SIEMENS

Acvatix™

# Static balance valves PN 16

Flange connection: VMF41.., threaded connection: VMI41..

**Static balance valve**

- Equipped with pressure test points P/T
- DN15 - DN50 made of brass (Hpb59-1), DN65 - DN500 made of nodular cast iron
- DN15…DN500
- Nominal flow rate range ($k_{vs}$) 3.2…4180 $m^3/h$
- With digital handwheel display and flow lock functions
- Tight shut-off design

## Features

- Excellent flow regulation performance, used in static balance flow balancing for heating, ventilation, and air conditioning (HVAC) systems
- For closed hydraulic circuits

## Type summary

| Product type (ASN) | Stock No. (SSN) | DN | $k_{vs}$ [$m^3/h$] | Description |
|---|---|---|---|---|
| VMI41.15Q | S55299-V100 | 15 | 3.2 | Static balance valve, threaded connection PN16, DN15 |
| VMI41.20Q | S55299-V101 | 20 | 5.2 | Static balance valve, threaded connection PN16, DN20 |
| VMI41.25Q | S55299-V102 | 25 | 9.1 | Static balance valve, threaded connection PN16, DN25 |
| VMI41.32Q | S55299-V103 | 32 | 20.1 | Static balance valve, threaded connection PN16, DN32 |
| VMI41.40Q | S55299-V104 | 40 | 26.7 | Static balance valve, threaded connection PN16, DN40 |
| VMI41.50Q | S55299-V105 | 50 | 39.6 | Static balance valve, threaded connection PN16, DN50 |
| VMF41.65Q | S55299-V106 | 65 | 93 | Static balance valve, flange connection PN16, DN65 |
| VMF41.80Q | S55299-V107 | 80 | 103 | Static balance valve, flange connection PN16, DN80 |
| VMF41.100Q | S55299-V108 | 100 | 194 | Static balance valve, flange connection PN16, DN100 |
| VMF41.125Q | S55299-V109 | 125 | 229 | Static balance valve, flange connection PN16, DN125 |
| VMF41.150Q | S55299-V110 | 150 | 402 | Static balance valve, flange connection PN16, DN150 |
| VMF41.200Q | S55299-V111 | 200 | 710 | Static balance valve, flange connection PN16, DN200 |
| VMF41.250Q | S55299-V112 | 250 | 1124 | Static balance valve, flange connection PN16, DN250 |
| VMF41.300Q | S55299-V113 | 300 | 1296 | Static balance valve, flange connection PN16, DN300 |
| VMF41.350Q | S55299-V114 | 350 | 2250 | Static balance valve, flange connection PN16, DN350 |
| VMF41.400Q | S55299-V115 | 400 | 3050 | Static balance valve, flange connection PN16, DN400 |
| VMF41.450Q | S55299-V116 | 450 | 3720 | Static balance valve, flange connection PN16, DN450 |
| VMF41.500Q | S55299-V117 | 500 | 4180 | Static balance valve, flange connection PN16, DN500 |

**Note:**

DN = Nominal diameter

$k_{vs}$ = The nominal flow rate of water at 5°C to 30°C passing through the valve each hour when the valve is fully open (H100), and the differential pressure before and after the valve is 100 kPa (1 bar)

### Ordering

When ordering, please specify the quantity, product type, and order number.

For example:

| Product type | Stock No. | Description |
|---|---|---|
| VMF41.100Q | S55299-V108 | Static balance valve, flange connection PN16, DN100 |

### Delivery

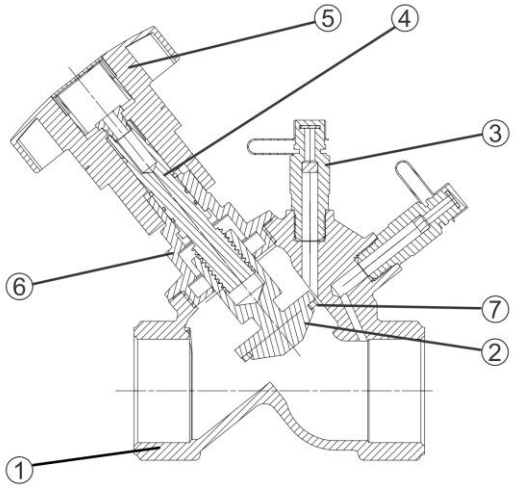
Counter-flanges, bolts and gaskets are not in the scope of supply.

## Accessories

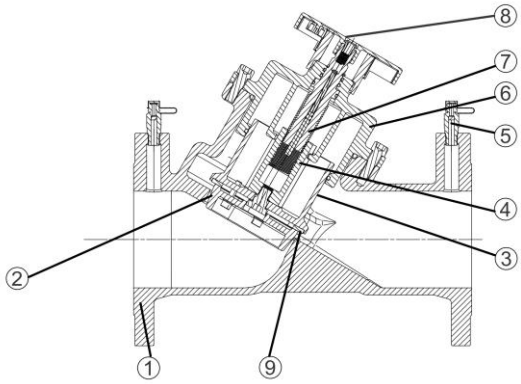
| Product type | Order No | Image | Description |
|---|---|---|---|
| ALE10 | ALE10 |  | Electronic manometer, not including measuring cable and measuring probe. Measurement range 0...700 kPa. A differential pressure over 1000 kPa will damage the pressure sensor.<br>This is used to measure the differential pressure of static balance valve and differential pressure between $P_1$ and $P_2$ / $P_3$ of the PICV.<br>Functions of the manometer:<br>● Start / Stop<br>● Automatic zero position<br>● Backlit display<br>● Display: Out→ Outside the measuring range<br>● Holding function |
| ALE11 | ALE11 |  | Measuring cable and measuring probe, for use with Siemens static balance valve and PICVs. Equipped with G 1/8" connectors with 2 x 40 mm pins. |

## Design Features

### VMI41..

| Figure | Serial No. | Component name |
|---|---|---|
|  | 1 | Valve body |
| | 2 | Valve plug |
| | 3 | Pressure test points |
| | 4 | Valve stem |
| | 5 | Handwheel |
| | 6 | Valve bonnet |
| | 7 | Sealing o ring |

### VMF41..

| Figure | Serial No. | Component name |
|---|---|---|
|  | 1 | Valve body |
| | 2 | Valve plug |
| | 3 | Balance chamber |
| | 4 | Stem barrel |
| | 5 | Pressure test points |
| | 6 | Valve bonnet |
| | 7 | Valve stem |
| | 8 | Handwheel |
| | 9 | Sealing o ring |

## Technical Principles

Operating Principle: Static balance valves are used to adjust the medium flow passing through the inside of the valve body. Turning the balance valve handwheel moves the valve stem of the balance valve up and down, adjusting the valve channel diameter and changing the flow rate characteristics. The pressure test points at the top of the balance valve body is used to measure the differential pressure and the flow rate can be tested and adjusted according to this differential pressure.

## Settings

Please refer to the Mounting Instructions VMF41..(A6V13601014) and VMI41..(A6V13562897) supplied with the product

## Valve scale - kvs Table

**VMI41..**

| Scale | Flow rate ($m^3/h$) | | | | | |
|---|---|---|---|---|---|---|
| | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
| 0.5 | 0.2 | 0.8 | 0.6 | 1.9 | 2.6 | 4.0 |
| 1.0 | 0.5 | 0.9 | 0.7 | 3.6 | 4.3 | 7.9 |
| 1.5 | 0.7 | 1.2 | 0.9 | 4.7 | 5.0 | 11.9 |
| 2.0 | 0.9 | 1.4 | 2.2 | 5.9 | 6.1 | 15.0 |
| 2.5 | 1.1 | 1.6 | 3.7 | 7.1 | 7.6 | 17.1 |
| 3.0 | 1.3 | 1.9 | 5.1 | 8.4 | 8.9 | 18.7 |
| 3.5 | 1.6 | 2.3 | 6.1 | 9.8 | 10.4 | 20.6 |
| 4.0 | 2.0 | 2.9 | 6.7 | 11.2 | 12.4 | 22.5 |
| 4.5 | 2.3 | 3.5 | 7.3 | 12.6 | 14.9 | 24.6 |
| 5.0 | 2.6 | 4.0 | 7.6 | 13.8 | 17.2 | 26.3 |
| 5.5 | 2.8 | 4.4 | 7.9 | 14.7 | 19.3 | 28.0 |
| 6.0 | 2.9 | 4.7 | 8.2 | 15.6 | 19.9 | 29.2 |
| 6.5 | 3.1 | 4.9 | 8.6 | 16.7 | 21.0 | 29.6 |
| 7.0 | 3.2 | 5.0 | 8.8 | 17.5 | 22.1 | 31.6 |
| 7.5 | - | 5.2 | 9.1 | 18.3 | 23.3 | 32.9 |
| 8.0 | - | - | - | 18.9 | 24.4 | 34.5 |
| 8.5 | - | - | - | 19.5 | 25.3 | 35.7 |
| 9.0 | - | - | - | 19.9 | 26.1 | 36.9 |
| 9.5 | - | - | - | 20.1 | 26.7 | 38.1 |
| 10.0 | - | - | - | - | - | 39.6 |

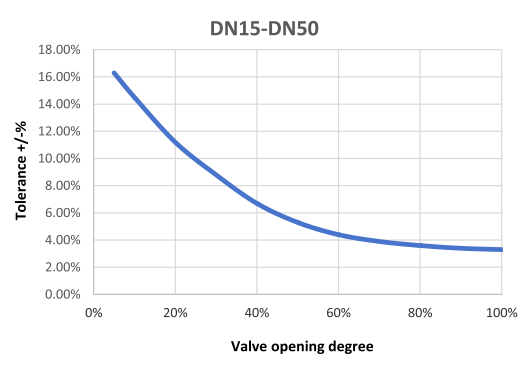
## VMF41..

| Scale | Flow rate ($m^3/h$) | | | | | |
|---|---|---|---|---|---|---|
| | DN65 | DN80 | DN100 | DN125 | DN150 | DN200 |
| 0.5 | 4 | 2 | 10 | 6 | 8 | 26 |
| 1.0 | 7 | 7 | 12 | 17 | 17 | 41 |
| 1.5 | 11 | 9 | 16 | 22 | 28 | 79 |
| 2.0 | 18 | 13 | 20 | 28 | 39 | 97 |
| 2.5 | 27 | 15 | 26 | 37 | 58 | 127 |
| 3.0 | 34 | 17 | 35 | 51 | 78 | 157 |
| 3.5 | 41 | 22 | 43 | 65 | 97 | 194 |
| 4.0 | 48 | 31 | 49 | 82 | 115 | 254 |
| 4.5 | 55 | 37 | 60 | 97 | 131 | 332 |
| 5.0 | 59 | 53 | 78 | 118 | 154 | 398 |
| 5.5 | 65 | 63 | 97 | 130 | 181 | 472 |
| 6.0 | 69 | 71 | 113 | 141 | 209 | 523 |
| 6.5 | 73 | 78 | 125 | 154 | 227 | 561 |
| 7.0 | 80 | 83 | 138 | 162 | 251 | 587 |
| 7.5 | 84 | 87 | 151 | 174 | 301 | 607 |
| 8.0 | 87 | 90 | 166 | 180 | 322 | 645 |
| 8.5 | 90 | 97 | 184 | 200 | 358 | 679 |
| 9.0 | 93 | 103 | 194 | 229 | 402 | 702 |
| 9.5 | - | - | - | - | - | 710 |

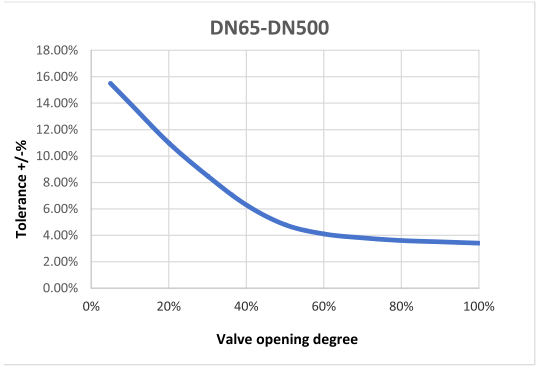
| Scale | Flow rate ($m^3/h$) | | | | | |
|---|---|---|---|---|---|---|
| | DN250 | DN300 | DN350 | DN400 | DN450 | DN500 |
| 1.0 | 56 | 56 | 170 | 238 | 275 | 352 |
| 2.0 | 138 | 134 | 261 | 393 | 465 | 611 |
| 3.0 | 236 | 233 | 405 | 587 | 685 | 928 |
| 4.0 | 291 | 302 | 597 | 808 | 900 | 1289 |
| 5.0 | 451 | 372 | 795 | 1100 | 1284 | 1634 |
| 6.0 | 575 | 570 | 1030 | 1440 | 1634 | 1983 |
| 7.0 | 658 | 764 | 1246 | 1678 | 1947 | 2413 |
| 8.0 | 764 | 852 | 1527 | 1946 | 2364 | 2804 |
| 9.0 | 902 | 947 | 1707 | 2238 | 2694 | 3212 |
| 10.0 | 998 | 1055 | 1884 | 2522 | 2970 | 3528 |
| 11.0 | 1042 | 1195 | 2048 | 2689 | 3270 | 3774 |
| 12.0 | 1124 | 1275 | 2162 | 2894 | 3535 | 3992 |
| 13.0 | - | 1296 | 2250 | 3050 | 3720 | 4180 |

## Mean flow rate accuracy

Threaded connection: VMI41..




Flange connection VMF41..




## Product Documentation

| Document type | Product | Document ID |
|---|---|---|
| Mounting Instructions | VMF41.. | A6V13601014 |
| | VMI41.. | A6V13562897 |
| Environmental Compatibility Declaration | VMF41.. | A5W00285063A |
| | VMI41.. | A5W00284073A |

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

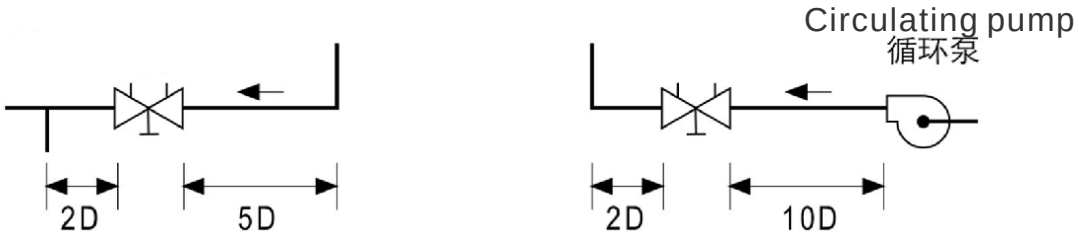
## Notes

### Safety

| ⚠ CAUTION | |
|---|---|
|  | **National safety regulations**<br>Failure to comply with national safety regulations may result in personal injury and property damage<br>● Observe national provisions and comply with the appropriate safety regulations. |

### Engineering

- Follow the direction of flow indicated (arrow on the valve body)!
- The valves should preferably be mounted in the return pipe where temperatures are lower (for heating circuits).
- It's necessary to equip a filter for the inlet pipe of the valves (for filtering out contaminants)
- To ensure the valves work correctly, usually it is necessary to maintain a certain installation distance for straight pipe sections when the valve is connected to elbow or water pump. Follow the rule of 5D in front of the valve and 2D after the valve when connecting to elbow; follow the rule of 10D when connecting to water pump.

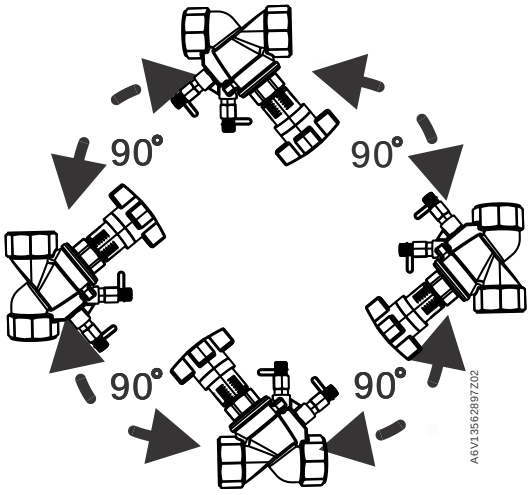



### Mounting

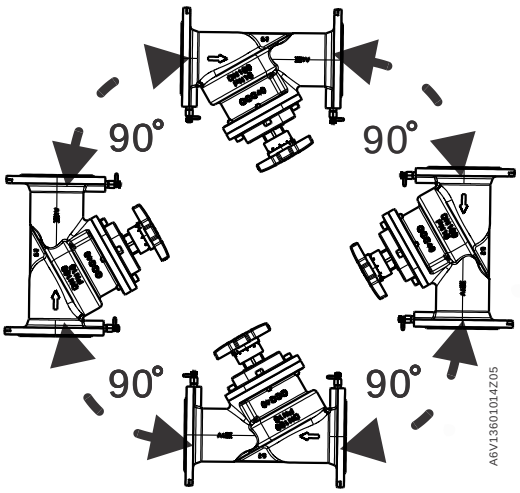
The Mounting Instructions supplied with the product A6V13562897 and A6V13601014.

**Mounting direction**

VMI41..



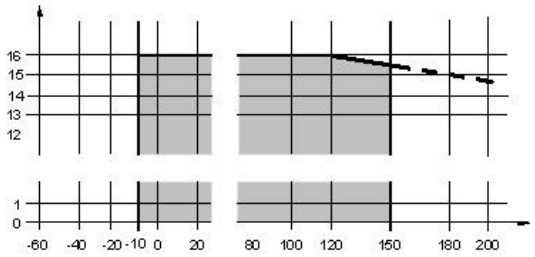

VMF41..




**Operating pressure and medium temperature**

Operating pressure and medium temperature are classified according to ISO 7005.

PN16 spheroidal graphite cast iron GGG40




Operating pressure and medium temperature of PN16 are in accordance with ISO 7005.

## Commissioning

| ⚠ WARNING | |
|---|---|
| ! | • The valve must be open when flushing or performing pressure testing on the system . The intense pressure shocks will damage a closed valve.<br>• Max. permissible differential pressure at the throttle is1.5/2.0 bar, max. permissible flow rate is ≤ 4 m/s.<br>• The factory default position of the valve is fully-open. |

## Maintenance

No maintenance required on static balance valves.

| ⚠ CAUTION | |
|---|---|
| ⚠ | **When performing repair work on the valve:**<br>• Shut off the pump and shut off the power supply.<br>• Close the shut-off valves in the pipeline system.<br>• Release the pressure in the pipeline system and wait for the pipeline to cool completely |

## Disposal

| | |
|---|---|
|  | This symbol or any other national label indicates that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.<br>For additional details, refer to Siemens information on disposal. |

## Technical data

| Function data | | |
|---|---|---|
| Nominal pressure | PN 16, in accordance with ISO 7268 | |
| Operating pressure | 1600 kPa (16 bar), in accordance with ISO 7268 | |
| Valve characteristics | Linear | |
| Leakage rate | Rate A (no visible leakage) ISO 5208 | |
| | Differential pressure at valve closed | DN15-DN300: 1600 kPa |
| | | DN350-DN500: 1000 kPa |
| Allowed media | Chilled water, low-temperature hot water, high-temperature hot water, and water with anti-freeze (ethylene glycol mixture)<br>The medium must obey VDI 2035 - Part 1 and Part 2 | |
| Medium temperature | -10...150°C | |
| Low-noise operation | When the valve is operated under a low noise level, the differential pressure should not exceed 150 kPa. | |

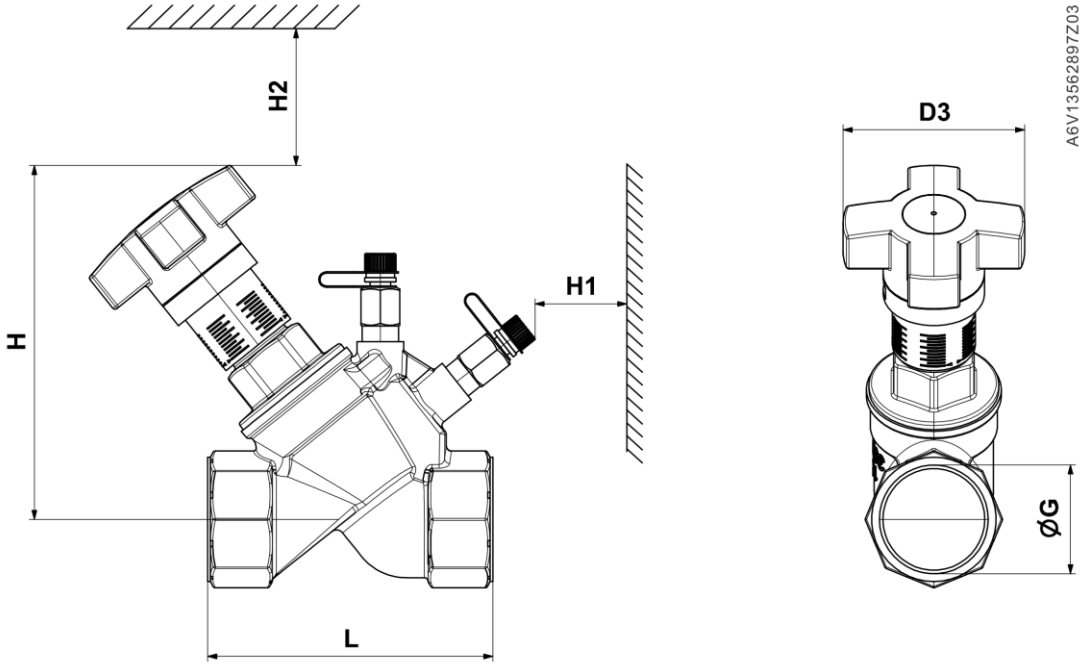
| Material | VMF41.. | VMI41.. |
|---|---|---|
| Valve body, valve cover | Coated nodular cast iron (GGG40) | Brass: Hpb59-1 |
| Valve stem | Brass: Hpb59-1 | Brass: Hpb59-1 |
| Balance chamber | Coated nodular cast iron (GGG40) | - |
| Valve plug | Coated nodular cast iron (GGG40) | Brass: Hpb59-1 |
| Sealing o ring | FKM | PTFE |
| Handwheel | DN65-300: Nylon PA66<br>DN350-500: Coated nodular cast iron (GGG40) | Nylon PA66 |

| General environmental conditions | | | |
|---|---|---|---|
| | Operation | Transportation | Storage |
| Temperature | 1…55°C | -30...65°C | -15...55°C |
| Humidity, non-condensing | 5...95% r.h. | <95% r.h. | 5...95% r.h. |

| Dimensions/Weight | |
|---|---|
| Dimensions | See Dimensions (mm) [▶ 10] |
| Weight | See Dimensions (mm) [▶ 10] |
| DN15-DN50 threaded connection | Internal threading Rp meeting ISO 7-1 |
| DN65-DN500 flange connection | ISO 7005-2, type 21, shape B |
| Pressure test points (P/T points) | G ¼ inches (connection)<br>Color definitions (loop chain)<br>P1 (Upstream): Red<br>P2 (Downstream): Blue |

## Dimensions (mm)

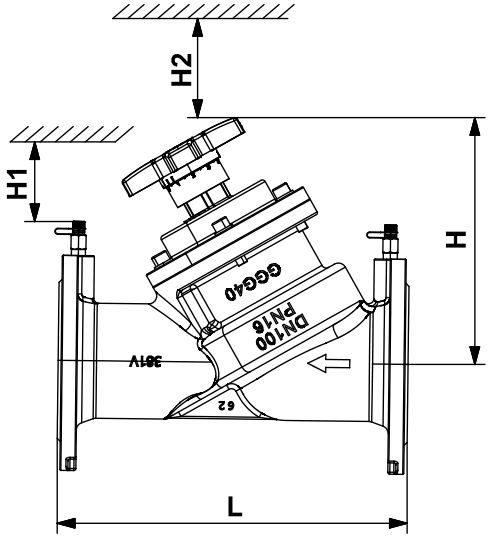
**VMI41..**

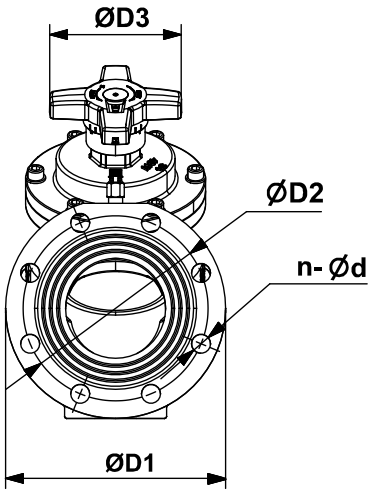



| Product type | DN | L | Ø G | D3 | H | H1 | H2 | Weight |
|---|---|---|---|---|---|---|---|---|
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| VMI41.15Q | 15 | 80 | Rp ½ | 71 | 115 | >200 | >170 | 0.62 |
| VMI41.20Q | 20 | 85 | Rp ¾ | 71 | 115 | >200 | >170 | 0.69 |
| VMI41.25Q | 25 | 100 | Rp 1 | 71 | 120 | >200 | >170 | 0.94 |
| VMI41.32Q | 32 | 110 | Rp 1¼ | 71 | 140 | >200 | >170 | 1.33 |
| VMI41.40Q | 40 | 120 | Rp 1½ | 71 | 140 | >200 | >170 | 1.65 |
| VMI41.50Q | 50 | 150 | Rp 2 | 71 | 150 | >200 | >170 | 2.61 |

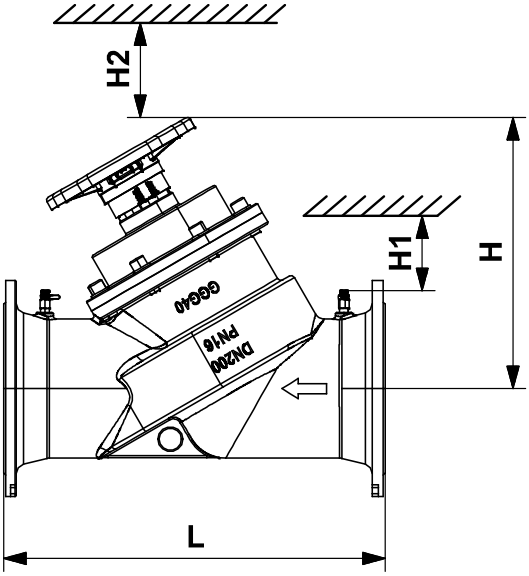
**VMF41..**

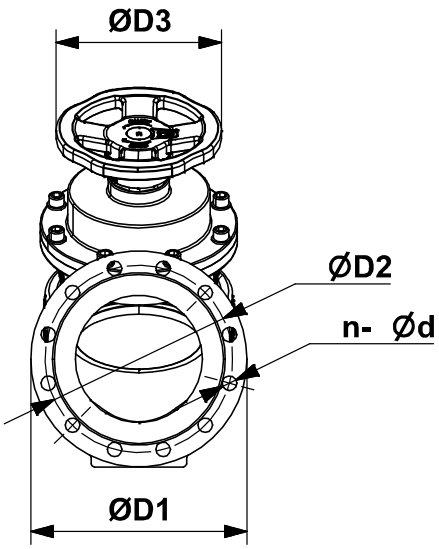
VMF41.. DN65-DN150




VMF41.. DN200-DN500



| Product type | DN | L | Ø D1 | Ø D2 | Ø d | Ø D3 | H | H1 | H2 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| VMF41.65Q | 65 | 290 | 185 | 145 | 19 (4x) | 125 | 210 | >200 | >230 | 13 |
| VMF41.80Q | 80 | 310 | 200 | 160 | 19 (8x) | 125 | 220 | >200 | >230 | 17.2 |
| VMF41.100Q | 100 | 350 | 220 | 180 | 19 (8x) | 125 | 245 | >200 | >230 | 25.1 |
| VMF41.125Q | 125 | 400 | 250 | 210 | 19 (8x) | 125 | 260 | >200 | >230 | 34 |
| VMF41.150Q | 150 | 480 | 285 | 240 | 23 (8x) | 125 | 280 | >200 | >230 | 48 |
| VMF41.200Q | 200 | 600 | 340 | 295 | 23 (12x) | 250 | 468 | >200 | >400 | 93 |
| VMF41.250Q | 250 | 730 | 405 | 355 | 28 (12x) | 250 | 503 | >200 | >400 | 135 |
| VMF41.300Q | 300 | 850 | 460 | 410 | 28 (12x) | 250 | 545 | >200 | >400 | 185 |
| VMF41.350Q | 350 | 980 | 520 | 470 | 28 (16x) | 400 | 605 | >200 | >400 | 305 |
| VMF41.400Q | 400 | 1100 | 580 | 525 | 31 (16x) | 400 | 645 | >200 | >400 | 416 |
| VMF41.450Q | 450 | 1200 | 640 | 585 | 31 (20x) | 400 | 698 | >200 | >400 | 557 |
| VMF41.500Q | 500 | 1250 | 715 | 650 | 34 (20x) | 400 | 755 | >200 | >400 | 606 |

## Revision numbers

| Product type | Valid from rev. no. |
|---|---|
| VMI41.15Q | ..A |
| VMI41.20Q | ..A |
| VMI41.25Q | ..A |
| VMI41.32Q | ..A |
| VMI41.40Q | ..A |
| VMI41.50Q | ..A |
| VMF41.65Q | ..B |
| VMF41.80Q | ..B |
| VMF41.100Q | ..B |
| VMF41.125Q | ..B |
| VMF41.150Q | ..B |
| VMF41.200Q | ..B |
| VMF41.250Q | ..B |
| VMF41.300Q | ..B |
| VMF41.350Q | ..B |
| VMF41.400Q | ..B |
| VMF41.450Q | ..B |
| VMF41.500Q | ..B |

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