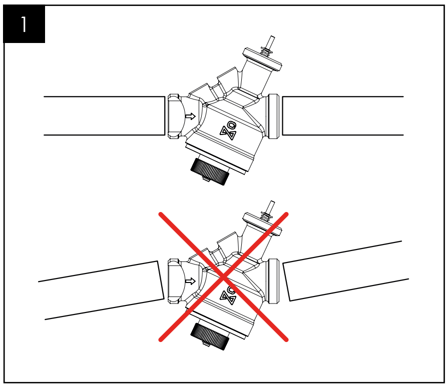
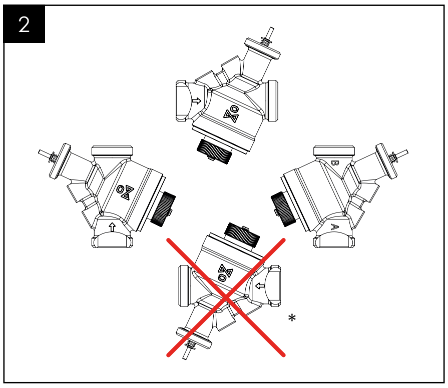
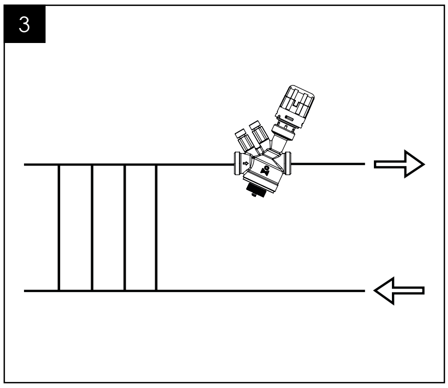
LIBRA DN15-32

Pressure Independent Control Valves

MOUNTING INSTRUCTIONS







* Position valid only coupling with MCA actuator.

⚠ **WARNING**

Media Compatibility - It is the responsibility of the installer or product specifier to verify media compatibility of the valves construction materials with the supplier of water treatment/heat transfer solution.

Best Practice Guidelines - Appropriate filter and a dirt separator shall be installed on the main branch pipework. Water treatment shall be executed according to VDI 2035 guidelines.

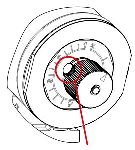
Recommendations - The pipework system should be flushed and strainers cleaned prior to the operation. Valves should be installed in the return pipe to reduce exposure to media temperature extremes. We recommend the use of sealants such as adhesive sealants for pipes or Teflon tape. When using hemp as a pipe sealant, make sure there are no threads left in the product or pipe.

Non compliance with the warnings provided in this document will invalidate the warranty.

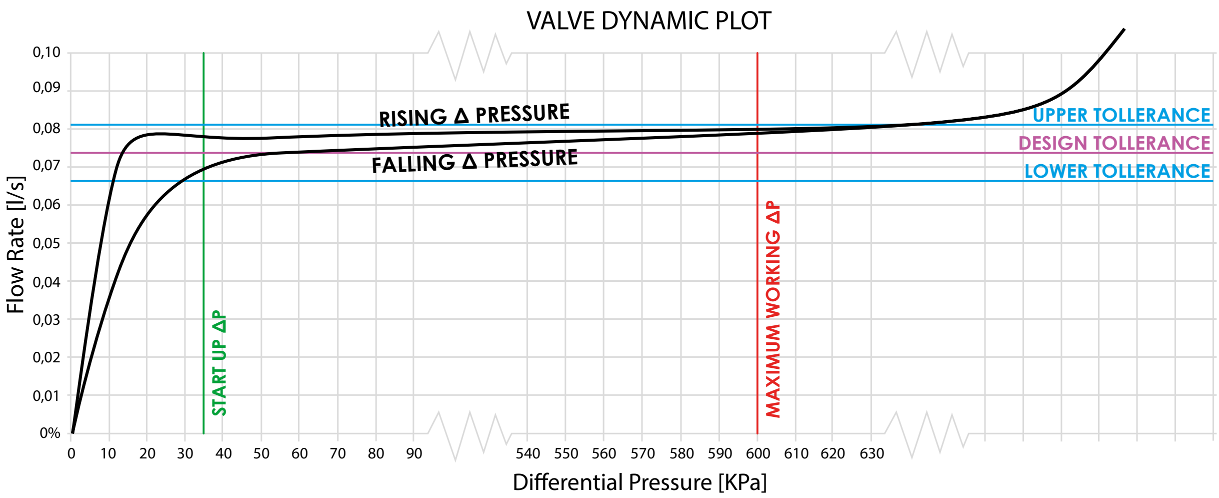
COMMISSIONING

Each LIBRA valve can be set independently and in any order provided there is sufficient pressure available to enable its integral spring-operated diaphragm to operate. Branches close to the pump are most likely to have sufficient pressure at start up and are therefore an obvious place to start. The commissioning procedure is as follows:

1. Ensure that the selected LIBRA 2 port valve is fully open. If the p/t plugs are present (VLX.P models) measure the pressure differential across its pressure tappings and confirm that the value obtained is greater than the minimum value indicated in the product brochure. If this is not the case investigate the causes and, if necessary, report to the designer.
2. Adjust pre-setting knob (caliber) to the specified design flow rate (for VLX5/VLX5P model use the locking screw to fix the position) and record the setting.
3. Repeat the above process for all of the LIBRA valves on the branch.
4. Measure the flow rate indicated at the flow measurement device on the branch. Confirm that the value recorded is equal to the sum of the flows set at downstream LIBRA valves. If this is not the case investigate the causes and, if necessary, report to the designer.
5. Repeat this procedure until all LIBRA valves in the system have been set and their summated flows checked against upstream flow measurement devices.
6. Measure the differential pressure across the LIBRA valve on the system index terminal (usually the most remote terminal from the pump). Adjust the pump speed until the pressure differential across this valve is equal to the minimum value indicated in the product brochure.
7. Determine the pressure differential at the sensor location. Usually the sensor is placed at the distance from the pump equal to 2/3 of the distence of the farthest terminal from the pump itself. Set the pump speed to control such that the value indicated at the sensor is maintained constant under all conditions.
8. Measure and record the total flow rate, pressure differential and energy consumption at the pump.
9. Run all two port valves to their closed positions. Measure and record the total flow rate, pressure differential and energy consumption at the pump. Calculate and report the overall energy saving achieved i.e. between full load and minimum load operation.



The performances stated in this sheet can be modified without any prior notice.



HYSTERESIS

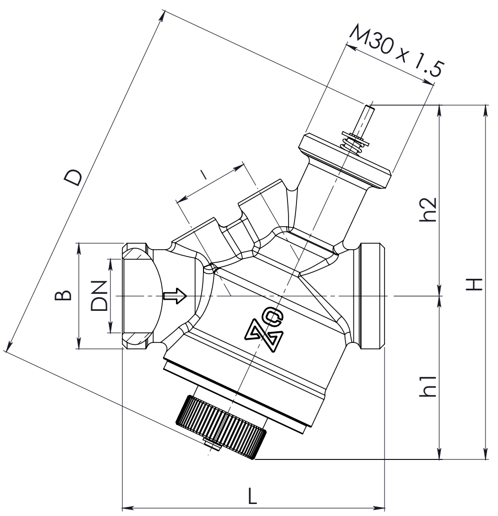
The accuracy with which the flow rate setting is maintained also depends on whether the pressure differential across the valve is rising or falling. It can be seen from the fig. 1 that there are distinct rising and falling pressure curves. The difference between the two curves is often referred to as the valve's "hysteresis". The hysteresis effect is caused by the sealing elements in the pressure regulating part of the valve, although the spring and elastic membrane may also have some influence. This hysteresis effect can be seen in all self-acting spring operated PICVs and DPCVs. Due to hysteresis, two repeatable flow readings can be obtained depending on whether the pressure differential across the valve has risen or fallen to the value when the measurement is taken. Since the valves are factory tested on their rising pressure curves, the flow setting device indicates flows that correspond to a rising rather than decreasing pressure differential. For the reasons explained, the valve's proportional band and hysteresis may cause flow values to vary from their set values. These effects can be minimised by ensuring that systems are:

- Designed such that when a PICV opens to increase the flow rate to a terminal unit, its pressure differential simultaneously increases rather than decreases.
- Commissioned such that when a PICV is set to its required flow rate, the pressure differential across the valve is as close as possible to its final operating value.

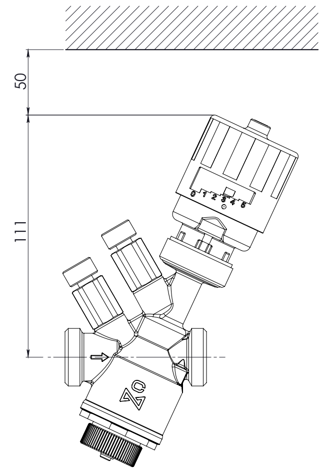
Both of these objectives can be easily achieved by ensuring that during commissioning and subsequent system operation, pump pressure always reduces as PICVs close. The best way to achieve this is to set the pump speed controller such that a constant pressure differential is maintained at a differential pressure sensor located towards the index PICV i.e. the PICV located furthest from the pump.
A single sensor located two thirds of the way along the index branch is satisfactory in systems with a uniform load pattern; alternatively multiple sensors across the most remote PICV controlled terminal branches can be used in systems with an unpredictable and varying load pattern. Controlling pump speed such that pump pressure is maintained constant should be avoided wherever possible. This solution inevitably results in large increases in pressure differential across PICVs as they close, resulting in the largest possible variations from set flow rate values, much better than standard two ports.

DIMENSIONS [mm]

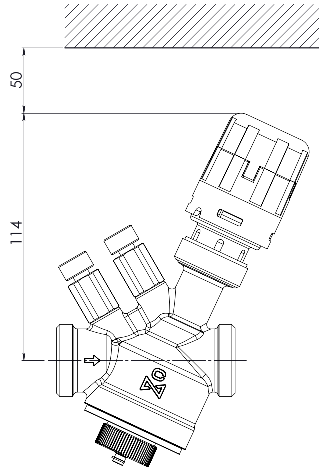
Cod.	DN	B	L	H	h1	h2	D	I	Weight [kg]	
									Without P/T PLUGS	With P/T PLUGS
VLX1	15	1/2"	65	108	50	58	115	24	0,343	0,404
VLX2	15	3/4"	65	108	50	58	115	24	0,343	0,404
VLX3	20	1"	82	111	51	60	117	24	0,543	0,604
VLX4	25	1 ¼"	95	129	68	61	138	27	0,966	1,027
VLX5	32	1 ½"	117	139	73	66	148	27	1,332	1,393



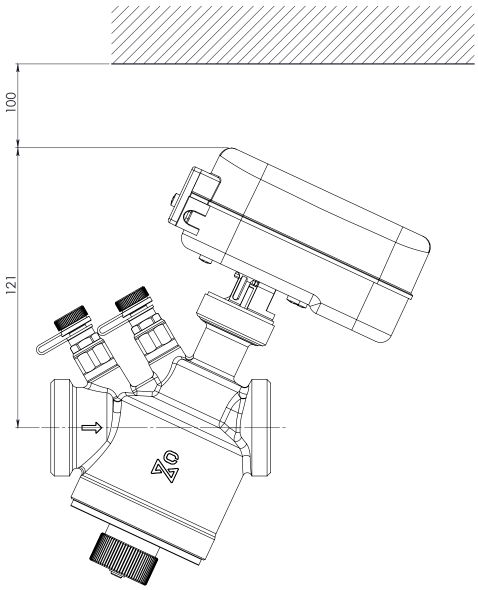
DN15 + MCA



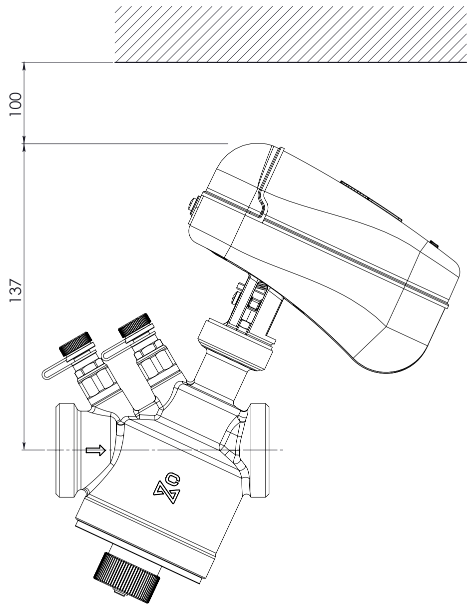
DN20 + MVX52B



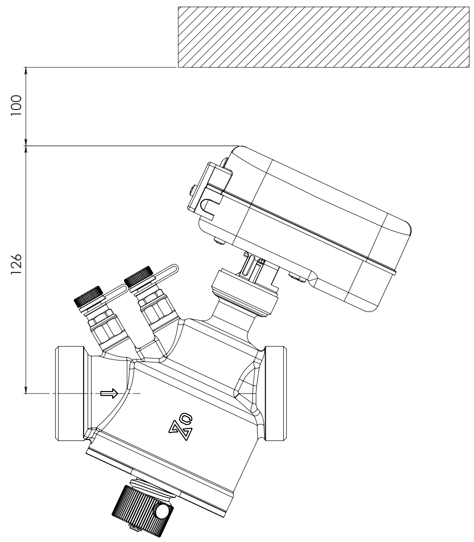
DN25 + MVT203S/MVT403S/MVT503SB



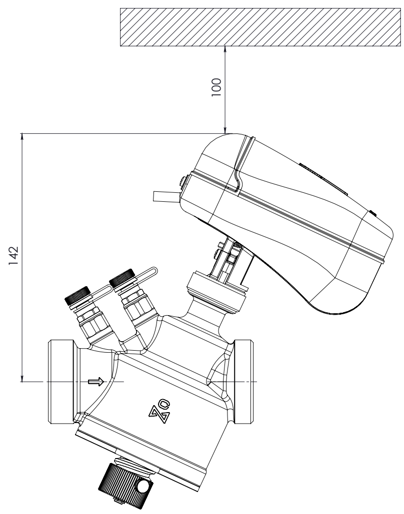
DN25 + MVC503R

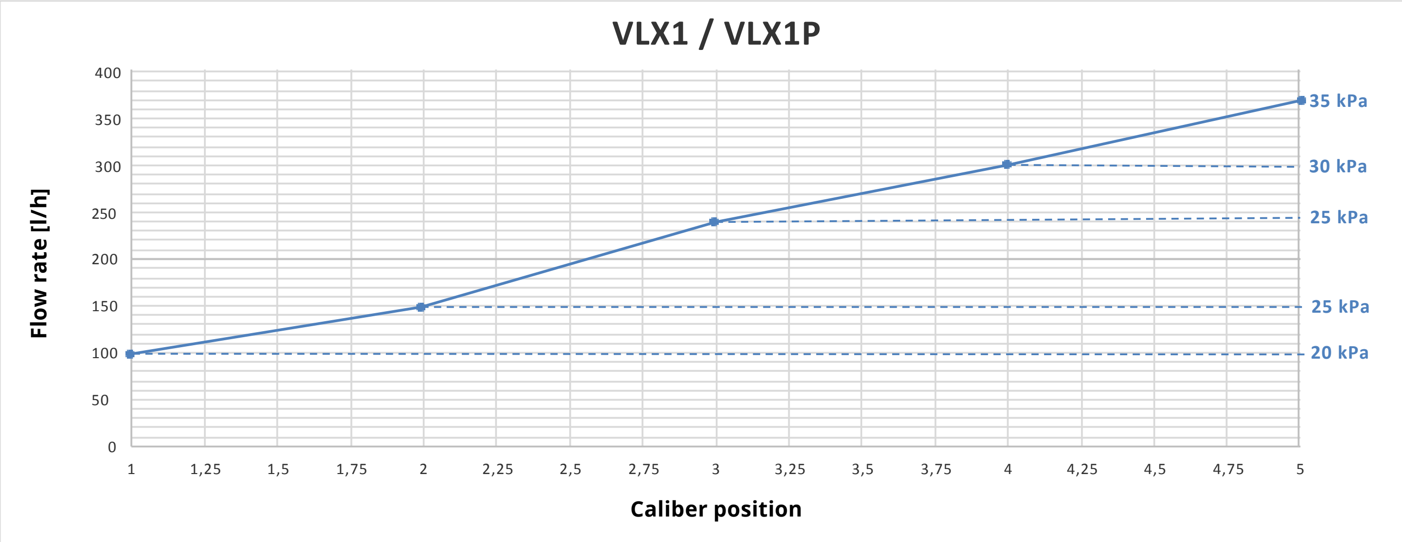


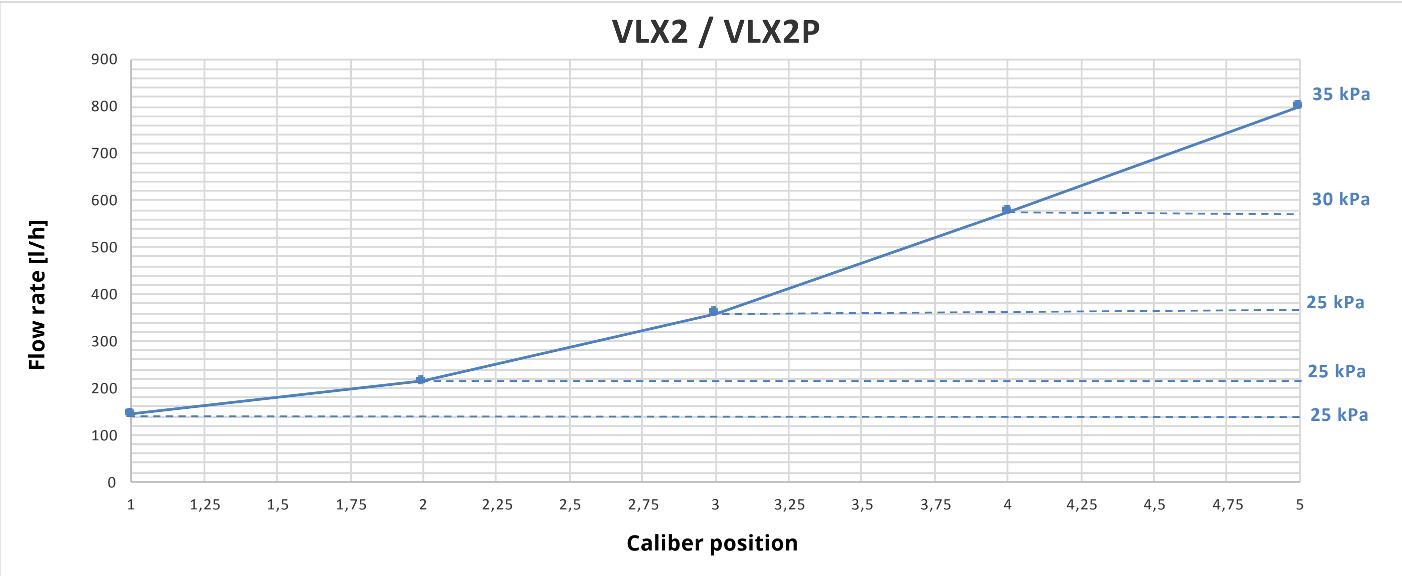
DN32 + MVT203S/MVT403S/MVT503SB

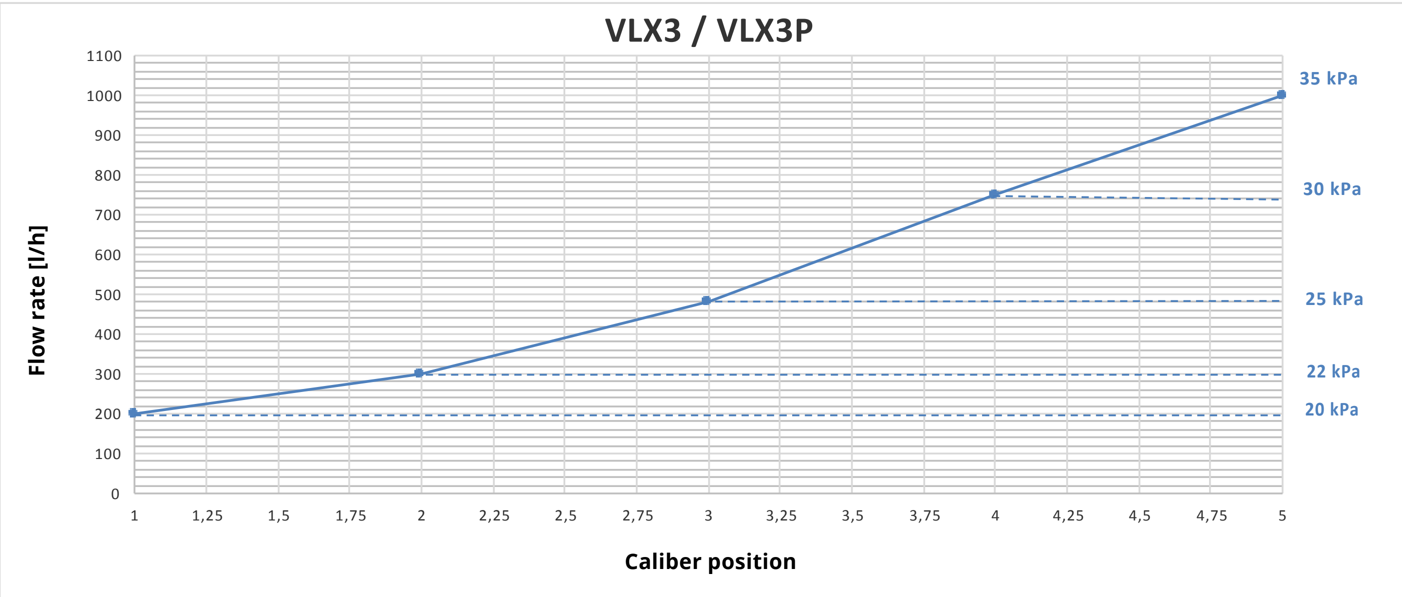


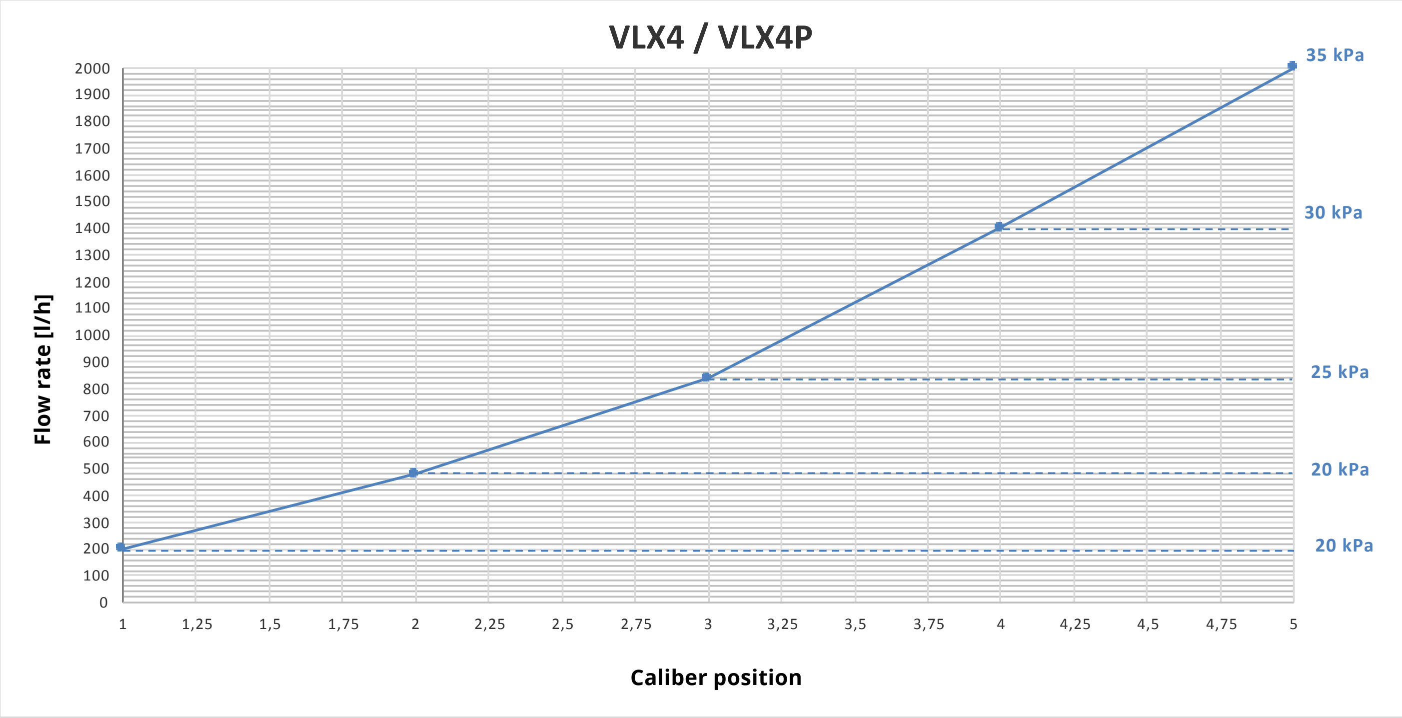
DN32 + MVC503R



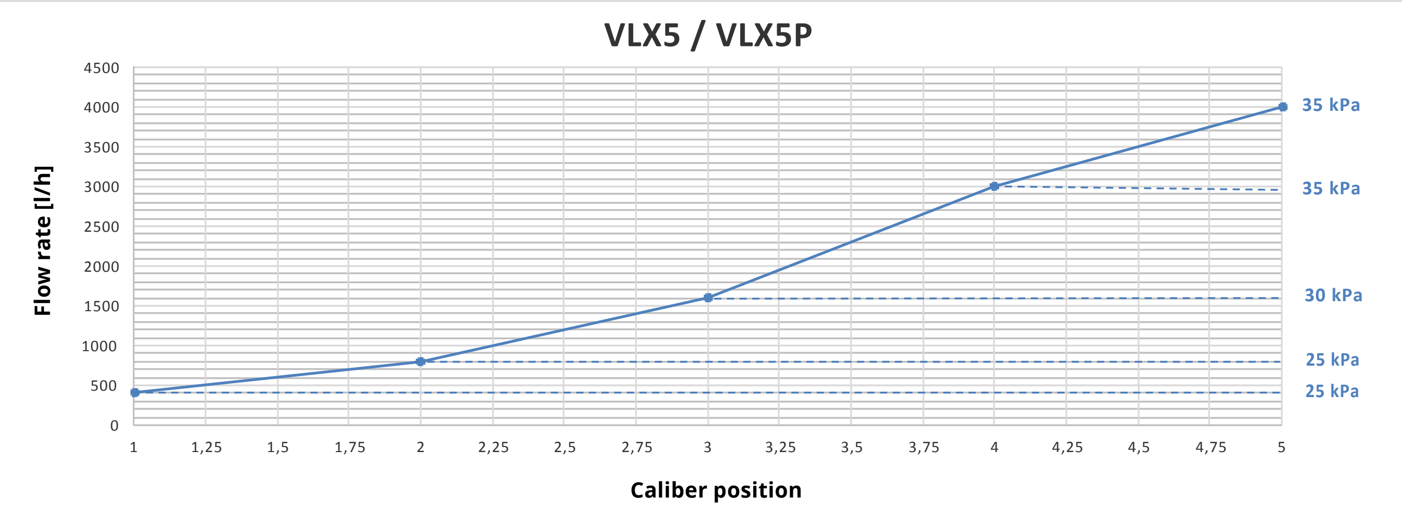

VLX1 / VLX1P
Flow rate [l/h]
0
50
100
150
200
250
300
350
400
1
1,25
1,5
1,75
2
2,25
2,5
2,75
3
3,25
3,5
3,75
4
4,25
4,5
4,75
5
Caliber position
35 kPa
30 kPa
25 kPa
25 kPa
20 kPa


VLX2 / VLX2P
Flow rate [l/h]
0
100
200
300
400
500
600
700
800
900
1
1,25
1,5
1,75
2
2,25
2,5
2,75
3
3,25
3,5
3,75
4
4,25
4,5
4,75
5
Caliber position
35 kPa
30 kPa
25 kPa
25 kPa
25 kPa


VLX3 / VLX3P
Flow rate [l/h]
0
100
200
300
400
500
600
700
800
900
1000
1100
1
1,25
1,5
1,75
2
2,25
2,5
2,75
3
3,25
3,5
3,75
4
4,25
4,5
4,75
5
Caliber position
35 kPa
30 kPa
25 kPa
22 kPa
20 kPa



VLX4 / VLX4P
Flow rate [l/h]
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
1
1,25
1,5
1,75
2
2,25
2,5
2,75
3
3,25
3,5
3,75
4
4,25
4,5
4,75
5
Caliber position
35 kPa
30 kPa
25 kPa
20 kPa
20 kPa



VLX5 / VLX5P
Flow rate [l/h]
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1
1,25
1,5
1,75
2
2,25
2,5
2,75
3
3,25
3,5
3,75
4
4,25
4,5
4,75
5
Caliber position
35 kPa
35 kPa
30 kPa
25 kPa
25 kPa

TABLE FLOW RATE - CALIBRATION

Caliber Position	Flow Rate [l/h]				
	VLX1 / VLX1P	VLX2 / VLX2P	VLX3 / VLX3P	VLX4 / VLX4P	VLX5 / VLX5P
5	**375**	**800**	**1000**	**2000**	**4000**
4,75	356	744	938	1850	3750
4,5	338	688	875	1700	3500
4,25	319	631	813	1550	3250
4	**300**	**575**	**750**	**1400**	**3000**
3,75	285	521	683	1260	2650
3,5	270	468	615	1120	2300
3,25	255	414	548	980	1950
3	**240**	**360**	**480**	**840**	**1600**
2,75	218	324	435	750	1400
2,5	195	288	390	660	1200
2,25	173	251	345	570	1000
2	**150**	**215**	**300**	**480**	**800**
1,75	138	198	275	410	700
1,5	125	180	250	340	600
1,25	113	163	225	270	500
1	**100**	**145**	**200**	**200**	**400**