



## VX 570 - Vortex Flow sensor for vapour, gases and liquids

The high-precision all-rounder with integrated pressure and temperature compensation

### FIELD OF APPLICATION:

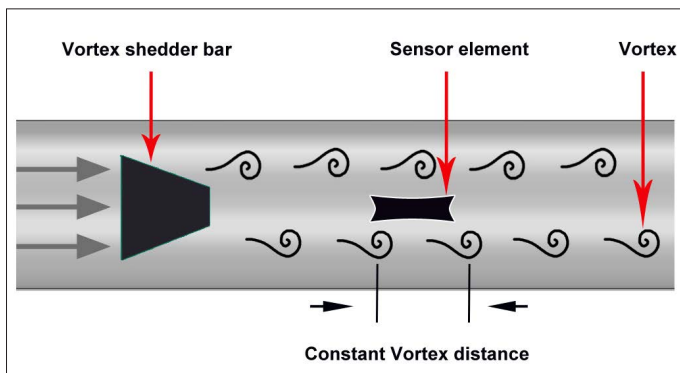
- Measurement of saturated vapour or superheated vapour
- Measurement of liquids
- Measurement of mixed gases
- Measurement of corrosive media

### Benefits at a glance:

- Measurement of standard volume flow, operating volume flow, mass flow
- Measurement at high temperatures of up to 350°C
- Measurement up to 63 bar
- Suitable for unknown/changing gas compositions and mixed gases
- Aggression resistant – all parts in contact with media made of stainless steel
- Not sensitive to vibrations due to reference vibration measurement
- No moving parts



### Vortex operating principle, vortex frequency:





Example code for VX 570:

0698 0570\_A1\_B1\_C1\_D1\_E1\_F1\_G1\_H1\_I1

| Basic model                            |                                                                                |
|----------------------------------------|--------------------------------------------------------------------------------|
| A1                                     | Vortex mass flow meter with integrated temperature and pressure sensor         |
| A2                                     | Vortex flow meter without integrated temperature and pressure sensor           |
| Measured medium:                       |                                                                                |
| B1                                     | Vapour                                                                         |
| B2                                     | Liquids                                                                        |
| B3                                     | Gas                                                                            |
| Display option                         |                                                                                |
| C1                                     | With display                                                                   |
| Measuring section                      |                                                                                |
| D1                                     | 1/2" (DN 15)                                                                   |
| D2                                     | 3/4" (DN 20)                                                                   |
| D3                                     | 1" (DN 25)                                                                     |
| D4                                     | 1 1/4" (DN 32)                                                                 |
| D5                                     | 1 1/2" (DN 40)                                                                 |
| D6                                     | 2" (DN 50)                                                                     |
| D7                                     | 2 1/2" (DN 65)                                                                 |
| D8                                     | 3" (DN 80)                                                                     |
| D9                                     | 4" (DN 100)                                                                    |
| D10                                    | 5" (DN 125)                                                                    |
| D11                                    | 6" (DN 150)                                                                    |
| D12                                    | 8" (DN 200)                                                                    |
| D13                                    | 10" (DN 250)                                                                   |
| D14                                    | 12" (DN 300)                                                                   |
| Process connection                     |                                                                                |
| E1                                     | Intermediate flange up to 16 bar(g) / 232 psi(g)                               |
| E2                                     | Flange DIN PN 16                                                               |
| E3                                     | Flange DIN PN 25                                                               |
| E4                                     | Flange DIN PN 40                                                               |
| E5                                     | Flange DIN PN 63                                                               |
| E6                                     | Flange ANSI Class 150 lbs                                                      |
| E7                                     | Flange ANSI Class 300 lbs                                                      |
| E8                                     | Flange ANSI Class 400 lbs                                                      |
| Signal outputs / bus connection option |                                                                                |
| F1                                     | 3 x 4...20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU) |
| F2                                     | Ethernet-Interface (Modbus/TCP), 3 x 4...20 mA, RS 485 (Modbus-RTU)            |
| F3                                     | RS 485 (Modbus-RTU)                                                            |
| Reference standard                     |                                                                                |
| G1                                     | 20 °C, 1000 mbar                                                               |
| G2                                     | 0 °C, 1013.25 mbar                                                             |
| G3                                     | 15 °C, 981 mbar                                                                |
| G4                                     | 15 °C, 1013.25 mbar                                                            |
| G5                                     | Operating conditions                                                           |
| Surface condition                      |                                                                                |
| H1                                     | Standard version                                                               |
| H2                                     | Special cleaning – oil and grease free (e.g. for oxygen application)           |
| Max. process temperature               |                                                                                |
| I1                                     | up to 150 °C                                                                   |
| I2                                     | up to 250 °C                                                                   |
| I3                                     | up to 350 °C (can only be selected in combination with A2)                     |

| Measuring ranges of VX 570 (in m/s under operating conditions) |       |        |        |        |         |       |
|----------------------------------------------------------------|-------|--------|--------|--------|---------|-------|
| Nominal width                                                  | Gas   |        | Vapour |        | Liquids |       |
|                                                                | from  | to     | from   | to     | from    | to    |
| DN 15 - DN 20                                                  | 6 m/s | 60 m/s | 6 m/s  | 70 m/s | 0.3 m/s | 7 m/s |
| DN 25 - DN 32                                                  | 4 m/s | 60 m/s | 4 m/s  | 70 m/s |         |       |
| DN 40 - DN 300                                                 | 2 m/s | 60 m/s | 2 m/s  | 70 m/s |         |       |

| TECHNICAL DATA VX 570                                        |                                                                                                   |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Measuring range:                                             | See table                                                                                         |
| Measured medium:                                             | Primary single-phase gases, mixed gases, saturated vapour, superheated vapour and liquids         |
| Accuracy:                                                    | <b>Gas / Vapour:</b><br>± 1 % of m.v., (Re > 20,000)<br>± 2 % of m.v., (10,000 < Re < 20,000)     |
| Volume flow (m³/h)                                           | <b>Liquids:</b><br>± 0.75 % of m.v., (Re > 20,000)<br>± 2 % of m.v., (10,000 < Re < 20,000)       |
| Mass flow (kg/h) or standard volume flow (Nm³/h)             | <b>Gas / Vapour:</b><br>± 1.5 % of m.v., (Re > 20,000)<br>± 2.5 % of m.v., (10,000 < Re < 20,000) |
| Measuring principle:                                         | Vortex – vortex frequency measurement                                                             |
| Process temperature:                                         | -40°...+350°C                                                                                     |
| Process pressure:                                            | up to 63 bar (g)                                                                                  |
| Protection class                                             | IP67                                                                                              |
| Material measuring section and parts in contact with medium: | Stainless steel 304                                                                               |
| Material display unit:                                       | Aluminium – die casting                                                                           |
| Signal outputs:                                              | As standard:<br>RS 485 (Modbus-RTU), 3x 4...20 mA,<br><br><b>Optional:</b><br>Ethernet interface  |
| Power supply:                                                | 18...36 VDC                                                                                       |
| Measuring span:                                              | Gases: 1:30<br>Vapour: 1:35<br>Liquids 1:35                                                       |
| Viscosity                                                    | DN 15 ≤ 4 mPas<br>DN 25 ≤ 5 mPas<br>DN 40...DN 300 ≤ 7 mPas                                       |
| Repeatability:                                               | ± 0.3 % o. M. V.                                                                                  |
| Process connection:                                          | Flange DIN EN1092-1<br>Flange ANSI<br>Intermediate flange                                         |

| DESCRIPTION                                                               | ORDER NO.                           |
|---------------------------------------------------------------------------|-------------------------------------|
| VX 570 – Vortex flow sensor for vapour, gases and liquids                 | 0698 0570 +<br>Order code<br>A...I_ |
| Further accessories:<br>ISO calibration certificate at 5 measuring points | 3200 0001                           |



| Measuring ranges for <b>gases</b> and <b>liquids</b> VX 570 under operating conditions |     |        |               |               |              |              |               |               |              |              |
|----------------------------------------------------------------------------------------|-----|--------|---------------|---------------|--------------|--------------|---------------|---------------|--------------|--------------|
| Inside diameter of pipe                                                                |     |        | Gases         |               |              |              | Liquids       |               |              |              |
| Inch                                                                                   | mm  | DN     | Min flow m3/h | Max flow m3/h | Min flow cfm | Max flow cfm | Min flow m3/h | Max flow m3/h | Min flow GPM | Max flow GPM |
| 1/2"                                                                                   | 15  | DN 15  | 3.8           | 44.5          | 2.2          | 26.2         | 0.2           | 4.4           | 0.8          | 19.6         |
| 3/4"                                                                                   | 20  | DN 20  | 6.8           | 79.1          | 4            | 46.6         | 0.3           | 7.9           | 1.5          | 34.8         |
| 1"                                                                                     | 25  | DN 25  | 7.1           | 123.6         | 4.2          | 72.7         | 0.5           | 12.4          | 2.3          | 54.4         |
| 1 1/4"                                                                                 | 32  | DN 32  | 11.6          | 202.5         | 6.8          | 119.2        | 0.9           | 20.2          | 3.8          | 89.2         |
| 1 1/2"                                                                                 | 40  | DN 40  | 9             | 316.4         | 5.3          | 186.2        | 1.4           | 31.6          | 6.0          | 139.3        |
| 2"                                                                                     | 50  | DN 50  | 14.1          | 494.4         | 8.3          | 291          | 2.1           | 49.4          | 9.3          | 217.7        |
| 2 1/2"                                                                                 | 65  | DN 65  | 23.9          | 835.5         | 14           | 491.7        | 3.6           | 83.5          | 15.8         | 367.8        |
| 3"                                                                                     | 80  | DN 80  | 36.2          | 1265.5        | 21.3         | 744.9        | 5.4           | 126.6         | 23.9         | 557.2        |
| 4"                                                                                     | 100 | DN 100 | 56.5          | 1977.4        | 33.3         | 1163.9       | 8.5           | 197.7         | 37.3         | 870.6        |
| 5"                                                                                     | 125 | DN 125 | 88.3          | 3089.7        | 52           | 1818.5       | 13.2          | 309.0         | 58.3         | 1360.4       |
| 6"                                                                                     | 150 | DN 150 | 127.1         | 4449.2        | 74.8         | 2618.7       | 19.1          | 444.9         | 84.0         | 1958.9       |
| 8"                                                                                     | 200 | DN 200 | 226           | 7909.6        | 133          | 4655.4       | 33.9          | 791.0         | 149.3        | 3482.5       |
| 10"                                                                                    | 250 | DN 250 | 353.1         | 12358.8       | 207.8        | 7274.1       | 53.0          | 1235.9        | 233.2        | 5441.4       |
| 12"                                                                                    | 300 | DN 300 | 508.5         | 17796.6       | 299.3        | 10474.7      | 76.3          | 1779.7        | 335.8        | 7835.6       |

| Measuring ranges for <b>vapour</b> VX 570 under operating conditions in kg/h |     |        |                |         |               |         |               |         |               |         |               |         |               |         |               |         |
|------------------------------------------------------------------------------|-----|--------|----------------|---------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|
| Inside diameter of pipe                                                      |     |        | T=112 °C       |         | T=121 °C      |         | T=134 °C      |         | T=144 °C      |         | T=159 °C      |         | T=165 °C      |         | T=171 °C      |         |
|                                                                              |     |        | P=0.5 bar(g)   |         | P=1 bar(g)    |         | P=2 bar(g)    |         | P=3 bar(g)    |         | P=5 bar(g)    |         | P=6 bar(g)    |         | P=7 bar(g)    |         |
|                                                                              |     |        | D=0.8798 kg/m3 |         | D=1.155 kg/m3 |         | D=1.672 kg/m3 |         | D=2.185 kg/m3 |         | D=3.182 kg/m3 |         | D=3.671 kg/m3 |         | D=4.218 kg/m3 |         |
| Inch                                                                         | mm  | DN     | Min            | Max     | Min           | Max     | Min           | Max     | Min           | Max     | Min           | Max     | Min           | Max     | Min           | Max     |
| 1/2"                                                                         | 15  | DN 15  | 3.4            | 39.1    | 4.4           | 51.4    | 6.4           | 74.4    | 8.3           | 97.2    | 12.1          | 141.6   | 14.0          | 163.3   | 16.1          | 187.7   |
| 3/4"                                                                         | 20  | DN 20  | 6.0            | 69.6    | 7.8           | 91.4    | 11.3          | 132.2   | 14.8          | 172.8   | 21.6          | 251.7   | 24.9          | 290.4   | 28.6          | 333.6   |
| 1"                                                                           | 25  | DN 25  | 6.2            | 108.7   | 8.2           | 142.7   | 11.8          | 206.6   | 15.4          | 270.0   | 22.5          | 393.3   | 25.9          | 453.7   | 29.8          | 521.3   |
| 1 1/4"                                                                       | 32  | DN 32  | 10.2           | 178.1   | 13.4          | 233.9   | 19.3          | 338.6   | 25.3          | 442.4   | 36.8          | 644.3   | 42.5          | 743.3   | 48.8          | 854.1   |
| 1 1/2"                                                                       | 40  | DN 40  | 8.0            | 278.4   | 10.4          | 365.4   | 15.1          | 529.0   | 19.8          | 691.3   | 28.8          | 1006.7  | 33.2          | 1161.4  | 38.1          | 1334.5  |
| 2"                                                                           | 50  | DN 50  | 12.4           | 434.9   | 16.3          | 571.0   | 23.6          | 826.6   | 30.9          | 1080.2  | 44.9          | 1573.0  | 51.9          | 1814.8  | 59.6          | 2085.2  |
| 2 1/2"                                                                       | 65  | DN 65  | 21.0           | 735.0   | 27.6          | 964.9   | 39.9          | 1396.9  | 52.2          | 1825.5  | 76.0          | 2658.4  | 87.6          | 3066.9  | 100.7         | 3523.9  |
| 3"                                                                           | 80  | DN 80  | 31.8           | 1113.4  | 41.8          | 1461.7  | 60.5          | 2116.0  | 79.0          | 2765.2  | 115.1         | 4026.9  | 132.7         | 4645.8  | 152.5         | 5338.0  |
| 4"                                                                           | 100 | DN 100 | 49.7           | 1739.7  | 65.3          | 2283.9  | 94.5          | 3306.2  | 123.4         | 4320.6  | 179.8         | 6292.1  | 207.4         | 7259.0  | 238.3         | 8340.7  |
| 5"                                                                           | 125 | DN 125 | 77.7           | 2718.3  | 102.0         | 3568.6  | 147.6         | 5166.0  | 192.9         | 6751.0  | 280.9         | 9831.4  | 324.1         | 11342.2 | 372.4         | 13032.3 |
| 6"                                                                           | 150 | DN 150 | 111.8          | 3914.4  | 146.8         | 5138.8  | 212.5         | 7439.0  | 277.8         | 9721.4  | 404.5         | 14157.2 | 466.7         | 16332.8 | 536.2         | 18766.5 |
| 8"                                                                           | 200 | DN 200 | 198.8          | 6958.9  | 261.0         | 9135.6  | 377.9         | 13224.9 | 493.8         | 17282.5 | 719.1         | 25168.4 | 829.6         | 29036.2 | 953.2         | 33362.7 |
| 10"                                                                          | 250 | DN 250 | 310.7          | 10873.2 | 407.8         | 14274.4 | 590.4         | 20663.8 | 771.5         | 27003.9 | 1123.6        | 39325.6 | 1296.3        | 45369.0 | 1489.4        | 52129.2 |
| 12"                                                                          | 300 | DN 300 | 447.4          | 15657.5 | 587.3         | 20555.1 | 850.2         | 29755.9 | 1111.0        | 38885.6 | 1618.0        | 56628.8 | 1866.6        | 65331.4 | 2144.7        | 75066.1 |

| Measuring ranges for <b>vapour</b> VX 570 under operating conditions kg/h |     |        |               |         |               |          |               |          |               |          |               |          |               |          |
|---------------------------------------------------------------------------|-----|--------|---------------|---------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| Inside diameter of pipe                                                   |     |        | T=176 °C      |         | T=185 °C      |          | T=192 °C      |          | T=199 °C      |          | T=210 °C      |          | T=215 °C      |          |
|                                                                           |     |        | P=8 bar(g)    |         | P=10 bar(g)   |          | P=12 bar(g)   |          | P=14 bar(g)   |          | P=18 bar(g)   |          | P=20 bar(g)   |          |
|                                                                           |     |        | D=4.723 kg/m3 |         | D=5.752 kg/m3 |          | D=6.671 kg/m3 |          | D=7.706 kg/m3 |          | D=9.593 kg/m3 |          | D=10.57 kg/m3 |          |
| Inch                                                                      | mm  | DN     | Min           | Max     | Min           | Max      | Min           | Max      | Min           | Max      | Min           | Max      | Min           | Max      |
| 1/2"                                                                      | 15  | DN 15  | 18.0          | 210.1   | 21.9          | 255.9    | 25.4          | 296.8    | 29.4          | 342.9    | 36.6          | 426.8    | 40.3          | 470.3    |
| 3/4"                                                                      | 20  | DN 20  | 32.0          | 373.6   | 39.0          | 455.0    | 45.2          | 527.6    | 52.2          | 609.5    | 65.0          | 758.8    | 71.7          | 836.0    |
| 1"                                                                        | 25  | DN 25  | 33.4          | 583.7   | 40.6          | 710.9    | 47.1          | 824.5    | 54.4          | 952.4    | 67.7          | 1185.6   | 74.6          | 1306.3   |
| 1 1/4"                                                                    | 32  | DN 32  | 54.6          | 956.3   | 66.6          | 1164.7   | 77.2          | 1350.8   | 89.2          | 1560.4   | 111.0         | 1942.4   | 122.3         | 2140.3   |
| 1 1/2"                                                                    | 40  | DN 40  | 42.7          | 1494.3  | 52.0          | 1819.8   | 60.3          | 2110.6   | 69.7          | 2438.1   | 86.7          | 3035.1   | 95.5          | 3344.2   |
| 2"                                                                        | 50  | DN 50  | 66.7          | 2334.8  | 81.2          | 2843.5   | 94.2          | 3297.8   | 108.8         | 3809.5   | 135.5         | 4742.3   | 149.3         | 5225.3   |
| 2 1/2"                                                                    | 65  | DN 65  | 112.7         | 3945.8  | 137.3         | 4805.5   | 159.2         | 5573.3   | 183.9         | 6438.0   | 229.0         | 8014.5   | 252.3         | 8830.7   |
| 3"                                                                        | 80  | DN 80  | 170.8         | 5977.1  | 208.0         | 7279.4   | 241.2         | 8442.4   | 278.6         | 9752.2   | 346.9         | 12140.3  | 382.2         | 13376.7  |
| 4"                                                                        | 100 | DN 100 | 266.8         | 9339.3  | 325.0         | 11374.0  | 376.9         | 13191.2  | 435.4         | 15237.9  | 542.0         | 18969.2  | 597.2         | 20901.1  |
| 5"                                                                        | 125 | DN 125 | 416.9         | 14592.6 | 507.8         | 17771.9  | 588.9         | 20611.3  | 680.3         | 23809.1  | 846.8         | 29639.4  | 933.1         | 32658.0  |
| 6"                                                                        | 150 | DN 150 | 600.4         | 21013.3 | 731.2         | 25591.5  | 848.0         | 29680.3  | 979.6         | 34285.2  | 1219.4        | 42680.7  | 1343.6        | 47027.5  |
| 8"                                                                        | 200 | DN 200 | 1067.3        | 37357.1 | 1299.9        | 45496.0  | 1507.6        | 52765.0  | 1741.5        | 60951.4  | 2167.9        | 75876.8  | 2388.7        | 83604.5  |
| 10"                                                                       | 250 | DN 250 | 1667.7        | 58370.4 | 2031.1        | 71087.6  | 2355.6        | 82445.3  | 2721.0        | 95236.6  | 3387.4        | 118557.6 | 3732.3        | 130632.1 |
| 12"                                                                       | 300 | DN 300 | 2401.5        | 84053.4 | 2924.7        | 102366.1 | 3392.0        | 118721.2 | 3918.3        | 137140.7 | 4877.8        | 170722.9 | 5374.6        | 188110.2 |


**Measuring ranges for vapour VX 570 under operating conditions in lb/h**

| Inside diameter of pipe |     |        | T=233.6 °F      |         | T=249.8 °F      |         | T=273.2 °F      |         | T=291.2 °F      |         | T=318.2 °F      |          | T=329 °F        |          | T=339.8 °F      |          |
|-------------------------|-----|--------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|----------|-----------------|----------|-----------------|----------|
|                         |     |        | P=7.3 psi(g)    |         | P=14.5 psi(g)   |         | P=29 psi(g)     |         | P=43.5 psi(g)   |         | P=72.5 psi(g)   |          | P=87 psi(g)     |          | P=101.5 psi(g)  |          |
|                         |     |        | D=0.0034 lb/ft3 |         | D=0.0721 lb/ft3 |         | D=0.1044 lb/ft3 |         | D=0.1364 lb/ft3 |         | D=0.1986 lb/ft3 |          | D=0.2292 lb/ft3 |          | D=0.2633 lb/ft3 |          |
| Inch                    | mm  | DN     | Min             | Max     | Min             | Max     | Min             | Max     | Min             | Max     | Min             | Max      | Min             | Max      | Min             | Max      |
| 1/2"                    | 15  | DN 15  | 7.4             | 86.3    | 9.7             | 113.3   | 14.1            | 164.0   | 18.4            | 214.3   | 26.8            | 312.1    | 30.9            | 360.1    | 35.5            | 413.7    |
| 3/4"                    | 20  | DN 20  | 13.2            | 153.4   | 17.3            | 201.4   | 25.0            | 291.6   | 32.7            | 381.0   | 47.6            | 554.9    | 54.9            | 640.1    | 63.0            | 735.5    |
| 1"                      | 25  | DN 25  | 13.7            | 239.7   | 18.0            | 314.7   | 26.0            | 455.6   | 34.0            | 595.3   | 49.5            | 867.0    | 57.2            | 1000.2   | 65.7            | 1149.3   |
| 1 1/4"                  | 32  | DN 32  | 22.4            | 392.7   | 29.5            | 515.6   | 42.7            | 746.4   | 55.7            | 975.4   | 81.2            | 1420.5   | 93.6            | 1638.8   | 107.6           | 1882.9   |
| 1 1/2"                  | 40  | DN 40  | 17.5            | 613.7   | 23.0            | 805.6   | 33.3            | 1166.2  | 43.5            | 1524.1  | 63.4            | 2219.5   | 73.2            | 2560.6   | 84.1            | 2942.1   |
| 2"                      | 50  | DN 50  | 27.4            | 958.9   | 36.0            | 1258.8  | 52.1            | 1822.2  | 68.0            | 2381.3  | 99.1            | 3467.9   | 114.3           | 4000.9   | 131.3           | 4597.0   |
| 2 1/2"                  | 65  | DN 65  | 46.3            | 1620.5  | 60.8            | 2127.3  | 88.0            | 3079.6  | 115.0           | 4024.5  | 167.5           | 5860.8   | 193.2           | 6761.5   | 222.0           | 7768.9   |
| 3"                      | 80  | DN 80  | 70.1            | 2454.7  | 92.1            | 3222.5  | 133.3           | 4664.9  | 174.2           | 6096.2  | 253.7           | 8877.9   | 292.6           | 10242.2  | 336.2           | 11768.4  |
| 4"                      | 100 | DN 100 | 109.6           | 3835.4  | 143.9           | 5035.1  | 208.3           | 7289.0  | 272.2           | 9525.3  | 396.3           | 13871.7  | 457.2           | 16003.4  | 525.4           | 18388.0  |
| 5"                      | 125 | DN 125 | 171.2           | 5992.8  | 224.8           | 7867.4  | 325.4           | 11389.0 | 425.2           | 14883.3 | 619.3           | 21674.5  | 714.4           | 25005.4  | 820.9           | 28731.3  |
| 6"                      | 150 | DN 150 | 246.6           | 8629.7  | 323.7           | 11329.1 | 468.6           | 16400.2 | 612.3           | 21432.0 | 891.8           | 31211.3  | 1028.8          | 36007.7  | 1182.1          | 41373.1  |
| 8"                      | 200 | DN 200 | 438.3           | 15341.7 | 575.4           | 20140.5 | 833.0           | 29155.8 | 1088.6          | 38101.4 | 1585.3          | 55486.7  | 1829.0          | 64013.8  | 2101.5          | 73552.2  |
| 10"                     | 250 | DN 250 | 684.9           | 23971.4 | 899.1           | 31469.6 | 1301.6          | 45556.0 | 1701.0          | 59533.4 | 2477.1          | 86698.0  | 2857.8          | 100021.5 | 3283.6          | 114925.3 |
| 12"                     | 300 | DN 300 | 986.3           | 34518.8 | 1294.7          | 45316.2 | 1874.3          | 65600.6 | 2449.4          | 85728.1 | 3567.0          | 124845.2 | 4115.2          | 144031.0 | 4728.4          | 165492.4 |

**Measuring ranges for vapour VX 570 under operating conditions in lb/h**

| Inside diameter of pipe |     |        | T=348.8 °F      |          | T=365 °F        |          | T=377.6 °F      |          | T=390.2 °F      |          | T=410 °F        |          | T=419 °F        |          |
|-------------------------|-----|--------|-----------------|----------|-----------------|----------|-----------------|----------|-----------------|----------|-----------------|----------|-----------------|----------|
|                         |     |        | P=116 psi(g)    |          | P=145 psi(g)    |          | P=174 psi(g)    |          | P=203 psi(g)    |          | P=261 psi(g)    |          | P=290 psi(g)    |          |
|                         |     |        | D=0.2948 lb/ft3 |          | D=0.3591 lb/ft3 |          | D=0.4165 lb/ft3 |          | D=0.4811 lb/ft3 |          | D=0.5989 lb/ft3 |          | D=0.6599 lb/ft3 |          |
| Inch                    | mm  | DN     | Min             | Max      | Min             | Max      | Min             | Max      | Min             | Max      | Min             | Max      | Min             | Max      |
| 1/2"                    | 15  | DN 15  | 39.7            | 463.3    | 48.4            | 564.2    | 56.1            | 654.3    | 64.8            | 755.9    | 80.7            | 940.9    | 88.9            | 1036.8   |
| 3/4"                    | 20  | DN 20  | 70.6            | 823.6    | 86.0            | 1003.0   | 99.7            | 1163.3   | 115.2           | 1343.7   | 143.4           | 1672.8   | 158.0           | 1843.2   |
| 1"                      | 25  | DN 25  | 73.5            | 1286.8   | 89.6            | 1567.2   | 103.9           | 1817.6   | 120.0           | 2099.6   | 149.4           | 2613.7   | 164.6           | 2879.9   |
| 1 1/4"                  | 32  | DN 32  | 120.5           | 2108.4   | 146.7           | 2567.7   | 170.2           | 2978.0   | 196.6           | 3440.0   | 244.7           | 4282.4   | 269.6           | 4718.5   |
| 1 1/2"                  | 40  | DN 40  | 94.1            | 3294.3   | 114.6           | 4012.1   | 132.9           | 4653.1   | 153.6           | 5375.0   | 191.2           | 6691.2   | 210.6           | 7372.7   |
| 2"                      | 50  | DN 50  | 147.1           | 5147.4   | 179.1           | 6268.9   | 207.7           | 7270.4   | 240.0           | 8398.4   | 298.7           | 10455.0  | 329.1           | 11519.8  |
| 2 1/2"                  | 65  | DN 65  | 248.5           | 8699.1   | 302.7           | 10594.4  | 351.1           | 12287.0  | 405.5           | 14193.3  | 504.8           | 17668.9  | 556.2           | 19468.4  |
| 3"                      | 80  | DN 80  | 376.5           | 13177.3  | 458.5           | 16048.3  | 531.8           | 18612.3  | 614.3           | 21500.0  | 764.7           | 26764.8  | 842.6           | 29490.6  |
| 4"                      | 100 | DN 100 | 588.3           | 20589.6  | 716.4           | 25075.4  | 830.9           | 29081.7  | 959.8           | 33593.7  | 1194.9          | 41819.9  | 1316.5          | 46079.1  |
| 5"                      | 125 | DN 125 | 919.2           | 32171.2  | 1119.4          | 39180.3  | 1298.3          | 45440.2  | 1499.7          | 52490.2  | 1867.0          | 65343.7  | 2057.1          | 71998.6  |
| 6"                      | 150 | DN 150 | 1323.6          | 46326.5  | 1612.0          | 56419.7  | 1869.5          | 65433.9  | 2159.6          | 75585.9  | 2688.4          | 94094.9  | 2962.2          | 103678.0 |
| 8"                      | 200 | DN 200 | 2353.1          | 82358.2  | 2865.8          | 100301.6 | 3323.6          | 116326.8 | 3839.3          | 134374.9 | 4779.4          | 167279.8 | 5266.2          | 184316.4 |
| 10"                     | 250 | DN 250 | 3676.7          | 128684.7 | 4477.8          | 156721.3 | 5193.2          | 181760.7 | 5998.9          | 209960.7 | 7467.8          | 261374.7 | 8228.4          | 287994.4 |
| 12"                     | 300 | DN 300 | 5294.5          | 185306.0 | 6448.0          | 225678.6 | 7478.2          | 261735.4 | 8638.4          | 302343.4 | 10753.7         | 376379.5 | 11848.9         | 414711.9 |