# Three-Way Mixing Valve

## with or without presetting, for heating and cooling systems

To be precise.

**Heimeier**

# Three-Way Mixing Valve

## Description

HEIMEIER three-way mixing valve, with or without presetting, for mixing volume flows in heating and cooling systems, made of gunmetal, with protection cap.

Stainless spindle with double O-ring sealing. Outer O-ring can be exchanged without draining the system.

Models: flat sealing, and flat sealing with T-piece. Connection with threaded, soldering, or welding nipples.

Models: conically sealing DN 15, G $3/4$ male thread. Connection with HEIMEIER compression fittings for plastic, copper, precision steel, or multi-layer pipes.

Operating temperature 2 °C to 120 °C; with protection cap or actuator up to 100 °C. Admissible operating over-pressure PB 10 bar.

Max. admissible differential pressure:
DN 15 = 1.20 bar
DN 20 = 0.75 bar
DN 25 = 0.50 bar
DN 32 = 0.25 bar

## Construction

**Three-Way Mixing Valve** (black protection cap)

Thermostatic insert

A

AB

Corrosion-resistant gunmetal body

B
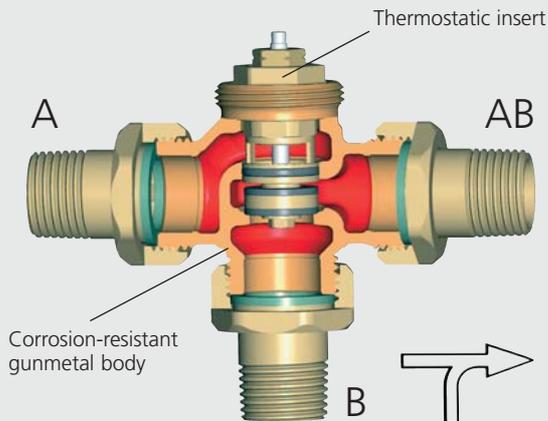
• **models with or without presetting**

• **ideal for supply temperature control with actuator EMO 3/230**

• **for all HEIMEIER thermostatic heads and actuators**

• **corrosion-resistant gunmetal body**

• **universal connection possibilities**

**Three-Way Mixing Valve with Presetting** (white protection cap)

Thermostatic insert with presetting

A

AB

Setting key

B

# Three-Way Mixing Valve
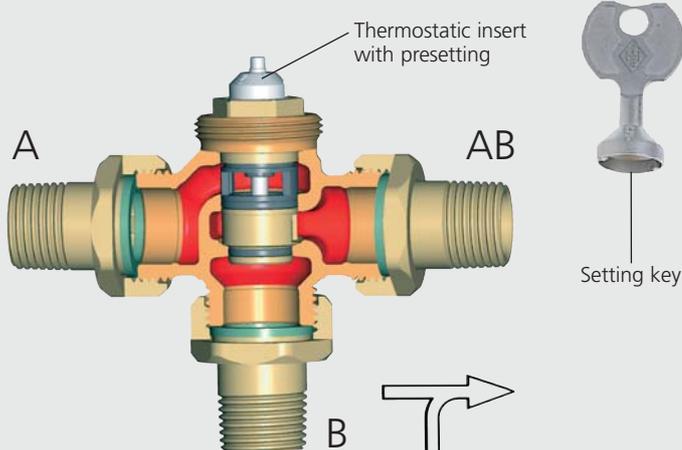
## Function

Thermostatic heads (brochure: Thermostatic Head K with contact or immersion sensor and/or thermostatic heads) are used for proportional control without auxiliary power. When the temperature rises, the angled B-AB passage is closed, and the straight A-AB passage is opened.

The EMO 1, EMO EIB, EMOLON, and/or EMO 3 / EMO 3/230 motorized actuators are used for proportional and/or three-step control with auxiliary power (brochure: EMO, EMO EIB, EMOLON).

The EMO T (brochure: EMO T) thermal actuator is used for two-step control with auxiliary power.

In the model normally open (NO), the angled B-AB passage is open without , and the straight A-AB passage is closed without current.

In the model, normally closed (NC), the angled B-AB passage is closed without current, and the straight A-AB passage is open without current.

The models with continuously adjustable presetting enable the adjustment of the necessary volume flow in the AB outlet. To preset, the setting key is slipped onto the valve insert, and the desired value is set. The setting values are displayed on the front of the valve insert. Without an instrument, the presetting cannot be manipulated by unauthorised persons.

## Application

**Mixing function**
Admixture control in heating or cooling systems. Variable volume flow in the primary circuit. Constant volume flow in the secondary circuit.

**Distributing function**
Power control in heating or cooling systems by means of flow rate control. Constant volume flow in the primary circuit. Variable volume flow in the secondary circuit.

### Principle heating mode[1]

with EMO T thermal actuator normally open (NO), or with motorized actuator EMO 1/3/EIB/LON[2]

**Mixing function**



Primary circuit — Secondary circuit — ④

**Distributing function**



Primary circuit — Secondary circuit — ④
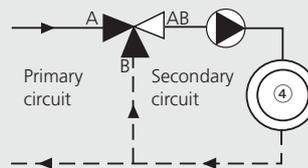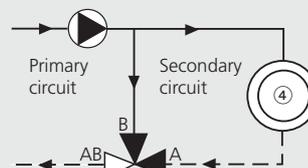
with thermostatic head or with EMO T thermal actuator normally closed (NC)

**Mixing function**



Primary circuit — Secondary circuit — ④

**Distributing function**



Primary circuit — Secondary circuit — ④
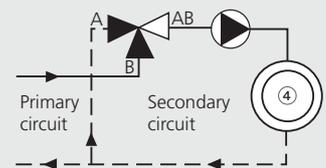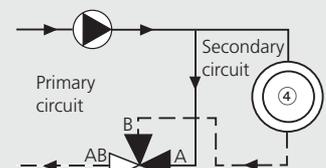
[1] For cooling, the connection of inlets A and B must be exchanged.
[2] The effective direction of the EMO 1/3/EIB/LON motorized actuators is determined by the controller or the connection.

### Examples of use
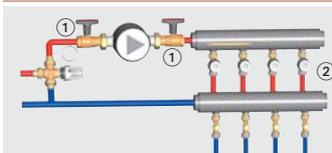


Supply temperature control for floor heating circuit manifolds with thermostatic head K with contact sensor.
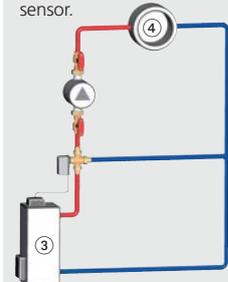
Supply temperature control by means of admixture control in the heating circuit with EMO 3/230.
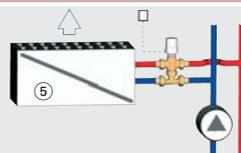
Water-side control of fan-coil appliances (air-conditioning systems / fan-coil units), e.g. with EMO T (NO).
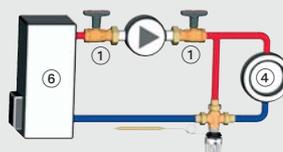
Return temperature increase for solid-fuel boilers with thermostatic head K with contact sensor.
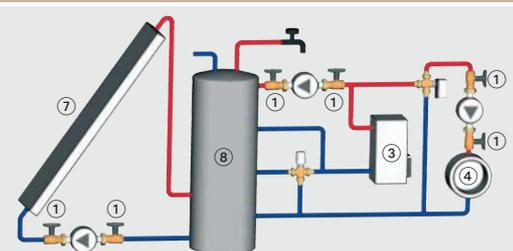
Heating support for bivalent solar facilities with EMO T (NO), for example.

Admixture control in the heating circuit with EMO 3/230, for example.

① Globo P
② Floor heating circuit manifold
③ Oil/gas boiler
④ Radiator
⑤ Fan/coil unit
⑥ Solid-fuel boiler
⑦ Solar collector
⑧ Combined solar storage tank

### Information

To prevent damage and incrustation in hot water heating systems, the composition of the heat transfer medium should meet VDI [German Engineer Association] directive 2035. The instruction leaflet of the VdTÜV [German Association of Technical Inspection Authorities]

"1466/AGFW-Merkblatt 5/15" must be observed for industrial and long-distance energy systems. Mineral oil or mineral-oil based lubricants of all kinds in the heat transfer medium lead to considerable swelling and, in most cases, to a failure of EPDM seals. When using non-nitrite anti-

freeze and anti-corrosive agents based on ethylene glycol, please read the respective particulars-especially on the concentration of the individual additives-in the manufacturer's documentation.

# Three-Way Mixing Valve

## Article numbers

### Three-Way Mixing Valve without Presetting (black protection cap)

| Illustration | Article | DN | art. no. | DN | art. no. | DN | art. no. | DN | art. no. |
|---|---|---|---|---|---|---|---|---|---|
| | **Three-way mixing valve** flat sealing | 15 | **4170-02.000** | 20 | **4170-03.000** | 25 | **4170-04.000** | 32 | **4170-05.000** |
| | **Three-way mixing valve with T-piece** flat sealing | 15 | **4172-02.000** | 20 | **4172-03.000** | – | – | – | – |
| | **Three-way mixing valve** conically sealing | 15 G ¾ Male thread | **4171-02.000** | – | – | – | – | – | – |

### Three-Way Mixing Valve with Presetting (white protection cap)

| Illustration | Article | DN | art. no. | DN | art. no. | DN | art. no. | DN | art. no. |
|---|---|---|---|---|---|---|---|---|---|
| | **Three-way mixing valve** flat sealing | 15 | **4175-02.000** | 20 | **4175-03.000** | – | – | – | – |
| | **Three-way mixing valve with T-piece** flat sealing | 15 | **4177-02.000** | 20 | **4177-03.000** | – | – | – | – |
| | **Three-way mixing valve** conically sealing | 15 G ¾ Male thread | **4176-02.000** | – | – | – | – | – | – |

| Illustration | Description | art. no. |
|---|---|---|
| | **Setting key** for activating the three-way mixing valve with presetting. For thermostatic valve body also V-exakt/F-exakt. | **3501-02.142** |
| | **Universal spanner** as an alternative to the setting key (art. no. 3501-02.142), for activating the three-way mixing valve with presetting. Also for thermostatic valve bodies V-exakt/F-exakt, thermostatic head B (temperature setting), Regulux lockshield, Vekolux double connection fitting, and radiator air vents. | **0530-01.433** |
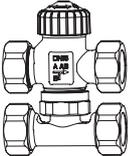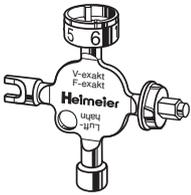
# Three-Way Mixing Valve

Heimeier

## Accessories

### For Three-Way Mixing Valve, Flat Sealing

| Illustration | Description | DN valve | Ø pipe | art. no. |
|---|---|---|---|---|
| | **Connecting nipple** for flat sealing three-way mixing valves. | | | |
| | **Threaded nipple** | 15 ($1/2$″) | R $1/2$ | **4160-02.010** |
| | | 20 ($3/4$″) | R $3/4$ | **4160-03.010** |
| | | 25 (1″) | R 1 | **4160-04.010** |
| | | 32 ($11/4$″) | R $11/4$ | **4160-05.010** |
| | **Soldering nipple** | 15 ($1/2$″) | 15 | **4160-15.039** |
| | | 15 ($1/2$″) | 16 | **4160-16.039** |
| | | 15 ($1/2$″) | 18 | **4160-18.039** |
| | | 20 ($3/4$″) | 22 | **4160-22.039** |
| | | 25 (1″) | 28 | **4160-28.039** |
| | | 32 ($11/4$″) | 35 | **4160-35.039** |
| | **Welding nipple** | 15 ($1/2$″) | 20,8 | **4160-02.043** |
| | | 20 ($3/4$″) | 26,3 | **4160-03.043** |
| | | 25 (1″) | 33,2 | **4160-04.043** |
| | | 32 ($11/4$″) | 41,8 | **4160-05.043** |
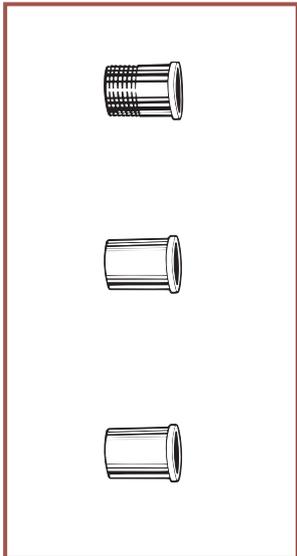
### For Three-Way Mixing Valve, Conically Sealing

| Illustration | Description | L [mm] | Ø pipe | art. no. |
|---|---|---|---|---|
| | **Compression fitting** for copper or precision steel pipes. Brass. Metal-to-metal joint. For pipes with 0.8–1 mm thick walls, support bushes must be used. Observe pipe manufacturer's particulars. | | 10 | **1300-10.351** |
| | | | 12 | **1300-12.351** |
| | | | 14 | **1300-14.351** |
| | | | 15 | **1300-15.351** |
| | | | 16 | **1300-16.351** |
| | | | 18 | **1300-18.351** |
| | **Support bushes** for copper or precision steel pipes with 1 mm thick walls. Brass. | 18,5 | 10 | **1300-10.170** |
| | | 25,0 | 12 | **1300-12.170** |
| | | 25,0 | 14 | **1300-14.170** |
| | | 26,0 | 15 | **1300-15.170** |
| | | 26,3 | 16 | **1300-16.170** |
| | | 26,8 | 18 | **1300-18.170** |
| | **Compression fitting** for copper or precision steel pipes. Brass, nickel-plated. Soft sealing. | | 12 | **1313-12.351** |
| | | | 14 | **1313-14.351** |
| | | | 15 | **1313-15.351** |
| | | | 16 | **1313-16.351** |
| | | | 18 | **1313-18.351** |
| | **Compression fitting** for plastic pipes. Brass. | | 12 x 2 | **1301-12.351** |
| | | | 14 x 2 | **1301-14.351** |
| | | | 16 x 2 | **1301-16.351** |
| | | | 17 x 2 | **1301-17.351** |
| | | | 18 x 2 | **1301-18.351** |
| | | | 18 x 2,5 | **1302-18.351** |
| | | | 20 x 2 | **1301-20.351** |
| | | | 21 x 2,5 | **1301-21.351** |
| | **Compression fitting** for multi-layer pipes.. Brass. | | 14 x 2 | **1330-14.351** |
| | | | 16 x 2 | **1330-16.351** |
| | | | 18 x 2 | **1330-18.351** |

# Three-Way Mixing Valve

## Technical data

### Diagram, three-way mixing valve, $k_{vs}$ values



DN 32 ($k_{vs}$ 6.40)
DN 25 ($k_{vs}$ 4.60)
DN 20 ($k_{vs}$ 3.50)
DN 15 ($k_{vs}$ 2.50)

Pressure loss $\Delta p$ [kPa]
Pressure loss $\Delta p$ [mbar]
Pressure loss $\Delta p$ [mm water head]
Mass flow $\dot{m}$ [kg/h]
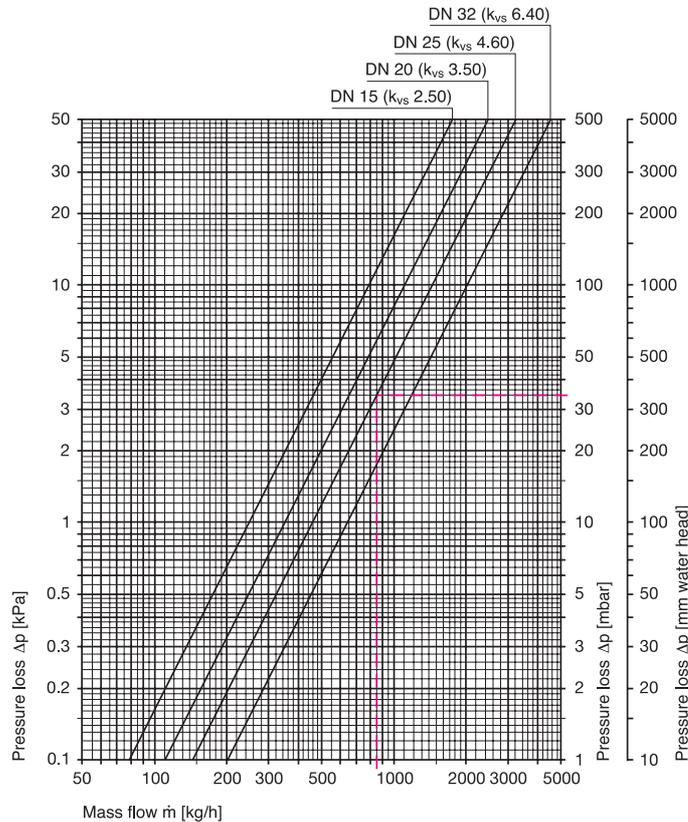
| Three-way mixing valve | $k_v$ value with thermostatic head [1] [m³/h] | $k_{vs}$ value [2] [m³/h] | Admissible operating temperature TB [°C] | Admissible operating over-pressure PB [bar] | Admissible differential pressure under which the valve still closes $\Delta p$ [bar] |
|---|---|---|---|---|---|
| DN 15 | 1,40 | 2,50 | 120 | 10 | 1,20 |
| DN 15 with T-piece | 1,40 | 2,50 | 120 | 10 | 1,20 |
| DN 20 | 1,90 | 3,50 | 120 | 10 | 0,75 |
| DN 20 with T-piece | 1,90 | 3,50 | 120 | 10 | 0,75 |
| DN 25 | 2,60 | 4,60 | 120 | 10 | 0,50 |
| DN 32 | 3,50 | 6,40 | 120 | 10 | 0,25 |

1) The kv value corresponds with the flow in angular direction B-AB or in straight direction A-AB when the valve cone is in the middle respectively. The mixing ratio is then 50 %.

2) The $K_{vs}$ value corresponds with the flow in angular direction B-AB when the valve is fully open, or with the flow in straight direction A-AB when the valve is closed.

### Calculation example

Required: pressure loss $\Delta p_v$

Given: three-way mixing valve DN 25 with actuator (add-mixing control)
heat flow $\dot{Q}$ = 14830 W
Supply temperature primary circuit $t_v$ = 70 °C
Return temperature secondary circuit $t_r$ = 55 °C

Solution: Mass flow $\dot{m} = \dfrac{\dot{Q}}{c \cdot \Delta t} = \dfrac{14830}{1,163 \cdot (70\text{-}55)} = 850$ kg/h

pressure loss from diagram $\Delta p_V$ = 34 mbar

# Three-Way Mixing Valve

## Technical data

### Diagram, three-way mixing valve with presetting, $k_{VS}$ values

**DN 15**



**DN 20**
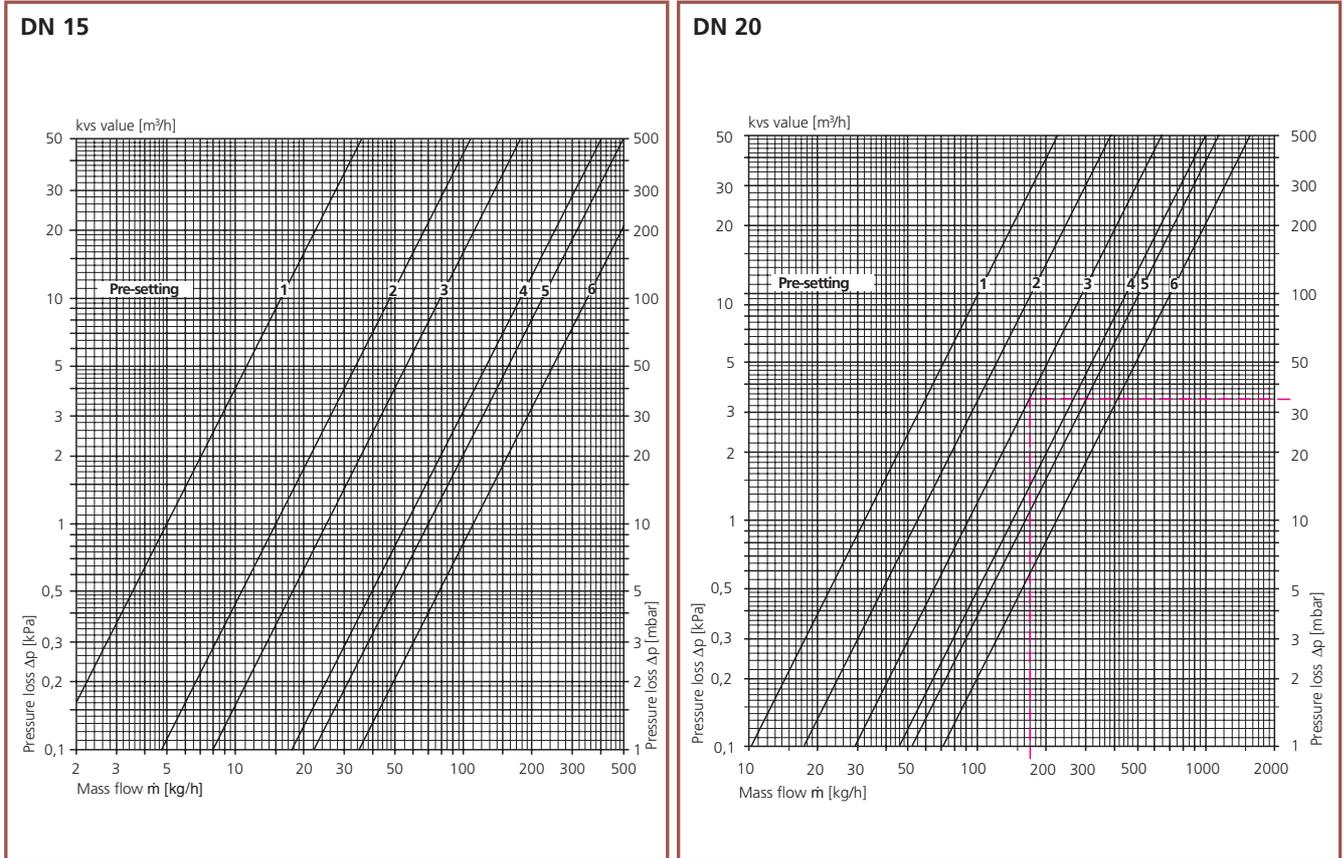


| Three-way mixing valve with presetting | | Presetting | | | | | | Admissible operating temperature TB [°C] | Admissible operating over-pressure PB [bar] | Admissible differential pressure under which the valve still closes Δp [bar] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| DN 15 | $k_V$ value with thermostatic head[1] [m³/h] | 0,03 | 0,08 | 0,13 | 0,29 | 0,37 | 0,58 | 120 | 10 | 1,20 |
| | $k_{VS}$ value[2] [m³/h] | 0,05 | 0,15 | 0,25 | 0,56 | 0,70 | 1,10 | | | |
| DN 20 | $k_V$ value with thermostatic head[1] [m³/h] | 0,16 | 0,28 | 0,47 | 0,75 | 0,85 | 1,15 | 120 | 10 | 0,75 |
| | $k_{VS}$ value[2] [m³/h] | 0,32 | 0,55 | 0,92 | 1,42 | 1,61 | 2,11 | | | |

1) The kv value corresponds with the flow in angular direction B-AB or in straight direction A-AB when the valve cone is in the middle respectively. The mixing ratio is then 50 %.

2) The $K_{vs}$ value corresponds with the flow in angular direction B-AB when the valve is fully open, or with the flow in straight direction A-AB when the valve is closed.

### Calculation example

Required: Presetting value for three-way mixing valve NW 20 with actuator (admixture control)

Given: 
Heat flow $\dot{Q}$ = 5930 W
Supply temperature primary circuit $t_v$ = 70 °C
Return temperature secondary circuit $t_r$ = 40 °C
Pressure loss $\Delta p_V$ = 34 mbar

Solution: Mass flow $\dot{m} = \dfrac{\dot{Q}}{c \cdot \Delta t} = \dfrac{5930}{1{,}163 \cdot (70\text{-}40)} = 170$ kg/h

Presetting value as per diagram: 3

# Three-Way Mixing Valve

## Dimensions

### flat sealing
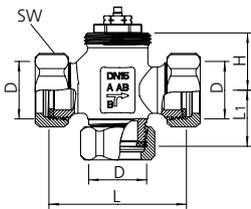


### flat sealing, with T-piece
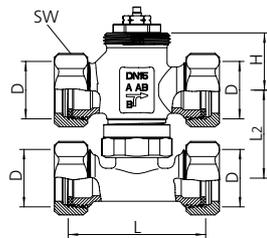


### conically sealing
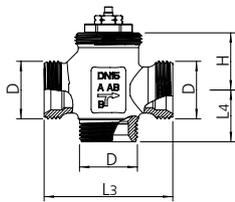


### Threaded nipple
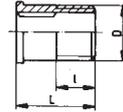


| D | L | I |
|---|---|---|
| R 1/2 | 27,5 | 13,2 |
| R 3/4 | 30,5 | 14,5 |
| R 1 | 33 | 16,8 |
| R 1 1/4 | 36,5 | 19,1 |

### Soldering nipple
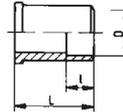


| D | L | I |
|---|---|---|
| 15 | 18 | 12 |
| 16 | 19 | 13 |
| 18 | 20 | 14 |
| 22 | 23 | 17 |
| 28 | 27 | 20 |
| 35 | 32 | 35 |

### Welding nipple



| D | L | d |
|---|---|---|
| 20,8 | 35 | 17 |
| 26,3 | 40 | 22 |
| 33,2 | 45 | 28 |
| 41,8 | 45 | 34 |

| DN | D | L | L$_1$ | L$_2$ | L$_3$ | L$_4$ | H | SW |
|----|---|---|----|----|----|----|---|----|
| 15 | G 3/4 | 62 | 25,5 | 40 | 58 | 23,5 | 26,0 | 30 |
| 20 | G 1 | 71 | 35,5 | 60 | | | 31,5 | 37 |
| 25 | G 1 1/4 | 84 | 42,0 | | | | 33,5 | 47 |
| 32 | G 1 1/2 | 89 | 44,5 | | | | 33,5 | 52 |

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