General Specifications

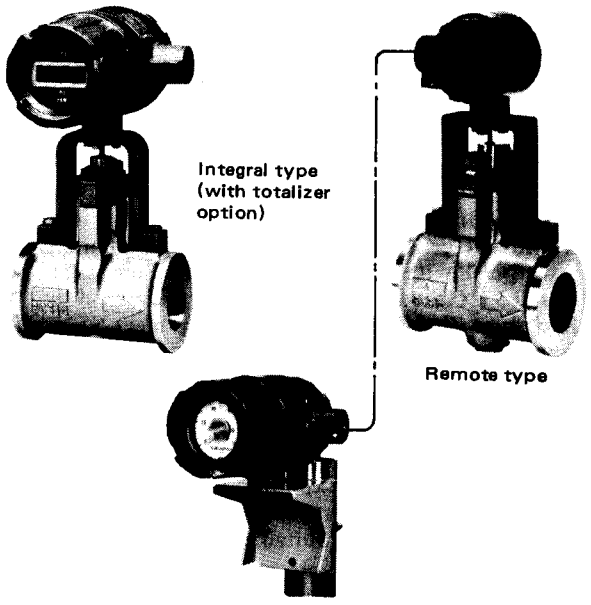
Model YF100 Vortex Flowmeters

YEWFLO (STYLE C)

These YF100 Vortex Flowmeters measure process fluid flow by measuring the rate at which vortices are shedded from a shedder in the process flow line. A piezoelectric sensor mounted outside the flow line is used as the transducer. Two Flowmeter versions are available: one has a built-in (integral) converter, the other–used with a remote converter–is for when the detector is inaccessible or when high temperature process liquid, gas or steam flow is to be measured. In either case, the associated converter provides a pulse output or a 4 to 20 mA DC signal proportional to flow rates.

YEWFLO features–summarized below–match a wide range of applications:

- Simple, rugged construction
- Reliable–no moving parts, no fluid-sensor contact
- Both wide rangeability and high accuracy
- Converter provides pulse or current output
- Low installed cost



STANDARD SPECIFICATIONS

Fluid to be Measured: Liquid, gas or steam.

Measurable Flow Rates: Refer to Sizing Charts.

Accuracy: (on linear ranges)

Liquid: ±0.8% of rate.

Gas and Steam: ±1.5% of rate.

For analog output version, add ±0.1% of full scale to the above values.

Repeatability: 0.2% of flow rate.

Span Setting: For analog outputs, a screw-type span adjustment allows span to be adjusted in the following ranges.

Liquid: 0–1.1 to 0–10 m/s or 0–3.7 to 0–32 ft/s for 1- to 4-inch flowmeters.
0–1.5 to 0–10 m/s or 0–5 to 0–32 ft/s for 1/2, 6- and 8-inch flowmeter

Gas or Steam: 0–11 to 0–80 m/s or 0–37 to 262 ft/s
0–15 to 0–80 m/s or 0–50 to 0–262 ft/s for 1/2- and 8-inch

Time Constant: 3.0 sec (analog output version)

Output Signal (from converter):

Analog: 4 to 20 mA DC, 2 wire system.

Pulse: Voltage pulse, 3 wire system.
Low level: 0 to 2 V.
High level: Vs (Input supply voltage) (minus) 2V.
Duty cycle: 50% (with totalizer: when "scaled pulse" output is selected, pulse duty cycle are irregular.)
Nominal values of pulse frequency are shown in Table 1.

Power Supply Voltage and Load Requirements:

Analog output: 12 to 45 VDC.
See "Relationship between supply voltage and external load resistance" Figure 1.

Pulse output: 12 to 30 VDC (Input supply voltage)
Permissible voltage ripple: less than ±1.5 V with an input supply voltage of more than 13.5V.
Minimum load resistance; 10 kΩ.
Maximum line capacitance: 0.22 μF.
Maximum leadwire resistance: 50 Ω.

Process Temperature Limits: -40 to 300°C (-40 to 572°F). Refer to Figure 2 for integral converter type. High temperature version (-40 to 400°C or -40 to 752°F) available on request.

Process Pressure Limits: -1 kg/cm^2 (-15 psi) to flange ratings.

Ambient Temperature Limits:

−40 to 80°C (−40 to 176°F).
With indicator: −20 to 60°C (−4 to 140°F).
With totalizer: −10 to 60°C (14 to 140°F).
FM Explosionproof: −40 to 60°C (−40 to 140°F).

Ambient Humidity Limits: 5 to 100% relative humidity.

Signal Cable: Order model YF011 for remote converter type.

Maximum cable length: 20m (65 ft).

Cable Conduit Connection: ANSI ½ NPT female.

Mounting: Flowmeter can be installed vertically, horizontally or at any other angle. For liquid service, the flow line must be filled with the liquid.

Size of Adjoining Flowline: Schedule No. 40 or lower, for 1/2- to 2-inch flowmeters. Schedule No. 80 or lower pipes for 3- to 8-inch flowmeters.

Flowline Straightness: The length of straight flow line upstream and downstream of the flowmeter should be the same as generally recommended for an orifice meter (ASME, Fluid Meter).

If a single elbow or reducer is installed upstream of the flowmeter, install it at a distance at least 10 times the

YOKOGAWA ◆
Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180 Japan
Tel.: 0422-52-5586 Telex: 02822-327 YEW MTJ Fax.: 0422-52-9802

GS 1F2B2-U

9th Edition: Feb. 1991 (YG)

flow line internal diameter upstream of the vortex flowmeter; the flow line should be straight for a distance at least 5 times the flow line internal diameter downstream of the vortex flowmeter. If a shut-off valve is located upstream of the flowmeter, provide a straight pipe – if possible more than 40 times as long as the pipe inside diameter – between it and the flowmeter.

* At least 20 times as long as the pipe inside diameter.

Pressure and Temperature Taps: For pressure and temperature measurement, the pressure and temperature taps should be located as shown in Figure 3.

Material:

Body: ASTM A296 Grade CF8M (AISI 316) stainless steel, DIN 17445-1.4552 stainless steel, or ASTM A216 Grade WCC carbon steel.

Flowmeter Housing and Cover: Aluminum alloy, finished with polyurethane paint. Dark green (Munsell 5.0 GY 3.6/1.3.)

Enclosure Classification: Designed to meet NEMA Type 4-protection Watertight and Dust-tight.

Electrical Classification: Approved by FM explosionproof Class I, Groups B, C & D, Division 1 & 2. Dustignitionproof Class II, Groups E, F & G, Division 1 & 2. Class III, Division 1 & 2. Temperature range T6.

Approved by CSA. Explosion-proof class I, Groups C & D, Division 1 & 2. Dustignition-proof class II, Group E, F & G. Division 1 & 2. Suitable for class III, Division 1 & 2.

Approved by FM intrinsically safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G, Nonincendive for Class I, Division 2, Groups A, B, C and D and suitable for Class II, Division 2, Groups F and G hazardous locations. Entity parameters (output circuit): Vmax = 31.5 V, Imax = 500 mA, Pmax = 1.1 W, Ci = 6 nF. This approval does not include the totalizer option.

Approved by SAA intrinsically safe for Ex ia IIC T6 and Ex n IIC T6 Class I Zone 2.

Approved by SAA Explosionproof for Ex d IIB T6 IP54 Class I, Zone 1.

Approved by CSA Intrinsically Safety for Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Encl. 4:

OPTIONS

Indicator: (Suffix code: TBL)

Available for 4 to 20 mA DC output version. 0 to 100% uniform 250° circular scale, scale length: 130 mm (5.1 inch), Class 1.5 (accuracy: ±1.5% of full scale value), weight: Add 0.8 kg (1.8 lb).

(Actual flowrate scale . . . . . Suffix code: **TBS**)

Stainless Steel Tag Number Plate: (Suffix code: **SCT**)

AISI 304 stainless steel tag number plate.

Totalizer: (Suffix code: **TBT**)

Available for 4 to 20 mA DC and pulse output versions. Six-digit LCD display. Scaler setting accuracy: ±0.05%. Retransmission signal: analog or pulse (for pulse output, "scaled" and "unscaled" are possible). Totalizer value protection at power failure: depends on built-in battery.

Not available for FM and SAA intrinsically safe.

Weight: Add 0.5 kg (1.1 lb.)

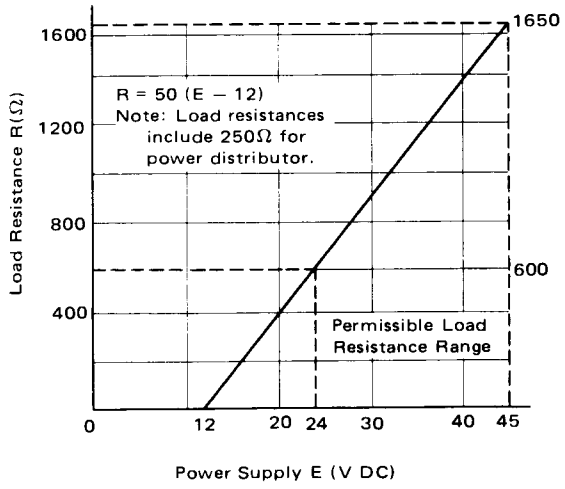


Figure 1. Relationship between Supply Voltage and Load Resistance (Analog output version)

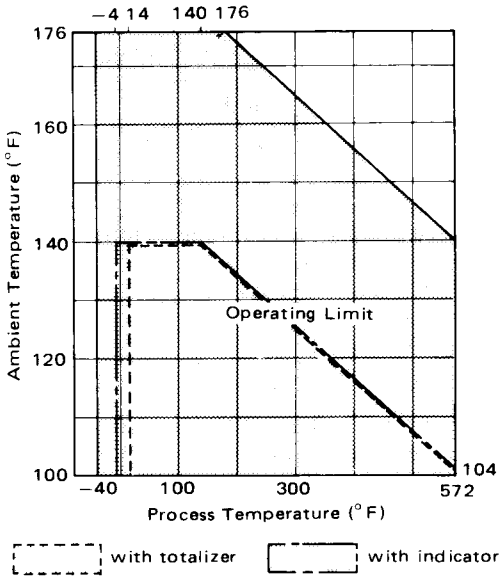


Figure 2. Operating Temperature Hi-Limit (Integral Converter type)

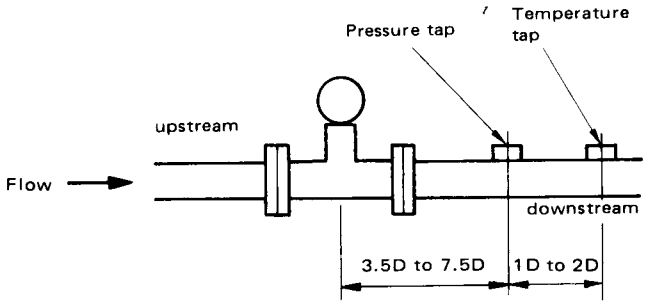


Figure 3. Pressure and Temperature Taps.

Table 1. Nominal Pulse Rate and K-Factor

Nominal Size		Internal Diameter inch	Cross Sectional Area ft^2	Nominal Pulse Rate Hz/ft/s	Nominal K-Factor	
mm	inch				Pulse/ U.S.gal.	Pulse/ft^3
15	1/2	0.57	0.0018	19.1	1423	10645
25	1	1.01	0.0056	10.8	259	1940
40	1-1/2	1.56	0.0133	7.05	70.8	530
50	2	2.01	0.022	5.59	33.9	253
80	3	2.80	0.043	4.02	12.6	94.3
100	4	3.69	0.074	3.00	5.39	40.3
150	6	5.46	0.163	2.03	1.67	12.5
200	8	7.31	0.291	1.52	0.7	5.24

Pressure Loss: Obtained from the following equations.

$$\Delta P = 2.33 \times 10^{-4} \cdot \gamma_f \cdot V^2$$

$$\text{or } \Delta P = 3.89 \times 10^{-5} \cdot \gamma_f \cdot \frac{(Q_1)^2}{D^4}$$

$$\Delta P = 6.05 \times 10^{-7} \cdot \gamma_f \cdot \frac{(Q_2)^2}{D^4}$$

where,

ΔP : Pressure loss (psi)
γ_f : Specific weight at operating conditions (lb/ft^3)
V : Flow velocity (ft/s)
Q_1 : Actual flow rate (U.S. gpm)
Q_2 : Actual flow rate (ACFH)
D : Internal Diameter (inch)

Figures 4 and 5 shows pressure loss versus flow rates.

Minimum Back Pressure (Liquids service only): Confirm that the flow line pressure is sufficiently high that no cavitation occurs. The optimum line pressure can be obtained from the following equation.

$$P = 2.7 \cdot \Delta P + 1.3 \cdot P_0$$

where,

P : Line pressure, 3.5 to 7.5 times flow line internal diameter downstream of the vortex shedder. (psia).
ΔP : Pressure loss (psi). Refer to the item above.
P_0 : Saturation liquid vapor pressure (psia) at operating temperature.

(Example)

Water flow rate: 0 to 200 U.S. gpm
Specific weight: 61.91 lb/ft^3
Operating pressure: 0.5 kg/cm^{2}G (7.11 psig)
Operating temperature: 40°C (104°F)
Flowmeter size: 2 inch
Solution

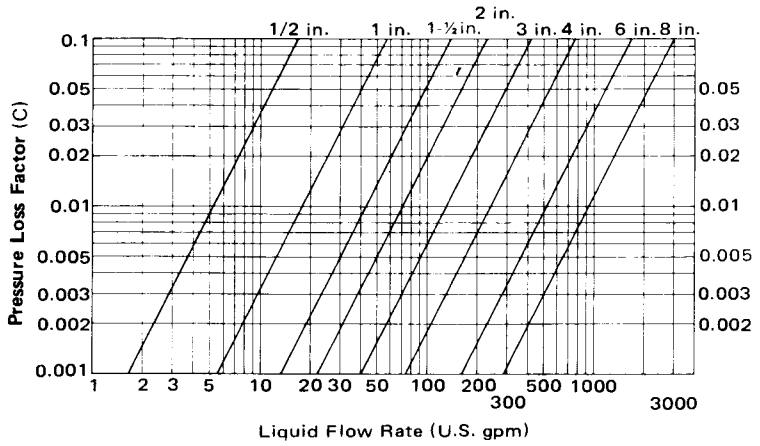
$$\Delta P = 3.89 \times 10^{-5} \times 61.91 \times \frac{200^2}{2.01^4}$$

$$= 5.90 \text{ psi}$$

$$P = 2.7 \times 5.90 + 1.3 \times 1.07$$

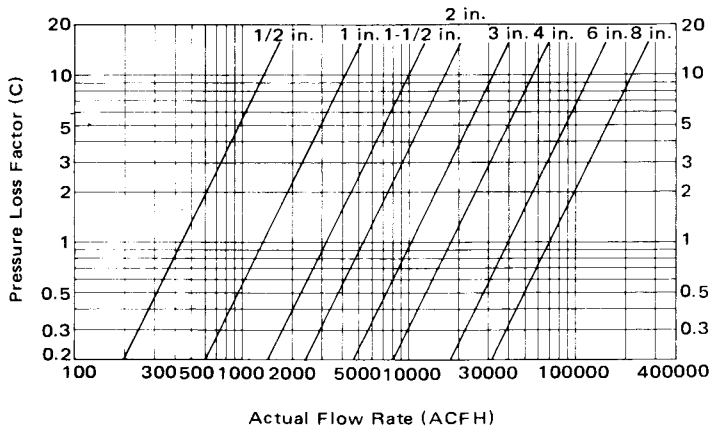
$$= 17.32 \text{ psia} = 2.63 \text{ psig}$$

Since the operating pressure of 7.11 psig is higher than 2.63 psig, no cavitation occurs.



$\Delta P = C \times \gamma_{f1}$
$\Delta P = 7.481 \times \gamma_{f2} \times C$
or $\Delta P = 62.4 \times C \times S.G.$
ΔP: Pressure loss (psi)
γ_{f1} : Specific weight (lb/ft^3)
γ_{f2} : Specific weight (lb/U.S.gal)
S.G.: Specific gravity

Figure 4. Pressure Loss–Liquid



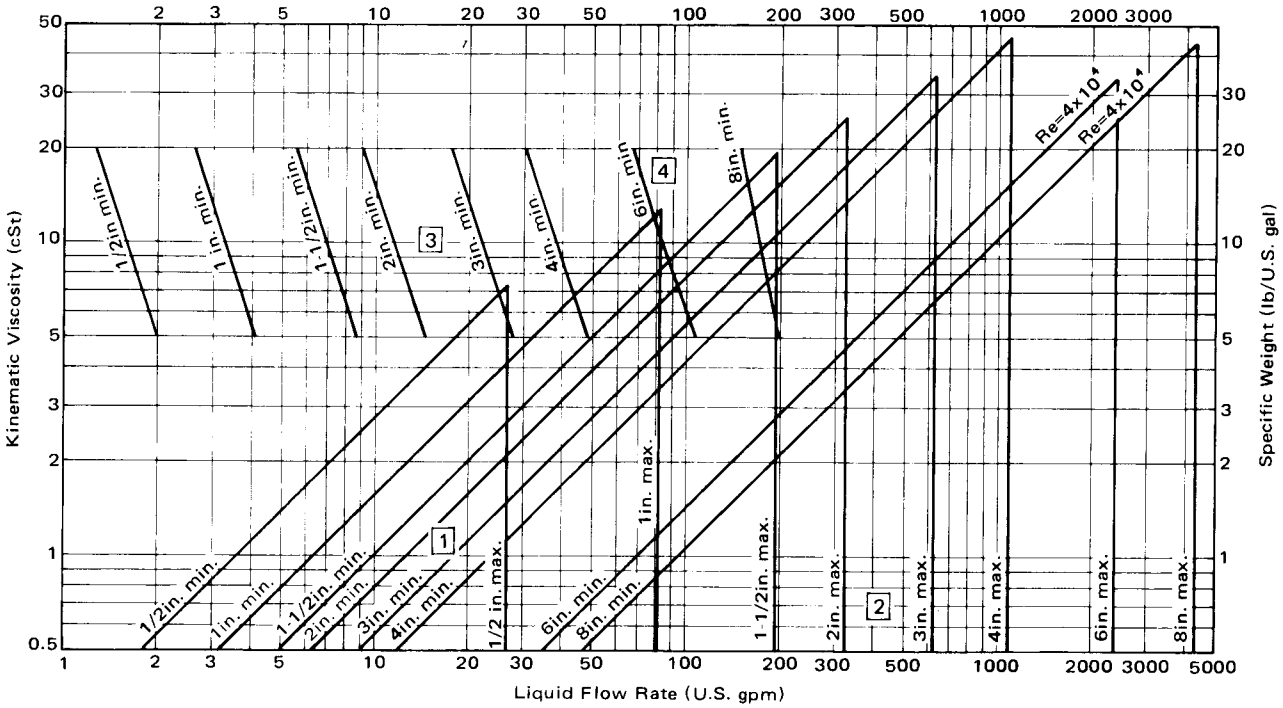
$\Delta P = C \times \gamma_f$
or $\Delta P = C/\upsilon_f$
ΔP: Pressure loss (psi)
γ_f : Specific weight at operating conditions (lb/ft^3)
υ_f : Specific volume at operating conditions (ft^3/lb)

Figure 5. Pressure Loss–Gas and Steam

Table 2. Water Flow Rates

Nominal Size		Miminum and Maximum Measurable Flow Rates in U.S. gpm (a)
mm	inch	
15	1/2	1.6 (4.2) and 26
25	1	(c) 3.3 (7.3) and 82 (b)
40	1-1/2	6.9 (11.3) and 196
50	2	12 (14.5) and 324
80	3	22 and 627
100	4	39 and 1090
150	6	84 and 2390
200	8	171 and 4280

(a) At standard conditions of 15°C (59°F).
(b) Maximum flow rates are based on 10 m/s (32 ft/s).
(c) The values in parentheses show the minimum linear flow rate (Re = 20,000 or 40,000) when they are higher than the minimum measurable flow rate.



[1] 1/2 to 4in: $Q = 6.321 \times D \cdot \nu$ (Re = 20,000)
6in: $Q = 69.08 \times \nu$ (Re = 40,000)
8in: $Q = 92.34 \times \nu$ (Re = 40,000)

[2] $Q = 14740 \times S$

[3] 1/2in: $Q = 3.430 \times \gamma_f^{-\frac{1}{3}}$
1in: $Q = 6.668 \times \gamma_f^{-\frac{1}{3}}$
1½ to 6in: $Q = 5.699 \times D^2 \cdot \gamma_f^{-\frac{1}{3}}$
8in: $Q = 271.6 \times \gamma_f^{-\frac{1}{5}}$

[4] 6in: $Q = 128.3 \times \gamma_f^{-\frac{1}{3}}$
(when $\gamma_f > 8.36$ lb/U.S. gal or 62.6 lb/ft^3)

Q: Liquid flow rate (U.S. gpm)
D: Internal diameter (inch)
S: Cross sectional area (ft^2)
γ_f: Specific weight of normal operating conditions (lb/U.S. gal)

Note 1. The minimum flow rate is the larger of those defined by curves [1] and [3]

Note 2. ν (cSt) = μ (cP) / γ (g/cm^3)

Figure 6. Sizing Chart–Liquid

Table 3. Air Flow Rates at Selected Process Pressures

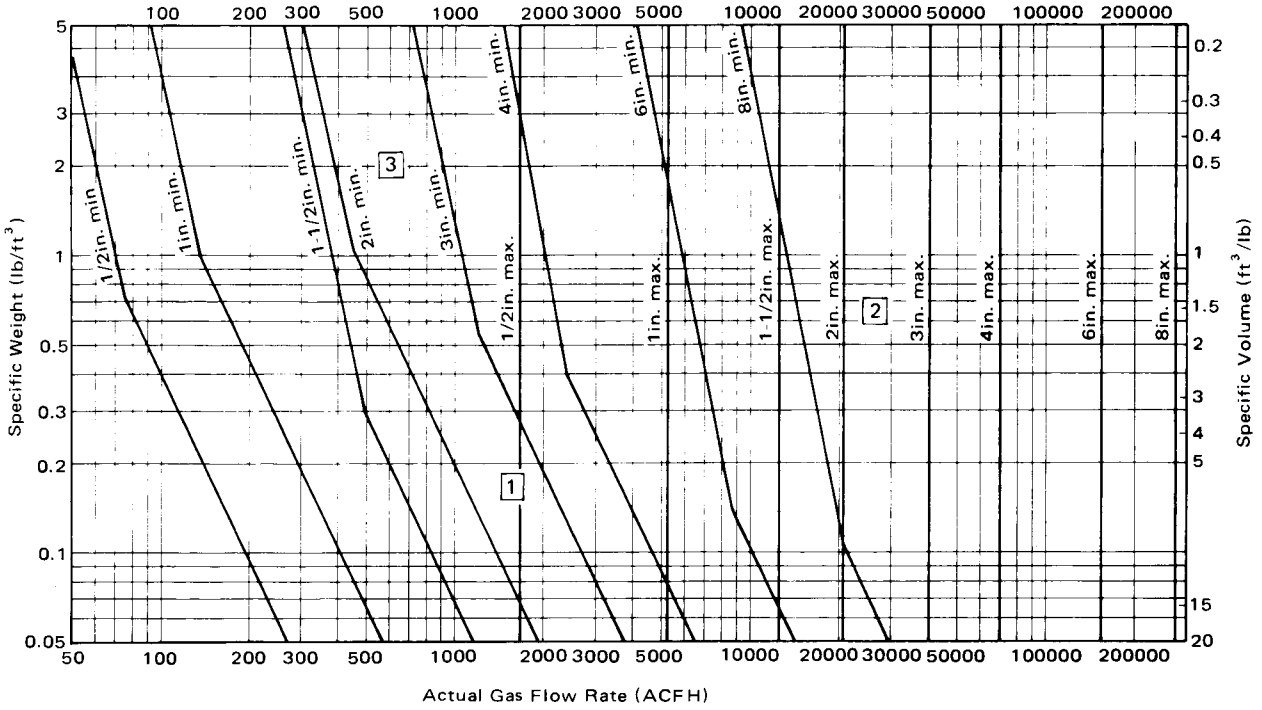
Nominal Size		Flow Rate Limits	Minimum and Maximum Measurable Flow Rates in SCFH (a)							
mm	inch		0 psig (b) (0kg/cm²)	50 psig (3.52kg/cm²)	100 psig (7.03kg/cm²)	150 psig (10.5kg/cm²)	200 psig (14.1kg/cm²)	300 psig (21.1kg/cm²)	400 psig (28.1kg/cm²)	500 psig (35.2kg/cm²)
15	1/2	min. (c)	216 (430)	452	602	747	923	1253	1562	1857
		max. (d)	1670	7480	13200	19000	24800	36300	47900	59500
25	1	min.	467 (754)	979	1310	1570	1900	2580	3220	3820
		max.	5290	23200	41200	59200	77200	113000	149000	185000
40	1-1/2	min.	954 (1170)	2070	3260	4360	5380	7310	9110	10900
		max.	12500	55300	98000	140000	183000	269000	354000	407000
50	2	min.	1580	3320	4420	5290	6180	8380	10500	12500
		max.	20700	91000	162000	232000	303000	445000	524000	524000
80	3	min.	3050	6400	8760	11800	14500	19700	24600	29200
		max.	40600	178000	317000	455000	593000	731000	731000	731000
100	4	min.	5330	11600	18200	24300	30100	40800	50900	60500
		max.	69900	307000	545000	783000	963000	963000	963000	963000
150	6	min.	11700	31900	50500	67400	83300	114000	141000	168000
		max.	154000	677000	1200000	1420000	1420000	1420000	1420000	1420000
200	8	min.	24400	72900	114800	153400	189600	257500	321000	382000
		max.	274000	1210000	1900000	1900000	1900000	1900000	1900000	1900000

(a) At standard conditions of 15°C (59°F) and 1.0332 kg/cm² absolute (14.7 psia). SCFH: Standard cubic feet per hour.
(b) Pressure listed is at process temperature of 15°C (59°F).
(c) Minimum values are determined from Figure 7. The values in parenthesis show the minimum linear flow rate (Re=20,000 or 40,000) when they are higher than the minimum measurable flow rate.
(d) Maximum flow rates are based on 80 m/s (262 ft/s) or Reynolds number limit (7,000,000), whichever is lower.

Table 4. Saturated Steam Flow Rates at Selected Process Pressures

Nominal Size		Flow Rate Limits	Minimum and Maximum Operating Flow Rates in lb/h										
mm	inch		1.05 kg/cm² (15psig)	1.76 kg/cm² (25psig)	3.52 kg/cm² (50psig)	5.27 kg/cm² (75psig)	7.03 kg/cm² (100psig)	8.79 kg/cm² (125psig)	10.55 kg/cm² (150psig)	12.30 kg/cm² (175psig)	14.06 kg/cm² (200psig)	17.58 kg/cm² (250psig)	21.09 kg/cm² (300psig)
15	1/2	min. (a)	16.0 (24.3)	18.3 (24.9)	24.2	26.9	31.9	33.1	36.2	38.4	40.7	45.1	49.0
		max. (b)	122	160	279	345	435	526	627	705	793	974	1150
25	1	min.	34.6 (40.2)	39.7 (41.3)	49.9	58.2	65.3	71.8	77.8	83.2	88.2	97.7	107
		max.	379	499	790	1070	1350	1630	1910	2190	2460	3020	3580
40	1-1/2	min.	70.8	82.0	102	119	134	148	168	187	205	242	277
		max.	906	1190	1880	2560	3220	3900	4570	5230	5880	7220	8560
50	2	min.	118	135	169	198	222	244	264	282	299	331	360
		max.	1490	1970	3120	4240	5330	6450	7570	8650	9730	11900	14100
80	3	min.	227	260	327	381	427	470	509	544	577	649	743
		max.	2890	3810	6020	8190	10300	12400	14600	16700	18800	23000	27300
100	4	min.	396	453	570	664	745	824	935	1050	1150	1350	1550
		max.	5050	6650	10500	14200	19900	21700	25500	29100	32800	40200	47700
150	6	min.	866	991	1280	1640	1960	2290	2600	2890	3180	3740	4280
		max.	11000	14500	22900	31200	39300	47500	55700	63700	71700	88000	101000
200	8	min.	1810	2080	3130	3710	4880	5190	5970	6560	7210	8490	9720
		max.	19800	26000	41200	56000	70400	85300	100000	114000	128000	132000	135000

(a) Minimum values are determined from Figure 8. The values in parenthesis show the minimum linear flow rate (Re=20,000 or 40,000) when they are higher than the minimum measurable flow rate.
(b) Maximum flow rates are based on 80 m/s (262 ft/s) or Reynolds number limit (7,000,000), whichever is lower.



1 1/2in: $Q_f = \frac{59.39}{\sqrt{\gamma_f}}$

1in: $Q_f = \frac{128.90}{\sqrt{\gamma_f}}$

1-1/2 to 6in: $Q_f = \frac{107.9 \times D^2}{\sqrt{\gamma_f}}$

8in: $Q_f = \frac{6740}{\sqrt{\gamma_f}}$

2 $Q_f = 5135 \cdot D^2$

3

1/2in:	$Q_f = 64.45 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.76$ lb/ft³)
1in:	$Q_f = 132.7 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.91$ lb/ft³)
1-1/2in:	$Q_f = 376.6 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.30$ lb/ft³)
2in:	$Q_f = 431.7 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 1.05$ lb/ft³)
3in:	$Q_f = 1013 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.55$ lb/ft³)
4in:	$Q_f = 2102 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.30$ lb/ft³)
6in:	$Q_f = 5828 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.14$ lb/ft³)
8in:	$Q_f = 13244 \cdot \gamma_f^{-\frac{1}{5}}$	(when $\gamma_f > 0.11$ lb/ft³)

Q_f: Actual flow rate (ACFH)
D: Internal diameter (inch)
γ_f: Specific weight at normal operating conditions (lb/ft³)

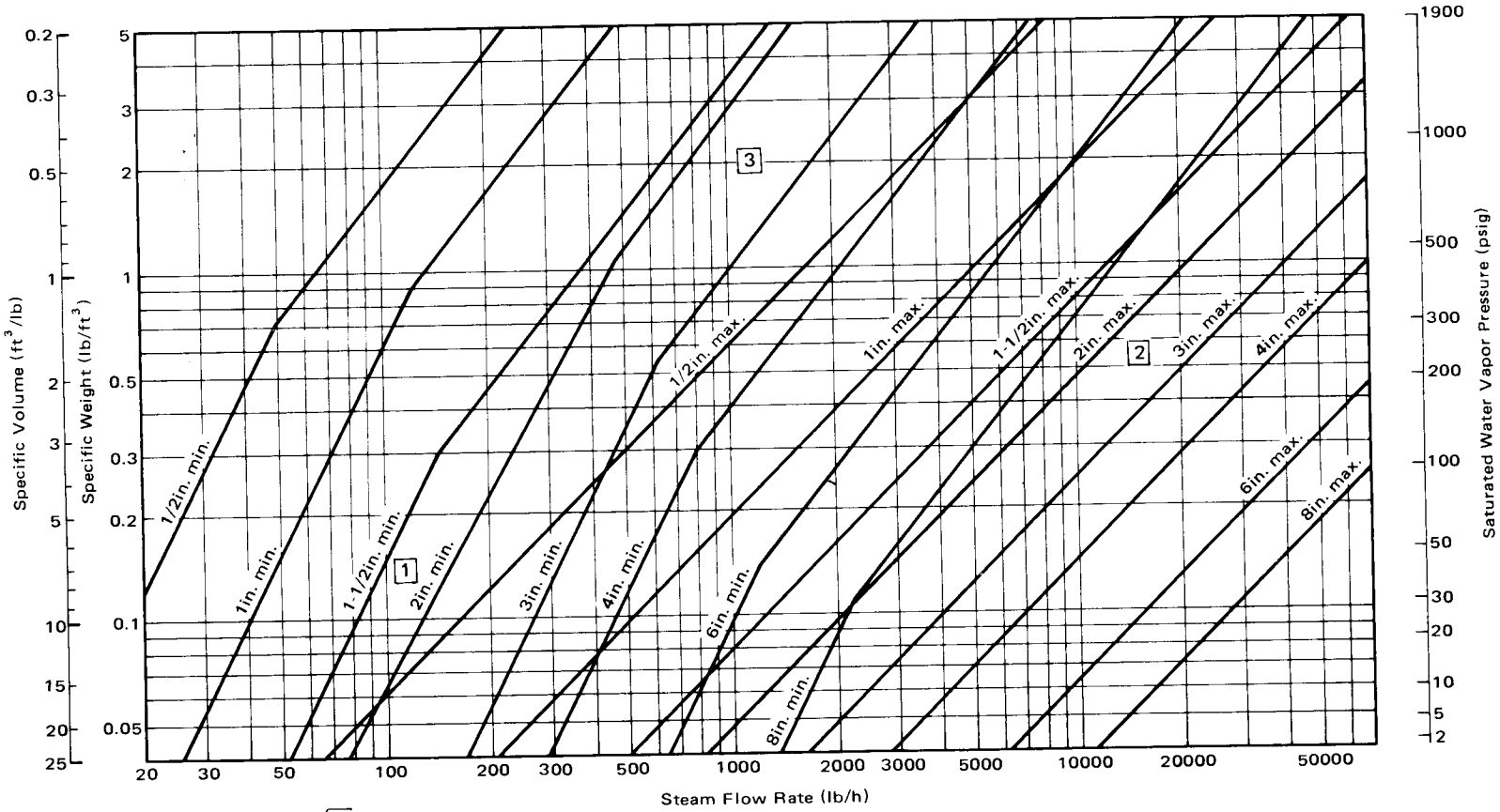
Note γ_f and Q_f corresponding to the scale flow rate are calculated from the following equations.

$$\gamma_f = \gamma_s \times \frac{P + 14.7}{14.7} \times \frac{520}{T + 460} \times \frac{1}{K}$$

$$Q_f = Q_s \times \frac{14.7}{P + 14.7} \times \frac{T + 460}{520} \times K$$

γ_s: Specific weight at standard conditions (lb/ft³)
P: Normal operating pressure (psig)
T: Normal operating temperature (°F)
Q_s: Flow rate at standard conditions (SCFH)
K: Deviation factor

Figure 7. Sizing Chart–Gas



[1] 1/2in $W = 59.39\sqrt{\gamma_f}$

1in: $W = 128.9\sqrt{\gamma_f}$

1-1/2 to 6in: $W = 107.9 \times D^2 \cdot \sqrt{\gamma_f}$

8in: $W = 6740\sqrt{\gamma_f}$

[2] $W = 5135 \times D^2 \cdot \gamma_f$

[3] 1/2in: $W = 64.45 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.76$ lb/ft³)

1in: $W = 132.7 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.91$ lb/ft³)

1-1/2in: $W = 376.6 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.30$ lb/ft³)

2in: $W = 431.7 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 1.05$ lb/ft³)

3in: $W = 1013 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.55$ lb/ft³)

4in: $W = 2102 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.30$ lb/ft³)

6in: $W = 5828 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.14$ lb/ft³)

8in: $W = 13244 \times \gamma_f^{\frac{4}{5}}$ (when $\gamma_f > 0.11$ lb/ft³)

W: Steam flow rate (lb/h)

D: Internal diameter (inch)

γ_f: Specific weight at normal operating conditions (lb/ft³)

Note Steam measurements are influenced by the moisture in the steam.

$\upsilon = x \cdot \upsilon_g + (1 - x)\upsilon_f$

where, υ: Specific volume of steam/water mixture.

υ_g: Specific volume of saturated water vapor in steam.

υ_f: Specific volume of water in steam.

x: Dryness fraction

(1 - x): Wetness fraction

Figure 8. Sizing Chart–Steam

Table 5. Flowmeter Selection Guide

Nominal Size mm (inch)		15(1/2)	25(1)	40(1-1/2)	50(2)	80(3)	100(4)	150(6)	200(8)
Process Connection	Wafer Type	YES	YES	YES	YES	YES	YES	NO	NO
	Flange Type	YES	YES	YES	YES	YES	YES	YES	YES
Body Material	Stainless Steel	YES	YES	YES	YES	YES	YES	YES	YES
	Carbon Steel	NO	NO	NO	NO	NO	NO	YES	YES

Model and Suffix Codes

YF100 Vortex Flowmeters

Model	Suffix Code		Description
YF101			Size 15mm (1-1/2inch)
YF102			Size 25mm (1inch)
YF104			Size 40mm (1-1/2inch)
YF105			Size 50mm (2inch)
YF108			Size 80mm (3inch)
YF110			Size 100mm (4inch)
YF115			Size 150mm (6inch)
YF120			Size 200mm (8inch)
Converter	-AL		Integral type (Liquid)
	-AG		Integral type (Gas or Steam)
	-NN		Remote converter type
Output Signal		S	4 to 20mA DC
		P	Pulse Output
		N	Remote converter type
Process *1 Connection		A1	ANSI Class 150 flange
		A2	ANSI Class 300 flange
		A3	ANSI Class 600 flange (Note1)
		D2	DIN PN10/16 flange (Note 2)
		D4	DIN PN25/40 flange (Note 3)
		B1	ANSI Class 150 wafer
		B2	ANSI Class 300 wafer
		B3	ANSI Class 600 wafer
		E2	DIN PN10/16 wafer (Note 4)
		E4	DIN PN25/40 wafer (Note 5)
		E5	DIN PN64 wafer
		E6	DIN PN100 wafer (Note 6)
Electrical Connection *1		A	ANSI 1/2NPT Female
		D	DIN Pg13.5 Female
Vortex Shedder Material	-S3		Stainless Steel
Body Material *4		S3	Stainless Steel (ASTM)
		C6	Carbon Steel (Note 7)
Style Code		*C	Style C
Electrical Classification *2		/CES	CENELEC (PTB) Intrinsically safe *3
		/FMS	NEC (FM) Intrinsically safe *3
		/FMF	NEC (FM) Explosionproof *1
		/SAS	SAA Intrinsically safe *3
		/SAF	SAA Explosionproof
		/CSF	CSA Explosionproof
		/CSS	CSA Intrinsically safe *4
Options *3		/□/□	

*1 : Process connection — when ordering, ANSI flange or wafer for FM explosionsproof, specify ANSI 1/2NPT Female

*2 : DIN Pg 13.5 female — not available for /FMF, /FMS, and /SAS.

*3 : CENELEC, FM, SAA Intrinsically safe — not available for Integral Totalizer.

*4 : CSA Intrinsically safe — not applicable for HPT (High Temperature Version).

(Note 1) Not appliable for 15 mm, 25 mm, 40 mm and 200 mm.
(Note 2) DIN PN16 for 200 mm (8 inch).
(Note 3) DIN PN40 for 200 mm (8 inch). Specify D4 for DIN PN10/40 of 500 mm (2 inch).
(Note 4) Applied to 100 mm (4 inch). Should use E4 for less than 100 mm (4 inch).
(Note 5) Specify E4 for DIN PN10/40 of less than 100 mm (4 inch).
(Note 6) Specify E6 for DIN PN64/100 of 50 mm (2 inch) to 100 mm (4 inch).
(Note 7) Not applicable for ANSI 600 flange type of size 150 mm (6 inch).

YFA11 Vortex Flow Converter (Remote type)

Model	Suffix Code		Description
YFA11			Vortex Flow Converter
Fluid	-L		Liquid
	-G		Gas or Steam
Output Signal		S	4 to 20 mA DC
		P	Pulse Output
Mounting		P	2 inch Pipe Mounting
Electrical Connection*2		J	JIS PF1/2 Female
		A	ANSI 1/2NPT Female
		D	DIN Pg13.5 Female*3
Flowmeter Nominal Size	-01		15mm (1/2 inch)
	-02		25mm (1 inch)
	-04		40mm (1-1/2 inch)
	05		50mm (2 inch)
	08		80mm (3 inch)
	-10		100mm (4 inch)
	-15		150mm (6 inch)
	-20		200mm (8 inch)
Style Code		*C	Style C
Electrical Classification	/CES		CENELEC (PTB) Intrinsically safe *3
	/FMS		NEC (FM) Intrinsically safe *3
	/JSF		JIS Explosionproof
	/FMF		NEC (FM) Explosionproof
	/SAS		SAA Intrinsically safe *3
Options	/□/□		

YF011 Signal Cable (Remote type)

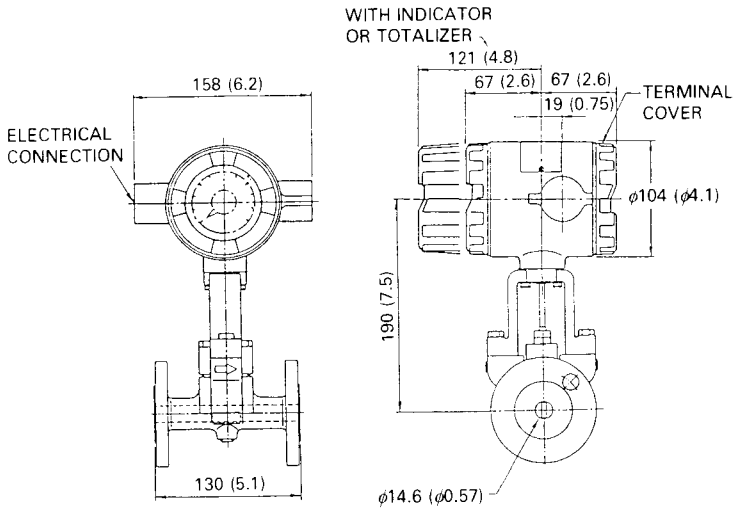
Model	Suffix Code		Description
YF011			Signal Cable
Cable End	-0		Without Preparation
	-1		With Preparation
Cable Length	-05		5m
	-10		10m
	-15		15m
	-20		20m
Style Code	*C		Style C
Electrical Classification	/CES		CENELEC (PTB) Intrinsically Safe
Options	/C□		With cable end finish parts An entered digit shows required set quantity. Only for YF011-0

EXTERNAL DIMENSIONS

Unit: mm (inch)

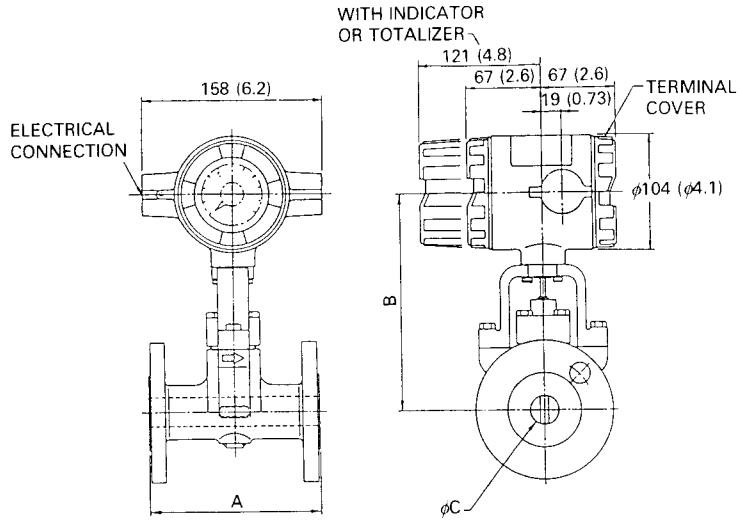
- **INTEGRAL TYPE**

Flange Type



WEIGHT

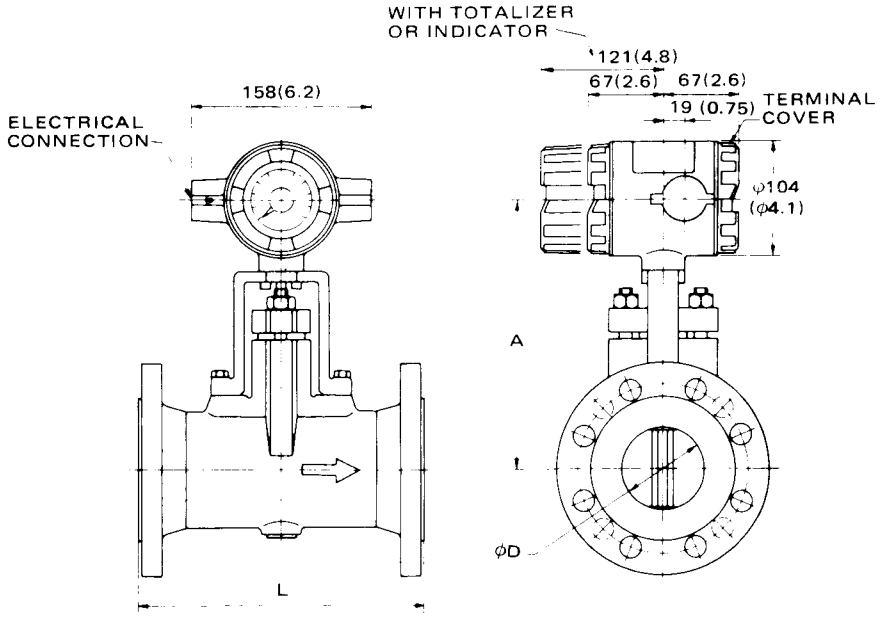
ANSI 150	4.8 kg (10.6 lb)
ANSI 300	5.0 kg (11.0 lb)



SIZE	A	B	φC
1 inch	150(5.9)	192(7.6)	25.7(1.01)
1-1/2 inch	150(5.9)	199(7.8)	39.7(1.56)

WEIGHT

SIZE	ANSI	
	150	300
1 inch	7.3 kg (16.1 lb)	7.9 kg (17.4 lb)
1-1/2 inch	8.5 kg (18.7 lb)	10.0 kg (22.0 lb)

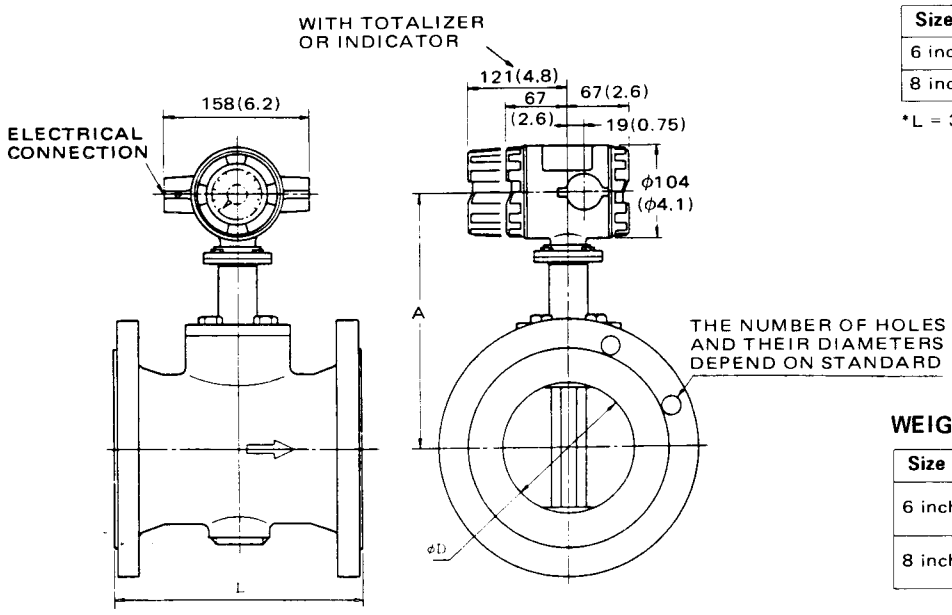


Size	A	D	L
2inch	221(8.7)	51.1(2.01)	200(7.9)*
3inch	238(9.4)	71.0(2.80)	250(9.8)*
4inch	253(10)	93.8(3.69)	260(10.2)*

*L=230(9.1) for ANSI Class 600 flange.

WEIGHT

Size	Class 150	Class 300	Class 600
2inch	12kg(26lb)	13kg(29lb)	15kg(33lb)
3inch	21kg(46lb)	24kg(53lb)	28kg(62lb)
4inch	30kg(66lb)	37kg(81lb)	53kg(117lb)



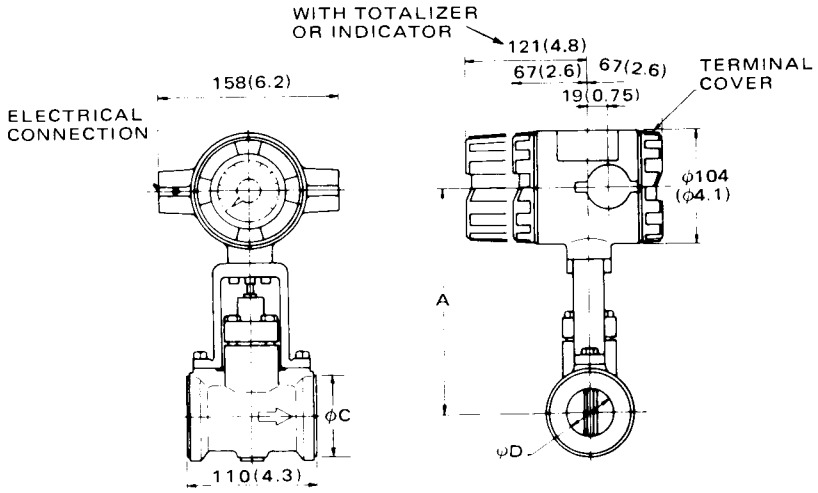
Size	A	D	L
6 inch	272(10.7)	138.8(5.46)	270*(10.6*)
8 inch	304(12.0)	185.6(7.31)	310 (12.2)

*L = 310(12.2) for ANSI Class 600.

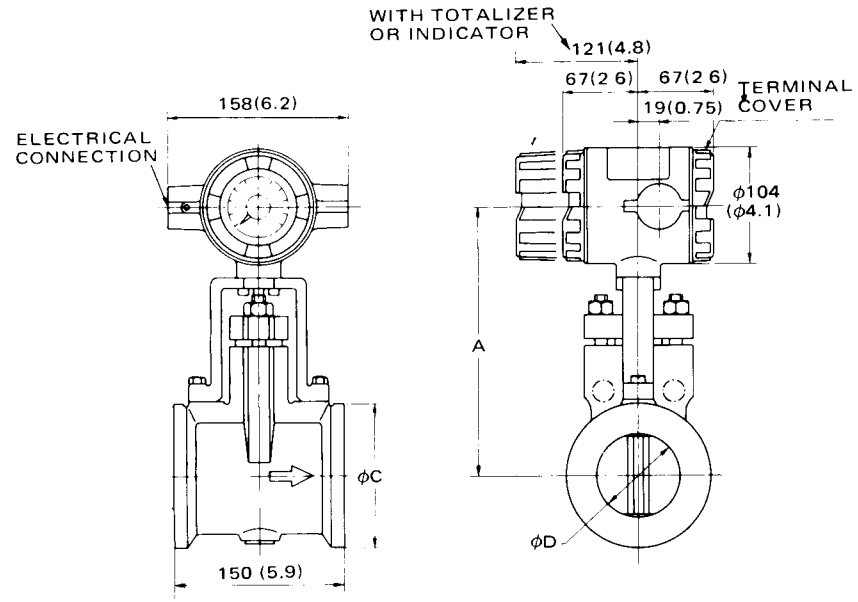
WEIGHT

Size	Class 150	Class 300	Class 600
6 inch	37kg (82lb)	55kg (121lb)	85kg (187lb)
8 inch	56kg (123lb)	81kg (179lb)	—

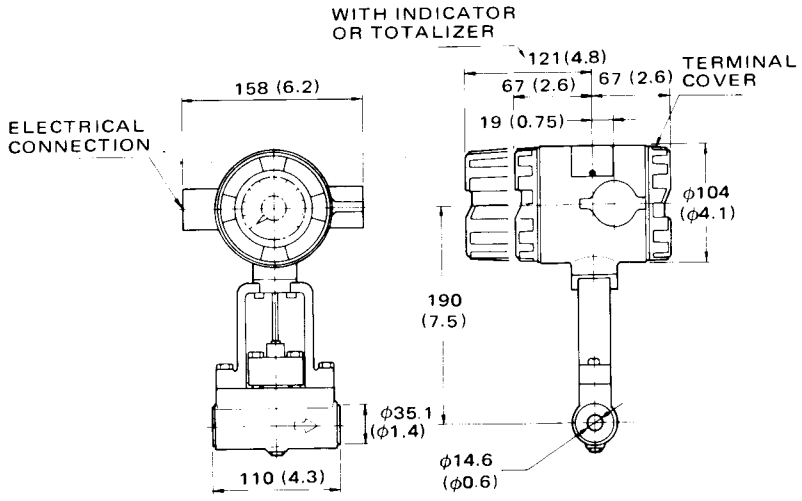
Wafer Type



Size	A	C	D	WEIGHT
1inch	192(7.6)	50.8(2.00)	25.7(1.01)	4.7kg(10lb)
1-1/2 inch	199(7.8)	73 (2.87)	39.7(1.56)	5.3kg(12lb)



Size	A	C	D	WEIGHT
2inch	221(8.7)	92 (3.62)	51.1(2.01)	7.4kg(16lb)
3inch	238(9.4)	127 (5.00)	71.0(2.80)	12kg(26lb)
4inch	253(10)	157.2(6.19)	93.8(3.69)	15kg(33lb)

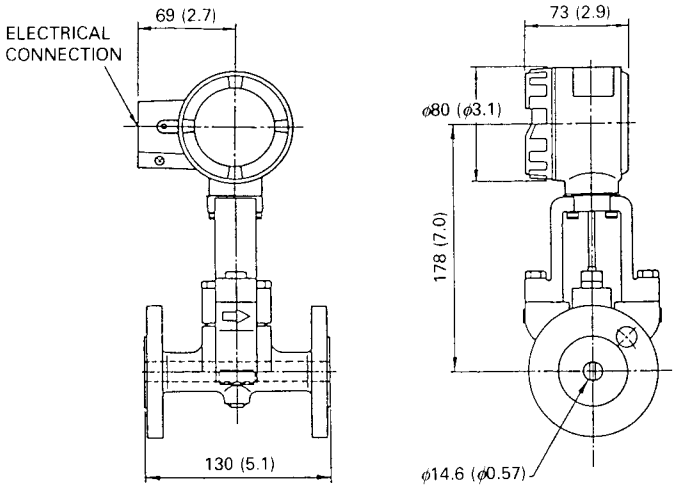


Size: 1/2 inch
Weight: 4 kg (8.8 lb)

- **REMOTE TYPE**

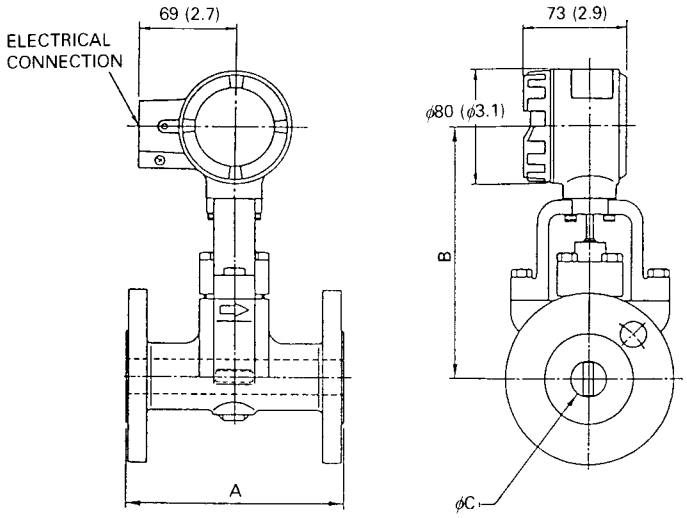
Flange Type

Unit: mm (inch)



WEIGHT

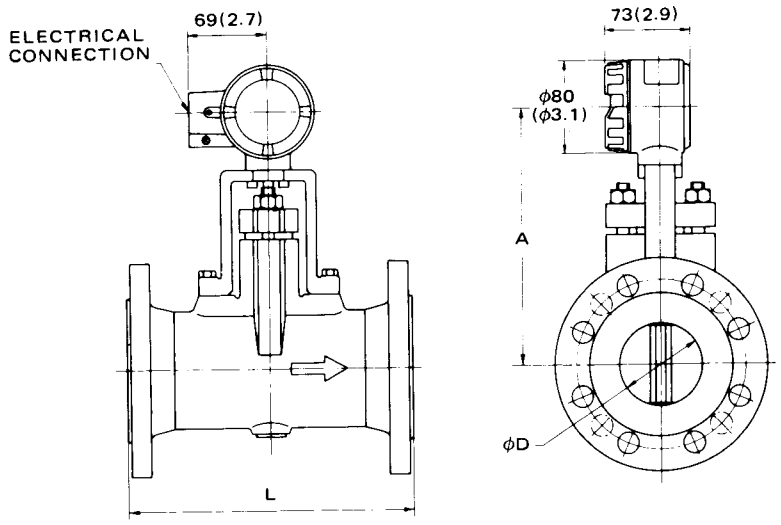
ANSI 150	3.6 kg (7.9 lb)
ANSI 300	3.8 kg (8.4 lb)



SIZE	A	B	ϕC
1 inch	150(5.9)	180(7.1)	25.7(1.01)
1-1/2 inch	150(5.9)	187(7.4)	39.7(1.56)

WEIGHT

SIZE	ANSI	
	150	300
1 inch	6.1 kg (13.4 lb)	6.7 kg (14.8 lb)
1-1/2 inch	7.6 kg (16.8 lb)	8.8 kg (19.4 lb)

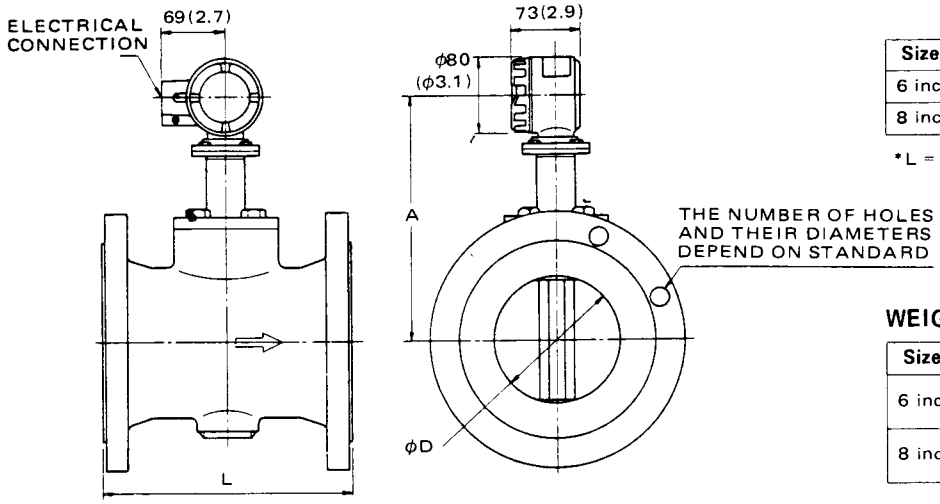


Size	A	D	L
2 inch	209 (8.2)	51.1 (2.01)	200 (7.9)*
3 inch	226 (8.9)	71.0 (2.80)	250 (9.8)
4 inch	241 (9.5)	93.8 (3.69)	260 (10.2)

* L=230(9.1) for ANSI Class 600 flange.

WEIGHT

Size	Class 150	Class 300	Class 600
2 inch	11kg (24lb)	12kg (26lb)	14kg (31lb)
3 inch	20kg (44lb)	23kg (51lb)	27kg (59lb)
4 inch	29kg (64lb)	36kg (79lb)	52kg (115lb)



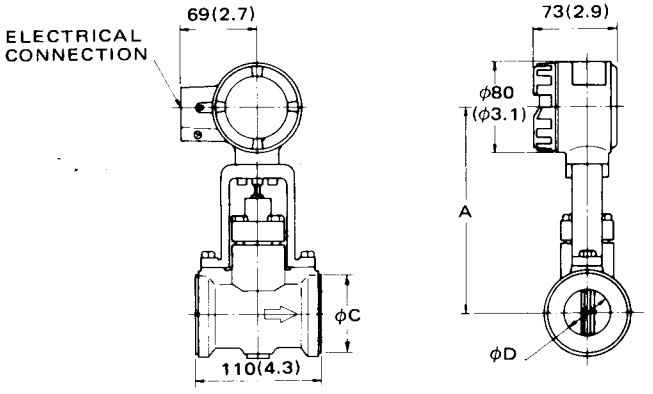
Size	A	D	L
6 inch	260(10.2)	138.8(5.46)	270*(10.6*)
8 inch	292(11.5)	185.6(7.31)	310 (12.2)

*L = 310(12.2) for ANSI Class 600.

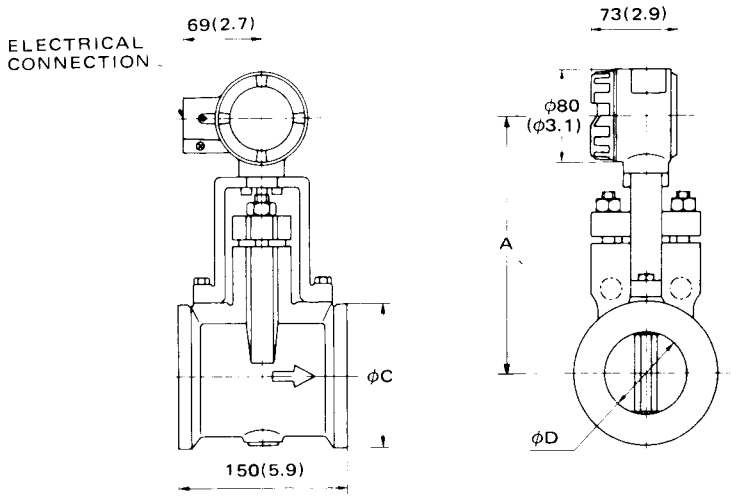
WEIGHT

Size	Class 150	Class 300	Class 600
6 inch	36kg (79lb)	54kg (119lb)	84kg (185lb)
8 inch	55kg (121lb)	80kg (176lb)	—

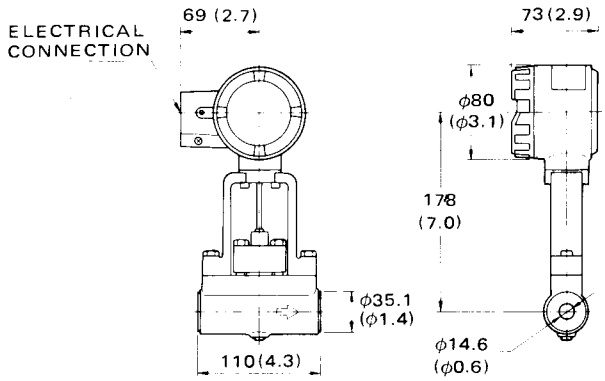
Wafer Type



Size	A	C	D	WEIGHT
1inch	180(7.1)	50.8(2.00)	25.7(1.01)	3.7kg(8.1lb)
1-1/2 inch	187(7.4)	73 (2.87)	39.7(1.56)	4.3kg(9.5lb)

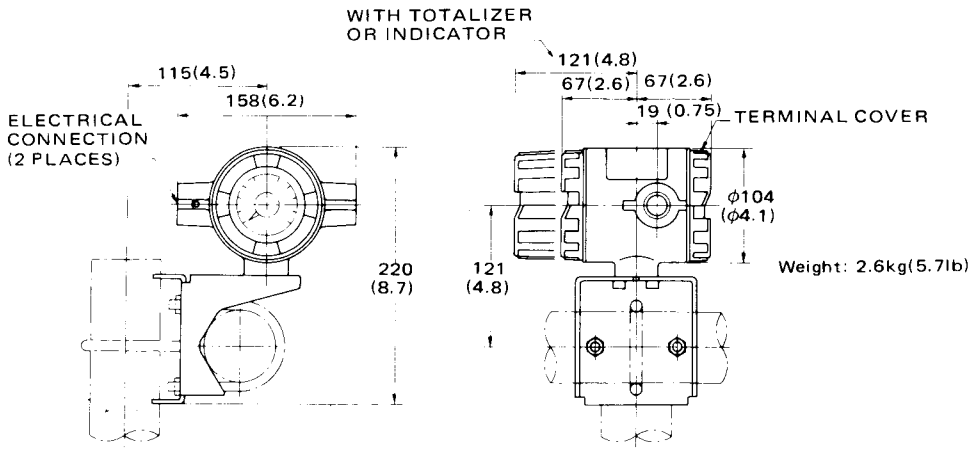


Size	A	C	D	WEIGHT
2inch	209(8.2)	92 (3.62)	51.1(2.01)	6.4kg(14lb)
3inch	226(8.9)	127 (5.00)	71.0(2 80)	11kg(24lb)
4inch	241(9.5)	157.2(6.19)	93.8(3.69)	14kg(31lb)



Size: 1/2 inch
Weight: 3 kg (6.6 lb)

Vortex Flow Converter



========== RELATED EQUIPMENT ==========

YFCT Flow Computing Totalizer . . . . See GS 1P1B1-E
BARD Safety Barrier . . . . . See GS 1B4S1-E
SDBT Distributor . . . . . See GS 1B4T1-E

========= ORDERING INSTRUCTIONS =========

Specify the following when ordering:
1. Model and suffix codes.
2. Flow conditions.
   a. Fluid name, or Gas composition.
   b. Maximum scale reading, normal flow rate and minimum flow rate.
   c. Maximum and normal operating temperatures.
   d. Maximum and normal operating pressures.
   e. Specific weight at normal operating conditions. Specific weight of gas at standard conditions.
   f. Viscosity at normal operating conditions.
   g. Relative humidity at normal operating conditions (wet gas only).