

## Differential Pressure Control Valve

***NexusValve***  
*Passim*





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# 1. Safety instructions

## **Please read the instructions carefully before installation**

The installation and initial operation of the assembly may be carried out only by an authorised specialist company.

Prior to starting work, familiarise yourself with all parts and how they are handled.

The application examples in these operating instructions are ideas sketched out. Local laws and regulations have to be observed.

## **Target group:**

**These instructions are intended for authorised specialists exclusively.** Work on the heating system, the potable water as well as gas and power network may be carried out by specialists only.



**Please follow these safety instructions carefully in order to avoid hazards and damage to people and property.**

## **1.1 Rules/regulations**

Please observe the applicable accident prevention regulations, the environmental legislation and the legal rules for mounting, installation and operation. Moreover, please observe the appropriate guidelines of German standard DIN, EN, DVGW, VDI and VDE (including lightning protection) as well as all current relevant country-specific standards, laws and regulations. Old and newly enforced regulations and standards shall apply, if they are relevant for the individual case. Moreover, the regulations of your local energy supply company have to be observed.

## **Electrical connection:**

**Electrical wiring work may be carried out by qualified electricians only. The VDE regulations and the specifications of the relevant energy supply company have to be met.**

## **Excerpt:**

### **Installation and construction of heat generators as well as the drinking water heaters:**

DIN EN 4753, Part 1: Water heater and water heating plants for potable and process water.

DIN EN 12828 Heating systems in buildings.

Allowed medium (cf. DIN EN 12828): Heating water according to VDI 2035 (non-corrosive), water-glycol mixtures with up to max. 50% glycol content.

DIN 18 421: Insulation work on technical plants

AV B Wa s V Regulations concerning the general conditions for the supply with water

DIN EN 806 ff.: Technical rules for potable water installation

DIN 1988 ff.: Technical rules for potable water installation (national addition)

DIN EN 1717: Protection of potable water against contaminations

DIN 4751: Safety equipment

## **Electrical connection:**

VDE 0100: Erection of electrical equipment, grounding, protective conductor, potential equalisation conductor.

VDE 0701: Repair, modification and testing of electrical devices.

VDE 0185: General aspects on the erection of lightning protection systems.

VDE 0190: Main potential equalisation of electrical plants.

VDE 0855: Installation of antenna plants (shall apply mutatis mutandis).

**Additional remarks:**

VDI 6002 Sheet 1: General principles, system technology and use in house building

VDI 6002, Sheet 2: Use in students' hostels, retirement homes, hospitals, indoor swimming pools and on camping facilities

**Caution:**

**Prior to any electrical wiring work on pumps and controls, these modules have to be disconnected from voltage correctly.**

## 1.2 Intended use

Inexpert installation as well as use for a purpose not intended of the assembly shall rule out all warranty claims.

All shut-off valves may be closed by an approved specialist only in case of servicing as otherwise the safety valves are not effective.



**Do not modify the electrical components, the construction or the hydraulic components! You will impair the safe function of the plant otherwise.**

## 1.3 Initial operation

Prior to the initial operation, the plant has to be tested for tightness, correct hydraulic connection as well as accurate and correct electrical connection. In addition, the plant has to be flushed correctly and/as required in keeping with German standard DIN 4753. The initial operation has to be carried out by a trained specialist, which has to be recorded in writing. In addition, the settings have to be put down in writing. The technical documentation has to be available at the device.

## 1.4 Working on the system

**The plant has to be de-energised and to be checked for the absence of voltage (such as on the separate fuse or a master switch). Secure the plant against unintentional restart.**

(If gas is used as fuel, close the gas shut-off valve and secure against unintentional opening.) Repair work on component parts with a safety-relevant function is impermissible.

## 1.5 Liability

We reserve all copyrights for this document. Wrongful use, in particular reproduction and forwarding to third parties shall not be permitted.

These installation and operating instructions shall have to be handed to the customer. The executing and/or authorised tradesperson (such as fitter) shall have to explain the function and operation of the plant to the customer in an intelligible manner.

## 2. Introduction



### 2.1 Description

#### **DN 15-80**

The NexusValve Passim is a differential pressure control valve used in hydronic heating or cooling systems. By ensuring a constant differential pressure across motorized or static balancing valves, the NexusValve Passim valve provides the conditions necessary to achieve the desired flow distribution in a system. The NexusValve Passim valve eliminates also noise nuisance caused by high differential pressure across radiator thermostats, two-way control valves or other components in a system.

## 2.2 Benefits

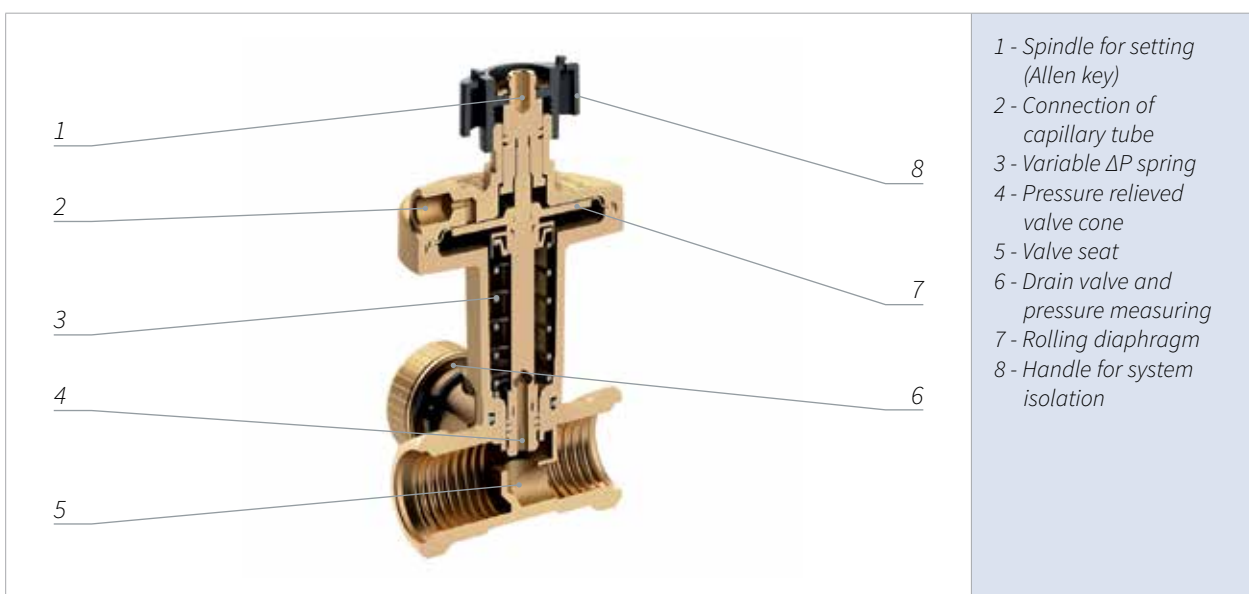
- Wide setting range for different applications: 5-25 kPa, 20-40 kPa, 20-65 kPa, 35-75 kPa, 60-100 kPa
- Ensures correct balance regardless of pressure fluctuations in the system
- Eliminates noise problems
- Shut-off and draining functions (DN 15-50 valves)
- Can be installed directly onto bends and reducers
- Compact design ensures flexible installation
- Robust construction, pressure class PN25 (PN16)
- Accurate and easy setting of designed flow in combination with NexusValve Fluctus or NexusValve Vertex
- Possible to do project handovers in stages due to zone balancing
- Partial close-downs can be done easily without influencing other parts of the system
- Easy commissioning saves time and money
- No overflows, no unnecessary energy consumption, better thermal comfort
- Spring housing dismounted making installation in restricted spaces or onto compact units easier (DN 65-80 valves)

## 2. Introduction

### 2.3 Design

#### DN 15-50

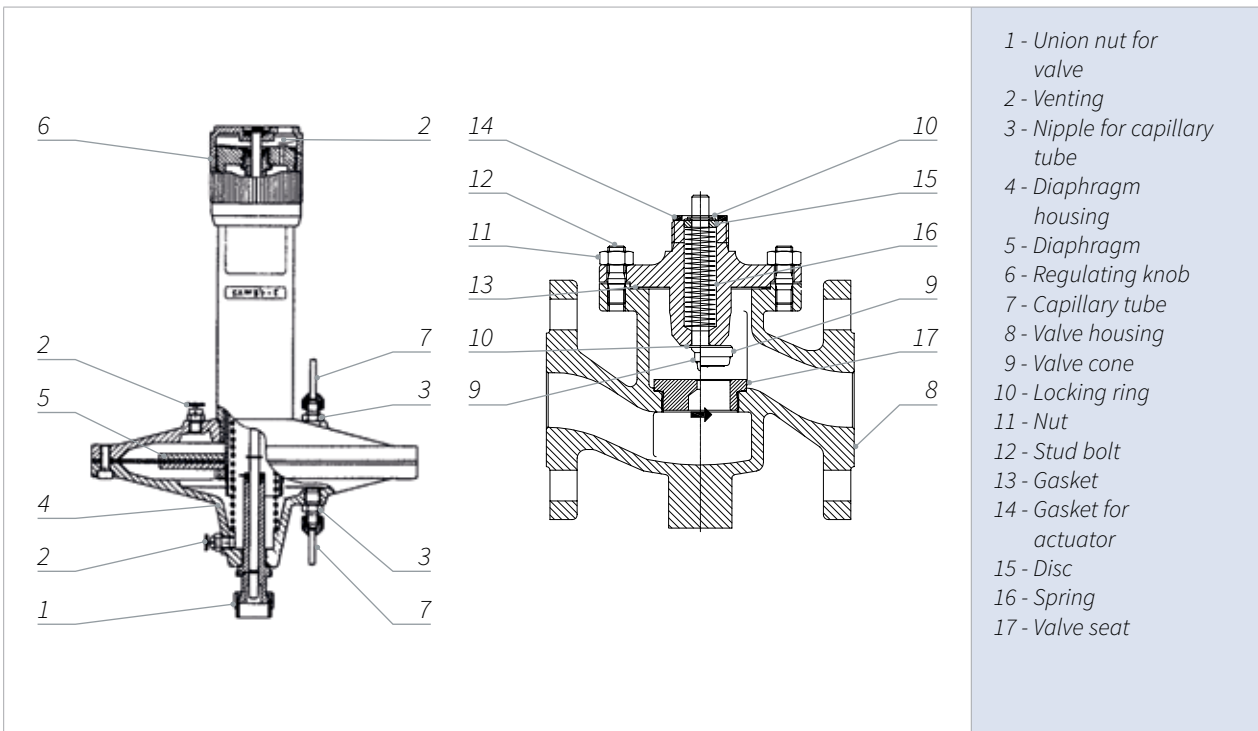
The NexusValve Passim is installed in the return line. The supply line pressure is channeled above the diaphragm of the NexusValve Passim valve through a capillary tube, connected to a partner valve like the NexusValve Fluctus, NexusValve Vertex or in some instances just to a T-piece in the system. When system pressure increases, it also increases above the internal diaphragm of the NexusValve Passim, forcing the spindle downwards and thereby closing the valve gradually. As a result a constant pressure drop is obtained across the circuit controlled by the NexusValve Passim.





**DN 65-80**

The NexusValve Passim is installed either in the supply or the return line. The supply line pressure is channeled above the diaphragm and the return line pressure under the diaphragm, through capillary tubes. One capillary tube can be connected to a partner valve like the NexusValve Fluctus or to a T-piece in the system, and the other capillary tube to the flange of the NexusValve Passim valve. When system pressure increases, it also increases above the internal diaphragm of the NexusValve Passim, forcing the cone downwards and thereby closing the valve gradually. The result is a constant pressure drop obtained across the circuit controlled by the NexusValve Passim. Without the actuator the valve is held in an open position by means of a spring. With force applied on the spindle, the valve will close.



## 2. Introduction

### 2.4 Pressure balancing

#### DN 15-50

The NexusValve Passim is provided with a selection of actuators for different pressure ranges. Depending on the actuator type the NexusValve Passim is factory pre-set at:

- 10 kPa - actuator 5-25 kPa for NexusValve Passim DN 15 - 50
- 30 kPa - actuator 20-40 kPa for NexusValve Passim DN 15 - 50
- 40 kPa - actuator 20-65 kPa for NexusValve Passim DN 15 - 32
- 60 kPa - actuator 35-75 kPa for NexusValve Passim DN 40 - 50
- 80 kPa - actuator 60-100 kPa for NexusValve Passim DN 50



By using an Allen key any setting within the differential pressure range can be provided. The flow is isolated by rotating the black handle.



The maximum permissible operating torque for setting the differential pressure is 3 Nm!

**DN 65-80**

The NexusValve Passim is provided with a selection of actuators for different pressure ranges. Depending on the actuator type the NexusValve Passim is factory pre-set at:

- 50 kPa - actuator 20-80 kPa for NexusValve Passim DN 65 - 80
- 100 kPa - actuator 70-130 kPa for NexusValve Passim DN 65 - 80



By rotating the regulating knob any setting within the differential pressure range can be provided.

## 2. Introduction

### 2.5 With partner valve

#### DN 15-50

The NexusValve Passim can be used in combination with the NexusValve Vertex with drain, as a partner valve. In this case the capillary tube is connected to the NexusValve Vertex valve installed in the supply line. The pre-setting of the differential pressure is set by use of an Allen key in the NexusValve Passim valve and the design flow is then set on the NexusValve Vertex valve. When the capillary tube is connected to the drain valve on the P/T port with the greater measured pressure, the NexusValve Vertex valve is inside the circuit controlled by the NexusValve Passim valve. In this case the pressure loss across the NexusValve Vertex valve must be added to the pressure loss in the controlled circuit and needs to be taken into account when setting the NexusValve Passim. When the capillary tube is connected to the drain valve on the P/T port with the lower measured pressure, the NexusValve Vertex valve is outside the circuit controlled by the NexusValve Passim valve.



The NexusValve Passim valve can also be used in combination with the NexusValve Fluctus with drain, as a partner valve. In this case the capillary tube is connected to the NexusValve Fluctus installed in the supply line. The pre-setting of the differential pressure is made as mentioned above, while the design flow can be easily and precisely set when measuring the direct flow – utilising the unique measuring feature of the NexusValve Fluctus. When the NexusValve Fluctus is used as a partner valve it is always in the circuit controlled by the NexusValve Passim valve. The pressure loss across the NexusValve Fluctus must therefore be added to the pressure loss in the controlled circuit and needs to be taken into account when setting the NexusValve Passim valve. The NexusValve Passim can also be installed in combination with the NexusValve Relax with drain to maintain constant differential pressure, service the controlled part of the system and measure the flow.

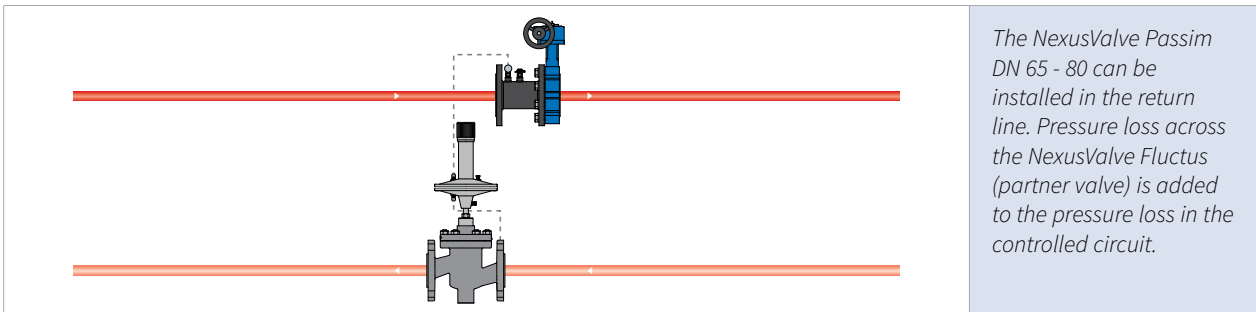


**DN 65-80**

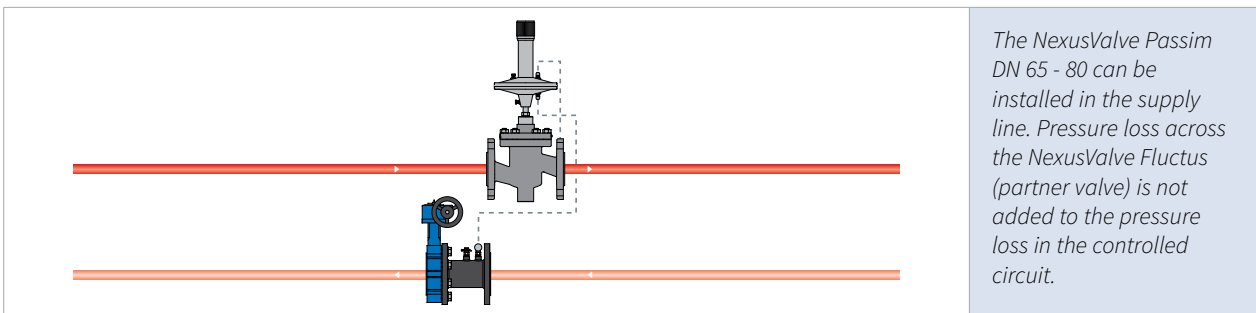
NexusValve Passim can be used in combination with a NexusValve Fluctus with drain, as a partner valve. In this case one capillary tube is connected to the NexusValve Fluctus and the other capillary tube to the flange of the NexusValve Passim. The pre-setting of the differential pressure is set by use of the regulating knob on the NexusValve Passim valve and the design flow is then set on the NexusValve Fluctus valve.



When the NexusValve Fluctus is used as a partner valve and installed in the supply line, it is within the circuit controlled by the NexusValve Passim. In this case the pressure loss across the NexusValve Fluctus valve adds to the pressure loss in the controlled circuit and needs to be taken into account when setting the NexusValve Passim valve.



When the NexusValve Fluctus is used as a partner valve and installed in the return line, it is outside the circuit controlled by the NexusValve Passim. Consequently its pressure loss is not taken into account when setting the NexusValve Passim.

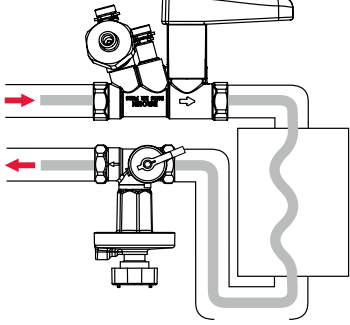
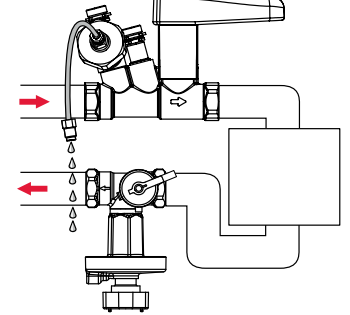
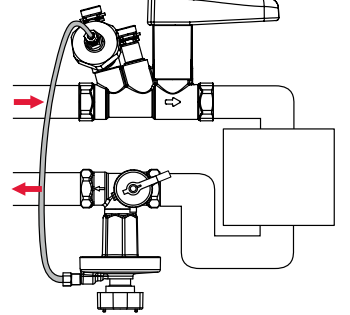
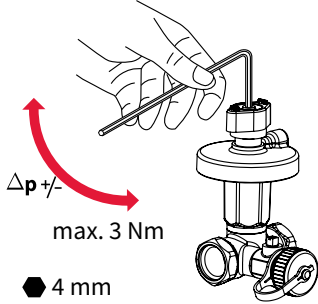


## 2. Introduction

### 2.6 Mounting

#### 2.6.1 Mounting Instructions DN15 - 50

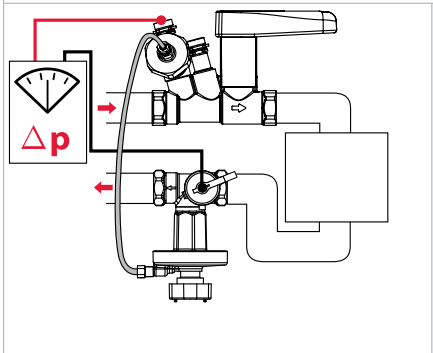
	<p>An arrow on the NexusValve Passim DN15-50 valve housing indicates the flow direction to be respected.</p> <p>The NexusValve Passim valve must always be installed in the return line..</p>
	<p>Loose hems must not hang into the pipe.</p>
	<p>Deburring of pipe ends is required to prevent system clogging.</p>
	<p>Recommendation for the installation situation of a partner valve NexusValve Fluctus:</p> <ul style="list-style-type: none"> <li>- position of the measuring connections preferably upwards</li> <li>- also possible position of the measuring connections +/- 70 ° rotated (in horizontal position).</li> </ul> <p>The positioning of the NexusValve Passim is possible in all directions (360° around the pipe axis).</p>
	<p>No straight piping is required before and after the NexusValve Fluctus (as partner-valve) and NexusValve Passim valves. The valves can be installed directly on bends and flexible hoses, etc.</p>
	<p>When the NexusValve Vertex is used as a partner valve 5 × DN straight piping is required when the valve is mounted directly after a bend and 2 × DN straight piping when the valve is mounted directly before a bend.</p> <p>No straight piping is required before and after the NexusValve Passim.</p>

	<p>System flushing is to be done before the capillary tube is mounted.</p>
	<p>The capillary tube is connected onto the NexusValve partner valve (or a T-piece) on the supply side. It has to be flushed to ensure that there is no air left.</p>
	<p>The capillary tube is then mounted onto the NexusValve Passim and thus the differential pressure controller is active.</p>
	<p>The setting of the differential pressure is done by using an Allen key and counting the number of complete turns. The turns are to be performed clockwise, from the first (pre-set) position of:</p> <ul style="list-style-type: none"> <li>5.0 kPa for NexusValve Passim 5-25 kPa,</li> <li>20 kPa for NexusValve Passim 20-40 kPa</li> <li>20 kPa for NexusValve Passim 20-65 kPa</li> <li>35 kPa for NexusValve Passim 35-75 kPa</li> <li>60 kPa for NexusValve Passim 60-100 kPa</li> </ul> <p>The setting tables indicate how many turns of the (4 mm) Allen key are required to achieve the desired NexusValve Passim setting. No more turns than stated in the tables must be performed counting from the first position.</p> <p>The maximum permissible operating torque for setting the differential pressure is 3 Nm!</p>

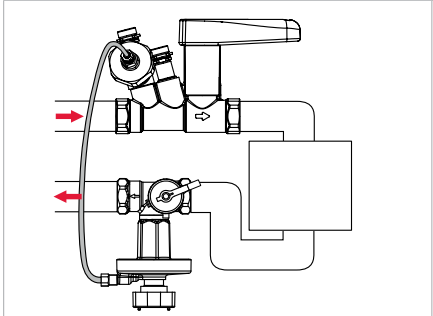


Isolation of the system flow by means of the NexusValve Passim is done by turning the black handle clockwise until the valve is fully closed. To avoid damaging the differential pressure controller during isolation the pressure drop across the valve should never exceed 250 kPa. An alternative is to dismount the capillary tube on one side before isolating the valve to protect the differential pressure controller. When valves are shut off, the secondary side of the system can be drained through the 3/4" externally threaded drain valve on the NexusValve Passim. The end cap needs to be removed, hose attached and the ball valve opened to enable draining.

It is essential to ensure that the presetting is only activated when the NexusValve Passim is open. This is achieved by the fact that the consumer is open and the NexusValve Passim is not closed via the shut-off function. This is the only way to guarantee a perfect presetting function and avoid damage to the differential pressure regulator.

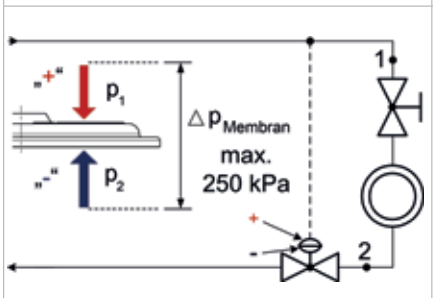


When using a flowmeter the differential pressure across the riser or zone can be determined. After connecting the flowmeter to the high pressure port on the NexusValve Fluctus (or the NexusValve Vertex) and to the drain valve of the NexusValve Passim, the manometer will display the pressure drop across the riser and the partner valve. When a NexusValve Fluctus is used as a partner valve, its pressure drop is always included in the circuit controlled by the NexusValve Passim valve. When using a NexusValve Vertex as a partner valve, it is important to check if the pressure drop across the valve is included in the circuit controlled by the NexusValve Passim valve or not (this depends into which of the two NexusValve Vertex measuring points the flowmeter needle is inserted).



When the system is pressure tested, the capillary tube must be connected and all valves in the circuit after the NexusValve Passim valve opened. This is required to secure the same static pressure on both sides of the diaphragm in order to avoid damaging the differential pressure controller.

Maximum test pressure is 25 bar.

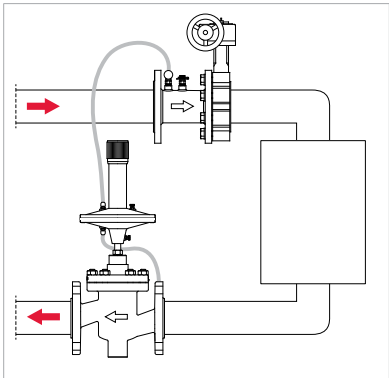
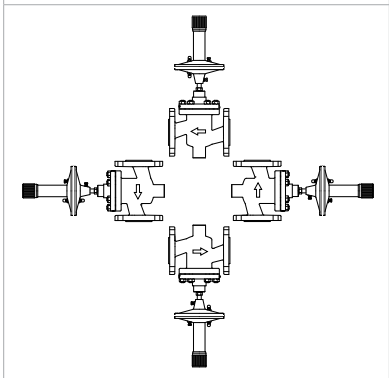
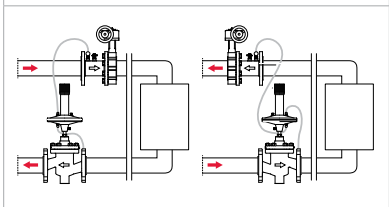
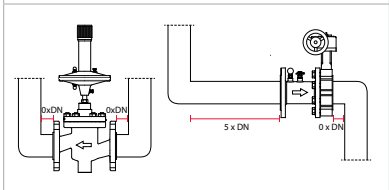
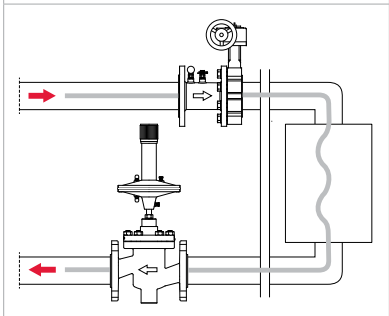


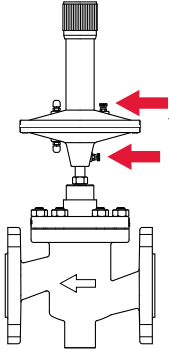
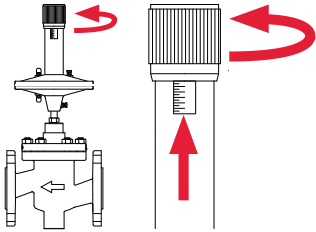
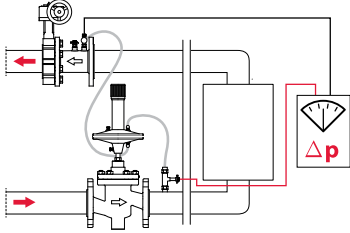
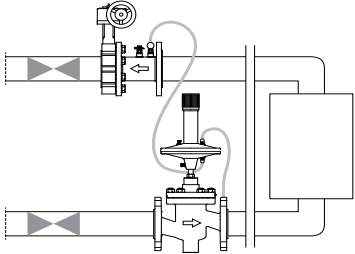
The maximum permissible differential pressure between the upper side of the membrane („+“) and the lower side of the membrane („-“) of the NexusValve Passim is 250 kPa. A possible pressure drop in the system circuit, e.g. due to cooling down when the heating circuit is closed, must be taken into account. In practice, an approximate value of approx. 10 kPa / K can be assumed for this.

If the maximum permissible differential pressure across the membrane is exceeded, the NexusValve Passim may malfunction. Valves that close tightly against high differential pressures and electric motor drives in the system circuit can promote this malfunction.



## 2.6.2 Mounting Instructions DN65 - 80

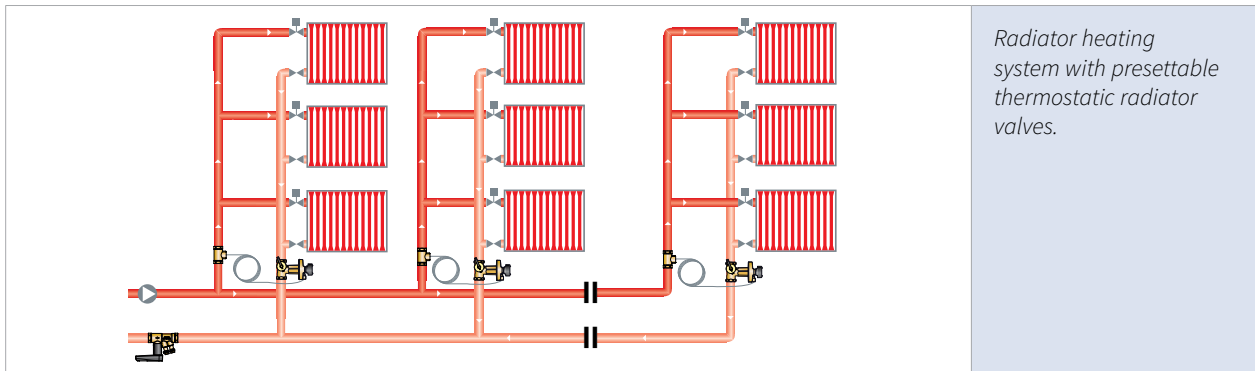
	<p>An arrow on the NexusValve valve housing indicates the flow direction to be respected. The NexusValve Passim can be installed in any position in the return or in the supply line.</p>
	<p>The NexusValve Passim can be installed in any position.</p>
	<p>Das NexusValve Passim kann entweder im Rück- oder im Vorlauf installiert werden.</p>
	<p>No straight piping is required before and after the NexusValve Passim. No straight piping is required before and after the NexusValve Passim. It can be installed directly on bends and flexible hoses, etc.</p>
	<p>System flushing and pressure testing is to be done before the actuator and the capillary tubes are mounted. The NexusValve Passim is normally open when the actuator is not mounted.</p> <p>Maximum system pressure is 16 bar.</p>

	<p>After the installation of the actuator and the capillary tubes, the diaphragm chamber has to be vented by bleeding through the vent plugs.</p>
	<p>The setting of the differential pressure is done by turning the regulating knob. The edge of the knob indicates the required differential pressure on the actuator scale.</p>
	<p>When using a flowmeter the differential pressure across the riser or zone can be determined. After connecting the flowmeter to the high pressure port on the partner valve (NexusValve Fluctus) and to the, provided as an accessory, drain valve installed in a T-piece, the flowmeter will display the pressure drop in the controlled circuit.</p>
	<p>The NexusValve Passim valve does not incorporate a shut off function. It is recommended to install isolation valves to be able to service the controlled circuit.</p>

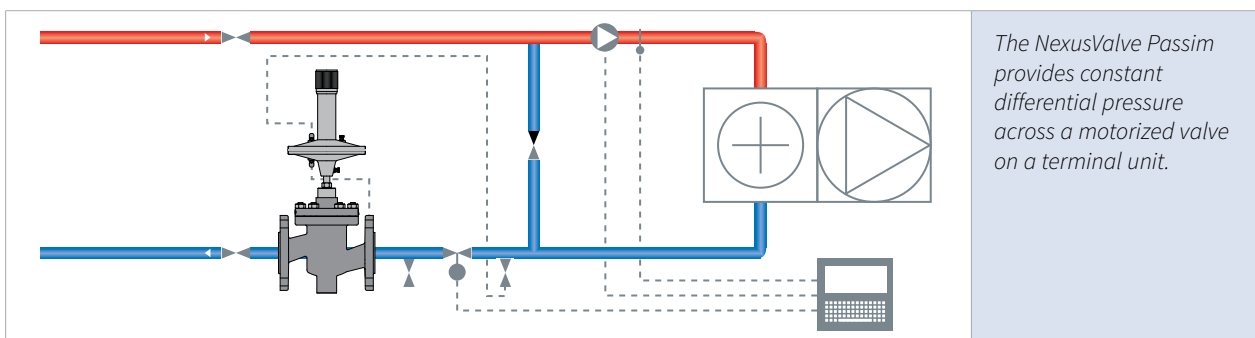
## 2. Introduction

### 2.7 Operation

Depending on the application, the NexusValve Passim can either be used as a zone valve placed in risers or branches controlling a constant pressure difference across multiple terminal units, or as a terminal unit valve ensuring the required pressure drop across each terminal unit at all loads.

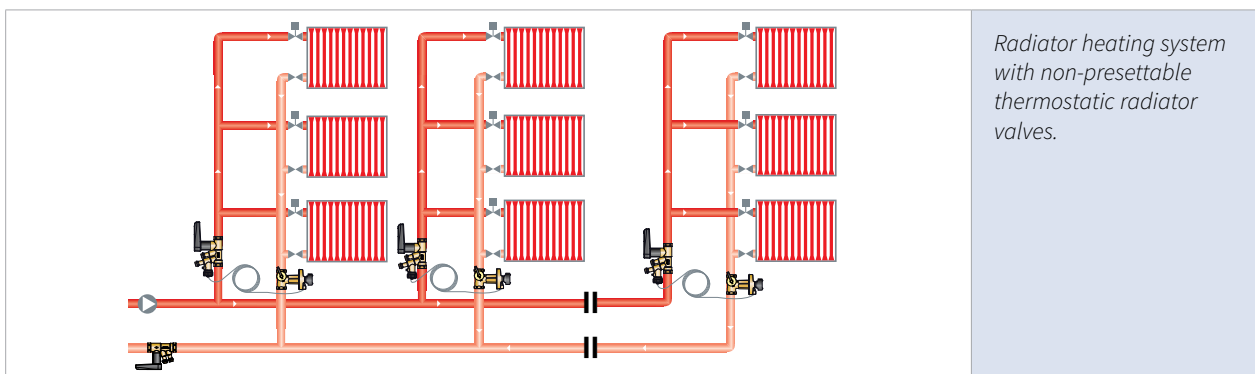


*Radiator heating system with pre-settable thermostatic radiator valves.*



*The NexusValve Passim provides constant differential pressure across a motorized valve on a terminal unit.*

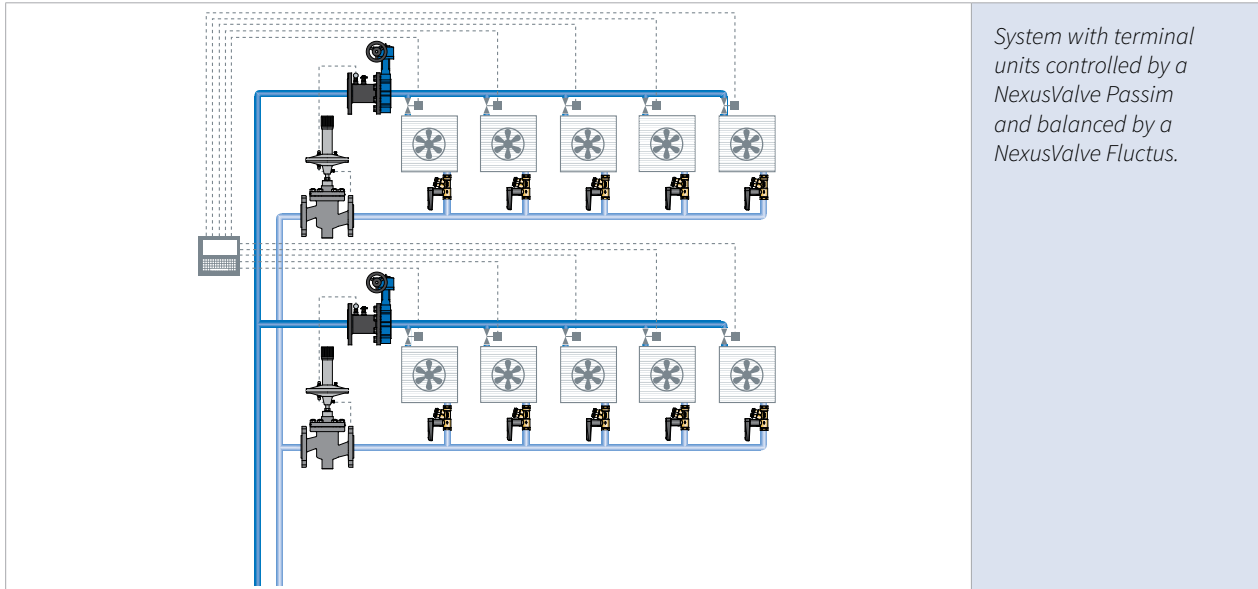
When the NexusValve Passim valve is installed in combination with NexusValve Fluctus or NexusValve Vertex, the valves can be used as both a constant pressure regulator and as a maximum flow limiter. This ensures each zone or terminal unit the required pressure drop and that the designed flow will never be exceeded.



*Radiator heating system with non-pre-settable thermostatic radiator valves.*

Such a solution is widely used in radiator heating systems with non-pre-settable thermostatic radiator valves. NexusValve Passim along with NexusValve Fluctus can be used to limit maximum flow in long branches with several terminal

units. The flow distribution among the terminal units is ensured by the proper commissioning of static balancing valves and the operation of motorized valves.



As NexusValve Passim ensures the required differential pressure for a circuit under all loads, it is possible to do project handovers in stages due to zone balancing – saving both time and money spent on re-commissioning. In practice parts of a building can be taken into use gradually as it is completed ensuring a cost effective handover of the entire project. Partial close-downs can also be done easily without influencing other parts of the system.

The NexusValve Passim will ensure no overflows and thereby no unnecessary energy consumption, and it will eliminate noise problems, providing a perfectly controlled system.

The maximum permissible differential pressure between the upper side of the diaphragm (“+”) and the lower side of the diaphragm (“-”) of the NexusValve Passim is 250 kPa. A possible pressure drop in the system circuit, e.g. due to cooling when the heating circuit is closed, must also be taken into account. In practice, an approximate value of approx. 10 kPa / K can be assumed for this.

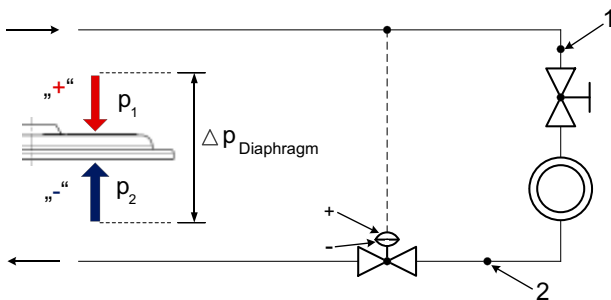
Example 1:

System pressure (static): 200 kPa

Pump pressure (dynamic): 100 kPa

Pressure drop in the heating circuit: 50 kPa

Operation (valve in the heating circuit open)



$$T_1 = 50^\circ\text{C}$$

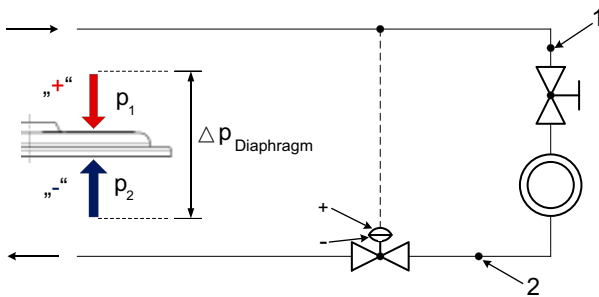
$$p_1 = 300 \text{ kPa}$$

$$T_2 = 30^\circ\text{C}$$

$$p_2 = 250 \text{ kPa}$$

$$\Delta p_{\text{Diaphragm}} = 50 \text{ kPa}$$

Operation (valve in the heating circuit closed)



$$T_1' = 50^\circ\text{C}$$

$$p_1' = 300 \text{ kPa}$$

$$T_2' = 30^\circ\text{C}$$

$$p_2' = 200 \text{ kPa}$$

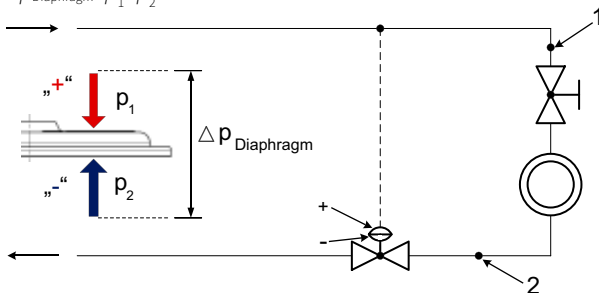
$$\Delta p_{\text{Diaphragm}} = 100 \text{ kPa}$$

Pressure difference due to the cooling of the heating circuit

Cooling of the emitter from  $T_2=30^\circ\text{C}$  to ambient temperature  $T_\infty=20^\circ\text{C}$  leads to an additional pressure difference of  $\Delta p_{\text{cooling}} \approx 100 \text{ kPa}$

$$p_2'' = p_2' - \Delta p_{\text{cooling}} = 100 \text{ kPa}$$

$$\Delta p_{\text{Diaphragm}}'' = p_1' - p_2'' \approx 200 \text{ kPa}$$



$$T_1'' = 50^\circ\text{C}$$

$$p_1'' = 300 \text{ kPa}$$

$$T_2'' = 20^\circ\text{C}$$

$$p_2'' = 100 \text{ kPa}$$

$$\Delta p_{\text{Diaphragm}}'' = 200 \text{ kPa}$$

Example 2:

Increase in the pump pressure and the return temperature in the heating circuit.

System pressure: 200 kPa

Pump pressure: 200 kPa

Pressure drop across emitters: 50 kPa

$T_1 = 60^\circ\text{C}$

$T_2 = 40^\circ\text{C}$

Other system parameters and greater thermal cooling lead to an impermissible differential pressure between the top and bottom of the diaphragm.

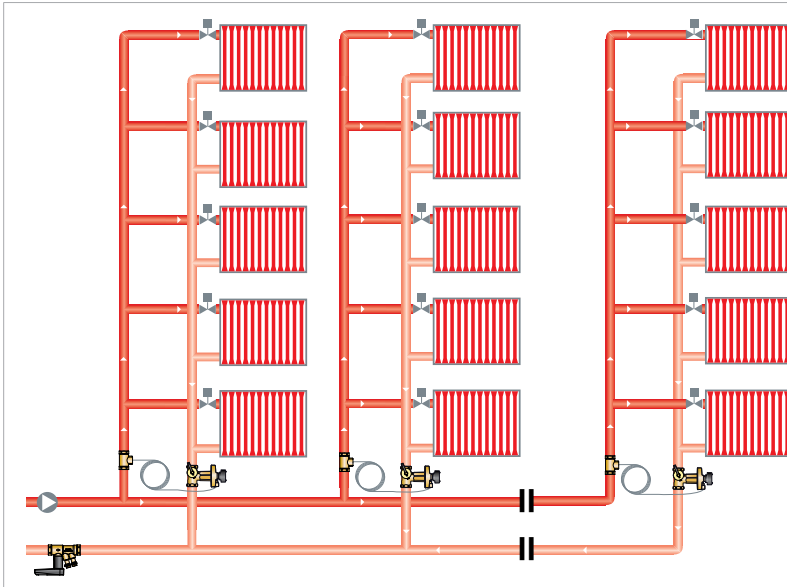


$$\Delta p_{\text{Diaphragm}}^{\text{max}} = 400 \text{ kPa}$$

If the maximum permissible differential pressure across the diaphragm is exceeded, the NexusValve Passim may malfunction. Valves that close tightly against high differential pressures and electric motor drives in the system circuit can promote this malfunction.

## 3. Applications

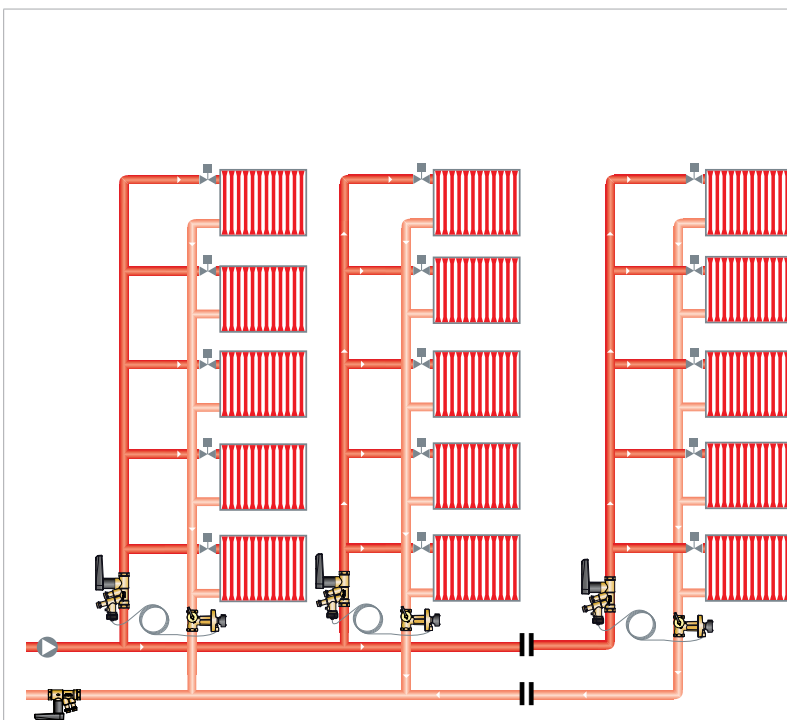
DN 15-50



*Application 1 - Heating system with pre-settable thermostatic radiator valves*

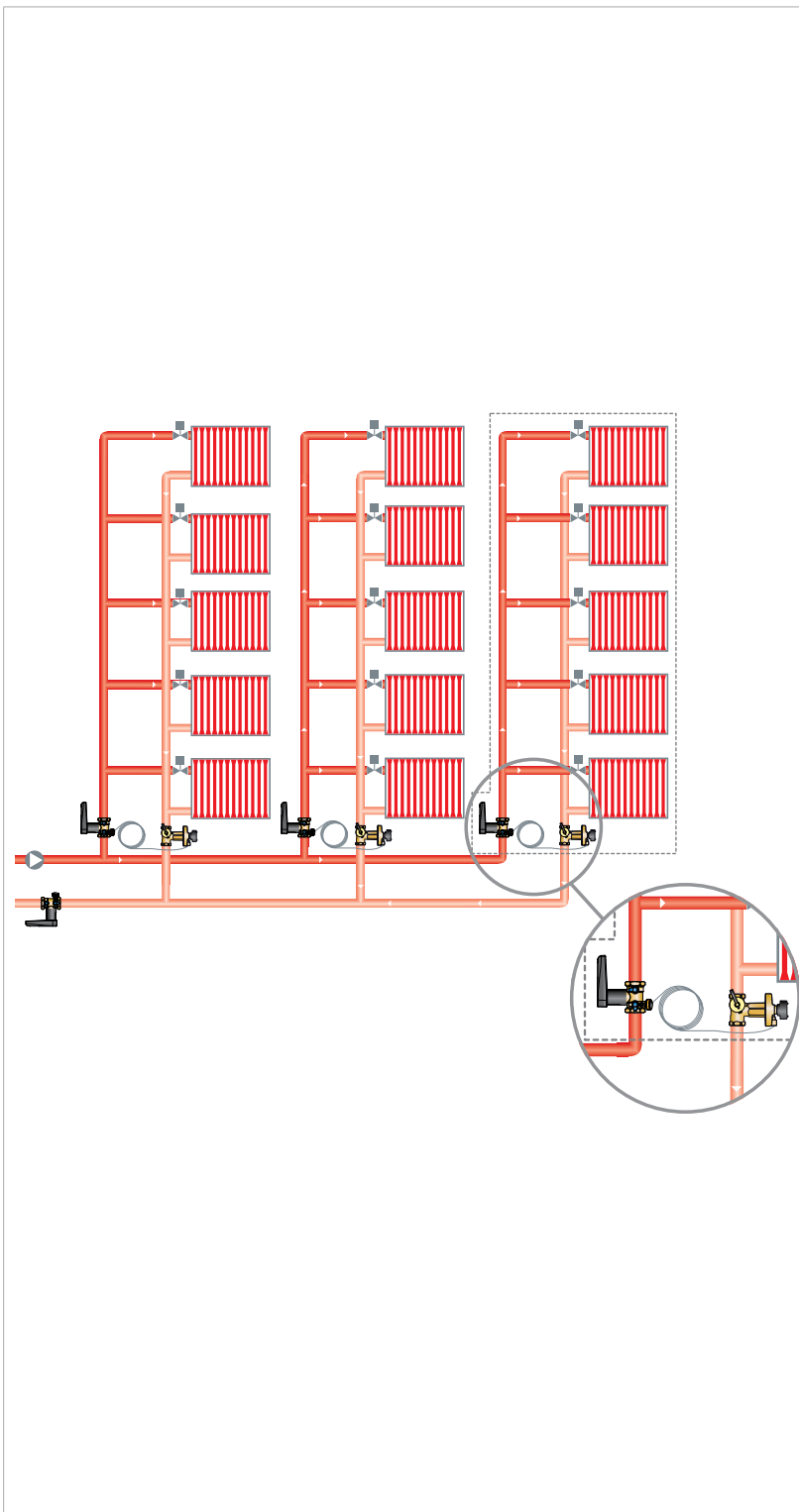
*Differential pressure across the circuits is stabilised by using NexusValve Passim valves.*

*In systems with pre-settable thermostatic radiator valves (TRV), the stabilised differential pressure allows optimum conditions to control the room temperature. By pre-setting the TRV valves, flow is limited and overflow situations are avoided. Noise problems are at the same time also eliminated when using NexusValve Passim valves.*



*Application 2 - Heating system with non-pre-settable thermostatic radiator valves*

*Differential pressure across the circuits is stabilised using NexusValve Passim valves. Some systems are equipped with non-pre-settable thermostatic radiator valves (TRV). Such installations are hard to regulate properly, and significant overflow situations can occur. The NexusValve Passim will stabilise the differential pressure across a circuit and provide proper conditions to control the room temperature. When installed with a NexusValve Fluctus or a NexusValve Vertex as partner valve, the maximum flow can be limited to design flow rate. Overflow situations in the circuit are thereby avoided. This will not provide the correct distribution of flow among the radiators, but it will improve the system performance substantially. Noise nuisances are at the same time also eliminated when using NexusValve Passim valves.*

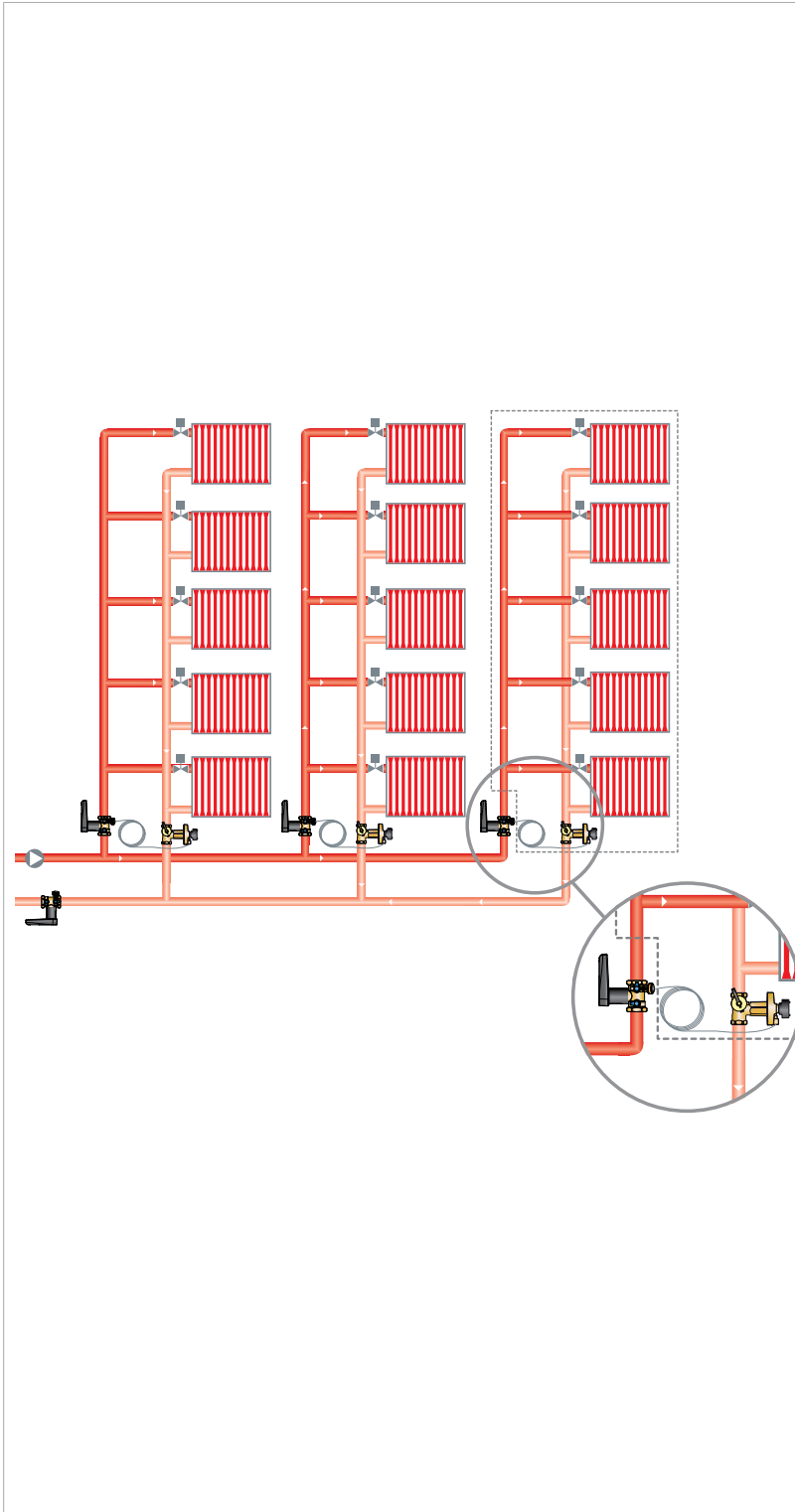


*Application 3A - Central heating system with NexusValve Passim and NexusValve Vertex*

*The NexusValve Vertex valve and the NexusValve Passim differential pressure control valve can be connected in a way so that the NexusValve Vertex valve is inside the circuit controlled by the NexusValve Passim valve. This is done when the capillary tube from the NexusValve Passim valve is connected to the drain valve at the P/T port of the NexusValve Vertex valve with the higher measured pressure. This application is common for heating systems with non-presettable thermostatic radiator valves. In this case the pressure loss across the NexusValve Vertex valve needs to be taken into account when setting the NexusValve Passim differential pressure control valve. The flow obtained across the NexusValve Vertex valve is kept constant due to the constant differential pressure obtained (as long as there is no load change required from the terminal units).*

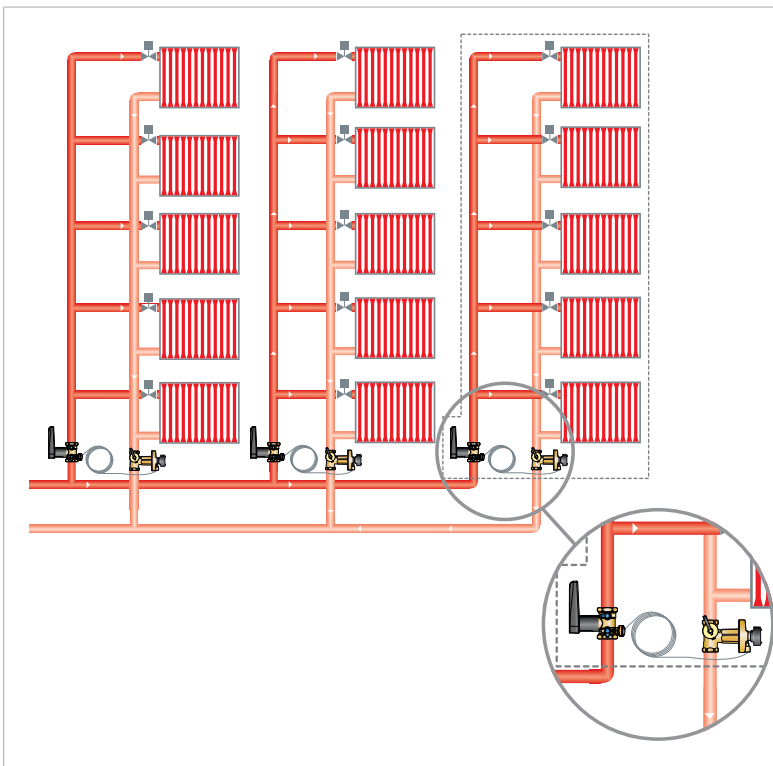


## 3.Applications



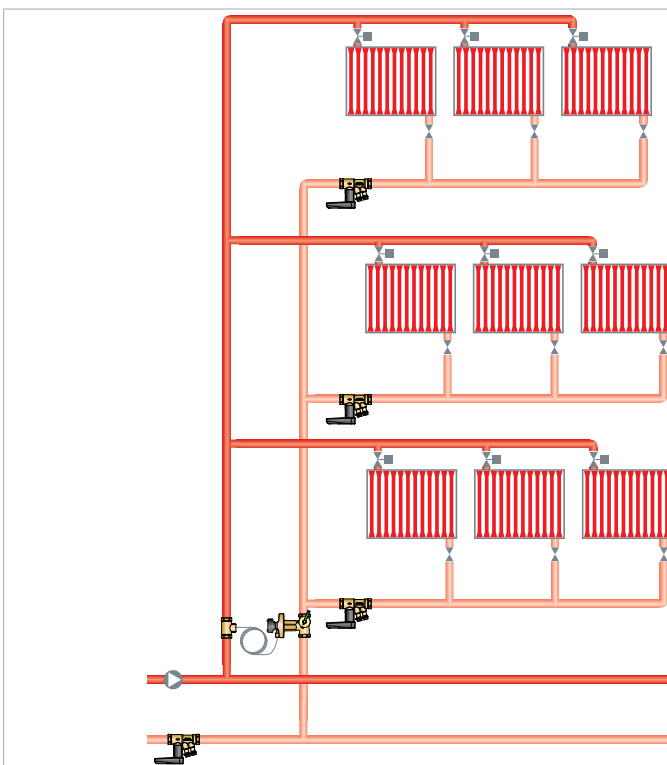
*Application 3B - Central heating system with NexusValve Passim and NexusValve Vertex*

*The NexusValve Vertex valve and the NexusValve Passim differential pressure control valve can be connected in a way so that the NexusValve Vertex valve is outside the circuit controlled by the NexusValve Passim valve. This is done when the capillary tube from the NexusValve Passim valve is connected to the drain valve at the P/T plug of the NexusValve Vertex valve with the lower measured pressure. This application is common for heating systems with pre-settable thermostatic radiator valves. The NexusValve Vertex valve can in this application be used as a measuring valve to check if the pre-setting made on the thermostatic radiator valves is correct and if the designed flow is achieved. The NexusValve Vertex valve is in this application typically fully open or in a position providing just enough pressure loss required for flow measurement. In this way the pressure loss in the system is kept low.*



*Application 4 - Central heating system with the NexusValve Passim and the NexusValve Relax*

*The NexusValve Relax “shut-off valve” can be used as a partner valve to the NexusValve Passim. This combination is suitable for systems with presettable thermostatic radiator valves. The individual flow is set on the thermostatic radiator valve, whereas the flow for the riser can be verified on the NexusValve Relax provided that the pressure loss across its measuring points is at least 3.0 kPa. The NexusValve Relax can be inside or outside the controlled by the NexusValve Passim part of the system.*

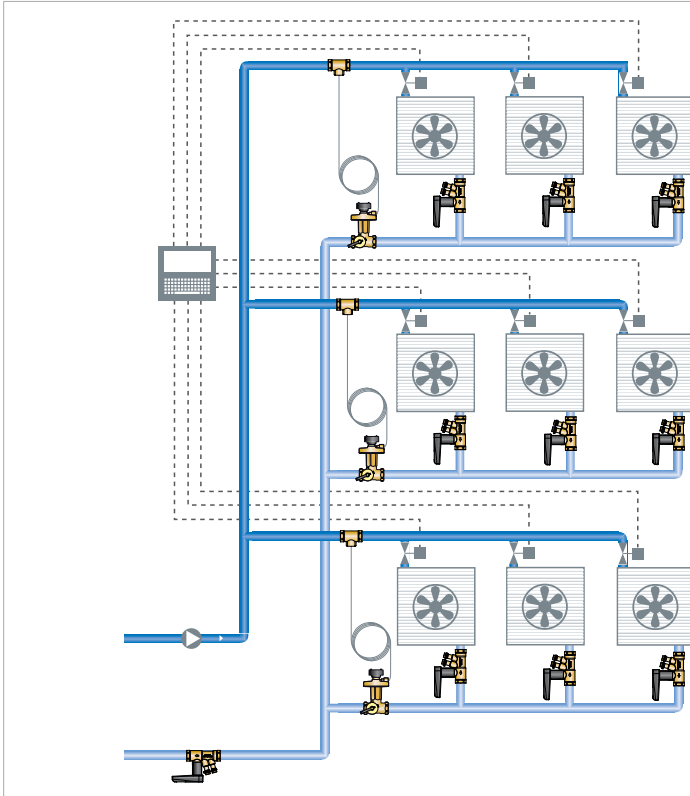


*Application 5 - Heating system with differential pressure control valves on risers and manual balancing valves on sub-circuits*

*A NexusValve Passim on each riser provides a stable differential pressure from the main pipe to the risers and to the sub-circuits. A NexusValve Fluctus or a NexusValve Vertex on each sub-circuit prevents overflow situations.*

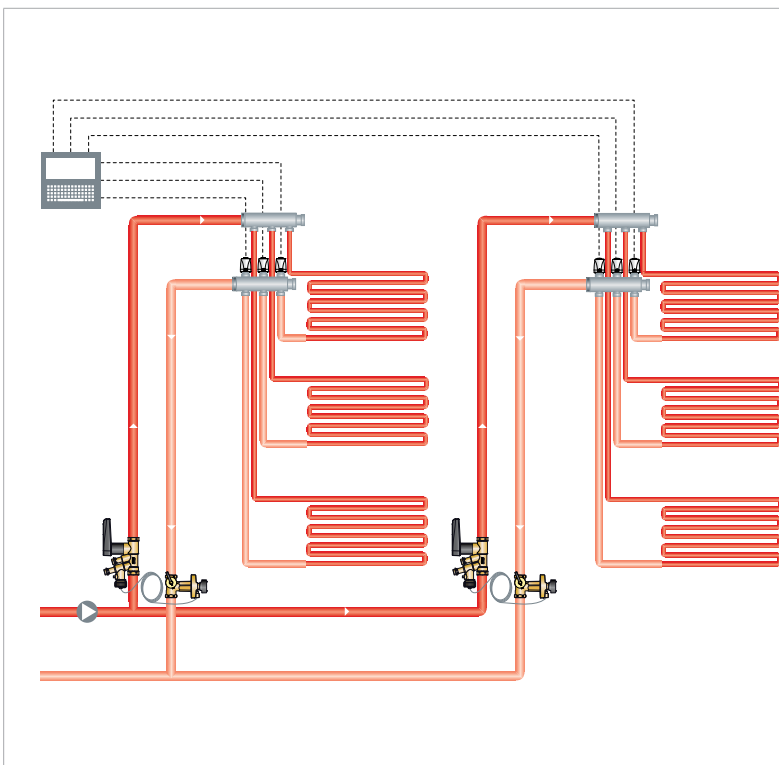
*The differential pressure limitation function of the NexusValve Passim valve will furthermore prevent noise problems in the system.*

### 3.Applications



*Application 6 - Cooling system with differential pressure control valves on branches and manual balancing valves on terminal units*

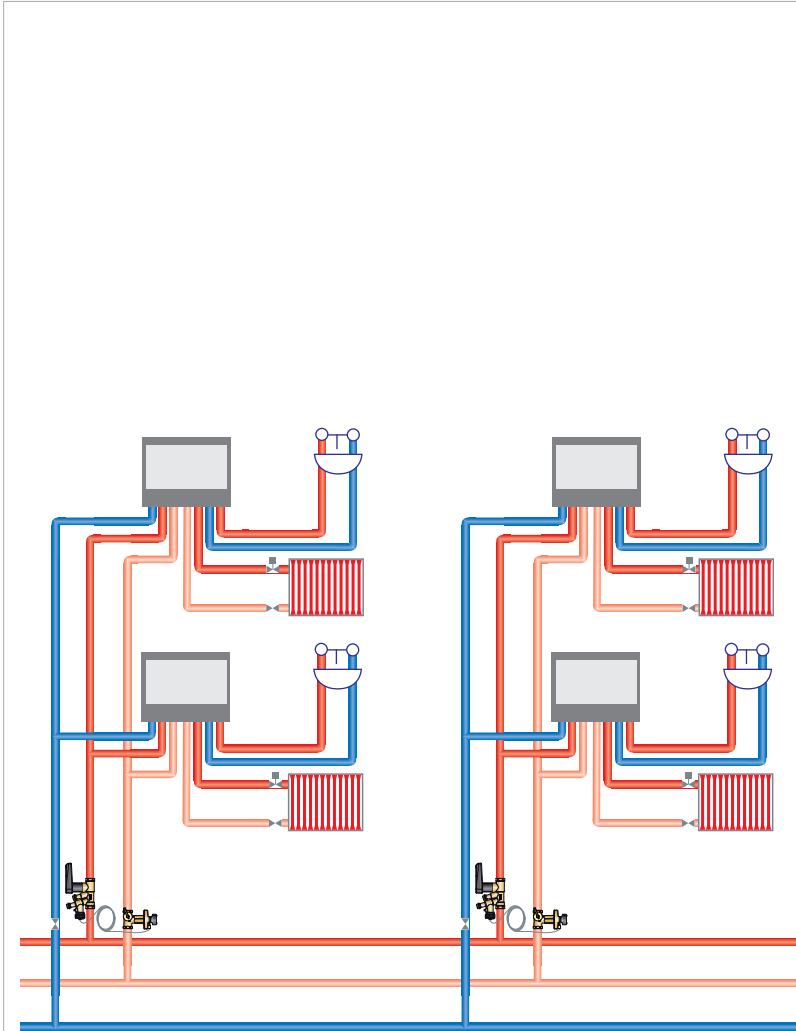
*In a system with a high concentration of small terminal units, the differential pressure can be stabilised across a group of terminal units using the NexusValve Passim. NexusValve Fluctus or NexusValve Vertex on each terminal unit limit at the same time the flow according to design conditions. The differential pressure control of the NexusValve Passim valve will furthermore prevent noise problems in the system.*



*Application 7 - Underfloor heating system*

*In a system with several underfloor heating manifolds the differential pressure is stabilized by use of NexusValve Passim on each branch. The flow adjustment in one manifold will not affect the flow in the remaining manifolds.*

*NexusValve Fluctus or NexusValve Vertex will ensure the designed flow in every manifold. As a result of this, system commissioning is easy, allowing time and cost savings, and the design flow is never exceeded.*



*Application 8 - Flat station and district heating system*

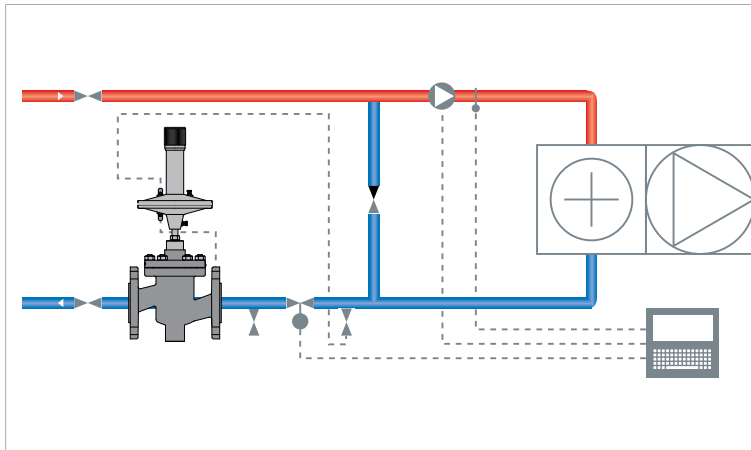
*NexusValve Passim can be installed in systems with flat stations. In this type of application flow fluctuations, due to a significant difference between heat consumption for domestic hot water production and for heating purpose, is a typical problem. By installing NexusValve Passim the differential pressure is stabilized in every section of the system. The NexusValve Passim ensures that a changed flow in one section of the system does not affect the flow and operation of the remaining part of the system.*

*The same function as above applies to district heating systems. NexusValve Passim installed in district heating substations will provide stable working conditions for motorized valves on heat exchangers. As a result motorized valves operate only in reference to the changing heat load and not to compensate for fluctuating pressure in the district heating system.*

## 3.Applications

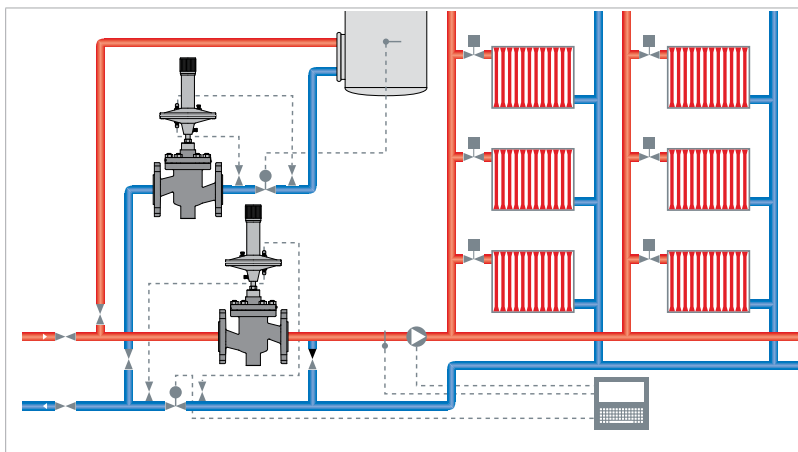
### DN 65-80

The NexusValve Passim DN 65 and DN 80 can be used in applications 1-8 as well as in the following ones:



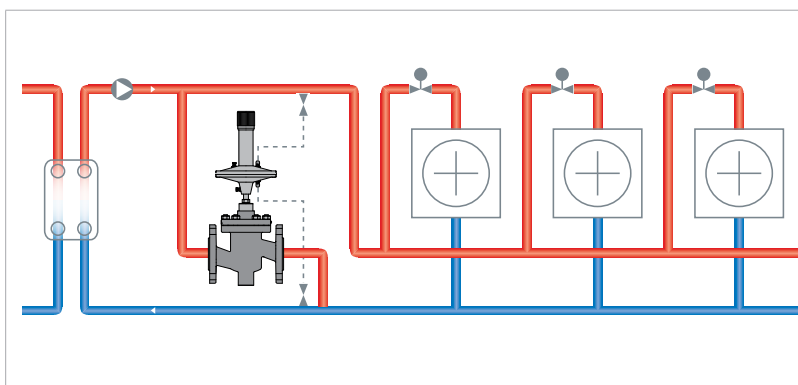
*Application 9 - Precise temperature control in air handling units*

*When temperatures have to be kept within close limits like in ventilating plants, control may be difficult if the differential pressure in the system is not constant. This may be overcome by installing a NexusValve Passim which stabilizes the differential pressure across the motorized valve. As a result the motorized valve reacts only on temperature signals and not on pressure fluctuations.*



*Application 10 - Precise temperature control in domestic water and central heating systems*

*The NexusValve Passim valve will in a hot water tank circuit (heat exchanger) or in a central heating system maintain a constant differential pressure across the motorized valve. By providing a stable working condition the motorized valve reacts only on the temperature signal and does not have to compensate for pressure fluctuations.*



*Application 11 - Pressure relief by pump or supply and return line by-pass*

*The NexusValve Passim can be used in by-pass around pumps or across the supply and return lines of a circuit. This prevents the pump from working against a dead head when all the subcircuits are closed down.*

**Note:** *For this application the NexusValve Passim with reverse acting valve needs to be ordered. The valve is provided on request only!*

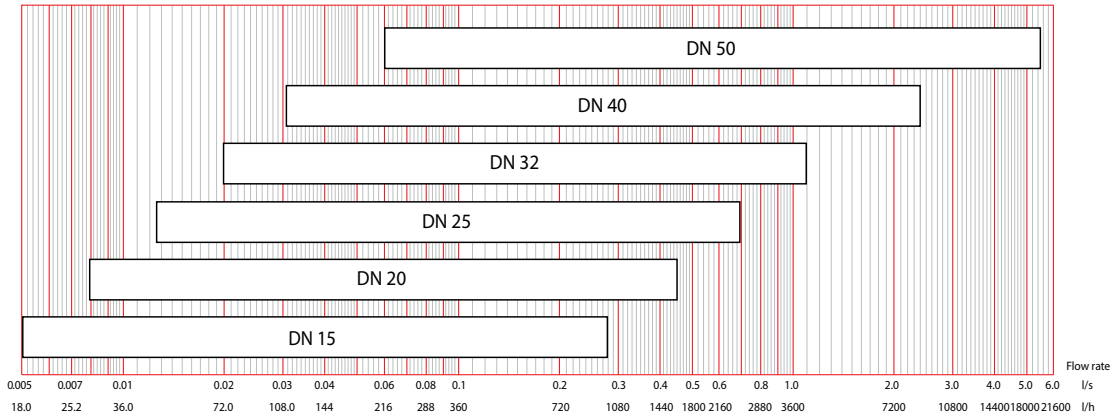
The NexusValve Passim can be installed in the return or the supply line. Installation in the return line is preferable where there is a risk of air in the system, and in high buildings where the pressure in the return pipe does not considerably exceed the static pressure. For low buildings (and high pressures) it is preferable to install the NexusValve Passim in the supply line to reduce the pressure in terminal units.

# 4. Product data sheet

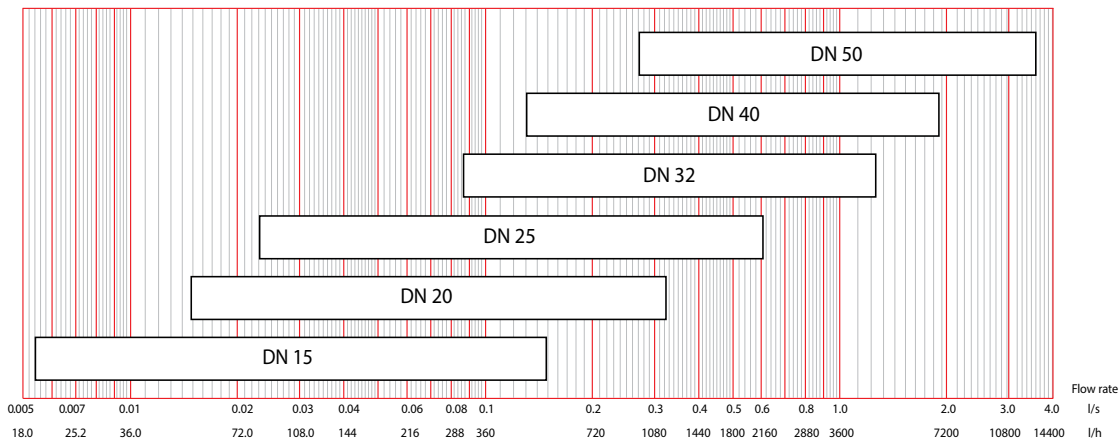
## 4.1 Product finder

### NexusValve Passim DN 15-50

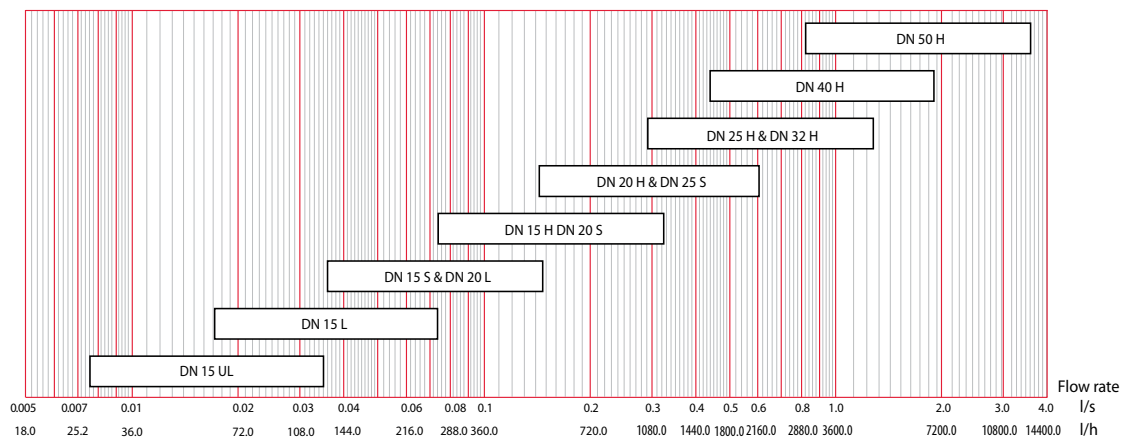
NexusValve Passim



NexusValve Vertex – partner valve to NexusValve Passim



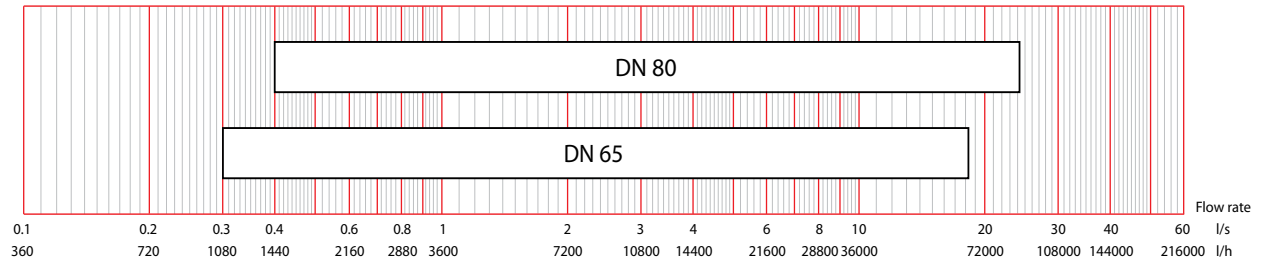
NexusValve Fluctus – partner valve to NexusValve Passim



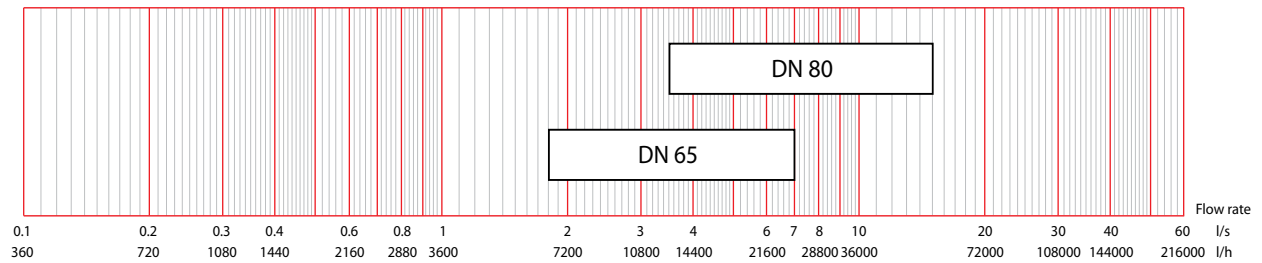
# 4. Product data sheet

## NexusValve Passim DN 65-80

NexusValve Passim



NexusValve Fluctus – partner valve to NexusValve Passim



Flow range		Dimension	Differential pressure setting range kPa	Factory setting [kPa]
l/s	l/h			
0.005-0.222	18-800	DN 15	5-25	10
0.010-0.281	36-1010		20-40	30
0.010-0,360	36-1290		20-65	40
0.007-0.347	28-1250	DN 20	5-25	10
0.016-0.439	56-1580		20-40	30
0.016-0560	56-2020		20-65	40
0.013-0.556	45-2000	DN 25	5-25	10
0.025-0.703	89-2530		20-40	30
0.025-0896	89-3230		20-65	40
0.019-0.875	70-3150	DN 32	5-25	10
0.039-1.11	141-3980		20-40	30
0.039-1.41	141-5080		20-65	40
0.031-1.39	112-5000	DN 40	5-25	10
0.062-1.76	224-6330		20-40	30
0.082-2.41	296-8660		35-75	60
0.062-2.78	224-10000	DN 50	5-25	10
0.124-3.51	447-12650		20-40	30
0.164-4.81	592-17320		35-75	60
0.215-5.56	775-20000		60-100	80
0.289-14.4	1040-51880	DN 65	20-80	50
0.539-18.4	1940-66130		70-130	100
0.397-19.9	1430-71550	DN 80	20-80	50
0.689-25.3	2480-87640		70-130	100



## 4. Product data sheet

### 4.2 NexusValve Passim DN 15-50, DN 65-80





#### 4.2.1 Passim DN 15-32 female/female with drain

Dimensions	Specifications
	<p><b>Max. temperature</b> 120°C (135°C temporarily)  <b>Min. temperature</b> -20°C  <b>Max. differential pressure *</b> 250 kPa  <b>Max. pressure</b> PN 25  <b>Differential pressure setting range</b> 5-25 kPa, 20-40 kPa  <b>Accuracy</b> +/-25%  <b>Marking on valve</b> DN, PN, flow arrow, DR, Kvs            Differential pressure setting range            Female thread ISO 7/1 parallel</p>
	<p><b>Connection</b></p> <p><b>Valve housing, seat, cone and internal mechanical parts</b> DR Brass CW602N  <b>Spring</b> Stainless steel  <b>Sealings and diaphragm</b> EPDM  <b>Isolation knob</b> PPS</p>

DN	A (mm)	B (mm)	C (mm) (diameter)	D (mm)
DN 15	61	101	62	60,5
DN 15	61	101	62	60,5
DN 20	71	122	62	62
DN 20	71	122	62	62
DN 25	84	146	96	65
DN 25	84	146	96	65
DN 32	96	148	96	69
DN 32	96	148	96	69

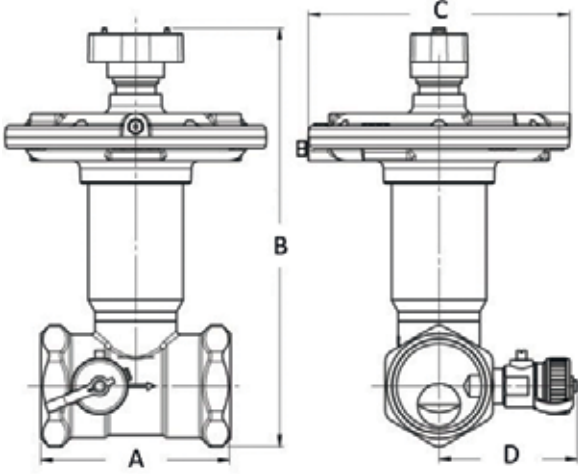
**Note!** Information on press adaptors and other is provided in the chapter Accessories.

\* The maximum permissible differential pressure across the valve seat of the NexusValve Passim is 250 kPa.

Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 15</b>					
	MN80597.521	DN 15	½"	1.6	5-25
	MN80597.522	DN 15	½"	1.6	20-40
	MN80597.5222	DN 15	½"	1.6	20-65
<b>DN 20</b>					
	MN80597.523	DN 20	¾"	2.5	5-25
	MN80597.524	DN 20	¾"	2.5	20-40
	MN80597.5242	DN 20	¾"	2.5	20-65
<b>DN 25</b>					
	MN80597.525	DN 25	1"	4.0	5-25
	MN80597.526	DN 25	1"	4.0	20-40
	MN80597.5262	DN 25	1"	4.0	20-65
<b>DN 32</b>					
	MN80597.527	DN 32	1¼"	6.3	5-25
	MN80597.528	DN 32	1¼"	6.3	20-40
	MN80597.5282	DN 32	1¼"	6.3	20-65

## 4. Product data sheet




### 4.2.2 Passim DN 40 female/female with drain Passim

Dimensions	Specifications
	<p><b>Max. temperature</b> 120°C (135°C temporarily)  <b>Min. temperature</b> -20°C  <b>Max. differential pressure*</b> 250 kPa  <b>Max. pressure</b> PN 25  <b>Differential pressure setting range</b> 5-25 kPa, 20-40 kPa, 35-75 kPa  <b>Accuracy</b> +/-25%  <b>Marking on valve</b> DN, PN, flow arrow, DR, Kvs            Differential pressure setting range  <b>Connection</b> Female thread ISO 7/1 parallel  <b>Valve housing, seat, cone and internal mechanical parts</b> DR Brass CW602N  <b>Spring</b> Stainless steel  <b>Sealings and diaphragm</b> EPDM  <b>Isolation knob</b> PPS  <b>Top and bottom plates</b> EN-GJL-250 (GG25)</p>

DN	A (mm)	B (mm)	C (mm) (diameter)	D (mm)
DN 40	99,5	194	138	73
DN 40	99,5	220	138	73
DN 40	99,5	235	138	73

**Note!** Information on press adaptors and other is provided in the chapter Accessories.

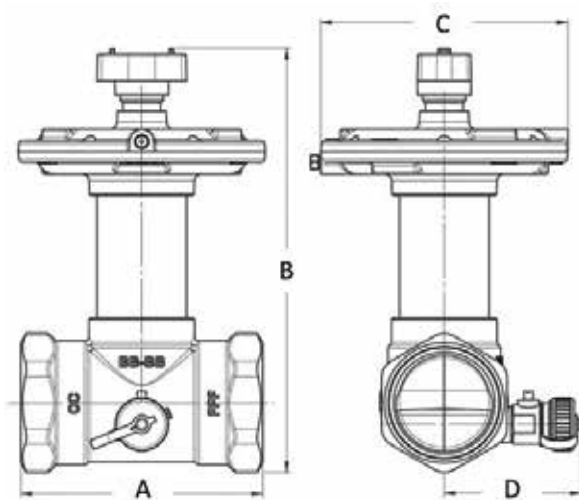
\* The maximum permissible differential pressure across the valve seat of the NexusValve Passim is 250 kPa.

Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 40</b> 	MN80597.570	DN 40	1½"	10	5-25
<b>DN 40</b> 	MN80597.571	DN 40	1½"	10	20-40
<b>DN 40</b> 	MN80597.572	DN 40	1½"	10	35-75

## 4. Product data sheet

### 4.2.3 Passim DN 50 female/female with drain

#### Dimensions






#### Specifications

<b>Max. temperature</b>	120°C (135°C temporarily)
<b>Min. temperature</b>	-20°C
<b>Max. differential pressure *</b>	250 kPa
<b>Max. pressure</b>	PN 25
<b>Differential pressure setting range</b>	5-25 kPa, 20-40 kPa, 35-75 kPa, 60-100kPa
<b>Accuracy</b>	+/-25%
<b>Marking on valve</b>	DN, PN, flow arrow, DR, Kvs Differential pressure setting range
<b>Connection</b>	Female thread ISO 7/1 parallel EN-GJL-250 (GG25)
<b>Valve housing</b>	EN-GJL-250 (GG25)
<b>Seat, cone and internal mechanical parts</b>	DR Brass CW602N
<b>Spring</b>	Stainless steel
<b>Sealings and diaphragm</b>	EPDM
<b>Isolation knob</b>	PPS
<b>Top and bottom plates</b>	EN-GJL-250 (GG25)

DN	A (mm)	B (mm)	C (mm) (diameter)	D (mm)
DN 50	135	206,5	138	76,5
DN 50	135	232	138	76,5
DN 50	135	247,5	138	76,5
DN 50	135	286	138	76,5

**Note!** Information on press adaptors and other is provided in the chapter Accessories.

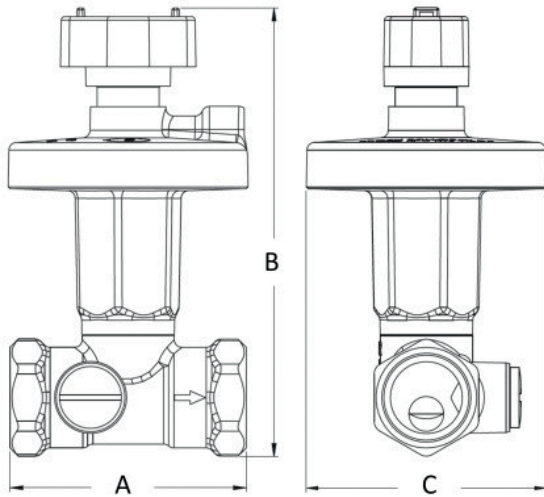
\* The maximum permissible differential pressure across the valve seat of the NexusValve Passim is 250 kPa.

Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 50</b> 	MN80597.580	DN 50	2"	20	5-25
<b>DN 50</b> 	MN80597.581	DN 50	2"	20	20-40
<b>DN 50</b> 	MN80597.582	DN 50	2"	20	35-75
<b>DN 50</b> 	MN80597.583	DN 50	2"	20	60-100

## 4. Product data sheet

### 4.2.4 Passim DN 15-32 female/female without drain

#### Dimensions







#### Specifications

<b>Max. temperature</b>	120°C (135°C temporarily)
<b>Min. temperature</b>	-20°C
<b>Max. differential pressure *</b>	250 kPa
<b>Max. pressure</b>	PN 25
<b>Differential pressure setting range</b>	5-25 kPa, 20-40 kPa
<b>Accuracy</b>	+/-25%
<b>Marking on valve</b>	DN, PN, flow arrow, DR, Kvs Differential pressure setting range
<b>Connection</b>	Female thread ISO 7/1 parallel
<b>Valve housing, seat, cone and internal mechanical parts</b>	DR Brass CW602N
<b>Spring</b>	Stainless steel
<b>Sealings and diaphragm</b>	EPDM
<b>Isolation knob</b>	PPS

DN	A (mm)	B (mm)	C (mm) (diameter)
DN 15	61	101	62
DN 15	61	101	62
DN 20	71	122	62
DN 20	71	122	62
DN 25	84	146	96
DN 25	84	146	96
DN 32	96	148	96
DN 32	96	148	96

**Note!** Information on press adaptors and other is provided in the chapter Accessories.

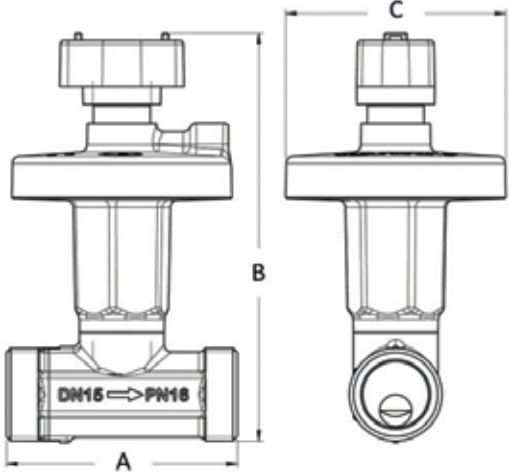
\* The maximum permissible differential pressure across the valve seat of the NexusValve Passim is 250 kPa.

Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 15</b> 	MN80597.560	DN 15	½"	1.6	5-25
	MN80597.561	DN 15	½"	1.6	20-40
<b>DN 20</b> 	MN80597.562	DN 20	¾"	2.5	5-25
	MN80597.563	DN 20	¾"	2.5	20-40
<b>DN 25</b> 	MN80597.564	DN 25	1"	4.0	5-25
	MN80597.565	DN 25	1"	4.0	20-40
<b>DN 32</b> 	MN80597.566	DN 32	1¼"	6.3	5-25
	MN80597.567	DN 32	1¼"	6.3	20-40




## 4. Product data sheet

### 4.2.5 Passim DN 15 male/male without drain

Dimensions	Specifications
	<p><b>Max. temperature</b> 120°C (135°C temporarily)  <b>Min. temperature</b> -20°C  <b>Max. differential pressure **</b> 450 kPa  <b>Max. pressure</b> PN 16  <b>Differential pressure setting range</b> 5-25 kPa, 20-40 kPa  <b>Accuracy</b> +/-25%  <b>Marking on valve</b> DN, PN, flow arrow, DR, Kvs            Differential pressure setting range            Male thread G 3/4" ISO228</p> <p><b>Connection</b></p> <p><b>Valve housing, cone and internal mechanical parts</b> DR Brass CW602N  <b>Spring and valve seat</b> Stainless steel  <b>Sealings and diaphragm</b> EPDM  <b>Isolation knob</b> PPS</p>

DN	A (mm)	B (mm)	C (mm) (diameter)
DN 15	65	101,9	62
DN 15	65	101,9	62

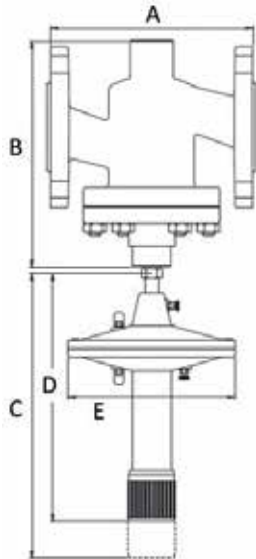
**Note!** Information on press adaptors and other is provided in the chapter Accessories.

Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 15</b> 	MN80597.550	DN 15	3/4"	1.6	5-25
	MN80597.551	DN 15	3/4"	1.6	20-40

\*\* The maximum permissible differential pressure across the valve seat of the NexusValve Passim is 450 kPa.

### 4.2.6 Passim DN 65-80 flange/flange

#### Dimensions





#### Specifications

<b>Max. temperature</b>	120°C 120°C (150°C only if the actuator is installed below the valve)
<b>Min. temperature</b>	-20°C
<b>Max. differential pressure</b>	1600 kPa
<b>Max. pressure</b>	PN 16
<b>Differential pressure setting range</b>	20-80 kPa, 70-130 kPa
<b>Leakage range</b>	Less than 0.05% of the full flow (according to VDI/VDE 2174)
<b>Marking on valve</b>	DN, PN, flow arrow, Kvs, differential pressure setting range, material
<b>Connection</b>	Flange EN 1092-2 PN16
<b>Valve housing</b>	Cast iron EN-GJS-400-15
<b>Seat, cone and spindle</b>	Stainless steel
<b>Spring</b>	Stainless steel
<b>Nuts and bolts</b>	24 CrMo 5/A4
<b>Sealing and diaphragm</b>	EPDM

DN	A (mm)	B (mm)	C (mm)	D (mm)	E (mm) (diameter)
DN 65	290	264	508	400	240
DN 80	310	279	508	400	240

**Note!** Information on press adaptors and other is provided in the chapter Accessories.

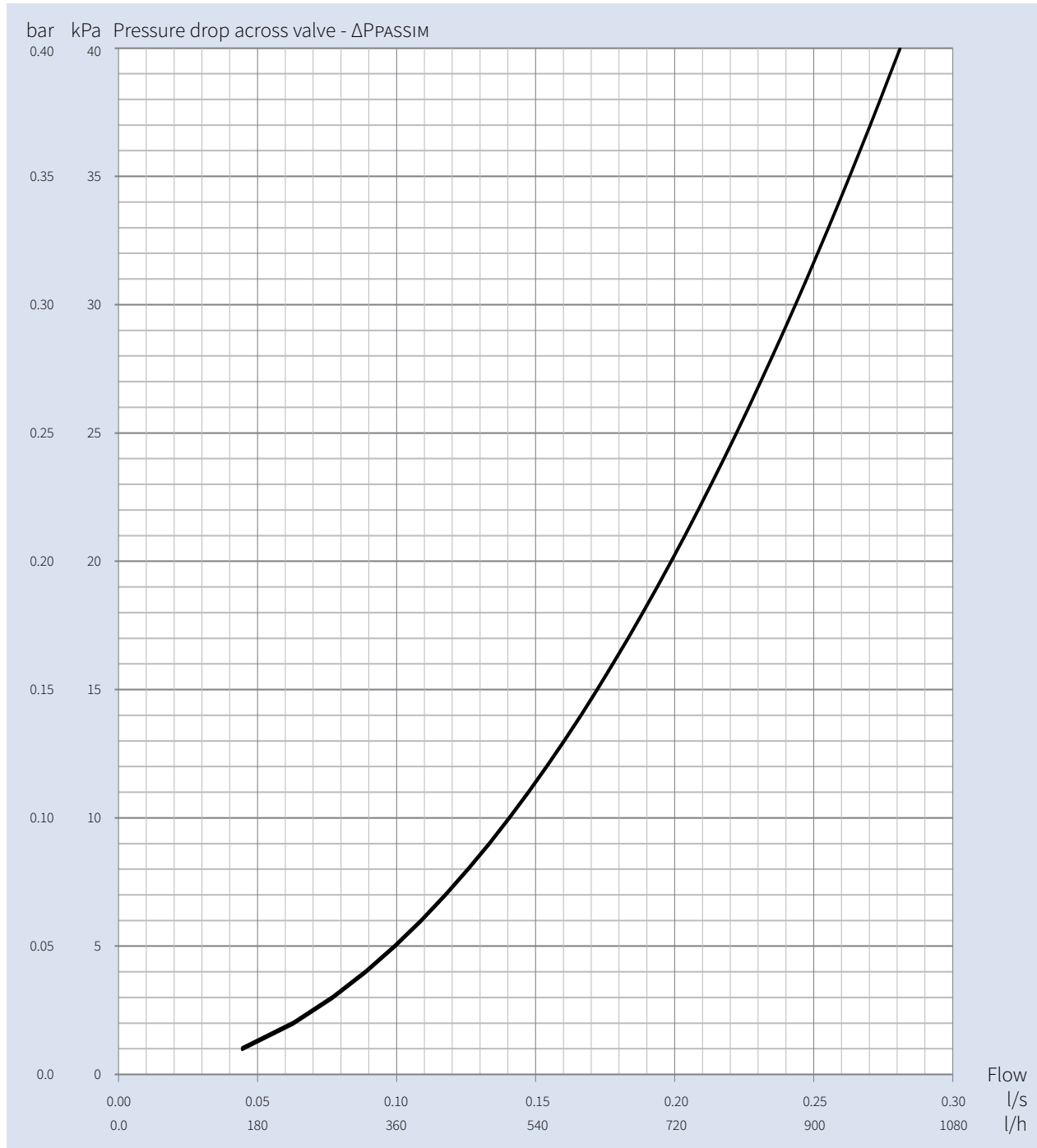
Valve	Article	Dimension	Nom. Inch	Kvs m <sup>3</sup> /h	ΔP Setting Range [kPa]
<b>DN 65</b> 	MN80597.602	DN 65	2½"	58	20-80
	MN80597.604	DN 65	2½"	58	70-130
<b>DN 80</b> 	MN80597.605	DN 80	3"	80	20-80
	MN80597.603	DN 80	3"	80	70-130

## 4. Product data sheet

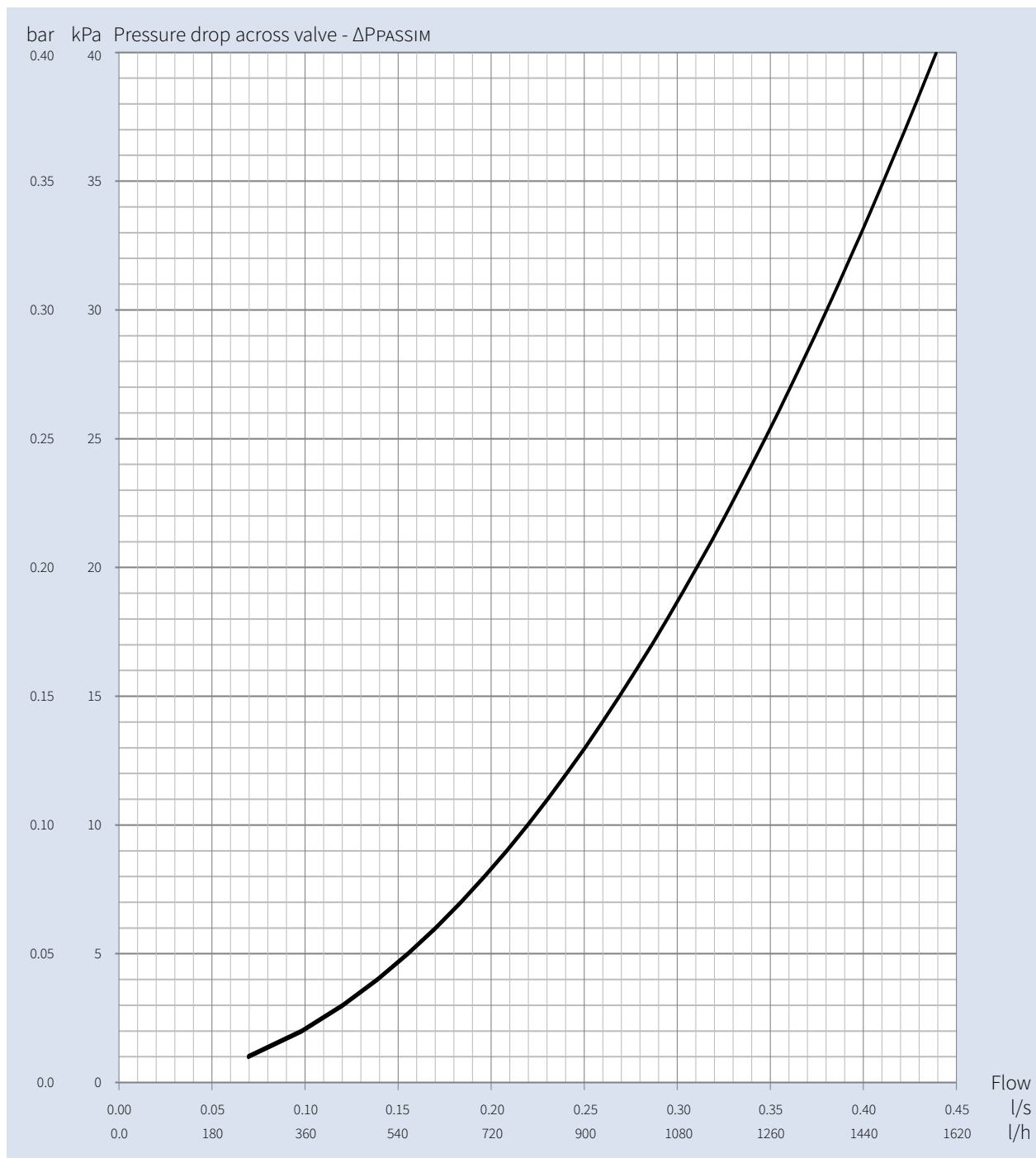
### 4.3 Flow diagrams

The graphs are used to determine the total pressure loss across the NexusValve Passim at the required flow.

#### DN 15 - female/female and male/male

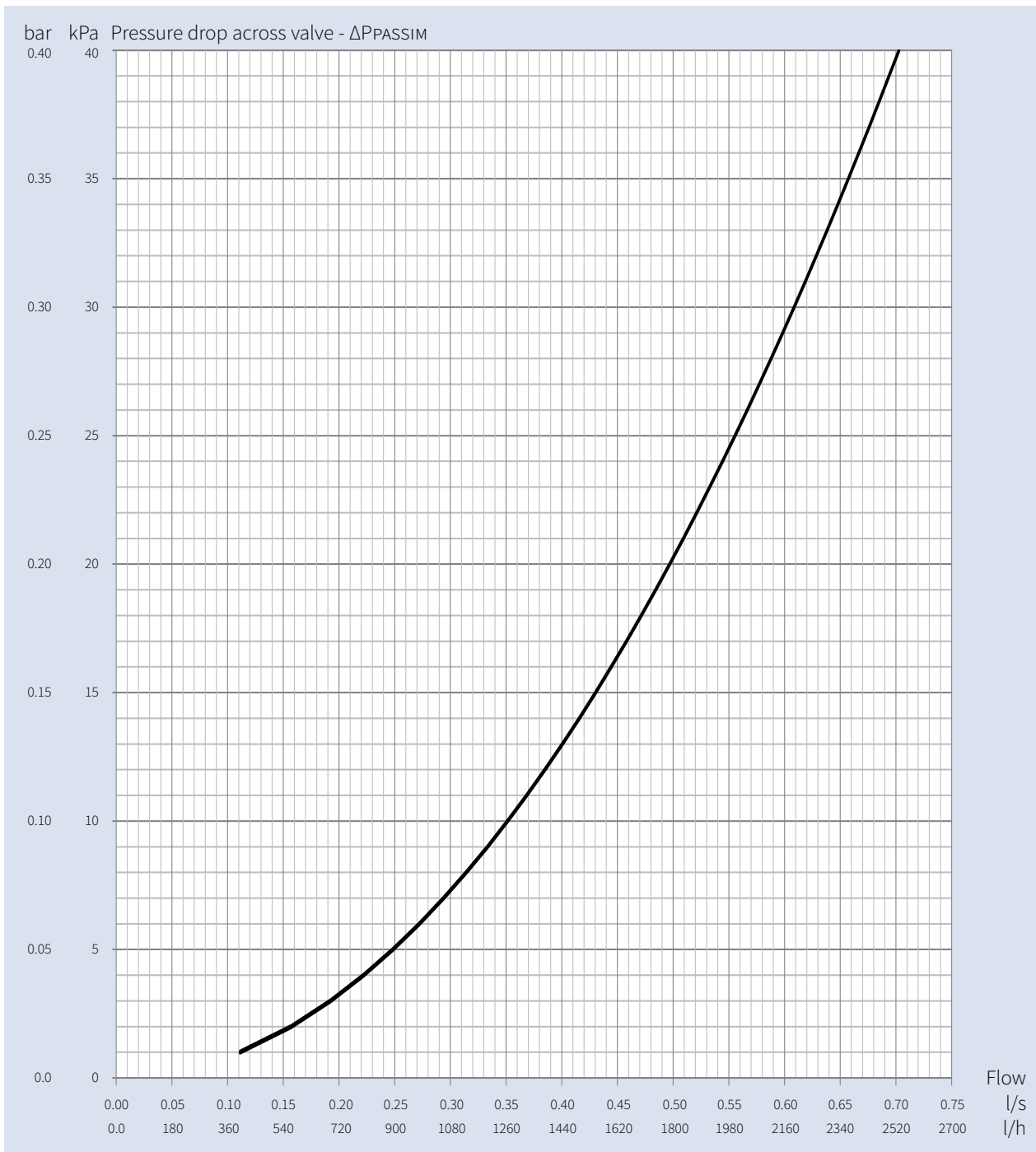


**DN 20 - female/female**

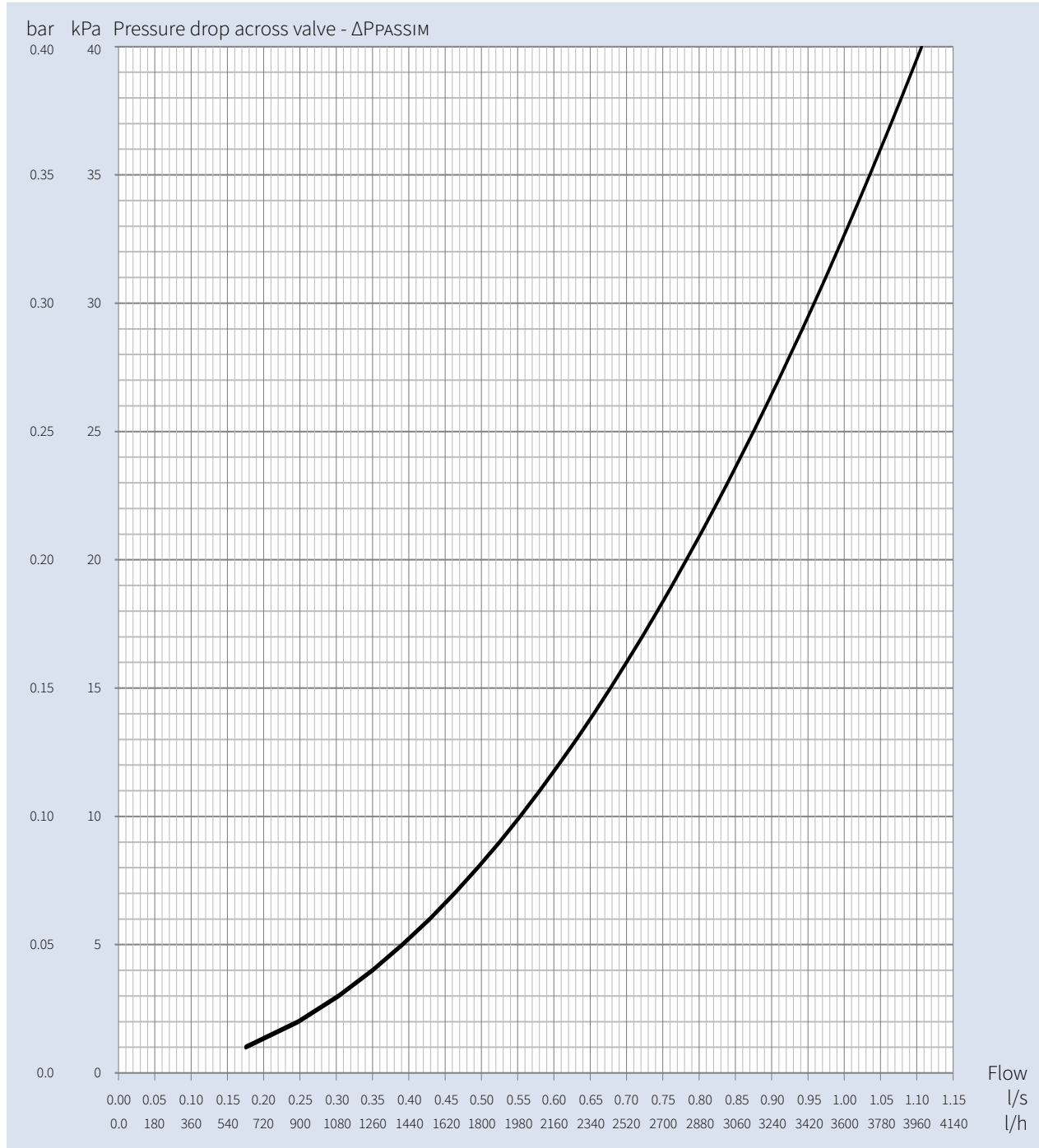


## 4. Product data sheet

### DN 25 - female/female

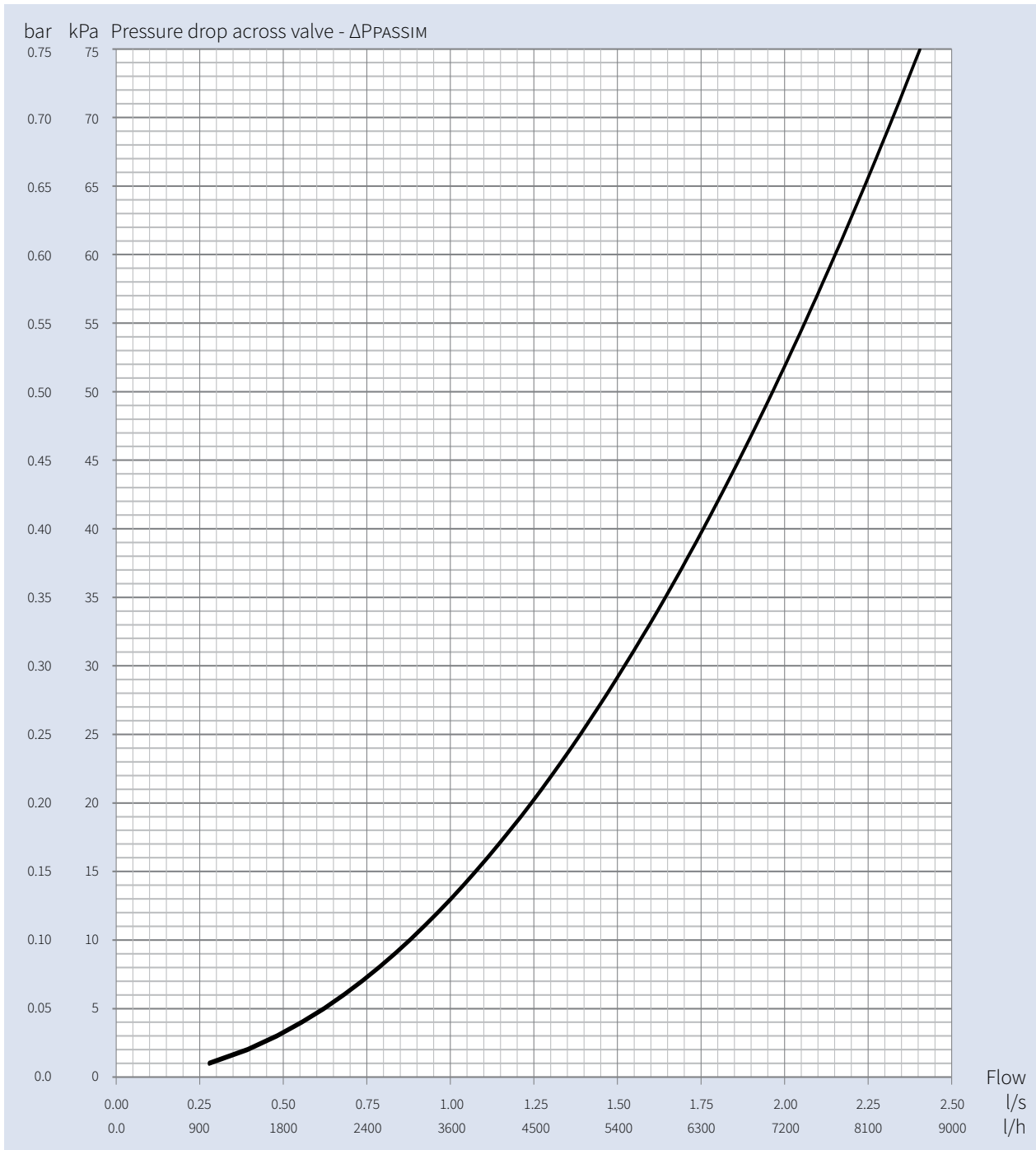


**DN 32 - female/female**

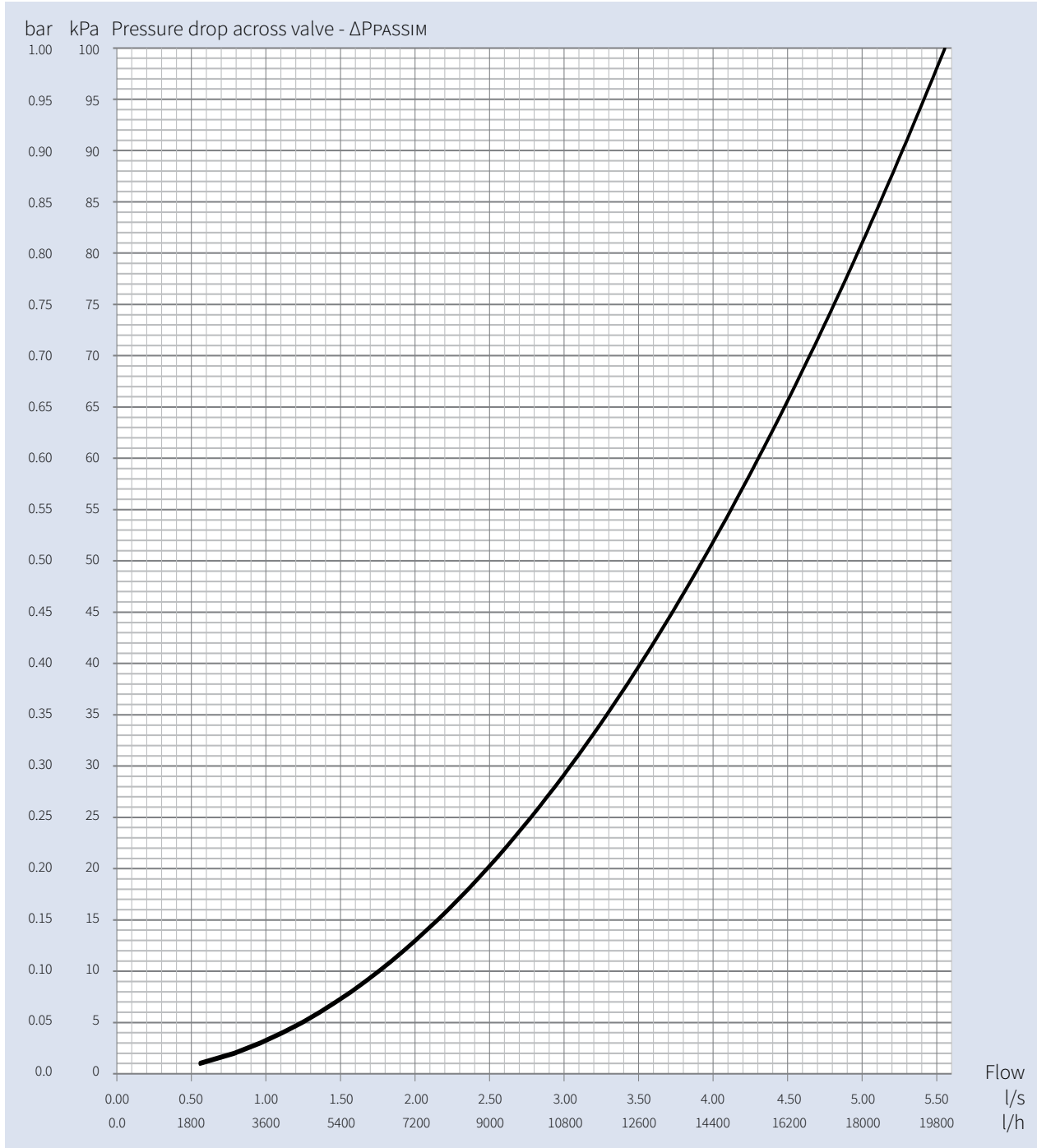


## 4. Product data sheet

### DN 40 - female/female



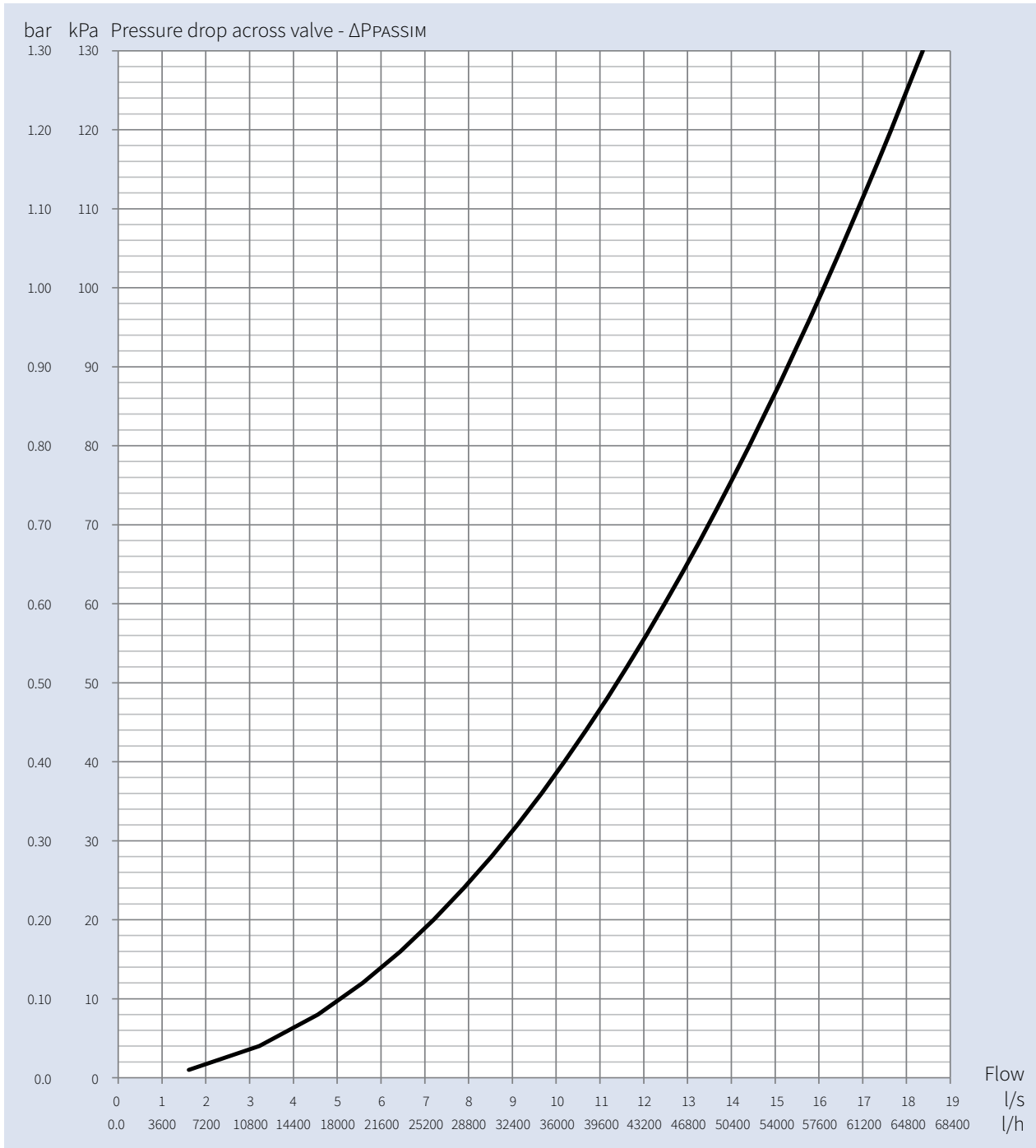
**DN 50 - female/female**



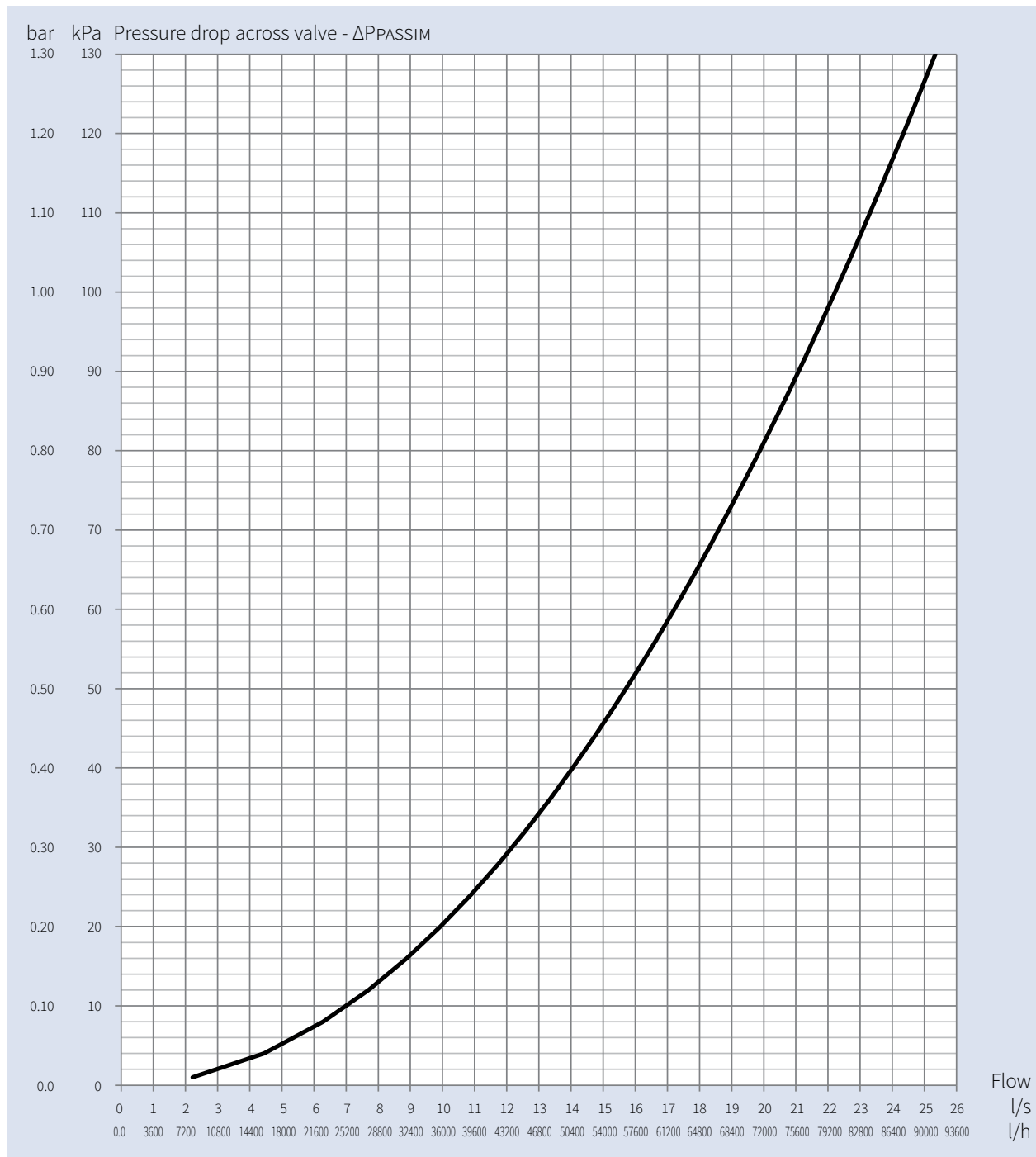


## 4. Product data sheet

### DN 65 - flange/flange



**DN 80 - flange/flange**



## 4. Product data sheet

### 4.4 Valve sizing

The available flow ranges in reference to the required differential pressure settings on the NexusValve Passim are specified in the tables.




#### DN 15 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h
5	18	358
6	20	392
7	21	423
8	23	453
9	24	480
10	25	506
11	27	531
12	28	554
13	29	577
14	30	599
15	31	620
16	32	640
17	33	660
18	34	679
19	35	697
20	36	716
21	37	733
22	38	750
23	38	767
24	39	784
25	40	800

Setting kPa	Min. flow l/h	Max. flow l/h
20	36	716
21	37	733
22	38	750
24	39	784
25	40	800
26	41	816
27	42	831
29	43	862
30	44	876
31	45	891
33	46	919
34	47	933
35	47	947
37	49	973
38	49	986
39	50	999
40	51	1010

Setting kPa	Min. flow l/h	Max. flow l/h
20	36	716
23	38	767
26	41	816
29	43	862
32	45	905
35	47	947
38	49	986
41	51	1024
44	53	1061
47	55	1097
50	57	1131
53	58	1165
56	60	1197
59	61	1229
62	63	1260
65	64	1290

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.


Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.0054-0.148	19-530	DN 15	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.0076-0.035	27-126	DN 15UL	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	0.0172-0.074	62-266	DN 15L	
	0.036-0.148	130-530	DN 15S	
	0.074-0.325	267-1170	DN 15H	
	-	-	DN 15	NexusValve Relax with drain Manual Relax.

**DN 15 - male/male**

Setting kPa	Min. flow l/h	Max. flow l/h
5	18	358
6	20	392
7	21	423
8	23	453
9	24	480
10	25	506
11	27	531
12	28	554
13	29	577
14	30	599
15	31	620
16	32	640
17	33	660
18	34	679
19	35	697
20	36	716
21	37	733
22	38	750
23	38	767
24	39	784
25	40	800

Setting kPa	Min. flow l/h	Max. flow l/h
20	36	716
21	37	733
23	38	767
24	39	784
25	40	800
26	41	816
28	42	847
29	43	862
30	44	876
31	45	891
33	46	919
34	47	933
35	47	947
36	48	960
38	49	986
39	50	999
40	51	1010

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.0054-0.148	19-530	DN 15	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.0076-0.035	27-126	DN 15UL	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	0.0172-0.074	62-266	DN 15L	
	0.036-0.148	130-530	DN 15S	
	0.074-0.325	267-1170	DN 15H	
	-	-	DN 15	NexusValve Relax with drain Manual Relax.

## 4. Product data sheet




### DN 20 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h
5	28	559
6	31	612
7	33	661
8	35	707
9	38	750
10	40	791
11	41	829
12	43	866
13	45	901
14	47	935
15	48	968
16	50	1000
17	52	1030
18	53	1060
19	54	1090
20	56	1120
21	57	1150
22	59	1170
23	60	1200
24	61	1230
25	63	1250

Setting kPa	Min. flow l/h	Max. flow l/h
20	56	1120
21	57	1150
22	59	1170
24	61	1230
25	63	1250
26	64	1280
27	65	1300
29	67	1350
30	68	1370
31	70	1390
33	72	1440
34	73	1460
35	74	1480
37	76	1520
38	77	1540
39	78	1560
40	79	1580

Setting kPa	Min. flow l/h	Max. flow l/h
20	56	1118
23	60	1199
26	64	1275
29	67	1346
32	71	1414
35	74	1479
38	77	1541
41	80	1601
44	83	1658
47	86	1714
50	88	1768
53	91	1820
56	94	1871
59	96	1920
62	98	1969
65	101	2016

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.015-0.325	55-1170	DN 20	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.036-0.148 0.074-0.325 0.142-0.603	130-530 267-1170 511-2170	DN 20L DN 20S DN 20H	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	-	-	DN 20	NexusValve Relax with drain Manual Relax.




### DN 25 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h
5	45	894
6	49	980
7	53	1060
8	57	1130
9	60	1200
10	63	1270
11	66	1330
12	69	1390
13	72	1440
14	75	1500
15	77	1550
16	80	1600
17	82	1650
18	85	1700
19	87	1740
20	89	1790
21	92	1830
22	94	1880
23	96	1920
24	98	1960
25	100	2000

Setting kPa	Min. flow l/h	Max. flow l/h
20	89	1790
22	94	1880
24	98	1960
26	102	2040
28	106	2120
30	110	2190
32	113	2260
34	117	2330
36	120	2400
38	123	2470
40	126	2530

Setting kPa	Min. flow l/h	Max. flow l/h
20	89	1789
23	96	1918
26	102	2040
29	108	2154
32	113	2263
35	118	2366
38	123	2466
41	128	2561
44	133	2653
47	137	2742
50	141	2828
53	146	2912
56	150	2993
59	154	3072
62	157	3150
65	161	3225

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.023-0.603	84-2170	DN 20	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.142-0.603 0.29-1.25	511-2170 1044-4500	DN 25S DN 25H	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	-	-	DN 20	NexusValve Relax with drain Manual Relax.

## 4. Product data sheet




### DN 32 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h
5	70	1410
6	77	1540
7	83	1670
8	89	1780
9	95	1890
10	100	1990
11	104	2090
12	109	2180
13	114	2270
14	118	2360
15	122	2440
16	126	2520
17	130	2600
18	134	2670
19	137	2750
20	141	2820
21	144	2890
22	148	2960
23	151	3020
24	154	3090
25	158	3150

Setting kPa	Min. flow l/h	Max. flow l/h
20	141	2820
22	148	2960
24	154	3090
26	161	3210
28	167	3330
30	173	3450
32	178	3560
34	184	3670
36	189	3780
38	194	3880
40	199	3980

Setting kPa	Min. flow l/h	Max. flow l/h
20	141	2817
23	151	3021
26	161	3212
29	170	3393
32	178	3564
35	186	3727
38	194	3884
41	202	4034
44	209	4179
47	216	4319
50	223	4455
53	229	4586
56	236	4714
59	242	4839
62	248	4961
65	254	5079




The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.087-1.25	310-4500	DN 32	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.29-125	1044-4500	DN 32H	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	-	-	DN 32	NexusValve Relax with drain Manual Relax.

### DN 40 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h
5	112	2240	20	224	4470	35	296	5920
6	122	2450	21	229	4580	37	304	6080
7	132	2650	22	235	4690	39	312	6250
8	141	2830	23	240	4800	41	320	6400
9	150	3000	24	245	4900	43	328	6560
10	158	3160	25	250	5000	45	335	6710
11	166	3320	26	255	5100	47	343	6860
12	173	3460	27	260	5200	49	350	7000
13	180	3610	28	265	5290	51	357	7140
14	187	3740	29	269	5390	53	364	7280
15	194	3870	30	274	5480	55	371	7420
16	200	4000	31	278	5570	57	377	7550
17	206	4120	32	283	5660	59	384	7680
18	212	4240	33	287	5750	61	391	7810
19	218	4360	34	292	5830	63	397	7940
20	224	4470	35	296	5920	65	403	8060
21	229	4580	36	300	6000	67	409	8190
22	235	4690	37	304	6080	69	415	8310
23	240	4800	38	308	6160	71	421	8430
24	245	4900	39	312	6250	73	427	8540
25	250	5000	40	316	6330	75	433	8660

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.13-1.88	450-6770	DN 40	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.44-1.88	1584-6760	DN 40H	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	-	-	DN 20	NexusValve Relax with drain – Manual Relax.





## 4. Product data sheet

### DN 50 - female/female

Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h
5	224	4470	20	447	8940	35	592	11830	60	775	15490
6	245	4900	21	458	9170	37	608	12170	62	787	15750
7	265	5290	22	469	9380	39	624	12490	64	800	16000
8	283	5660	23	480	9590	41	640	12810	66	812	16250
9	300	6000	24	490	9800	43	656	13120	68	825	16500
10	316	6330	25	500	10000	45	671	13420	70	837	16730
11	332	6630	26	510	10200	47	686	13710	72	849	16970
12	346	6930	27	520	10390	49	700	14000	74	860	17210
13	361	7210	28	529	10580	51	714	14280	76	872	17440
14	374	7480	29	539	10770	53	728	14560	78	883	17660
15	387	7750	30	548	10950	55	742	14830	80	894	17890
16	400	8000	31	557	11140	57	755	15100	82	906	18110
17	412	8250	32	566	11310	59	768	15360	84	917	18330
18	424	8490	33	574	11490	61	781	15620	86	927	18550
19	436	8720	34	583	11660	63	794	15880	88	938	18760
20	447	8940	35	592	11830	65	806	16130	90	949	18970
21	458	9170	36	600	12000	67	819	16370	92	959	19180
22	469	9380	37	608	12170	69	831	16610	94	970	19390
23	480	9590	38	616	12330	71	843	16850	96	980	19600
24	490	9800	39	624	12490	73	854	17090	98	990	19800
25	500	10000	40	632	12650	75	866	17320	100	1000	20000


The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	0.27-3.51	960-12640	DN 50	NexusValve Vertex with drain. Flow diagram can be found in Manual Vertex.
	0.82-3.51	2952-12630	DN 50H	NexusValve Fluctus with drain. Flow diagrams can be found in Manual Fluctus.
	-	-	DN 50	NexusValve Relax with drain – Manual Relax.

### DN 65 - flange/flange

20-80 kPa			20-80 kPa			70-130 kPa			70-130 kPa		
Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h
20	1040	25940	50	1640	41010	70	1940	48530	100	2320	58000
22	1090	27200	52	1670	41820	72	1970	49220	102	2340	58580
24	1140	28410	54	1710	42620	74	2000	49890	104	2370	59150
26	1180	29570	56	1740	43400	76	2020	50560	106	2390	59720
28	1230	30690	58	1770	44170	78	2050	51220	108	2410	60280
30	1270	31770	60	1800	44930	80	2080	51880	110	2430	60830
32	1310	32810	62	1830	45670	82	2100	52520	112	2460	61380
34	1350	33820	64	1860	46400	84	2130	53160	114	2480	61930
36	1390	34800	66	1890	47120	86	2150	53790	116	2500	62470
38	1430	35750	68	1910	47830	88	2180	54410	118	2520	63000
40	1470	36680	70	1940	48530	90	2200	55020	120	2540	63540
42	1500	37590	72	1970	49220	92	2230	55630	122	2560	64060
44	1540	38470	74	2000	49890	94	2250	56230	124	2580	64590
46	1570	39340	76	2020	50560	96	2270	56830	126	2600	65110
48	1610	40180	78	2050	51220	98	2300	57420	128	2630	65620
			80	2080	51880				130	2650	66130

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.


Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	1.8-7.00	650-25200	DN 65	NexusValve Fluctus with Combi Drain Maxi for capillary tube connection (Combi Drain Maxi is provided as an accessory). Flow diagram – Manual Fluctus
	3.5-15.0	12600-54000	DN 80	
	6.2-26.0	22300-93600	DN 100	

## 4. Product data sheet

### DN 80 - flange/flange

20-80 kPa			20-80 kPa			70-130 kPa			70-130 kPa		
Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h	Setting kPa	Min. flow l/h	Max. flow l/h
20	1430	35780	50	2260	56570	60	2480	61970	90	3040	75900
22	1500	37520	52	2310	57690	62	2520	63000	92	3070	76730
24	1570	39190	54	2350	58790	64	2560	64000	94	3100	77560
26	1630	40790	56	2400	59870	66	2600	64990	96	3140	78380
28	1690	42330	58	2440	60930	68	2640	65970	98	3170	79200
30	1750	43820	60	2480	61970	70	2680	66930	100	3200	80000
32	1810	45260	62	2520	63000	72	2720	67880	102	3230	80800
34	1870	46650	64	2560	64000	74	2750	68820	104	3260	81580
36	1920	48000	66	2600	64990	76	2790	69740	106	3300	82370
38	1970	49320	68	2640	65970	78	2830	70650	108	3330	83140
40	2020	50600	70	2680	66930	80	2860	71550	110	3360	83910
42	2070	51850	72	2720	67880	82	2900	72440	112	3390	84670
44	2120	53070	74	2750	68820	84	2930	73320	114	3420	85420
46	2170	54260	76	2790	69740	86	2970	74190	116	3450	86160
48	2220	55430	78	2830	70650	88	3000	75050	118	3480	86900
			80	2860	71550				120	3510	87640

The NexusValve Passim can be combined with the NexusValve Vertex or the NexusValve Fluctus to provide constant differential pressure in the controlled part of the system as well as to ensure the option of limiting the maximum flow. For more details the application examples must be consulted.

Partner valve	Flow range		Dimension	Description
	l/s	l/h		
	1.8-7.00	650-25200	DN 65	NexusValve Fluctus with Combi Drain Maxi for capillary tube connection (Combi Drain Maxi is provided as an accessory). Flow diagram – Manual Fluctus
	3.5-15.0	12600-54000	DN 80	

## 4.5 Valve setting

The NexusValve Passim DN 15 is provided with two pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

### DN 15 - female/female

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	21
2	22
3	24
4	25
5	26
6	27
7	29
8	30
9	31
10	33
11	34
12	35
13	37
14	38
15	39
16	40

Differential pressure setting range 20-65 kPa	
Turns	kPa
2	20
3	23
4	26
5	29
6	32
7	35
8	38
9	41
10	44
11	47
12	50
13	53
14	56
15	59
16	62
17	65

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
20-65 kPa	40 kPa

### Other settingsFactory setting



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

## 4. Product data sheet

The NexusValve Passim DN 15 is provided with two pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

### DN 15 - male/male

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	21
2	22
3	24
4	25
5	26
6	27
7	29
8	30
9	31
10	33
11	34
12	35
13	37
14	38
15	39
16	40

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa

### Other settingsFactory setting



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

NexusValve Passim DN 20 is provided with two pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

**DN 20 - female/female**

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	21
2	22
3	24
4	25
5	26
6	27
7	29
8	30
9	31
10	33
11	34
12	35
13	37
14	38
15	39
16	40

Differential pressure setting range 20-65 kPa	
Turns	kPa
2	20
3	23
4	26
5	29
6	32
7	35
8	38
9	41
10	44
11	47
12	50
13	53
14	56
15	59
16	62
17	65

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
20-65 kPa	40 kPa

**Other settingsFactory setting**



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

## 4. Product data sheet

NexusValve Passim DN 25 is provided with two pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

### DN 25 - female/female

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	22
2	24
3	26
4	28
5	30
6	32
7	34
8	36
9	38
10	40

Differential pressure setting range 20-65 kPa	
Turns	kPa
2	20
3	23
4	26
5	29
6	32
7	35
8	38
9	41
10	44
11	47
12	50
13	53
14	56
15	59
16	62
17	65

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
20-65 kPa	40 kPa

### Other settingsFactory setting



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

NexusValve Passim DN 32 is provided with two pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

**DN 32 - female/female**

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	22
2	24
3	26
4	28
5	30
6	32
7	34
8	36
9	38
10	40

Differential pressure setting range 20-65 kPa	
Turns	kPa
2	20
3	23
4	26
5	29
6	32
7	35
8	38
9	41
10	44
11	47
12	50
13	53
14	56
15	59
16	62
17	65

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
20-65 kPa	40 kPa

**Other settingsFactory setting**



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.



## 4. Product data sheet

NexusValve Passim DN 40 is provided with three pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

### DN 40 - female/female

Differential pressure setting range 5-25 kPa	
Turns	kPa
0	5
1	6
2	7
3	8
4	9
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25

Differential pressure setting range 20-40 kPa	
Turns	kPa
0	20
1	21
2	22
3	23
4	24
5	25
6	26
7	27
8	28
9	29
10	30
11	31
12	32
13	33
14	34
15	35
16	36
17	37
18	38
19	39
20	40

Differential pressure setting range 35-75 kPa	
Turns	kPa
0	35
1	37
2	39
3	41
4	43
5	45
6	47
7	49
8	51
9	53
10	55
11	57
12	59
13	61
14	63
15	65
16	67
17	69
18	71
19	73
20	75

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
35-75 kPa	60 kPa

### Other settingsFactory setting



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

NexusValve Passim DN 50 is provided with four pressure setting ranges. The pressure setting is carried out by means of an Allen key. The number of turns needed to obtain the required differential pressure setting is specified in the tables.

**DN 50 - female/female**

Differential pressure setting range 5-25 kPa		Differential pressure setting range 20-40 kPa		Differential pressure setting range 35-75 kPa		Differential pressure setting range 60-100 kPa	
Turns	kPa	Turns	kPa	Turns	kPa	Turns	kPa
0	5	0	20	0	35	0	60
1	6	1	21	1	37	1	62
2	7	2	22	2	39	2	64
3	8	3	23	3	41	3	66
4	9	4	24	4	43	4	68
5	10	5	25	5	45	5	70
6	11	6	26	6	47	6	72
7	12	7	27	7	49	7	74
8	13	8	28	8	51	8	76
9	14	9	29	9	53	9	78
10	15	10	30	10	55	10	80
11	16	11	31	11	57	11	82
12	17	12	32	12	59	12	84
13	18	13	33	13	61	13	86
14	19	14	34	14	63	14	88
15	20	15	35	15	65	15	90
16	21	16	36	16	67	16	92
17	22	17	37	17	69	17	94
18	23	18	38	18	71	18	96
19	24	19	39	19	73	19	98
20	25	20	40	20	75	20	100

Differential pressure setting range	Factory setting
5-25 kPa	10 kPa
20-40 kPa	30 kPa
35-75 kPa	60 kPa
60-100 kPa	80 kPa

**Other settingsFactory setting**



To set the NexusValve Passim to any other setting, turn the Allen key counterclockwise till the end point is reached and the spring is completely loosened. From this point turn the Allen key clockwise the number of turns that will give the required  $\Delta P$ -setting according to the tables above. 4 mm Allen key is used for differential pressure setting.

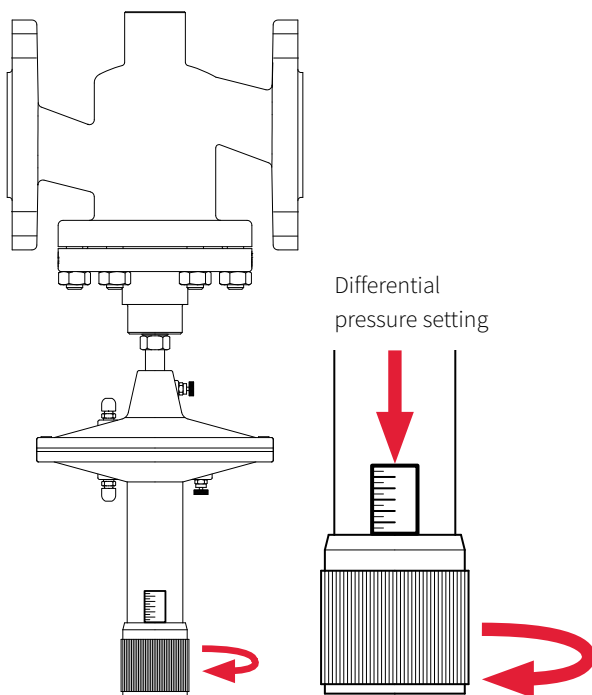
## 4. Product data sheet

### DN 65 - flange/flange

The NexusValve Passim DN 65 is provided with two differential pressure setting ranges. The differential pressure setting is carried out by means of a regulating knob. The setting scale is clearly marked on the actuator. Any differential pressure setting can be verified by checking the position of the regulating knob edge in reference to the scale.

Differential pressure setting range	Factory setting
20-80 kPa	50 kPa
70-130 kPa	100 kPa

### Other settingsFactory setting



To set the NexusValve Passim to any other setting, turn the regulating knob so that the edge of the knob points to the required differential pressure on the actuator scale.

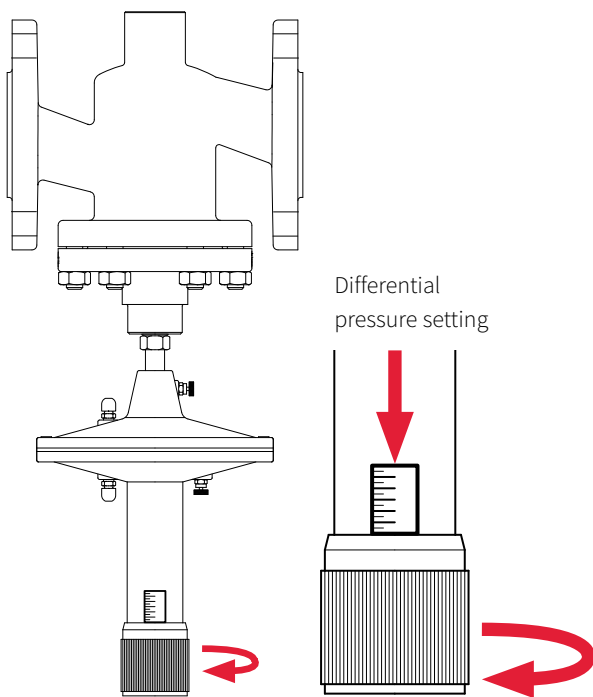
The NexusValve Passim DN 65 is provided with two capillary tubes so the valve can be installed in the supply or the return line. The valve does not offer the shut off function, thus it is recommended to install isolation valves in the system with NexusValve Passim DN 65.

**DN 80 - flange/flange**

The NexusValve Passim DN 80 is provided with two differential pressure setting ranges. The differential pressure setting is carried out by means of a regulating knob. The setting scale is clearly marked on the actuator. Any differential pressure setting can be verified by checking the position of the regulating knob edge in reference to the scale.

Differential pressure setting range	Factory setting
20-80 kPa	50 kPa
70-130 kPa	100 kPa

**Other settingsFactory setting**








To set the NexusValve Passim to any other setting, turn the regulating knob so that the edge of the knob points to the required differential pressure on the actuator scale.

The NexusValve Passim DN 80 is provided with two capillary tubes so the valve can be installed in the supply or the return line. The valve does not offer the shut off function, thus it is recommended to install service isolation valves in the system with NexusValve Passim DN 80.

## 5. Accessoires

There is a wide range of accessories and spare parts available for NexusValve Passim valves.  
These comprise: insulation jackets, press adaptors, high capacity drain valve and other

Accessories	Article	Dimension	Description
	MN80597.706	DN 15	NexusValve Vertex with drain for capillary tube connection.
	MN80597.707	DN 20	
	MN80597.708	DN 25	
	MN80597.709	DN 32	
	MN80597.710	DN 40	
	MN80597.711	DN 50	
	MN80597.530	DN 15U	NexusValve Fluctus with drain for capillary tube connection.
	MN80597.531	DN 15L	
	MN80597.532	DN 15S	
	MN80597.533	DN 15H	
	MN80597.534	DN 20L	
	MN80597.535	DN 20S	
	MN80597.536	DN 20H	
	MN80597.537	DN 25S	
	MN80597.538	DN 25H	
	MN80597.539	DN 32H	
	MN80597.540	DN 40H	
	MN80597.541	DN 50H	
	MN80597.726	DN 15	
	MN80597.727	DN 20	
MN80597.728	DN 25		
MN80597.729	DN 32		
MN80597.730	DN 40		
MN80597.731	DN 50		
			

Accessories	Article	Dimension	Description
	MN80597.0001	15 mm × ½"	Pre-sealed press adaptors (2 pcs) for valve DN 15 -50, max. 16 bar
	MN80597.0002	18 mm × ½"	
	MN80597.0003	15 mm × ¾"	
	MN80597.0004	18 mm × ¾"	
	MN80597.0005	22 mm × ¾"	
	MN80597.0006	28 mm × 1"	
	MN80597.0007	35 mm × 1¼"	
	MN80597.0008	42 mm × 1½"	
	MN80597.0009	54 mm × 2"	
	MN80597.0203	¾"	Cap with test point installed on the drain or T-piece valve of the NexusValve Passim for measuring the differential pressure during commissioning
	MN80597.471	DN 65	NexusValve Fluctus, when used as a partner valve, must be provided with Combi Drain Maxi for capillary tube connection. The drain is provided as an accessory and must be ordered separately.
	MN80597.472	DN 80	
	MN80597.473	DN 100	
	MN80597.0204	R ¼"	Combi Drain Maxi – drain with measuring point for NexusValve Fluctus DN 65 - 600. The capillary tube from the NexusValve® Passim can be connected to the ¼" coupling delivered along with the Combi Drain Maxi and installed on the drain
	MN80597.0208	1.0 m, Ø 4 mm	Capillary tube with ¼" connector for NexusValve Passim DN 15 -50
	MN80597.0209	2.0 m, Ø 4 mm	Capillary tube with ¼" connector for NexusValve Passim DN 15 -50

## 6. Sizing examples

### 6.1 DN 15-50

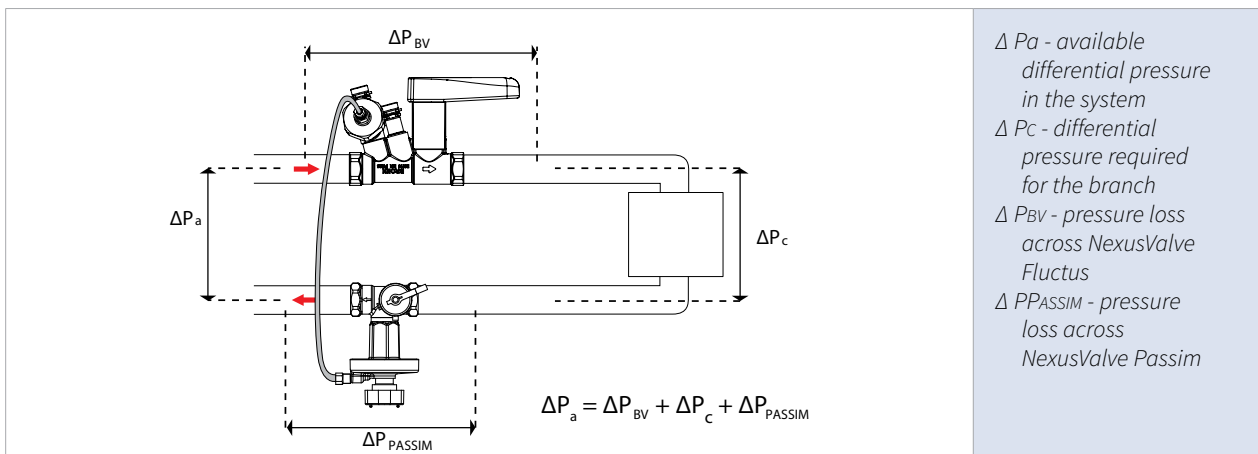
#### 6.1.1 System with NexusValve Passim and NexusValve Fluctus

A NexusValve Passim and a NexusValve Fluctus partner valve is in this example sized to the following conditions:

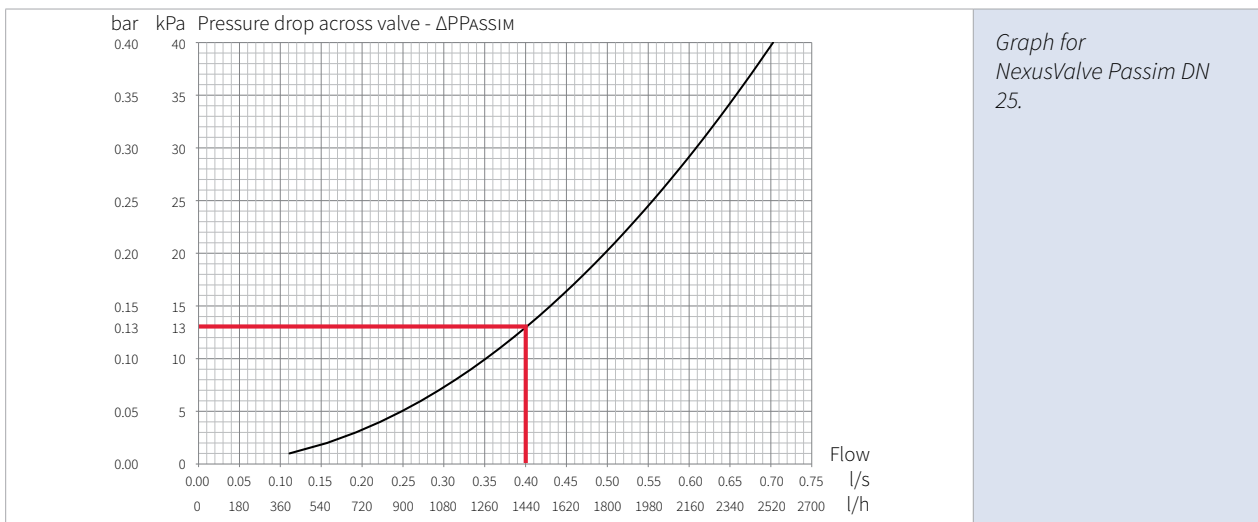
The designed branch flow controlled by the NexusValve Passim is 0.4 l/s (1440 l/h).

The available system differential pressure ( $\Delta P_a$ ) is 50 kPa.

The required branch differential pressure ( $\Delta P_c$ ) is 20 kPa.



The pressure loss across the NexusValve Passim valve is found in the product data sheet graphs.



Three valves (in fully open position) can provide the required flow of 0.4 l/s:

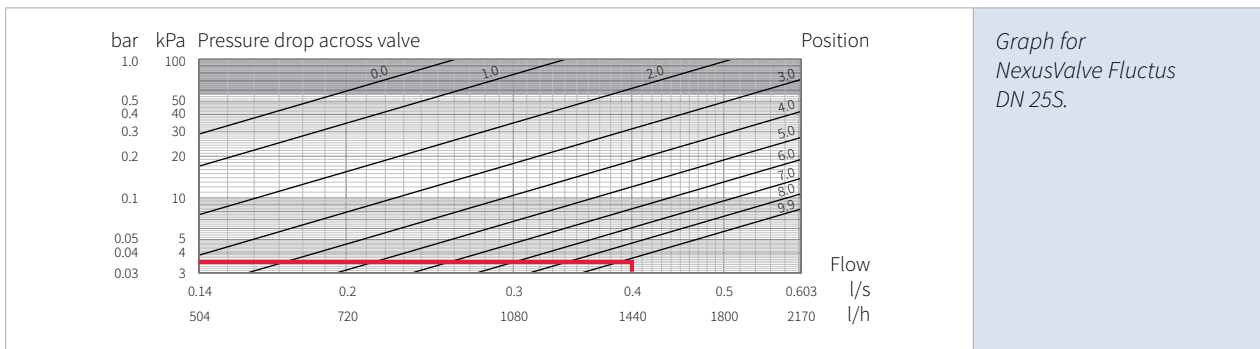
NexusValve Passim DN 20  $\Delta P_{PASSIM} = 33$  kPa

NexusValve Passim DN 25  $\Delta P_{PASSIM} = 13$  kPa

NexusValve Passim DN 32  $\Delta P_{PASSIM} = 5$  kPa

The suitable NexusValve Fluctus partner valve is selected from the flow diagrams in the Fluctus manual. It is recommended to use valves in fully open position at the required flow to reduce the pump head and save energy:

- NexusValve Fluctus DN 20H  $\Delta P_{BV} = 6.5$  kPa
- NexusValve Fluctus DN 25S  $\Delta P_{BV} = 3.5$  kPa
- NexusValve Fluctus DN 32H  $\Delta P_{BV} = 1.2$  kPa



The minimum required  $\Delta P_a$  for each valve set is calculated as follows:  $\Delta P_a = \Delta P_{BV} + \Delta P_c + \Delta P_{PASSIM}$

DN 20 Min.  $\Delta P_a = 6.5$  kPa + 20 kPa + 33 kPa = 59.5 kPa

DN 25 Min.  $\Delta P_a = 3.5$  kPa + 20 kPa + 13 kPa = 36.5 kPa

DN 32 Min.  $\Delta P_a = 1.2$  kPa + 20 kPa + 5 kPa = 26.2 kPa

To ensure the best functionality of the NexusValve Passim, the smallest possible valve is selected. However, the DN 20 solution requires minimum  $\Delta P_a$  of 59.5 kPa to operate properly, and the system provides a  $\Delta P_a$  of only 50 kPa.

Therefore the DN 25 valve is selected with an 20-40 kPa actuator.

The correct  $\Delta P$  setting on the NexusValve Passim is:  $\Delta P_{BV} + \Delta P_c = 3.5$  kPa + 20 kPa = 23.5 kPa

To make sure the NexusValve Passim valve will keep the required differential pressure ( $\Delta P_c + \Delta P_{BV}$ ) [kPa] constant within the circuit at flow 0.4 l/s, the product data sheets must be consulted.

Setting kPa	Min. flow l/h	Max. flow l/h
20	89	1790
22	94	1880
<b>24</b>	<b>98</b>	<b>1960</b>
26	102	2040
28	106	2120
30	110	2190

*Extract from the NexusValve Passim DN 25 sizing table.*

At a setting of 24 kPa, the available flow range is 98-1960 l/h and the design flow of 1440 l/h is within the range.

Articles used:

NexusValve Passim DN 25, 20-40 kPa, Article No. MN80597.526

NexusValve Fluctus with drain DN 25 S, Article No. MN80597.537



## 6. Sizing examples

### 6.1.2 System with NexusValve Passim and NexusValve Vertex

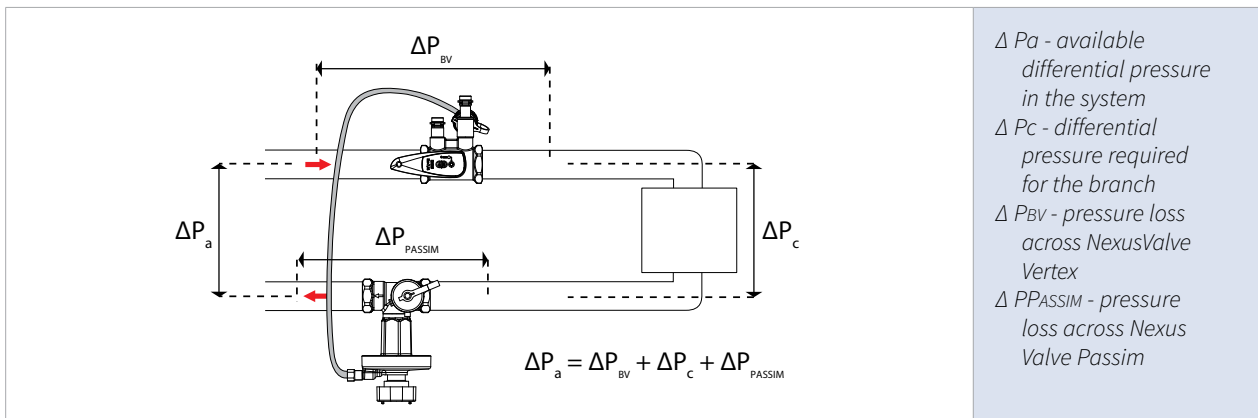
A NexusValve Passim and a NexusValve Vertex are in this example sized to the following conditions:

The designed branch flow controlled by the NexusValve Passim valve is 0.15 l/s (540 l/h).

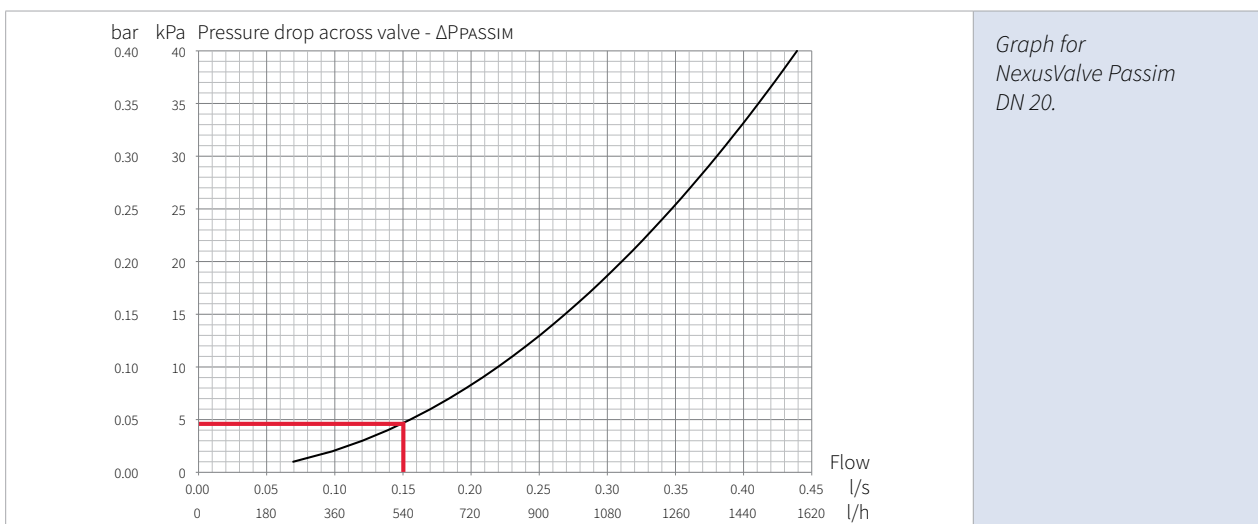
The available system differential pressure ( $\Delta P_a$ ) is 35 kPa.

The required branch differential pressure ( $\Delta P_c$ ) is 15 kPa.

The system has radiators with pre-settable thermostatic radiator valves installed. The flow can therefore be adjusted on the thermostatic radiator valves and the NexusValve Vertex can be installed outside the circuit controlled by the NexusValve Passim. Pressure loss across the NexusValve Vertex is not taken into account when setting the NexusValve Passim. The NexusValve Vertex must be in a fully open position.



The pressure loss across the NexusValve Passim valve is found in the product data sheet graphs.



Three valves (in fully open position) can provide required flow of 0.15 l/s:

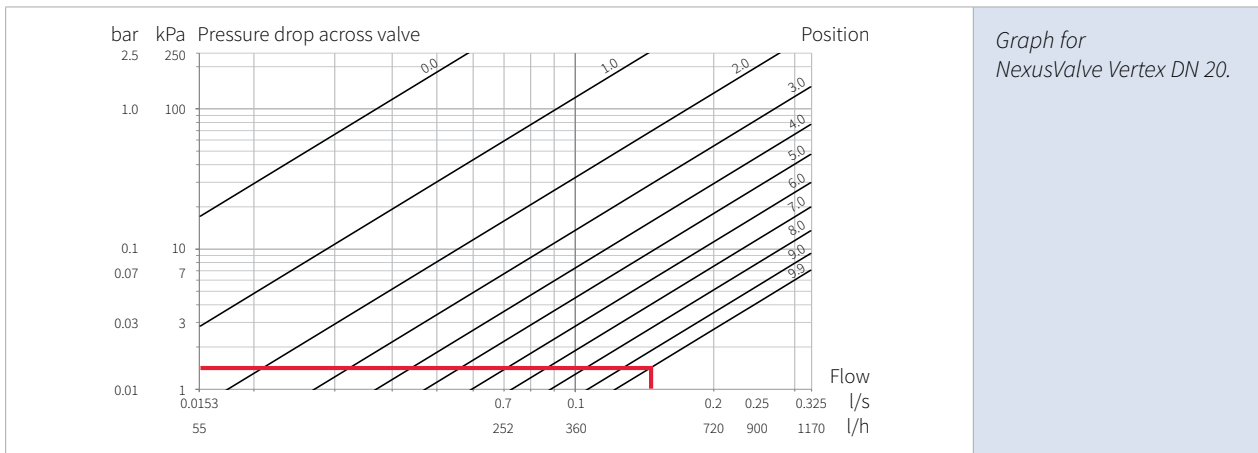
NexusValve Passim DN 15  $\Delta P_{PASSIM} = 11.5$  kPa

NexusValve Passim DN 20  $\Delta P_{PASSIM} = 4.5$  kPa

NexusValve Passim DN 25  $\Delta P_{PASSIM} = 2.0$  kPa

The suitable NexusValve Vertex partner valve is selected based on the flow diagrams in manual Vertex. It is recommended to use valves in fully open position at the required flow to reduce the pump head and save energy:

- NexusValve Vertex DN 15  $\Delta P_{BV} = 10.0$  kPa
- NexusValve Vertex DN 20  $\Delta P_{BV} = 1.5$  kPa
- NexusValve Vertex DN 25  $\Delta P_{BV} = 1.0$  kPa



The minimum required  $\Delta P_a$  for each valve set is calculated as follows:  $\Delta P_a = \Delta P_{BV} + \Delta P_c + \Delta P_{PASSIM}$

DN 15 Min.  $\Delta P_a = 10.0$  kPa +  $15.0$  kPa +  $11.5$  kPa =  $36.5$  kPa

DN 20 Min.  $\Delta P_a = 1.5$  kPa +  $15.0$  kPa +  $4.5$  kPa =  $21.0$  kPa

DN 25 Min.  $\Delta P_a = 0.5$  kPa +  $15.0$  kPa +  $2.0$  kPa =  $17.5$  kPa

To ensure the best functionality of the NexusValve Passim, the smallest possible valve is selected. However, the DN 15 solution requires minimum  $\Delta P_a$  of  $36.5$  kPa to operate properly, and the system provides a  $\Delta P_a$  of only  $35$  kPa.

Therefore the DN 20 valve is selected with an 5-25 kPa actuator.

The correct  $\Delta P$  setting on the NexusValve Passim valve is:  $\Delta P_c = 15.0$  kPa

To make sure the NexusValve Passim valve will keep the required differential pressure  $\Delta P_c$  [kPa] constant within the circuit at flow  $0.15$  l/s, the product data sheets must be consulted.

Setting kPa	Min. flow l/h	Max. flow l/h
12	43	866
13	45	901
14	47	935
<b>15</b>	<b>48</b>	<b>968</b>
16	50	1000

Extract from the NexusValve Passim DN 20 sizing table.

At a setting of  $15$  kPa, the available flow range is  $48-968$  l/h and the design flow of  $540$  l/h is within the range.

Articles used:

NexusValve Passim DN 20, 5-25 kPa, Article No. MN80597.523

NexusValve Vertex with drain DN 20 Article No. MN80597.707

## 6. Sizing examples

### 6.2 DN 65-80

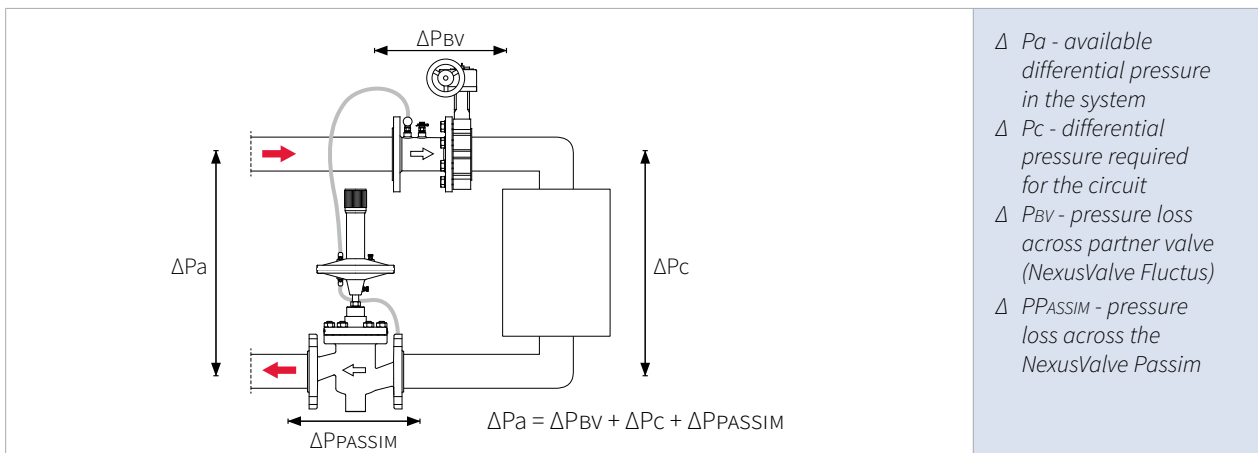
#### 6.2.1 System with NexusValve Passim and NexusValve Fluctus

A NexusValve Passim and a NexusValve Fluctus partner valve are sized to the following conditions:

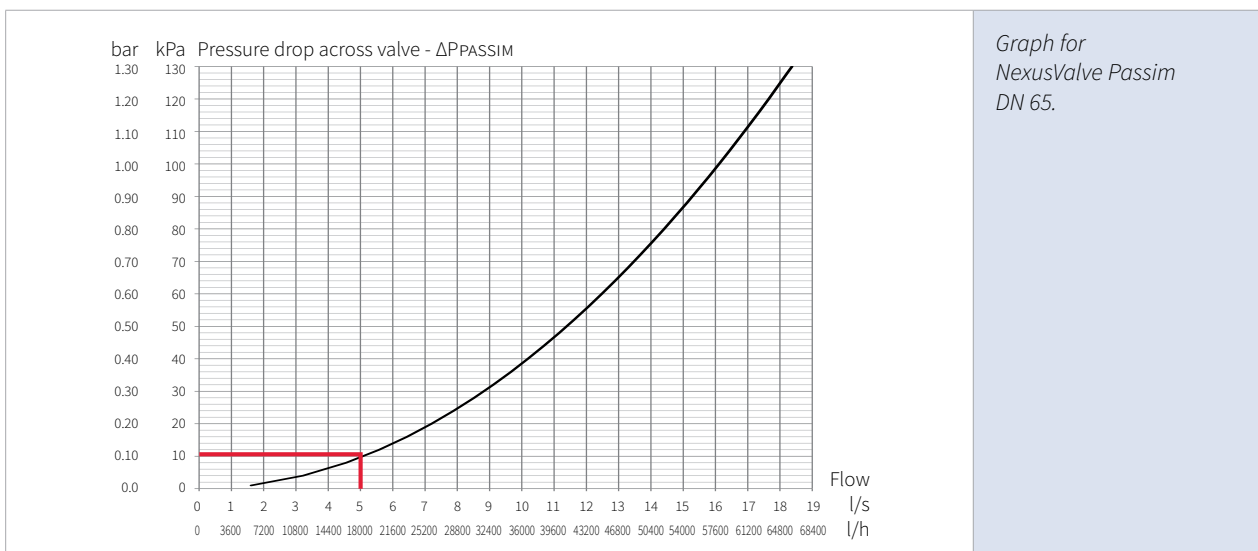
The designed branch flow controlled by the NexusValve Passim is 5.0 l/s (18000 l/h).

The available system differential pressure ( $\Delta Pa$ ) is 60 kPa.

The required branch differential pressure controlled by the NexusValve Passim ( $\Delta Pc$ ) is 40 kPa.



The pressure loss across the NexusValve Passim valve is found in the product data sheet graphs.



Two valves (in fully open position) can provide the required flow of 5.0 l/s:

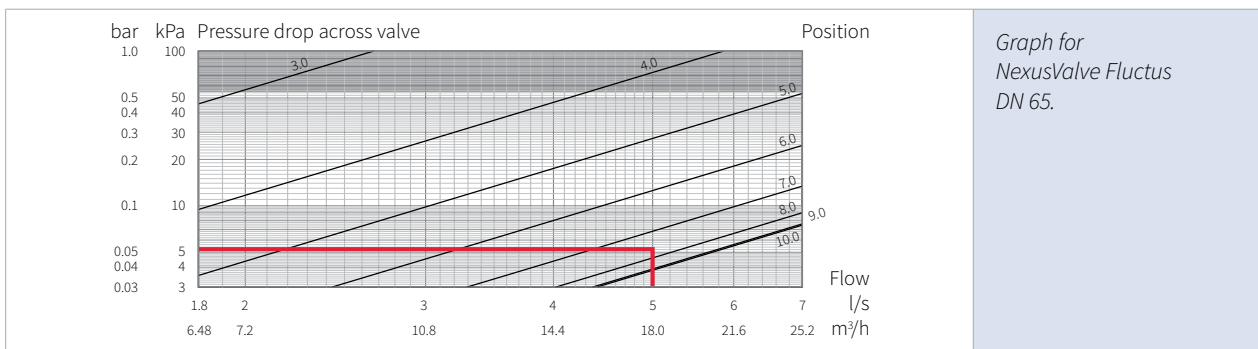
NexusValve Passim DN 65  $\Delta PPASSIM = 10$  kPa

NexusValve Passim DN 80  $\Delta PPASSIM = 5$  kPa

The suitable NexusValve Fluctus partner valves are selected based on the flow diagrams in manual Fluctus. It is recommended that the valve setting at the required flow is as close to the fully open position as possible. This enables the valve to operate at the required authority, and any valve setting change will result in a high pressure loss for precise flow adjustment:

NexusValve Fluctus DN 65,  $\Delta P_{bv} = 5.3$  kPa valve fully open

NexusValve Fluctus DN 80,  $\Delta P_{bv} = 4.0$  kPa valve in position 3.5



The minimum required  $\Delta P_a$  for each valve set is calculated as follows:

$$\Delta P_a = \Delta P_{bv} + \Delta P_c + \Delta P_{PASSIM}$$

DN 65 Min.  $\Delta P_a = 5.3$  kPa + 40 kPa + 10 kPa = 55.3 kPa

DN 80 Min.  $\Delta P_a = 4.0$  kPa + 40 kPa + 5 kPa = 49.0 kPa

To ensure the best functionality of the NexusValve Passim, the smallest possible valve is selected. Therefore the DN 65 valve is selected with an actuator 20-80 kPa.

The correct  $\Delta P$  setting on the NexusValve Passim valve is:  $\Delta P_{bv} + \Delta P_c = 5.3$  kPa + 40 kPa = 45.3 kPa

To make sure the NexusValve Passim valve will keep the required differential pressure ( $\Delta P_c + \Delta P_{bv}$ ) [kPa] constant within the circuit at flow Q [l/s], the product data sheets must be consulted. At the setting of 46 kPa, the available flow range is 1570 l/h to 39340 l/h and the design flow of 18000 l/h is within the range.

20-80 kPa		
Setting kPa	Min. flow l/h	Max. flow l/h
38	1430	35750
40	1470	36680
42	1500	37590
44	1540	38470
<b>46</b>	<b>1570</b>	<b>39340</b>

Extract of the table for NexusValve Passim DN 65.

Ordering: NexusValve Passim DN 65, Article No.: MN80597.602,

NexusValve Fluctus DN 65, Article No.: MN80597.471,

Combi Drain Maxi for capillary tube connection, Article No.: MN80597.0204

## 6. Sizing examples

### 6.3 General specifications DN 15-50

#### 1. Differential pressure control valve DN 15 - 50

1.1. The Contractor must install differential pressure control valves where indicated in drawings.

#### 2. Function

- 2.1. The valve must be used to provide constant differential pressure in the controlled circuit.
- 2.2. Differential pressure setting must be externally adjustable.
- 2.3. The positioning of the valve with actuator must be possible in all directions (360° around the pipe axis).
- 2.4. The valve must have no requirement for straight up- or downstream piping.

#### 3. Valve Body

- 3.1. The valve body must be made of hot stamped DR brass CW602N CuZn36Pb2As or of cast iron EN-GJL-250 (GG25).
- 3.2. The pressure rating must be no less than PN25 (PN16).
- 3.3. The valve must comprise differential pressure control, isolation and draining in one single unit.
- 3.4. A flow arrow must be indicated in the valve body.
- 3.5. The actuator and drain valve must be positioned perpendicular to each other.
- 3.6. Pressure testing must be possible in all directions (360° around the pipe axis) after installing a test point cap on the drain valve.

#### 4. Actuator

- 4.1. The housing of the actuator must be made of DR brass CW602N CuZn36Pb2As or of cast iron EN-GJL-250 (GG25).
- 4.2. The actuator must incorporate a handle for valve isolation.
- 4.3. The actuator must enable differential pressure setting using an Allen key.
- 4.4. Twenty 360° rotations of an Allen key must ensure the full differential pressure setting range.

## 6.4 General specifications DN 65-100

### 1. Differential pressure control valve DN 65 - 80

- 1.1. The Contractor must install the differential pressure control valve where indicated in drawings.

### 2. Function

- 2.1. The valve must be used to provide constant differential pressure in the controlled circuit.
- 2.2. Differential pressure setting must be externally adjustable.
- 2.3. The positioning of the valve with actuator must be possible in all directions (360° around the pipe axis) at a temperature range up to 120°C.
- 2.4. The valve must have no requirement for straight up- or downstream piping.

### 3. Valve Body

- 3.1. The valve body must be made of cast iron EN-GJS-400-15.
- 3.2. The pressure rating must be no less than PN16.
- 3.3. The valve must be installed in the supply or in the return line.
- 3.4. A flow arrow must be indicated on the valve body.

### 4. Actuator

- 4.1. The actuator housing must be made of cast iron.
- 4.2. The actuator must incorporate a knob for differential pressure setting.
- 4.3. The differential pressure setting scale must be marked on the actuator.
- 4.4. The edge of the regulating knob must indicate the differential pressure setting.
- 4.5. Actuators with different setting ranges must be interchangeable.

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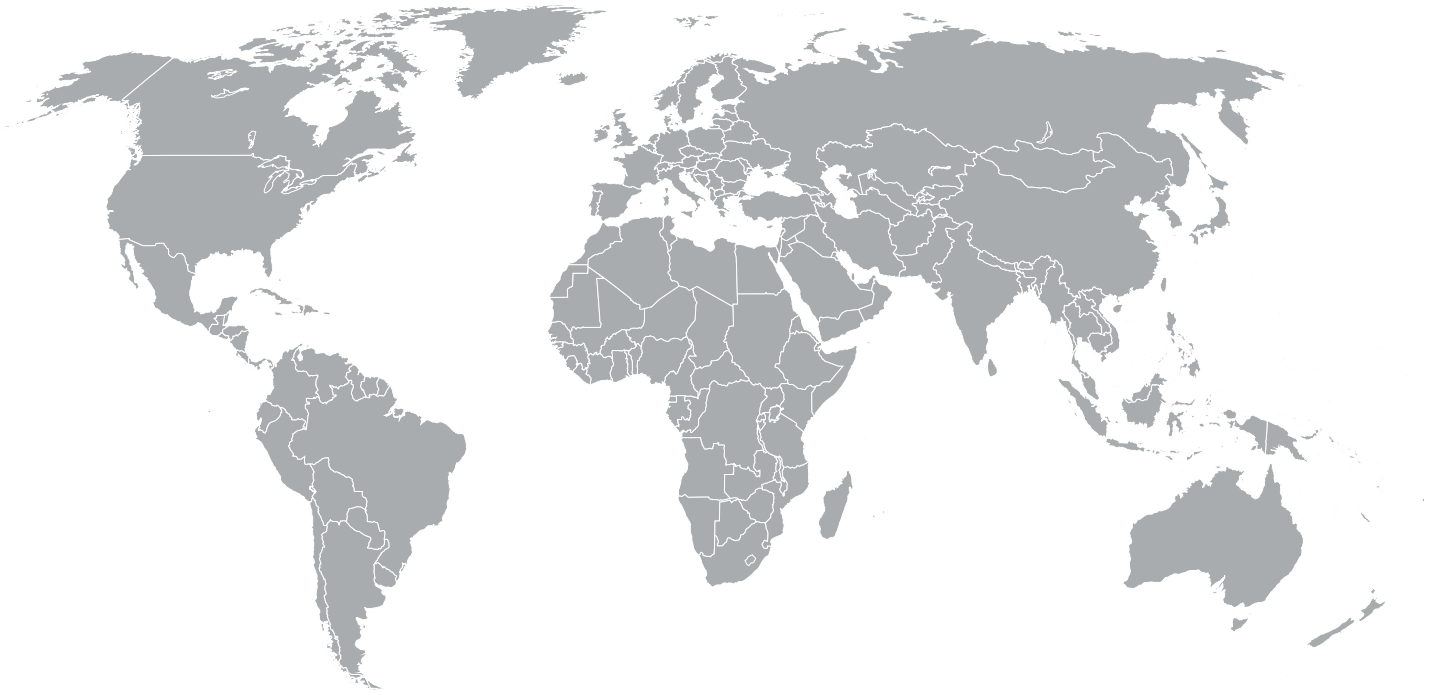
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