



DXU2F080C.111621

dynamx™ variable flow-control valves, series DXU_C

- Electronic pressure-independent flow control (MID)
- 2-way or 3-way flow-control control valves
- Integrated flow measurement
- Integrated ΔT measurement
- Power supply U_v : AC/DC 24Volt
- Flow rate set point via control signal Y_1 : 0..10Vdc or digital
- MP *MultiProtocol* : MODBUS RTU and BACnet MSTP communication.
- Wireless commissioning with Bluetooth® communication
- Available with integrated application control functions ¹⁾

0..254'000 l/h



DN50..DN150

Dynamic Flow Networking®

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



Advantages

- ✓ 4-in-1 solution
- ✓ variable flow control
- ✓ automatic balancing
- ✓ no minimum Δp required
- ✓ flow and energy recording
- ✓ MP *MultiProtocol* on RS485 bus
- ✓ Bluetooth® wireless communication
- ✓ patented technology EP230793

Description

The *dynamx™* Ultima control valves, DXU_C series, are electronic pressure-independent flow-control control valves and combine four functions: (1) a control valve, (2) a dynamic pressure-independent balancing valve, (3) a shut-off valve (4) an energy meter.

DXU_C is used in variable flow HVAC systems and is designed for air handling units, heat exchangers, etc. DXU_C replaces both the (static) balancing valve, and the readjustment valve.

DXU_C series is available as 2-way or 3-way valves with different flow ranges for optimal sizing. DXU_C can be used in HVAC systems for buildings with a nominal system pressure of 16bar (PN16) and water temperatures: +2°C..+130°C ²⁾(non-condensing).

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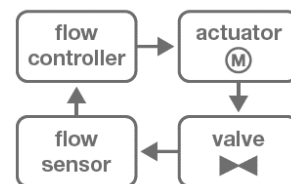
¹⁾ option

²⁾ the pressures listed are maximum values limited by the maximum allowable temperatures in the pressure-temperature diagram

1. How it works

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

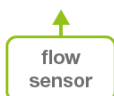
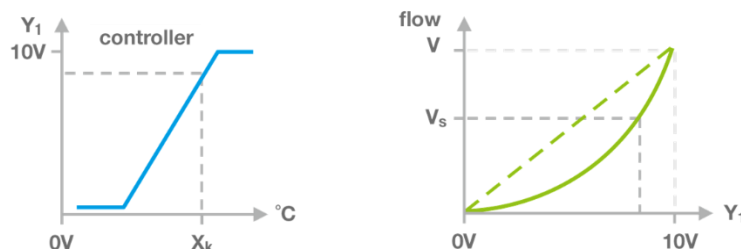
- a control valve
- a drive
- a flow sensor
- a flow regulator



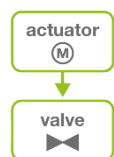
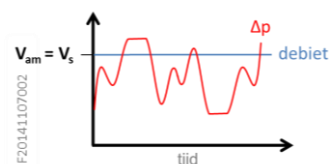
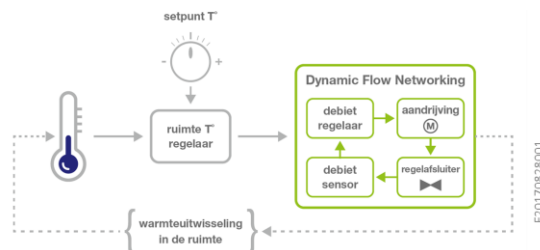
On top of these basic building blocks, additional control functions can optionally be added such as, for example, a water temperature controller.



In *analog* mode, the internal flow controller of the *dynamx™* receives a set point from an external controller via a Y_1 : 0..10Vdc control signal. Internally, this setpoint is converted to a flow setpoint, being 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.



DXU_C will control the flow rate to a specified set point, independent of any pressure changes in the system at e.g. partial 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.

Independent of the operating mode, DXU_C can be applied for variable or constant flow control or for maximum flow limitation. 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.



DXU_C features wireless Bluetooth® communication, which allows easy wireless access via a smartphone or tablet.



The *dynamx™* DXU_C control valves can be supplied with MP *MultiProtocol* communication, allowing them to be included in both MODBUS and BACnet communication networks.

2. Technical Data

Electric

Supply voltage U_v	AC 24 Volts (±10%), 50Hz DC 24 volts (±10%) ⁽¹⁾
Control signal Y₁	0..10Vdc (0.17mA)
Additional sensor input Y₂	0..10Vdc (0.17mA)
Feedback signal X₁	0..10Vdc (≤ 2mA) actual flow rate, scaled to max flow rate set heating or cooling
Electrical connection	PVC cable, 7x 0.5mm ² , length L _C = 2m

Flow measurement

Sensor type MID	ultrasonic TTM, no moving parts
Sensor accuracy	compliant with MID-2014/32/EU, EN1434-4:2007
Measuring accuracy	class 2
Unit of measurement	m ³ /h ⁽²⁾ , l/s, l/min, gpm (UK), gpm (US)

Temperature measurement

Sensor type MID	Pt500 or Pt1000 in accordance with EN60751
Paired sensors	In accordance with MID-2014/32/EU, EN1434-4:2007
MID Module	Module B (heat)

Hydraulic

Construction	DXU2_C DXU3_C	2-way 3-way, mixing
Nominal pressure		PN16 (16 bar) ⁽³⁾
Control characteristic		equiprocentual ⁽²⁾ or linear
Leakage rate		sealed (EN 1349 VI G1)
Differential	<i>min.</i> <i>max.</i>	no minimum differential pressure required depending on DN size
Setting flow rate set point		via analog signal (Y ₁), or via bus communication, or via wireless Bluetooth® communication & APP
Medium		water (without glycol)
Medium quality		in accordance with VDI 2035
Medium temperature		+5°C..+130°C
Connection		flanges PN16 in accordance with EN1092-2 Type 21
Startup time		3..5min after power on
Tensionless position		last position

Material

Housing	polypropylene, steel
Wet parts	cast iron GG25 (EN-JL1040), brass (CW614N), EPDM, thermoplastics, STAINLESS STEEL (1.4401, 1.4122, 1.4301), ceramic materials

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, without condensation
Mechanical environment		M1 (fixed installation with minimal vibration)
Maintenance / Calibration		maintenance-free, without calibration

⁽¹⁾ AC rectified voltage only

⁽²⁾ factory default setting

⁽³⁾ the specified pressures are maximum values limited by the maximum allowable temperatures in the pressure-temperature diagram.

Note: PN25 available on request

3. MP MultiProtocol

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



Thanks to this *MultiProtocol* communication, the DXU_C control valves can be integrated either into a:



- MODBUS, or a
- BACnet network

By integrating the *dynamx™* control valves into a MODBUS or BACnet network, the setpoint can also be set via the bus, the current flow rate can be monitored remotely, etc. A selection of settings can also be adjusted via the bus.

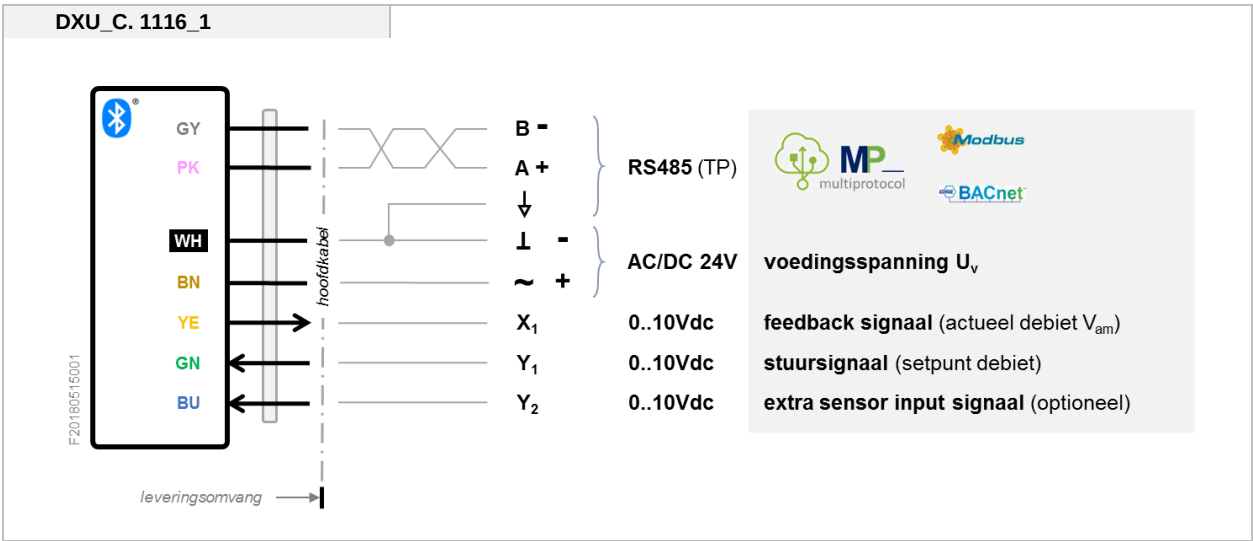
Technical specifications		
Protocol	MODBUS	RTU/MSTP, slave
	BACnet	MSTP, slave
Physical layer		RS485, 2-wire (twisted pair) not isolated
Bushing ends		120Ω end resistance at each end of the canister
Communication settings ³⁾		9600, 19200 or 38400 ²⁾ Baud 1 start bit even ²⁾ / odd / no parity 8 data bits 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 compliance with local EMC regulations during installation, connection and commissioning of DXU_C with a communication bus

²⁾ factory default settings

³⁾ can be set via Bluetooth wireless® communication & dxLink™ APP or via the BUS communication

4. Electrical connection



WH	BK	BN	GN	YE	BU	PK	GY
white	black	brown	green	yellow	blue	pink	grey
wit	zwart	bruin	groen	geel	blauw	roos	grijs
blanc	noir	brun	vert	jaune	bleu	rose	gris
weiß	schwarz	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.

Compliant 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. Power consumption

Type	DN	Δp_s	P	Dim
	[mm]	[kPa]	[W]	[VA]

Standard versions

DXU_F050C. _ 1 _ _ _ _	50	150	5,5	6
DXU_F065C. _ 1 _ _ _ _	65	100	5,5	6
DXU_F080C. _ 1 _ _ _ _	80	230	8,5	9
DXU_F100C. _ 1 _ _ _ _	100	140	8,5	9
DXU_F150C. _ 1 _ _ _ _	150	120	20,5	21

Special versions with increased closing pressure Δp_s

DXU_F050C. _ 2 _ _ _ _	50	350	8,5	9
DXU_F065C. _ 2 _ _ _ _	65	350	8,5	9
DXU_F080C. _ 2 _ _ _ _	80	350	20,5	21
DXU_F100C. _ 2 _ _ _ _	100	500	20,5	21
DXU_F150C. _ 2 _ _ _ _	150	550	50	50

Legend

P	electrical consumption in watts
Dim	sizing in Volts amperes

6. Flow rate and pressure range

Dynamx™ control valves are available in different flow ranges to allow optimal selection and reduce pumping energy

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]
DXU_F050C. _____	50	30,5	105	6.811	9.633	13.623	30.000
DXU_F065C. _____	65	48,8	175	10.903	15.419	21.806	48.000
DXU_F080C. _____	80	70,7	280	15.811	22.361	31.623	70.000
DXU_F100C. _____	100	118,7	420	26.541	37.534	53.081	118.000
DXU_F150C. _____	150	254,7	1.050	56.959	80.552	113.917	254.000

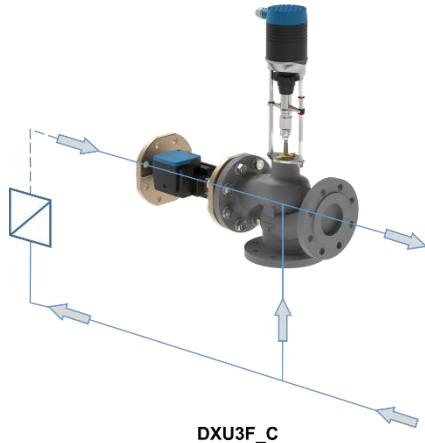
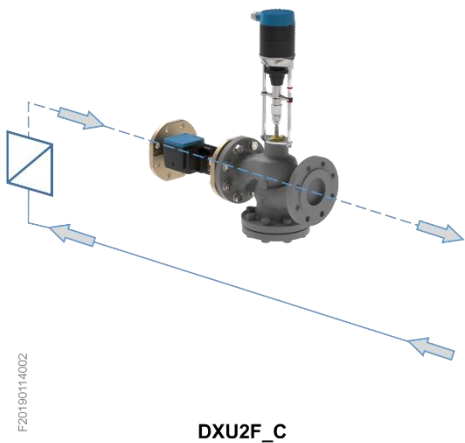
Legend

DN	unit dimensions
K _{vs}	K _{vs} value of the unit
V _{min}	minimum controllable flow rate
V ₅	flow rate at Δp 5 kPa
V ₁₀	flow rate at Δp 10 kPa
V ₂₀	flow rate at Δp 20 kPa
V _{max}	flow range (0..V _{max})

7. Flow direction

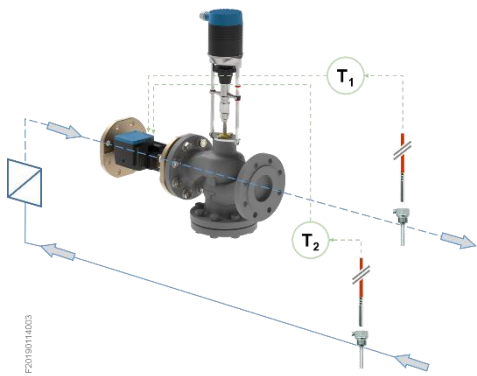
Flow direction

DXU_C flow-control control valves have a fixed flow direction, as specified in the drawing. An arrow on the valve body indicates the input and output of the control valve.

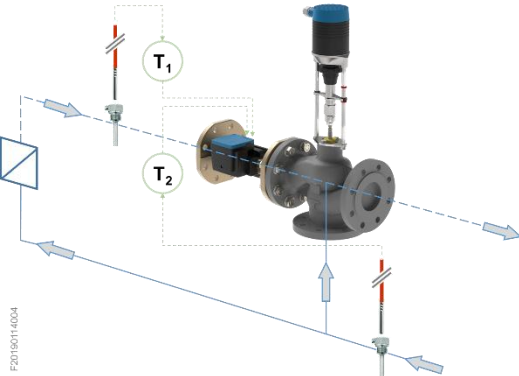


8. Temperature sensors

The *dynamx*TM DXU_C control valves are available with two temperature sensors, for measuring supply and return water temperature. Both temperature sensors T₁ and T₂ have a free cable length of 2m and should be mounted on site.



DXU2F_C



DXU3F_C

T₁ + T₂ to measure the temperature difference of the medium, $\Delta T = |T_1 - T_2|$

temperature sensor with immersion sleeve ¹⁾

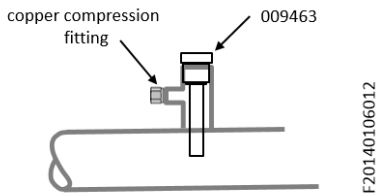


Type			
DXU_F050C ____ 2 ____	1st	1st	2pcs
DXU_F065C ____ 2 ____	1st	1st	2pcs
DXU_F080C ____ 2 ____	1st	1st	2pcs
DXU_F100C ____ 2 ____	1st	1st	2pcs
DXU_F150C ____ 2 ____	1st	1st	2pcs

¹⁾ Stainless steel AISI 304 (1.4301), process connection R¹/₂ (standard 2 immersion sleeves are included in delivery)

²⁾ other accessories for mounting temperature sensors are not part of the delivery and must be ordered separately

Assembly example





9. Status LED

The integrated LEDs provide useful information that can help during startup and commissioning:

- + 1x LED power supply
- + 1x LED communication status
- + 1x LED Bluetooth® communication



Available on the
App Store

GET IT ON
Google Play

10. Wireless commissioning

Thanks to the integrated Bluetooth® technology, the DXU_C control valves have a wireless interface for commissioning purposes.

There is no easier way to install and commission your hydraulic systems than with the dxLink™ APP. All the information you need is available on your smartphone or tablet.

This function can be combined with MODBUS or BACnet bus communication.



11. Related information



C.101 - 01	Assembly Instructions
C.101 - 02	User manual MODBUS RTU
C.101 - 03	User manual BACnet MSTP
C.101 - 04	Data files REVIT

12. Intellectual property

DXU_C is based on technology protected by international patents:

- European Patent No. EP2307938
- European Patent No. EP2706425
- European Patent No. EP3812870
- 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



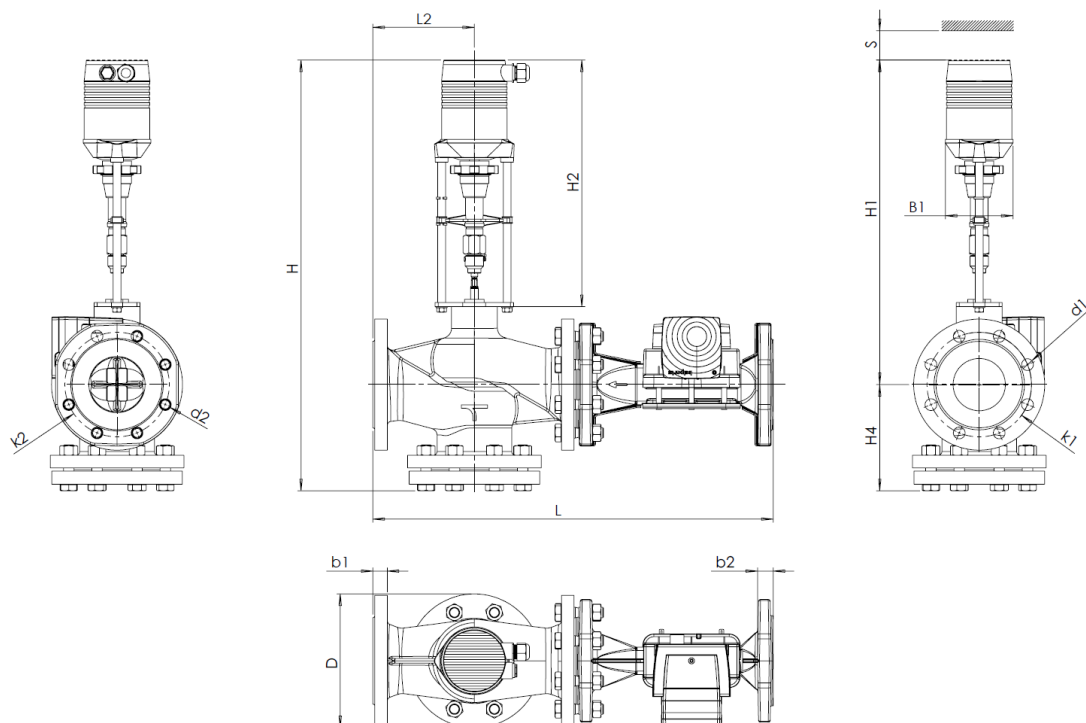
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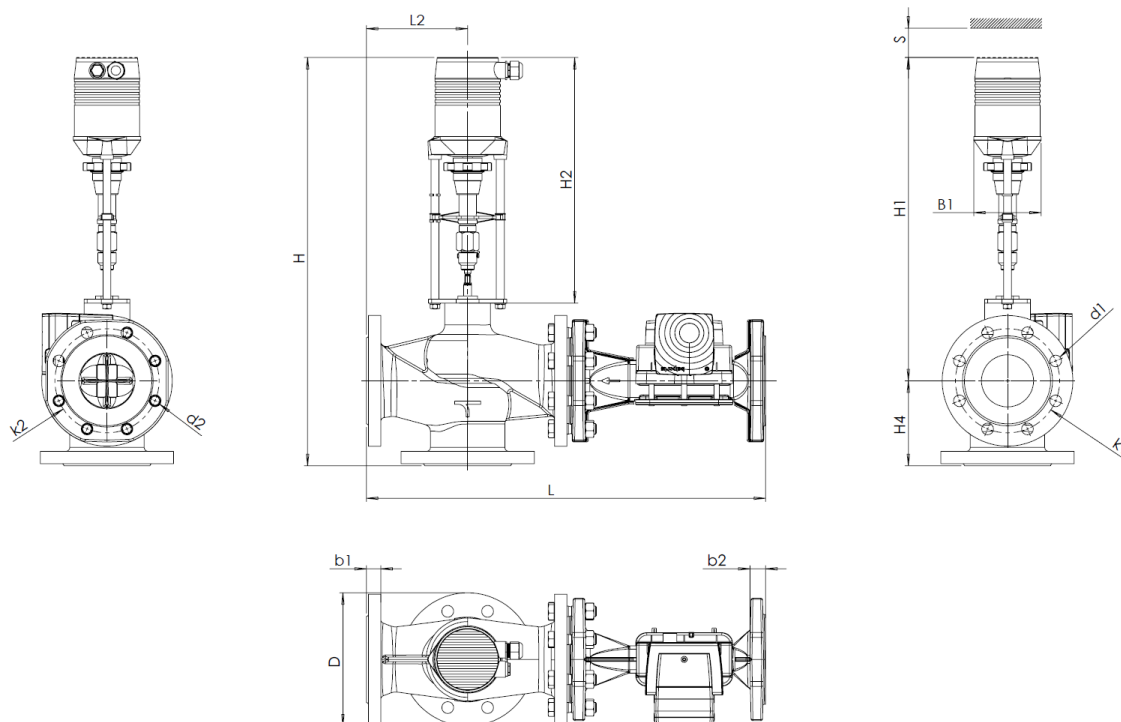
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13. Dimensions

DXU2F_C 'ONE'



DXU3F_C 'ONE'



14. Dimensions

(continued)

Afmetingen																
k2	d2	H	L2	H2	L	H4	H1	S	B1	d1	k1	b1	b2	D	m	
[mm]																[kg]
DXU2F050C	125	18	414	115	225	503	130	282	140	109	18	125	20	20	165	24,8
DXU3F050C	125	18	384	115	225	503	100	282	140	109	18	125	20	20	165	21,1
DXU2F065C	145	18	483	145	225	593	150	335	140	109	18	145	20	22	186	37,3
DXU3F065C	145	18	453	145	225	593	120	335	140	109	18	145	20	22	186	32,5
DXU2F080C	160	18	659	155	377	613	162	496	140	104	18	160	22	24	205	46
DXU3F080C	160	18	627	155	377	613	130	496	140	104	18	160	22	24	205	40,2
DXU2F100C	180	18	686	175	377	713	182	506	140	104	18	180	24	24	221	68,1
DXU3F100C	180	18	654	175	377	713	150	506	140	104	18	180	24	24	221	61,2
DXU2F150C	250	28	1012	241	665	981	207	805	140	135	22	240	34	26	277	147
DXU3F150C	250	28	975	241	665	981	170	805	140	135	22	240	34	26	277	134

T20190520001

14. Article coding

DXU	2	F	080	C	1	1	1	6	2	1	
SERIES				VERSION							
DXU											Series <i>dynamx</i> ™ control valves DXU <i>dynamx</i> ™ Ultima
	2										Number of connections 2 2-way control valve 3 3-way control valve
		F									Assembly F with PN16 flanges EN1092-2, type 21
			050								Size (DN) 050 DN50 (on demand) 065 DN65 080 DN80 100 DN100 150 DN150
				C							Features C standard flow control
					1						Supply voltage 1 AC/DC 24 volts
						1					Version 1 standard version 2 Drive with increased drive force, higher Δp_s
							0				User interface 0 - 1 with integrated Bluetooth® communication
								0			Bus communication 0 without bus communication (standalone) ¹⁾ 6 With MP <i>MultiProtocol</i> (MODBUS, BACnet)
									0		ΔT measurement 0 without ΔT measurement 2 with ΔT measurement (T ₁ + T ₂)
										1	Connection cord length 1 standard length L _(c) (PVC)

¹⁾Note: This can only be done for a DXU_C version with integrated Bluetooth® communication.

15. Ordering Information



Type	AC/DC 24V [Volts]	DN [mm]	K _{vs} [m³/h]	V ₅ [l/h]	V ₁₀ [l/h]	V _{max} [l/h]	Δp _s [kPa]				ΔT [°C]	L _c [m]
								0..10Vdc		MP multiprotocol		

2-way version

DXU2F050C.111621	▲	●	50	30,5	6.811	9.633	30.000	150	●	●	●	●	2m
DXU2F065C.111621	▲	●	65	48,8	10.903	15.419	48.000	100	●	●	●	●	2m
DXU2F080C.111621	▲	●	80	70,7	15.811	22.361	70.000	230	●	●	●	●	2m
DXU2F100C.111621	▲	●	100	118,7	26.541	37.534	118.000	140	●	●	●	●	2m
DXU2F150C.111621	▲	●	150	254,7	56.959	80.552	254.000	120	●	●	●	●	2m

3-way version, mixing

DXU3F050C.111621	▲	●	50	30,5	6.811	9.633	30.000	150	●	●	●	●	2m
DXU3F065C.111621	▲	●	65	48,8	10.903	15.419	48.000	100	●	●	●	●	2m
DXU3F080C.111621	▲	●	80	70,7	15.811	22.361	70.000	230	●	●	●	●	2m
DXU3F100C.111621	▲	●	100	118,7	26.541	37.534	118.000	140	●	●	●	●	2m
DXU3F150C.111621	▲	●	150	254,7	56.959	80.552	254.000	120	●	●	●	●	2m

OPTIONS

SERIES	VERSION						Description	
DXU_C	1	1	1	6	2	1	standard version	▲
	—	2	—	—	—	—	drive with increased drive force, gives higher Δp _s	△
	—	—	1	0	—	—	without bus communication (standalone)	△
	—	—	—	—	0	—	without medium temperature sensors	△
	—	—	—	—	—	—	.L05 PVC cable length 5m	△
	—	—	—	—	—	—	.L10 PVC cable length 10m	△

Legend

DN	luminaire connection	Δp _s	maximum closing pressure	ΔT	ΔT temperature measurement
K _{vs}	K _{vs} -value control valve		Bluetooth® wireless communication	L _(c)	standard cable length (PVC)
V ₅	flow rate at Δp 5 kPa		with RS485 bus interface		
V ₁₀	flow rate at Δp 10 kPa				
V _{max}	flow range (0..V _{max})		MultiProtocol (MODBUS, BACnet)		

▲ standard

△ on request (min. quantities and/or longer delivery times apply, please contact us)