■ Nominal size : 20mm (Fluid : air)



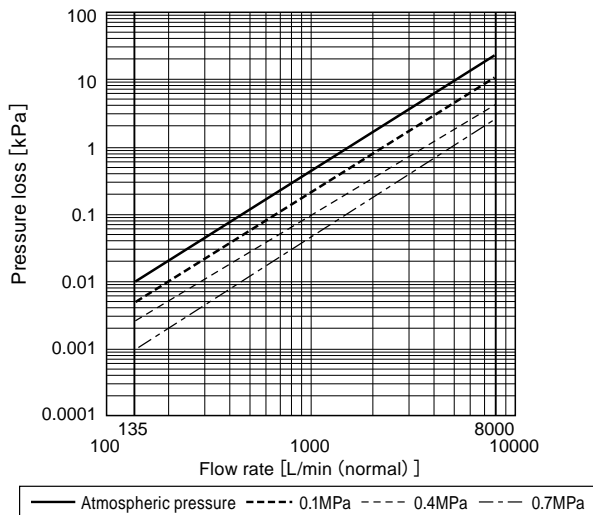
■ Nominal size : 25mm (Fluid : air)



■ Nominal size : 40mm (Fluid : air)

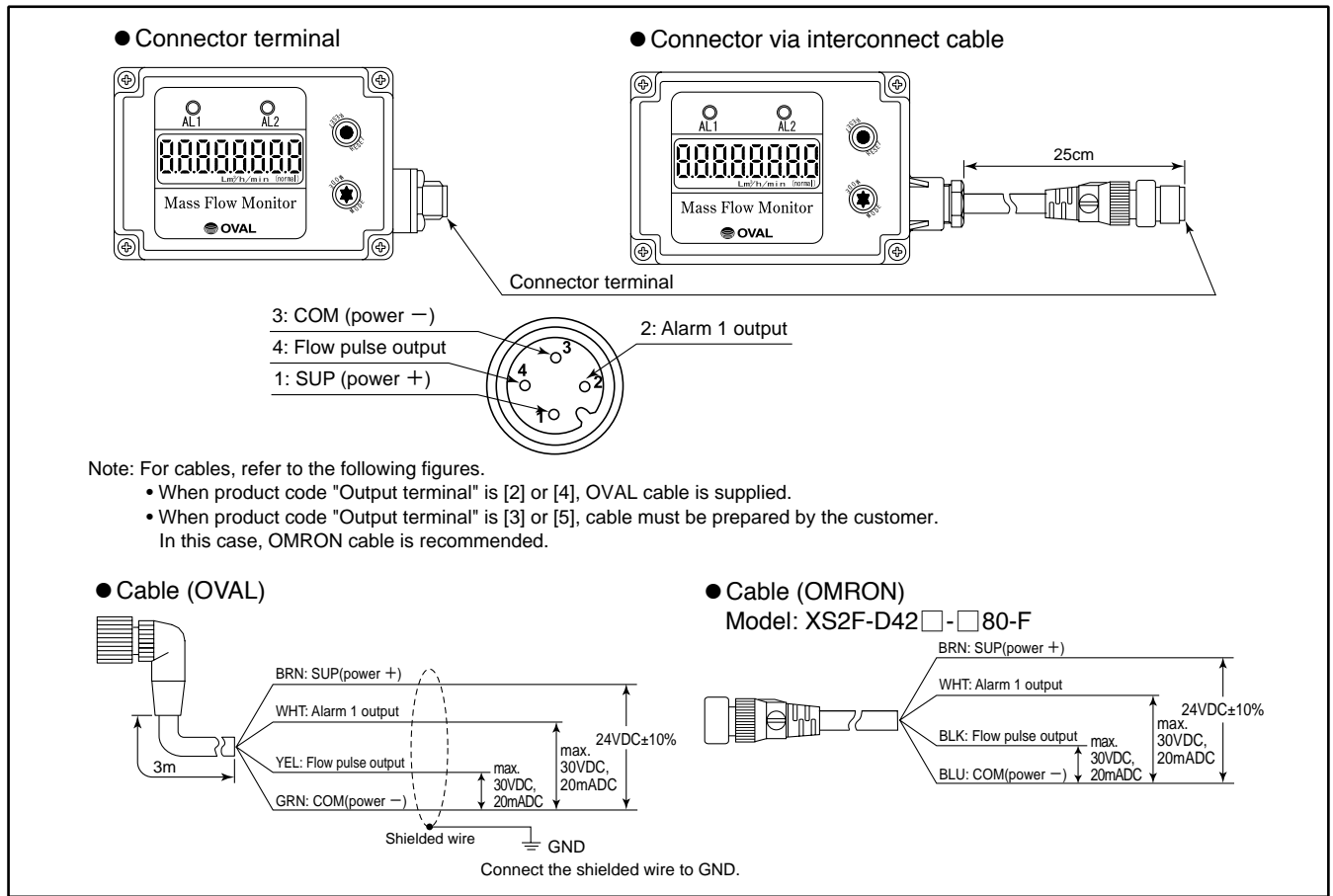


■ Nominal size : 50mm (Fluid : air)

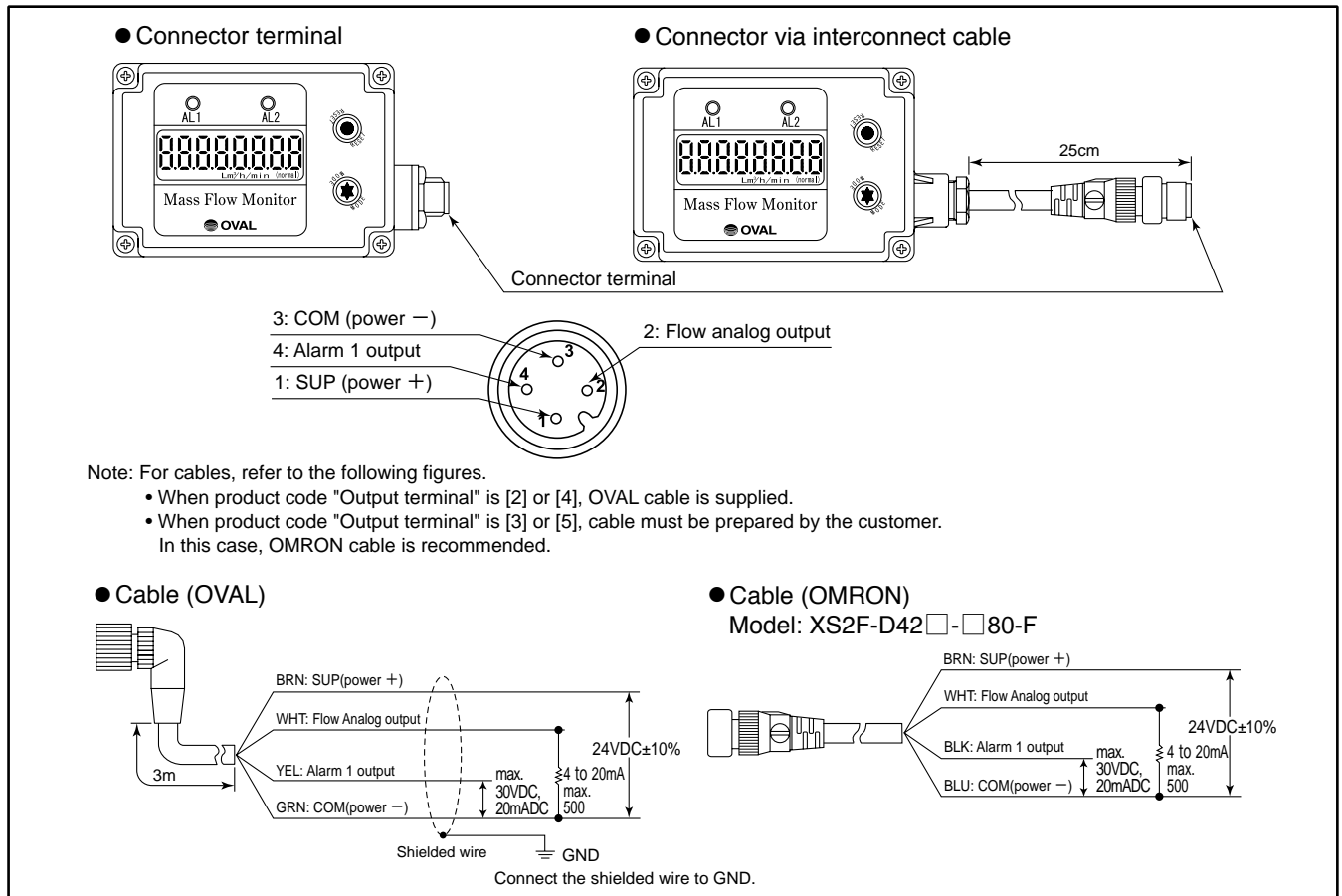


■ APPLICABLE STANDARDS

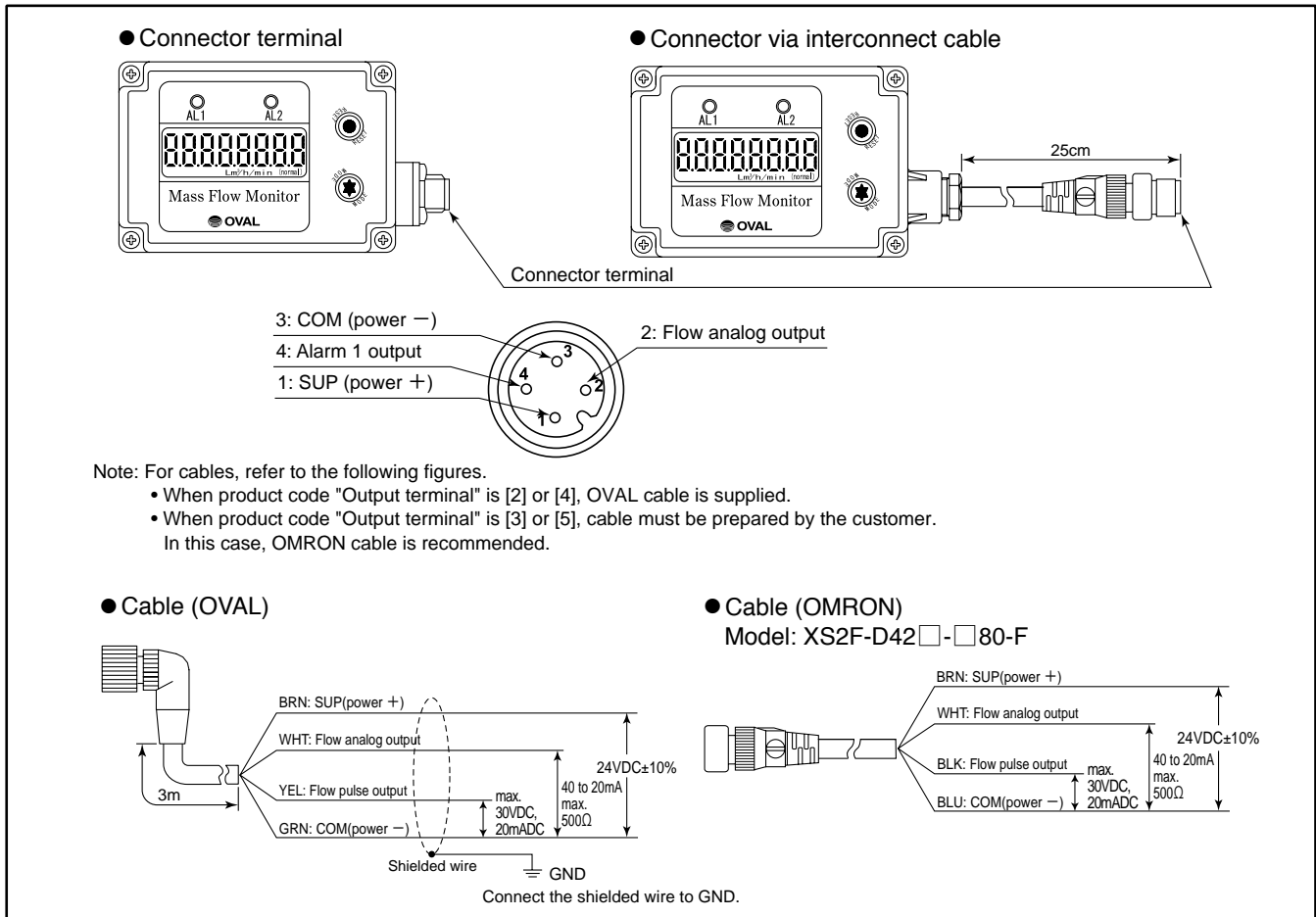
(1) Flow pulse output + single alarm point specifications



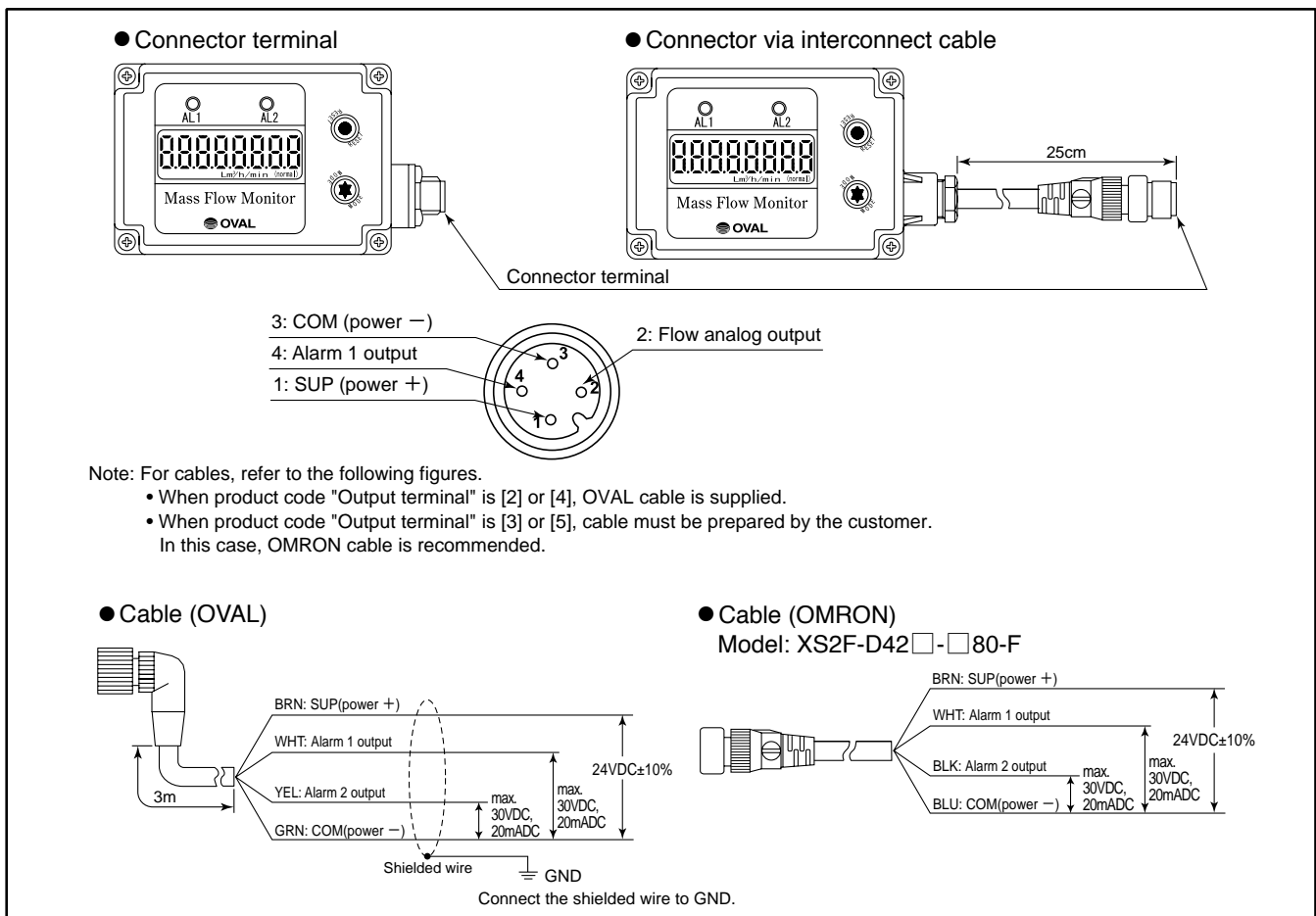
(2) Flow analog output + one alarm specifications



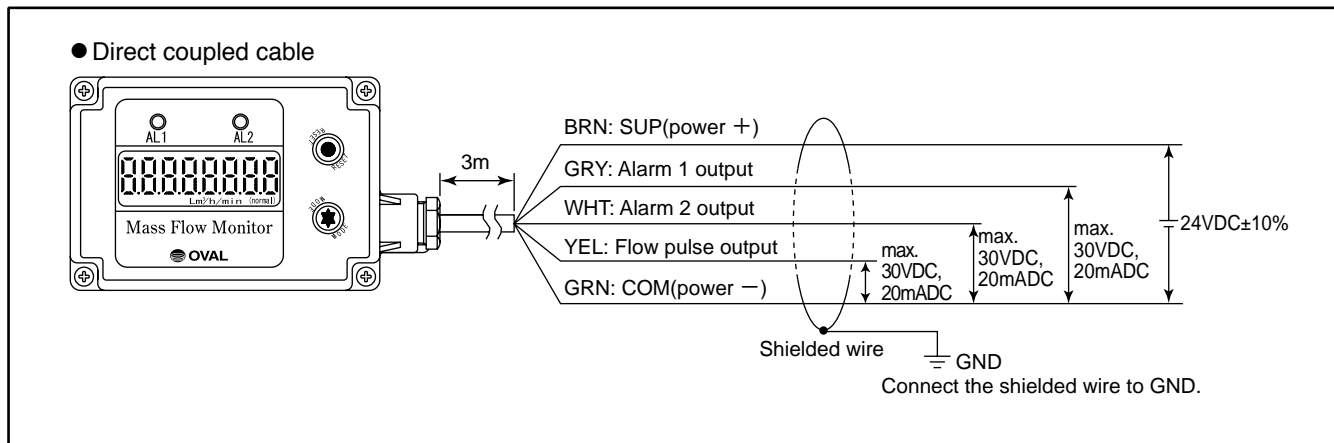
(3) Flow pulse output + flow analog output specifications



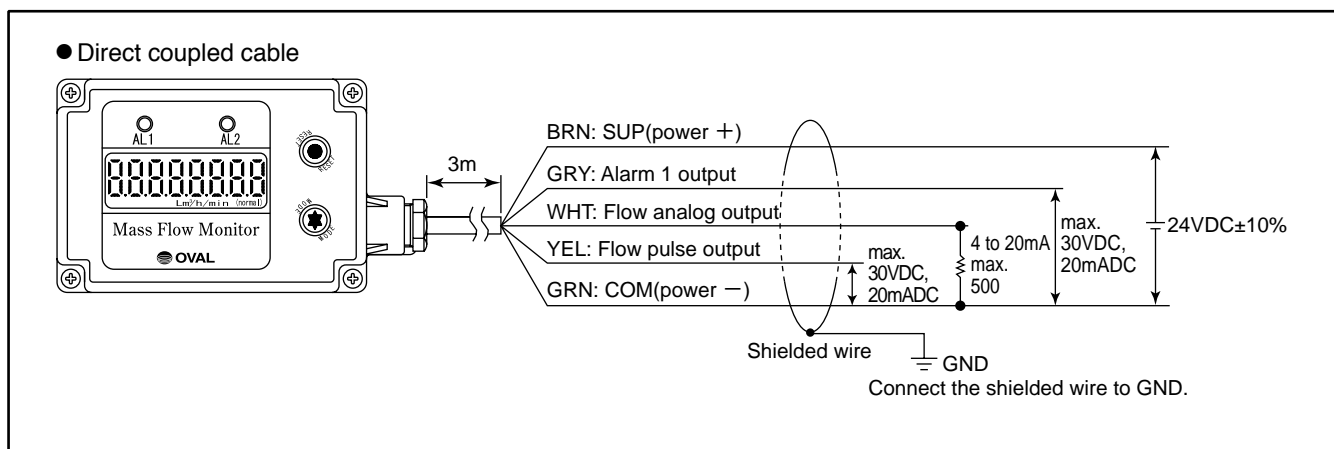
(4) Two alarm point specifications



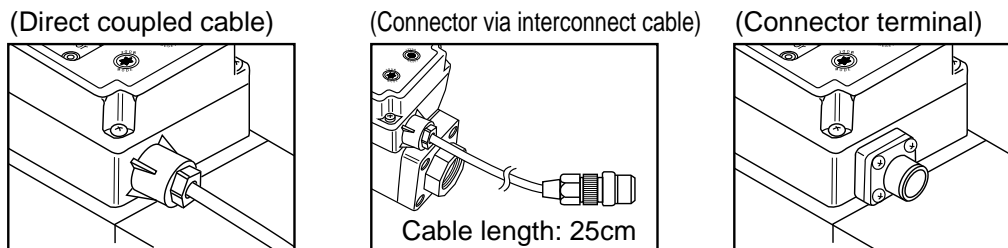
(5) Flow pulse output + two alarm points specifications



(6) Flow pulse output + flow analog output + single alarm point specifications



■ EXPLANATION OF OUTPUT TERMINAL TYPES ▶



■ CABLE SPECIFICATIONS

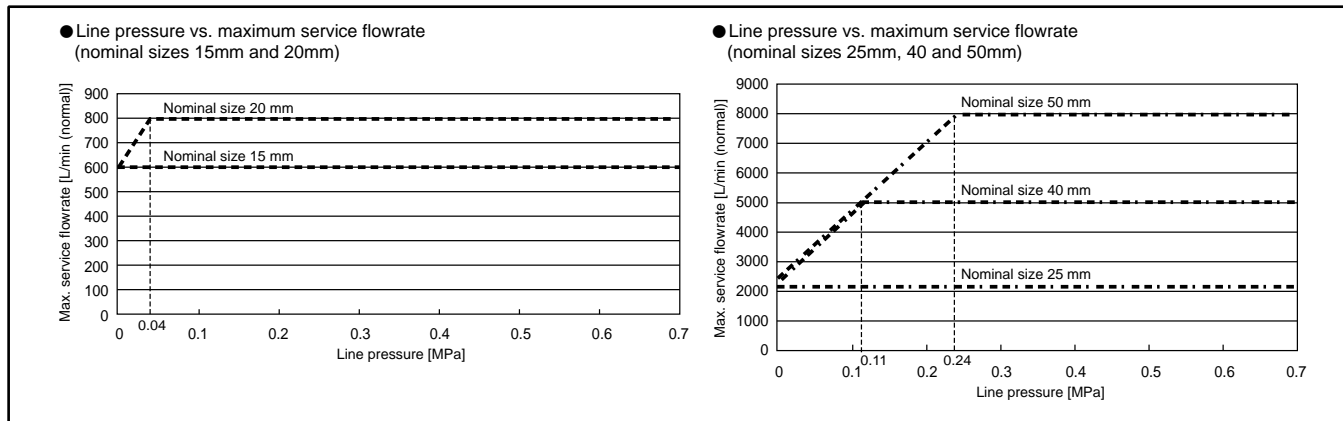
Applicable cable depends on the specifications of the 15th digit "Output Terminal" of the product code. Refer to the following table.

15th digit of product code	"Output Terminal" specifications *1	Cable Specifications	State at shipment from factory
[1]	Cable coupled directly	[OVAL cable] 5-conductor shield cable Length: 3 m, O.D.: 6.3 mm	Directly coupled to the product body.
[2]	Connector via interconnect cable (with cable)	[OVAL cable] 4-conductor shield cable with connector Length: 3 m, O.D.: 6 mm	Packed together with product body.
[4]	Connector terminal (with cable)		
[3]	Connector via interconnect cable (without cable)	[Recommended cable] Manufacturer: OMRON Model: XS2F-D42□-□80-F	Cable is not supplied with the product. To be prepared by the customer. The cable shown on the left is recommended. (Purchase the cable directly from the manufacturer.)
[5]	Connector terminal (without cable)	Name: Cabled connector socket single side connector Length: As specified by the customer O.D.: 6 mm	

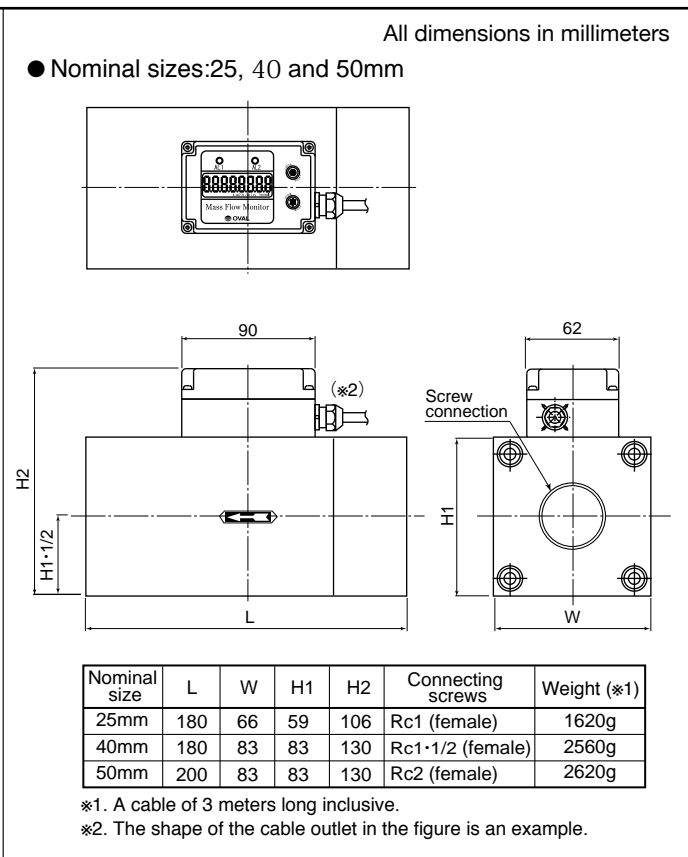
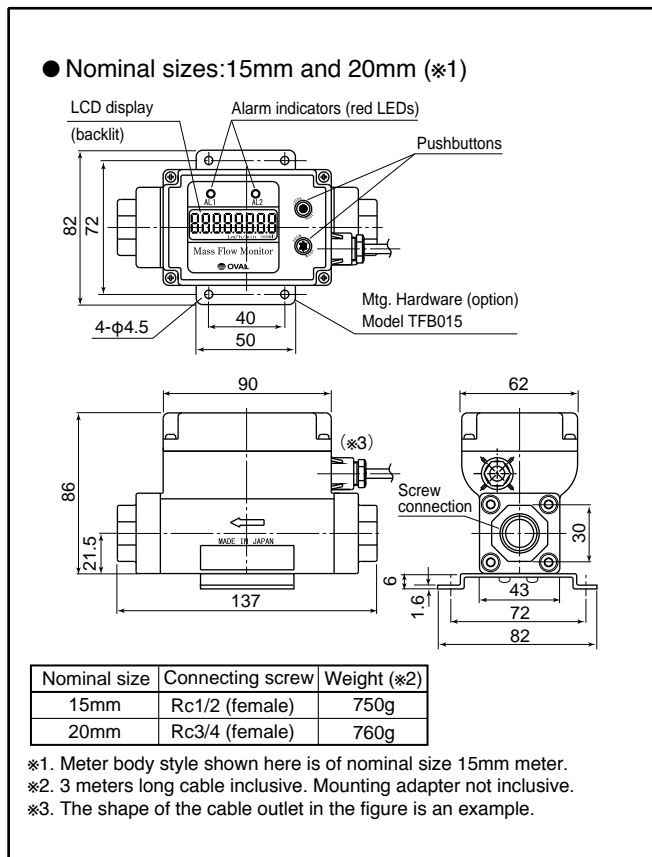
*1 For the kind and shape of the output terminal, refer to the section "Explanation of Output Terminal".

■ MAXIMUM SERVICE FLOWRATE

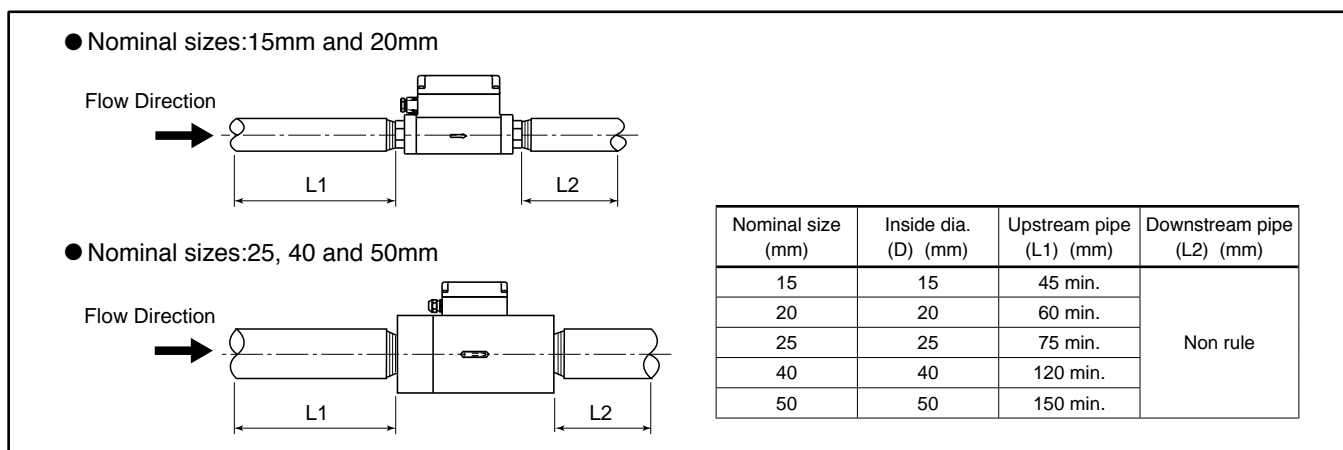
The maximum service flowrate varies with line pressure. Therefore, determine the maximum service flowrate from the following graphs and place the sensor in service within the rate so obtained.



■ OUTLINE DIMENSIONS



■ REQUIRED STRAIGHT PIPE LENGTHS



■ PRODUCT CODE EXPLANATION

Item	Product Code															Description									
	①	②	③	④	⑤	⑥	—	⑦	⑧	⑨	⑩	—	⑪	⑫	⑬		⑭	⑮							
Model	T	F																Mass flow monitor							
Type			1															Standard type							
Nominal size			0	1	5	—												15mm							
			0	2	0	—												20mm							
			0	2	5	—												25mm							
			0	4	0	—												40mm							
			0	5	0	—												50mm							
Body material																		A	A5052 Aluminum (meter sizes 25mm, 40mm and 50mm)						
																		P	PBT (meter sizes 15mm and 20mm)						
Max. operating pressure																		1	0.7MPa						
Sensor design																		1	Meter sizes 15mm and 20mm						
																		2	Meter sizes 25mm, 40mm and 50mm						
Metered fluid																		G	—	Compressed air and nitrogen					
Connection rating (*1)																			1	Rc thread (female)					
Display																			1	Totalizer and digital indicator					
Output (*2)																			1	Output x 2: Flow pulse + single alarm point					
																			2	Output x 2: Flow analog + single alarm point					
																			3	Output x 2: Flow pulse + flow analog					
																			4	Output x 2: Two alarm points					
																			5	Output x 3: Flow pulse + two alarm points					
																			7	Output x 3: Flow pulse + flow analog + single alarm point					
Version																			A	Standard					
Output terminals																					Nom. size (mm)				
																					15	20	25	40	50
																		1	Direct coupled cable (output x 3, 5 conductor, 3 meters long)		○	○	○	○	○
																		2	Connector via cable (output x 2) Cable furnished (4 conductor, 3 meters long)		○	○	×	×	×
																		3	Connector via cable (output x 2) Less cable		○	○	×	×	×
																		4	Connector terminal (output x 2) Cable furnished (4 conductor, 3 meters long)		×	×	○	○	○
																	5	Connector terminal (output x 2) Less cable		×	×	○	○	○	

*1: 15mm: Rc1 /2, 20mm: Rc3/4, 25mm: Rc1, 40mm: Rc1-1 /2, 50mm: Rc2

*2: You can select either 2 outputs or 3 outputs, but the availability of "Output terminal" type is limited depending on the number of outputs.

*: Mounting hardware for nominal sizes 15mm and 20mm monitors (option) Product code:TFB015

