

**Outline**

VTW Wafer-Cone® integrate VH Wafer-Cone® differential pressure flowmeter and small sized Variable Area flowmeter are integrated into one Wafer-Cone® bypass flowmeter. As the meter requires little straight runs and little head loss compared to orifice plate, it offers you reduction of construction cost and energy saving.

**Features**

- Simple installation  
Wafer connection makes installation simple. Flowmeter body flanges designed to match the pipe flanges guide to the pipe center line.
- Short straight runs  
The required straight runs are less than 1/5 of those required for orifice and vortex flowmeters. The narrow installation space allow simple and flexible piping arrangement plan. It leads to space and cost saving.
- Low pressure loss  
The meter requires smaller pressure loss compared to the other type of meter at the same flow rate.
- Matching any flow direction  
It can measure either horizontal, vertical, upward, or downward flow. The orientation of the indicator can be set in a simple way at field.
- Alarm contact as on option  
Maximum 2 alarm contacts with indicator are available. The meter serves both continuous flow indication and no flow detection alarm.



- Easy maintenance  
The simple and rugged mechanism constructed of small number of parts make maintenance easy.

**Standard Specification**

Meter size 25, 40, 50, 65, 80, 100 mm  
 Connection Wafer type  
 Rating JIS10K/20K, ANSI Class 150/300  
 Connection size Same as meter size  
 Material SCS14A (Body), SUS316 (Cone), Heat-resistant glass (Tapered Tube), O-ring (Fluorocarbon rubber)  
 Measuring fluid Water or liquids having equivalent viscosity to water  
 Fluid pressure Maximum 1.0 MPa  
 Fluid temperature Maximum 120°C for general type, 60°C for alarm type  
 Accuracy of the reading ±3.0% of Full Scale  
 Scale range 10:2  
 Flow direction Either horizontal, vertical, upward, or downward flow

● Required straight runs

Type of joints	Up-stream side	Down-stream side
1 piece of 90° bend	0D	0D
2 pieces of 90° bend	0D	0D
T joint	0D	0D
Butterfly valve (Flow control valve)	3D	3D
Butterfly valve (Fully open)	3D	0D
Gate valve (Fully open)	0D	0D
Expander (Diameter 0.67D expands to 1D, length 2.5D)	1D	1D
Reducer (Diameter 3D reduces to 1D, length 3.5D)	1D	1D

[Notes]  
 D shows the nominal size of Wafer-Cone® flowmeter.  
 The required straight runs are the distance from the flange faces of Wafer-Cone® flowmeter.  
 Add 1D to the above mentioned figures for the service β ratio is 0.65 or more.

**Measuring Range**

Meter Size / Connection size	Measuring range class 1			Measuring range class 2			Measuring range class 3		
	Scale range (m³/h)	β ratio	Permanent Pressure loss (kPa)	Scale range (m³/h)	β ratio	Permanent pressure loss (kPa)	Scale range (m³/h)	β ratio	Permanent pressure loss (kPa)
25A 1"	0.26 to 1.3	0.45	8.3	0.6 to 3	0.65	5.6	0.9 to 4.5	0.75	4.5
40A 1-1/2"	0.8 to 4	0.50	7.3	1.6 to 8	0.65	6.5	2.8 to 14	0.80	3.7
50A 2"	1.2 to 6	0.45	10.5	2.4 to 12	0.65	5.2	5 to 25	0.80	4.3
65A 2-1/2"	1.6 to 8	0.45	8.8	3.6 to 18	0.65	5.7	7 to 35	0.80	4.0
80A 3"	2.4 to 12	0.45	8.2	7 to 35	0.70	5.2	10 to 50	0.80	3.3
100A 4"	4 to 20	0.45	7.7	10 to 50	0.65	5.8	18 to 90	0.80	3.6

# VTW series integral type Wafer-Cone® Differential flowmeter

## Additional Features

One or two alarm contacts, optical alarm units can be fitted in the local indicator as an option.

- Specifications

Detection	By two infrared sensing method
Detection hysteresis	3 mm
Measuring object	Transparent liquid
Detectable float velocity	Approximately less than 7.5 m/sec
Detectable time interval	Approximately 150 μ sec
Indication	Two color LED
	At normal condition when power is switched on Green
	At alarm condition when power is switched on Red
Alarm operation	High or low alarm
	By change-over switch
Output logic	Positive logic or negative logic
	By change-over switch
Status when power switched on	Alarm or non Alarm
	By change-over switch
Change-over switch	Changing over is valid when power is off.
	Switch positions are detected by the meter when power is on.
Output	Photo coupler 30V DC
	DC 100mA max. open drain
Output isolation	More than 1500 V AC
Output response speed	0.5 sec or less
Back up	By condenser
	Back out, Repeated cycle
	More then 5 minute interval required.
	Min. 3 second of operation is kept.
Connection	By 4 cores shielded cable
Mounting	Screwed by metal fittings
Body enclosure	Simple protection against dripping water
Environmental conditions	No direct sunshine No vibration
Ambient temperature, humidity	0 to 50 °C and less than 90% RH
	No condensate
Storing temperature, humidity	-5 to 50 °C and less than 90%RH
	No condensate
Power supply	12 to 24 V DC ±10% 35 mA or less
Power consumption	35 mA or less at 12 V DC
Weight	Approximately 50 g

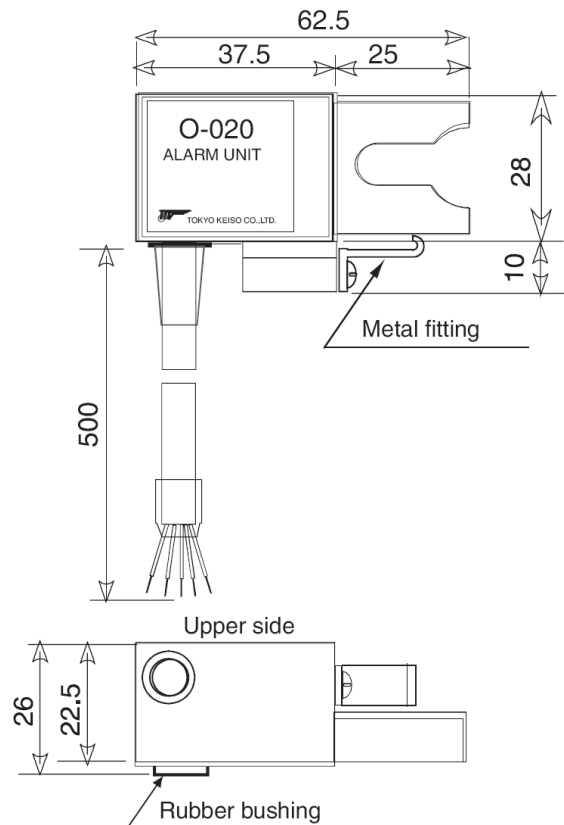
- Wire color and its usage

Green	Signal
Black	Power GND
Red	Power +
White	Pulse output open drain
Gray	Pulse output GND
Black thick	Shield

- Switch function

Switch No.	Item	OFF	ON
1	Alarm change-over	Low alarm	High alarm
2	Output logic	Normal Open	Normal Close
3	Status when power switched on	Alarm	Non alarm

- Dimensions



**MODEL CODE**

Model Code							Description
VTW	1	3	J1	-45	1	/K1	(Example)
Material	1						SCS14A/SUS316
Meter size /Connection size		3					25A (1")
		4					40A (1-1/2")
		5					50A (2")
		6					65A (2-1/2")
		7					80A (3")
		8					100A (4")
Connection rating			J1				JIS10K
			J2				JIS20K
			A2				ANSI Class 150
			A5				ANSI Class 300
			Z				Other
V-Cone β ratio				-45			0.45
				-50			0.50
				-55			0.55
				-60			0.60
				-65			0.65
				-70			0.70
				-75			0.75
				-80			0.80
Measuring range					1		Measuring range class 1
					2		Measuring range class 2
					3		Measuring range class 3
Additional features : Alarm function						/K1	Optical alarm unit (high or low alarm change-over) x 1
						/K2	Optical alarm unit (high or low alarm change-over) x 2

**Stud Bolt Size**

Connection rating	JIS		ANSI	
	10K (mm)	20K (mm)	Class 150 (inch)	Class 300 (inch)
25A (1")	M16 x 130	M16 x 140	1/2 x 5	5/8 x 5-1/4
40A (1-1/2")	M16 x 160	M16 x 160	1/2 x 6	3/4 x 6-3/4
50A (2")	M16 x 170	M16 x 170	1/2 x 6-1/2	5/8 x 6-3/4
65A (2-1/2")	M16 x 190	M16 x 190	5/6 x 7-1/2	3/4 x 8
80A (3")	M16 x 210	M20 x 220	5/8 x 8-1/4	3/4 x 9
100A (4")	M16 x 240	M20 x 260	5/8 x 9-1/2	3/4 x 10-1/2

Cautions on the use of glass tube variable area flowmeters

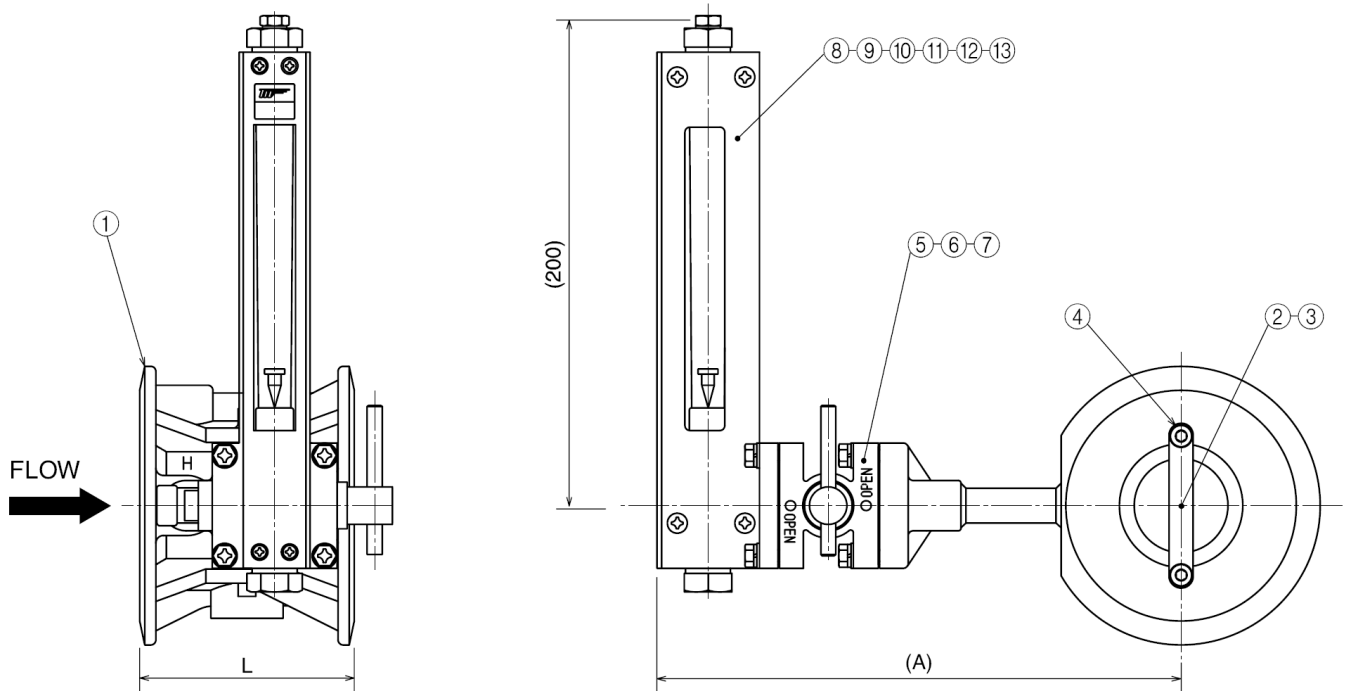
**CAUTION**

Avoid the use of glass tube variable area flowmeters for the following services.

- Liquid services subject to impulse pressure in the process.
- Secondary accidents might occur due to the breakage of glass in such services:
  - Toxic fluid such as poisons, stimulant and narcotics
  - Flammable fluids
  - Explosive fluids
- Gas handling process where breakage of glass might result in gas leakage or scattering of glass fragments.
- The installation places of the flowmeters where breakage of glass might be caused by the accidents from the surrounding piping or equipment.
- On-off operation where breakage of glass might be cause by the collision of the float inside meter due to the abrupt change of flow.
- Services where the heat shock by abrupt change of temperature is expected.

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## Dimensions and Material



### Material

Part No.	Part Name	Material
1	Detector body	SCS14A
2	Cone	SUS316
3	Support	SUS316
4	Fastening screws	SUS316L
5	Cock piece	SCS14
6	Cock axis	SUS316
7	O-ring	Fluorocarbon rubber
8	Indication part	SCS14
9	Tapered tube	Heat-resistant glass
10	Float	Titanium
11	Cover	SUS304/ABS
12	Scale dial	Polycarbonate
13	O-ring	Fluorocarbon rubber

### Dimension List

Meter size (mm)	L (mm)	A (mm)	Weight (kg)
25	57	195	2.2
40	76	204	3.2
50	86	210	3.7
65	102	225	5.7
80	121	240	7.7
100	152	258	12.2

- Wafer-Cone® is registered trademarks of McCROMETER, Inc
- Specification is subject to change without notice.

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