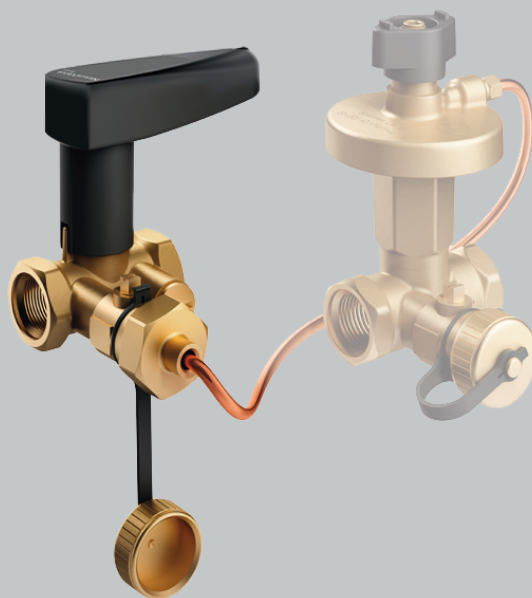




**Shut-off valve with drain
measuring function**

Nexus Valve
Relax



meibes

Table of contents

Chapter Nexus Valve Relax

1.	Safety instructions	4
1.1	Rules/regulations	4
1.2	Intended use	5
1.3	Initial operation	5
1.4	Working on the system	5
1.5	Liability	5
2.	Introduction	6
2.1	Description	6
2.2	Benefits	6
2.3	Design	7
2.4	Service and partner valve	7
2.5	Measurement	9
2.6	Mounting	10
3.	Applications	11
4.	Product data sheet	13
4.1	Product finder	13
4.2	Dimensions and Specifications	14
4.2.1	Nexus Valve Vertex DN 15-50 female/female	14
4.2.2	Nexus Valve Relax DN15-50 female/female with drain	15
4.3	Flow measuring	17
5.	Sizing examples	18
5.1	Sizing Nexus Valve Relax and Nexus Valve Fluctus	18
5.2	Sizing Nexus Valve Relax and Nexus Valve Passim	20
5.3	General specifications	22

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.

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

The Nexus Valve Relax is a shut-off valve for use in heating and cooling systems as a stand alone, service or a partner valve. The Nexus Valve Relax is available in sizes DN 15 to DN 50 in two versions. One version with plugged P/T ports and the other with a drain valve mounted. All valves are manufactured in dezincification resistant brass (DZR). In systems where double regulating valves like Nexus Valve Fluctus and Nexus Valve Vertex, or pressure independent flow control valves like Nexus Valve Vivax, are installed, Nexus Valve Relax can be used as a service valve for terminal units, branches and zones. When installed in combination with a Nexus Valve Passim, differential pressure control valve, the Nexus Valve Relax can be used as a partner valve. Connecting the valves via a capillary tube enables differential pressure stabilization in the controlled part of the system.

The Nexus Valve Relax is available with various accessories like:

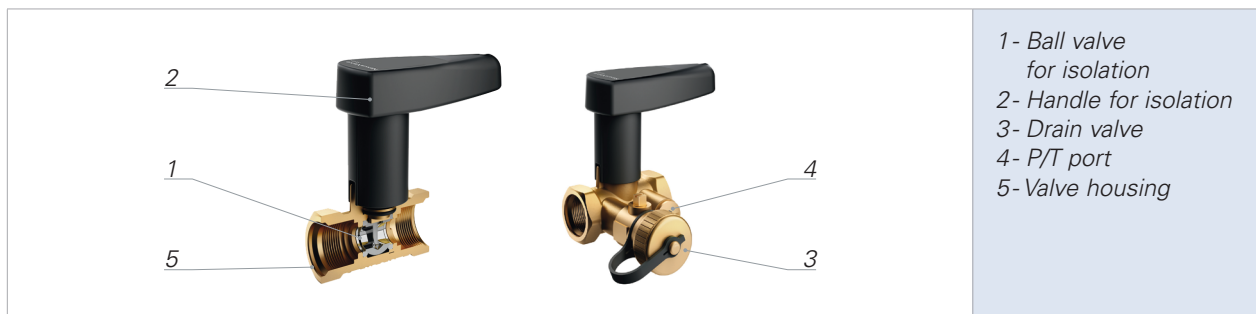
- Drain valve
- Measuring points
- Measuring points for high temperature, up to 135°C
- Cap with measuring point (installed on the drain valve)
- Combi Drain Midi (with an independent measuring point)

2.2 Benefits

- Product range from DN 15 to DN 50 for heating and cooling systems
- Isolation, drain and measuring functions all in one unit
- Compact design for installation in confined spaces
- Flow direction irrelevant for the valve installation
- Isolation of flow simply done using the quarter-turn handle
- Ideal as a service valve and partner valve

2.3 Design

The Nexus Valve Relax is designed for flow isolation as well as draining and measuring functions – all in one unit. Isolating the system flow is done by a simple quarter-turn of the handle. The position of the handle makes it at the same time easy to identify whether the valve is in an open or closed position. To enable flow measuring the optional measuring points need to be mounted in the valve.

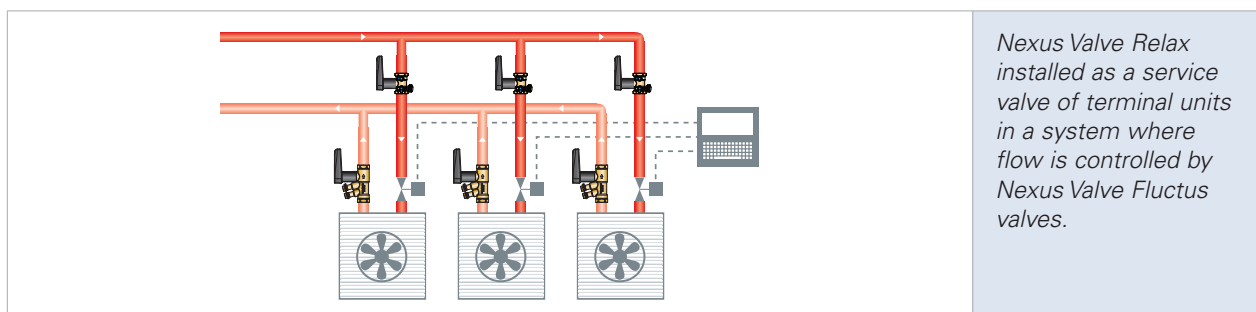


The compact design of Nexus Valve Relax ensures that the valve fits perfectly even in confined spaces where access to the system is restricted. The Nexus Valve Relax is at the same time designed for bi-directional flow making installation in any position and regardless of flow direction possible. This ensures a completely flexible and error-free installation.



2.4 Service and partner valve

The Nexus Valve Relax can be used as a service valve, for shut-off and drain functions at terminal units or circuits, when installed together with Nexus Valve Fluctus, Nexus Valve Vertex or Nexus Valve Vivax valves.



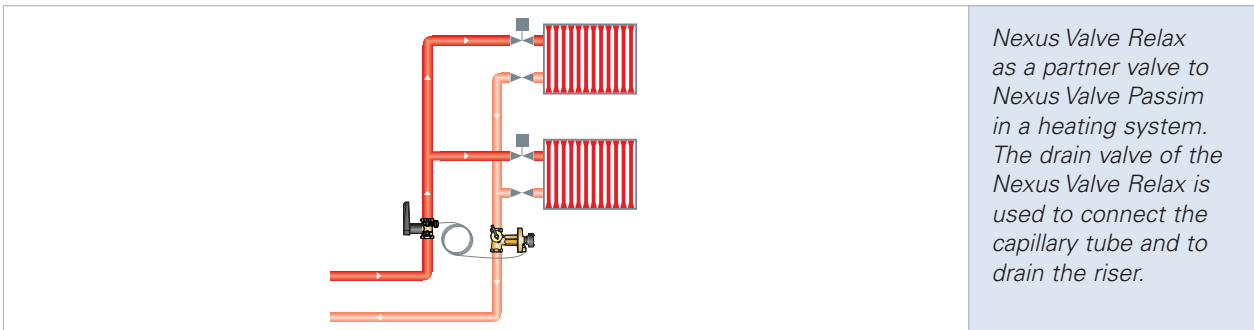
2. Introduction

The Nexus Valve Relax can be used as a partner valve together with the Nexus Valve Passim. The capillary tube is connected from the Nexus Valve Passim to the drain valve of the Nexus Valve Relax, enabling differential pressure stabilization in the controlled part of a system.



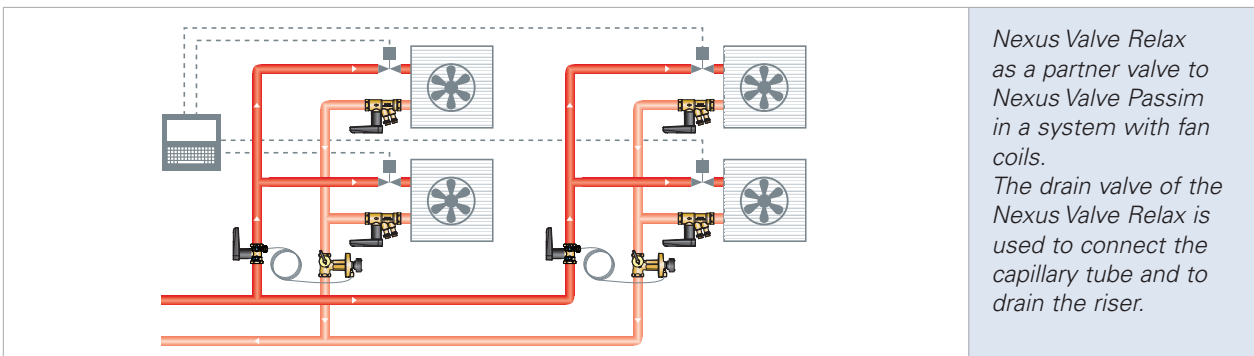
Nexus Valve Relax and Nexus Valve Passim connected via a capillary tube for differential pressure stabilization in a system.

It is recommended that the capillary tube is connected to the drain valve at the P/T port behind the shut-off ball of the Nexus Valve Relax when valves are installed in a system riser or in a branch with terminal units. By doing so the pressure loss across the Nexus Valve Relax is not included in the controlled circuit. Flow isolation and riser draining is at the same time made possible during service. This type of installation is recommended for heating systems with pre-settable thermostatic radiator valves. In such installations the required flow is achieved by pre-setting thermostatic radiator valves whereas the differential pressure stabilization keeps the flow constant.



Nexus Valve Relax as a partner valve to Nexus Valve Passim in a heating system. The drain valve of the Nexus Valve Relax is used to connect the capillary tube and to drain the riser.

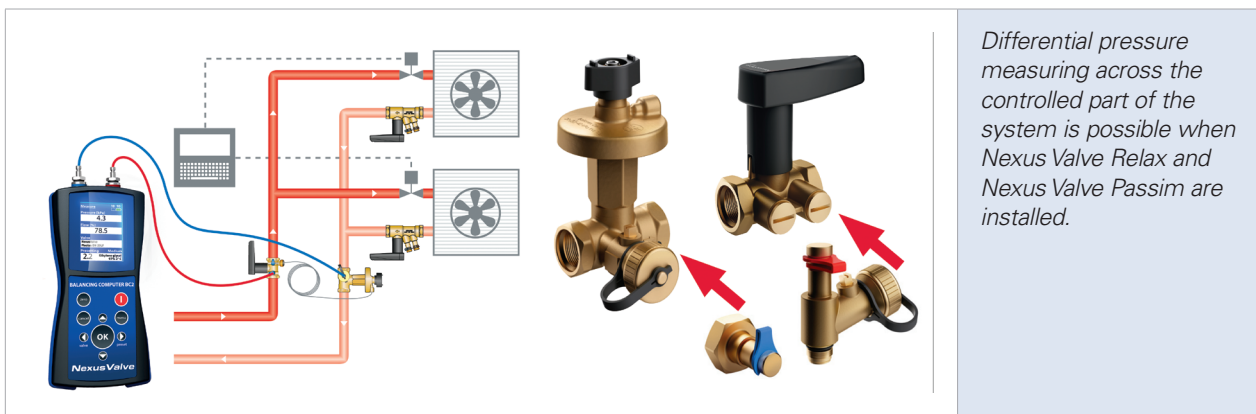
The combination of Nexus Valve Relax and Nexus Valve Passim valves can also be used in risers or branches of cooling and heating systems where balancing valves are installed at the terminal units to ensure the required flow distribution. By providing constant differential pressure in circuits, the system is divided into several smaller and independent subsystems for improved balancing. As a result the commissioning of the complete system also becomes easier.



Nexus Valve Relax as a partner valve to Nexus Valve Passim in a system with fan coils. The drain valve of the Nexus Valve Relax is used to connect the capillary tube and to drain the riser.

2.5 Measurement

When the Nexus Valve Relax is used as a partner valve together with the Nexus Valve Passim, the differential pressure setting can be verified by connecting a balancing computer to the valves during system commissioning. To enable measuring, a cap with measuring point is installed on the drain of the Nexus Valve Passim valve and a combi drain (with an independent measuring point) is installed on the Nexus Valve Relax valve. Alternatively, when the Nexus Valve Relax with drain is already installed in a system and there is a need to verify the differential pressure, a measuring point can be mounted in the factory blinded P/T port. In this way differential pressure measuring can be performed.



The Nexus Valve Relax is provided with a restricted flow shut-off ball which is used to generate pressure loss. This allows for a flow verification across the Nexus Valve Relax valve when the pressure loss across the P/T ports is at least 3.0 kPa. The measuring signal is at this point strong enough to provide accurate flow measuring. To perform a flow verification, the Kvm value (measured across the P/T ports) of the Nexus Valve Relax needs to be typed into the flow balancing computer.



More details can be found in the sizing examples and in the data sheets.

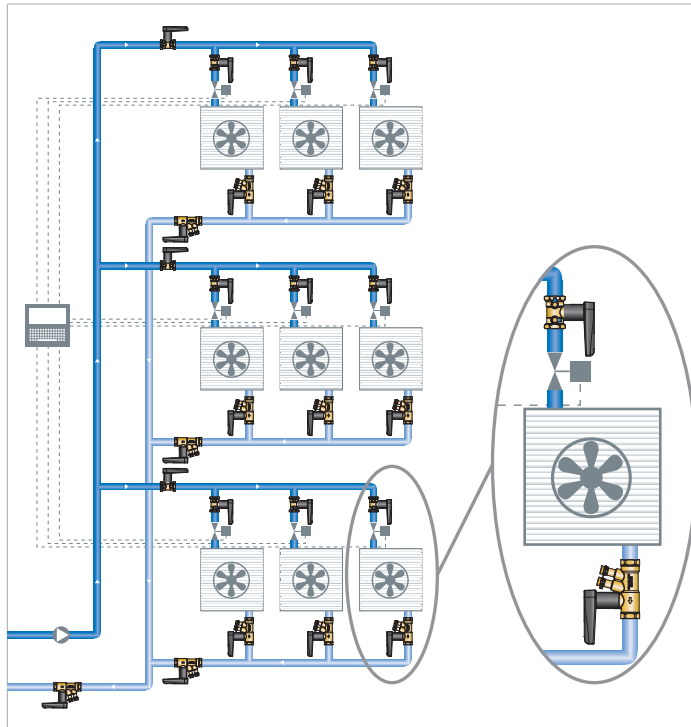
2. Introduction

2.6 Mounting

The Nexus Valve Relax can be installed regardless of the flow direction and in any position. When provided with drain valve the Nexus Valve Relax must be installed correctly: the drain valve must be mounted after the shut-off valve of the Nexus Valve Relax to be able to drain the terminal unit, circuit or zone. The Nexus Valve Relax requires the specified installation space to perform isolation by the use of the quarter-turn handle.

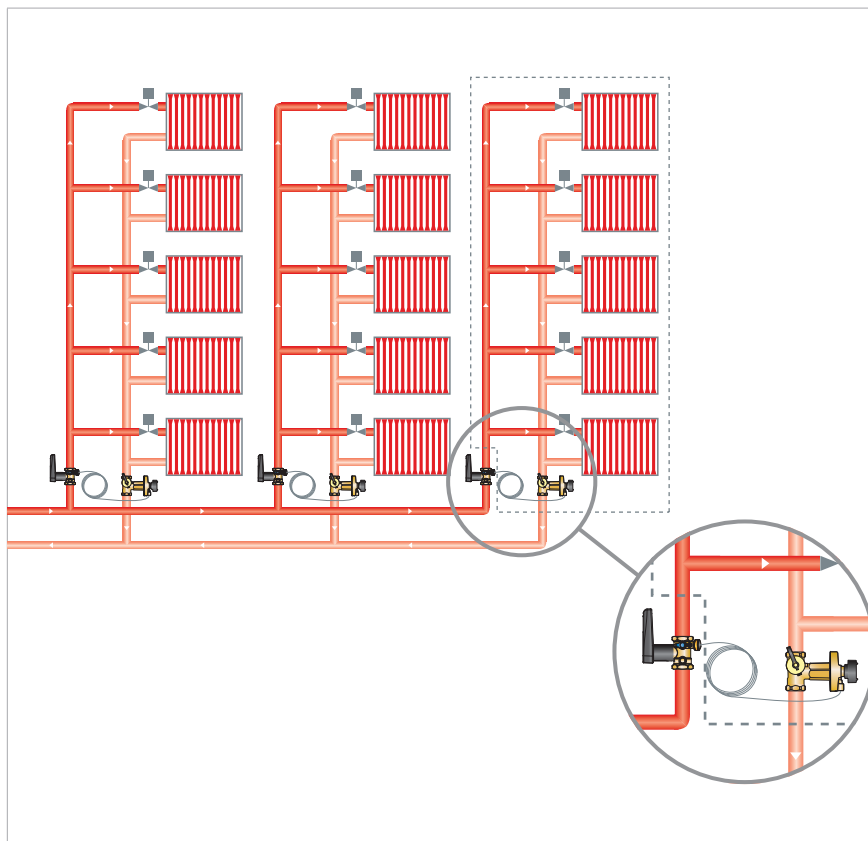
When used as a service valve the Nexus Valve Relax does not require straight piping – installation directly at bends, flexible hoses, etc. is possible. However when used for flow verification a straight pipe of 5 x pipe diameter is required when mounted after a bend and 2 x pipe diameter when mounted before a bend. The Nexus Valve Relax accessories can, after removing the plugs, be mounted into the P/T ports using a torx 27 wrench.

3. Applications



Application 1 - Fan coil - terminal unit system

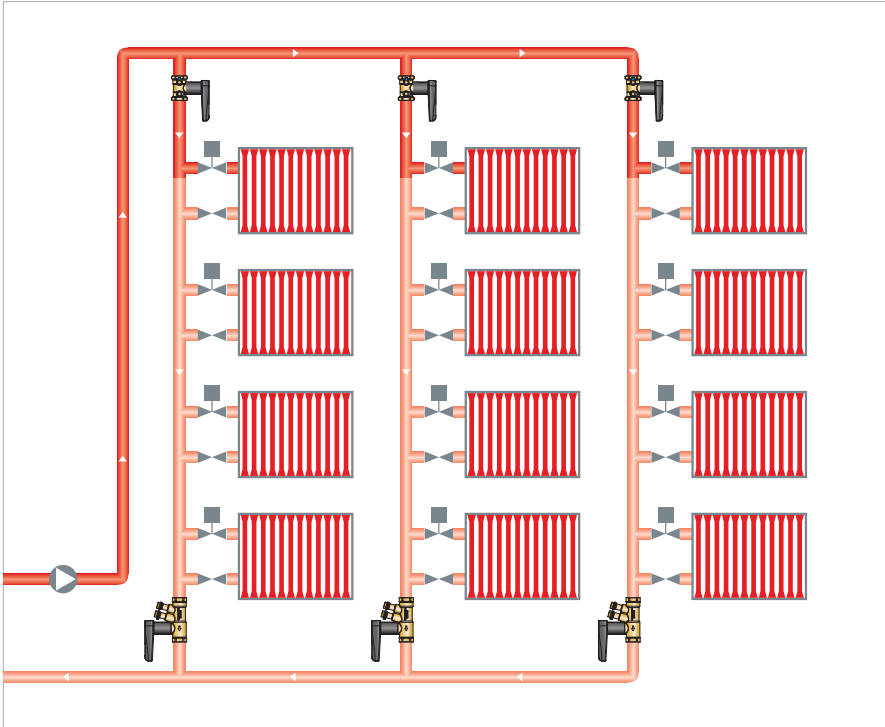
This system with fan coils has Nexus Valve Relax installed along with Nexus Valve Fluctus. The Nexus Valve Relax valves enable servicing and drainage of terminal units and system zones.



Application 2 - Central heating system with differential pressure control valves

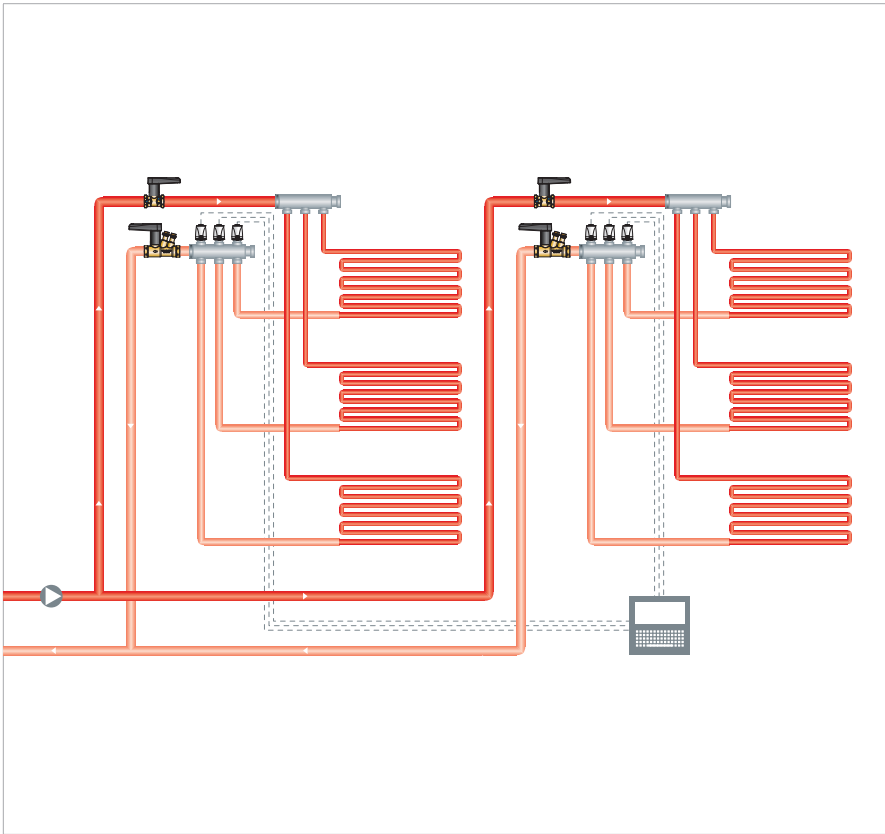
This central heating system application has pre-settable thermostatic radiator valves installed together with Nexus Valve Passim, differential pressure control valves, and Nexus Valve Relax valves. The Nexus Valve Passim is installed in the return pipe and is via a capillary tube connected to the Nexus Valve Relax installed in the supply line. This valve arrangement ensures constant differential pressure in the zone or riser, prevents possible noise across thermostatic radiator valves, and enables system service. The capillary tube must be connected to the drain mounted in the P/T port of the Nexus Valve Relax as shown to avoid including the pressure loss across the Nexus Valve Relax valve in the controlled circuit.

3. Applications



Application 3 - One-pipe heating system

In this one-pipe heating system application the flow is controlled by Nexus Valve Fluctus (or Nexus Valve Vertex) valves. The Nexus Valve Relax is installed as a service valve in the flow line.



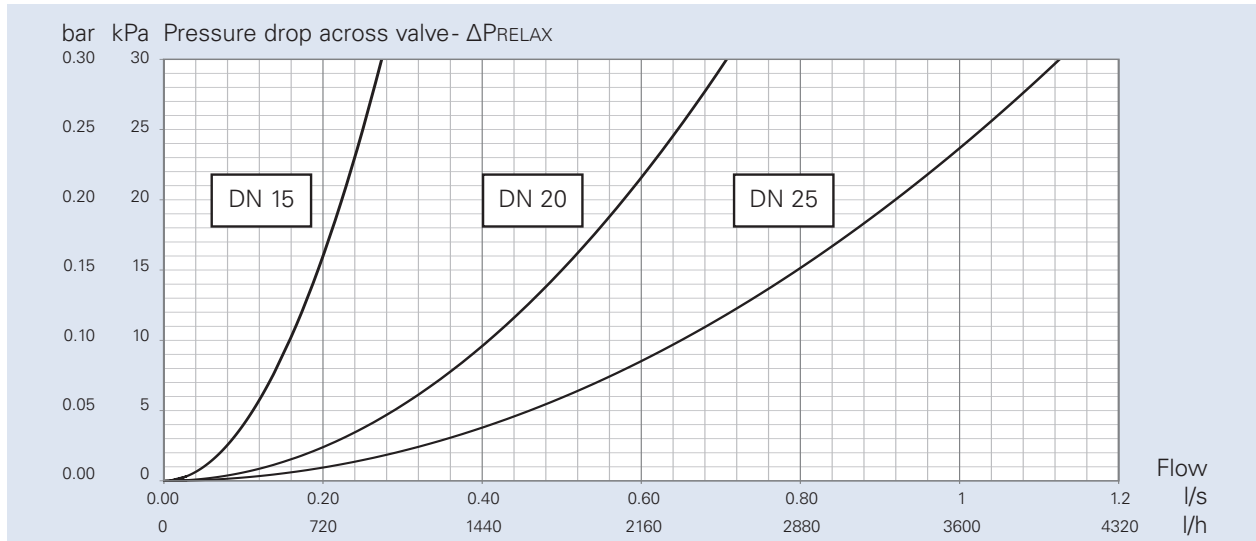
Application 4 - Underfloor heating system

In this underfloor heating system application the Nexus Valve Relax is used to isolate flow to the manifolds for service purposes.

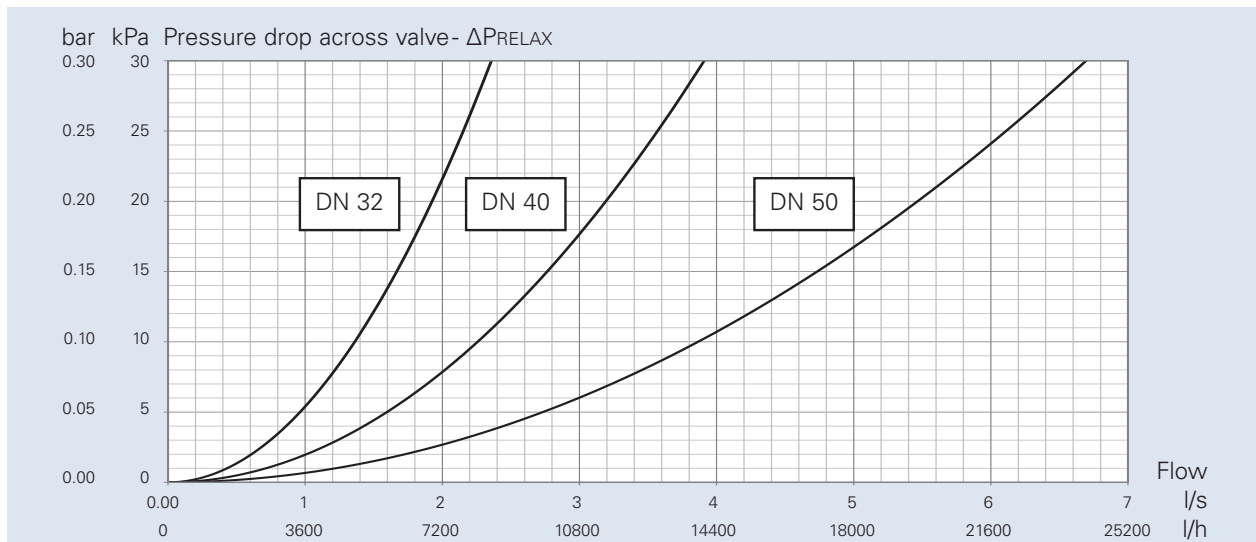
4. Product data sheet

4.1 Product finder

DN 15 - 25



DN 32 - 50

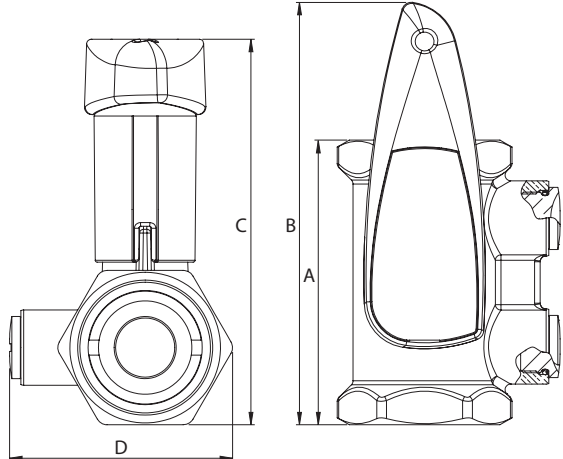


4. Product data sheet

Kvs m3/h	Dimension
1.80	DN 15
4.65	DN 20
7.40	DN 25
15.5	DN 32
25.7	DN 40
44.0	DN 50

4.2 Dimensions and Specifications

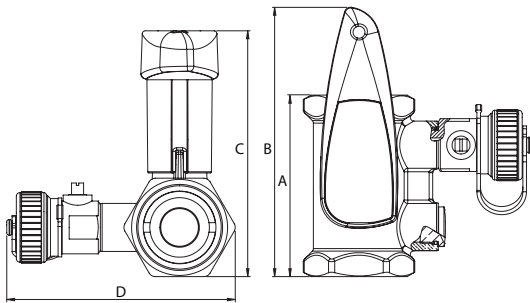
4.2.1 Nexus Valve Vertex DN 15-50 female/female

Dimensions	Specifications
 <p>The drawing shows two views of the valve. The front view on the left shows a circular valve body with a handle on top. Dimension 'D' is the diameter of the valve body. The side view on the right shows the valve's profile. Dimension 'A' is the height from the base to the handle. Dimension 'B' is the height from the base to the top of the valve body. Dimension 'C' is the height of the handle assembly.</p>	<p>Max. temperature 120°C (135°C with P/T ports plugged or high temperature measuring points)</p> <p>Min. temperature -20°C</p> <p>Max. pressure 25 bar</p> <p>Press ends 16 bar</p> <p>Marking on valve (Handle) valve name (Valve body) DN, PN</p> <p>Connection Female thread ISO 7/1 parallel</p> <p>Valve housing DR Brass CW602N CuZn36Pb2As</p> <p>Ball & needle DR Brass CW602N (chrome plated)</p> <p>Valve handle Polyamide (PA6.6 30%GF)</p> <p>Sealings O-rings EPDM, Gaskets PTFE, Test point sealing EPDM</p>

DN	A (mm)	B (mm)	C (mm)	D (mm)
DN 15	57.6	103.2	88.9	47.2
DN 20	63.2	106.0	94.2	53.2
DN 25	75.6	112.2	102.4	59.2
DN 32	89.0	165.0	137.0	67.0
DN 40	98.0	170.0	144.0	73.0
DN 50	119.0	180.0	159.0	85.0

4.2.2 Nexus Valve Relax DN15-50 female/female with drain

Dimensions



Specifications

Max. temperature	120°C (135°C with P/T ports plugged or high temperature measuring points)
Min. temperature	-20°C
Max. pressure	25 bar
Press ends	16 bar
Marking on valve	(Handle) valve name (Valve body) DN, PN
Connection	Female thread ISO 7/1 parallel
Valve housing	DR Brass CW602N CuZn36Pb2As
Ball & needle	DR Brass CW602N (chrome plated)
Valve handle	Polyamide (PA6.6 30%GF)
Sealings	O-rings EPDM, Gaskets PTFE, Test point sealing EPDM

DN	A (mm)	B (mm)	C (mm)	D (mm)
DN 15	57.6	103.2	88.9	83.2
DN 20	63.2	106.0	94.2	89.2
DN 25	75.6	112.2	102.4	95.2
DN 32	89.0	165.0	137.0	103.0
DN 40	98.0	170.0	144.0	109.0
DN 50	119.0	180.0	159.0	121.0

Note! Information on insulation jackets, press adaptors and other is provided in the chapter Accessories.

4. Product data sheet

Valve Dimension	Article	Article with drain	Norm. Inch	Kvs m ³ /h	Kvm m ³ /h
DN 15	N80597.720 	N80597.726 	½"	1.80	1.70
DN 20	N80597.721 	N80597.727 	¾"	4.65	4.20
DN 25	N80597.722 	N80597.728 	1"	7.40	6.65
DN 32	N80597.723 	N80597.729 	1 ¼"	15.5	13.4
DN 40	N80597.724 	N80597.730 	1 ½"	25.7	21.1
DN 50	N80597.725 	N80597.731 	2"	44.0	35.7

Note! The Kvs value refers to the pressure loss across the whole valve.

The Kvm value refers to the pressure loss across the measuring points and must be used only for the flow verification during system commissioning.

4.3 Flow measuring

Flow measuring is possible across a Nexus Valve Relax valve when the pressure loss across the measuring points is equal to or greater than 3.0 kPa.



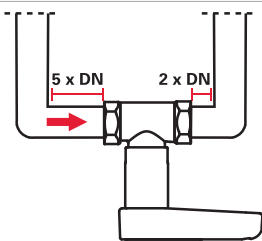
When the Nexus Valve Relax is fully open and the pressure loss across the measuring points is equal to or greater than 3.0 kPa, the Kvm can be entered into a balancing computer for flow verification.

In order to achieve at least 3.0 kPa pressure loss across the measuring points of a Nexus Valve Relax valve, the flows must be according to the below stated minimum flows values:

Kvm m ³ /h	Dimension	Minimum required flow l/h	Pressure loss across the measuring points kPa
1.70	DN 15	290	3.0
4.20	DN 20	730	3.0
6.65	DN 25	1150	3.0
13.4	DN 32	2300	3.0
21.1	DN 40	3600	3.0
35.7	DN 50	6100	3.0

The Nexus Valve Relax measurement function is particularly useful in central heating systems with pre-settable thermostatic radiator valves and differential pressure control valves installed in each riser. Flow balancing valves are not required in this type of application, but using Nexus Valve Relax as a partner valve to the Nexus Valve Passim makes it possible to verify the correct flow distribution in each riser.

Note! When verifying the flow, the Nexus Valve Relax must be always in open position.



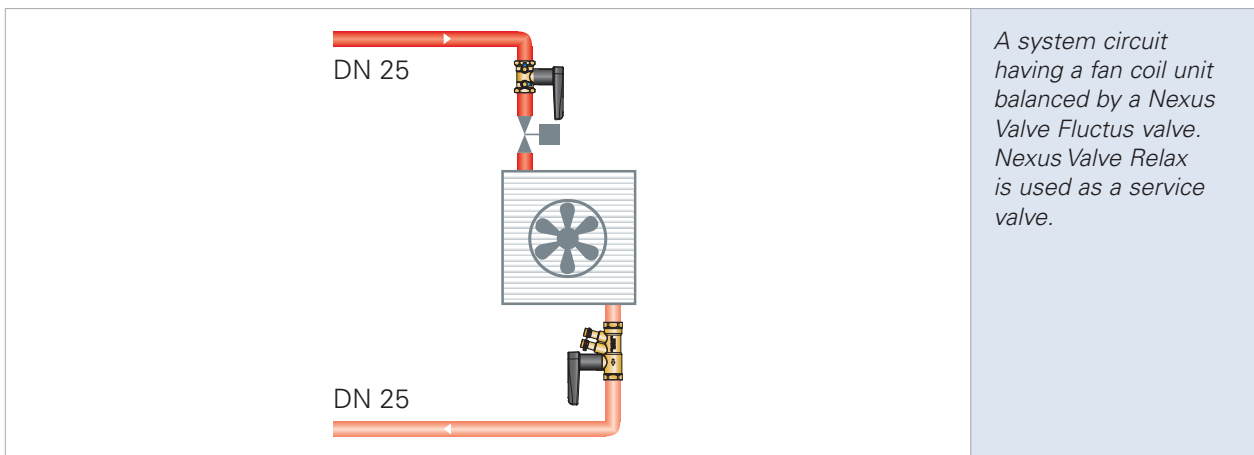
5 × DN straight piping in front of the Nexus Valve Relax valve and 2 × DN straight piping after the valve must be provided for flow verification.

5. Sizing examples

Sizing the Nexus Valve Relax is initially made according to the system pipe size used. The following examples show, however, how to size Nexus Valve valves according to the required system flow using smaller valve sizing than the system pipe.

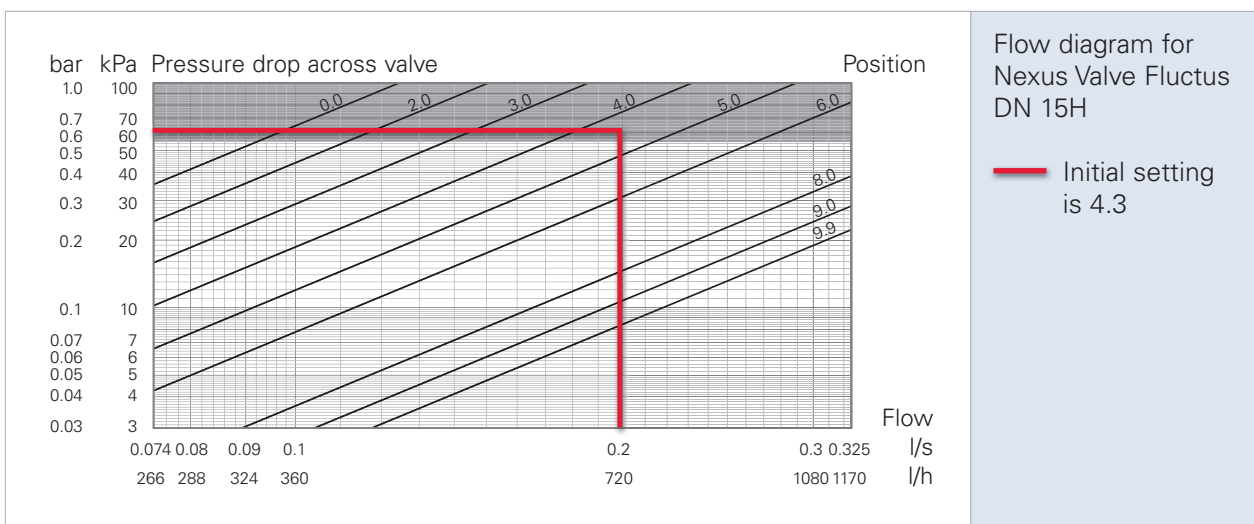
5.1 Sizing Nexus Valve Relax and Nexus Valve Fluctus

In the below system the Nexus Valve Fluctus ensures the required flow in the terminal unit whereas the motorized valve connected to a BMS system or a room thermostat controls the indoor temperature and the Nexus Valve Relax operates as a service valve.

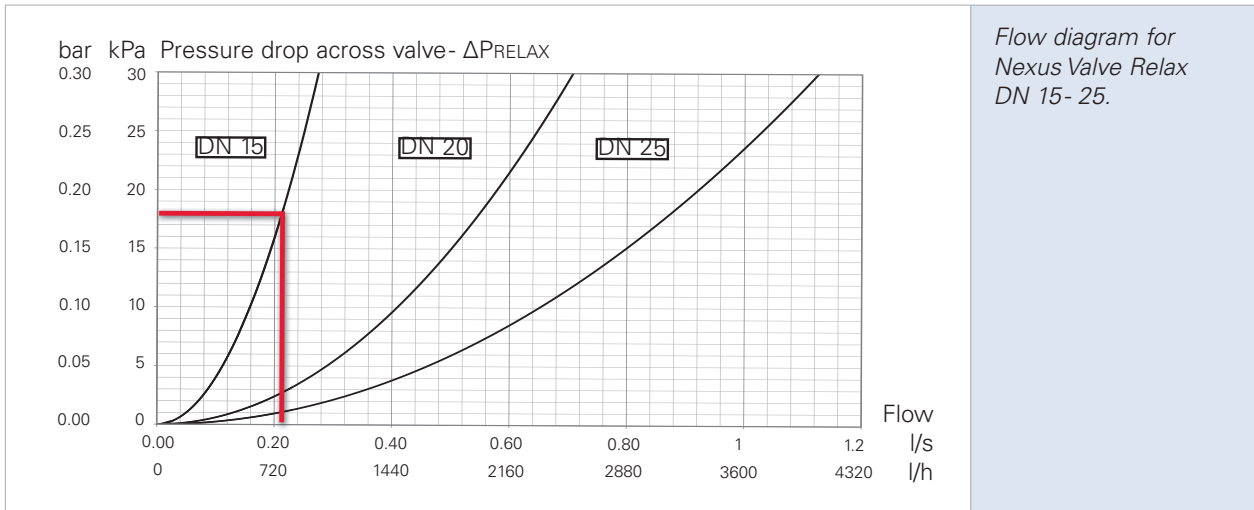


The required flow through the Nexus Valve Fluctus valve to the fan coil unit is: 0.20 l/s (720 l/h) Due to the installed pump the required pressure loss across the Nexus Valve Fluctus valve is: 65 kPa.

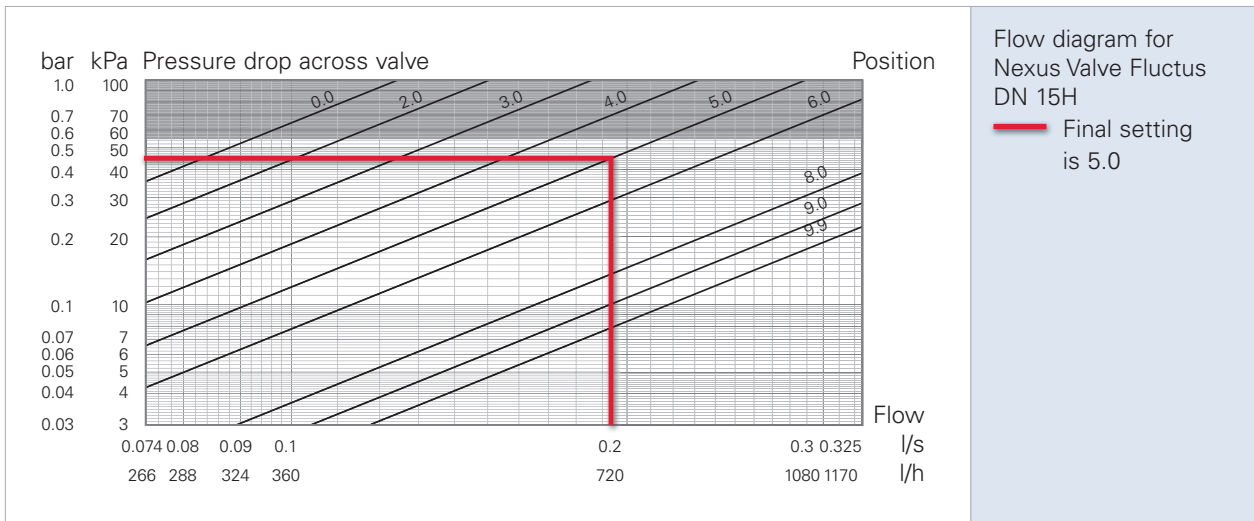
The required flow and pressure loss is reached with a Nexus Valve Fluctus DN 15H valve.



Under the same conditions the Nexus Valve Relax DN 15 is dimensioned.



Nexus Valve Relax DN 15 ensures 18.0 kPa pressure loss at the required flow of 720 l/h. As a result the required pressure loss across the Nexus Valve Fluctus DN 15H is: $DP_{bv} = 65 \text{ kPa} - 18.0 \text{ kPa} = 47.0 \text{ kPa}$.



This helps to avoid potential noise problems and lengthens the lifespan of the balancing valve.

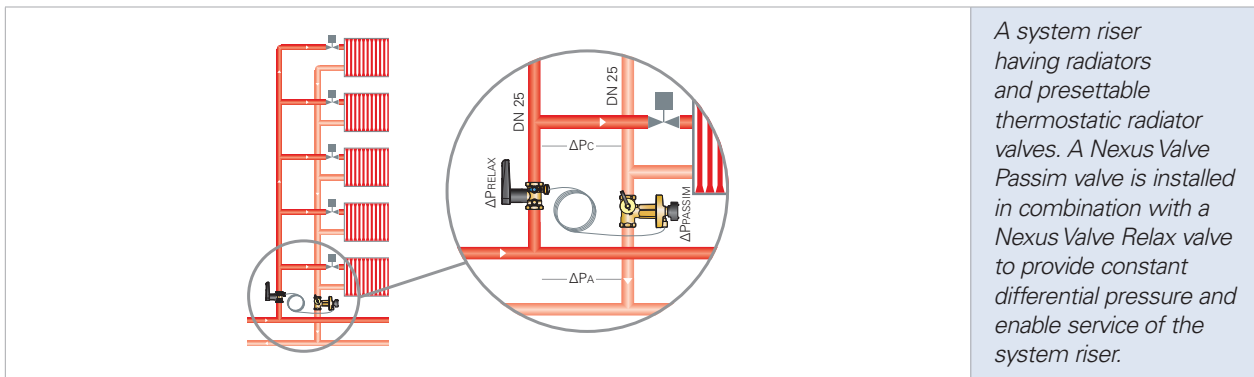
Note! Nexus Valve Relax must be either fully open or fully closed! Any intermediate position of the ball valve is not allowed.

Ordering: Nexus Valve Fluctus DN 15H, Article No.: N80597.403
Nexus Valve Relax DN 15 with drain, Article No.: N80597.726

4. Sizing examples

5.2 Sizing Nexus Valve Relax and Nexus Valve Passim

The following central heating system, consisting of several risers with radiators and pre-settable thermostatic radiator valves, has Nexus Valve Passim and Nexus Valve Relax valves installed. Nexus Valve Passim is used to provide the required differential pressure in risers whereas Nexus Valve Relax is used as a service and partner valve. The thermostatic radiator valves are pre-settable and therefore flow balancing valves are not needed in this installation.



The Nexus Valve Passim and the Nexus Valve Relax must be sized for the following riser.

The flow in the riser is: 0.25 l/s (900 l/h) and the required differential pressure is: $\Delta P_c = 15.0 \text{ kPa}$

Available riser differential pressure is: $\Delta P_A = 37.0 \text{ kPa}$

Based on above information, the following valves can be selected:

Nexus Valve Passim DN 20 at a flow of 0.25 l/s (requires 13.0 kPa Pressure loss). Nexus Valve Relax DN 25 (equal to the pipe size) at a flow of 0.25 l/s generates 1.5 kPa pressure loss (1.8 kPa across the P/T ports) or Nexus Valve Relax DN 20 which at a flow of 0.25 l/s generates 4.0 kPa pressure loss.

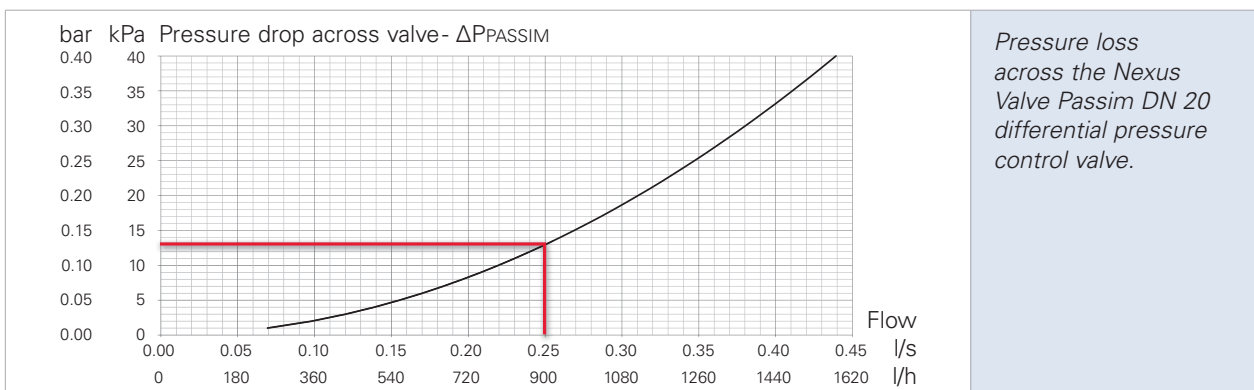
Pressure loss across the measuring points of Nexus Valve Relax DN 20 is calculated as follows:

$$\Delta P_{Bm} = \frac{Q \text{ [m}^3\text{/h]}}{Kvm \text{ [m}^3\text{/h]}} = \frac{\frac{900}{1000} \text{ m}^3\text{/h}}{4.2 \text{ m}^3\text{/h}} = 0.046 \text{ bar} = 4.6 \text{ kPa}.$$

The required riser pressure using Nexus Valve Passim DN 20 and Nexus Valve Relax DN 20 is:

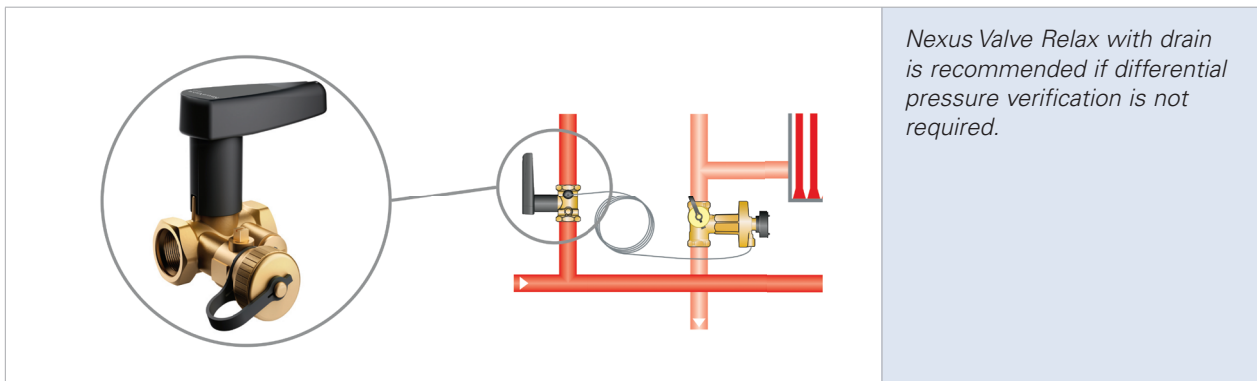
$$\Delta P_{PRELAX} + \Delta P_{PASSIM} + \Delta P_c = 4.0 + 13.0 + 15.0 \text{ kPa} = 32.0 \text{ kPa} < \Delta P_A$$

Based on this calculation Nexus Valve Relax DN 20 can be used for this application. Since the available pressure is $\Delta P_A = 37.0 \text{ kPa}$, the excess pressure ($37.0 - 32.0 = 5.0 \text{ kPa}$) is reduced by the Nexus Valve Passim valve.

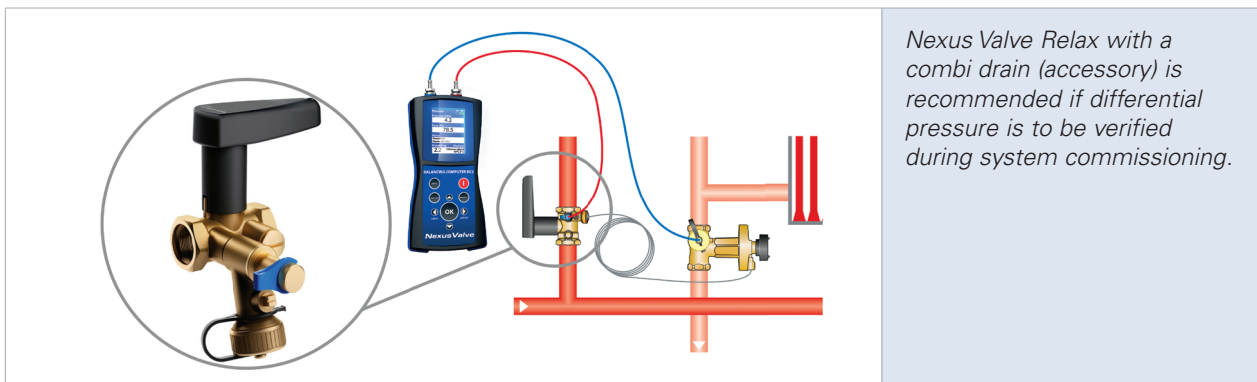


The generated pressure loss across P/T ports of the Nexus Valve Relax DN 20 is 4.6 kPa. As a result the flow across the Nexus Valve Relax DN 20 valve can be verified after providing measuring points (available as an accessory). If the flow is to be verified, straight piping of 5 × DN before and 2 × DN after the Nexus Valve Relax valve is required.

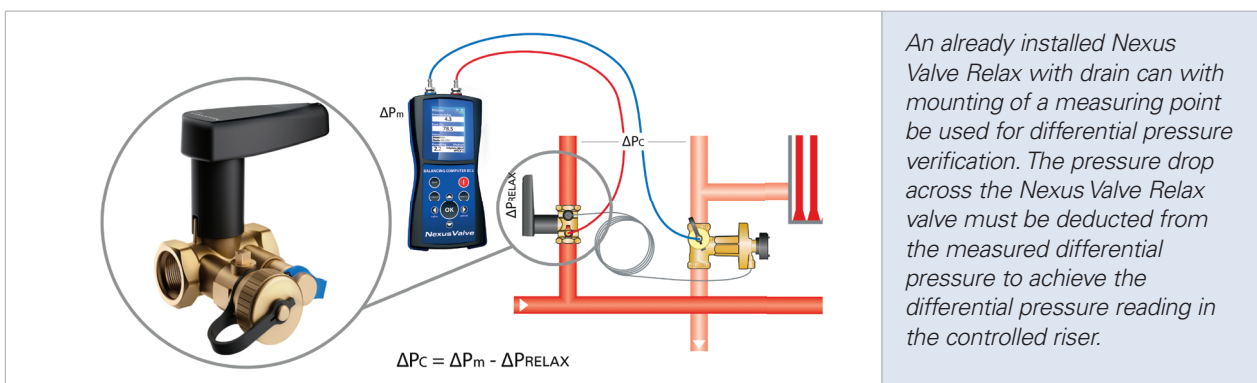
Nexus Valve Relax can be provided in three different configurations for this application, depending on the necessity for differential pressure verification in the controlled part of the riser.



Nexus Valve Relax with drain is recommended if differential pressure verification is not required.



Nexus Valve Relax with a combi drain (accessory) is recommended if differential pressure is to be verified during system commissioning.



An already installed Nexus Valve Relax with drain can with mounting of a measuring point be used for differential pressure verification. The pressure drop across the Nexus Valve Relax valve must be deducted from the measured differential pressure to achieve the differential pressure reading in the controlled riser.

Ordering:

Nexus Valve Passim DN 20, Article No.: N80597.523

Nexus Valve Relax DN 20, Article No.: N80597.721

4. Sizing examples

5.3 General specifications

1. Shut-off valve DN 15 - 50

1.1. The Contractor must install shut-off valves where indicated in drawings.

2. Valve Body

- 2.1. The valve body must be made of hot stamped DR brass CW602N CuZn36Pb2As.
- 2.2. The pressure rating must be no less than PN25 (PN16 with press adaptors).
- 2.3. The valve must be able to perform isolation and optionally draining and pressure measurement in one single unit.
- 2.4. The valve must be bi-directional to flow, and no flow arrow must be indicated in the valve body.
- 2.5. The isolation handle and the measuring points must be positioned in plane incline at an angle of 90° to each other.
- 2.6. Testing through measuring points must be possible in all valve positions.
- 2.7. One P/T port must be in front of the isolation ball and the other behind the isolation ball.
- 2.8. The valve must incorporate a restricted flow ball for the isolation and optional flow measurement.
- 2.9. The size of the valve must be clearly marked on the housing.

3. Functions

- 3.1. The valve must have a visible quarter-turn open/close function.
- 3.2. The flow measurement must be possible at pressure loss of at least 3.0 kPa.
- 3.3. Flow through the valve must be possible in both directions at the same Kv value.

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Contact data

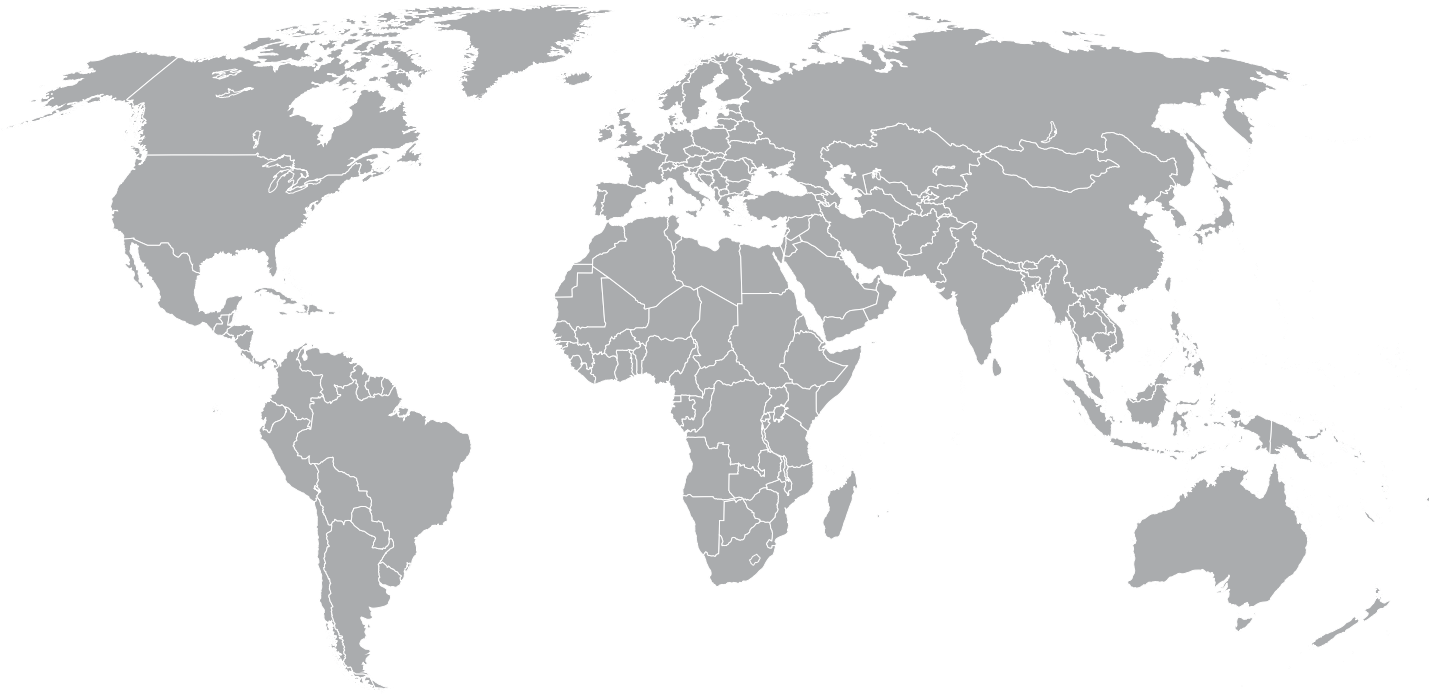
Germany

Meibes System-Technik GmbH

Ringstrasse 18

D-04827 Gerichshain

www.meibes.de



meibes-group

meibes

meibes System-Technik GmbH · Ringstraße 18 · D-04827 Gerichshain

Phone + 49(0) 3 42 92 7 13-0 · Fax + 49(0) 3 42 92 7 13-808

info@meibes.de · www.meibes.de

Subject to technical modifications

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