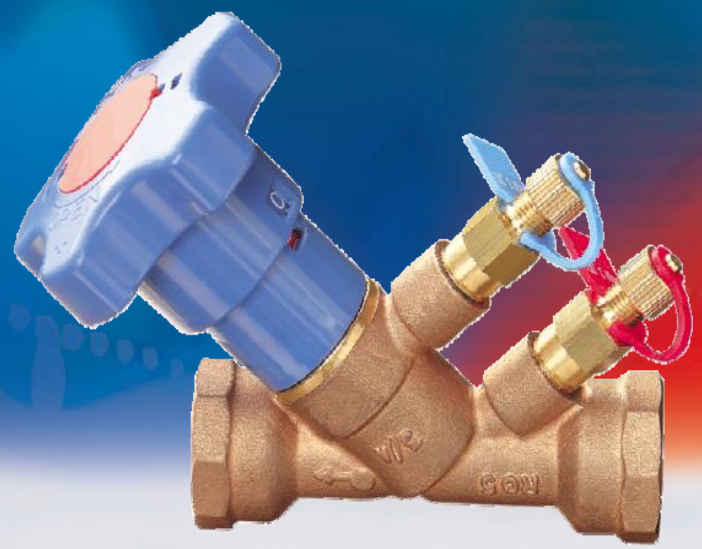
# BALANCING VALVES – VARIABLE ORIFICE Series 9505



Balancing Valve range threaded ISO228/1 connection ½” to 2”.

Bronze body. PN25.

Variable orifice with linear and circular scale.

WATTS INDUSTRIES

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## DESCRIPTION

Inadequate flow rate can lead to the malfunction of terminal units, in both heating or air conditioning applications, that can result in a temperature difference of 5°C to 6°C in each zone.

This will cause an increase of energy consumption, an over size of the pump system and additional system operating costs. By installing the balancing valves the system parameters can be maintained constant with an optimal setting of the building designed values.

**Main Product Characteristics.**

Variable orifice bronze body double regulating valve. Threaded F/F (ISO228/1)

Valve body designed according to BS7350. Tolerance on nominal Kv for completely open valve ± 5% (see flow rate section, test according to BS7350)

PN25 (Max 25bar with temperature up to 80°C, max 20bar at 100°C).

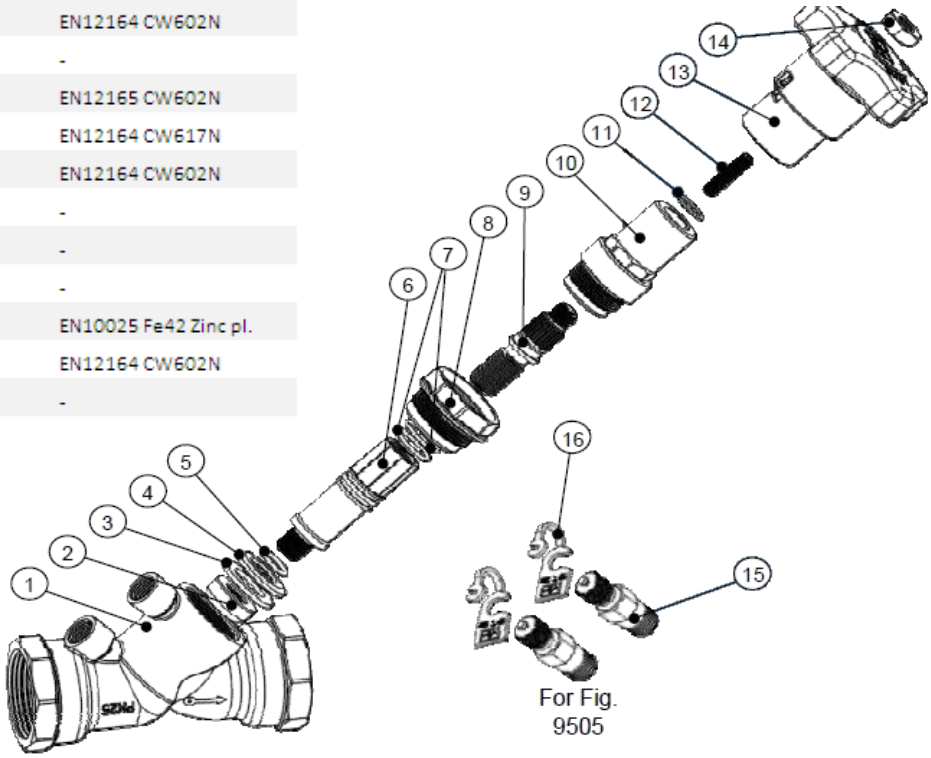
**Working conditions**

Water: -10°C to +130°C.

Below 0°C only for water with added antifreezing fluids

Over 100°C only for water with additives avoiding boiling.

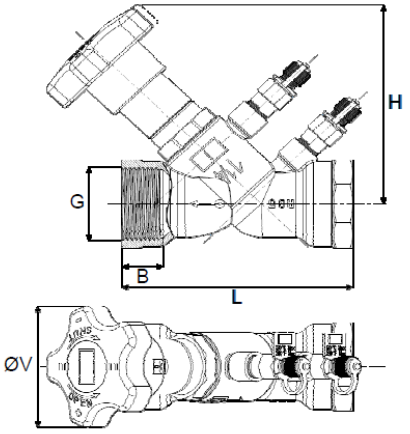
| N. | Part | Material | Norm |
|---|---|---|---|
| 1 | Body | Bronze | EN1982 CB491K |
| 2 | Balancing Cone | DZR brass | EN12164 CW602N |
| 3 | gasket disc | PTFE | - |
| 4 | Disc | DZR brass | EN12164 CW602N |
| 5 | Disc o'ring | EPDM Perox | - |
| 6 | Disc stem | DZR brass | EN12164 CW602N |
| 7 | Stem o'ring | EPDM Perox | - |
| 8 | Union | DZR brass | EN12165 CW602N |
| 9 | Stem o'ring | 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 | EN12164 CW602N |
| 16 | Tie | Polyprop. (blue/red) | - |




For Fig. 9505

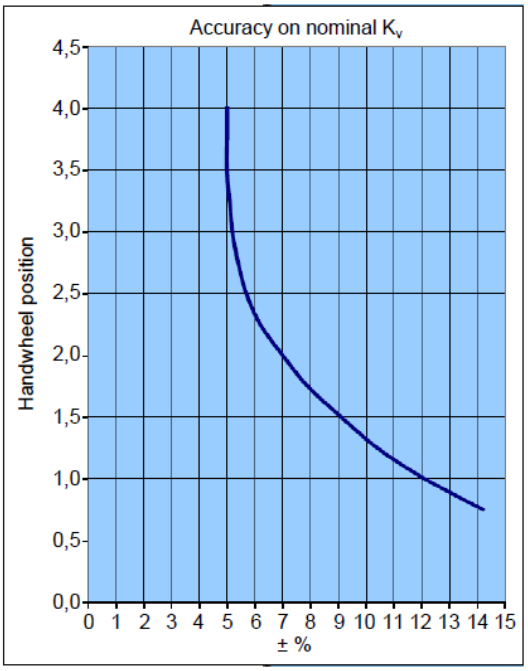
## DIMENSIONS

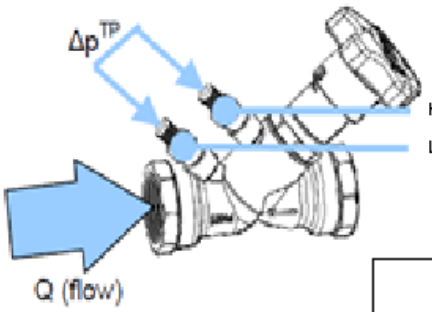
| DN | G | H [mm] | L [mm] | B [mm] | ØV [mm] | Wgt [g] | Flow rate [l/s] |
|---|---|---|---|---|---|---|---|
| 015 | 1/2" | 90 | 90 | 17,5 | 70 | 505 | 0,062 - 0,148 |
| 020 | 3/4" | 90 | 102 | 18 | 70 | 565 | 0,138 - 0,325 |
| 025 | 1" | 90 | 110 | 19 | 70 | 705 | 0,258 - 0,603 |
| 032 | 1.1/4" | 116 | 121 | 22 | 70 | 1005 | 0, 540 - 1,250 |
| 040 | 1.1/2" | 116 | 142 | 24 | 70 | 1355 | 0,810 - 1,88 |
| 050 | 2" | 116 | 161 | 27 | 70 | 1925 | 1,520 - 3,51 |




## FLOW RATE

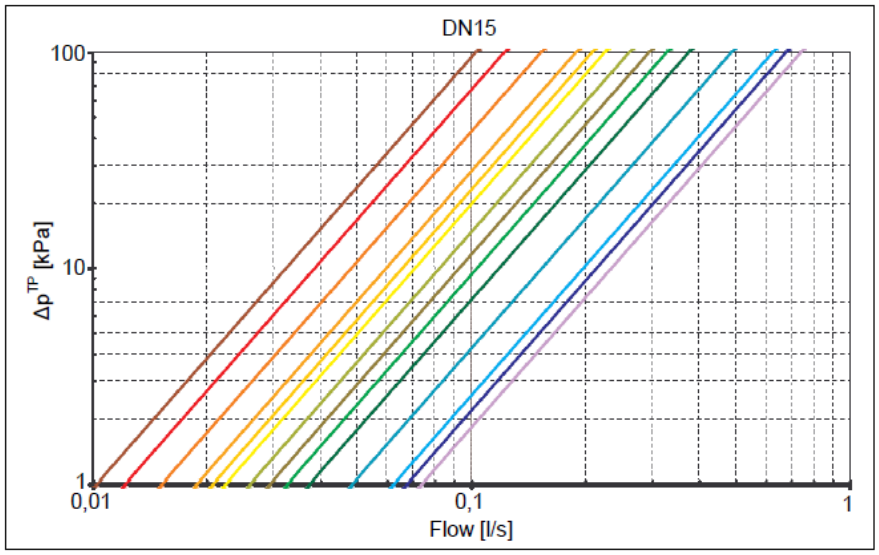
| Handwheel position | Kv [m3/h @ 1bar] 015 | 020 | 025 | 032 | 040 | 050 |
|---|---|---|---|---|---|---|
| 0,5 | 0,37 | 0,40 | 1,40 | 1,40 | 2,70 | 3,90 |
| 0,6 | 0,40 | 0,44 | 1,58 | 2,12 | 2,85 | 4,23 |
| 0,7 | 0,44 | 0,50 | 1,70 | 2,60 | 3,00 | 5,00 |
| 0,8 | 0,47 | 0,57 | 1,80 | 2,92 | 3,16 | 5,97 |
| 0,9 | 0,52 | 0,64 | 1,89 | 3,13 | 3,32 | 6,94 |
| 1,0 | 0,55 | 0,70 | 2,00 | 3,30 | 3,50 | 7,80 |
| 1,1 | 0,60 | 0,75 | 2,12 | 3,42 | 3,69 | 8,47 |
| 1,2 | 0,64 | 0,77 | 2,26 | 3,56 | 3,94 | 8,98 |
| 1,3 | 0,68 | 0,80 | 2,40 | 3,70 | 4,10 | 9,40 |
| 1,4 | 0,71 | 0,84 | 2,50 | 3,90 | 4,29 | 9,98 |
| 1,5 | 0,75 | 0,90 | 2,60 | 4,10 | 4,50 | 10,60 |
| 1,6 | 0,78 | 1,00 | 2,74 | 4,23 | 4,68 | 11,32 |
| 1,7 | 0,81 | 1,00 | 2,90 | 4,40 | 4,90 | 12,10 |
| 1,8 | 0,87 | 1,07 | 3,06 | 4,61 | 5,23 | 12,94 |
| 1,9 | 0,91 | 1,14 | 3,27 | 4,86 | 5,62 | 13,84 |
| 2,0 | 0,94 | 1,20 | 3,50 | 5,10 | 6,10 | 14,80 |
| 2,1 | 0,97 | 1,25 | 3,76 | 5,53 | 6,67 | 15,80 |
| 2,2 | 1,00 | 1,29 | 4,03 | 5,95 | 7,37 | 16,84 |
| 2,3 | 1,06 | 1,30 | 4,30 | 6,50 | 8,20 | 17,90 |
| 2,4 | 1,10 | 1,39 | 4,56 | 6,97 | 9,05 | 18,92 |
| 2,5 | 1,18 | 1,50 | 4,80 | 7,60 | 10,00 | 19,90 |
| 2,6 | 1,26 | 1,57 | 4,96 | 8,13 | 10,78 | 20,81 |
| 2,7 | 1,35 | 1,70 | 5,10 | 8,60 | 11,60 | 21,70 |
| 2,8 | 1,49 | 1,85 | 5,24 | 9,32 | 12,53 | 22,45 |
| 2,9 | 1,63 | 2,02 | 5,37 | 9,86 | 13,38 | 23,20 |
| 3,0 | 1,75 | 2,20 | 5,50 | 10,40 | 14,41 | 23,90 |
| 3,1 | 1,93 | 2,43 | 5,60 | 10,66 | 15,00 | 24,62 |
| 3,2 | 2,08 | 2,67 | 5,71 | 10,86 | 15,74 | 25,29 |
| 3,3 | 2,25 | 2,90 | 5,80 | 10,90 | 16,60 | 25,90 |
| 3,4 | 2,35 | 3,15 | 5,91 | 11,06 | 17,06 | 26,56 |
| 3,5 | 2,44 | 3,40 | 6,00 | 11,20 | 17,60 | 27,20 |
| 3,6 | 2,46 | 3,61 | 6,10 | 11,25 | 18,13 | 27,74 |
| 3,7 | 2,50 | 3,80 | 6,18 | 11,31 | 18,57 | 28,30 |
| 3,8 | 2,55 | 3,96 | 6,26 | 11,47 | 18,94 | 28,83 |
| 3,9 | 2,60 | 4,06 | 6,34 | 11,69 | 19,24 | 29,34 |
| 4,0 | 2,67 | 4,10 | 6,40 | 12,00 | 19,50 | 29,80 |

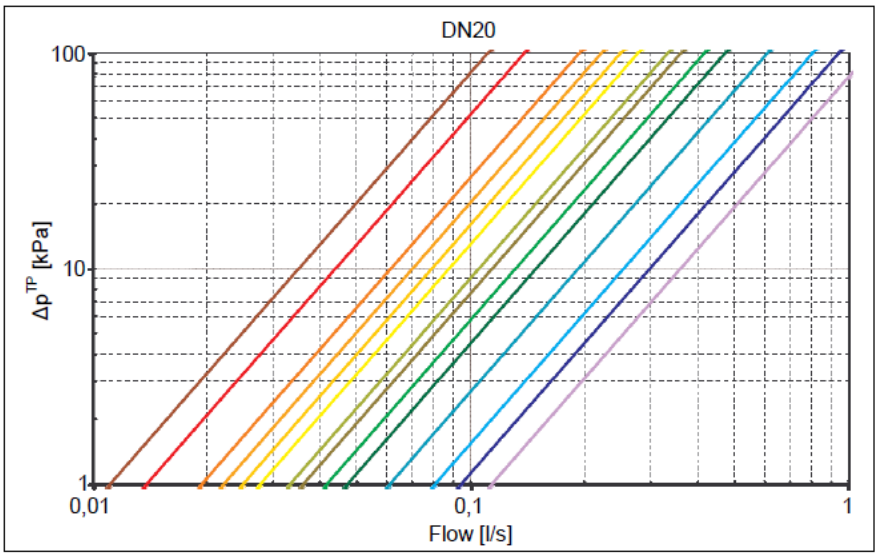


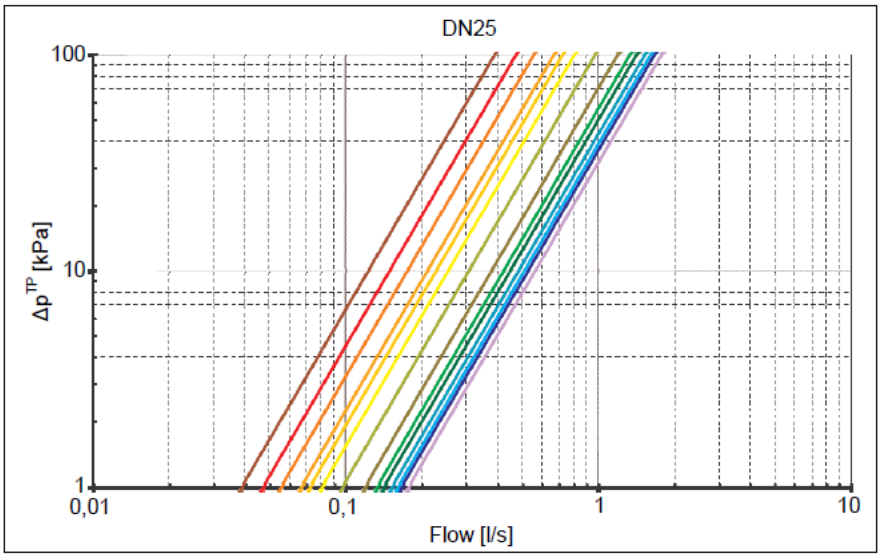




$$Q = \frac{K_v \cdot \sqrt{\Delta p^{TP}}}{36}$$

Formula linking flow Q (in l/s) and Δp 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 Δp 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.

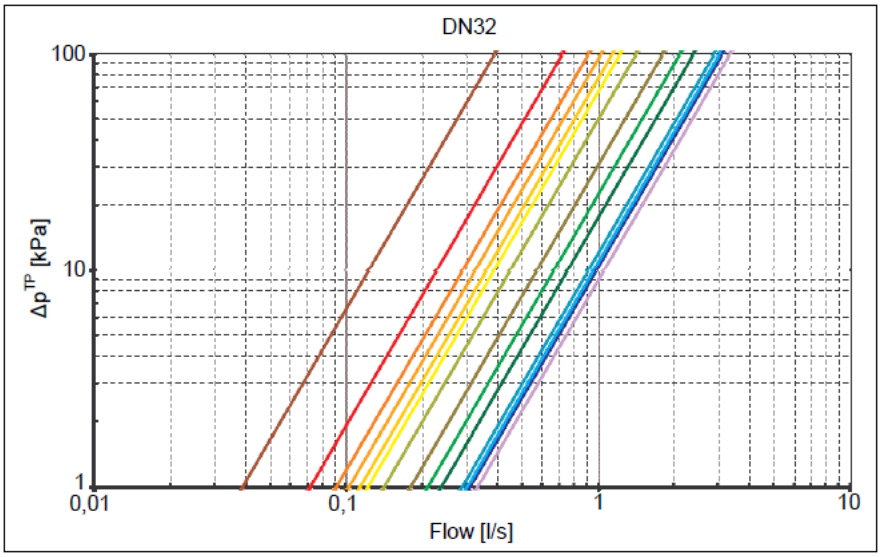


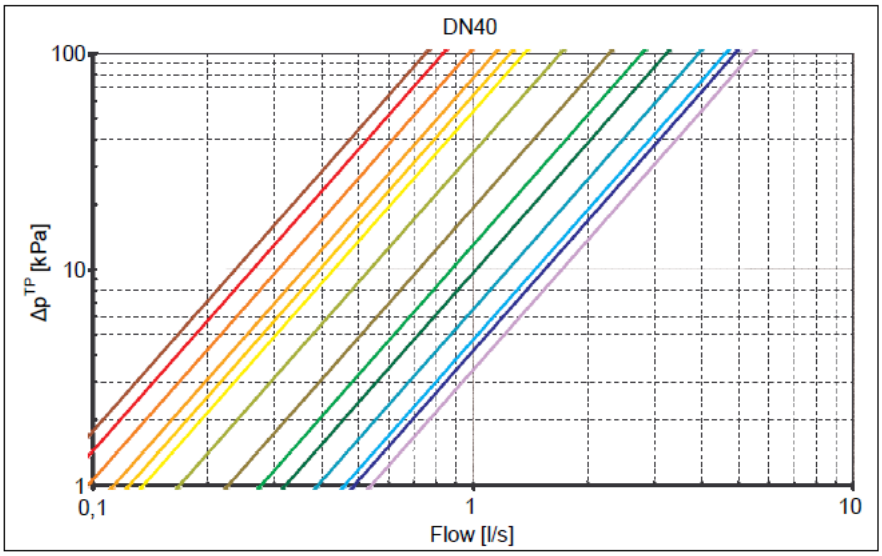



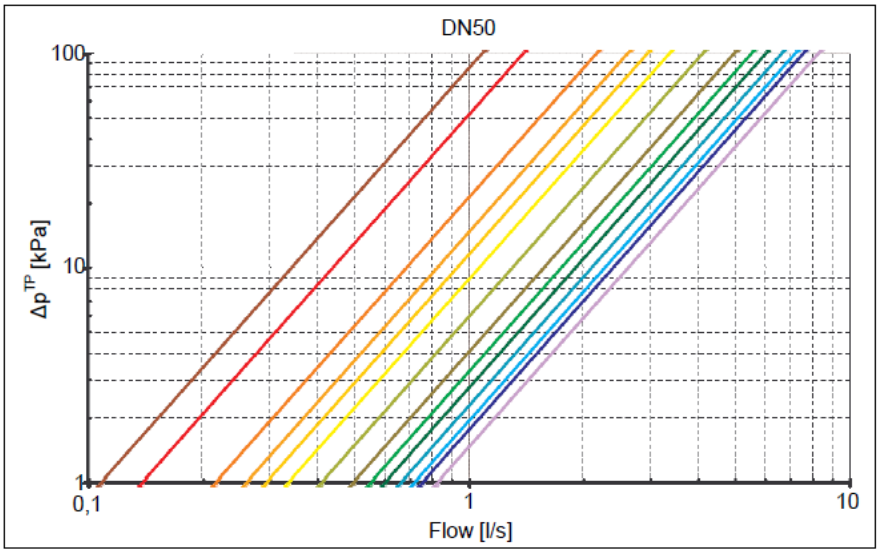




Handwheel position

- 4,0
- 3,5
- 3,3
- 3,0
- 2,7
- 2,5
- 2,3
- 2,0
- 1,7
- 1,5
- 1,3
- 1,0
- 0,7
- 0,5



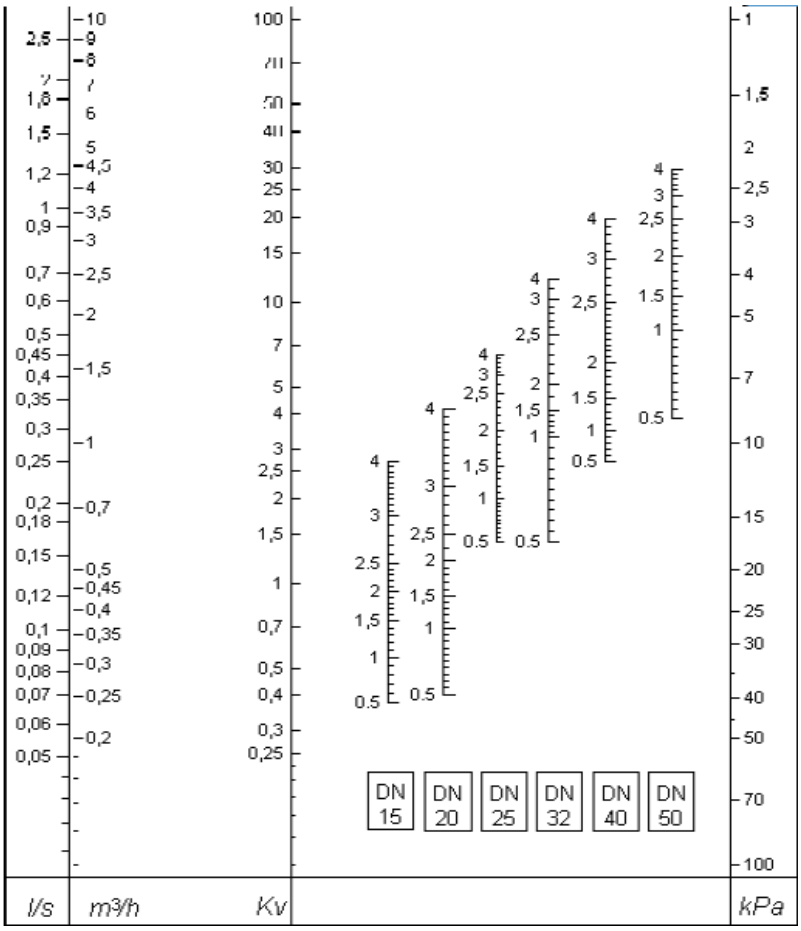

Handwheel position

- 4,0
- 3,5
- 3,3
- 3,0
- 2,7
- 2,5
- 2,3
- 2,0
- 1,7
- 1,5
- 1,3
- 1,0
- 0,7
- 0,5

## PRODUCT CODES

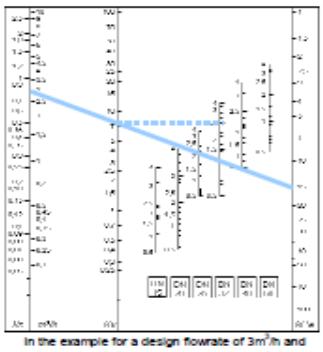
| Part Number | size |
|---|---|
| F9505B015WII | 1/2" |
| F9505B020WII | 3/4" |
| F9505B025WII | 1" |
| F9505B032WII | 1.1/4" |
| F9505B040WII | 1.1/2" |
| F9505B050WII | 2" |

## 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 3m³/h and design Δp 15kPa handwheel position of 2,5 is determined for a DN32 valve

A Division of Watts Water Technology Inc.

**Watts Industries Deutschland GmbH**

Godramsteiner Hauptstraß167 – 76829 Landau – Germany

Phone: +49 (0) 6341.9656-222 – Fax: +49 (0) 6341.9656.220

info@wattsindustries.de – www.wattsindustries.com