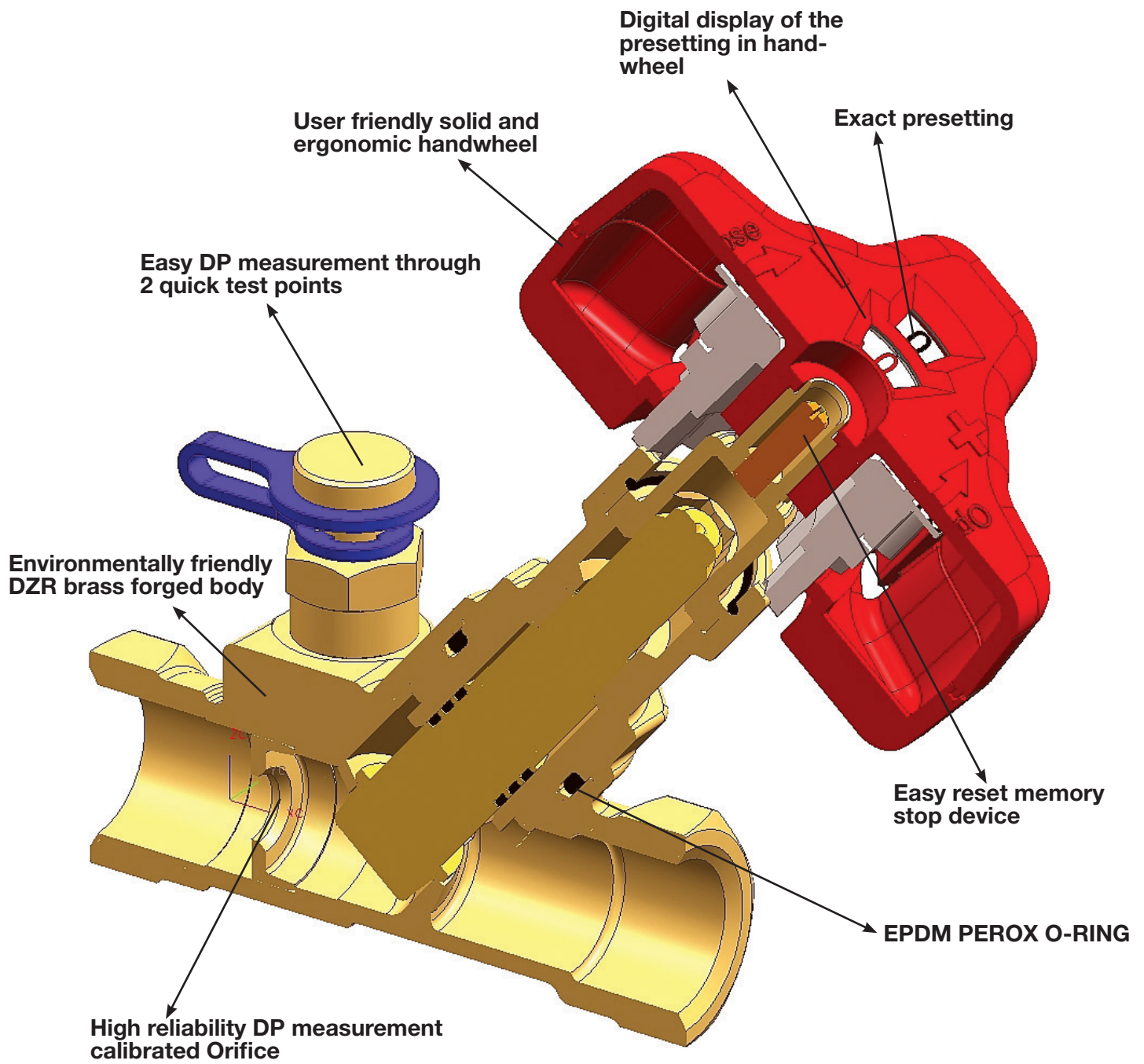


HERZ Integral Fixed Orifice Commissioning Valve



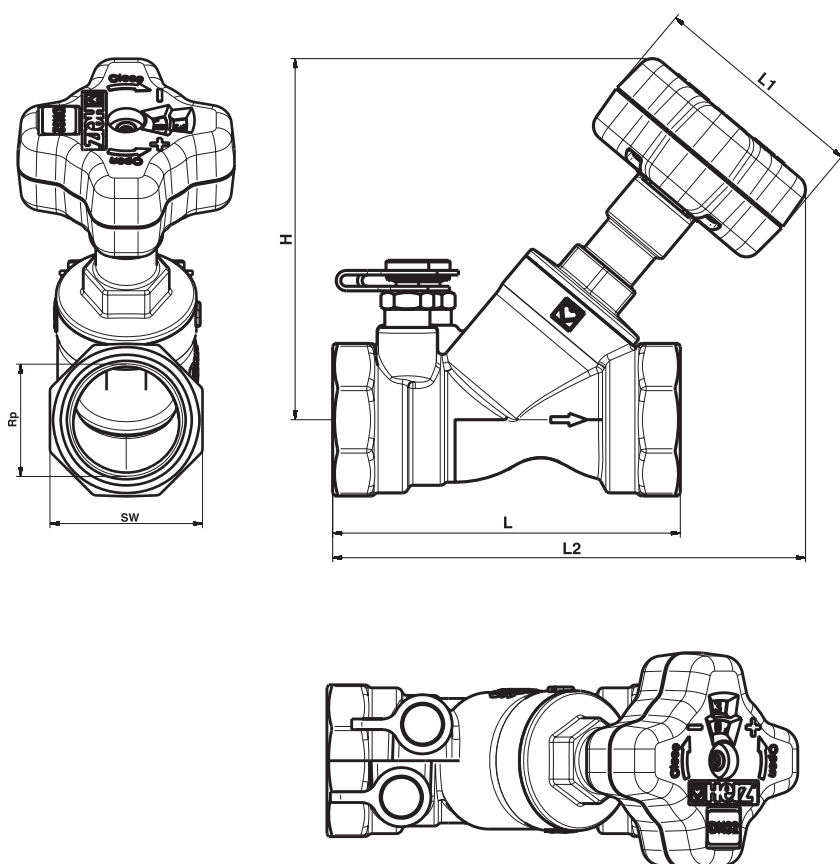




Part of the extensive range of Circuit Balancing valves from Herz. The new Herz 4017 DRZ combined regulating and measuring valve has an integral orifice incorporated into the valve casting. Available in sizes from DN15 to DN50. The valve is also available in Low Flow and Medium Flow DN15 versions.

The commissioning valve has hidden regulating and locking functions with high accuracy and good repeatability.

The valve is fitted with two standard pressure test points, extended test points are available when required.



Presetting Procedure

1. Set to the desired step according to calculation (digital display on the hand wheel).
2. Remove the hand wheel securing screw
3. Screw the presetting spindle, which is now accessible, in up to the stop.
4. Replace the hand wheel securing screw.

**Max. operating temperature 130 °C (up to DN 32)
110 °C (from DN 40)**

Max. operating pressure 20 bar

Advantages:

- The flow rate through orifice is constant for all pre-set values, i.e. quick and easy balancing
- Infinitely adjustable presetting, the flow rate which goes through the orifice is precisely controlled
- Through the use of an integrated orifice, the pressure drop is very precisely measurable
- Kv-value of integrated orifice is shown in the descriptive table
- Accuracy $\pm 5\%$

Dimension	Art.-Nr.	L	L1	L2	H	SW 6-kant	SW 8-kant
DN 15 LF	1 4017 11	83	71	130	97	27	-
DN 15 MF	1 4017 21	83	71	130	97	27	-
DN 15	1 4017 01	83	71	130	97	27	-
DN 20	1 4017 02	91	71	135	100	32	-
DN 25	1 4017 03	100	71	145	110	41	-
DN 32	1 4017 04	114	71	155	118	-	50
DN 40	1 4017 05	125	71	168	130	-	55
DN 50	1 4017 06	146	110	191	146	-	70

STRÖMAX 4017 M

	DN 15 LF	DN 15 MF	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
Kvs	0,48	0,97	1,95	3,95	7,90	15,75	21,50	46,70
Position of hand-wheel								
0,5	0,05	0,17	0,40	0,33	0,66	0,60	1,10	2,55
1,0	0,07	0,30	0,60	0,63	1,04	1,00	3,10	4,50
1,5	0,14	0,42	0,80	1,20	1,90	2,20	4,80	6,60
2,0	0,22	0,53	1,00	1,70	3,10	3,50	6,30	8,70
2,5	0,29	0,66	1,15	2,25	4,20	4,65	7,90	10,80
3,0	0,35	0,78	1,42	2,80	5,00	5,90	9,50	13,00
3,5	0,41	0,86	1,80	3,25	5,80	7,25	11,20	15,30
4,0	0,46	0,88	2,00	3,60	6,50	8,85	13,00	18,00
4,5	-	-	-	-	-	9,90	14,70	20,20
5,0	-	-	-	-	-	11,40	16,25	22,50
5,5	-	-	-	-	-	12,50	17,40	25,00
6,0	-	-	-	-	-	13,30	18,50	26,70
6,5	-	-	-	-	-	-	-	28,60
7,0	-	-	-	-	-	-	-	30,30
7,5	-	-	-	-	-	-	-	31,90
8,0	-	-	-	-	-	-	-	33,00

FLOWRATE

$$Q = \frac{K_{vs} \cdot \sqrt{\Delta p_s}}{36} \quad [l/s]$$

PRESSURE LOSS in fully open position:

$$= HLF \cdot \Delta p_s \quad [kPa]$$

PRESSURE LOSS in fully open position:

$$= K \cdot \frac{v^2}{2 \cdot g} \quad [mH_2O]$$

Kvs = Flow coefficient through the pressure test points of the valve

Kv = Flow coefficient through the valve

HLF = Head loss factor

K = Head loss coefficient

v = flow velocity

g = gravitational constant

Δps = differential pressure through the pressure test points of the valve

STRÖMAX 4017 M

Function

Two test points are mounted next to handwheel on the same side of the valve across the integral orifice and factory sealed. This arrangement ensures the best accessibility in any position and optimum connection of measuring instruments.

Field of application

For isolating and balancing of the cold and hot water systems in buildings or for the adjustment of hydraulic supply-lines.



STRÖMAX 4017 R

Function

STRÖMAX-4017-R valves are of the same mechanical design as STRÖMAX-4017-M.

Field of application

For isolating and balancing of the cold and hot water systems in buildings.



STRÖMAX 4017 ML

Function

One standard test point and one test point fitted with a capillary connection are mounted next to handwheel on the same side of the valve across integral orifice and factory sealed. This arrangement ensures the best accessibility in any position and optimum connection of measuring instruments.

Field of application

For isolating and balancing of the cold and hot water systems in buildings or for the adjustment of hydraulic supply lines.

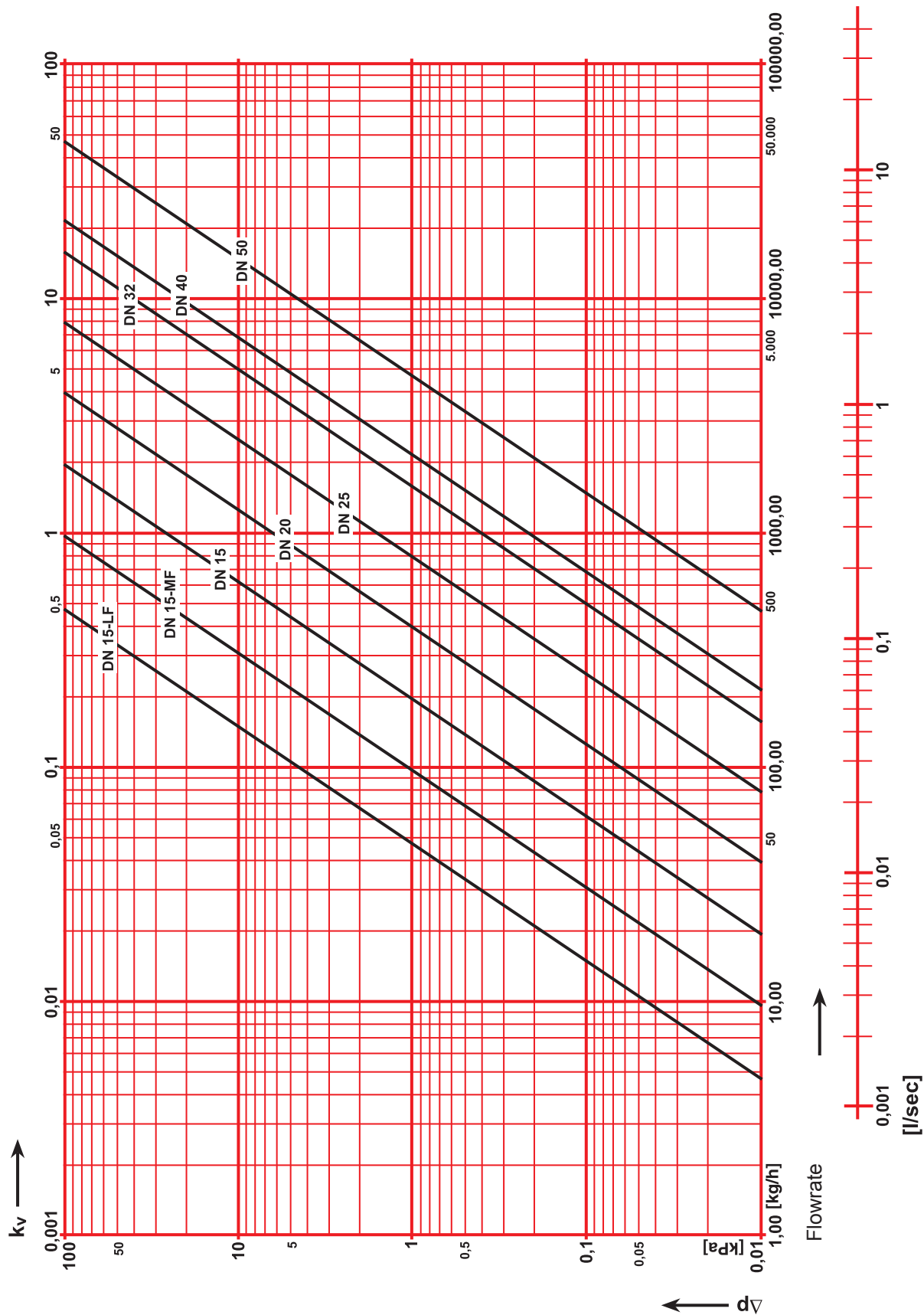


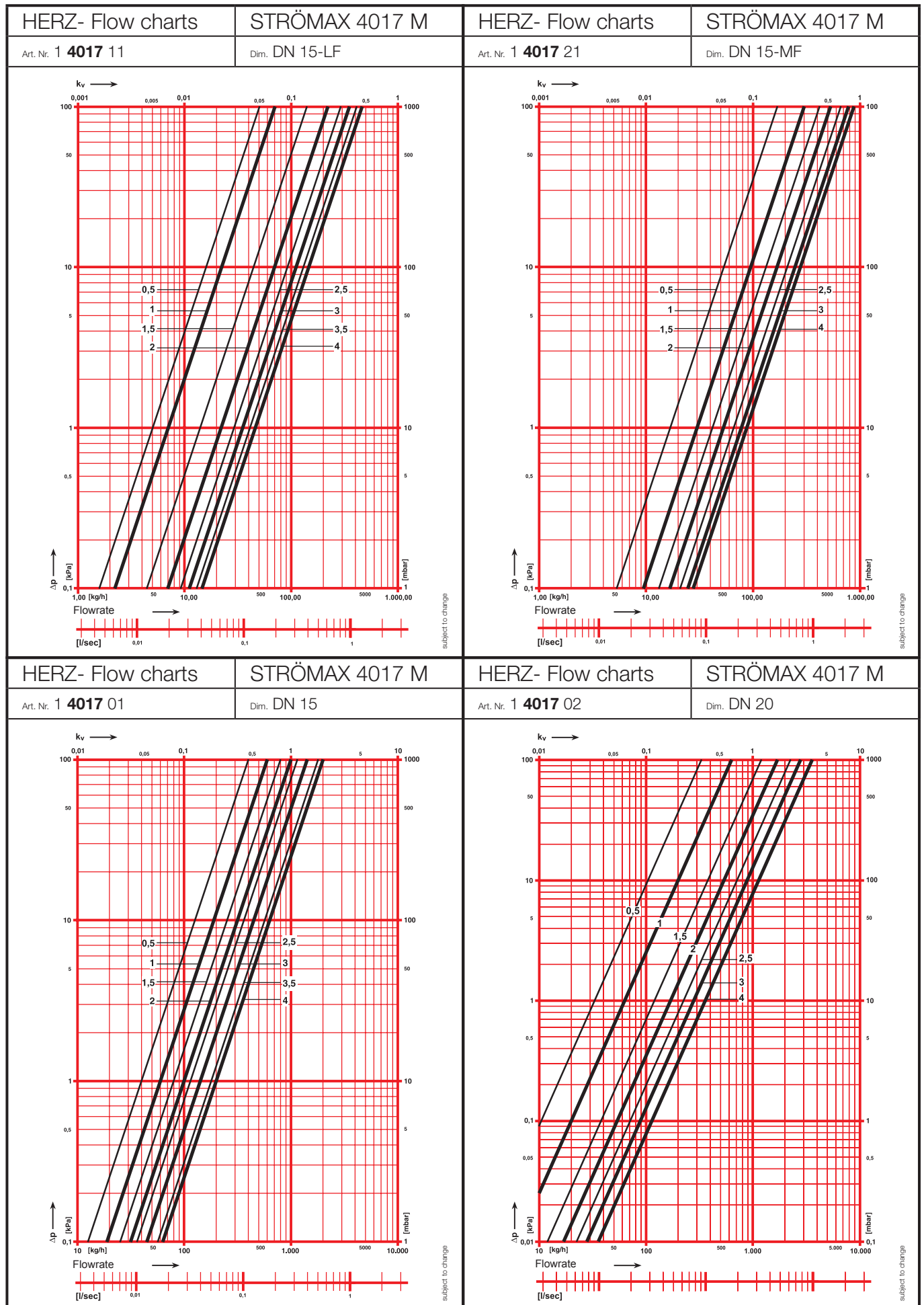
HERZ- Flow charts

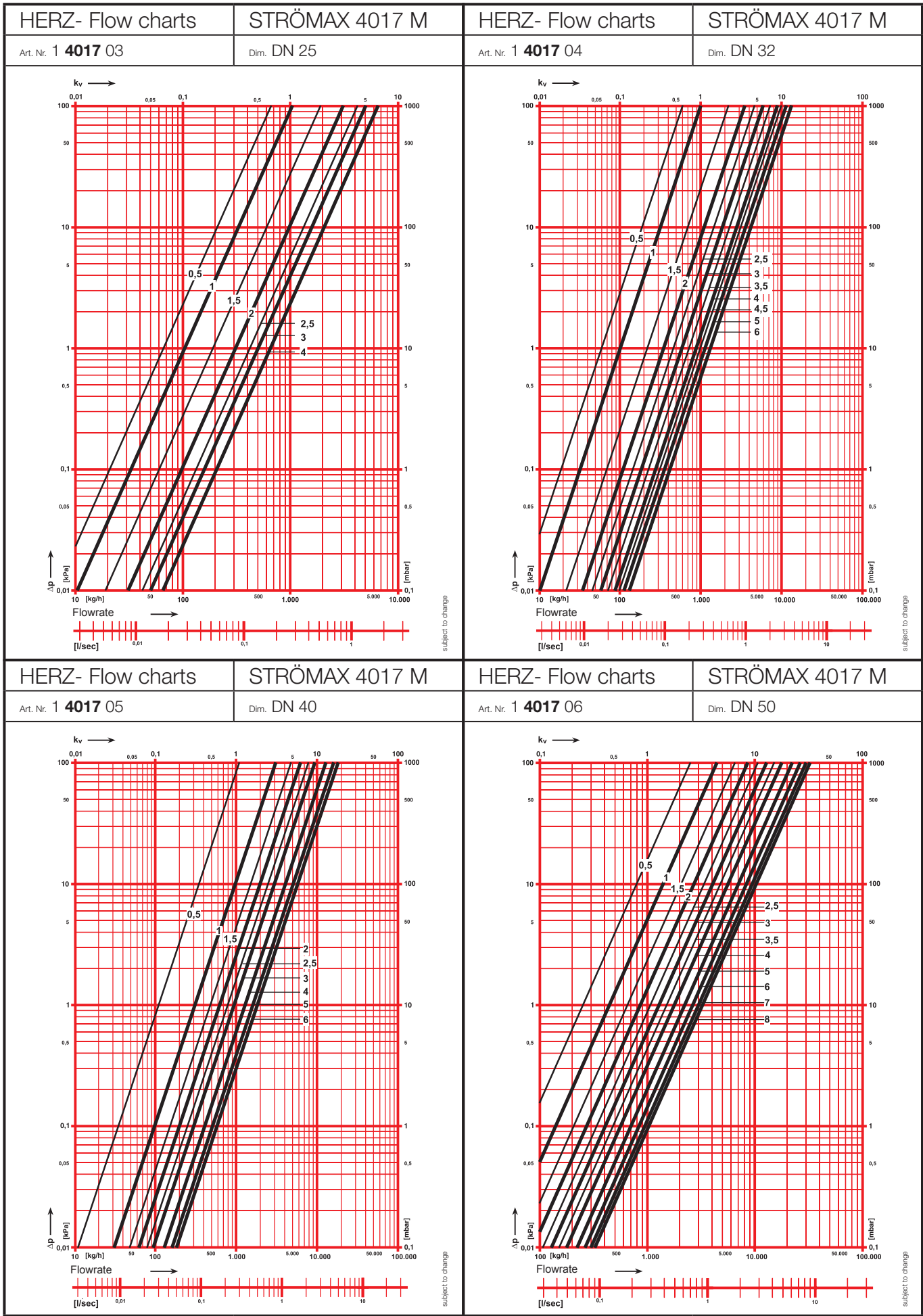
STRÖMAX 4017 M

Art. Nr. **4017**

flow data - flow signal







The following points must be considered before commissioning:

1. The adjustment of a valve in a sub-circuit alters the flow not only in the sub-circuit, but also in other circuits in the system. If such an adjustment reduces the flow in the sub-circuit then the flow elsewhere must increase, as the total mass flow rate is constant.
2. If water flows through a pipe which has a number of branches then the percentage of the total flow in each branch remains constant irrespective of how the total mass flow alters.
3. The initial objective is to obtain the same percentage of the total flow rate in each part of the system (%DFR).
4. Flow is induced into less favoured circuits from favoured circuits.
5. Start with the most favoured branch to induce flow to less favoured branches (greatest %DFR).
6. The index circuit is that circuit displaying the lowest %DFR of the group of circuits on any one branch.
7. Each circuit is balanced against the index circuit starting with the circuit next to the pump and working back to the index.
8. Once all the groups of circuits within branches have been adjusted, the branch valves can be balanced as for the terminals working back towards the index.

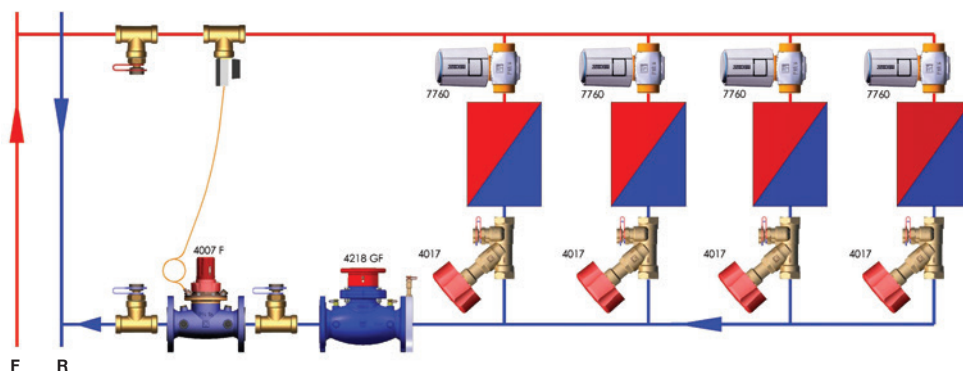
Proportional Balancing with 4017 Fixed Orifice Valves:

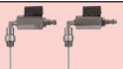
1. With all terminal commissioning valves fully open with the main branch valve fully open and the control valves disabled and fully open, an initial differential pressure reading (signal) is taken at all commissioning valves.
2. The Percentage of Design Flow Rate is then calculated for all (%DFR)

$$\%DFR = 100 \times \sqrt{\frac{\text{Actual Signal } (\Delta P)}{\text{Design Signal } (\Delta P)}}$$

Start with the most favoured branch to induce flow to less favoured branches (greatest %DFR). The index circuit is that circuit displaying the lowest %DFR of the group of circuits on any one branch.

3. Each circuit is balanced against the index circuit starting with the circuit next to the pump and working back to the index.
4. Once all the groups of circuits within branches have been adjusted, the branch valves can be balanced as for the terminals working back towards the index.
5. When using Fixed Orifice the Pressure drop (signal) is used as the measuring unit
6. The formula for establishing the signal to be achieved is
7. Target $\Delta P = (\text{Index } \%DFR / 100)^2 \times \text{Design Signal}$
8. As each valve is regulated, the index %DFR will tend to increase. It is the current value which is used in the reiteration.
9. Identify the index unit of the branch being balanced, this is usually the last measuring point on the branch and will have the lowest %DFR
10. Calculate the target DP signal for the valve with the next lowest %DFR
11. Adjust the regulating valve so that the target signal is achieved within $\pm 5\%$ of the index %DFR. A further iteration may be required if the circuit being balanced is not within $\pm 5\%$.
12. Continue by adjusting the regulating valve for the next terminal nearer the pump until the DFR for this terminal is within $\pm 5\%$ of the index terminal.
13. Complete the branch, then proceed to the next most favoured branch on the riser and carry out terminal balancing as before.
14. The process is repeated until all branches have been adjusted and balanced proportionally to one another.

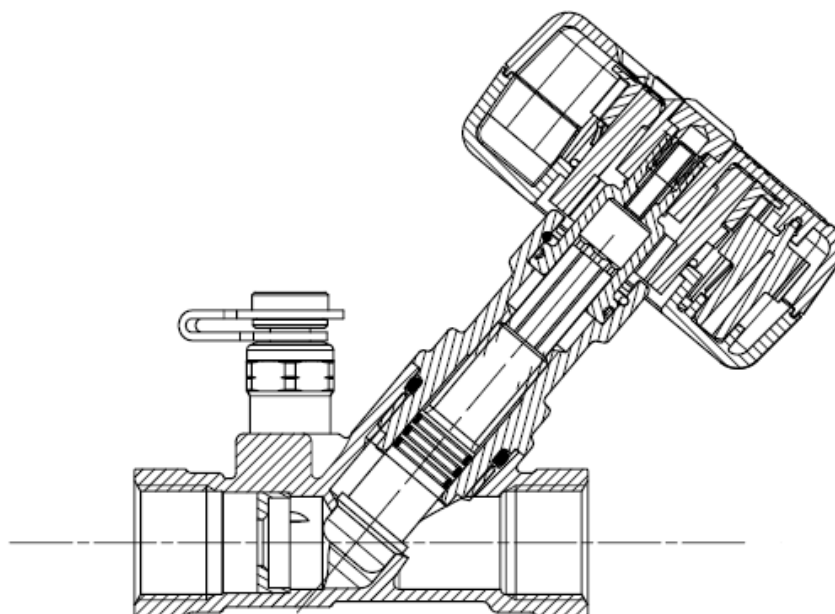


			Order number
	Test point adaptors		1 0284 00
	Test point extension 1 Set = 2 Pcs	1/4	1 0284 10
	Test points for HERZ-STRÖMAX-Circuit regulating valves (manufactured from 2004), brass version, blue cap (return) for flow computer.	1/4	1 0284 01
	Test points for HERZ-STRÖMAX-Circuit regulating valves (manufactured from 2004), brass version, red cap (flow) for flow computer.	1/4	1 0284 02
	Test points for HERZ-STRÖMAX-Circuit regulating valves BrassExtended model for insulated valves up to 40mm version, blue cap (return) for flow computer.	1/4	1 0284 11
	Test points for HERZ-STRÖMAX-Circuit regulating valves. Brass version, red cap (flow) for flow computer. Extended model for insulated valves up to 40 mm.	1/4	1 0284 12
	Test points with draining function Brass version, red cap (flow).	1/4	1 0284 22
	Test points with draining function Brass version, blue cap (return).	1/4	1 0284 21
	Test points long version with draining function, blue cap	1/4	1 0284 23
	Test points long version with draining function, red cap	1/4	1 0284 24
	Presetting marker Plastic tag for marking the presetting step. Can be mounted on the valve or pipe.		1 6517 05
	Test points with pulse pipe connection brass version, blue cap (return) for flow computer.	1/4	1 0284 03
	Test points with pulse pipe connection brass version, red cap (flow) for flow computer.	1/4	1 0284 03

Suitable actuators for 7217 V

	Order number	Supply voltage	Description	Regulation	Function	Adapter
	1 7990 32	24 V	DDC-actuating drive automatic stroke recognition	0-10 V modulating	modulating normally closed	included
	1 7990 31	24 V	DDC-actuating drive without automatic stroke recognition	0-10 V	modulating normally closed	included
	1 7708 39	230 V	HERZ-actuating drive	2-point or pulse control	normally closed	included
	1 7708 37	230 V	HERZ-actuating drive	2-point or pulse control with end switch	normally closed	included
	1 7708 31	230 V	HERZ-actuating drive	2-point or pulse control	normally open	included
	1 7711 01	230 V	HERZ-actuating drive	2-point or pulse control	normally closed	included
	1 7711 10	230 V	HERZ-actuating drive	2-point or pulse control	normally closed	included
	1 7711 11	230 V	HERZ-actuating drive	2-point or pulse control	normally open	included
	1 7711 12	24 V	HERZ-actuating drive	2-point or pulse control	normally closed	included
	1 7711 13	24 V	HERZ-actuating drive	2-point or pulse control	normally open	included

Operation and Installation Manual



4017

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1.0 General information about manual

That manual is an instruction for safe installation and maintenance. In case of difficulties, which cannot be solved by following the instructions, please contact the supplier or manufacturer.

Assembly and installation must be carried out by licensed and specially trained persons.

Damaged parts and components must be replaced with original spare parts.

For maintenance and repairs the current regional safety requirements must be followed.

All specifications and information within this document are reflecting the information available at the time of going to print and meant for informational purpose only. HERZ Armaturen reserves the right to modify and change products as well as its technical specifications and/or its function according to technological progress and requirements.

2.0 Storage and transport

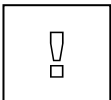
The valve is pre-assembled and delivered ex-factory.

Storage: Temperature -15° to + 60 °C

3.0 Description

3.1 Field of application

For hydraulic balancing and isolating of manifolds, risers, heat exchangers, in heating and cooling systems. The regulating valve is equipped with two test points so it is possible to measure the differential pressure by use of the proper measuring devices and to determine the flow rate accordingly.



Caution: For certain flow media special materials are required. The valves are designed for normal operating conditions.

3.2 Operation

By turning the hand wheel (right clockwise) the valve is closed.

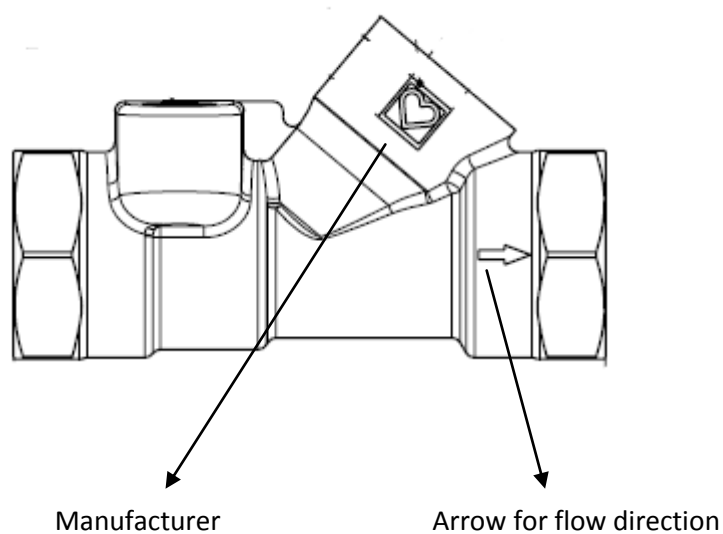
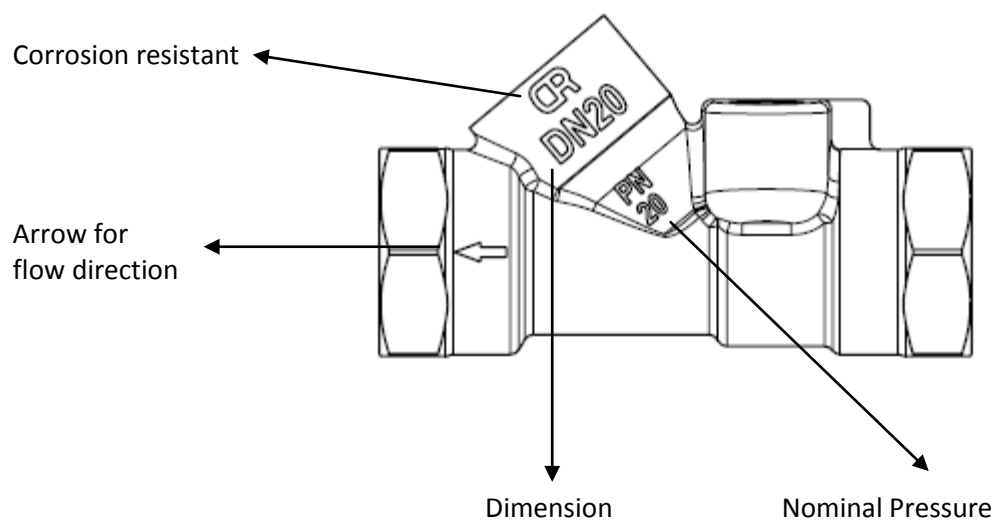
The position of the disk is indicated on the digital display. Red numbers show full turns and black numbers display 1/10 turns. The valve will be delivered in position 3.0. The hand wheel mechanics are adjusted so that the digital display indicates 0.0 if the valve is closed. The valve set position can be locked easily by means of a concealed memory stop. The valve can be isolated and returned to the preset position at any time. The presetting is obscured by the hand wheel and protected against unauthorized operation.

3.3 Technical Data

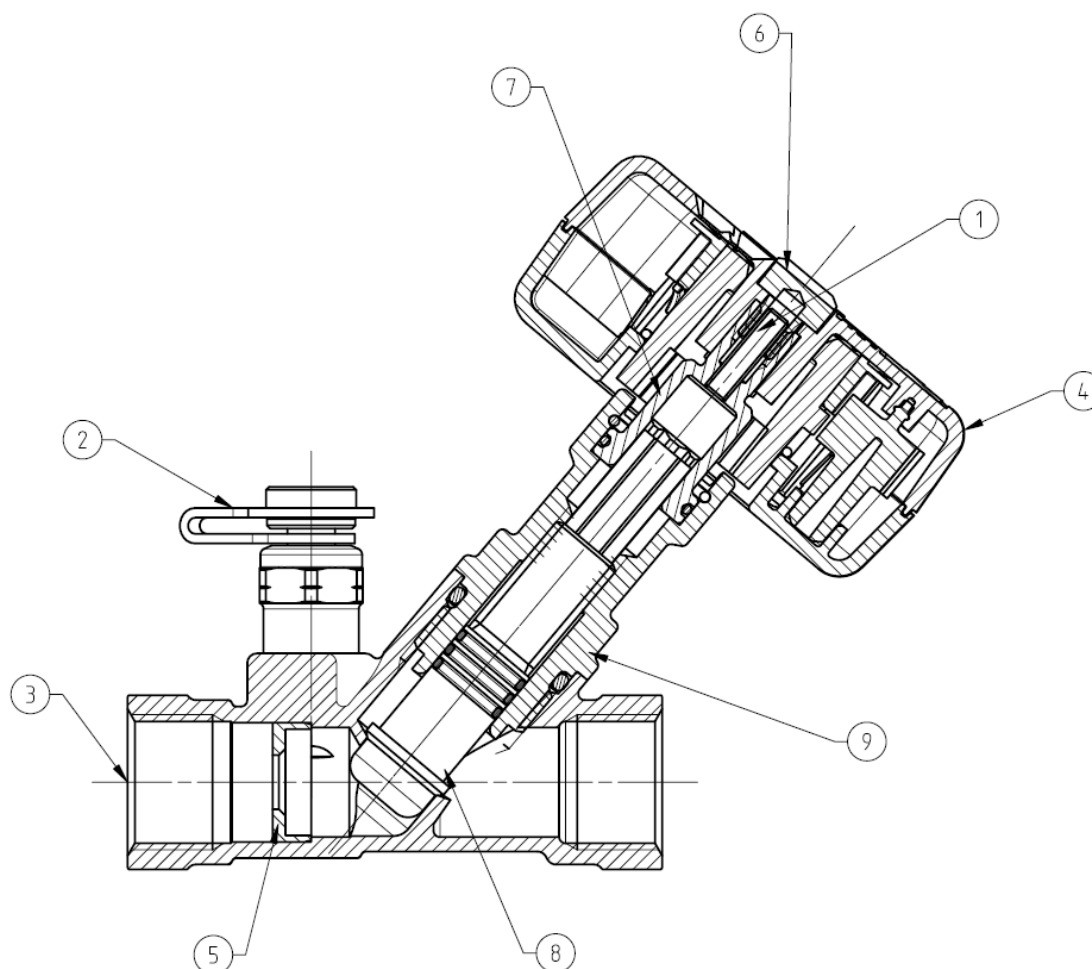
Please refer to the technical data sheet.

3.4 Marking on the body

The figure is an example. Valves of other dimensions and model may be different.



3.5 Figure



Position	Description
1	threaded pin
2	Measuring valve
3	Y-Body
4	Hand wheel
5	Orifice plate
6	Scew
7	Turn catcher
8	Spindle
9	Upper part

4.0 Mounting

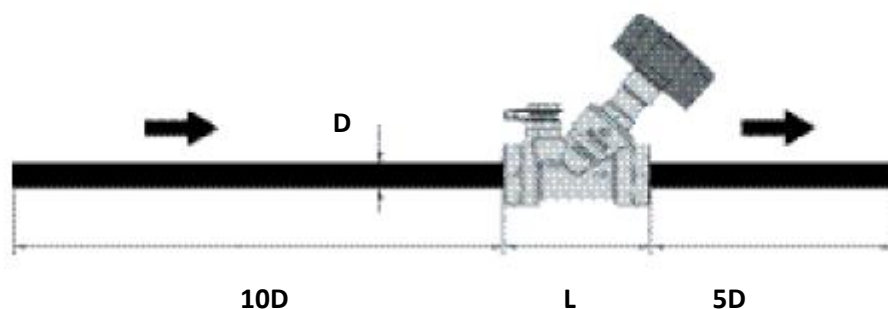
The commissioning valves can optionally be connected to a threaded pipe or used on a calibrated copper pipe compression adapter. Compression adapters must be ordered separately.

The commissioning valves can also be used in systems with plastic pipes. Plastic pipe connections are fitted to special adapters.

When installing soft steel or copper pipes with a pipe wall of 1 mm or less with compression unions, support sleeves have to be used (order no.: 1 0674 xx). When installing plastic pipes, suitable calibration tools are needed. Please refer to our instruction manual. For proper installation use silicone oil to lubricate the thread of the locking nut or olive screw as well as the olive.

By the use of HERZ-connections for copper and steel pipes the permissible temperatures and pressures according to EN 1254-2:1998 should be observed. For plastic pipes connections the maximum temperature is 80°C and maximum pressure 4 bar, as long as the pipe producer allows this.

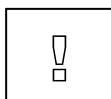
The valve can be mounted in any position. The flow direction according to the arrow marked on the valve body. It is recommended installing 10 x straight pipe diameters upstream and 5 x straight pipe diameters downstream of the valve.



Caution:

Please avoid introducing any dirt into the system when installing the valve.

Screw the pipe into the valve and with a suitable assembly tool taking care to support the valve during tightening to avoid distortion.



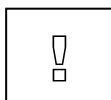
The installation of the valve should be carried out by competent trained professionals. Sealing materials should be used to seal the connection between the pipe and the valve. If space is restricted, the valve upper part can be removed during installation. When reassembling the upper part excessive tightening of the valve upper part is not necessary as the upper part is sealed with an O ring.

5.0 Commissioning

When using a differential pressure manometer, setting can be performed only on the basis of the HERZ-flow charts. A flowrate for the commissioning valve can only be set without specifying a pre-setting step if a measuring instrument is used. Follow the operating instructions when using a measuring computer.

Caution:

Before commissioning, information of the technical data sheet about material, temperature, pressure and flow direction should be checked.



The measurement valves may be opened only when an instrument is connected. If there are any leaks using hot water there is a risk of injury!

5.1 Presetting and fixing of the hand wheel

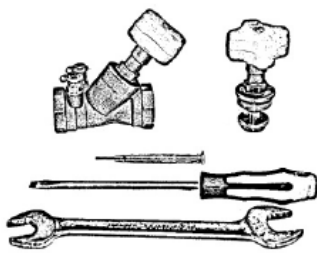
1. Set to the desired step according to calculation (digital display on the hand wheel).
2. Remove the hand wheel locking screw, do not remove the hand wheel from the valve.
3. Screw the presetting spindle, which is now accessible, in up to the stop.
4. Screw in the hand wheel locking screw again.
5. The pre-setting marker (1 6517 05) is fastened as a tag above the valve or pipe. The setting of the respective valve is marked by cutting or breaking off the teeth at the figures for full and partial turns. This permits checking and/or restoration of the original pre-setting made on the occasion of system set-up after servicing without having to rely on documentation.

Point 5 is not necessary for function, but is recommended.

6.0 Maintenance

The maintenance and service intervals are determined by the operator according to the requirements.

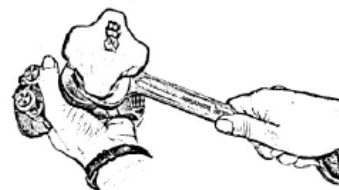
6.1 Disassembly of the upper part



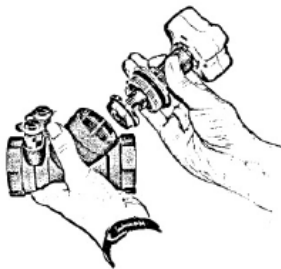
Prepare tools



Open valve



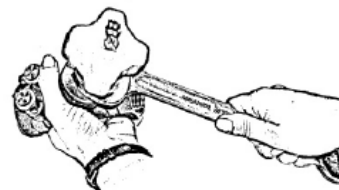
Unscrew topwork



Replace topwork



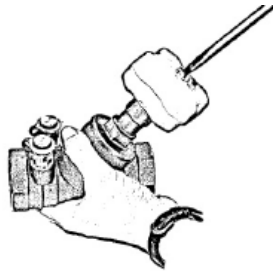
Check if new on is in position 3.0



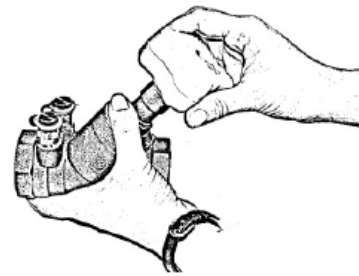
Fix new topwork



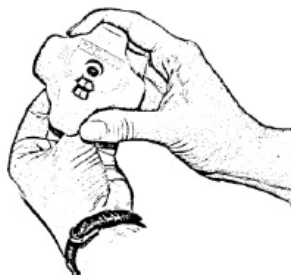
Check if it is closed on position 0.0.



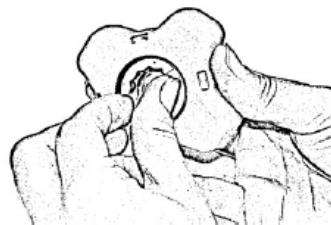
If not undo screw on top



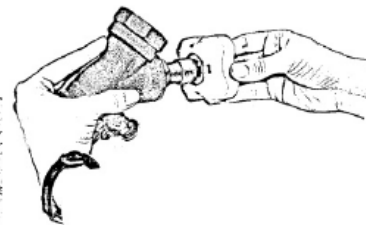
Remove hand wheel



Set counters on position 0.0.



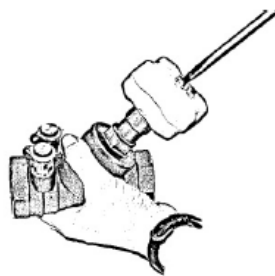
For rotation use ribs from bottom side



Put on handwheel (fit ribs of topwork into ribs of handwheel)



Open valve to required pos. and fix locking screw



Fix handwheel by screw

6.2 Disassembly of the upper part or the valve

In particular, the following points should be noted:

- No pressure in the pipe system
- medium must be cool
- emptied system

7.0 Identifying the causes in case of malfunctions

Please ensure that the installation and adjustment work has been carried out in accordance with these operating instructions.

In case of faults that cannot be corrected by the following table, please contact the supplier or manufacturer.

Problem	Reason	Solution
No flow	Valve is closed	Open valve
	Flange protection was not removed	Remove flange protection
Less flow	Valve not sufficiently open	Open valve
	Polluted strainer	Replace or clean filter
	Blockage in the pipe system	Check pipe system
Heavy operation	wrong direction of rotation	Note direction of rotation (against the clock the valve is opened)
Leaking at the spindle	Damaged upper part	Replace upper part/valve
Leakage at the valve seat	Hand wheel is not completely closed	retighten the Handwheel (without using tools)
	Seat disk is damaged by foreign objects	Replace valve
	To high differential pressure	Check pressure of the system and differential pressure, reduce pressure of the system
	polluted media (solids)	Clean valve and install strainer in front of the valve
valve cannot be opened	Stroke limitation was tighten to the spindle stop	Turn upward the stroke limitation
Display is not set to 0.0 , even the valve is completely closed	Display is not installed properly	Close valve, remove hand wheel, set display to 0.0, mount hand wheel

8.0 Warranty/Guarantee

Caution:

The content and period of warranty is specified in force at the time of delivery Edition of the "General Terms and Conditions of HERZ Armaturen GmbH" or in the sales contract itself.

For damage caused of incorrect handling or failure to comply with the instructions, data sheet and relevant regulations no guarantee claims can be asserted.

Natural wear and tear, installation of third-party products and maintenance are excluded from the warranty.

Any transport damage should be reported immediately to the competent cargo-handling or forwarding agent.