# Vortex Flow Meter

## KWIVF Series

The vortex flowmeter is used for measuring the flow velocity of gases or liquids in pipelines flowing full. The measuring principle is based on the development of a Karman vortex shedding street in the wake of a body built into the pipeline.

The periodic shedding of eddies occurs first from one side and then from the other side of a bluff body (vortex-shedding body) in stalled perpendicular to the pipe axis. Vortex shedding generates a so-called "Karman vortex street" with alternating pressure conditions whose frequency is proportional to the flow velocity.

### Application

- Boiler Industry (Steam Measure)
- Compressed Air Industry
- Textile Industry
- Paper Industry
- Heating Industry
- Metallurgical Industry
- Plastics Processing

### Features

- No moving parts inside, easy installation and maintenance
- Digital filter amplifier with wider measurement range and better anti-interference performance
- Wide flow ratio up to 33 : 1
- High Accuracy up to ± 0.2% optionally
- Max temperature up to + 420 °C
- Inline and Insertion type for option
- Integrated and remote transmitter for option
- Power-off record function
- CE and calibration certificate
- The remote type supports pressure and temperature compensation

**DA-Compact Type**

**DB-Compact Type**

**DA-Remote Type**

## Technical Data

| Description | Specifications |
|---|---|
| **Diameter** | DN15-DN700 (DB Type), DN10-DN500 (DA Type), DN200-DN2000 (Insertion Type) |
| **Accuracy** | Liquid: ± 1.0% of Rate |
| | Gas and Steam: ± 1.5% of Rate (± 1.0% of Rate for DA Type Option Only) |
| **Body Material** | SS304, SS316 |
| **Process Temperature** | T1: -20…+100°C, T2: -20…+250°C, T3: -20…+350°C, T4: -20…+420°C |
| **Ambient Temperature** | -10...+50°C |
| **Connection** | Flange, Wafer, Thread, Tri-Clamp |
| **Protection** | IP65, IP68 |
| **Power Supply** | 24 VDC and Battery for Option |
| **Communication** | RS485, HART |
| **Output** | 4-20mA, Pulse |

## Model Selection

| Model | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Series** | **KWIVF** | | | | | | |
| **Fluid** | | **L** | Liquid | | | | |
| | | **G** | Gas/Air | | | | |
| | | **S** | Steam | | | | |
| **Diameter** | | | **XXX** | Stand for diameter<br>015: DN15, 050: DN50, 100: DN100, 300: DN300 | | | |
| **Structure** | | | | **S** | Compact type | | |
| | | | | **L** | Remote type | | |
| **Converter Type** | | | | **C** | Fluid: Liquid, 24V DC, 4-20mA/Pulse Output, Digital Display, Ex | | |
| | | | | **V** | 24V DC, 4-20mA/Pulse Oiutput<br>(V type is only for Gas/Steam application), No Compensation | | |
| | | | | **DB** | 24V DC, 4-20mA/Pulse Output, Temperature & Pressure Compensation, 3 Wire for Option | | |
| | | | | **DA** | 24V DC, 4-20mA/Pulse Output, Temperature & Pressure Compensation, Digital Display, ±1.0 Accuracy, Max 420 °C, Ex, 3 Wire for Option | | |
| | | | | **Notice:** | 1) Modbus RS485 is Optional for V, D Series<br>2) Dual Power (24V DC + Battery) is Optional for C, V, D Series | | |
| **Body Material** | | | | | **S4** | SS304 | |
| | | | | | **S6** | SS316 | |
| **Explosion Proof** | | | | | | **BT** | ExdIIBT6 |
| | | | | | | **CT** | ExibIICT4 |
| | | | | | | **NA** | No Explosion Proof |
| **Connection** | | | | | | **WAF** | Wafer Connection |
| | | | | | | **DXX** | D16: DIN PN 16 Flange, D25: DIN PN 25 Flange… |
| | | | | | | **AXX** | A15: ANSI 150# Flange, A30: ANSI 300# Flange… |
| | | | | | | **JXX** | J10: JIS 10K Flange, J20: JIS 20K Flange… |
| | | | | | | **XXX** | Insertion, Thead, Tri-Clamp |
| **Temperature Rating** | | | | | | **T1** | -20…+100°C |
| | | | | | | **T2** | -20…+250°C |
| | | | | | | **T3** | -20…+350°C |
| | | | | | | **T4** | -20…+420°C (DA Type Only) |

## Flow Range

| Liquid Measurement | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Density ($kg/m^3$) | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 | 1400 | 1600 | 1800 | Qmax |
| Diameter | Different density fluid, the mini flow rate Qmin(Unit:$m^3/h$) | | | | | | | | | | (Unit:$m^3/h$) |
| DN15 | 0.66 | 0.55 | 0.52 | 0.41 | 0.4 | 0.39 | 0.33 | 0.31 | 0.29 | 0.26 | 4.5 |
| DN20 | 1.27 | 1.1 | 1.08 | 0.99 | 0.88 | 0.66 | 0.64 | 0.62 | 0.59 | 0.57 | 8 |
| DN25 | 1.43 | 1.32 | 1.21 | 1.16 | 1.1 | 0.99 | 0.9 | 0.84 | 0.78 | 0.75 | 12 |
| DN32 | 2.09 | 1.98 | 1.87 | 1.78 | 1.72 | 1.65 | 1.6 | 1.49 | 1.32 | 1.1 | 20 |
| DN40 | 3.85 | 3.52 | 3.3 | 3.08 | 2.86 | 2.51 | 2.42 | 2.31 | 2.2 | 2.09 | 32 |
| DN50 | 5.17 | 4.73 | 4.29 | 4.07 | 3.96 | 3.85 | 3.3 | 3.08 | 2.86 | 2.75 | 50 |
| DN65 | 7.81 | 7.15 | 6.93 | 6.82 | 6.71 | 6.6 | 5.5 | 4.95 | 4.62 | 4.4 | 84 |
| DN80 | 12.1 | 11 | 10.56 | 10.12 | 10.01 | 9.9 | 8.8 | 8.36 | 7.7 | 6.6 | 127 |
| DN100 | 22 | 19.8 | 18.7 | 17.6 | 16.5 | 15.4 | 14.3 | 13.2 | 11 | 9.9 | 198 |
| DN125 | 30.8 | 28.6 | 27.5 | 26.4 | 25.3 | 24.2 | 23.1 | 22 | 19.8 | 15.4 | 310 |
| DN150 | 57.2 | 55 | 49.5 | 46.2 | 39.6 | 35.2 | 33 | 30.8 | 28.6 | 22 | 445 |
| DN200 | 108.9 | 96.8 | 85.8 | 77 | 68.2 | 62.7 | 58.3 | 55 | 47.3 | 38.5 | 791 |
| DN250 | 202.4 | 181.5 | 165 | 143 | 121 | 97.9 | 88 | 79.2 | 74.8 | 60.5 | 1237 |
| DN300 | 275 | 242 | 220 | 198 | 176 | 140.8 | 132 | 121 | 107.8 | 84.7 | 1780 |

| Gas/Air Measurement | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Density ($kg/m^3$) | 0.5 | 0.8 | 1.2 | 2.4 | 3.6 | 4.8 | 6 | 7.2 | 8.4 | 9.6 | 12 | 20 | Qmax |
| Diameter | Different density fluid, the mini flow rate Qmin (Unit:$m^3/h$) | | | | | | | | | | | | Unit: ($m^3/h$) |
| DN15 | 5.28 | 3.85 | 3.52 | 3.08 | 2.97 | 2.86 | 2.75 | 2.64 | 2.53 | 2.42 | 2.31 | 2.2 | 38 |
| DN20 | 9.02 | 7.26 | 5.5 | 5.28 | 5.17 | 4.95 | 4.73 | 4.4 | 4.29 | 4.18 | 4.07 | 3.3 | 67 |
| DN25 | 11 | 9.9 | 8.69 | 8.36 | 7.92 | 7.59 | 7.26 | 6.82 | 6.49 | 5.94 | 5.5 | 4.95 | 100 |
| DN32 | 28.6 | 19.8 | 15.4 | 14.52 | 14.08 | 13.42 | 13.2 | 12.87 | 12.32 | 11.99 | 11.11 | 9.9 | 170 |
| DN40 | 41.8 | 27.5 | 22 | 20.9 | 19.8 | 18.7 | 17.6 | 16.5 | 15.4 | 14.3 | 13.2 | 11 | 300 |
| DN50 | 52.8 | 44 | 34.1 | 31.9 | 30.8 | 28.6 | 25.3 | 24.2 | 23.1 | 22 | 19.8 | 13.2 | 500 |
| DN65 | 88 | 72.6 | 58.3 | 49.5 | 48.4 | 46.2 | 44 | 41.8 | 38.5 | 33 | 28.6 | 19.8 | 780 |
| DN80 | 143 | 110 | 88 | 83.6 | 77 | 72.6 | 68.2 | 63.8 | 55 | 50.6 | 41.8 | 30.8 | 1200 |
| DN100 | 198 | 176 | 132 | 121 | 110 | 99 | 88 | 77 | 68.2 | 61.6 | 52.8 | 38.5 | 2000 |
| DN125 | 308 | 275 | 209 | 187 | 171.6 | 159.5 | 148.5 | 132 | 110 | 99 | 83.6 | 60.5 | 2900 |
| DN150 | 418 | 341 | 308 | 286 | 264 | 242 | 220 | 198 | 176 | 154 | 121 | 93.5 | 4100 |
| DN200 | 880 | 660 | 550 | 528 | 473 | 440 | 418 | 396 | 363 | 330 | 297 | 220 | 7500 |
| DN250 | 1100 | 968 | 869 | 803 | 748 | 682 | 649 | 572 | 528 | 462 | 440 | 330 | 12500 |
| DN300 | 1430 | 1309 | 1254 | 1166 | 1078 | 990 | 902 | 836 | 770 | 682 | 638 | 440 | 16500 |

## Flow Range

| Saturated Steam Measurement | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mpa | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.8 | 0.9 | 1 | 1.2 | 1.6 | 2 | Unit |
| °C | | 120 | 134 | 144 | 152 | 159 | 165 | 175 | 180 | 184 | 192 | 204 | 215 | |
| Kg/m³ | | 1.12 | 1.67 | 2.19 | 2.68 | 3.18 | 3.67 | 4.62 | 5.16 | 5.63 | 6.67 | 8.52 | 10.57 | |
| Diameter (mm) | | Different steam density corresponding with flow range | | | | | | | | | | | | |
| 15 | Qmin | 3.85 | 5.67 | 7.41 | 9.12 | 11 | 12.54 | 15.95 | 17.93 | 19.36 | 22.55 | 29.37 | 36.19 | kg/h |
| | Qmax | 35 | 51.5 | 67.4 | 83 | 100 | 115 | 146 | 163 | 176 | 205 | 268 | 329 | |
| 20 | Qmin | 6.84 | 10.07 | 13.09 | 16.17 | 19.58 | 22.44 | 28.49 | 32.01 | 34.43 | 40.04 | 52.25 | 64.35 | |
| | Qmax | 62.2 | 91.6 | 120 | 147 | 178 | 204 | 259 | 291 | 313 | 365 | 476 | 586 | |
| 25 | Qmin | 10.68 | 15.73 | 20.46 | 25.3 | 30.69 | 34.98 | 44.55 | 49.94 | 53.79 | 62.59 | 81.73 | 100.54 | |
| | Qmax | 97.1 | 143 | 187 | 230 | 279 | 318 | 405 | 454 | 489 | 569 | 743 | 914 | |
| 32 | Qmin | 17.49 | 25.63 | 33.66 | 41.47 | 50.27 | 57.42 | 72.93 | 81.95 | 88.11 | 102.63 | 133.1 | 163.9 | |
| | Qmax | 159 | 234 | 306 | 378 | 457 | 522 | 664 | 745 | 802 | 933 | 1218 | 1499 | |
| 40 | Qmin | 25.3 | 36.3 | 47.3 | 58.3 | 70.4 | 80.3 | 102.3 | 110 | 121 | 143 | 187 | 231 | |
| | Qmax | 300 | 440 | 575 | 710 | 860 | 980 | 1250 | 1400 | 1500 | 1750 | 2280 | 2810 | |
| 50 | Qmin | 38.5 | 38.5 | 57.2 | 69.3 | 83.6 | 96.8 | 122.1 | 137.5 | 143 | 165 | 220 | 275 | |
| | Qmax | 550 | 460 | 680 | 845 | 1020 | 1170 | 1480 | 1670 | 1800 | 2100 | 2730 | 3360 | |
| 65 | Qmin | 64.9 | 95.7 | 125.4 | 150.7 | 182.6 | 209 | 264 | 303.6 | 326.7 | 379.5 | 495 | 605 | |
| | Qmax | 790 | 1160 | 1520 | 1835 | 2222 | 2540 | 3230 | 3620 | 3970 | 4620 | 6030 | 7422 | |
| 80 | Qmin | 98.45 | 144.1 | 189.2 | 233.2 | 282.7 | 319 | 407 | 451 | 495 | 572 | 748 | 924 | |
| | Qmax | 1195 | 1760 | 2300 | 2800 | 3400 | 3900 | 4900 | 5580 | 6000 | 6999 | 9100 | 11000 | |
| 100 | Qmin | 0.15 | 0.22 | 0.3 | 0.36 | 0.44 | 0.51 | 0.64 | 0.72 | 0.77 | 0.9 | 1.1 | 1.43 | t/h |
| | Qmax | 1.87 | 2.75 | 3.6 | 4.43 | 5.36 | 6.12 | 7.78 | 8.73 | 9.4 | 11 | 14.3 | 17.6 | |
| 125 | Qmin | 0.24 | 0.35 | 0.46 | 0.56 | 0.68 | 0.78 | 1 | 1.1 | 1.21 | 1.41 | 1.84 | 2.2 | |
| | Qmax | 2.91 | 4.29 | 5.62 | 6.91 | 8.37 | 9.56 | 12 | 13.6 | 14.7 | 17 | 22.3 | 27.4 | |