W-STBV-16Q Series

Balancing and control valves

Technical Data Sheet

Watts.eu

Description

The Watts **W-STBV-16Q** Static Balancing Valve is designed for flow balancing in cooling, heating or process water systems. Its variable orifice measuring points enable convenient and accurate system commissioning.

W-STBV-16Q

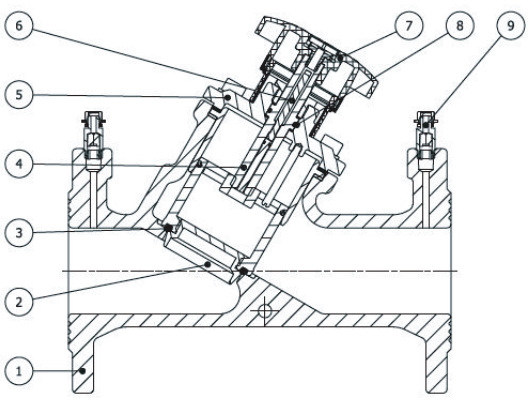
Balancing and control valve **with flanged connections** for heating and cooling systems. Accurate flow control, Numerical indicator of opening degree on the handwheel, Lockable set position, Shut-off function for troubleshooting or maintenance, Balanced valve core, easy to adjust, Self-sealing measuring points to protect against leakage, No-Rising stem, Variable Orifice

- Nominal Pressure: PN 16
- Temperature Range: -10°C÷120°C
- Patent No: ZL 2013 2 0890615.7

Type	Part No.	DN	Kvs	Weight (kg)
W-STBV-16Q	61170067E	65	94,47	15,63
W-STBV-16Q	61170068E	80	137,31	19,93
W-STBV-16Q	61170069E	100	211,20	26
W-STBV-16Q	61170070E	125	330,22	38
W-STBV-16Q	61170071E	150	408,32	62
W-STBV-16Q	61170072E	200	759,21	91,81
W-STBV-16Q	61170073E	250	1162,44	152,4
W-STBV-16Q	61170074E	300	1703,45	230,13

Technical features	
Nominal pressure	PN 16
Fluids	Water (liquid), Water + glycol (liquid) Not suitable for: Gases (Group 1 & 2) and liquids of Group 1 as defined in PED 2014/68/EU. The fluid must remain single-phase (no flashing) under all operating conditions. Not for steam/superheated water.
Maximum glycol content	50%. Higher percentages only on request and subject to Watts approval
Operating temperature	-10°C÷120°C Fluid temperatures below 0°C and above 100°C allowed only for water with anti-freezing or anti-boiling additives. For temperatures above 100°C, the vapor pressure of the selected fluid must be < 0,5 bar(g)
Connection standard	EN 1092-2
Test pressures	Hydraulic Shell: 24 bar Seat: 18 bar
CE Marking	No CE marking (Falls under art. 4.3 of Pressure Equipment Directive)
Other certifications	-

Pos.	Component	Materials
1	Body	Ductile Iron
2	Core	Bronze (DN65-DN150) Ductile Iron (DN200-DN300)
3	Seat Sealing	EPDM
4	Stem	Brass (DN65-DN150) Stainless Steel (DN200-DN300)
5	Bonnet	Ductile Iron
6	Core Rod	Stainless Steel
7	Handwheel	Polyamide (DN65-DN200) Cast Aluminum (DN250-DN300)
8	Stem Sealing	EPDM
9	Measuring Orifices	Brass



Application

All distribution networks, even the simplest, are made up of different branches, whose flow rates need to be defined at the design stage and must then correspond to the values calculated in the course of operation.

In an unbalanced system (Fig.1), the flow rate to the circuits nearest the pump is too high, while the flow rate to the circuits furthest from the pump is too low. The resulting temperature differences between different rooms not only detract from comfort but also increase energy consumption.
The use of thermostatic or control valves in this situation can cause noise.

The installation and correct setting of balancing and control valves (Fig. 2) on boiler room manifolds, at the bottom of risers and upstream of heat production and exchange units or zones ensures correct flow distribution, thus offering immediate benefits in terms of comfort and energy saving, as well as optimising the efficiency of the control system.

Unbalanced system

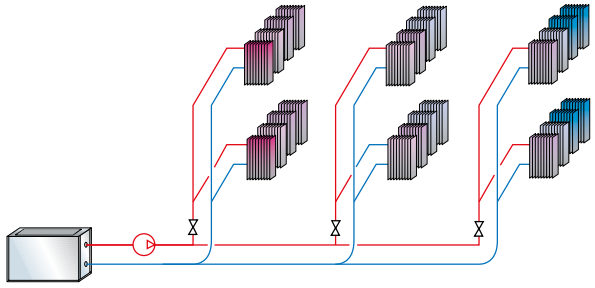


Fig. 1

Balanced system

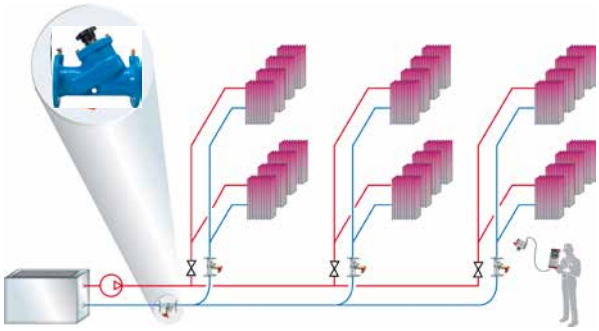


Fig. 2

Sizing

Where the pressure drop (Δp) to be balanced and the design flow are known, use the flow curve or formula shown below:

$$Kv = \frac{q}{\sqrt{\Delta p}}$$

where:
Kv = volumetric flow coefficient
q = flow rate in m^3/h
Δp = pressure drop (resistance) to be balanced in bar

The following can be determined from the above:

$$Kv = 0.01 \times \frac{q}{\sqrt{\Delta p}}$$ if q is expressed in l/h and Δp in kPa

$$Kv = 36 \times \frac{q}{\sqrt{\Delta p}}$$ if q is expressed in l/s and Δp in kPa

Table of Kv values at the various setpoint positions

TURNS	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300
1	13.60	14.04	17.60	24.43	30.15	61.52	93.35	77.84
2	31.17	28.24	38.74	40.42	50.84	114.27	177.64	180.75
3	48.10	42.78	57.33	64.45	70.45	158.44	247.53	244.12
4	59.80	62.08	76.51	89.52	93.93	194.06	295.25	309.35
5	68.35	82.97	99.39	116.92	122.20	228.97	345.49	353.48
6	76.07	103.73	132.54	166.10	149.16	295.88	480.61	408.11
7	82.61	119.93	167.56	206.71	182.19	375.28	599.27	566.22
8	87.84	127.67	190.21	243.57	223.49	452.07	705.34	742.04
9	94.47	137.31	211.20	272.85	288.33	526.00	809.04	867.56
10				307.07	326.57	589.74	916.65	1002.31
11				330.22	372.26	651.03	1006.79	1146.01
12					408.32	708.91	1081.64	1290.26
13						759.21	1162.44	1408.81
14								1514.31
15								1619.95
16								1703.45

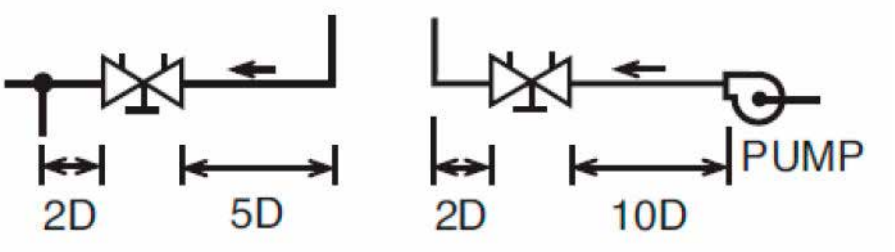
Balancing valves are generally selected in such a way that the desired setpoint value is reached when the valve is 75% open. This setpoint position leaves a certain margin for manoeuvre in the field.
For existing systems, it is often difficult to calculate the necessary setpoint value. To avoid undue oversizing, make sure the pressure drop, in the fully open position and at nominal flow rate, is at least 3 kPa. Similarly, when using a balancing valve on a circuit that does not require balancing a priori (e.g. the least favourable circuit), it is advisable to install a valve of the same DN as the pipe, with a setpoint position close to fully open and a pressure drop of at least 3 kPa (approximately 300 mm wg).

Opening Rate Setting:
Kv value can be set up in advance by rotating the handwheel. The preset value is shown in the main and ancillary window on the handwheel. The outer main window (black background with white text) indicates the integer portion of the valve's turns, while the inner ancillary window (blue background with white text) indicates the decimal portion of the valve's turns.

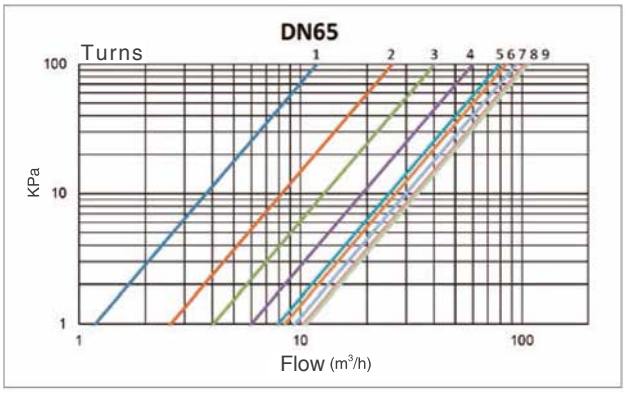
Opening Rate Locking:
1. Rotate the handwheel to set the opening rate to desired value.
2. Pry the plug on the center of the handwheel, and then use a screwdriver to rotate the nut under the plug clockwise. The nut drives the valve's core rod to rotate as well, until the core rod is deadlocked.
3. Put the plug back on the center of the handwheel to avoid debris.

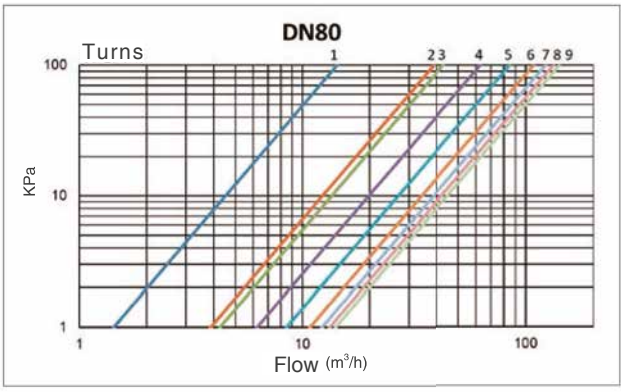
Installation

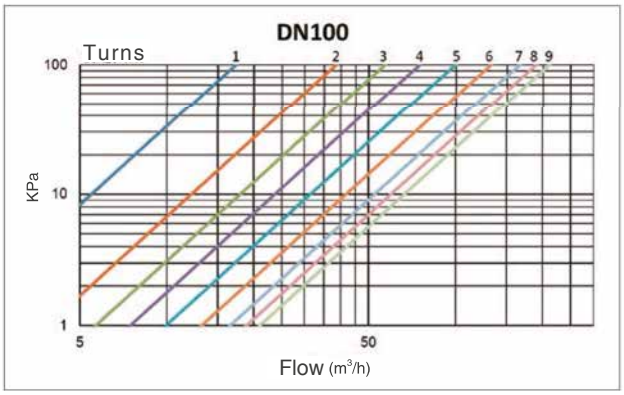
A thorough cleaning before installation is needed (chemical reagent can be applied if it is necessary) to ensure that there is not any rusting or dirt in the pipe. All the filters must be removed before washing to keep the flow smooth.
- The direction of the fluid must be in line with the direction of the arrow head on the valve's body.
- When connected to an elbow, the valve should keep 5d distance from the elbow if the elbow is ahead it, or keep 2d distance from the elbow if the elbow is behind it. When connected to a pump, the valve should keep 10d distance from the pump. The rules are illustrated as below:

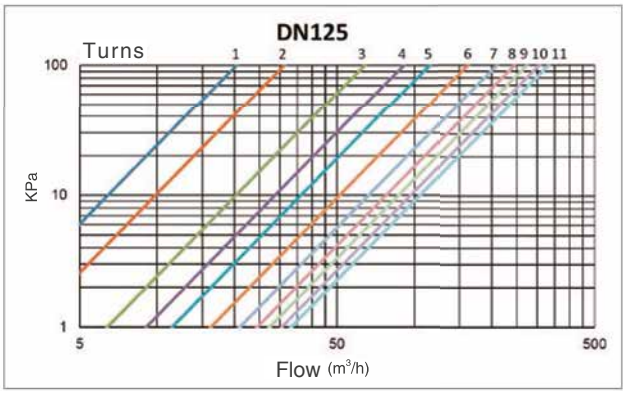


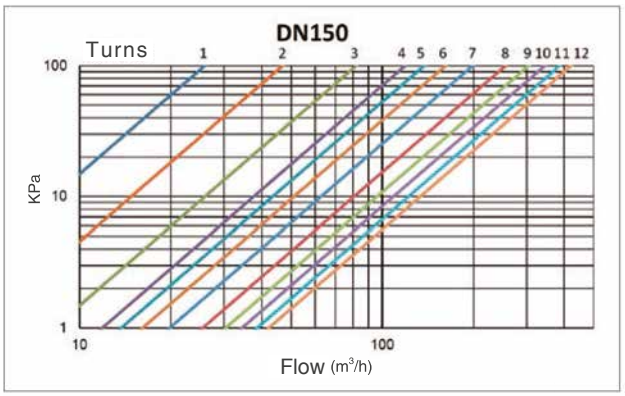
Characteristic Curves

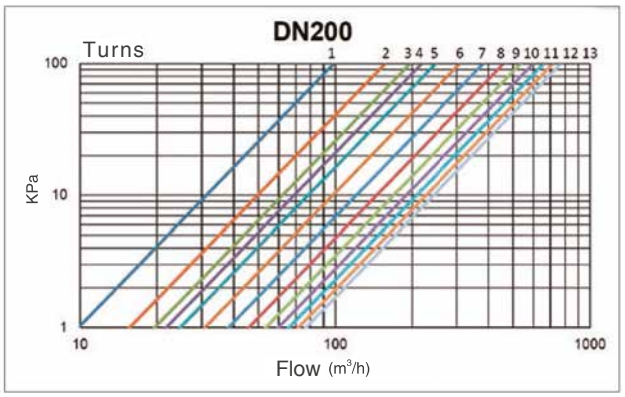


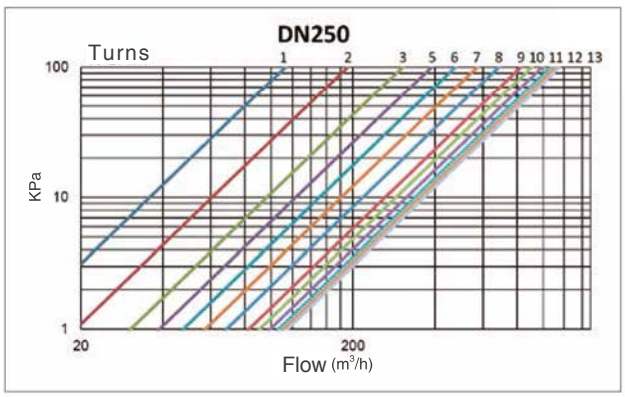


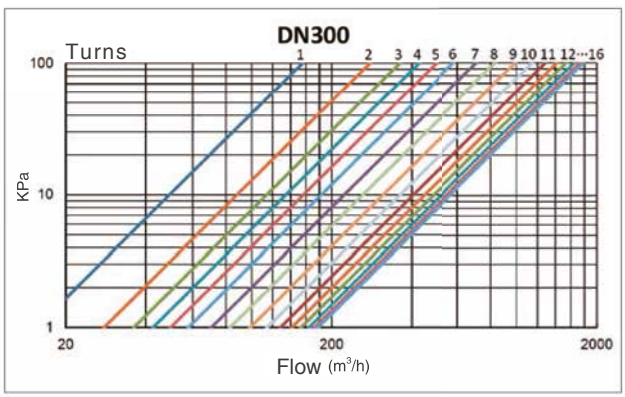






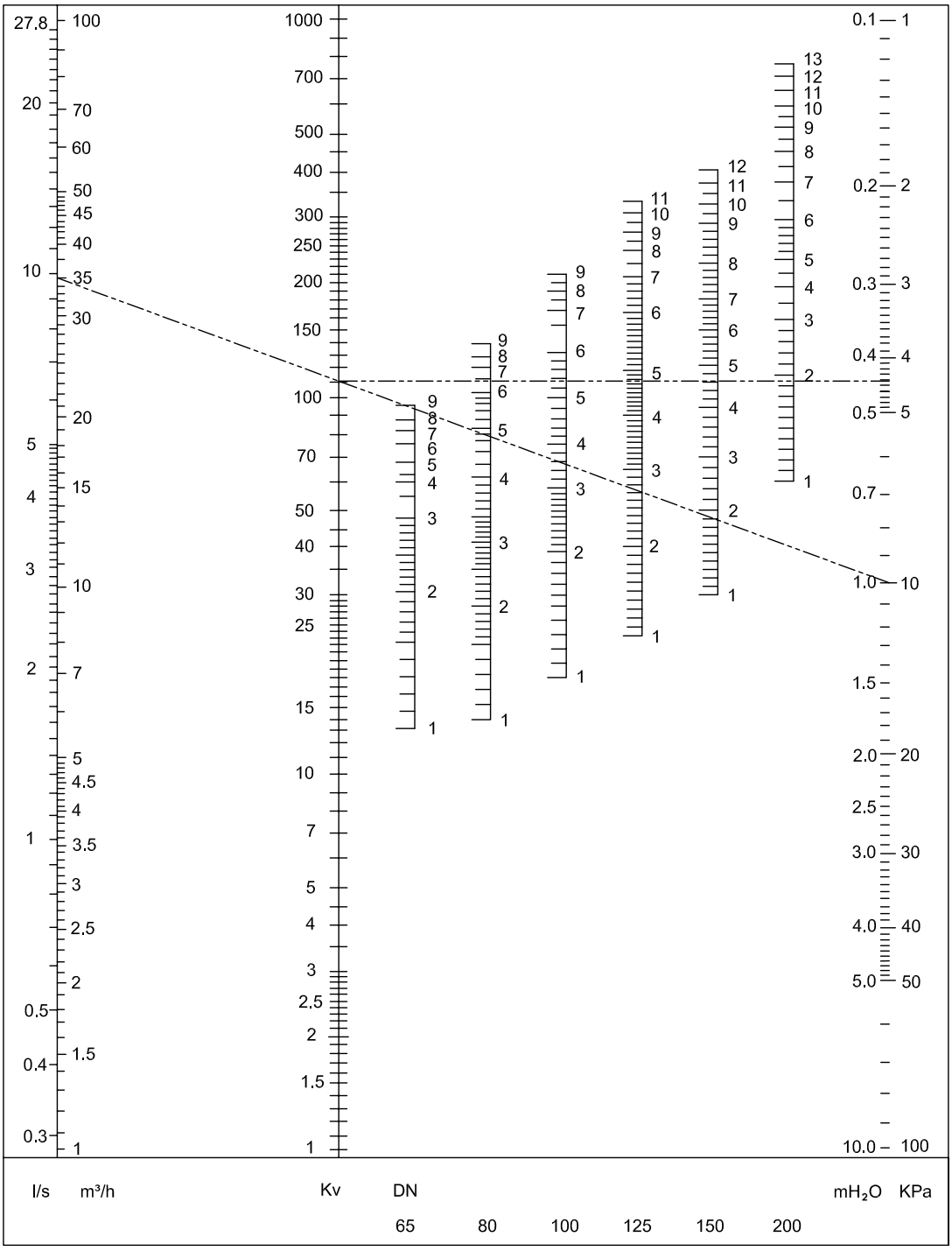


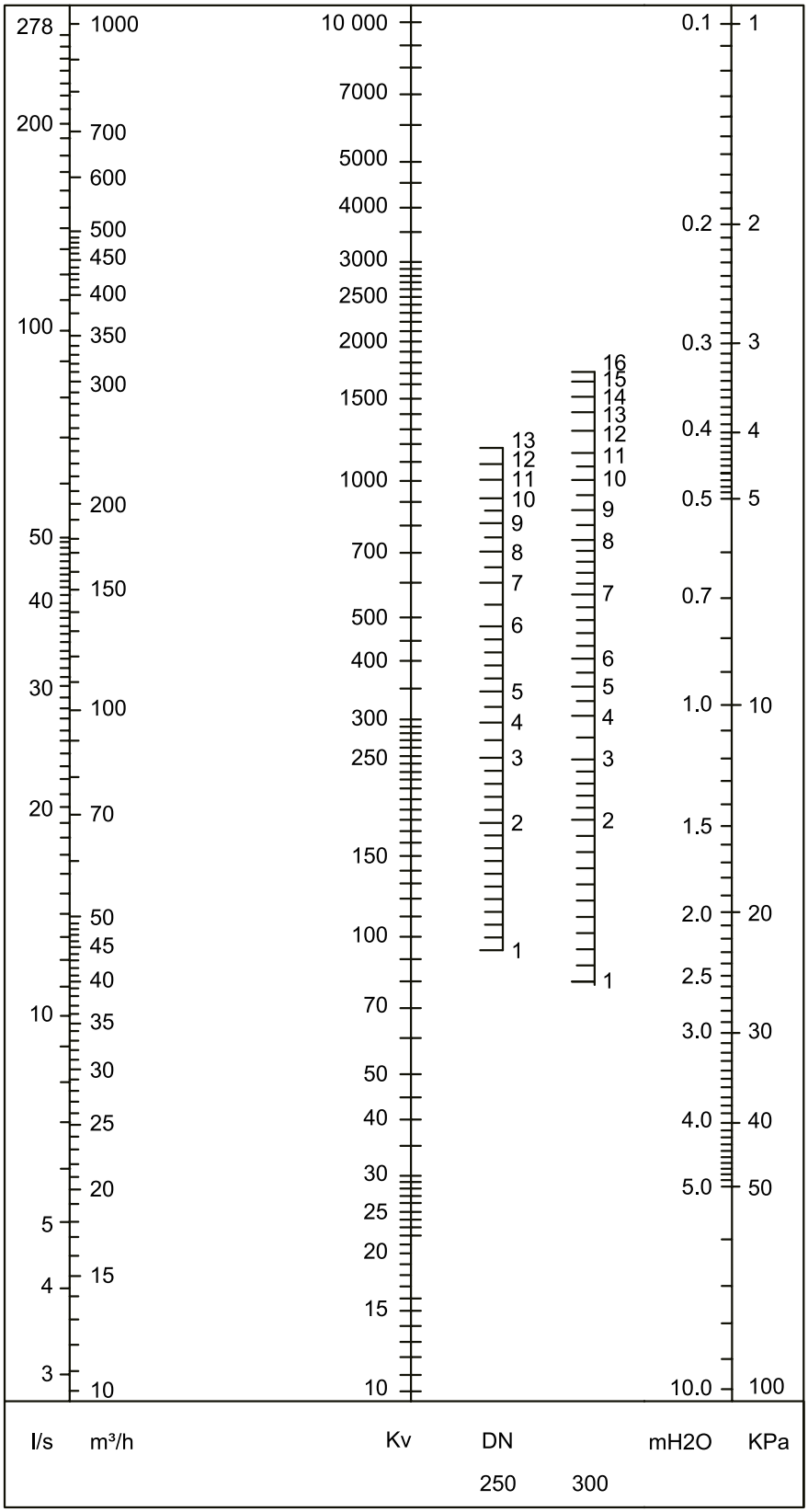




Selection Drawing

For example:
Q: An air conditioning system is equipped with a static balancing valve, with a design flow of 35 m3/h and a pressure drop of 10 kPa. Now we need to select a suitable static balancing valve.
A: As shown in the below model selection line diagram, read out the position point with Q=35m3/h from the left flow scale line, read the position point of 10 kPa from the right pressure drop scale line, connect the two points and the intersection point of Kv value scale line, and make the intersection point of horizontal line and the opening scale line of balance valve of different caliber. The intersection of DN80 intersection point is 6.9 circle, that of DN 100 intersection point is 5.4 circle, that of DN 125 intersection point is 4.8 circle, that of DN150 intersection point is 4.6 circle, and that of DN200 intersection point is 2.25 circle Based on the principle that the setting value is 75%, the DN80 balancing valve is recommended.

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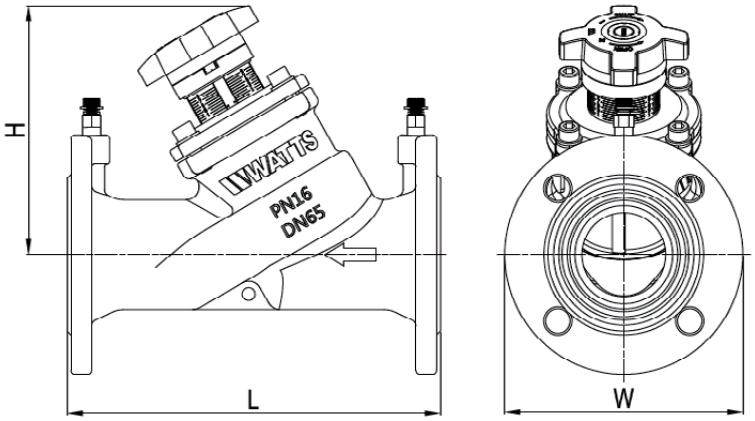
Overall dimensions (mm)

W-STBV-16Q



DN	L	H	W
65	290	195	185
80	310	215	200
100	350	230	220
125	400	330	250
150	480	350	285
200	600	420	340
250	730	460	405
300	850	600	460

Specification text

W-STBV-16Q Series

Variable orifice balancing and control valve **W-STBV-16Q Series** with flanged connections DN65-300 for heating and cooling systems. Accurate flow control, Numerical indicator of opening degree on the handwheel, Lockable set position, Shut-off function for troubleshooting or maintenance, Balanced valve core, easy to adjust, Self-sealing measuring points to protect against leakage, No-Rising stem. Ductile iron body, sealing EPDM. Nominal pressure 16 bar. Connection standard EN 1092-2. Fluid: liquid water (max glycol content 50%). Operating temperature range: from -10°C to 120°C.

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