# Fixed Orifice Double Regulating Valve
# **Fig. Anvil MBV–9510 Series**

**Fig. MBV–T–9517**
Threaded Ends

**Fig. MBV–S–9519**
Solder Joint Ends

## Features

Fixed orifice DZR brass double regulating valve. Intended for HVAC use. Threaded F/F (ASME B1.20.1 – NPT) or solder joint ends (ASME B16.22). Design according to BS7350. Tolerance on nominal $C_{vs}$ +3% (test according to BS7350). 300 WOG (Maximum 300psi up to 160˚F. Maximum 150psi at 260˚F.)

Available on following versions:

☐ MBV–T–9517, threaded ends, with test points

☐ MBV–S–9519, solder joint ends, with test points

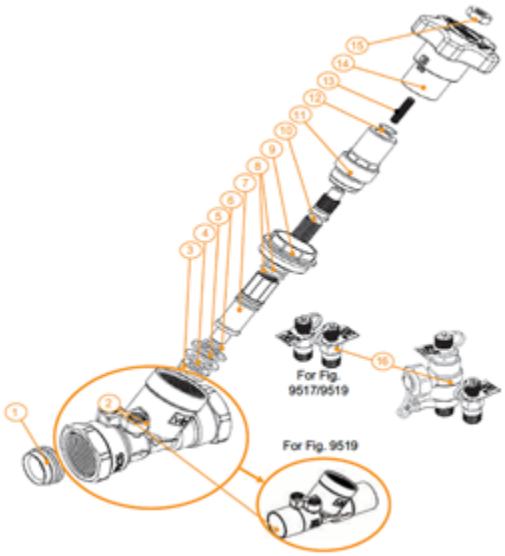
**Working Conditions:**

- Water (15˚F to 260˚F)
  below 32˚F only for water with added anti–freezing fluids
  over 212˚F only for water with added anti–boiling fluids

## Material Specifications

**1. Venturi Insert:** DZR Brass
**2. Body:** DZR Brass
**3. Balancing Cone:** DZR Brass
**4. Gasket Disc:** PTFE
**5. Disc[1]:** DZR Brass
**6. Disc O–Ring[1]:** EPDM Perox
**7. Disc Stem:** DZR Brass
**8. Stem O–Ring:** EPDM Perox
**9. Union[1]:** DZR Brass
**10. Stem:** Brass ASTM B124 C37700
**11. Bonnet:** DZR Brass
**12. Stop Spring Ring:** Spring Steel
**13. Screw:** Steel
**14. Handwheel:** ABS (Blue)
**15. Nut:** Zinc Plated Steel
**16. Test Point:** DZR Brass[2] ASTM C35330

[1] Only on 1 ¼", 1 ½" and 2"
[2] Test points with EPDM gaskets and polypropylene ties

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| PROJECT INFORMATION | APPROVAL STAMP |
|---|---|
| Project: | ☐ Approved |
| Address: | ☐ Approved as noted |
| Contractor: | ☐ Not approved |
| Engineer: | Remarks: |
| Submittal Date: | |
| Notes 1: | |
| Notes 2: | |

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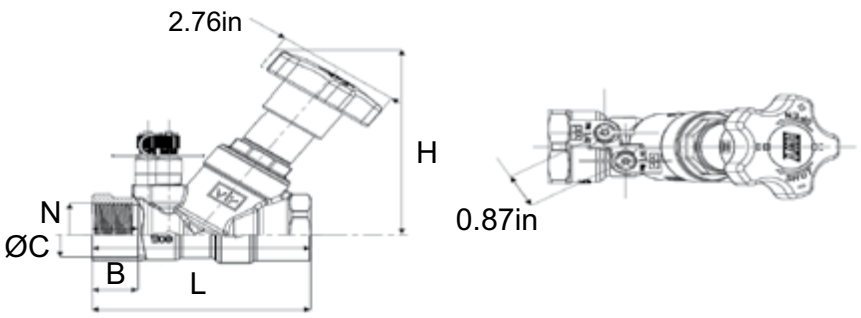


## Fixed Orifice Double Regulating Valve

| Valve Size | N | øC[1] | H | L[2] | B[2] | Approx. Wt.[2] Each | Flow Range |
|---|---|---|---|---|---|---|---|
| In./mm | In./mm | In./mm | In./mm | In./mm | In./mm | Lbs./Kg | GPM |
| U-½<br>15 | ½- 14<br>– | 0.627-0.631<br>15.93-16.03 | 4.06<br>103.1 | 3.46/3.74<br>87.9/95.0 | 0.71/0.55<br>18.0/14..0 | 1.23/1.16<br>0.56/0.53 | 0.27-0.71<br>– |
| L- ½<br>15 | ½- 14<br>– | 0.627-0.631<br>15.93-16.03 | 4.06<br>103.1 | 3.46/3.74<br>87.9/95.0 | 0.71/0.55<br>18.0/14..0 | 1.23/1.16<br>0.56/0.53 | 0.49-1.17<br>– |
| ½<br>15 | ½- 14<br>– | 0.627-0.631<br>15.93-16.03 | 4.06<br>103.1 | 3.46/3.74<br>87.9/95.0 | 0.71/0.55<br>18.0/14..0 | 1.23/1.16<br>0.56/0.53 | 0.98-2.35[3]<br>– |
| ¾<br>20 | ¾- 14<br>– | 0.877-0.881<br>22.28-22.38 | 4.06<br>103.1 | 3.78/4.18<br>96.0/106.2 | 0.75/0.76<br>19.1/19.3 | 1.43/1.34<br>0.65/0.61 | 2.19-5.15[3]<br>– |
| 1<br>25 | 1 - 11.5<br>– | 1.128-1.131<br>28.65-28.73 | 4.06<br>103.1 | 3.94/4.57<br>100.1/116.1 | 0.89/0.92<br>22.6/23.4 | 1.73/1.55<br>0.78/0.70 | 4.09-9.56[3]<br>– |
| 1¼<br>32 | 1¼- 11.5<br>– | 1.378-1.381<br>35.00-35.08 | 4.06<br>103.1 | 4.63/5.28<br>117.6/134.1 | 0.98/0.98<br>24.9/27.9 | 2.78/2.53<br>1.26/1.15 | 8.56-19.81[3]<br>– |
| 1½<br>40 | 1½- 11.5<br>– | 1.628-1.632<br>41.35-41.45 | 4.06<br>103.1 | 5.00/5.90<br>127.0/149.9 | 0.98/1.10<br>24.9/27.9 | 3.50/3.16<br>1.59/1.43 | 12.84-29.80[3]<br>– |
| 2<br>50 | 2 - 11.5<br>– | 2.128-2.132<br>54.05-54.15 | 4.06<br>103.1 | 5.72/6.73<br>145.3/170.9 | 1.15/1.35<br>29.2/34.3 | 4.80/4.46<br>2.18/2.02 | 24.09-55.63[3]<br>– |

[1] Tolerance field
[2] Threaded ends/soldering ends
[3] Dimension with VIR actuators, for more details please consult specific technical sheet
[4] Suggested flow range applicability (BS7350)

If used with measuring manometers different from those proposed by Anvil-RWV, please verify that sensibility of the measuring device is compatible with indicated minimum.

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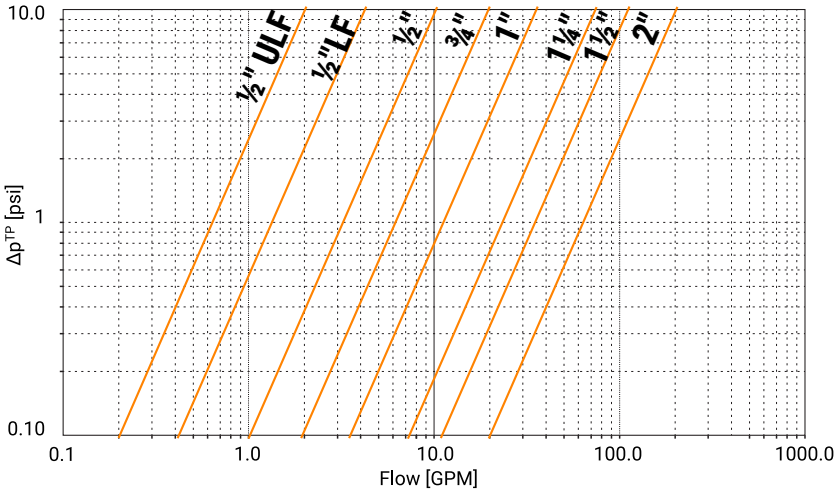
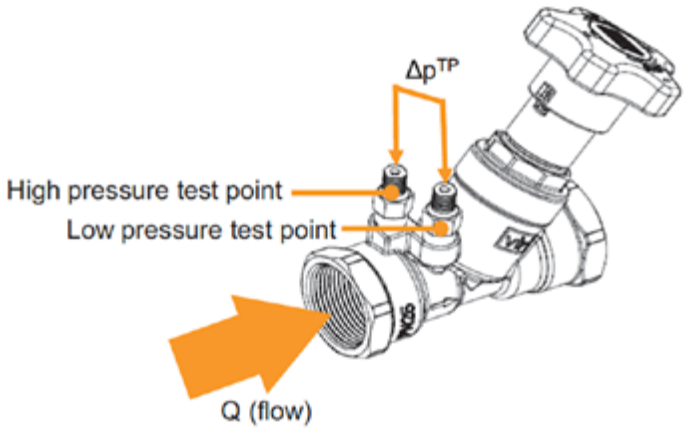
## Flow Diagram




½" ULF..... $C_{vs}$ venturi 0.64
½" LF..... $C_{vs}$ venturi 1.33
½" ..... $C_{vs}$ venturi 3.24
¾" ..... $C_{vs}$ venturi 6.16
1" ..... $C_{vs}$ venturi 11.24
1¼" ..... $C_{vs}$ venturi 23.41
1½" ..... $C_{vs}$ venturi 34.95
2" ..... $C_{vs}$ venturi 63.67




$$Q = C_{vs}^{venturi} \cdot \sqrt{\Delta p^{TP}}$$

Q = flow rate in GPM

Δp = differential pressure signal in psi generated through the pressure test points

$C_{vs}$ = flow coefficient

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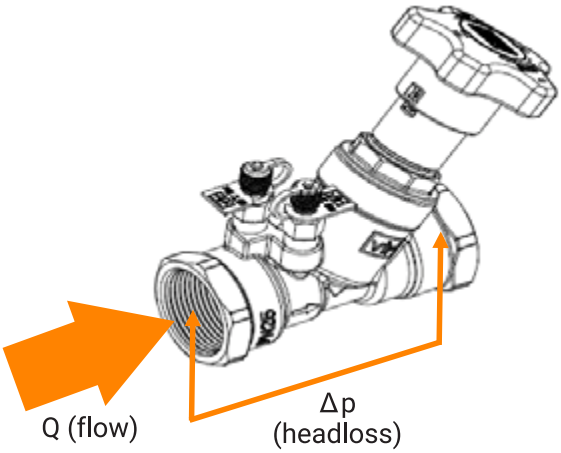
## Headloss

$$\Delta p = \left(\frac{Q}{C_V}\right)^2$$

Formula linking flow Q (in GPM) and theoretical valve headloss (pressure drop) Δp (in psi). $C_V$ depends on handwheel position as indicated in table.




## Headloss Calculation

| Handwheel Position | $C_V$ (GPM/psi$^{0.5}$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | U-½" | L-½" | ½" | ¾" | 1" | 1¼" | 1½" | 2" |
| – | GPM/psi | GPM/psi | GPM/psi | GPM/psi | GPM/psi | GPM/psi | GPM/psi | GPM/psi |
| 0.5 | 0.177 | 0.160 | 0.474 | 0.474 | 1.70 | 2.96 | 3.14 | 6.20 |
| 0.7 | 0.206 | 0.186 | 0.474 | 0.543 | 2.00 | 3.38 | 3.61 | 7.56 |
| 1.0 | 0.283 | 0.287 | 0.613 | 0.671 | 2.42 | 3.95 | 4.27 | 9.65 |
| 1.3 | 0.331 | 0.394 | 0.717 | 0.809 | 2.82 | 4.49 | 4.96 | 12.19 |
| 1.5 | 0.355 | 0.440 | 0.809 | 0.902 | 3.12 | 4.83 | 5.57 | 14.30 |
| 1.7 | 0.387 | 0.501 | 0.902 | 0.994 | 3.48 | 5.25 | 6.60 | 16.64 |
| 2.0 | 0.445 | 0.586 | 0.994 | 1.12 | 4.13 | 6.27 | 8.99 | 20.17 |
| 2.3 | 0.511 | 0.669 | 1.10 | 1.25 | 4.83 | 7.82 | 12.08 | 23.35 |
| 2.5 | 0.517 | 0.696 | 1.18 | 1.39 | 5.28 | 9.16 | 14.21 | 25.12 |
| 2.7 | 0.527 | 0.743 | 1.32 | 1.62 | 5.63 | 10.46 | 16.34 | 26.66 |
| 3.0 | 0.563 | 0.828 | 1.60 | 2.24 | 6.09 | 12.21 | 18.89 | 28.72 |
| 3.3 | 0.578 | 0.864 | 1.88 | 2.94 | 6.49 | 13.39 | 20.67 | 30.57 |
| 3.5 | 0.594 | 0.891 | 2.03 | 3.39 | 6.64 | 13.94 | 21.54 | 31.72 |
| 3.7 | 0.595 | 0.925 | 2.12 | 3.75 | 6.80 | 14.34 | 22.16 | 32.86 |
| 4.0 | 0.603 | 0.953 | 2.19 | 4.06 | 7.10 | 14.50 | 22.65 | 34.36 |
| 4.4 | 0.605 | 0.985 | 2.22 | 4.24 | 7.21 | – | – | – |

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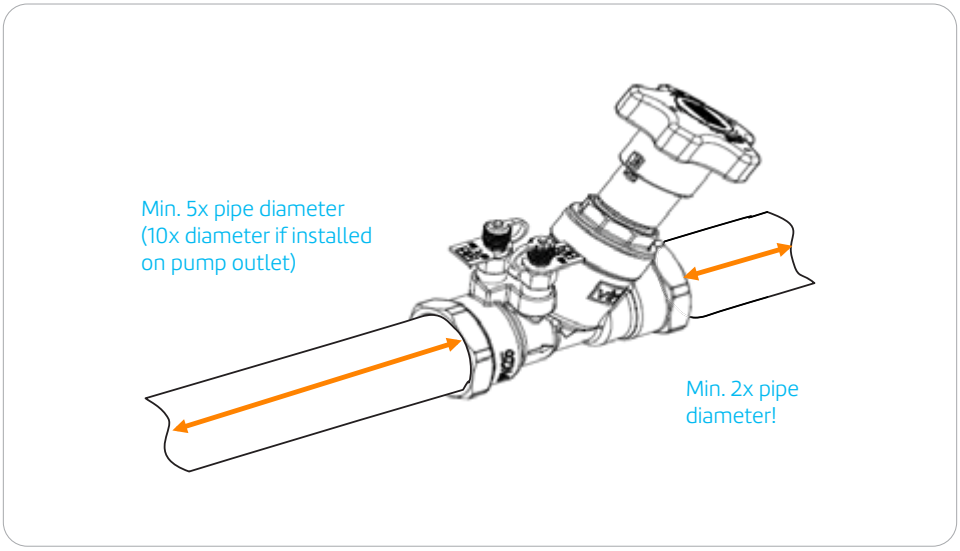
## Installation

To obtain the best performances valve must be installed on a pipe with its same nominal size preceded and followed by straight pipe lengths as per figure indications.

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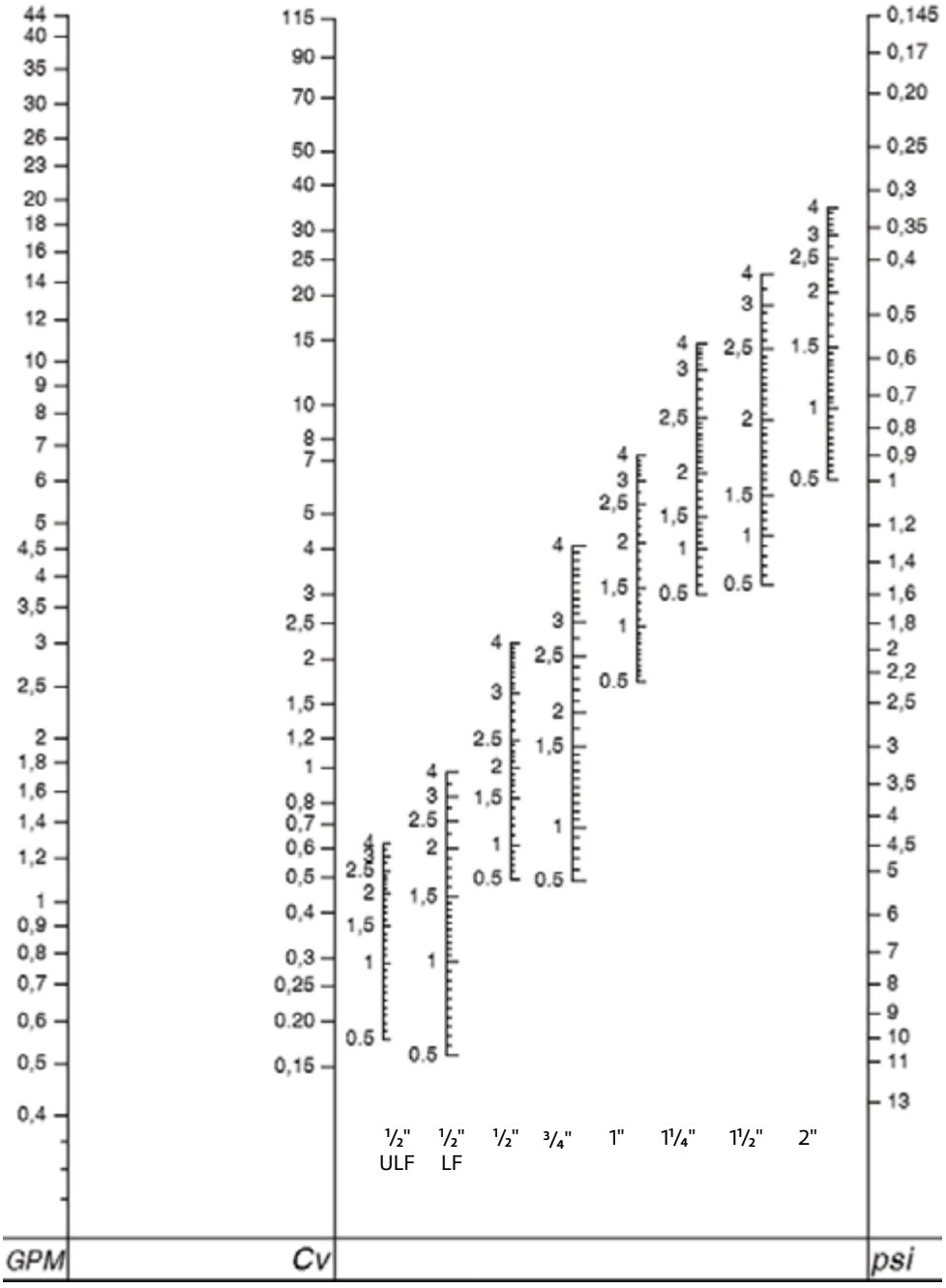
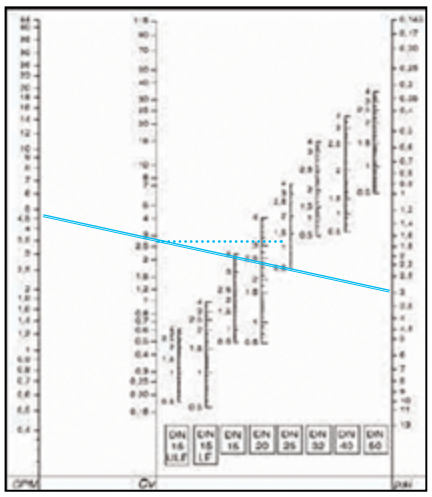
## Presetting




Using diagram, determine the presetting position of the valve with the given design flowrate and headloss:

1. Draw a straight line joining design flowrate and design headloss;
2. Determine design $C_V$ value as intersection of drawn line and $C_V$ axis;
3. Draw a straight horizontal line from intersection previously identified and the specific valve size axis;
4. Intersection determines handwheel position to use for presetting.



In the example for a design flowrate of 5GPM and design Δp 3psi handwheel position of 1.35 is determined for a 1" valve.

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