



DXU2F200D.211621

dynamx™ variable flow-control valves, series DXU_D

- Electronic pressure-independent flow control
- 2-port or 3-port flow control valves PN16 ¹⁾
- Integrated flow measurement
- Integrated ΔT measurement
- Power supply U_v: AC 230Volt
- Flow setpoint via ctrl signal Y₁: 0..10Vdc or digital
- MP *MultiProtocol*: MODBUS RTU and BACnet MSTP communication
- Wireless commissioning through Bluetooth[®] communication
- Available with integrated application control functions ²⁾

0..1'194'000 l/h

DN100..DN300

Dynamic Flow Networking[®]

The *dynamx*[™] flow-control 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*[™] flow-control valves provide 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

- ✓ 4-in-1 solution
- ✓ variable flow control
- ✓ automatic hydronic balancing
- ✓ no min. pressure upstream required
- ✓ flow and energy registration
- ✓ MP *MultiProtocol* communication
- ✓ Bluetooth[®] communication on board
- ✓ patented technology
EP 230793, EP 2706425

Description

The *dynamx*[™] Ultima XXL valves, series DXU_D, are electronic, pressure-independent flow-control valves. They combine four functions in one device: 1) a flow-control valve, 2) a dynamic, pressure-independent balancing valve a 3) shut-off valve and 4) an energy-monitoring device.

DXU_D is used in HVAC systems with variable flow and is designed e.g. for AHU, heat exchangers, etc. DXU_D replaces the (static) balancing valve, as well as the control valve.

The DXU_D series are available as 2-port or 3-port valves with different flow ranges for optimal sizing. DXU_D can be used in HVAC systems for buildings with a nominal system pressure of 16 bar (PN16) and water temperatures: +2°C..+120°C ¹⁾ (non-condensing).

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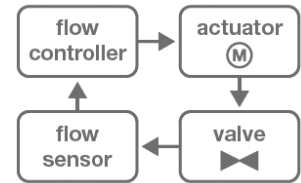
¹⁾ the pressures mentioned are maximum values, limited by the maximum admissible temperatures in the pressure-temperature flowchart

²⁾ option

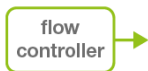
1. How it works

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:

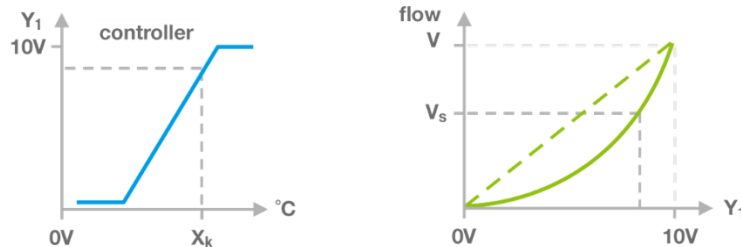
- a valve
- an actuator
- a flow sensor
- a flow controller



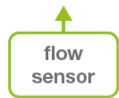
On top of these basic building blocks additional features can be added, like for example a water temperature controller.



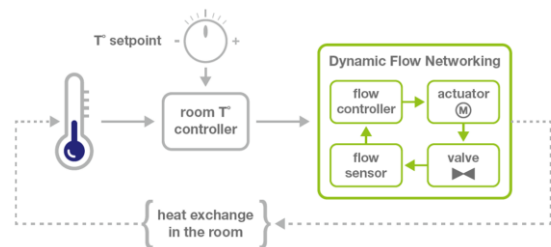
In analog mode, the internal flow controller of the *dynamx*™ valve receives a setpoint from the external controller Y_1 : 0..10Vdc. Internally this setpoint is converted into a flow setpoint, for either heating or cooling. Example:



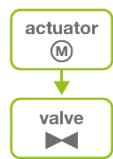
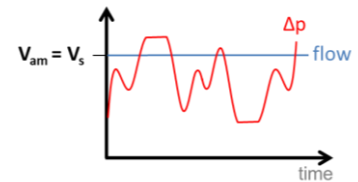
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The integrated flow sensor measures continuously the actual flow. The intern control loop will compare the actual flow with the desired flow and adjust the position of the control valve until the measured flow is equal to the required flow rate setpoint.



F20170828001



Thus DXU_D 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 searches for the ideal setpoint, to guarantee a maximum comfort for the user with minimal energy consumption.

Regardless of the operating mode, DXU_D can be used for a variable or constant flow control or a maximum flow limit. The output signal X_1 : 0..10Vdc, representing the actual 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.



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



The *dynamx*™ DXU_D valves can be supplied with MP bus *MultiProtocol* communication allowing to integrate them into MODBUS as well as BACnet communication networks.

2. Technical data

Electrical		
Power supply U_v	AC 230 Volt (±10%), 50Hz	
Input signal Y₁	0..10Vdc (0.17mA)	
Feedback signal X₁	0..10Vdc (≤ 2mA) the actual flow, scaled to the maximum flow settings for heating or cooling	
Electric wiring	U_v	2x1,5mm ² (+earth), length L _c
	Y₁ / X₁	6x 0,5mm ² , length 2m
	RS485	

Flow measurement	
Sensor type	ultrasonic TTM, no moving parts
Flow sensor class	according MID-2014/32/EU, EN1434-4:2007
Measuring unit	m ³ /h ¹⁾ , l/s, l/min, gpm (UK), gpm (US)

Temperature measuring ³⁾	
Sensor type	Pt500 or Pt1000 according to EN60751
Sensor pairing	according to MID-2014/32/EU, EN1434-4:2007

Hydronics		
Construction	DXU2_D	2-port
	DXU3_D	3-port, mixing
Nominal pressure rating		PN16 (16 bar) ²⁾
Control characteristic		equal percentage ¹⁾ or linear
Valve seat leakage		tight sealing (EN 1349 VI G1)
Differential pressure	<i>min.</i>	no minimum pressure upstream required
	<i>max.</i>	depending on DN size
Flow setpoint control		analog (Y ₁), via bus communication or via APP
Medium		water (glycol free)
Medium quality		according to VDI 2035
Medium temperature		+2°C..+120°C
Connections		flanges PN16 according to EN1092-2 Type 21
Start-up time		3..5min after power-up
Powerless position		last position

Material	
Housing	polypropylene, steel
Wetted parts	GG-25, brass, steel 1.0345, stainless steel (1.4057, 1.4122, 1.4404), EPDM

Environment		
Temperature	<i>ambient</i>	+10°C .. +45°C
	<i>storage</i>	-20°C .. +50°C
IP protection		IP54
Humidity		maximum 90% HR, without condensation
Mechanical environment		M1 (fixed installation with minimum vibrations)
Maintenance / calibration		without maintenance, without calibration

¹⁾ default factory setting

²⁾ the indicated pressures are maximum values which are limited by the maximum allowed temperatures in the pressure-temperature diagram.
PN25 available on request.

3. MODBUS / BACnet interface

The *dynamx*TM DXU_D valves are optionally available with an RS485 bus communication interface with an RS485 bus communication interface with the MP bus MultiProtocol functionality for easy integration¹⁾ in any building management system (GBS).



Thanks to this *MultiProtocol* communication the DXU_D control valves can be integrated either in a:

- MODBUS, or
- BACnet network

By integrating the *dynamx*TM 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 also be adjusted over the bus.

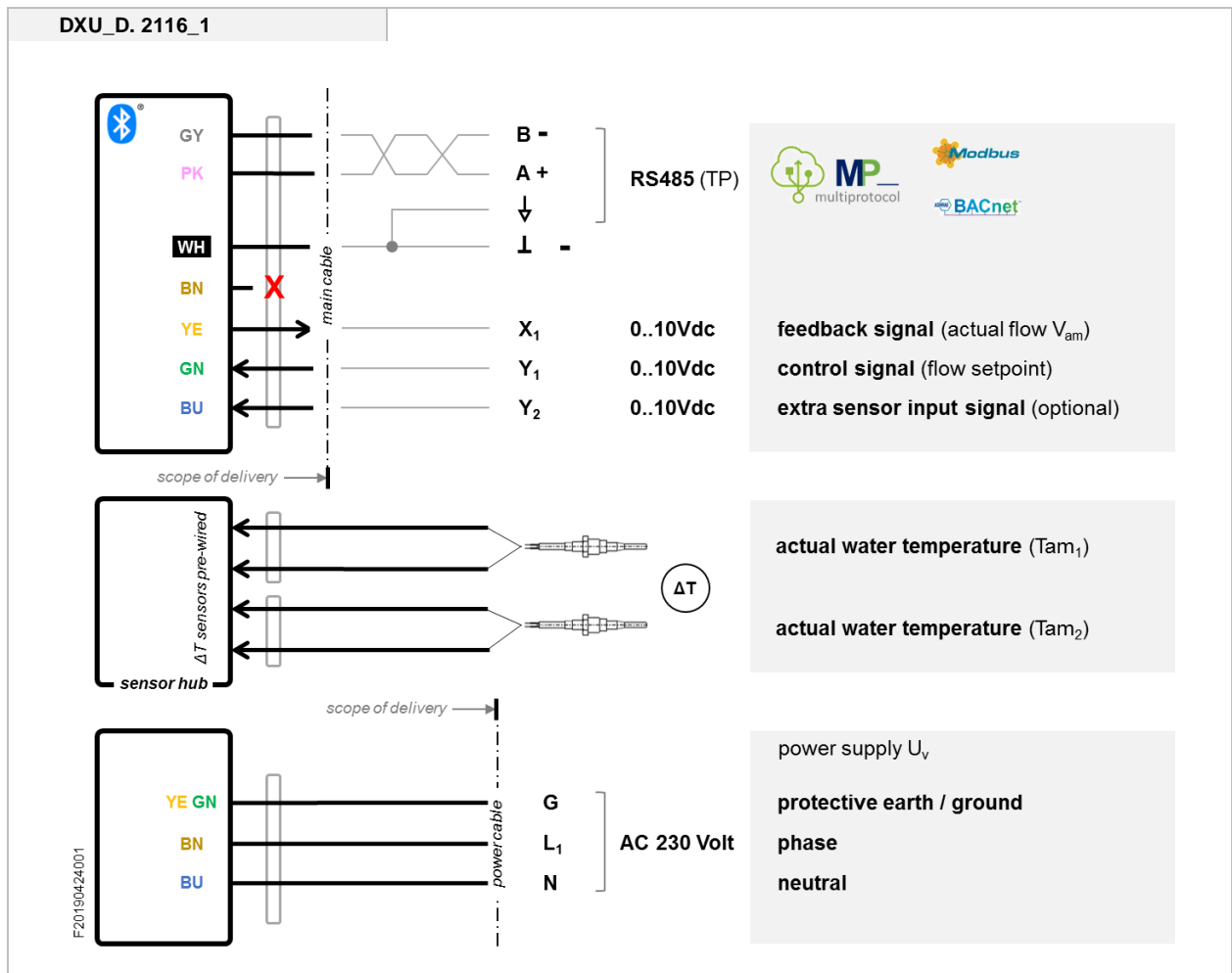
Technical specifications		
Protocol	MODBUS	RTU MS/TP, slave
	BACnet	MSTP, slave
Physical layer		RS485, 2-wire twisted pair not isolated
Bus termination		120Ω terminal resistor at each end of the bus
Communication settings ²⁾		9600, 19200 or 38400 ²⁾ Baud 1 start bit even ²⁾ / odd / no parity 8 data bits 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 complying with local EMC regulations when installing, connecting and commissioning DXU_D to a communication bus

²⁾ default settings ex works

³⁾ can be set via the de wireless Bluetooth® communication & dxLinkTM APP via the bus communication

4. Electrical wiring



Integrated Bluetooth® communication

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 safety transformer should be used according to local regulations.

Complies with the Electromagnetic Compatibility Directive 2014/30/EU, applying 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 consumption

Type	DN [mm]	Δp_s [kPa]	P [VA]
2-port			
DXU2F100D. _____	100	140	13
DXU2F125D. _____	125	160	25
DXU2F150D. _____	150	120	25
DXU2F200D. _____	200	600	25
DXU2F250D. _____	250	100	63
DXU2F300D. _____	300	150	63
3-port			
DXU3F100D. _____	100	140	13
DXU3F125D. _____	125	160	25
DXU3F150D. _____	150	120	25
DXU3F200D. _____	200	110	25
DXU3F250D. _____	250	100	63
DXU3F300D. _____	300	150	63

6. Flow range

In order to achieve optimum sizing and to minimize pump consumption, *dynamx*TM flow-control valves are available with different flow rates.

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_F100D. _____	100	147	1.200	32.880	46.499	56.949	147.000
DXU_F125D. _____	125	196	2.000	43.841	62.000	75.934	196.000
DXU_F150D. _____	150	301	3.000	67.518	95.485	116.945	301.000
DXU_F200D. _____	200	496	5.000	110.954	156.912	221.907	496.000
DXU_F250D. _____	250	970	8.000	217.056	306.964	375.953	970.000
DXU_F300D. _____	300	1.194	11.200	267.019	377.622	462.491	1.194.000

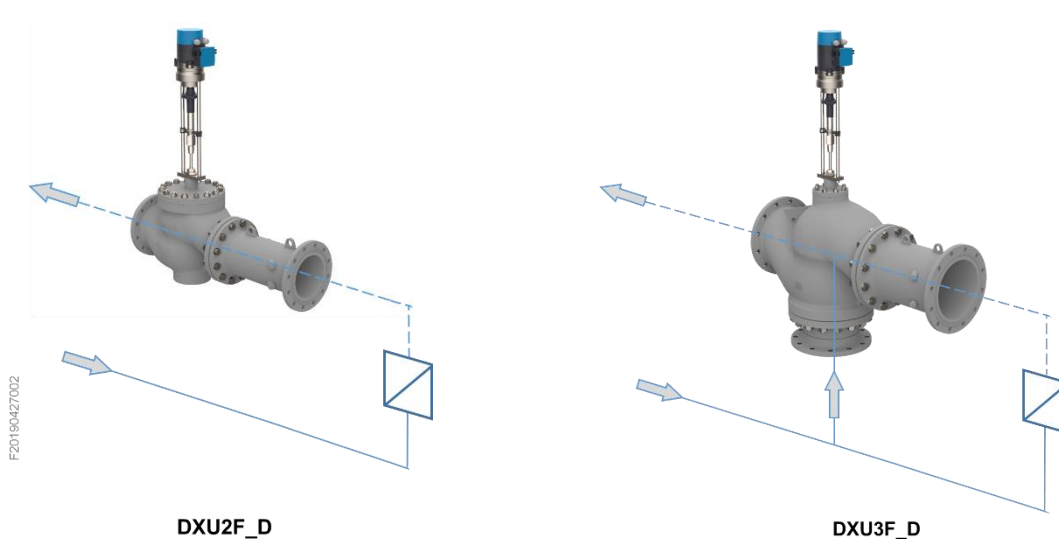
Legend

DN	valve size
K _{vs}	K _{vs} -value of the flow-control valve
V _{min}	minimum controllable flow
V ₅	flow range at Δp 5kPa
V ₁₀	flow range at Δp 10kPa
V ₂₀	flow range at Δp 20kPa
V _{max}	flow range (0..V _{max})

7. Hydraulic connection

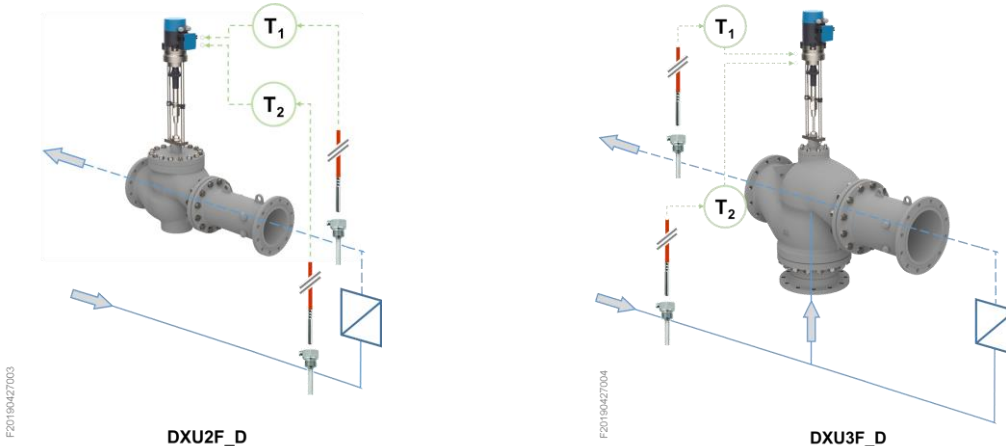
Flow direction

The *dynamx*TM DXU flow-control valves have a fixed flow direction, as specified in the drawing. An arrow on the valve body indicates the in- and output of the flow control valve.



8. Temperature sensors

The *dynamx*™ DXU valves are available with two temperature sensors for the measurement of the in- and output water temperature. Both temperature sensors T₁ and T₂ have a free cable length of 2m and must be mounted on site.



T₁ + T₂ allows the measurement of the differential temperature of the medium, $\Delta T = |T_1 - T_2|$

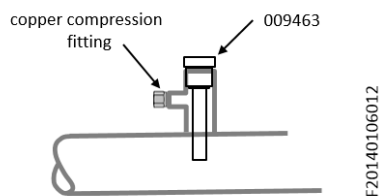
temperature sensor with sensor pocket ¹⁾



Type			
DXU_F100D _ 2_	1pc	1pc	2pcs
DXU_F125D _ 2_	1pc	1pc	2pcs
DXU_F150D _ 2_	1pc	1pc	2pcs
DXU_F200D _ 2_	1pc	1pc	2pcs
DXU_F250D _ 2_	1pc	1pc	2pcs
DXU_F300D _ 2_	1pc	1pc	2pcs

- ¹⁾ stainless steel AISI 304 (1.4301), process connection R½ (standard 2pcs sensor pockets included in the scope of delivery)
- ²⁾ other mounting accessories for the temperature sensors are not a part of the delivery scope and have to be ordered separately.

Mounting example





9. Status information (LED)

The integrated LEDs provide useful information that can help during the start-up and commissioning of the installation:

- + 1x LED power supply
- + 1x LED status of the communication

10. Wireless commissioning

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



There is no easier way to get your hydronic systems installed and properly commissioned than with the dxLink™ APP.

All the information you need is right there, on your smartphone or tablet.

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



11. Other resources



C.102 - 01	Mounting instructions
C.102 - 02	User manual MODBUS RTU
C.102 - 03	User manual BACnet MSTP
C.102 - 04	Data files REVIT

12. Intellectual property

DXU_D is based on technology, protected by international patents:

- European patent Nr. 2307938
- European patent Nr. 2706425
- Chinese patent Nr. ZL200880130728.9
- United States Patent Nr. 9823666
- Registered community design RCD N° 004030633-0001
- Registered community design RCD N° 004030633-0002



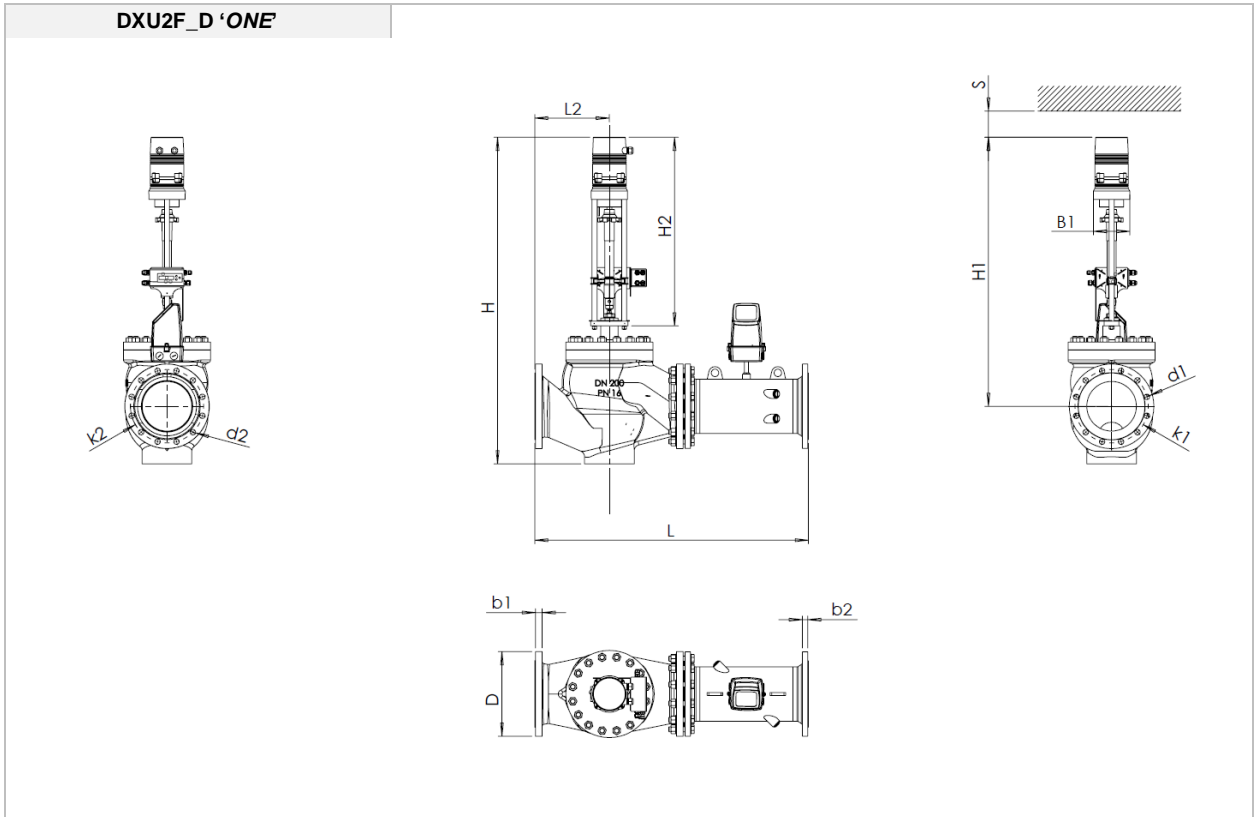
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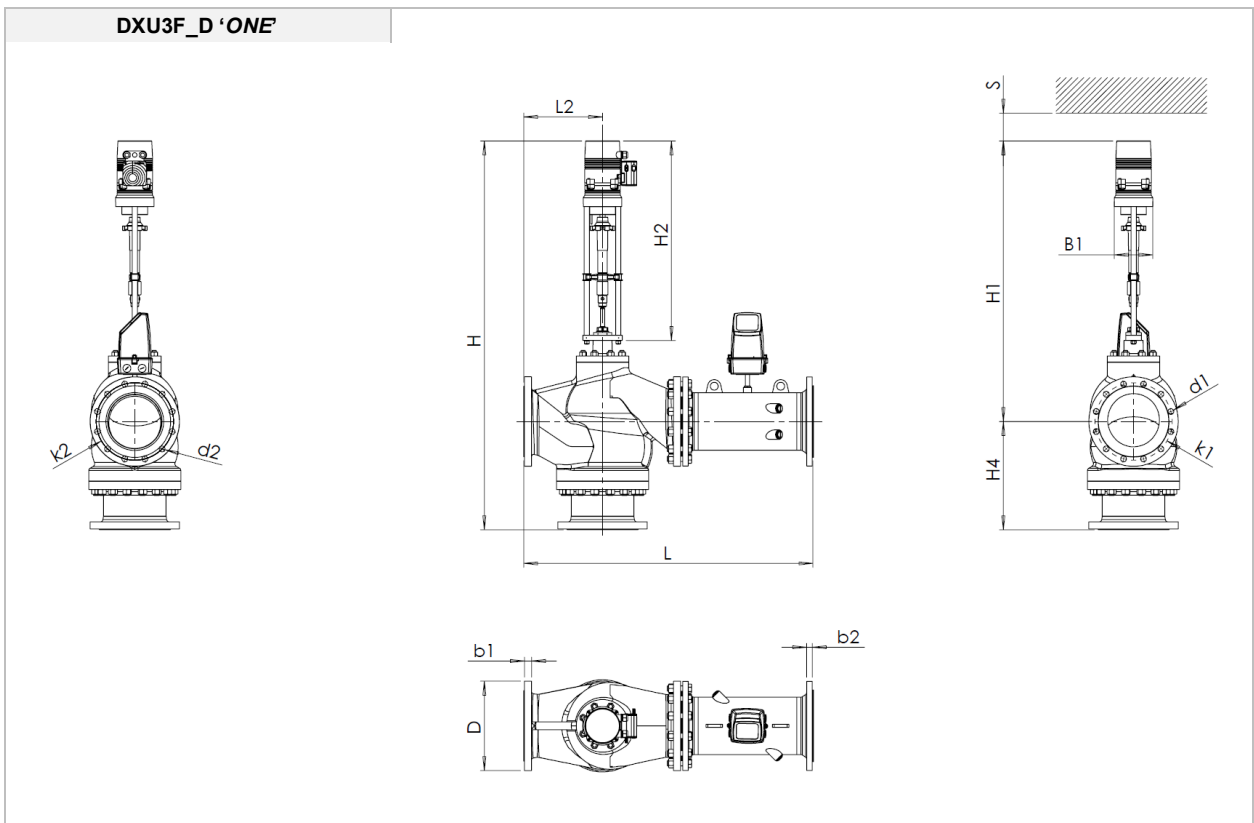
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13. Dimensions

DXU2F_D 'ONE'



DXU3F_D 'ONE'



14. Dimensions (continued)

Dimensions																	
	k2	d2	H	L2	H2	L	H4	H1	S	B1	d1	k1	b1	b2	D	[kg]	
																m _{alive}	m _{sensor}
	295	22	1098	300	665	1102	-	845	200	135	22	295	21	21	340	137	38
DXU2F200D.211621																	
	295	22	1060	300	665	1102	215	845	200	135	22	295	21	21	340	119	38
DXU3F200D.211621																	
	355	26	1395	366	760	1334	-	1138	200	147	26	355	29	23	406	302	60
DXU2F250D.221621																	
	355	26	1570	366	760	1334	450	1120	200	147	26	355	29	23	406	347	60
DXU3F250D.221621																	
	410	26	1574	426	805	1355	-	1243	200	147	26	410	32	28	461	392	66
DXU2F300D.221621																	
	410	26	1770	426	805	1355	551	1220	200	147	26	410	32	28	461	452	66
DXU3F300D.221621																	

T20190425001

14. Item reference numbers

DXU	2	F	200	D	2	1	1	6	2	1	
SERIES				VERSION							
DXU											dynamx™ series flow-control valves
											DXU_D dynamx™ Ultima XXL
											Number of ports
	2										2 2-port flow-control valve
	3										3 3-port flow-control valve (mixing)
											Mounting
		F									F with PN16 flanges EN1092-2, type 21
											Size (DN)
			100								100 DN100
			125								125 DN125
			150								150 DN150
			200								200 DN200
			250								250 DN250
			300								300 DN300
											Functions
				D							D standard flow control "XXL"
											Power supply
					2						2 AC 230 Volt
											Version
						1					1 standard version
						2					2 actuator with higher actuating force, increased Δp_s
											User interface
							1				1 with integrated Bluetooth® communication
											Bus-communication RS485
								6			6 with MP <i>MultiProtocol</i> (MODBUS, BACnet)
											ΔT-measurement
									0		0 without ΔT -measurement
									2		2 standard version : with ΔT -measurement ($T_1 + T_2$)
											Cable length
										1	1 standard cable length L_c (PVC)

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15. Ordering information



R20190227001

Type	AC	DN	K _{vs}	V ₅	V ₁₀	V _{max}	Δp _s				ΔT	L _c
	230V							0..10Vdc		MP multiprotocol	[°C]	[m]
	[Volt]	[mm]	[m ³ /h]	[l/h]	[l/h]	[l/h]	[kPa]					

2-port version

DXU2F100D.211621	▲	●	100	147	32.880	46.499	147.000	140	●	●	●	●	2m
DXU2F125D.211621	▲	●	125	196	43.841	62.000	196.000	160	●	●	●	●	2m
DXU2F150D.211621	▲	●	150	301	67.518	95.485	301.000	120	●	●	●	●	2m
DXU2F200D.211621	▲	●	200	496	110.954	156.912	496.000	600	●	●	●	●	5m
DXU2F250D.221621	▲	●	250	970	217.056	306.964	970.000	100	●	●	●	●	5m
DXU2F300D.221621	▲	●	300	1.194	267.019	377.622	1.194.000	150	●	●	●	●	5m

3-port version, mixing

DXU3F100D.211621	▲	●	100	147	32.880	46.499	147.000	140	●	●	●	●	2m
DXU3F125D.211621	▲	●	125	196	43.841	62.000	196.000	160	●	●	●	●	2m
DXU3F150D.211621	▲	●	150	301	67.518	95.485	301.000	120	●	●	●	●	2m
DXU3F200D.211621	▲	●	200	496	110.954	156.912	496.000	110	●	●	●	●	5m
DXU3F250D.221621	▲	●	250	970	217.056	306.964	970.000	100	●	●	●	●	5m
DXU3F300D.221621	▲	●	300	1.194	267.019	377.622	1.194.000	150	●	●	●	●	5m

OPTIONS

Series	VERSION					Description		
DXU_D	2	1	1	6	2	1	standard version	▲
	-	2	-	-	-	-	actuator with higher actuating force, offering increased Δp _s	△
	-	-	-	-	0	-	without medium temperature sensors	△

Legend

DN	valve size	V ₅	flow range at Δp 5kPa	Δp _s	maximum close-off pressure
K _{vs}	K _{vs} -value in m ³ /h	V ₁₀	flow range at Δp 10kPa	T ₂	medium temperature sensor Nr.2
		V _{max}	flow range (0..V _{max})	L _c	standard cable length (PVC)

▲ standard

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

