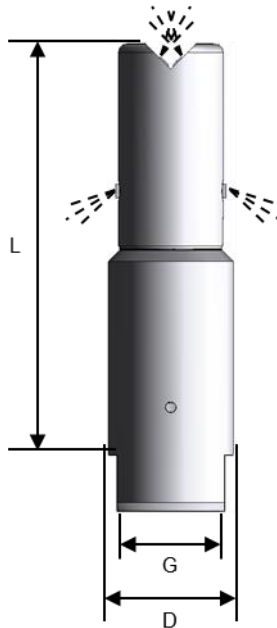


Whirl jet nozzle

WSD-FR 1000

Whirl jet nozzles type WSD-FR 1000 have, in addition to the radial-radiating nozzles for tube cleaning, front-directed nozzles with which the nozzles clean their way through the pipe effectively. Due to the repulsive force of the emerging high-pressure water, the nozzle rotor rotates several thousand revolutions. The whirl jet nozzles are available in many diameters for adaptation to different pipe diameters.



Special benefits

- Robust design and easy rotor exchange
- For use with lances or hoses (see additional information)

Additional information

- The use of whirl jet nozzles WSD-FR with hoses is only permitted in conjunction with a suitable forward feeding unit (see accessories)
- In vertical cleaning applications the nozzle must only be used from bottom to top

Technical data

| | |
|--------------------|----------------|
| Operating pressure | max. 1.000 bar |
|--------------------|----------------|

Variants whirl jet nozzles

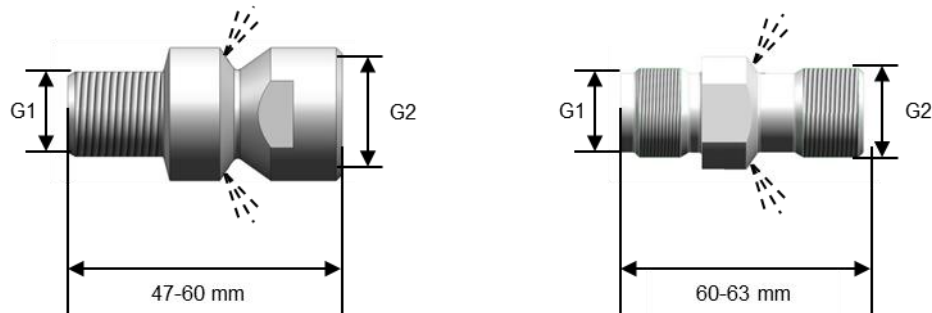
| Type | Ø D [mm] | Length L [mm] | Thread G [mm] | Nozzle-Ø F [mm] | Nozzle-Ø R [mm] | Material-Number |
|----------|----------|---------------|---------------|-----------------|-----------------|-----------------|
| WSD-FR12 | 12 | 50 | iG 1/8" | 2x 0,5 | 2x 0,5 | 9.886-713.0 |
| | | | | 2x 0,8 | 2x 0,8 | 9.886-625.0 |
| | | | | 2x 1,0 | 2x 1,0 | 9.886-749.0 |
| WSD-FR18 | 18 | 70 | iG 1/4" | 2x 0,8 | 2x 0,8 | 9.886-626.0 |
| WSD-FR22 | 22 | 80 | iG 1/4" | 2x 0,5 | 2x 0,5 | 9.886-627.0 |
| | | | | 2x 0,6 | 2x 0,6 | 9.910-937.0 |
| | | | | 2x 0,8 | 2x 0,8 | 9.886-628.0 |
| | | | | 2x 1,0 | 2x 1,0 | 9.886-750.0 |
| WSD-FR31 | 31 | 115 | iM22 x 1,5 | 2x 0,6 | 2x 0,6 | 9.910-942.0 |
| | | | | 2x 0,8 | 2x 0,8 | 9.910-951.0 |
| | | | | 2x 1,0 | 2x 1,0 | 9.886-630.0 |
| WSD-FR47 | 47 | 160 | iM22 x 1,5 | 2x 0,75 | 2x 0,8 | 9.910-950.0 |
| | | | | 2x 1,0 | 2x 1,0 | 9.886-631.0 |
| | | | | 2x 1,5 | 2x 1,5 | 9.910-936.0 |

| Performance chart whirl jet nozzle | | | | | | | | | | | | | | | | |
|------------------------------------|----------------|----------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Type | Nozzle R* [mm] | Nozzle F* [mm] | Operating pressure [bar] | | | | | | | | | | | | | |
| | | | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | | | Flow rate [l/min] | | | | | | | | | | | | | |
| FR 12 | 2x 0,5 | 2x 0,5 | 8 | 8 | 9 | 9 | 19 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 13 | 13 |
| | 2x 0,8 | 2x 0,8 | 20 | 21 | 22 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 33 |
| | 2x 1,0 | 2x 1,0 | 31 | 33 | 35 | 37 | 39 | 40 | 42 | 44 | 45 | 47 | 48 | 50 | 51 | 52 |
| FR 18 | 2x 0,8 | 2x 0,8 | 26 | 28 | 30 | 31 | 33 | 34 | 36 | 37 | 38 | 40 | 41 | 42 | 43 | 44 |
| FR 22 | 2x 0,5 | 2x 0,5 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 16 | 16 | 17 | 17 | 18 | 18 | 19 |
| | 2x 0,6 | 2x 0,6 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 22 | 23 | 14 | 25 | 25 | 26 | 27 |
| | 2x 0,8 | 2x 0,6 | 22 | 23 | 25 | 26 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| | 2x 0,8 | 2x 0,8 | 28 | 30 | 32 | 34 | 35 | 37 | 38 | 40 | 41 | 42 | 44 | 45 | 46 | 47 |
| | 2x 1,0 | 2x 1,0 | 44 | 47 | 50 | 52 | 55 | 57 | 60 | 62 | 64 | 66 | 68 | 70 | 72 | 74 |
| FR 31 | 2x 0,6 | 2x 0,6 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 27 | 28 | 28 |
| | 2x 0,8 | 2x 0,8 | 30 | 32 | 34 | 35 | 37 | 39 | 40 | 42 | 43 | 45 | 46 | 48 | 49 | 50 |
| | 2x 1,0 | 2x 1,0 | 46 | 50 | 53 | 55 | 58 | 61 | 63 | 66 | 68 | 70 | 72 | 74 | 76 | 78 |
| FR 47 | 2x 0,8 | 2x 0,75 | 29 | 31 | 33 | 34 | 36 | 38 | 39 | 41 | 42 | 44 | 45 | 46 | 47 | 49 |
| | 2x 1,0 | 2x 1,0 | 48 | 51 | 54 | 57 | 60 | 63 | 65 | 68 | 70 | 72 | 75 | 77 | 79 | 81 |
| | 2x 1,5 | 2x 1,5 | 108 | 115 | 122 | 129 | 135 | 141 | 147 | 152 | 158 | 163 | 168 | 173 | 177 | 182 |

* F = front-directed nozzles; R = radial nozzles

Accessories

| Spare sealing rings | |
|---------------------|-----------------|
| for | Material-Number |
| WSD-FR12 | 6.025-316.0 |
| WSD-FR18 | 6.025-298.0 |
| WSD-FR22 | |
| WSD-FR31 | 9.881-445.0 |
| WSD-FR47 | |

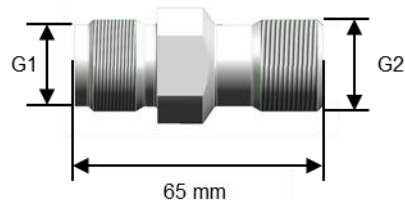


Variants forward feed units

| Type | for | Threads G1 – G2 [mm] | Nozzle-Ø [mm] | Material-Number |
|-----------|----------------------|--------------------------------|---------------|-----------------|
| VSE 12 | WSD-FR12 | aG 1/8" – iG 1/8" | 2x 0,8 | 9.886-632.0 |
| VSE 18 | WSD-FR18 | aG 1/4" – iG 1/4" | 2x 0,8 | 9.886-634.0 |
| VSE 22 | WSD-FR22 | aG 1/4" – iG 1/4" | 2x 0,9 | 9.886-636.0 |
| VSE 31/47 | WSD-FR31 WSD-FR47 | aM22 x 1,5 – aM22 x 1,5 60°DK | 2x 0,9 | 9.886-638.0 |
| | | aM22 x 1,5 – aM22 x 1,5 60°DK | 4x 0,9 | 9.886-704.0 |
| | | aM22 x 1,5 – aM24 x 1,5 24°DK | 4x 0,9 | 9.919-134.0 |
| | | aM22 x 1,5 – aM22 x 1,5 24°DKO | 2x 0,9 | 9.886-639.0 |
| | | aM22 x 1,5 – aM24 x 1,5 24°DKO | | 9.886-640.0 |

Performance chart forward feed unit

| Type | Operating pressure [bar] | | | | | | | | | | | | | | |
|--------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | Flow rate [l/min] | | | | | | | | | | | | | | |
| VSE 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 21 | 22 | 22 | 23 | 24 | 25 |
| VSE 18 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 21 | 22 | 22 | 23 | 24 | 24 |
| VSE 22 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 27 | 28 | 29 | 30 | 30 |
| VSE 31 2x0,9 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 27 | 28 | 29 | 30 | 30 |
| VSE 31 4x0,9 | 36 | 39 | 41 | 44 | 46 | 49 | 51 | 53 | 55 | 57 | 59 | 60 | 62 | 64 | 66 |
| VSE 47 2x0,9 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 27 | 28 | 29 | 30 | 30 |
| VSE 47 4x0,9 | 36 | 39 | 41 | 44 | 46 | 49 | 51 | 53 | 55 | 57 | 59 | 60 | 62 | 64 | 66 |



Hose connector

| Type | for | Threads G1 – G2 [mm] | Material-Number |
|------|----------------------|--------------------------------|-----------------|
| SAA | WSD-FR31 WSD-FR47 | aM22 x 1,5 – aM24 x 1,5 24°DKO | 9.877-951.0 |