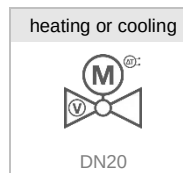




DXC2P20B.111601

dynamx™ flow-control valves, DXC2_B series

- Electronic pressure-independent flow control
- Integrated flow measurement
- Integrated ΔT measurement (option)
- Supply voltage U_v : AC/DC 24 Volt
- Flow rate set point via control signal Y_1 : 0..10Vdc or digital
- MP *MultiProtocol* : MODBUS RTU and BACnet MSTP communication
- Wireless commissioning via Bluetooth® communication
- Integrated room control (option)



Dynamic Flow Networking®

The dynamx™ control valves are designed for automatic and hydraulic balancing while controlling flow in real time, eliminating the need for static balancing valves. The dynamx™ control valves provide perfect hydraulic balancing in the hydraulic network, both at full and part load, without additional components: Dynamic Flow Networking® (DFN).



Advantages

- ✓ 5-in-1 solution
- ✓ variable flow rate
- ✓ automatic balancing
- ✓ no minimum Δp required
- ✓ flow and energy recording
- ✓ MP *MultiProtocol* communications
- ✓ Bluetooth® communication on-board

Description

The dynamx™ Compact 2-way control valves, type DXC2_B, combine five functions: 1) a control valve, 2) a dynamic pressure-independent balancing valve, 3) a shut-off valve, 4) energy monitoring, and 5) optional integrated room temperature control.

DXC2_B is used in HVAC systems with variable flow rates and is designed for air conditioning ceilings or fan coil units (2-pipe system), among others. DXC2_B replaces both the (static) balancing valve, and the readjustment valve.

The DXC2_B made of bronze/brass is equipped with a flat coupling ISO228/1 and can be used in HVAC systems for buildings with water temperatures between +5°C..+90°C with a nominal system pressure of 16 bar (PN16).

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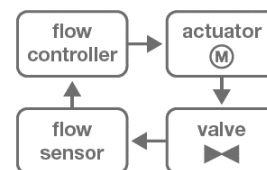
Patented technology

EP2307938
EP2706425
EP3812870
EP3280937
EP3918236 (pending)

1. How it works

dynamx™ flow-control valves are designed to accurately control flow in any consumer. To do this, dynamx™ has 4 basic building blocks:

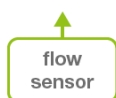
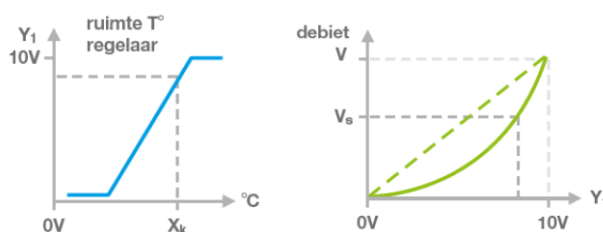
- a control valve
- a drive
- a flow sensor
- a flow controller



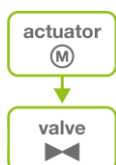
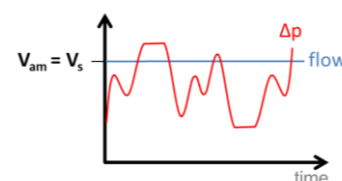
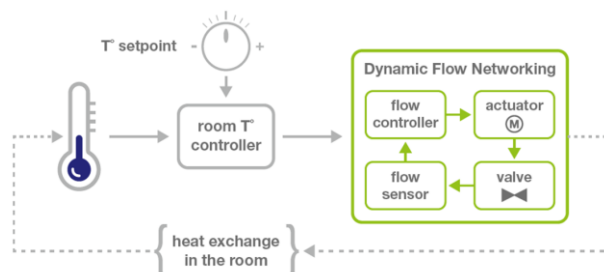
On top of these basic building blocks, additional functions can be added such as bus communication, wireless communication or additional temperature sensors.



In *analog* mode, the internal flow controller of the dynamx™ control valve receives a set point from an external controller Y_1 : 0..10Vdc. Internally, this set point is converted to a flow set point, for heating or cooling. Example:



The integrated flow sensor continuously measures the actual flow rate. The internal control loop compares the actual flow rate with the desired flow rate and adjusts the position of the control valve so that the measured flow rate matches the flow rate set point.



DXC2_B will control the flow rate to a specified set point, independent of any pressure changes in the system at e.g. part load. The control valve automatically adapts to the system parameters and searches for the ideal set point, aiming for maximum user comfort with minimum energy consumption.

The feedback signal X_1 : 0..10Vdc indicates the current flow rate and can be used to monitor the current flow rate.



Thanks to this innovative technology, dynamx™ control valves can be used in a much larger flow range than conventional control valves.



DXC2_B has wireless Bluetooth® communication on board, which allows easy wireless commissioning via a smartphone or tablet.



The dynamx™ DXC2_B control valves can be equipped with MP MultiProtocol communication allowing them to be integrated into both MODBUS and BACnet networks.

2. Technical specs

Electric		
Supply voltage U _v		AC 24 Volt (-20%/+20%), 50Hz DC 24 Volt (-10%/+10%)
Consumption		3W
Sizing		5W / 5VA (220mA)
Input signal Y ₁		0..10Vdc (0.17mA)
Optional sensor input Y ₂		0..10Vdc (0.17mA)
Feedback signal X ₁		0..10Vdc (≤ 2mA) actual flow rate, scaled according to the max flow rate heating or cooling
Electrical connection ¹⁾		1m PVC cable, 7x 0.5mm ²
Flow rate measurement		
Sensor type		ultrasonic TTM, no moving parts
Unit of measurement		m ³ /h ²⁾ , l/s, l/min, gpm (UK), gpm (US)
Temperature measurement ³⁾		
Sensor type		Pt1000 ²⁾ or Pt500 in accordance with EN60751
ΔT measurement		paired sensors
Hydraulic		
Nominal pressure		PN16 (16 bar)
Control characteristic		equal percentage ²⁾ or linear
Differential pressure	<i>min.</i> <i>max</i>	no minimum differential pressure required 1,5 bar (150kPa)
Maximum flow rate set point V _{max}		separate heating and cooling setting
Flow rate set point setting		analog (Y ₁), via bus communication, or via Bluetooth communication and dxLink APP ³⁾
K _{vs} value		2.4 m/h ³
Medium		water (without glycol)
Medium quality		in accordance with VDI 2035
Medium temperature		+5°C..+90°C
Connection		G¾" flat coupling in accordance with ISO228/1
Startup time		3..5 min. after power on
Position in currentless state		normally closed
Material		
Housing		ABS
Parts in contact with water		bronze, brass ⁴⁾ , EPDM, composite Stainless steel (1.4401 and 1.4301)
Surroundings		
Temperature	<i>area</i> <i>storage</i>	+10°C .. +45°C -20°C .. +50°C
IP degree of protection		IP54
Humidity		maximum 90% HR, non-condensing
Maintenance / calibration		no maintenance nor calibration required

¹⁾ main cable

²⁾ factory default

³⁾ optional

⁴⁾ - CW617N brass : standard
- CW602N brass (DZR) : on request

3. Flow range



The dynamx™ Compact control valves, type DXC2_B, are available with one, wide flow range, which will be selected according to the maximum intended differential pressure across the control valves.

Type	DN [mm]	K _{vs} [m³/h]	V ₅ [l/h]	V ₁₀ [l/h]	V ₂₀ [l/h]	V _{max} [l/h]
DXC2P20B	20	2,4	537	759	1.073	120 ..2.400

Legend

K _{vs}	Kvs value of the unit
V ₅	flow rate at Δp 5kPa
V ₁₀	flow rate at Δp 10kPa
V ₂₀	flow rate at Δp 20kPa
V _{max}	design flow rate (0..V _{max})

4. MP MultiProtocol

The dynamx™ DXC2_ control valves can optionally be supplied with an RS485 bus communication interface with the MP *MultiProtocol* functionality for easy integration¹⁾ into any building management system (BMS).

Thanks to this MP *MultiProtocol* communication, the DXC2_ control valves can be integrated into different types of networks:

- MODBUS
- BACnet
- Bluetooth®

By integrating the dynamx™ control valves into a MODBUS or BACnet network, the set point can also be controlled by the bus, the actual flow rate can be monitored remotely, etc. The bus also provides the ability to customize a selection of settings.



System Integration

Protocol	MODBUS	RTU/MSTP, slave
	BACnet	MSTP, slave
	Bluetooth®	with license-free APP, dxLink 21™
Physical layer wired network		RS485, not isolated
Type of bus cable		2-wire twisted pair with common shielded twisted pair STP or FTP
Unit load		1/8
Terminal resistance		120Ω end resistor (R _{TERM}) to each end of the bus
Communication settings ²⁾		9600, 19200 or 38400 ³⁾ Baud 1 starter bit even ³⁾ / odd / no parity 8 data bits 1 stop bit
Topology		multi-drop bus, maximum length 1,000m
Stub length		maximum 1m, preferably in daisy chain

¹⁾ the installer is responsible for compliance with local EMC regulations when installing, connecting and commissioning the DXC2_ in a communications bus network

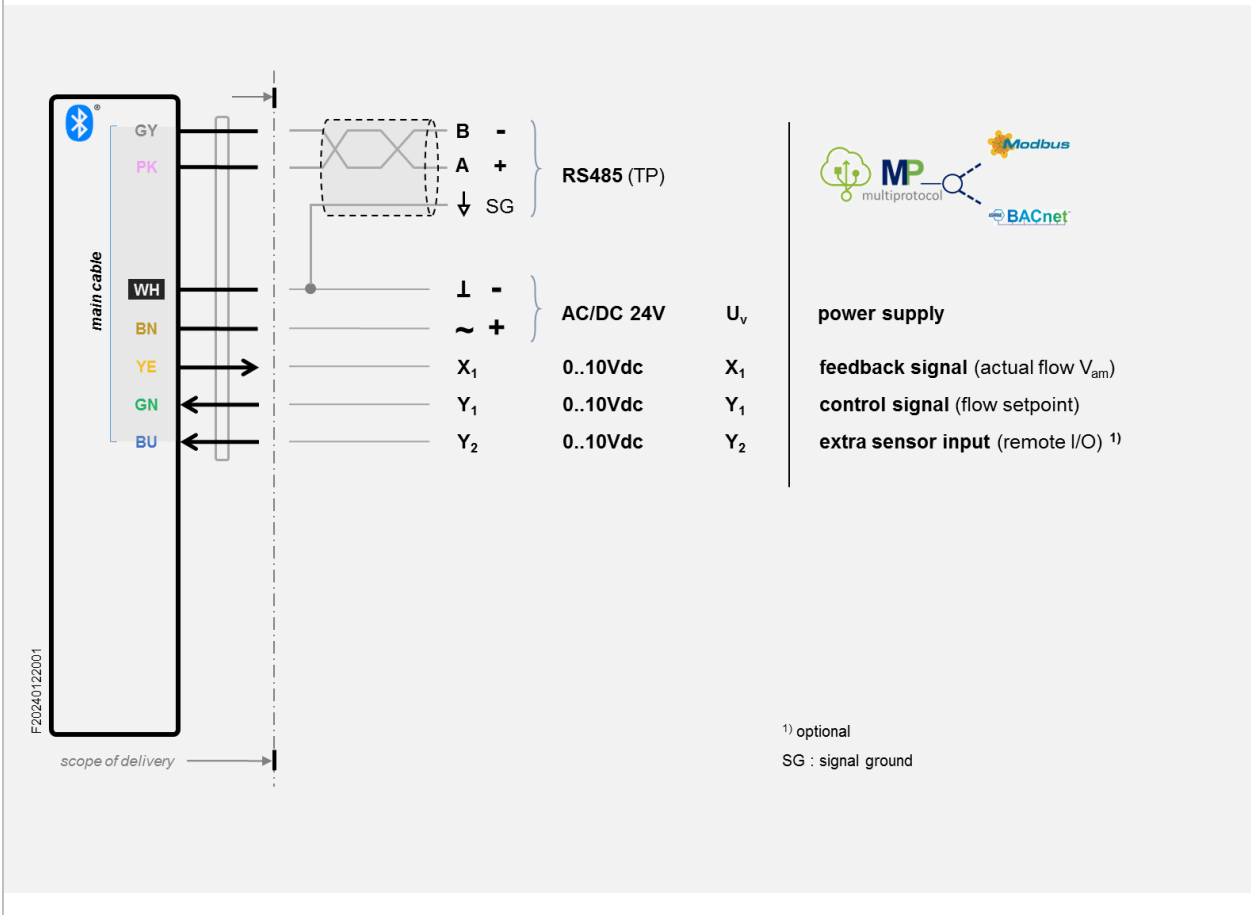
²⁾ can be set up via the Bluetooth® dxLink21™ APP or via the dxLink™ MS Windows commissioning tool via MODBUS communication

³⁾ default settings

5. Electrical connection

1 | 2

DXC2_B. 11_601



WH	BN	GN	YE	BU	PK	GY
white	brown	green	yellow	blue	pink	grey
wit	bruin	groen	geel	blauw	roos	grijs
blanc	brun	vert	jaune	bleu	rose	gris
weiß	braun	grün	gelb	blau	pink	grau

Individual wires are color coded, no numbering. Color coding according DIN 47100.

i A low voltage transformer should be used in accordance with local regulations.

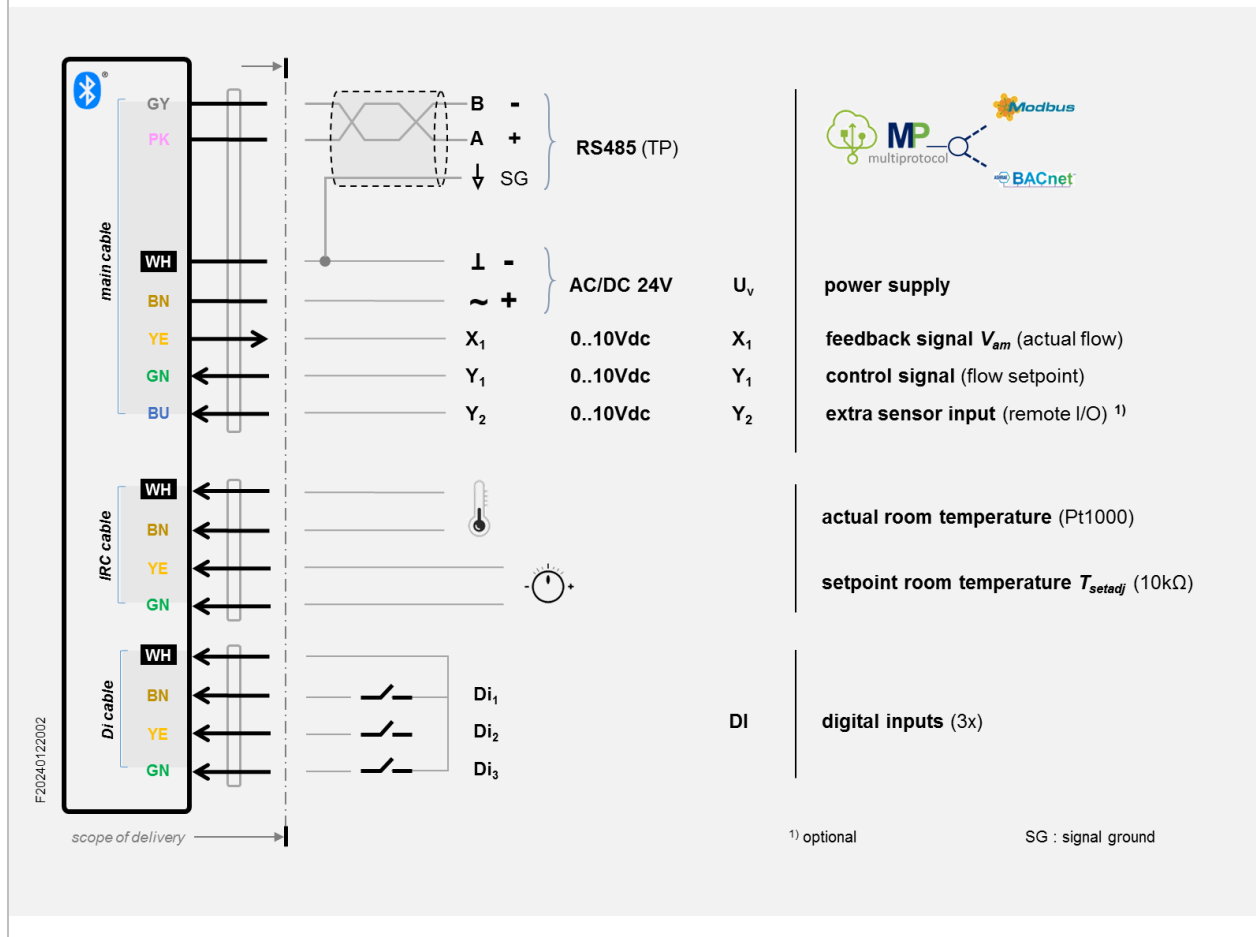
In accordance with the Electromagnetic Compatibility Directive 2014/32/EU, according to the applied standards

- EN 61000-3-2 (2014)
- EN 61000-3-3 (2013)
- EN 61000-6-1 (2007)
- EN 61000-6-3 (2007) (A1: 2011 / AC: 2012)

5. Electrical connection

2 | 2

DXC2_B00.11_601



WH	BN	GN	YE	BU	PK	GY
white	brown	green	yellow	blue	pink	grey
wit	bruin	groen	geel	blauw	roos	grijs
blanc	brun	vert	jaune	bleu	rose	gris
weiß	braun	grün	gelb	blau	pink	grau

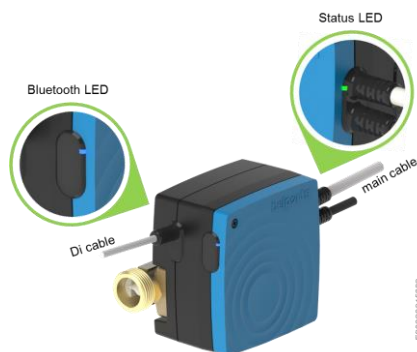
Individual wires are color coded, no numbering. Color coding according DIN 47100.

i A low voltage transformer should be used in accordance with local regulations.

In accordance with the Electromagnetic Compatibility Directive 2014/32/EU, according to the applied standards

- EN 61000-3-2 (2014)
- EN 61000-3-3 (2013)
- EN 61000-6-1 (2007)
- EN 61000-6-3 (2007) (A1: 2011 / AC: 2012)

6. Status LED



The integrated LEDs provide useful information that can help with startup and commissioning.

Status	
	power supply
	Bluetooth® communication
	bus network

7. Bluetooth® commissioning

dxLink21™

Thanks to the integrated Bluetooth® technology, the DXC2_ valves provide a wireless interface for commissioning purposes.

There is no easier way to install and properly commission your hydraulic systems than with the dxLink™21 APP.

This function can be used simultaneously with MODBUS or BACnet bus communication.

Note: these features may not be available on all versions, check ordering information



8. Software tool

dxLink™

All dynamx™ control valves can be easily integrated into any building management system but can also be used as standalone control valves.

dxLink™ is a software tool that allows dynamx™ control valves to be commissioned remotely, using the MODBUS bus communication capabilities of the control valves. This means that commissioning of a dynamx™ control valve does not require on-site intervention but can be performed from a central location. This significantly reduces the time required to commission the HVAC system and makes the system less prone to errors.

The dxLink™ software works with the Windows operating system.



9. Accessories

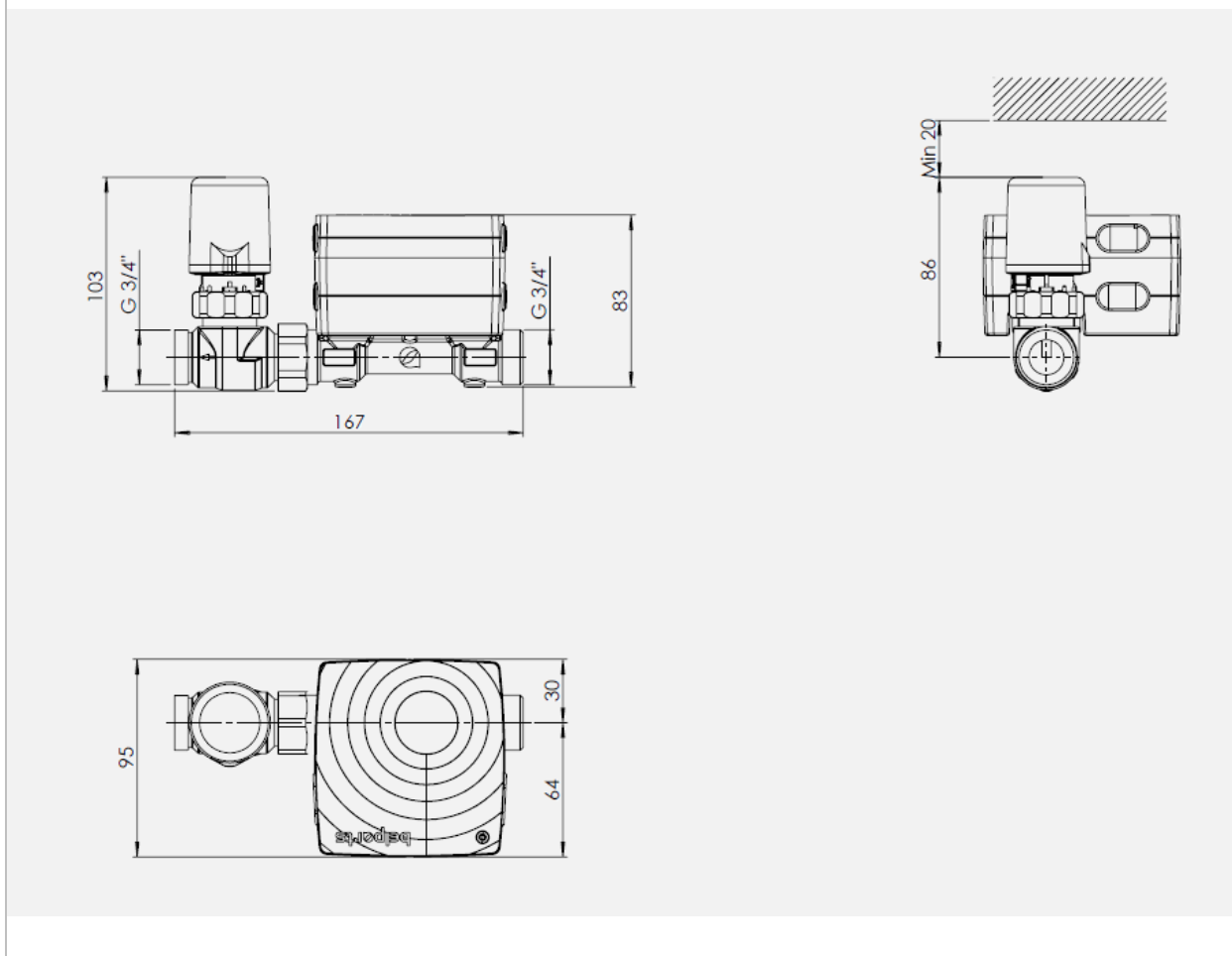
Item		Description
011404		DX.10H.011404 Tailpiece for DXC_B External thread G $\frac{1}{2}$ " x swivel G1" (internal thread)
010789		T.BK.G34.T34 Tailpiece with integrated ball valve Female thread G $\frac{3}{4}$ " x female thread G $\frac{3}{4}$ " (swivel)
009056		DX.10H.009056 Nipple for temperature sensor with external thread R $\frac{1}{2}$ " with female thread M10x1 for water temperature sensor
009702		DX.10H.009702 DN20 T-piece for T° sensor with integrated ball valve (internal thread G $\frac{3}{4}$ ") 3 ^{de} port with internal thread M10 for water temperature sensor T _x (supply sensors not included)

10. Dimensions

1 | 2

DXC2_B

Deliveries > 01.06.2023



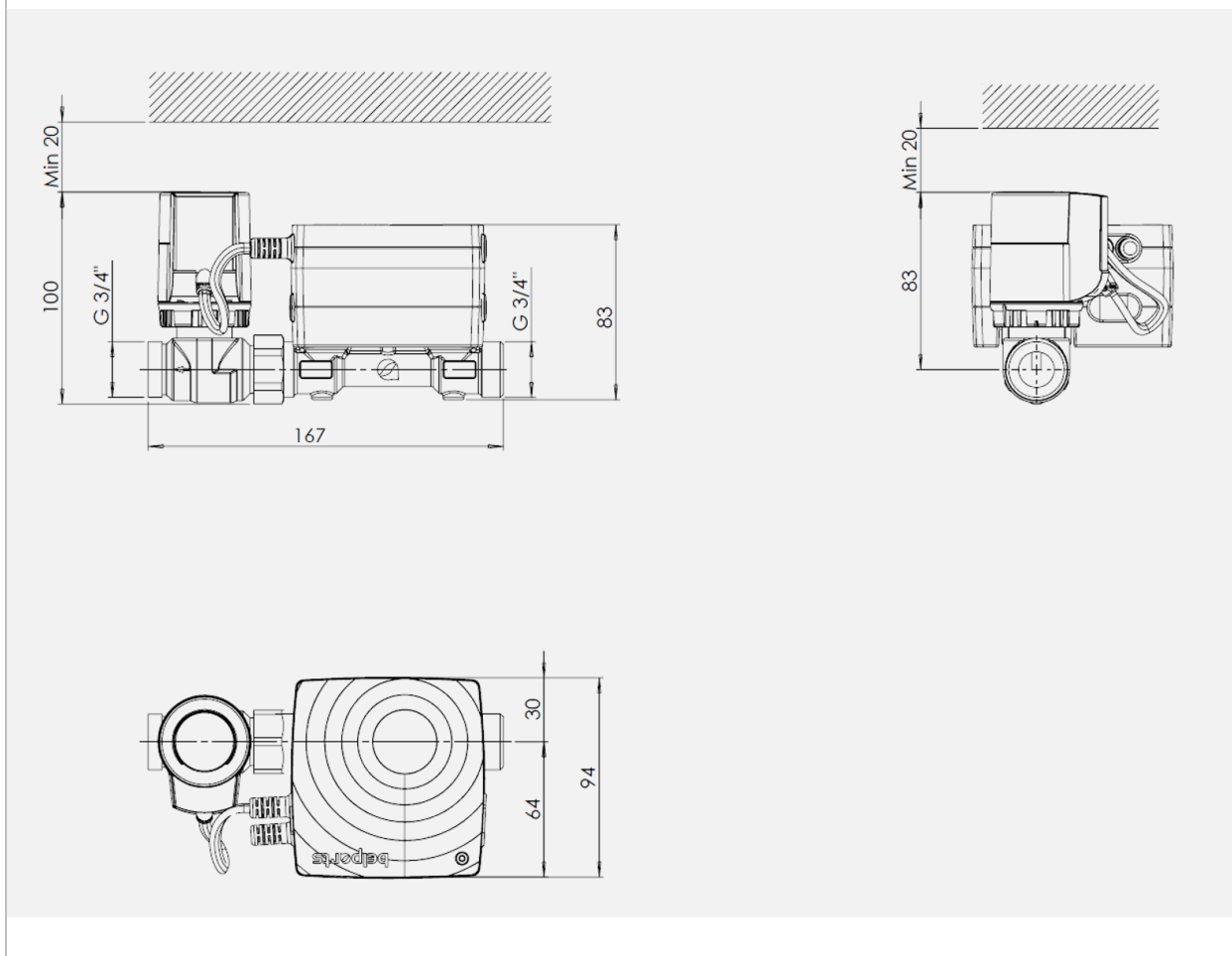
All dimensions in [mm]

10. Dimensions

2 | 2

DXC2_B

Deliveries < 30.05.2023



All dimensions in [mm]

11. Article coding

DXC	2	P	20	B	1	1	1	6	0	1	
SERIES				VERSION							
DXC											Series <i>dynamx</i> ™ control valves DXC dynamx™ Compact
	2										Number of connections 2 2-way control valve
		P									Assembly P flat-sealing ISO228/1
			20								Diameter (DN) 20 DN20, G¾"
				B B00							Function B standard flow control B00 B version, with integrated IRC function ¹⁾
					1						Supply voltage 1 AC/DC 24 Volts
						1					Implementation 1 standard version
							1 2				User interface 1 integrated Bluetooth® communication 2 wireless network Bluetooth® mesh
								6			Bus communication RS485 6 With MP <i>MultiProtocol</i> : MODBUS, BACnet and Bluetooth®
									0 2		ΔT measurement 0 without ΔT measurement 2 with ΔT measurement (T _{am1} + T _{am2}) ¹⁾
										1	Connection cord length 1 with standard length connection cord (PVC)

¹⁾ ΔT measurement cannot be combined with IRC function (B00)

12. Ordering information

Type	G _v [inch]	V ₅ [l/h]	V ₁₀ [l/h]	V ₂₀ [l/h]	V _{max} [l/h]	U _v [Volts]	Y ₁ [Volts]	Sensors			Ctrl		MultiProtocol			
								Flow	Di	ΔT	Flow	IRC				
						 24 V	 0..10Vdc		 3x						MODBUS	BACnet
																
Design flow at Δp 5kPa 10kPa 20kPa																

With MultiProtocol communication MODBUS RTU or BACnet MSTP

Basic

▲ DXC2P20B.111601	G _{3/4"}	537	759	1073	2400	●	●	●	-	-	●	●	●	-	●	●
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With integrated ΔT measurement

▲ DXC2P20B.111621	G _{3/4"}	537	759	1073	2400	●	●	●	-	●	●	-	●	-	●	●
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With integrated room temperature control (IRC - Integrated Room Control)

▲ DXC2P20B00.111621	G _{3/4"}	537	759	1073	2400	●	●	●	●	●	●	●	●	-	●	●
---------------------	-------------------	-----	-----	------	------	---	---	---	---	---	---	---	---	---	---	---

With Bluetooth® Mesh communication

With integrated room temperature control (IRC - Integrated Room Control)

▲ DXC2P20B00.112601	G _{3/4"}	537	759	1073	2400	●	●	●	●	-	●	●	-	●	●	●
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With integrated room temperature control (IRC - Integrated Room Control) and ΔT measurement

▲ DXC2P20B00.112621	G _{3/4"}	537	759	1073	2400	●	●	●	●	●	●	●	-	●	●	●
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Legend

DN	valve size	V _{max}	flow rate range (0..V _{max})	L _c	standard cable length (PVC)
Δp _s	maximum close-off pressure	V ₅	flow rate at Δp 5kPa		
IRC	with integrated room temperature control	V ₁₀	flow rate at Δp 10kPa		
	wireless Bluetooth® communication	V ₂₀	flow rate at Δp 20kPa		

▲ Standard design (assembly to order, delivery times may vary)

△ special design, delivery times on request, min. quantities apply

13. Further information



1	Mounting Instructions	MI 20190903001A
2	MODBUS-register list	MI 20220105001A
3	BACnet PICS	MI 20220105002A
4	REVIT-data files (BIM)	www.belparts.com

14. Intellectual property

DXC2_B is based on technology protected by international patents:

- European Patent No. EP2307938
- European Patent No. EP2706425
- European patent No. EP3812870
- European Patent No. EP3280937
- European Patent No. EP3918236 (patent pending)
- Chinese patent No. ZL200880130728.9
- United States Patent No. US9823666
- United States Patent No. US10394257
- Registered community model RCD No. 004030633-0001
- Registered community model RCD No. 004030633-0002



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