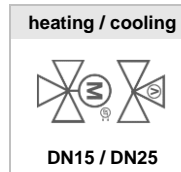




DYN6P25A

Variable flow-control 6-way valve, series DXN6_A

- For 4-pipes climate ceilings with change-over
- Pressure independent variable flow-control
- Integrated flow measurement
- Power supply U_v : AC 24Volt
- Flow setpoint via ctrl signal Y_1 : 0..10Vdc, split-range
- With MODBUS RTU/MSTP or BACnet MSTP
- With build in LCD display and navigation pad (optional)
- Integrated room temperature controller (optional)



Dynamic Flow Networking®

The *dynamx*™ valves are designed for automatic and dynamic hydronic balancing and real-time flow-control at the same time, thus eliminating the need for extra balancing valves. The *dynamx*™ valves take care of a perfect hydraulic balance in the hydraulic net, at full load as well as in part load without any extra components: Dynamic Flow Networking® (DFN).



Advantages

- ✓ 5-in-1 solution
- ✓ perfect variable flow control
- ✓ flow and energy registration
- ✓ no minimal Δp required
- ✓ separate V_{max} heating/cooling
- ✓ automatic balancing
- ✓ remote commissioning
- ✓ patented technology

Description

The *dynamx*™ Neo 6-way valve, series DXN6_A, combines five functions: (1) a flow control valve, (2) a pressure independent balancing valve, (3) a shut of valve, (4) a change-over valve and (5) optionally an integrated room temperature controller.

DXN6_A is used in HVAC systems with variable flow and is designed e.g. for climate ceilings or fan coil units which are controlled via switch-over between heating and cooling (4-pipes systems). DXN6_A replaces the (static) balancing valve, as well as the control valve.

The DXN6_A in brass is provided with flat connections ISO228/1 and can be used in HVAC systems for buildings with water temperatures between +5°C..+90°C (not condensing) with a nominal system pressure of 16 bar (PN16).

Optional assembly bracket, tail pieces, ball valves etc. can be supplied.

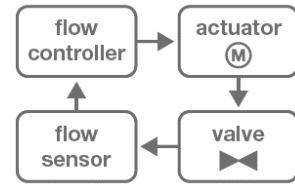
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1. How it works

The *dynamx*™ valves are designed to accurately control the flow through each consumer device. In order to achieve this, *dynamx*™ has 4 basic building blocks:

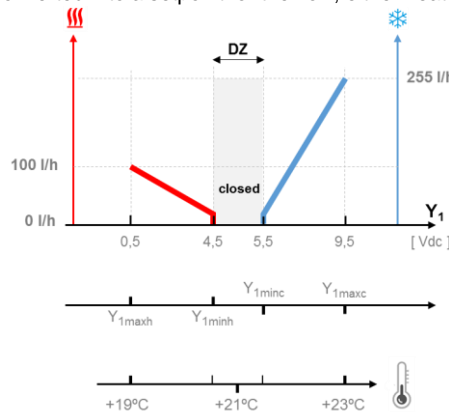
- a valve
- an actuator
- a flow sensor
- a flow controller



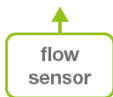
On top of these basic building blocks additional features can be added like for example an LCD display or additional temperature sensors.



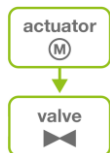
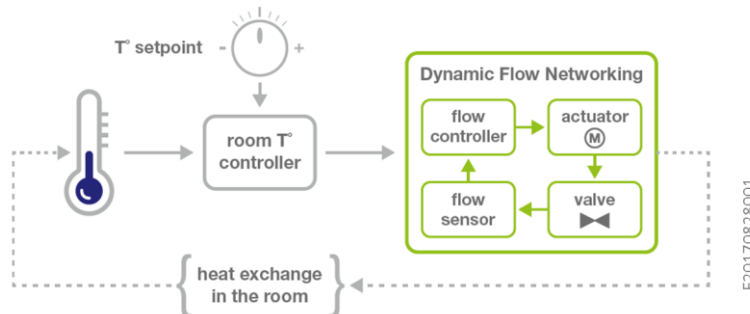
In *analog* mode, the internal flow controller of the *dynamx*™ valve receives a setpoint from the room T° controller through a split-range Y₁: 0..10Vdc control signal (heating : 0,5..4,5Vdc and cooling : 5,5..9,5Vdc). Internally this setpoint is converted into a setpoint for the flow, either heating or cooling. Example:



DZ (dead zone) : both heating and cooling are deactivated.



The integrated flow sensor measures continuously the actual flow. The intern control loop will compare the actual flow with the desired flow and adjust the position of the control valve until the measured flow is equal to the required flow rate setpoint.



Thus DXN6_A will control the flow towards the desired setpoint, independent of potential pressure fluctuations in the system e.g. in case of part load. The control valve adapts automatically to the system parameters and search for the ideal setpoint to guarantee a maximum comfort for the user with minimal energy consumption. The output signal X₁: 0..10Vdc representing the measured flow can be used for monitoring the actual flow.



Thanks to this innovative technology, the *dynamx*™ valves can be used in a much larger flow range compared to traditional control valves. In order to enable optimal sizing and reduce pump energy to the absolute minimum, *dynamx*™ valves are available in different flow ranges.



The *dynamx*™ DXN6_A valves can be supplied with a MODBUS RTU/MSTP or BACnet MSTP bus-communication interface. By integrating the *dynamx*™ valves into a MODBUS or BACnet network, the setpoint can also be set via the bus, the actual flow can be monitored remotely, etc. A selection of commissioning settings can then also be addressed over the bus network.



2. Technical data

Electrical

Power supply U_v	AC 24 Volt (-20%/+20%), 50Hz
Consumption	<i>during control</i> 3W (4VA) <i>stationary</i> 1,5W (2VA)
Input signal Y₁	0..10Vdc (0.17mA), split range 0,5..4,5Vdc heating mode : maximum flow heating → 0% 5,5..9,5Vdc cooling mode : 0% → maximum flow cooling
Feedback signal X₁	0..10Vdc (≤ 2mA) the actual flow, scaled to the maximum flow settings for heating or cooling
Electric wiring ¹⁾	PVC cable, 4x 0,5mm ² (length L _c)
Bus connection	STP cable, 4x twisted pair (length L _c)

Flow measurement

Sensor type	ultrasonic TTM, no moving parts
Flow sensor class	approved according to MID-2014/32/EU and EN1434-4:2007
Measuring unit	m ³ /h ²⁾ , l/s, l/min, gpm (UK), gpm (US)

Temperature measuring ³⁾

Sensor type	Pt500 according to EN60751
Sensor pairing	according to MID-2014/32/EU, EN1434-4:2007

Hydraulics

Nominal pressure rating	PN16 (16 bar)
Control characteristic	equal percentage ²⁾ or linear
Change-over	heating or cooling modus via Y ₁
Valve seat leakage	tight sealing (sealing 100%)
Differential pressure	<i>min.</i> no minimum differential pressure required <i>max.</i> 2bar (200kPa)
Maximum flow setpoint V_{max}	can be set for heating and cooling separately
Flow setpoint control	analog (Y ₁), via bus communication or via LCD ³⁾
K_{vs} value	<i>DXN6P15A</i> 1.4m ³ /h <i>DXN6P25A</i> 2.5m ³ /h
Medium	water (glycol free)
Medium quality	according to VDI 2035
Medium temperature	+5°C..+90°C
Connections	<i>DXN6P15A</i> flat connections ISO228/1 : 5x G ¹ / ₂ " + 1x G ³ / ₄ " ⁴⁾ <i>DXN6P25A</i> flat connections ISO228/1 : 6x G1"
Start-up time	3..5min after power-up

Material

Housing	ABS
Wet parts	brass ⁵⁾ , EPDM, composite stainless steel (1.4401 et 1.4301)

Environment

Humidity	maximum 90% HR, without condensation
Maintenance / calibration	without maintenance, without calibration
Temperature	<i>ambient</i> +10°C .. +45°C <i>storage</i> -20°C .. +50°C

¹⁾ number of wires depends on the version number, length L_c (see ordering table)

²⁾ default factory setting

³⁾ optional

⁴⁾ reduction G¹/₂" + 1xG³/₄" available as an accessory DX.10H.011404 available (to be ordered separately)

⁵⁾ - CW617N brass : standard
- CW602N brass (DZR): on request



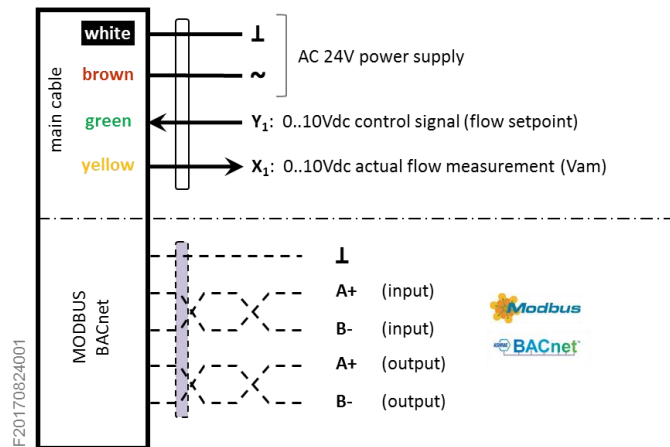
LCD display with navigation pad

3. LCD display

DXN6_A can optionally be delivered with an LCD display. The display shows the flow, the water temperature and other key values.

The built-in keyboard push buttons enables the user to read and/or modify settings of all major operating parameters of the DXN6_A.

4. Electrical wiring



Notes

- a low voltage safety transformer should be used according to local regulations
- complies to the Electromagnetic Compatibility Directive 2014/30/EU, applying standards
 - EN 61000-6-3 (2007)
 - EN 61000-3-2 (2006)
 - EN 61000-3-3 (1995) + am1(2001)
 - EN 61000-6-1 (2005)

5. MODBUS / BACnet Interface

The DXN6_B valves can optionally be delivered with a bus communication interface for an easy integration¹⁾ into each Building Management System (BMS):

- MODBUS RTU/MSTP
- BACnet MSTP

These types of bus communication are very well adapted for communication on a field level. It is simple, while offering reliable and robust data communication. The MODBUS communication technology is open, license-free and is available for each BMS-system on the market.

Technical specifications

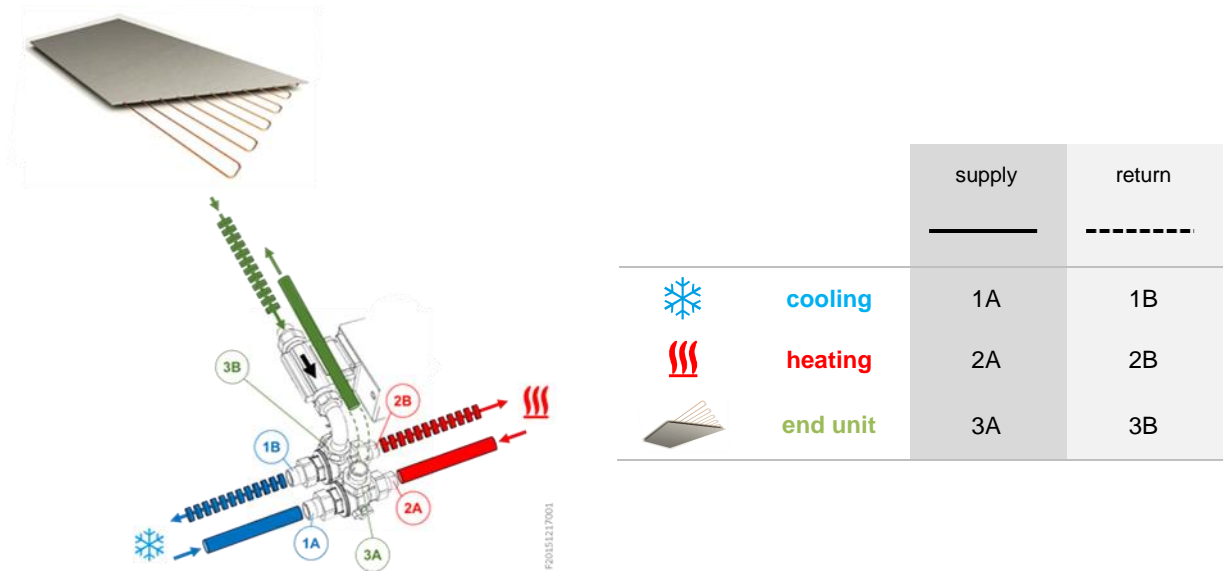
MODBUS protocol	RTU/MSTP, slave
BACnet protocol	MSTP, slave
Physical layer	RS485, 2-wire twisted pair
Bus termination	120Ω terminal resistor at each end of the bus
Communication settings ²⁾	9600, 19200 of 38400 Baud, 1 start bit, even ³⁾ /odd/no parity, 8 data bits, 1 stop bit
Topology	multi-drop bus, maximum length 1.000m
Drop length	maximum 2m, preferably in daisy chain
Bus cable type	shielded twisted pair STP or FTP

¹⁾ the installer is responsible for complying to local EMC regulations when installing, connecting and commissioning DXN6_A to a communication bus

²⁾ can be set via the LCD display (when ordered) or via dxLink™ commissioning tool over MODBUS communication

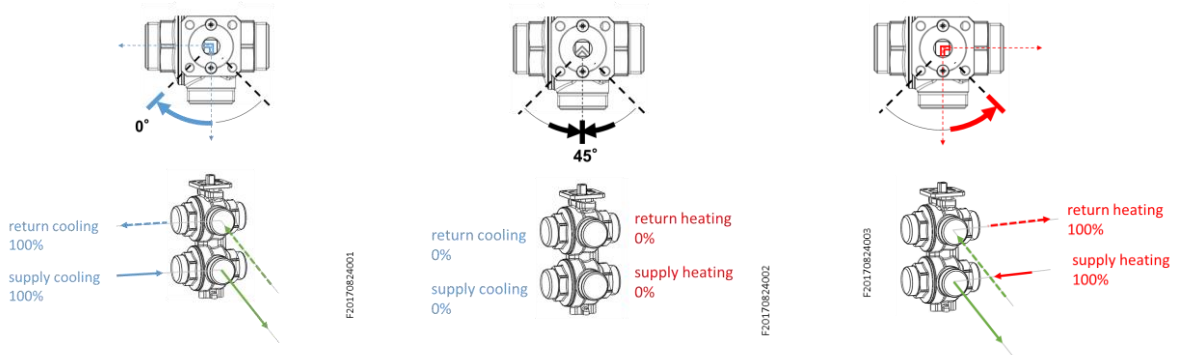
6. Process connections

The DXN6_A valves have a fixed flow direction and a fixed heating and cooling connection as specified in the drawing.



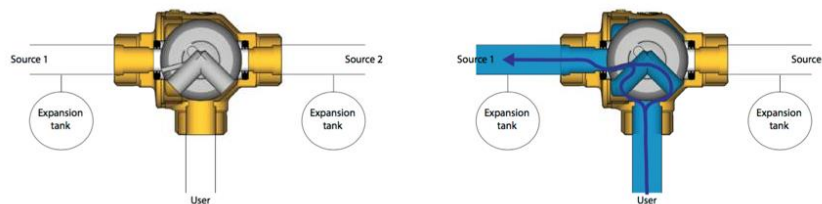
Change-over

The dynamx™ DXN6_A valves come with an integrated 6-way ball valve with a rotation angle of 90° in order to change over between heating and cooling.



Overpressure protection

The DXN6_A valves have an integrated mechanical protection against overpressure to compensate for pressure variations in closed position. The water towards the unit will be isolated when the valve is in a closed position. When the temperature of this water moves towards room temperature, pressure differences will occur. A small opening is made in the upper ball of the 6-way valve which will avoid these pressure differences. This opening does not compromise the tight sealing of the DXN6_A valve. As the bottom ball is not equipped with this opening, no water can flow through the unit when the valve is closed.



Furthermore, the overpressure protection does not influence the hydronic separation between heating and cooling. These 2 circuits remain separated.

7. Flow range

Type	DN [mm]	K _{vs} [m ³ /h]	V _{min} [l/h]	V ₅ [l/h]	V ₁₀ [l/h]	V ₂₀ [l/h]	V _{max} [l/h]
DXN6P15A	15	1,4	3	310	440	625	1400
DXN6P25A	25	2,5	3	555	790	1115	2500

V_{max} flow range (0..V_{max})

V_{min} minimum controllable flow

V₅ flow range at Δp 5kPa

V₁₀ flow range at Δp 10kPa

V₂₀ flow range at Δp 20kPa

8. Commissioning tool dxLink™

All *dynamx*™ valves can be integrated smoothly into each Building Management Systems or they can also be implemented as stand-alone devices.





dxLink™¹⁾

dxLink™ allows you to remotely commission *dynamx*™ valves using the MODBUS bus-communication capability of the valve. This means that commissioning a *dynamx*™ device does not require any action on the device itself but only from one central remote location. This greatly reduces the time required to commission the HVAC system and makes the system less error-prone.

dxLink™ allows you to read and set *dynamx*™ configuration variables and to read the current value of all variables remotely.








The dxLink™ software will work on computer with the Windows Operating System, from XP to Win8.

Type	Description
DX.10E.009940	 <p>dxLink™ - software license</p> <ul style="list-style-type: none"> - commissioning software for MS Windows - an unlimited number of <i>dynamx</i>™ devices can be commissioned - including 1 pc RS485-to-USB conversion cable
DX.10E.009942	 <p>RS485-to-USB conversion cable</p> <p>Used to connect a <i>dynamx</i>™ device with MODBUS RTU or BACnet (RS485) directly to a PC. Note: appropriate driver to be installed.</p>

¹⁾ requires a DXN6_A MODBUS version



9. Accessories

Type		Description
T.N6.SBU12		Set of 2pcs tail piece male G $\frac{1}{2}$ " x female G1" (nut) for DXN6P25
T.N6.SBU34		Set of 2pcs tail piece male G $\frac{3}{4}$ " x female G1" (nut) for DXN6P25
T.BKH.F12M12.RD		Tail piece with integrated ball valve for DXN6P15 : male G $\frac{1}{2}$ " x female G $\frac{1}{2}$ " (nut)
T.BK.G34.T34		Tail piece with integrated ball valve : female G $\frac{3}{4}$ " x female G $\frac{3}{4}$ " (nut)
T.BK.G1.T34		Tail piece with integrated ball valve : female G $\frac{3}{4}$ " x female G1" (nut)
DX.10H.011404		Reduction male G $\frac{1}{2}$ " x female G $\frac{3}{4}$ " for DXN6P15
T.N6.G12.ISOL.M4		Thermic insulation shell for DXN6P15 (M4)
T.N6.G1.ISOL.M4		Thermic insulation shell for DXN6P25 (M4)
T.DXN6/N6.L02		Mounting bracket "L" for DXN6P15
T.DXN6/N6.L01		Mounting bracket "L" for DXN6P25
DX.10M.011503		Mounting bracket for DXN6P15

10. Other resources



A.601 - 01	Dimensions drawings
A.601 - 02	Mounting instructions
A.601 - 03	User manual MODBUS RTU/MSTP
A.601 - 04	User manual BACnet/MSTP
A.601 - 05	Data files 3D STEP
A.601 - 06	Data files REVIT

11. Brands, trademarks & intellectual property



DXN6_A is based on technology protected by international patents:

- European patent Nr. 2307938
- Chinese patent Nr. ZL200880130728.9
- Patent pending Nr. US2011/0162742
- Registered community design RCD N° 001167076-0001

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MS Windows is a registered trademark of Microsoft Corp. MODBUS is a registered trademark of Schneider Electric. BACnet is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

12. Ordering information

1. OVERVIEW

Type	AC24 [Volt]	G _v	IP	config	K _{vs} [m ³ /h]	V _{max} [l/h]	V ₁₀ [l/h]	Δp _s [kPa]					L _c [m]
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Modbus

DXN6P15A.32401	▲	●	G½"	43	90°	1,4	1400	440	200	●	●	-	-	1m
DXN6P25A.32401	▲	●	G1"	43	90°	2,5	2500	790	200	●	●	-	-	1m
DXN6P15A00.32401	△	●	G½"	43	90°	1,4	1400	440	200	-	●	●	-	1m
DXN6P25A00.32401	△	●	G1"	43	90°	2,5	2500	790	200	-	●	●	-	1m

BACnet

DXN6P15A.32501	▲	●	G½"	43	90°	1,4	1400	440	200	●	●	-	-	1m
DXN6P25A.32501	▲	●	G1"	43	90°	2,5	2500	790	200	●	●	-	-	1m
DXN6P15A00.32501	△	●	G½"	43	90°	1,4	1400	440	200	-	●	●	-	1m
DXN6P25A00.32501	△	●	G1"	43	90°	2,5	2500	790	200	-	●	●	-	1m

2. OPTIONS

Type	
DXN6P_ _A_ _ . _ _ _ _ .L02	△ 2m cable length (standard PVC cable)
DXN6P_ _A_ _ . _ _ _ _ .L05	△ 5m cable length (standard PVC cable)
DXN6P_ _A_ _ . _ _ _ _ .L10	△ 10m cable length (standard PVC cable)
DXN6P_ _A_ _ . 1 _ 0 _ _	△ 0..10Vdc version (no bus-communication), with LCD display
DXN6P_ _A_ _ . 1 _ 4 _ _	△ with LCD display and with communication interface MODBUS RTU/MSTP
DXN6P_ _A_ _ . 1 _ 5 _ _	△ with LCD display and with communication interface BACnet MSTP
DXN6P_ _A_ _ . _ _ _ 1 _	△ with 1x medium temperature sensor (pre-wired)
DXN6P_ _A_ _ . _ _ _ 2 _	△ with 2x medium temperature sensors (pre-wired)
DXN6P_ _A_ _ . _ _ 3 _ _	△ straight version

Legend

G _v	connections valve body	V _{max}	flow range (0..V _{max})	config	configuration (90° or straight)
Δp _s	maximum close-off pressure	V ₁₀	flow range at Δp 10kPa		
IRC	with integrated room control function	L _c	standard cable length (PVC cable)		

▲ standard △ on request (min. quantities and/or longer lead times may apply, please contact us)