



Two-port valves (2-ports)



Three-port valves (3-ports)



## Two-port and three-port zone valves PN16

M..I421..

Zone valve for the control of hot or chilled water for

- Fan coil units
- Induction units
- Zones with radiators
- Floor heating via manifolds
- VAV applications
- Wall mounted boilers

### Use

- In ventilation and air conditioning systems for water-side terminal unit control in closed circuits, e.g. induction units, fan coil units, small re-heaters and small re-coolers, for use in:
  - Two-pipe systems with one heat exchanger for heating and cooling
  - Four-pipe systems with two separate heat exchangers for heating and cooling
- In closed circuit zone heating systems, e.g.
  - Individual storeys in a building
  - Apartments
  - Individual rooms

## Media

- Hot water: max. 110 °C
- Chilled water : above 2 °C
- Water containing anti-freeze agents: max. 50 % vol.

## Recommendation

Water should be treated as specified in VDI 2035

## Operating pressure

Max. 1600 kPa (16 bar) in accordance with ISO 7268 (DIN 2401)

## Type summary

DN [mm]	Connection	$k_{vs}$ [m <sup>3</sup> /h]	M..I.421... (2 ports)	$\Delta p_s$ [kPa]	MXI...421... (3 ports)	$\Delta p_{max}^{1)}$ [kPa]	Actuator Positioning force
15	R <sub>P</sub> ½"	2.0	<b>MVI421.15</b>	300	<b>MXI421.15</b>	150	<b>105N</b>
20	R <sub>P</sub> ¾"	3.5	<b>MVI421.20</b>	300	<b>MXI421.20</b>		
25	R <sub>P</sub> 1"	5.0	<b>MVI421.25</b>	150	<b>MXI421.25</b>		

1) For  $\Delta p_{max}$  = Where  $\Delta p_{max}$  is above 150 kPa, there is an increased risk of noise and erosion on the seat and plug

$\Delta p_s$  = Max. admissible pressure differential in kPa at which the valve is still capable of closing against the pressure

$\Delta p_{max}$  = Max. admissible pressure differential across the closed valve/actuator assembly

## Accessories

Typ	Designation	Switching point	Contact rating
<b>ASC2.1</b>	Auxiliary switch on / off	with approx. 50 % stroke	AC 250 V / 1 A

## Ordering

When ordering, please specify the quantity, product name and type reference

*Example*      **10 three-port valve, type MXI421.25**

## Delivery

The valves and actuators are packed together.

## Function

The zone valves are closed when de-energised. An on/off controller (thermostat) is required to drive the motorised valve actuators. If the temperature of the medium deviates from the setpoint, the controller delivers a control signal which drives the actuators, causing the valve to open. When the temperature of the medium reaches the setpoint, the control signal is cut off and the valve closes.

If required the MVI421.../MXI421... the valve can be added with an auxiliary switch ASC2.1.

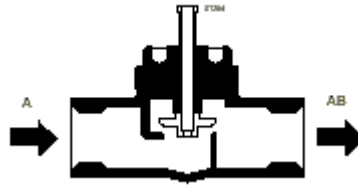
The valves should preferably be installed in the return, where the seals are exposed to lower temperatures. See also «Mounting notes» and «Commissioning notes».

**Recommendation:** A strainer should be fitted upstream of the valve.

**Two-port valves**

**(2 ports)**

MVI421...



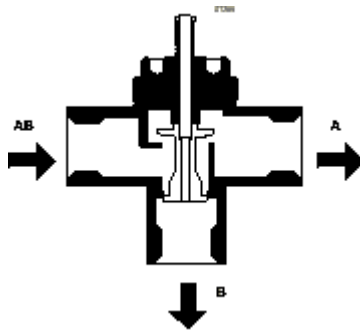
Flow only permissible in direction of arrow from AB → A (marked on valve body).

- Port AB = Variable flow through straight-through port (inlet)
- Port A = Variable flow through straight-through port (outlet)
- Stem retracted: Path AB → A closed
- Stem extended: Path AB → A open

**Three-port valves**

**(3 ports)**

MXI421



MXI421.. are diverting valves they can be used under certain circumstances as mixing valves (see «Use as mixing valves»).

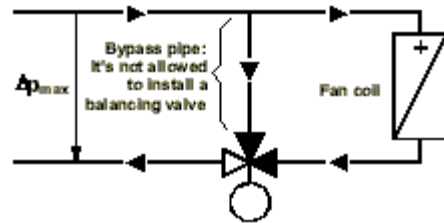
- Port AB = Constant total flow (inlet)
- Port A = Variable flow AB → A (outlet A)
- Port B = Variable flow AB → B through bypass (outlet B)
- Stem retracted: Path AB → A closed, bypass B open
- Stem extended: Path A → AB open, bypass B closed

Diverting mode:  
Flow from AB → A and B

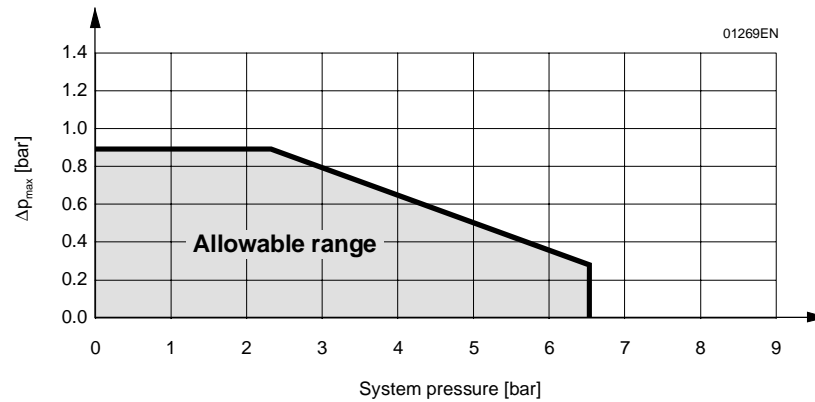
## Use as mixing valves

MXI421... are diverting valves. Under consideration of certain conditions they can be used as mixing valves too:

### Mounting in the return pipe

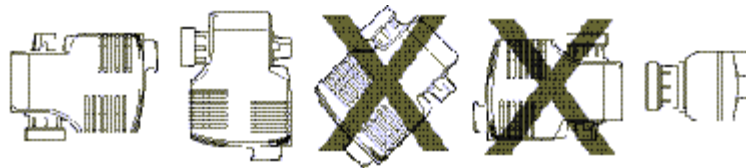


### Allowable $\Delta p_{v,max}$ in relation to the system pressure



*Example* At a system pressure of 5.5 bar (550 kPa) the maximum differential pressure  $\Delta p_{v,max}$  should not exceed 0.4bar (40 kPa).

## Mounting notes



*Permissible*

*Not permissible*

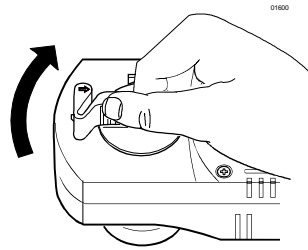
In addition, the direction of flow as described under «Engineering notes» must be observed.



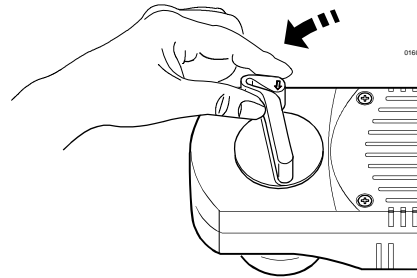
### Caution:

Suitable conduit shall be connected to the actuator when undergoing the wiring work of the product.

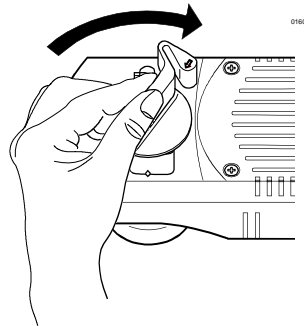
Valve manually open



Turning switch with approximately 90 % valve stroke latch



Switch manually release



Switch up to the impact turn and release

### Commissioning notes

#### Manual adjustment

Through operation of the manual adjuster or removed the actuator, the trough-port **AB** → **A** of the valve can be opened. With the 3 port valves, the bypass port will be closed. The valves will be opened by their own spring (normally open).

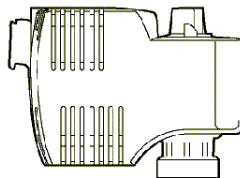
#### Warning !

Before performing any service work on the valve and/or actuator: switch OFF the pump and power supply, close the main shut-off valve in the pipework, release pressure in the pipes and allow them to cool down completely. If necessary, disconnect electrical connections from the terminals. The valve may be commissioned only with the manual wheel pre-set or with a correctly mounted actuator.

### Maintenance

The valve and actuator do not require maintenance  
Faulty actuators can be replaced without removing the valve from the pipework.  
The actuator cannot be repaired.

#### Replacement actuator



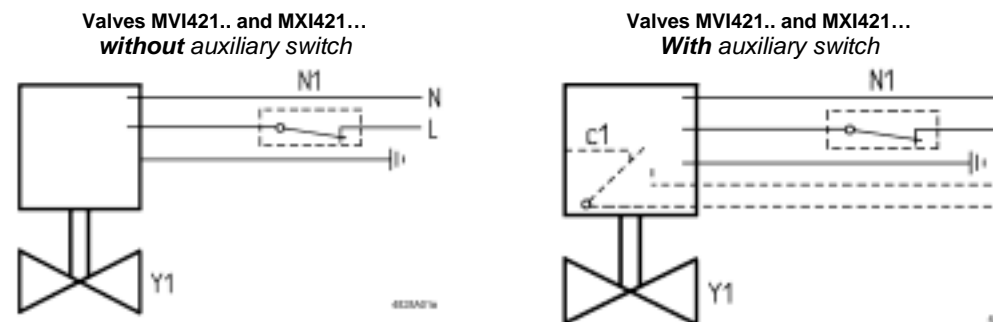
Replacement actuators (AC 230 V versions) can be ordered by quoting type code : **SFA21**

AC 24V versions can be ordered by quoting type code : **SFA71**

## Technical data

Operating data	Operating Pressure	PN16
	Leakage	
	– Path AB → A	0 ... 0.05 % of $k_{vs}$
	– Bypass B	max. 5 % of $k_{vs}$
	Pressure class PN16	Acc. to ISO 7268 (DIN 2401)
	Nominal stroke	2.5 mm
Materials	Valve materials	
	– Valve body	Brass
	– Stem	Stainless steel
	– Plug, seat, gland	Brass or bronze Rg5
	– O-rings	Special EPDM rubber
Dimensions / Weights	Dimensions	see «Dimensions» (table)
	Threaded connections	
	– Valve	BS 21 / ISO7-1
	Weights	see «Dimensions» (table)
Accessories		
Power Supply	Operating Voltage	230VAC – 15 / +10%
	Frequency	50/60Hz
	Power Consumption	9.8 VA
Function	Running time	35 seconds
	Nominal stroke	2.5 mm
	Nominal force	105N
General ambient conditions	Operation	
	Temperature	5 to 50°C
	Humidity	5 to 85% rh (non-condensing)
	Storage / transport	
	Temperature	-25 to 70°C
	Humidity	95% rh (non-condensing)
CE conformity	Meets the requirement for CE conformity to	
	– EMC Directive	89/336/EEC
	– Low voltage Directive	73/23/EEC

## Connection Diagram



Y1 Zone valve with actuator  
c1 Auxiliary switch (N/O contact)  
N1 Temperature controller (thermostat)  
L Earthing conductor (yellow/green)

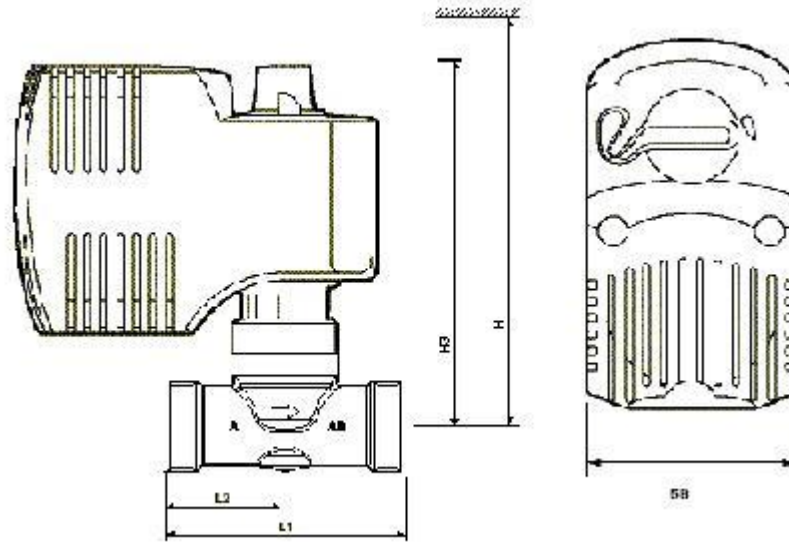
N Neutral conductor (blue)  
L Phase (brown)  
3 Auxiliary switch (orange)  
4 Auxiliary switch (grey)

## Dimensions

### Two-port valves (2 ports)

MVI421...

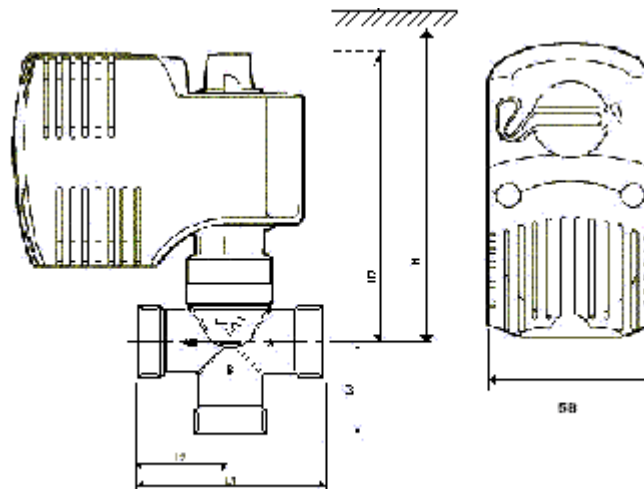
All dimensions in mm



DN [mm]	Thread	Valve type	D	H	H3	L1	L2	G [kg]
15	Rp $\frac{1}{2}$ "	MVI421.15	35	260	110	60	30	0.865
20	Rp $\frac{3}{4}$ "	MVI421.20	35	260	110	65	32.5	0.895
25	Rp1"	MVI421.25	35	260	110	84	42	1.105

### Three-port valves (3 ports)

MXI421...



DN [mm]	Thread	Valve type	D	H	H3	L1	L2	L3	G [kg]
15	Rp $\frac{1}{2}$ "	MXI421.15	30	260	110	60	30	30	0.934
20	Rp $\frac{3}{4}$ "	MXI421.20	35	260	110	65	32.5	32.5	0.965
25	Rp1"	MXI421.25	35	260	110	84	42	40	1.215

