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**9500 series**  
Variable Orifice Bronze Double  
Regulating Valve

**Description**

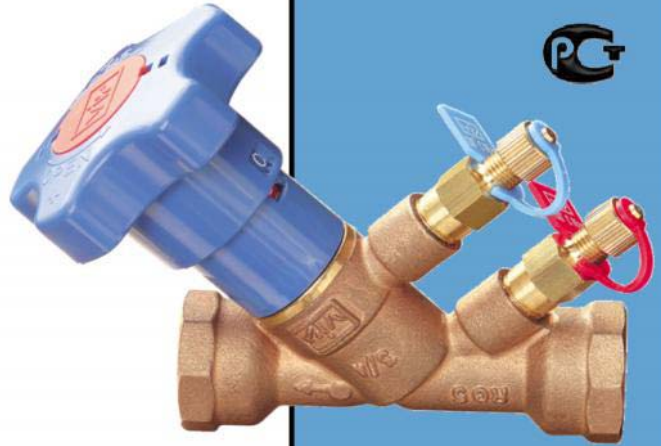
Variable orifice bronze double regulating valve  
Threaded F/F (ISO 228/1)  
Design according to BS7350  
Tolerance on nominal  $K_v$  for completely open valve  $\pm 5\%$   
(see flow measurement section, test according to BS7350)  
Available on following versions:

- Fig. 9500, with threaded and plugged drains ( $\frac{1}{4}$ " ISO 7/1Rp) (allow later mounting of test points)
  - Fig. 9505, with test points
  - Fig. 9506, with test points (high pressure TP with drain)
- Gost compliant

PN25 (Max 25bar up to 100°C, max 20bar at 130°C)

Working conditions:

- Water: -10°C to +130°C  
below 0°C only for water with added antifreezing fluids  
over 100°C only for water with added anti-boiling fluids



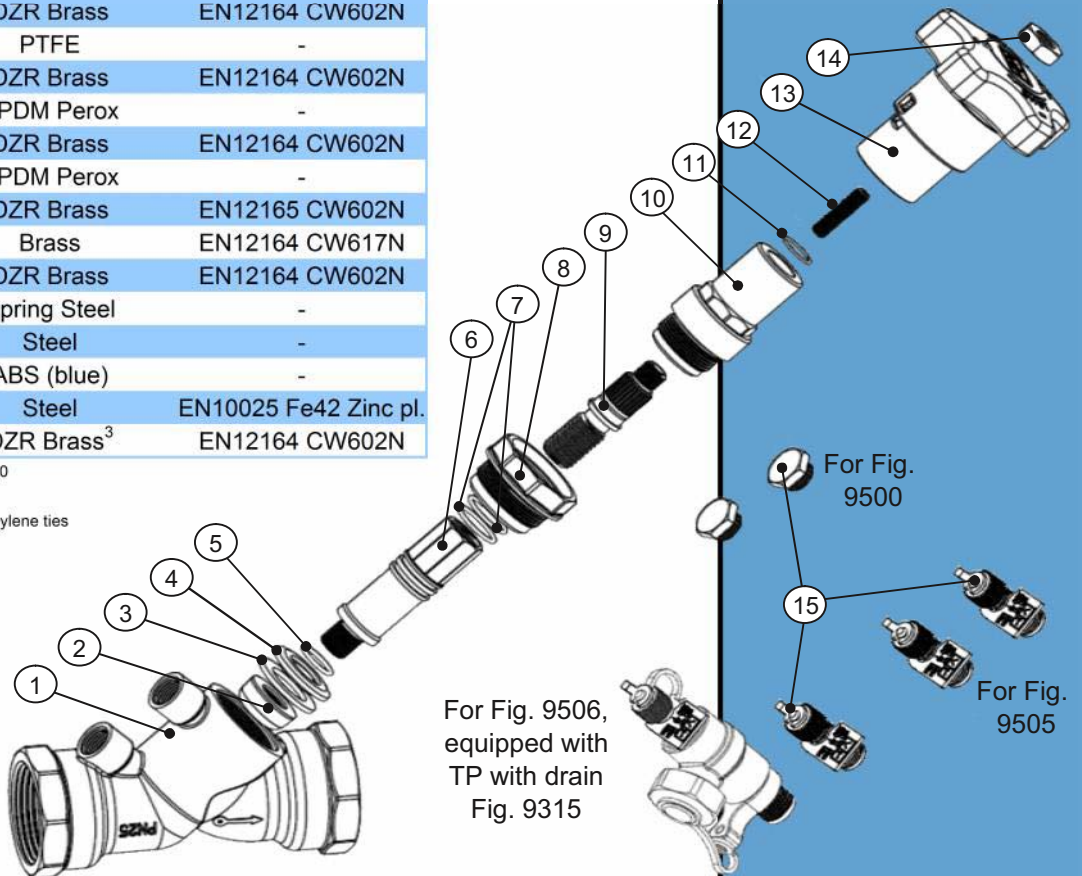
**Part List**

| N. | Part                        | Material               | Norm                  |
|----|-----------------------------|------------------------|-----------------------|
| 1  | Body                        | Bronze                 | EN1982 CB491K         |
| 2  | Balancing cone <sup>1</sup> | DZR Brass              | EN12164 CW602N        |
| 3  | Gasket disc                 | PTFE                   | -                     |
| 4  | Disc <sup>2</sup>           | DZR Brass              | EN12164 CW602N        |
| 5  | Disc O-ring <sup>2</sup>    | EPDM Perox             | -                     |
| 6  | Disc stem                   | DZR Brass              | EN12164 CW602N        |
| 7  | Stem O-ring                 | EPDM Perox             | -                     |
| 8  | Union <sup>2</sup>          | DZR Brass              | EN12165 CW602N        |
| 9  | Stem                        | Brass                  | EN12164 CW617N        |
| 10 | Bonnet                      | DZR Brass              | EN12164 CW602N        |
| 11 | Stop spring ring            | Spring Steel           | -                     |
| 12 | Screw                       | Steel                  | -                     |
| 13 | Handwheel                   | ABS (blue)             | -                     |
| 14 | Nut                         | Steel                  | EN10025 Fe42 Zinc pl. |
| 15 | Test point / plug           | DZR Brass <sup>3</sup> | EN12164 CW602N        |

<sup>1</sup>As a single piece as part of the stem for DN10

<sup>2</sup>Only on DN32, DN40 and DN50

<sup>3</sup>Test points with EPDM gaskets and polypropylene ties



For Fig. 9506, equipped with TP with drain Fig. 9315

For Fig. 9500

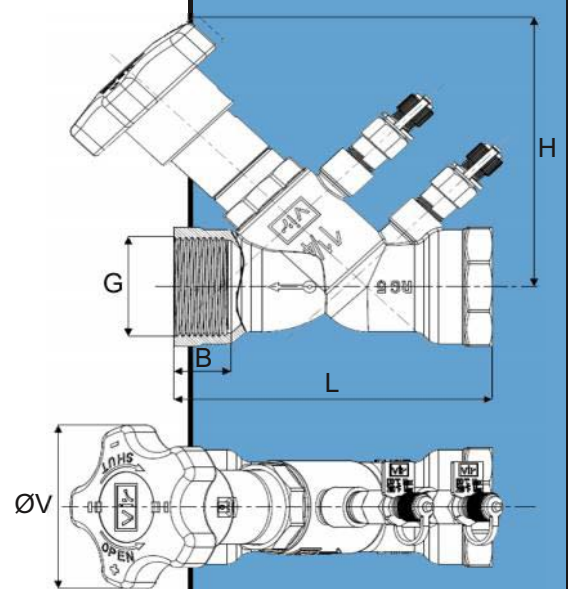
For Fig. 9505

## Dimensions

| DN  | G      | H (mm) | L (mm) | B (mm) | ØV (mm) | Wgt (g) | Flow range (l/s)         |
|-----|--------|--------|--------|--------|---------|---------|--------------------------|
| 010 | 3/8"   | 91,0   | 77,0   | 12,5   | 70      | 474     | 0,017-0,074              |
| 015 | 1/2"   | 90,0   | 90,0   | 17,5   | 70      | 505     | 0,062-0,148 <sup>1</sup> |
| 020 | 3/4"   | 90,0   | 102,0  | 18,0   | 70      | 565     | 0,138-0,325 <sup>1</sup> |
| 025 | 1"     | 90,0   | 110,0  | 19,0   | 70      | 705     | 0,258-0,603 <sup>1</sup> |
| 032 | 1 1/4" | 116,0  | 121,0  | 22,0   | 70      | 1005    | 0,540-1,250 <sup>1</sup> |
| 040 | 1 1/2" | 116,0  | 142,0  | 24,0   | 70      | 1355    | 0,810-1,88 <sup>1</sup>  |
| 050 | 2"     | 116,0  | 161,0  | 27,0   | 70      | 1925    | 1,520-3,51 <sup>1</sup>  |

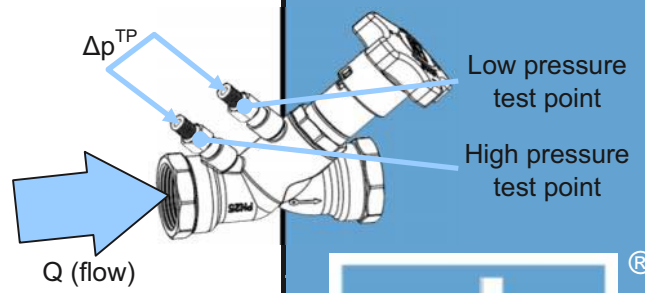
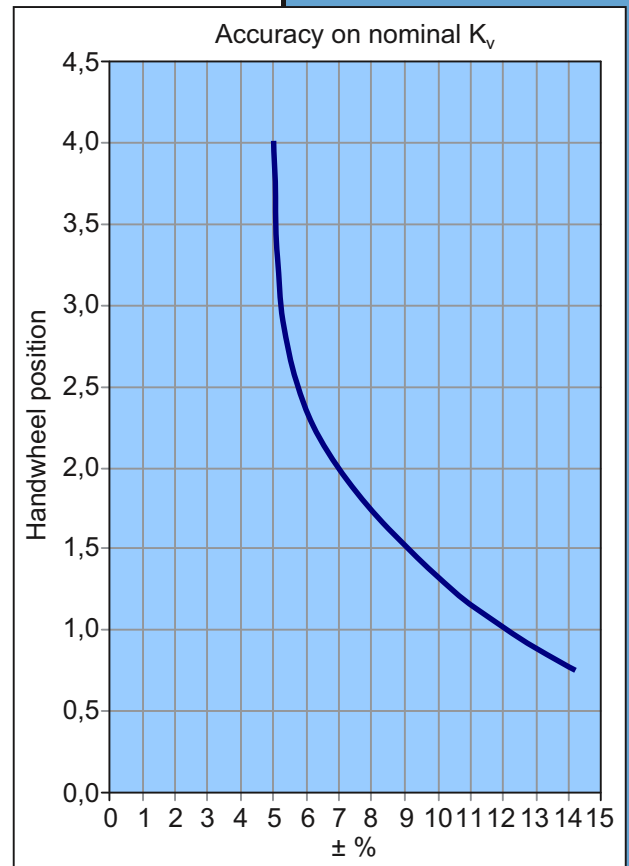
<sup>1</sup>Suggested flow range applicability (BS7350)

If used with measuring manometers different from those proposed by VIR please verify that sensibility of the measuring device is compatible with indicated minimum flow (see flow measurement paragraph)



## Flow Measurement

| Handwheel position | Kv (m3/h @ 1bar) |      |      |      |       |       |       |
|--------------------|------------------|------|------|------|-------|-------|-------|
|                    | 010              | 015  | 020  | 025  | 032   | 040   | 050   |
| 0,5                | 0,09             | 0,37 | 0,40 | 1,40 | 1,40  | 2,70  | 3,90  |
| 0,6                | 0,11             | 0,40 | 0,44 | 1,58 | 2,12  | 2,85  | 4,23  |
| 0,7                | 0,13             | 0,44 | 0,50 | 1,70 | 2,60  | 3,00  | 5,00  |
| 0,8                | 0,15             | 0,47 | 0,57 | 1,80 | 2,92  | 3,16  | 5,97  |
| 0,9                | 0,17             | 0,52 | 0,64 | 1,89 | 3,13  | 3,32  | 6,94  |
| 1,0                | 0,19             | 0,55 | 0,70 | 2,00 | 3,30  | 3,50  | 7,80  |
| 1,1                | 0,21             | 0,60 | 0,75 | 2,12 | 3,42  | 3,69  | 8,47  |
| 1,2                | 0,24             | 0,64 | 0,77 | 2,26 | 3,56  | 3,94  | 8,98  |
| 1,3                | 0,26             | 0,68 | 0,80 | 2,40 | 3,70  | 4,10  | 9,40  |
| 1,4                | 0,30             | 0,71 | 0,84 | 2,50 | 3,90  | 4,29  | 9,98  |
| 1,5                | 0,33             | 0,75 | 0,90 | 2,60 | 4,10  | 4,50  | 10,60 |
| 1,6                | 0,37             | 0,78 | 0,10 | 2,74 | 4,23  | 4,68  | 11,32 |
| 1,7                | 0,40             | 0,81 | 1,00 | 2,90 | 4,40  | 4,90  | 12,10 |
| 1,8                | 0,43             | 0,87 | 1,07 | 3,06 | 4,61  | 5,23  | 12,94 |
| 1,9                | 0,47             | 0,91 | 1,14 | 3,27 | 4,86  | 5,62  | 13,84 |
| 2,0                | 0,50             | 0,94 | 1,20 | 3,50 | 5,10  | 6,10  | 14,80 |
| 2,1                | 0,53             | 0,97 | 1,25 | 3,76 | 5,53  | 6,67  | 15,80 |
| 2,2                | 0,57             | 1,00 | 1,29 | 4,03 | 5,95  | 7,37  | 16,84 |
| 2,3                | 0,60             | 1,06 | 1,30 | 4,30 | 6,50  | 8,20  | 17,90 |
| 2,4                | 0,63             | 1,10 | 1,39 | 4,56 | 6,97  | 9,05  | 18,92 |
| 2,5                | 0,66             | 1,18 | 1,50 | 4,80 | 7,60  | 10,00 | 19,90 |
| 2,6                | 0,69             | 1,26 | 1,57 | 4,96 | 8,13  | 10,78 | 20,81 |
| 2,7                | 0,71             | 1,35 | 1,70 | 5,10 | 8,60  | 11,60 | 21,70 |
| 2,8                | 0,74             | 1,49 | 1,85 | 5,24 | 9,32  | 12,53 | 22,45 |
| 2,9                | 0,78             | 1,63 | 2,02 | 5,37 | 9,86  | 13,38 | 23,20 |
| 3,0                | 0,81             | 1,75 | 2,20 | 5,50 | 10,40 | 14,10 | 23,90 |
| 3,1                | 0,84             | 1,93 | 2,43 | 5,60 | 10,66 | 15,00 | 24,62 |
| 3,2                | 0,87             | 2,08 | 2,67 | 5,71 | 10,86 | 15,74 | 25,29 |
| 3,3                | 0,90             | 2,25 | 2,90 | 5,80 | 10,90 | 16,60 | 25,90 |
| 3,4                | 0,91             | 2,35 | 3,15 | 5,91 | 11,06 | 17,06 | 26,56 |
| 3,5                | 0,92             | 2,44 | 3,40 | 6,00 | 11,20 | 17,60 | 27,20 |
| 3,6                | 0,93             | 2,46 | 3,61 | 6,10 | 11,25 | 18,13 | 27,74 |
| 3,7                | 0,94             | 2,50 | 3,80 | 6,18 | 11,31 | 18,57 | 28,30 |
| 3,8                | 0,95             | 2,55 | 3,96 | 6,26 | 11,47 | 18,94 | 28,83 |
| 3,9                | 0,96             | 2,60 | 4,06 | 6,34 | 11,69 | 19,24 | 29,34 |
| 4,0                | 0,97             | 2,67 | 4,10 | 6,40 | 12,00 | 19,50 | 29,80 |

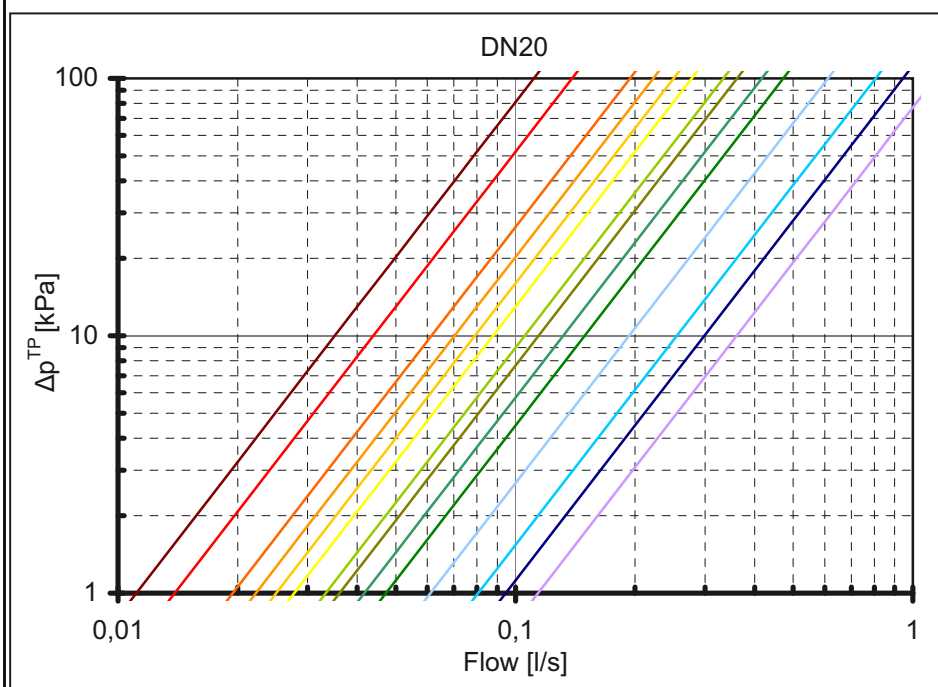
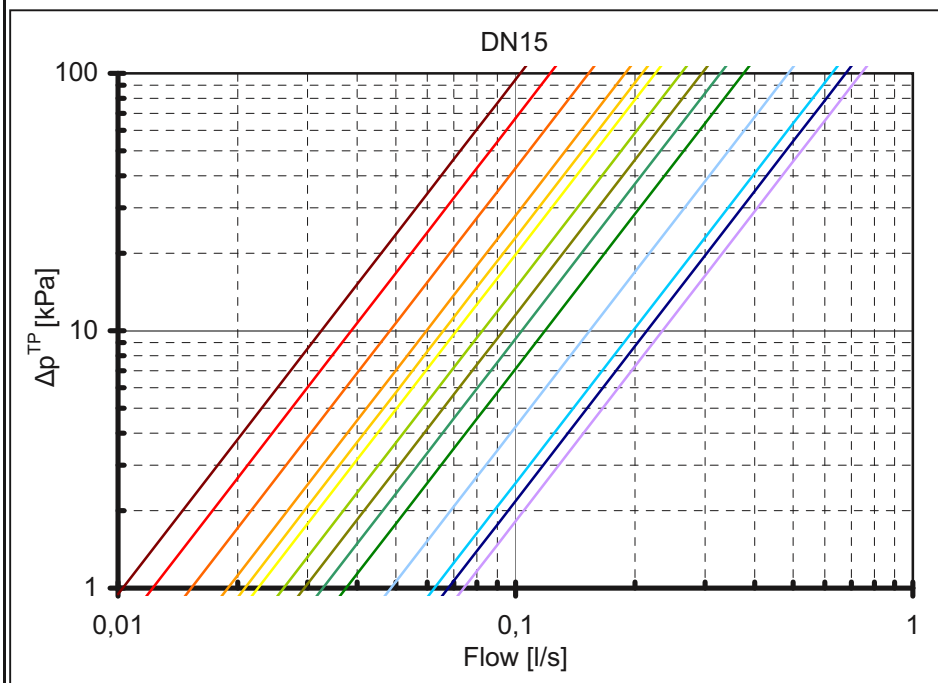
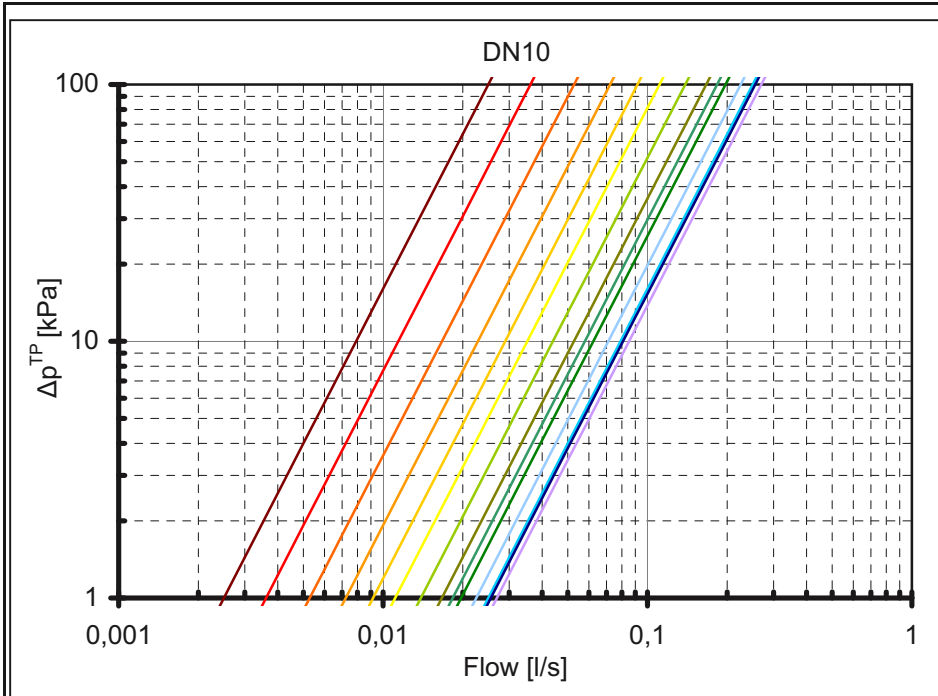


$$Q = \frac{K_v \cdot \sqrt{\Delta p^{TP}}}{36}$$

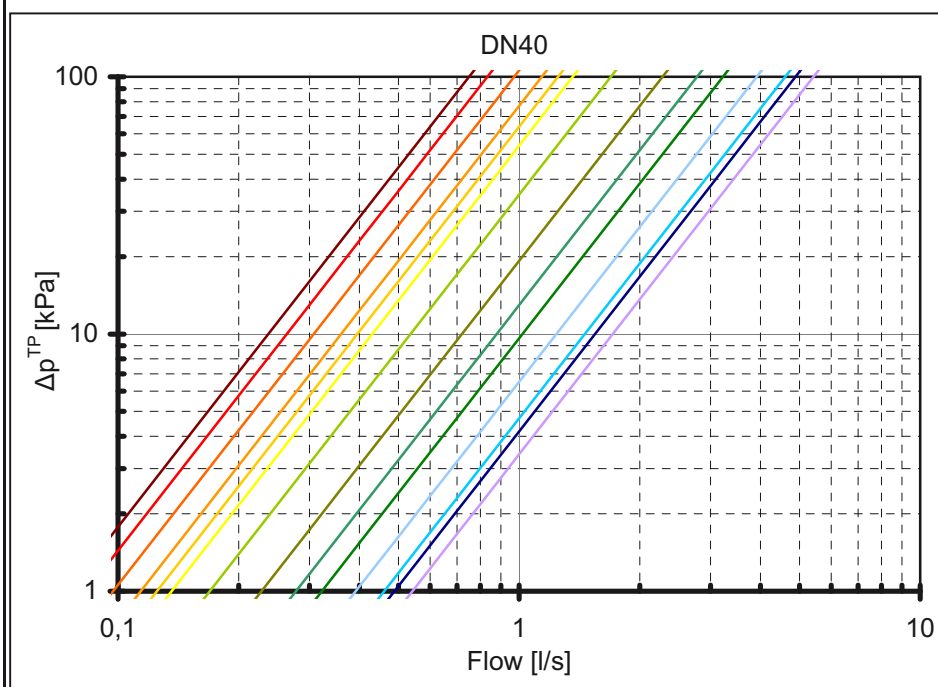
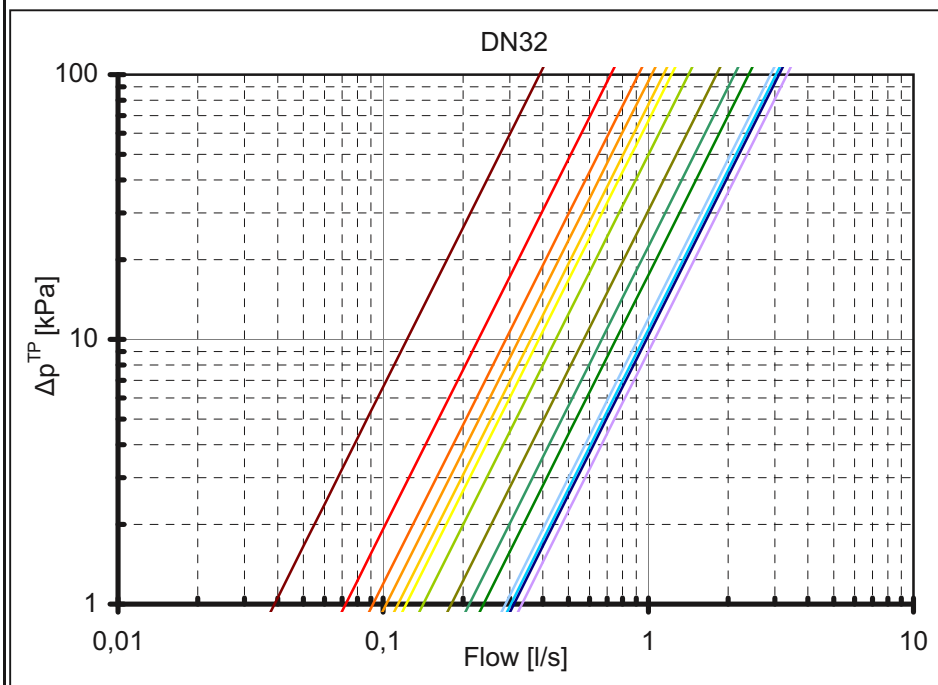
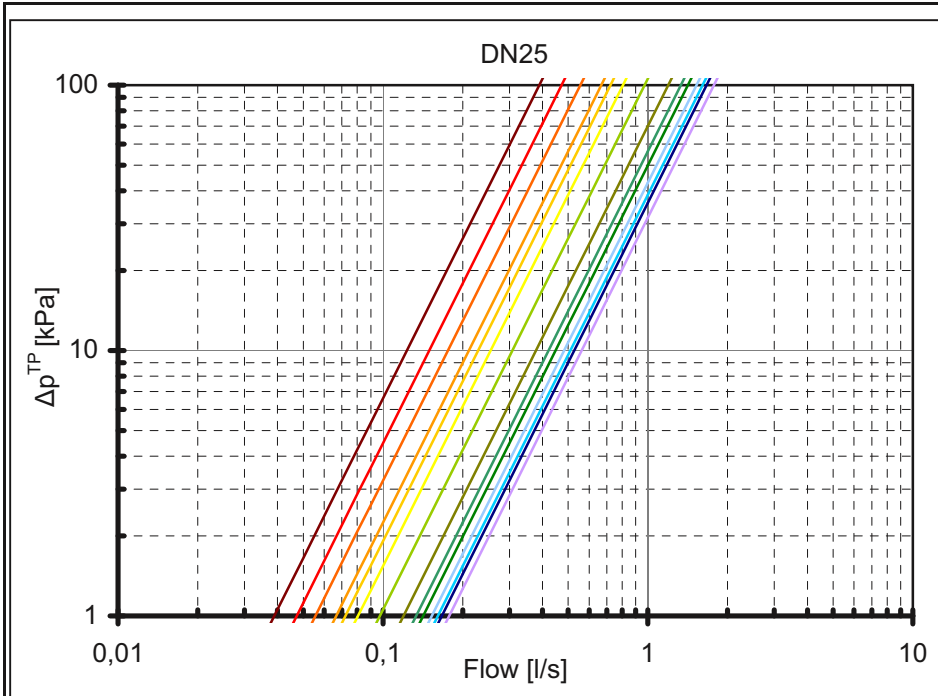
Formula linking flow Q (in l/s) and  $\Delta p$  measured at test points (in kPa).  $K_v$  depends on handwheel position as indicated on table.  
 Minimum flow that can be measured for each diameter may be calculated by using in the formula minimum  $\Delta p$  that can be measured by used manometer.  
 Valves are anyway designed for best performances when used on range previously suggested and as indicated by BS7350.



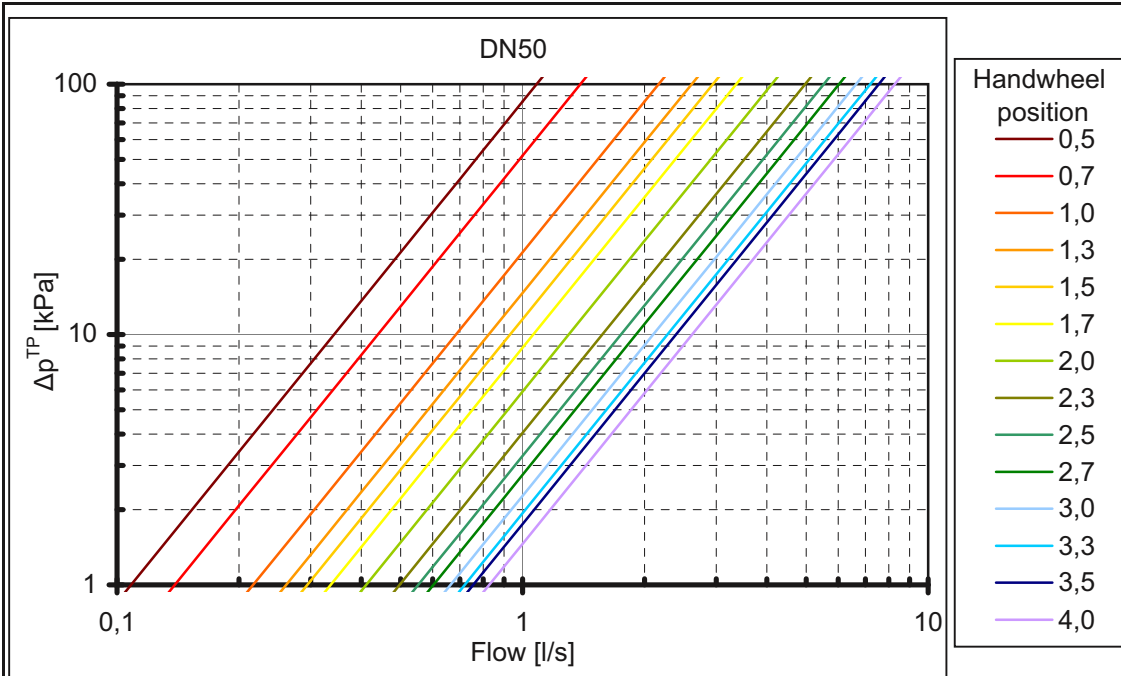
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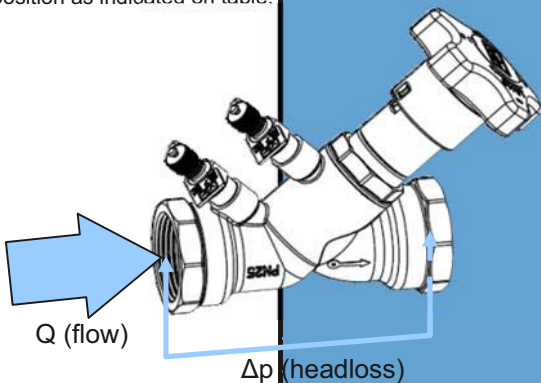


## Headloss calculation

| Handwheel position | Kv (m <sup>3</sup> /h @ 1bar) |      |      |      |       |       |       |
|--------------------|-------------------------------|------|------|------|-------|-------|-------|
|                    | 010                           | 015  | 020  | 025  | 032   | 040   | 050   |
| 0,5                | 0,09                          | 0,37 | 0,40 | 1,40 | 1,40  | 2,70  | 3,90  |
| 0,6                | 0,11                          | 0,40 | 0,44 | 1,58 | 2,12  | 2,85  | 4,23  |
| 0,7                | 0,13                          | 0,44 | 0,50 | 1,70 | 2,60  | 3,00  | 5,00  |
| 0,8                | 0,15                          | 0,47 | 0,57 | 1,80 | 2,92  | 3,16  | 5,97  |
| 0,9                | 0,17                          | 0,52 | 0,64 | 1,89 | 3,13  | 3,32  | 6,94  |
| 1,0                | 0,19                          | 0,55 | 0,70 | 2,00 | 3,30  | 3,50  | 7,80  |
| 1,1                | 0,21                          | 0,60 | 0,75 | 2,12 | 3,42  | 3,69  | 8,47  |
| 1,2                | 0,24                          | 0,64 | 0,77 | 2,26 | 3,56  | 3,94  | 8,98  |
| 1,3                | 0,26                          | 0,68 | 0,80 | 2,40 | 3,70  | 4,10  | 9,40  |
| 1,4                | 0,30                          | 0,71 | 0,84 | 2,50 | 3,90  | 4,29  | 9,98  |
| 1,5                | 0,33                          | 0,75 | 0,90 | 2,60 | 4,10  | 4,50  | 10,60 |
| 1,6                | 0,37                          | 0,78 | 0,10 | 2,74 | 4,23  | 4,68  | 11,32 |
| 1,7                | 0,40                          | 0,81 | 1,00 | 2,90 | 4,40  | 4,90  | 12,10 |
| 1,8                | 0,43                          | 0,87 | 1,07 | 3,06 | 4,61  | 5,23  | 12,94 |
| 1,9                | 0,47                          | 0,91 | 1,14 | 3,27 | 4,86  | 5,62  | 13,84 |
| 2,0                | 0,50                          | 0,94 | 1,20 | 3,50 | 5,10  | 6,10  | 14,80 |
| 2,1                | 0,53                          | 0,97 | 1,25 | 3,76 | 5,53  | 6,67  | 15,80 |
| 2,2                | 0,57                          | 1,00 | 1,29 | 4,03 | 5,95  | 7,37  | 16,84 |
| 2,3                | 0,60                          | 1,06 | 1,30 | 4,30 | 6,50  | 8,20  | 17,90 |
| 2,4                | 0,63                          | 1,10 | 1,39 | 4,56 | 6,97  | 9,05  | 18,92 |
| 2,5                | 0,66                          | 1,18 | 1,50 | 4,80 | 7,60  | 10,00 | 19,90 |
| 2,6                | 0,69                          | 1,26 | 1,57 | 4,96 | 8,13  | 10,78 | 20,81 |
| 2,7                | 0,71                          | 1,35 | 1,70 | 5,10 | 8,60  | 11,60 | 21,70 |
| 2,8                | 0,74                          | 1,49 | 1,85 | 5,24 | 9,32  | 12,53 | 22,45 |
| 2,9                | 0,78                          | 1,63 | 2,02 | 5,37 | 9,86  | 13,38 | 23,20 |
| 3,0                | 0,81                          | 1,75 | 2,20 | 5,50 | 10,40 | 14,10 | 23,90 |
| 3,1                | 0,84                          | 1,93 | 2,43 | 5,60 | 10,66 | 15,00 | 24,62 |
| 3,2                | 0,87                          | 2,08 | 2,67 | 5,71 | 10,86 | 15,74 | 25,29 |
| 3,3                | 0,90                          | 2,25 | 2,90 | 5,80 | 10,90 | 16,60 | 25,90 |
| 3,4                | 0,91                          | 2,35 | 3,15 | 5,91 | 11,06 | 17,06 | 26,56 |
| 3,5                | 0,92                          | 2,44 | 3,40 | 6,00 | 11,20 | 17,60 | 27,20 |
| 3,6                | 0,93                          | 2,46 | 3,61 | 6,10 | 11,25 | 18,13 | 27,74 |
| 3,7                | 0,94                          | 2,50 | 3,80 | 6,18 | 11,31 | 18,57 | 28,30 |
| 3,8                | 0,95                          | 2,55 | 3,96 | 6,26 | 11,47 | 18,94 | 28,83 |
| 3,9                | 0,96                          | 2,60 | 4,06 | 6,34 | 11,69 | 19,24 | 29,34 |
| 4,0                | 0,97                          | 2,67 | 4,10 | 6,40 | 12,00 | 19,50 | 29,80 |

$$\Delta p = \left( \frac{36 \cdot Q}{K_v} \right)^2$$

Formula linking flow Q (in l/s) and theoretical valve headloss Δp (in kPa).  
K<sub>v</sub> depends on handwheel position as indicated on table.



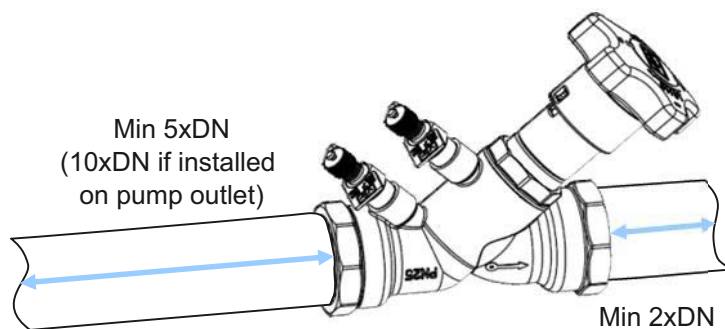
Copy of the table presented in flow measurement paragraph  
Δp (headloss) approximately equal to Δp<sup>TP</sup>



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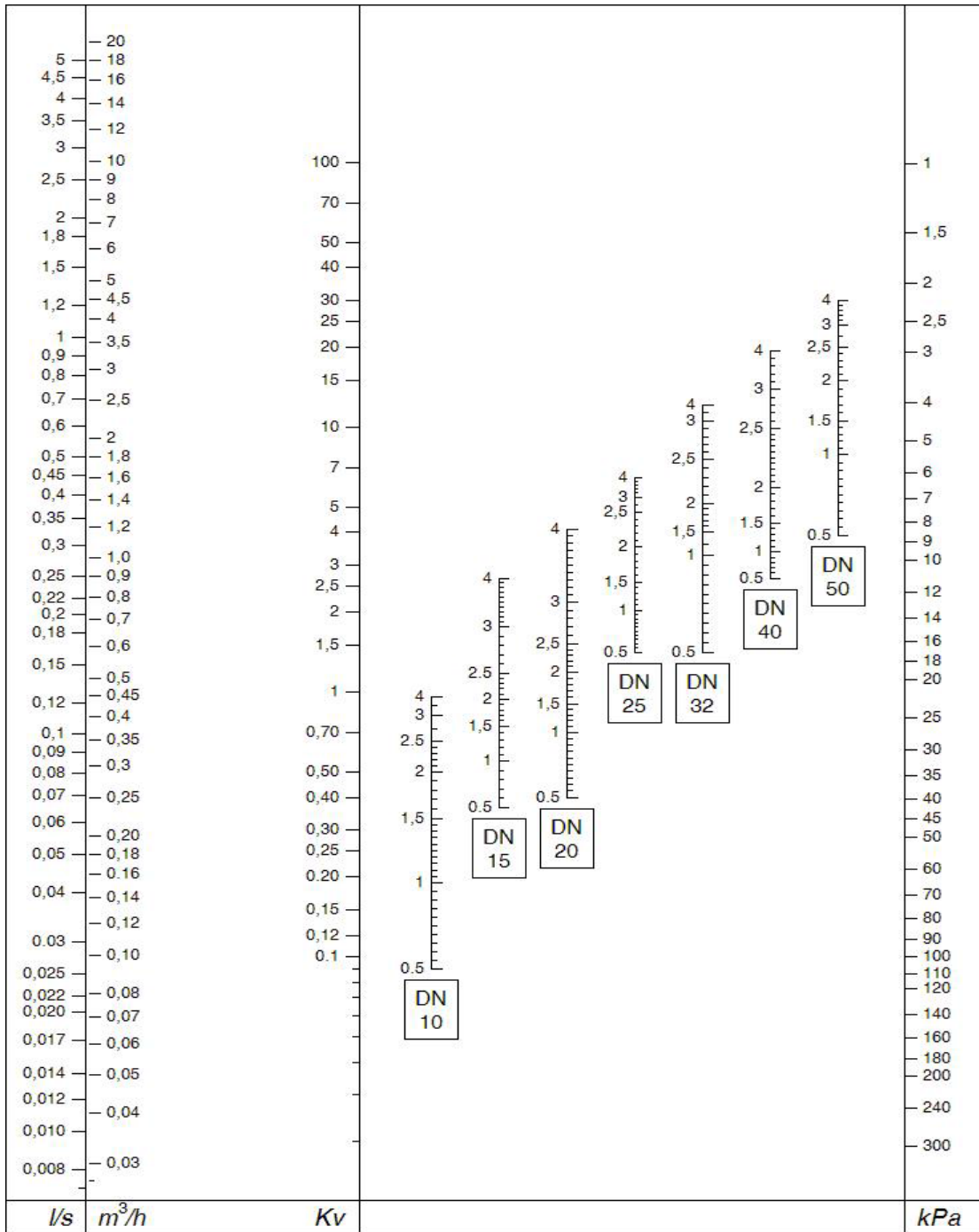
## Installation

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.



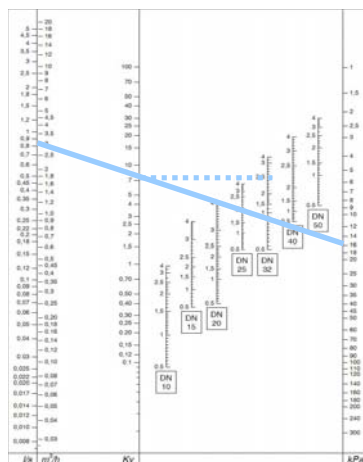
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# Presetting



By using diagram above is possible to esteem the presetting position of the valve with given design flowrate and headloss:

- 1) draw a straight line joining design flowrate and design headloss;
- 2) determine design  $K_v$  value as intersection of drawn line and  $K_v$  axis;
- 3) draw a straight horizontal line from intersection previously identified and the specific valve DN Axis;
- 4) intersection determines handwheel position to use for presetting.



In the example for a design flowrate of  $3\text{m}^3/\text{h}$  and design  $\Delta p$  16kPa handwheel position of 2,5 is determined for a DN32 valve



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