

OUTLINE

VH series 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 allows 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.
- 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
1, 1-1/2, 2, 2-1/2, 3, 4 inch
- Connection Wafer type
- Rating JIS10K, 20K
ANSI Class150, 300
DIN PN16, 40
GB PN1.6, 4.0
- Connection size Same as meter size
- Materials SCS14A (Detector body)
SUS316 (Cone)
Heat-resistant glass (Tapered tube)
O ring (Fluorocarbon rubber)



- Measuring fluid Water or liquids having equivalent viscosity to water.
Consult Tokyo Keiso about gas measurement.
- Fluid pressure Max. 1.0 MPa
- Fluid temperature Max. 120 °C
*: It is general data, and the maximum temperature may change by terms of use and environment.
- 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 | Upstream side | Downstream side |
|--|---------------|-----------------|
| 1 piece of 90° bend | 0D | 0D |
| 2 pieces of 90° bend | 0D | 0D |
| bend 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 (m ³ /h) | β ratio | Permanent pressure loss (kPa) | Scale range (m ³ /h) | β ratio | Permanent pressure loss (kPa) | Scale range (m ³ /h) | β ratio | Permanent pressure loss (kPa) |
| 25A | 1" | DN25 | 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" | DN40 | 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" | DN50 | 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" | DN65 | 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" | DN80 | 2.4 to 12 | 0.45 | 8.2 | 7 to 35 | 0.70 | 5.2 | 10 to 50 | 0.80 | 3.3 |
| 100A | 4" | DN100 | 4 to 20 | 0.45 | 7.7 | 10 to 50 | 0.65 | 5.8 | 18 to 90 | 0.80 | 3.6 |

The permanent pressure loss is the one at maximum flow rate.

MODEL CODES

| MODEL CODES | | | | | | | CONTENTS | | | | |
|--------------------------------|-----|---|----|-----|---|-----|-------------------------|--------|-------|--|--|
| VTW | □ | □ | □□ | -□□ | □ | /□□ | | | | | |
| Materials of detector | 1 | | | | | | SCS14A/SUS316 | | | | |
| Meter size /Connection size | 3 | | | | | | 25A | 1" | DN25 | | |
| | 4 | | | | | | 40A | 1-1/2" | DN40 | | |
| | 5 | | | | | | 50A | 2" | DN50 | | |
| | 6 | | | | | | 65A | 2-1/2" | DN65 | | |
| | 7 | | | | | | 80A | 3" | DN80 | | |
| | 8 | | | | | | 100A | 4" | DN100 | | |
| Connection rating | J1 | | | | | | JIS10K | | | | |
| | J2 | | | | | | JIS20K | | | | |
| | A2 | | | | | | ANSI Class 150 | | | | |
| | A5 | | | | | | ANSI Class 300 | | | | |
| | G1 | | | | | | GB PN1.6 | | | | |
| | G4 | | | | | | GB PN4.0 | | | | |
| | D1 | | | | | | DIN PN16 | | | | |
| | D4 | | | | | | DIN PN40 | | | | |
| 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 | | | | |

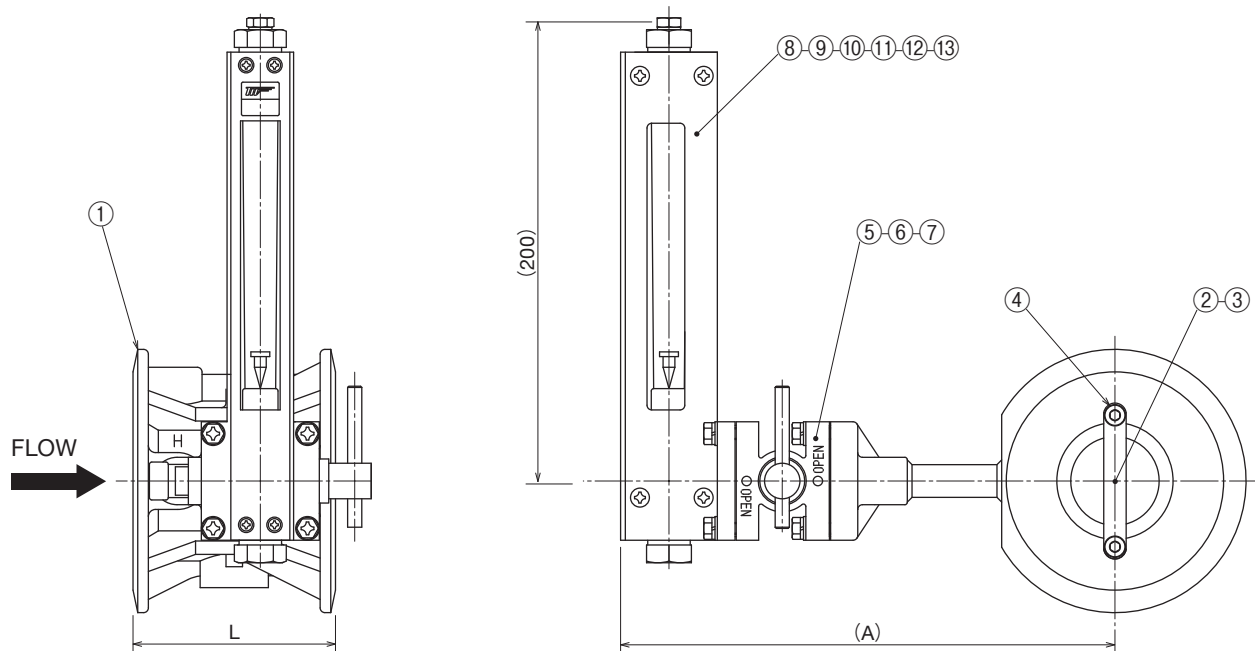
See aforementioned MEASURING RANGE for the relation between measuring range and β ratio.

STUD BOLT SIZE

Following size of stud bolts for the mounting are recommended.

| Connection rating | | | JIS | | ANSI | | DIN | | GB | |
|-------------------|--------|-------|-------------|-------------|--------------------|--------------------|--------------|--------------|---------------|---------------|
| | | | 10K (mm) | 20K (mm) | Class150 (inch) | Class300 (inch) | PN16 (mm) | PN40 (mm) | PN1.6 (mm) | PN4.0 (mm) |
| 25A | 1" | DN25 | M16×130 | M16×140 | 1/2×5 | 5/8×5-1/4 | M12×130 | M12×130 | M12×130 | M12×130 |
| 40A | 1-1/2" | DN40 | M16×160 | M16×160 | 1/2×6 | 3/4×6-3/4 | M16×160 | M16×160 | M16×160 | M16×160 |
| 50A | 2" | DN50 | M16×170 | M16×170 | 1/2×6-1/2 | 5/8×6-3/4 | M16×170 | M16×170 | M16×170 | M16×170 |
| 65A | 2-1/2" | DN65 | M16×190 | M16×190 | 5/8×7-1/2 | 3/4×8 | M16×190 | M16×190 | M16×190 | M16×190 |
| 80A | 3" | DN80 | M16×210 | M20×220 | 5/8×8-1/4 | 3/4×9 | M16×210 | M16×220 | M16×210 | M16×220 |
| 100A | 4" | DN100 | M16×240 | M20×260 | 5/8×9-1/2 | 3/4×10-1/2 | M16×240 | M20×260 | M16×240 | M20×260 |

DIMENSIONS



● Materials

| Part No. | Part name | Materials |
|----------|------------------|----------------------|
| 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 plate | Polycarbonate |
| 13 | O-ring | Fluorocarbon rubber |

● Dimension list

| Meter size (mm) | L (mm) | A (mm) | Weight (Approx.) 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 |

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 fluids 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 caused 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.

* Specification is subject to change without notice.

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TOKYO KEISO CO., LTD.

Head Office : Shiba Toho Building, 1-7-24 Shibakoen, Minato-ku, Tokyo 105-8558

Tel : +81-3-3431-1625 (KEY) ; Fax : +81-3-3433-4922

e-mail : overseas.sales@tokyokeiso.co.jp ; URL : <http://www.tokyokeiso.co.jp>