GENERAL SPECIFICATIONS

TOKICO | GS-F1190E

COUNTER TYPE TOKICO GAS FLOWMETER

GENERAL

COUNTER TYPE TOKICO GAS FLOWMETER is a R-model positive displacement flowmeter for gases which has two R-model rotors and measures the flow directly.

COUNTER TYPE TOKICO GAS FLOWMETER has little instrument accuracy change with passage of time because the two R-model rotors rotate without contact. Also the flowmeter can measure to high accuracy and wide flow rate range.

FEATURES

●High accuracy and wide flow rate range.

This flowmeter has higher accuracy than the calibration tolerance of the measurement regulations, and because a minimum flow can be measured to 5% of the maximum flow, it is suitable for the city gas measurement with a large flow change.

●Wide pressure range and small pressure loss.

Also, a cast steel body model which is available for gas pressure of 0.97 MPa is prepared.

Moreover, it is suitable also for the measurement of a low-pressure gas, because the pressure loss at the maximum flow rate is less than 0.2 kPa (at normal temperature and low-pressure air).

●Leak-free transmission system.

There is no gas leakage of the transmission system because a magnetic coupling unit is fitted on the rotation transmission from the measurement unit to the indicating unit.

●Small minimum sensitivity flow.

Though the minimum sensitivity flow of the rotor type meter is permitted up to 5% of the maximum flow by the measurement regulations, the minimum sensitivity flow of TOKICO GAS FLOWMETER is about 0.1% of the maximum flow.

●Built in automatic lubricating device.

Automatic lubrication of the ball bearings and the driving cogwheels of TOKICO GAS FLOWMETER axis is done even at a low flow rate by a built in automatic lubricating device of small rotation resistance. Moreover, because the oil surface meter is attached to the device, lubricant level check is easy.

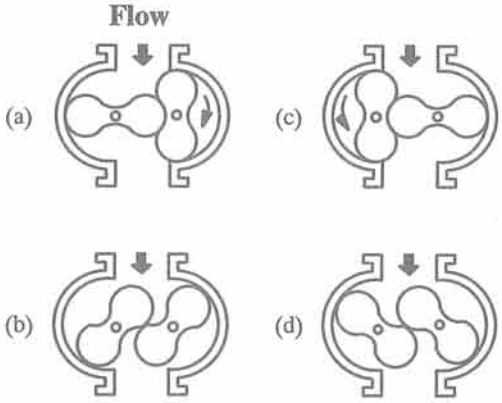
STANDARD SPECIFICATION (MEASURING UNIT)

Applicable Fluid Note) 1		City Gas, Natural Gas, Methane, Ethane, Propane, Butane, Air, Carbon Gas, Carbon Monoxide, Nitrogen, Helium, Hydrogen etc.	
Accuracy		Calibration tolerance Note) 2	
Flow Rate Range		Refer to the flow rate range table.	
Fluid Temperature		-10 ~ 40℃	
Max. Working Pressure		Max. 0.49 MPa { 5 kgf/cm² }	Max. 0.97 MPa { 9.9 kgf/cm² }
Test Pressure	Hydraulic Pressure	0.98 MPa { 10 kgf/cm² }	1.57 MPa { 16 kgf/cm² }
	Air Tight Pressure	0.61 MPa { 6.25 kgf/cm² }	1.27 MPa { 13 kgf/cm² }
Connection Size		50 mm (2 B) ~ 300 mm (12 B)	
Flange Rating		JIS 10K FF	JIS 10K RF
Material	Body	FC250	SCPH2
	Rotor	AC (Aluminum)	
	Magnetic Coupling	C3604, etc.	
Piping Installation		Vertical Piping (TOP → BOTTOM)	
Paint Color		Munsell 1.4PB 3.1/1.2	

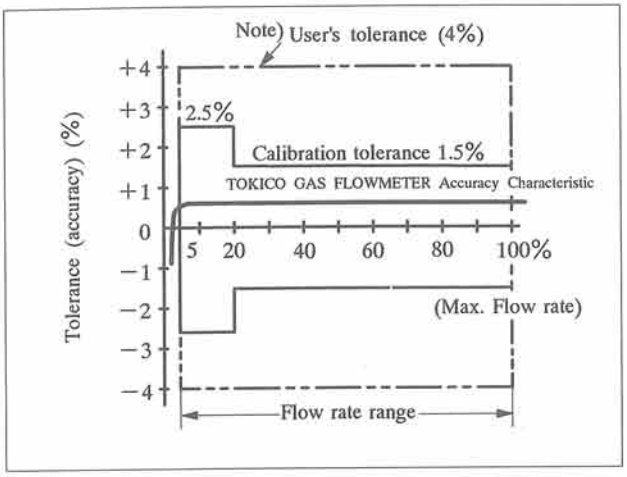
Note) 1. The flow rate range might be different from the standard for the gases with small density such as helium and hydrogen.

2. When connecting size is over 250 mm and use pressure exceeds 10 kPa {1.02 mH_2O}, official approval is excluded.

PRINCIPLE OF OPERATION

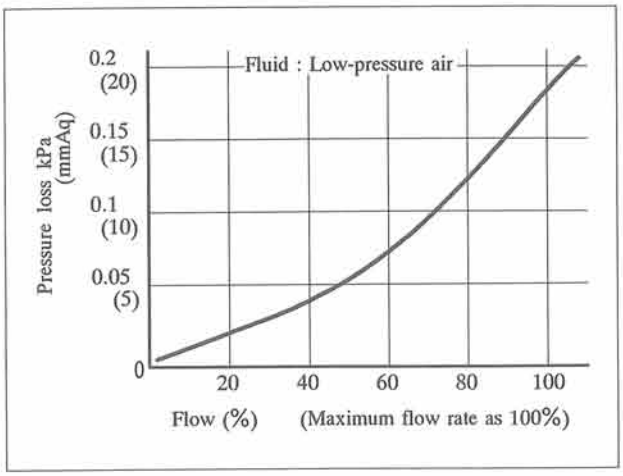


PERFORMANCE CHARACTERISTIC



Note) User's tolerance when inspecting the meter while installed.
: ±4%
User's tolerance when inspecting the meter while detached.
20~100% flow : ±3.5%
5~ 20% flow : ±4%

PRESSURE LOSS COEFFICIENT



FLOW RATE RANGE

Model	Conn. Size (mm)	Flow rate range (m^3/h)
0050	50	2.5 ~ 50
0125	80	Note) 1 5 ~ 125
0200	100	10 ~ 200
0350	150	Note) 2 15 ~ 350
0500		25 ~ 500
Z500	200	
0700	150	35 ~ 700
1000	200	50 ~ 1,000
2000	300	100 ~ 2,000

Note) Minimum flow for official approval product Note) 1: 6.2 m^3/h
Note) 2: 17 m^3/h

Flow rate conversion formula

$V = V_n \cdot P_n / (P + 101{,}322)$

V : Flow rate in use (m^3/h)
P : Pressure in use (Pa)
V_n : Flow rate at standard state (m^3/h [normal])
P_n : Pressure at standard state (=101,322 Pa [abs])

STANDARD SPECIFICATION (COUNTER TYPE INDICATING UNIT)

Display	Totalizing Counter	7 digits
	Auxiliary Scale	50-capitation scale
Contact Pulse Transmitter	Method	Lead switch
	Structure	Drip-Proof Note)
	Output Signal	Contact pulse (a-contact, c-contact)
	Contactor Capacity	12V DC 0.1A 1.2W
	Contactor Life	About 50 Million Transmissions
	Wiring Connection	G1/2 (PF1/2 Female Screw)
	Signal Cable	2 wicks shield line
	Cross-section Area of Cores	0.75 ~ 2 mm^2 (Outside diameter of cable : ϕ9~10.5)
	Transmission Distance	150 m
	Ambient Temperature	−10 ~ 40°C

Note) This transmitter is non-explosion-proof structure. When setting the meter up in a hazardous area, Please install the meter by the intrinsically safe explosion-proofs by using the pulse barrier (contact converter).

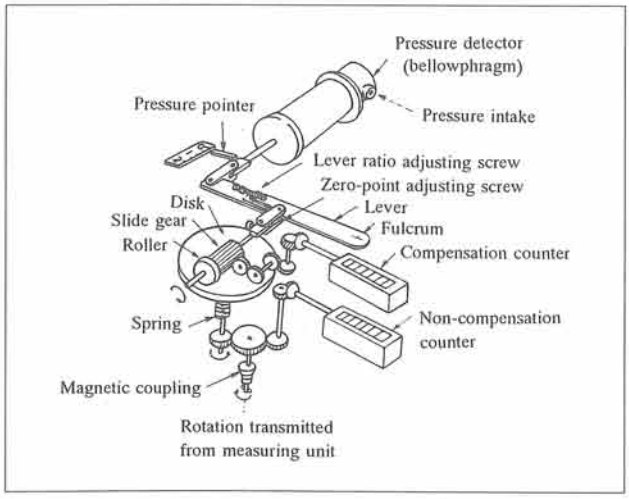
MECHANICAL TYPE PRESSURE COMPENSATOR

The mechanical type pressure compensator automatically converts and indicates the volume at base pressure (or any predetermined pressure) on the basis of the actual working pressure and volume of the gas measured by the measuring unit. Adapting a bellowphragm as the pressure detector, measures very accurately and has good response to pressure change. Since the pressure compensator unit adopts an accurate operating mechanism, highly accurate compensation can be done over a wide pressure range. The pressure compensator requires periodical checking/maintenance (lubricating, overhaul cleaning, etc.).

PRINCIPLE

Pressure change in the piping is detected as displacement by the bellowphragm of the pressure detector and transmitted to the operating unit via the lever mechanism. On the other hand, counting of the volumetric flow is transfered into the operating unit through the magnetic coupling and reduction gear train. The operating unit operates the pressure and volume by means of the stepless speed change transmission mechanism and indicates the volumetric flow under base pressure.

STRUCTURE



PRESSURE COMPENSATION FORMULA

By the Boyle-charle's law,

$$V_0 = \frac{P_1}{P_0} \cdot \frac{T_0}{T_1} \cdot V_1$$

V : Volume of gas
P : Absolute pressure of gas
T : Absolute temperature of gas
suffix 0 is in the state of the standard.
(0 ℃, 101,322 Pa [abs])
suffix 1 is in the state of use.

If only the pressure is considered, the volume ratio at the standard state versus the actual state is proportional to respective pressure.

$$V_0 = \frac{P_1}{P_0} \cdot V_1$$

The equation below is obtained.
If the base pressure P_2 is assumed to be 0.981 kPa {100 mmAq} to be supplied to the user, the gas volume V_2 at the base pressure will be :

$$V_2 = \frac{P_1}{(101{,}322, +981)} \cdot V_1$$

The operation by the above formula is automatically accomplished by the mechanical pressure compensator.

STANDARD SPECIFICATION

Compensating Range	0.020 ~ 0.196 MPa {0.2 ~ 2 kgf/cm²}
	0.049 ~ 0.294 MPa {0.5 ~ 3 kgf/cm²}
	0.245 ~ 0.785 MPa {2.5 ~ 8 kgf/cm²}
Base Pressure	0.981 kPa {100 mmAq}
Operation Accuracy	± 1 %
Structure	Drip-proof

ELECTRONIC TEMPERATURE & PRESSURE COMPENSATOR

The electronic temperature & pressure compensator locally operates in accordance with the Boyle-Charles' law and indicates the totalized volume of gas converted into value under base condition.

FEATURES

- **Highly accurate measurement.**
  Highly accurate operation can be made through combined use of accurate pressure sensor, temperature sensor and microcomputer.
- **Possible to read both temperature & pressure.**
  Non-compensated, temperature compensated, and pressure compensated totalized values and temperature and pressure can be indicated in addition to the temperature compensated totalized values.
- **Battery drive.**
  With a built-in battery, it is possible to use without exchanging the battery for seven years. Power supply construction is unnecessary.
- **Self-diagnosis function incorporated.**
  Occurrence of such troubles as battery exhaustion, flow pulse, and temperature or pressure abnormality are self-diagnosed and error codes are indicated.

STANDARD SPECIFICATION (ELECTRONIC TEMPERATURE & PRESSURE COMPENSATOR)

<table>
<tr><td rowspan="8">Display</td><td>Non-Compensated Flow Rate Totalized Value</td><td rowspan="3">7 digits</td><td rowspan="6">LCD</td><td rowspan="6">Display switched by a key & a rotary switch.</td></tr>
<tr><td>Temp. Compensated Flow Rate Totalized Value</td></tr>
<tr><td>Press. Compensated Flow Rate Totalized Value</td></tr>
<tr><td>Temperature</td><td>2 digits under decimal point</td></tr>
<tr><td>Pressure</td><td>3 digits under decimal point</td></tr>
<tr><td>Error Code</td><td>—</td></tr>
<tr><td>Passing time after error occurs</td><td>4 digits</td><td colspan="2"></td></tr>
<tr><td>Alarm Indication</td><td colspan="3">The head of the display (LCD) is E (one digit)</td></tr>
<tr><td>Ratio of Frequency Division</td><td colspan="3">1/1 , 1/10</td></tr>
<tr><td colspan="2" rowspan="3">Input signal</td><td colspan="3">Flow pulse signal (C-contact pulse, 0～2.5 Hz, by reed switch)</td></tr>
<tr><td colspan="3">Pressure signal (Actual gas pressure by pressure sensor)</td></tr>
<tr><td colspan="3">Temperature signal
(platinum resistance bulb sensor JPt100Ω at 0°C and A class 3-wire type)</td></tr>
<tr><td rowspan="3">Output Pulse</td><td>Content of output</td><td colspan="3">Flow pulse</td></tr>
<tr><td>Output signal</td><td colspan="3">Open collector 3-wire type (Max.12V DC) (after compensation)</td></tr>
<tr><td>Pulse Width (permissible current)</td><td colspan="3">0.25 s , 0.5 s , 2 s , (100 mA or less)</td></tr>
<tr><td colspan="2">Ratio of Frequency Division</td><td colspan="3">1/1 , 1/10 , 1/100</td></tr>
<tr><td colspan="2">Temperature & Pressure Compensation Operating Formula</td><td colspan="3">$Q = \frac{273.2 + T}{273.2 + t} \times \frac{101{,}322 + P}{101{,}322 + P} \times q$
Q : Compensated flow of temperature & pressure (m^3[normal]),
P : Compensated base pressure (Pa), T : Compensated base temperature (°C)
q : Non-Compensated flow (m^3), P : Gas pressure (Pa), t : Gas temperature (°C)</td></tr>
<tr><td rowspan="4">Pressure Compesation</td><td>Compensation Range</td><td colspan="3">For 1K : 0 ～ 0.098 MPa, For 3K : 0.049 ～ 0.294 MPa, For 9K : 0.294 ～ 0.971 MPa</td></tr>
<tr><td>Base Pressure</td><td colspan="3">Standard : 0.981 kPa {100 mmAq}, It is possible to set pressure at intervals of
0.49 kPa {50 mmAq} within the range of 0 ～ 1.962 kPa {200 mmAq}</td></tr>
<tr><td>Preset Pressure</td><td colspan="3">Standard : For 1K 0.029 MPa {0.3 kgf/cm²}, For 3K 0.147 MPa {1.5 kgf/cm²},
For 9K 0.686 MPa { 7 kgf/cm²} Note)</td></tr>
<tr><td>Operating Accuracy</td><td colspan="3">±0.8% (In the range of the pressure compensation)</td></tr>
<tr><td rowspan="3">Temperature Compensation</td><td>Compensation Range</td><td colspan="3">-20 ～ 50°C</td></tr>
<tr><td>Base Temperature
Preset Temperature</td><td colspan="3">Standard : 15°C (It is possible to set temperature at intervals of 1°C within the range of 0 ～ 25°C)
Standard : 15°C Note)</td></tr>
<tr><td>Operating Accuracy</td><td colspan="3">±0.2% (In the range of the temperature compensation)</td></tr>
<tr><td colspan="2">Power Supply (battery lifetime)</td><td colspan="3">Lithium battery (7 years:When the ordinary mode is used)</td></tr>
<tr><td colspan="2">Structure</td><td colspan="3">Non-explosion-proof, Structure to prevent rain, Mischief prevention by special key</td></tr>
<tr><td colspan="2">Ambient Temperature</td><td colspan="3">-20 ～ 60°C</td></tr>
<tr><td colspan="2">Ambient Humidity</td><td colspan="3">0 ～ 90% RH (at -20 ～ 40°C), 50%RH or less (at 41 ～ 60°C)</td></tr>
<tr><td colspan="2">Connecting Cable</td><td colspan="3">3-core shielded cable (core cross section area 1.25 mm²)</td></tr>
</table>

Note) If the compensation device detects the signal outside the undermentioned range, it changes into the preset value and continues the operation.

For 1K : -0.002 ～ 0.113 MPa {-0.02～ 1.15 kgf/cm²}
For 3K : -0.006 ～ 0.338 MPa {-0.06～ 3.45 kgf/cm²}
For 9K : -0.018 ～ 1.015 MPa {-0.18～10.35 kgf/cm²}
Temperature : -25 ～ 80°C

STANDARD UNITS OF TOTALIZING UNIT AND RANGE OF APPLICATION

COUNTER INDICATOR

Model	Conn. Size (mm)	Max. Flow Rate (m^3/h)	Indicator type		
			0X, 0T		0T
			Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)	Contact Pulse (m^3/P)
0050	50	50	0.1	2	0.1
0125	80	125	1	20	1
0200	100	200			
0350	150	350			
0500		500			
Z500	200				
0700	150	700			
1000	200	1,000			
2000	300	2,000			

MECHANICAL PRESSURE COMPENSATOR

Model	Conn. Size (mm)	Max. Flow Rate (m^3/h)	Indicator type								
			2X, 2T					3X, 3T			
			Compensated value			Non-compensated value		Compensated value			Non-compensated value	
			Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)	Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)
0050	50	50	0.1	2	0.1	0.1	2	0.1	2	0.1	0.1	2
0125	80	125	1	20	1	1	20	1	20	1	1	20
0200	100	200										
0350	150	350										
0500		500										
Z500	200											
0700	150	700										
1000	200	1,000										
2000	300	2,000	10	200				10	200			

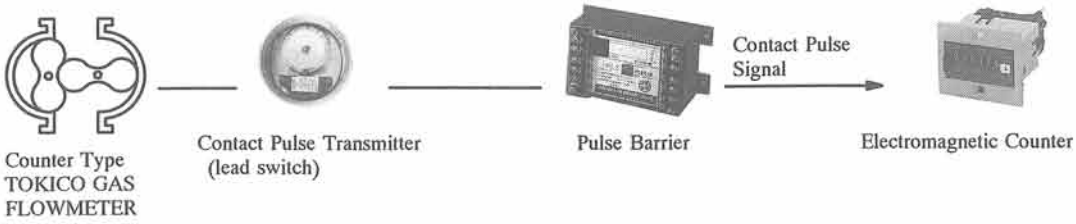
Model	Conn. Size (mm)	Max. Flow Rate (m^3/h)	Indicator type				
			8X, 8T				
			Compensated value			Non-compensated value	
			Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Auxiliary Scale (L)
0050	50	50	1	20	1	0.1	2
0125	80	125	10	200	10	1	20
0200	100	200					
0350	150	350					
0500		500					
Z500	200						
0700	150	700					
1000	200	1,000					
2000	300	2,000					

ELECTRONIC TEMPERATURE & PRESSURE COMPENSATOR (COMPENSATED VALUE)

(at pulse width 0.25s)

Model	Conn. Size (mm)	Max. Flow Rate (m^3/h)	Indicator type							
			0HN		1PN, 1HN		3PN, 3HN		9PN, 9HN	
			Totalizing Counter (7 digits) (m^3)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Contact Pulse (m^3/P)	Totalizing Counter (7 digits) (m^3)	Contact Pulse (m^3/P)
0050	50	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0125	80	125	1	1	1	1	1	1	1	1
0200	100	200								
0350	150	350								
0500		500								
Z500	200									
0700	150	700								
1000	200	1,000								10
2000	300	2,000						10		

EXAMPLE OF INSTRUMENTATION



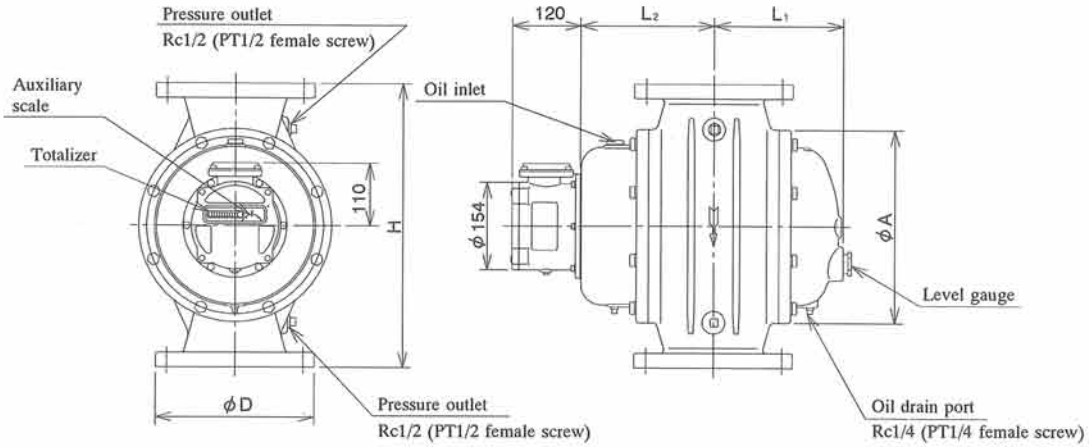
BASIC MODELS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	Contents
F	R	G												Counter Type TOKICO GAS FLOWMETER
Model														Applied Connection Size — Max. Flow Rate
			0	0	5	0								2 B (50 mm) — 50 m³/h
			0	1	2	5								3 B (80 mm) — 125 m³/h
			0	2	0	0								4 B (100 mm) — 200 m³/h
			0	3	5	0								6 B (150 mm) — 350 m³/h
			0	5	0	0								6 B (150 mm) — 500 m³/h
			Z	5	0	0								8 B (200 mm) — 500 m³/h
			0	7	0	0								6 B (150 mm) — 700 m³/h
			1	0	0	0								8 B (200 mm) — 1000 m³/h
			2	0	0	0								12 B (300 mm) — 2000 m³/h
Max. Working Pressure														Max. Working Press. MPa {kgf/cm²} — Outside Material — Applicable Flange Rating
							A							0.49 { 5 } — FC250 — JIS 10K FF
							B							0.97 { 9.9 } — SCPH2 — JIS 10K RF
Material														Body — Rotor — Magnetic Coupling
								A	A					FC250 — AC — C3604 etc.
								N	A					SCPH2
										—				

Indicator			Output Pulse	Press. Compensation Range
Indicator	0 X	Mechanical Type — Direct-Reading	None	———
	0 T		Contact Pulse	———
	2 X	Mechanical Type — Pressure Compensation	None	0.020～0.196 MPa {0.2～2.0 kgf/cm²}
	3 X			0.049～0.294 MPa {0.5～3.0 kgf/cm²}
	8 X			0.245～0.785 MPa {2.5～8.0 kgf/cm²}
	2 T		Contact Pulse	0.020～0.196 MPa {0.2～2.0 kgf/cm²}
	3 T			0.049～0.294 MPa {0.5～3.0 kgf/cm²}
	8 T			0.245～0.785 MPa {2.5～8.0 kgf/cm²}
	1 P N	Electronic Type — Pressure Compensation	Open Collector Output	0 ～0.098 MPa {0 ～1.0 kgf/cm²}
	3 P N			0.049～0.294 MPa {0.5～3.0 kgf/cm²}
	9 P N			0.294～0.971 MPa {3.0～9.9 kgf/cm²}
	0 H N	Electronic Type — Temperature Compensation		———
	1 H N	Electronic Type — Temperature & Pressure Compensation		0 ～0.098 MPa {0 ～1.0 kgf/cm²}
	3 H N			0.049～0.294 MPa {0.5～3.0 kgf/cm²}
	9 H N			0.294～0.971 MPa {3.0～9.9 kgf/cm²}

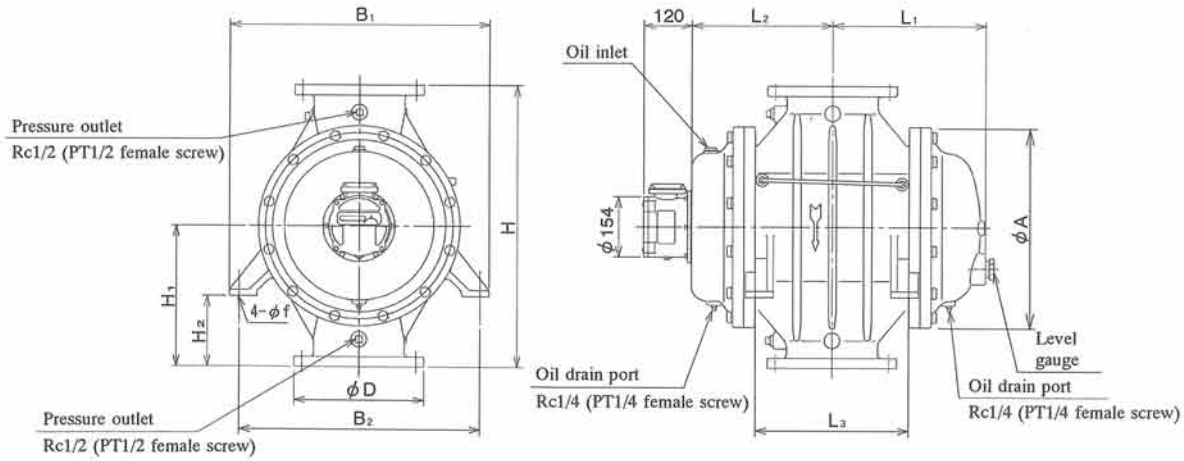
DIMENSION DRAWING

With counter indicator (model 0050～0700)



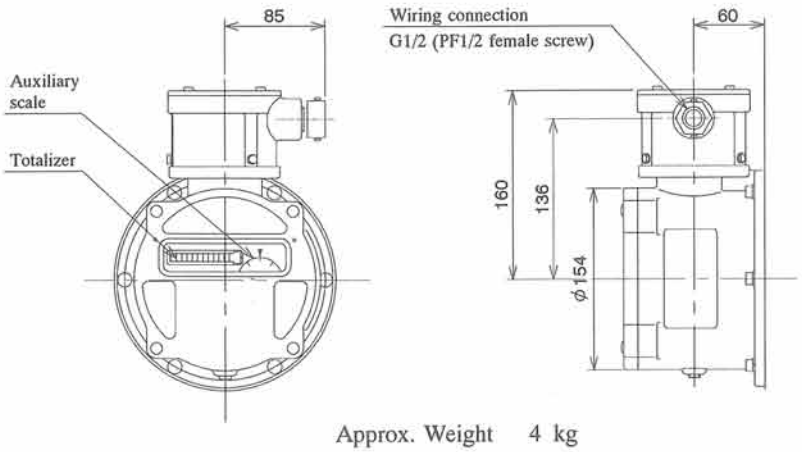
Model	Conn. Size (mm)	Dimensions (mm)					Approx. Weight (kg)
		H	L1	L2	φA	φD	
0050	50	220	130	150	161	155	22
0125	80	340	167	182	235	185	50
0200	100	400	177	185	280	210	60
0350	150	500	230	235	340	280	105
0500		620	265	253	420		175
Z500	200					330	180
0700	150		312	300		280	220

With counter indicator (model 1000～2000)



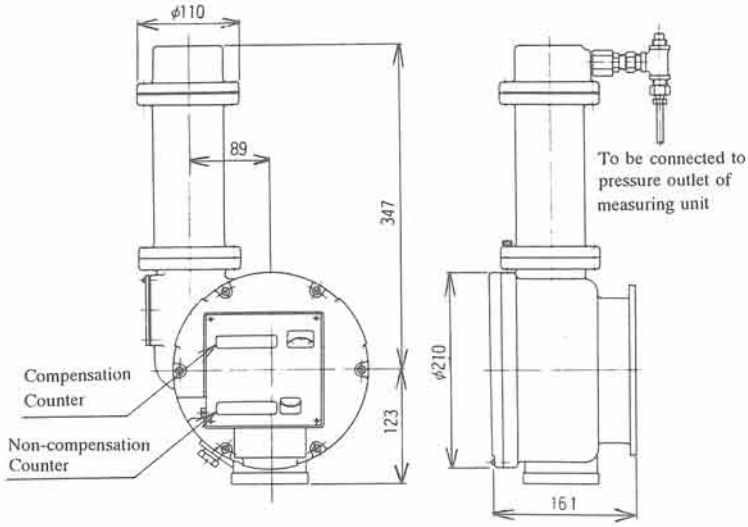
Model	Conn. Size (mm)	Dimensions (mm)											Approx. Weight (kg)
		H	H1	H2	L1	L2	L3	φA	B1	B2	φD	φf	
1000	200	720	360	180	393	360	390	512	660	612	330	20	360
2000	300	920	460	240	592	636	620	636	780	720	445	22	1,100

Counter indicator (with contact pulse transmitter)



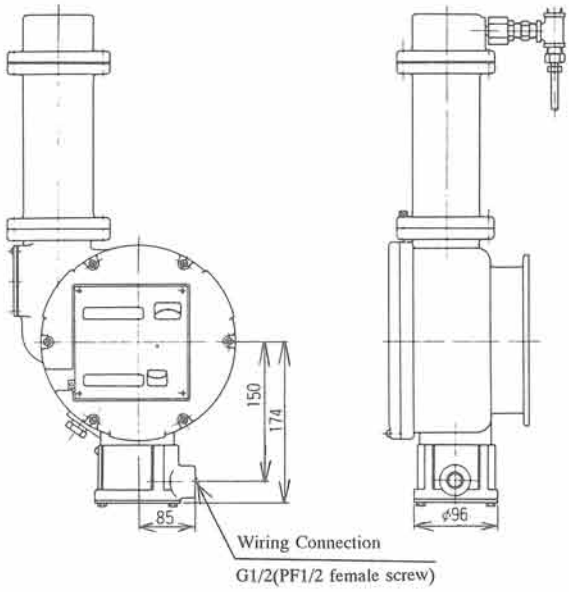
Approx. Weight 4 kg

Mechanical pressure compensator (without pulse transmitter)



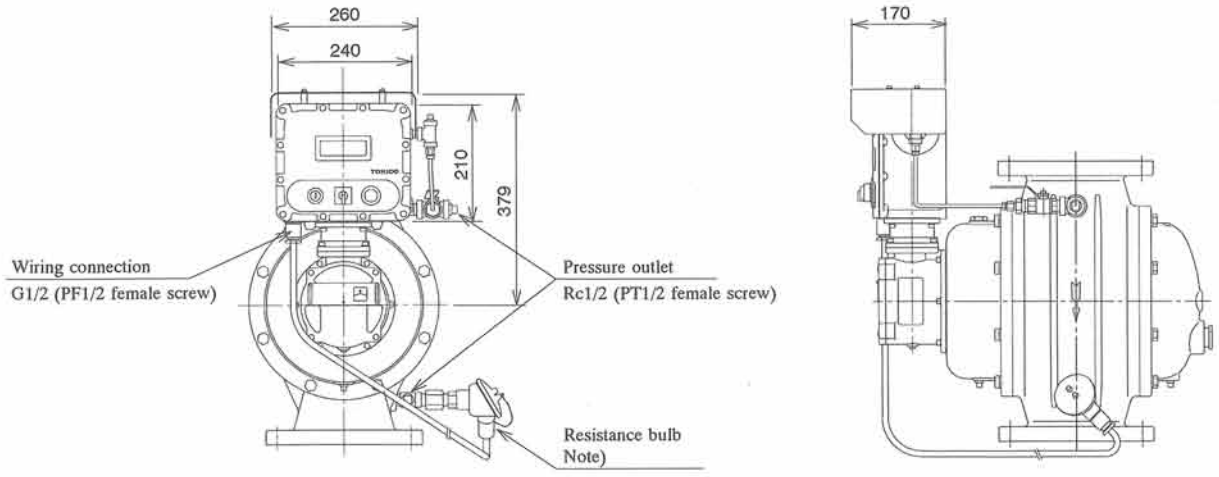
Approx. Weight 11 kg

Mechanical pressure compensator (with contact pulse transmitter)



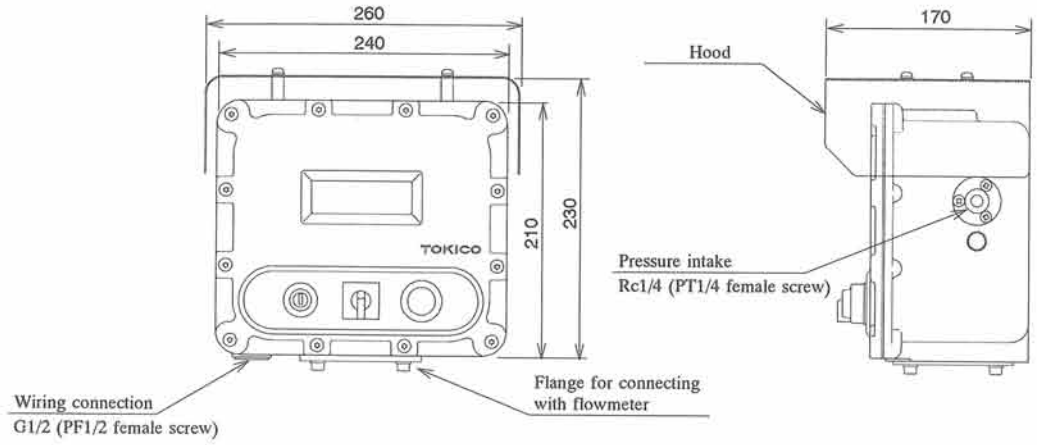
Approx. Weight 12 kg

TOKICO gas flowmeter with electronic temperature & pressure compensator



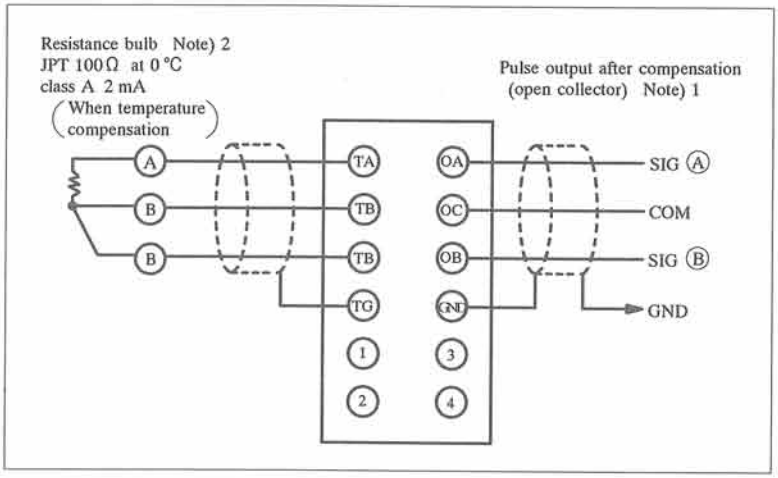
Note) The resistance bulb can be installed only for the type with temperature compensator.

Electronic temperature & pressure compensator



Approx. Weight 8 kg

DRAWING OF TERMINAL CONNECTING WIRES



Note) 1. Connect only when output pulse is taken out.
2. Connect when temperature compensation is made.
3. The terminal of ① ~ ④ is not connected.

ATTACHED EQUIPMENT

STRAINER FOR GAS

Two models of "Strainer only for gas" with large filter area and small pressure loss and "Y type strainer for gas" are prepared.

STANDARD SPECIFICATION

Model		Strainer only for gas	Y type gas strainer
Fluid Pressure		Max. 0.49 MPa { 5 kgf/cm^2 }	Max. 0.97 MPa { 9.9 kgf/cm^2 }
Pressure Loss		About 0.098 kPa {About 10 mmAq}	About 0.294 kPa {About 30 mmAq}
Test Pressure	Hydraulic Pressure	0.98 MPa { 10 kgf/cm^2 }	1.57 MPa { 16 kgf/cm^2 }
	Air tight Pressure	0.61 MPa { 6.25 kgf/cm^2 }	1.27 MPa { 13 kgf/cm^2 }
Flange Rating		JIS 10K FF	JIS 10K FF or RF
Material	Body	SS400, SGP	SS400, STPG
	Screen	Conn. Size 50 mm : PVF (200 mesh equivalent)	SUS304 (200 mesh)
		Conn. Size other than 50 mm : SUS304 (200 mesh)	
Paint Color		Munsell 1.4PB 3.1/1.2	

BASIC MODELS

1	2	3	4	5	6	7	8	Contents
F	S	G						Strainer only for gas
Conn. Size			0	5				2 B (50 mm)
			0	8				3 B (80 mm)
			1	0				4 B (100 mm)
			1	5				6 B (150 mm)
			2	0				8 B (200 mm)
Max. Working Pressure					A			Max. Working Press. 0.49 MPa { 5 kgf/cm² }

Material		Body	Screen	Frame	Conn. Size
	B K	SGP / SS400	SUS304	SS400 + Zinc Plating	05 type is excluded
	B L		PVF		Only 05 type

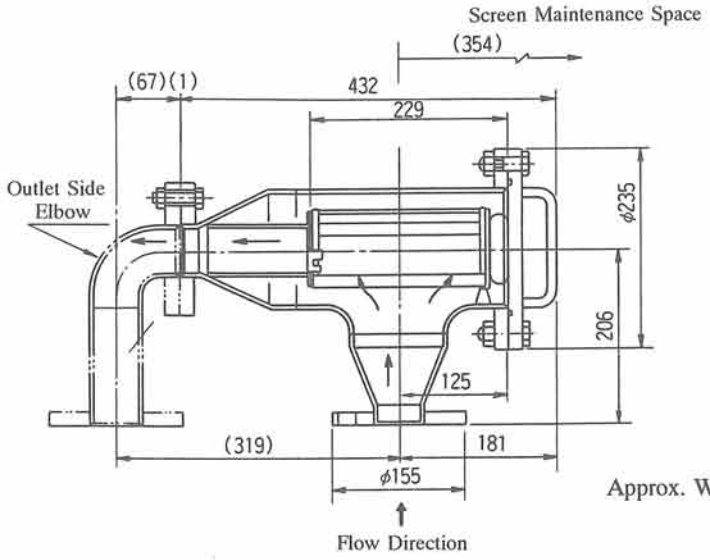
1	2	3	4	5	6	7	8	Contents
F	S	F						Y type strainer for gas
Conn. Size			0	5				2 B (50 mm)
			0	8				3 B (80 mm)
			1	0				4 B (100 mm)
			1	5				6 B (150 mm)
			2	0				8 B (200 mm)
			3	0				12 B (300 mm)
Max. Working Pressure					B			Max. Working Press. 0.97 MPa { 9.9 kgf/cm² }

Material		Body	Screen	Frame
	B P	STPG / SS400	SUS304	SUS304

DIMENSION DRAWING

STRAINER ONLY FOR GAS

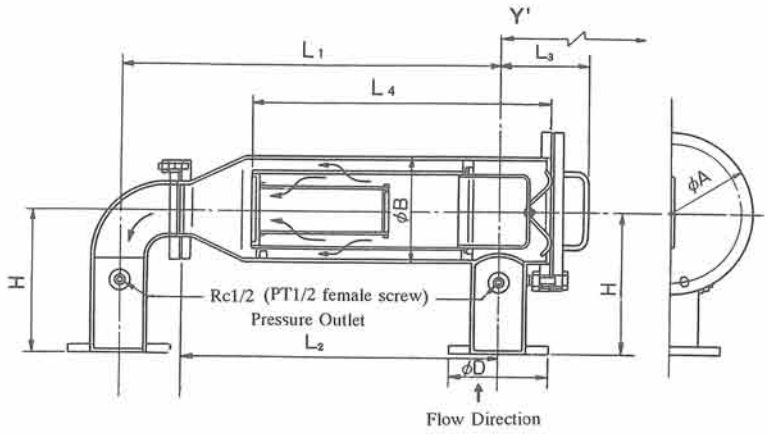
FSG05 (Conn. Size 50 mm)



Approx. Weight : 20 kg

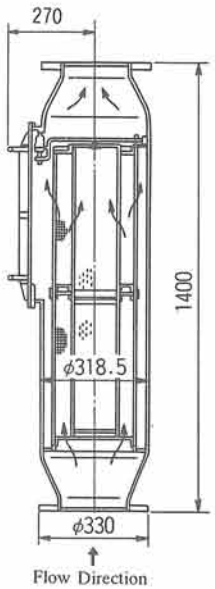
Note) Exit side elbow (Displayed in the imagination line) is an option.

FSG08~FSG15



Model	Conn. Size (mm)	Dimensions (mm)									Approx. Weight (kg)
		L_1	L_2	L_3	L_4	H	φA	φB	φD	Y'	
FSG08	80	630	529	176	528	200	280	165.5	185	625	53
FSG10	100	750	624	189	616	250	330	216.5	210	726	75
FSG15	150	1,100	918	259	926	300	445	318.5	280	1,102	157

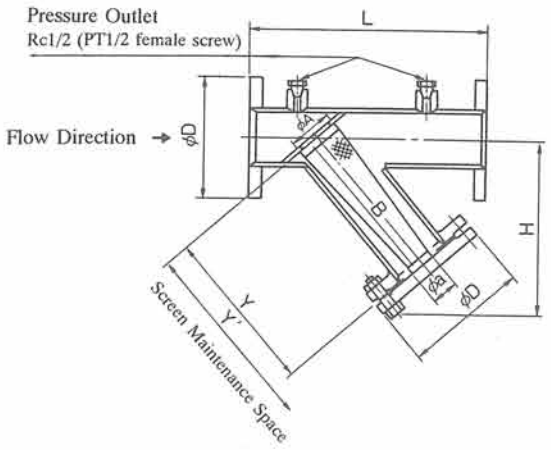
FSG20 (Conn. Size 200 mm)



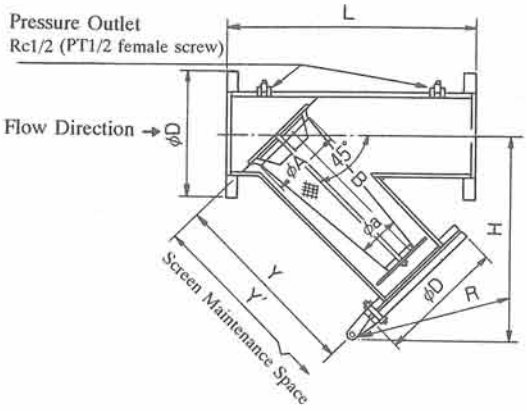
Approx. Weight : 130 kg

Y TYPE STRAINER FOR GAS

FSF05 ~ FSF15



FSF20 ~ FSF30

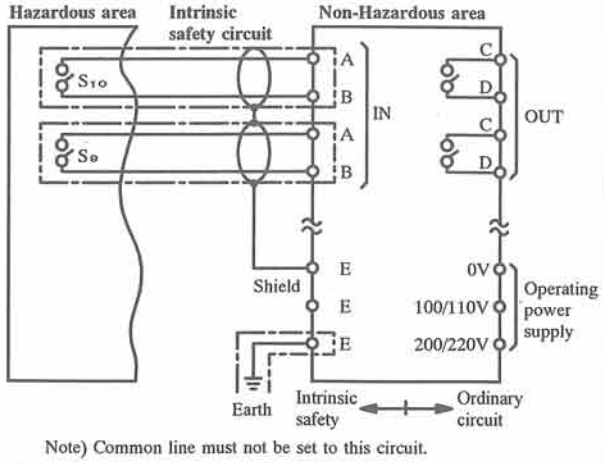


Model	Conn. Size (mm)	Dimensions (mm)									Approx. Weight (kg)
		L	H	Y	φA	φa	B	φD	R	Y'	
FSF05	50	320	200	178	47	28	182	155	—	360	10
FSF08	80	350	260	238	72	43	242	185	—	480	20
FSF10	100	360	290	265	96	61	269	210	—	540	28
FSF15	150	400	405	383	140	89	387	280	—	770	55
FSF20	200	650	531	510	183	117	452	330	384	1,000	67
FSF30	300	900	730	720	277	168	642	445	513	1,400	135

PULSE BARRIER (Contact Converter)

With the pulse barrier, the contact pulse transmitter is classed as an intrinsically safe explosion-proof system, and the intrinsic safety explosion-proof system is achieved by the installation of the barrier between the TOKICO gas flowmeter with contact pulse transmitter, and an ordinary receiver (non-explosion-proof area).

EXAMPLE OF CONNECTION



Note) Common line must not be set to this circuit.

STANDARD SPECIFICATION

Model		3001-3R	3002-3R	3005-3R
Number of Channels		1	2	5
Input contact short-circuit current		15V DC, 15 mA		
Response Time		10 ms		
Operation		a-Contact ON-OFF (Output relay ON when input contact is short-circuited)		
Output	Signal	Non-voltage contact ·· One pair a channel		
	Contact Capacity	Maximum 220V AC or 24V DC 3 A		
Explosion-proof Structure		i3nG5		
Ambient Temperature		0 ~ 50 °C		
Power Supply		100 / 200V AC 50 / 60 Hz common use		
Power Consumption		2.8VA	3.2VA	3.5VA
Dimensions		120×70×65 mm	120×92×65 mm	120×112×65 mm
Approx. Weight		0.7 kg	0.8 kg	0.85 kg

SUB-STRAINER

When the distance between the TOKICO gas flowmeter and the strainer is too long, and the strainer cannot be connected directly, a sub-strainer is installed in the entrarce to the flowmeter to prevent dust and welding waste entering the flowmeter.

Conn. Size (mm)	Dimensions (mm)					n	α°
	H	φC	φD	φE	φh		
50	50	120	155	25	19	4	45
80	60	150	185	40		8	22.5
100	70	175	210	50			
150	110	240	280	75	23		
200	175	290	330	80		12	15
300	210	400	445	120	25	16	11.25

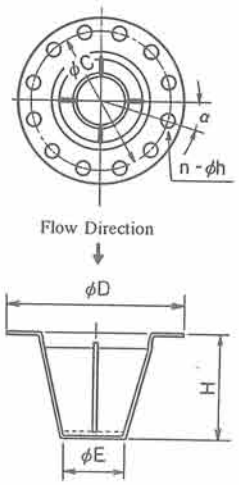
OIL FOR TOKICO GAS FLOWMETER

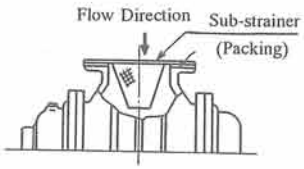
Please use TOKICO's exclusive oil for the TOKICO gas flowmeter.

Oil change Interval

Depending on different conditions, there is a difference in oil changing. Change oil once after a year, then change according to dirt levels.

DIMENSION DRAWING





Required oil quantity

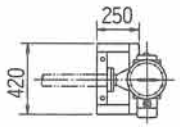
Model	Required oil quantity (L)
0050	0.25
0125	0.4
0200	0.75
0350	1.3
0500	2.3
Z0700	
1000	4
2000	9

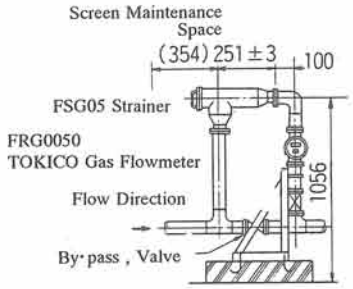
⚠ CAUTIONS FOR USE

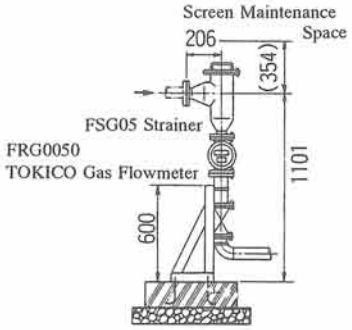
- Be sure to operate the flowmeter within the specification stamped on the name plate.
- Please give the flow direction from top to bottom, and install the flowmeter so that the rotor shaft become horizontal.
- Please provide the space for the convenience of flowmeter disassembly and maintenance.
- Because the dirt in piping causes the breakdown, please note that neither the welding waste nor sand, etc. enter especially at the new piping.
- Please inject oil into the flowmeter before the driving because the oil is not poured when the flowmeter is shipped.
- Please do not remove the dustproof seals attached on the entrance and the exit of the flanges of the flowmeter, immediately before the installation.
- The seal paint must not flow in the measurement room when painting the seal for the gas leakage prevention when the gas meter is installed.

PIPING EXAMPLE

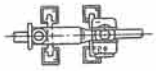
Connection Size
: 50 mm

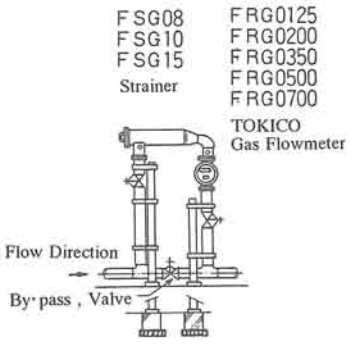




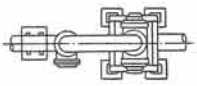


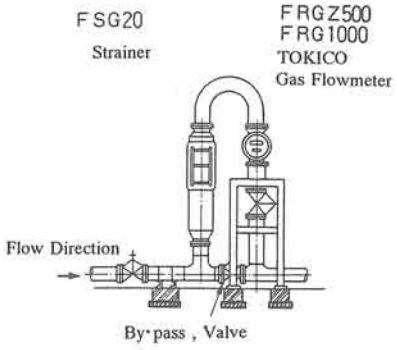
Connection Size
: 80 ～ 150 mm





Connection Size
: 200 mm





ORDERING INSTRUCTIONS : Specify the followings when ordering

No.	Item	Contents
1	Applicable Fluid Name	Name
2	Accuracy	± % (The standard is to conform to the official approval allowance)
3	Flow Rate	Maximum, Normal use, Minimum (Time of use for each day) (m^3/h)
4	Operating Temperature	Maximum, Normal use, Minimum (℃)
5	Operating Pressure	Maximum, Normal use, Minimum (MPa)
6	Connection Standard	Connection size, Flange standard etc.
7	Temperature Compensation	Necessary or no, Range of compensation and standard temperature, etc. if it is necessary
8	Pressure Compensation	Necessary or no, Range of compensation and standard pressure, etc. if it is necessary
9	Applied regulations	Name of regulations and standard
10	Attached equipment	Necessity of Strainer etc.
11	Power supply	With the Pulse transmitter
12	Official approval examination	Necessary or no

*Please use the flowmeter correctly after reading 'Guidance book'.
*The information in this General Specification subject to change without prior notice.

TOKICO LTD.
INTERNATIONAL OPERATIONS
PARALE MITSUI BUILDING
8 HIGASHIDA-CHO KAWASAKI-KU
KAWASAKI-CITY 210 JAPAN
TEL. (044)200-0244
INT' L FAX. (044) 200-0271