

AB-QM 4.0 CO⁶ Flexo, DN 15, PN 16

Description



Danfoss CO⁶ Flexo is a compact and timesaving connections set that combines a 6-way valve with an AB-QM PICV and control in applications with 4-pipe changeover systems, usually for radiant panels or chilled beams. The flow is controlled by the AB-QM for precise temperatures in the room and it avoids overflows which reduce the system's efficiency. The CO6 valve performs the switching between cooling and heating in a in 4-pipe changeover system.

Installation

Saving time and space

 Pre-assembled design Reduced installation time Easy setting and sizing, 100% authority and perfect control.

Trouble-free installations

- Compact and space saving installation
- Minimal built-in height
- Pressure tested at the factory

Service:

Save time and space

- Exchangeable CO⁶
- Exchangeable PICV
- Enables flow validation
- Easy disassembly (using hairpin connections)

Energy efficiency:

Pressure independent flow control with AB- QM 4.0 Improved indoor comfort with best performance and energy savings. Efficient energy transfer and minimal pumping costs.

Applications

CO⁶ Flexo is a pre-assembled, pressure- tested set used for terminal units, such as radiant panel and chilled beams. The Danfoss CO⁶ Flexo solution comprises AB-QM 4.0 (PICV) connected to 6way valve for switching between cold and hot water.

The AB-QM ensures and controls the required flow on every terminal unit and maintains Hydronic Balance in the system. The control valve has 100% authority and therefore ensures the stability of control. At partial load, there is no overflow, contrary to conventional solutions, because the AB-QM will always limit the flow to what is needed. By installing the AB-QM the whole system is divided into independent control loops.



There is a wide range of Danfoss actuators available for the AB-QM 4.0, suitable for every control need. Actuators are available as On/Off, 0-10 Volt, 4-20 mA, and digital via field bus.



Ordering

AB-QM 4.0 CO⁶ Flexo

Picture	Туре	Connection	Code No.
	DN15 LF	(turicht size (10aura)	003Z1580
	DN15	Straight pipe (18mm)	003Z1581
	DN15 LF	Internal thread 1/"	003Z1560
	DN15	internal thread ½	003Z1561

Actuator ChangeOver⁶

Туре	Cable length (m)	Power supply	Connection	Code No.
	1.5	24V AC	Open end	003Z3152
Actuator ChangeOver ⁶	5.0	24V AC	Open end	003Z3153
	1.5	230V AC	Open end	003Z3154
Actuator NovoCon ChangeOver ⁶	1	24V AC/DC	Plug-in	003Z8520
Actuator NovoCon ChangeOver ⁶ Energy	1 / Surface temperature sensors 1.5	24V AC/DC	Plug-in	003Z8521
Actuator NovoCon ChangeOver⁵ Flexible	1.5	24V AC/DC	Open end	003Z8522

Actuator

Туре	Speed (s/mm)	Power supply	Feedback signal	Control signal	Communication protocol	Enclosure	Code No.
NovoCon S	3/6/12/24	24V AC/DC	Yes	0-10 V, 2-10V,	BACnet MS/TP, Modbus RTU	IP54 (IP40 if mounted upside down)	003Z8504
AME 110 NL	- 24	24 24// 46	No	0-20mA, 4-20mA	-	IP42	082H8057
AME 110 NLX		24 24V AC	Yes		_		082H8060

For complete range of actuators, cables and accessories please refer to datasheet for relevant actuator

Accessories

Picture	Description	Material	Code No.
C.S.	AB-QM 4.0 DN15 EPP insulation	EPP	003Z7810
ΠΠοο	50x washers, o-rings, 50x short hairpin, 5x long hairpins	Washer - P.T.F.E. (TEFLON) O-ring - 70 EPDM 281 Hairpins - Inox	145H3018

Technical data

AB-QM 4.0 Nominal diameter		DN	15LF	15	
Flow range	Q _{nom} (100 %) ¹⁾	l/h	200	650	
Setting range ^{1), 2)}		%	10-100		
$\Delta p_{\min}^{3),4}$		kDa.	10	5	
Diff. pressure "	Δp _{max}	KPd	60	0	
Pressure stage		PN	2	5	
Control range			1:10	00	
Control valve's char	acteristic		Line	ear	
Leakage acc. to star	ndard IEC 534		No visible leak	age (at 100N)	
For shut off function	n		Acc. to ISO 5208 class	A - no visible leakage	
Flow medium			Water and water mixture for closed heating and cooling syster according to plant type I for DIN EN 14868. When used in plant T II for DIN EN 14868 appropriate protective measures are taken. T requirements of VDI 2035, part 1 + 2 are observed.		
Medium temperatu	re ⁵⁾	°C	+2 +120		
AB-QM 4.0 stroke		mm	4		
Connection	Actuator		M30	x 1.5	
CO ⁶ valve					
k _{vs}		m ³ /h	2.4		
k _{vs} of one port		111 / 11	3.	4	
Max. operating torq	ue	Nm	3.	0	
Shut off		kPa	80	0	
Pressure stage		PN	10	5	
Valve neck			Quick fix co	onnection	
Connection			Internal thread	Rp ½" (ISO 7/1)	
Certification and sta	andards		PED directive 20	14/68/EU Art. 4§	
Medium temperatu	re	°C	0 ·	+90	
Flexo set					
Diff. pressure of the set		kPa	20 (at 2001/h = 100% flow of AB-QM DN15 LF)	30 (at 650l/h = 100% flow of AB-QM DN15)	
Pressure stage		PN	16		
Connection	Connection port unit si	de	Internal thread G 1/2" / Straight pipe 18mm		
connection	Connection port system side		Internal thread G1/2" / Straight pipe 18mm		
Weight	Internal thread G 1/2	ka	3.7	3.7	
Weight	Straight pipe 18mm	Ng	3.3	3.3	
Materials in mediu	Im				
	Pipes		Stainless Steel (SS304)		
Pipes and fittings	Tailpiece		Brass (CW617N-DW)		
	Elbow		Brass (CW617N-DW)		
	O-ring		EPDM		
	Valve bodies		DZR Brass (CW602N)		
	Membranes and O-rings		EPDM		
	Springs		W.Nr. 1.4310		
PICV (AB-QM)	Spring support		PPSU		
	Shutter		DZR brass (CW602N)		
	Cone (Cv)		PPSU		
	Seat (Cv)		DZK brass (CW602N)		
	Screw		Stainless Steel (A2)		
(COD)	Ball				
oway (CO)	Seals		70 FPDM 281		
Material out of medium			70 EFD	101 201	
PICV (AR-OM) Plastic parts PA 6					
FICV (AD-QIVI) Plastic parts		CW614N Nickal Plated			
0	Hairnin		C WO 14IN INICKEI FIGLEO Stainlass Steel (SS304)		
Fittings	Nute		Brass (CW617N-DW)		
Accessories	AB-OM 4.0 Insulat	ion	FP	P	
			L		

 ¹⁾ Factory setting of the valve is done at nominal setting range.
 ²⁾ Regardless of the setting, the valve can modulate below 1 % of set flow.
 ³⁾ At min differential pressure the valve reaches at least 90% of the nominal flow. A declaration of performance is available upon request. 4) AB-QM 4.0

³ If the medium temperature when using AB-QM DN 15-20 is below 2 °C, than ice forming on the spindle must be prevented, therefore valve should be insulated with dedicated cooling insulation.

According suitability and usage especially in not oxygen tight systems please mind the instructions given by the coolant producer. Pc - pressure controller part Cv - Control valve part

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Design

- **1.** AB-QM 4.0.
- 2. CO⁶ valve
- 3. Stainless Steel pipe
- Click fit connections
 Union nut



Presetting

The calculated flow can be adjusted easily without using tools. To change the presetting (factory setting is 100% (10) follow steps below:

- 1. Remove the blue protective cap or the mounted actuator
- 2. Turn the pointer (clockwise to decrease) to the new setting

Note: In case of using digital actuator (NovoCon S), setting shall remain at 100%, for more info refer to NovoCon S datasheet.



Installation

Small installation dimensions enable easy installation of the Flexo connection set even in limited spaces. The PICV valve should be installed in the return pipe from the thermal unit with the flow in the direction of the arrow on the AB-QM valve body.



Note:

The connection set can be installed in both cooling and heating applications.

- the connection and fittings and hairpins shall be tightened and fixed by customer after transportation.
- for the version with straight pipe ending, deburring shall be done by customer.
- The AB-QM 4.0 CO6 Flexo Set valve must be fixed or hanged to/ from the ceiling
- To reduce heat loss, customer can insulate the set..

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Sizing

Example:

Given: Design flow in system 0.11 l/s ($0.39m^3/h = 390l/h$), Solution: In this case we can select AB-QM 4.0 DN15 with $Q_{nom} = 650 l/h$ Setting on the valve AB-QM 4.0 DN15 is design flow divided by nominal valve capacity, 390 l/h divided by 650 l/h = 60 %.





The inlet and outlet ports is determined according to AB-QM 4.0 flow direction and can be changed by flipping the AB-QM 4.0 valve.

Marking

Ports 1, 2 and 5 shall be outlet (return) Ports 4, 3 and 6 shall be inlet (supply)





No mixing



Note:

Default position of CO⁶ valve is source 1 open

Application principles AB-QM 4.0 CO⁶ Flexo

Anti-sticking requirements:

To reduce the risk of the ball valve sticking due to water quality, it is recommended that the valve is partially rotated at least once every 7 days. If the NovoCon actuator is used, this will can be handled by default.





Heating:





Dimensions







Data sheet AB-QM 4.0 CO⁶ Flexo, DN 15, PN 16

Tender text

Valve assembly for flexible installation of heating and cooling ceiling systems and fan coils to a 4-pipe system. The valve assembly shall have the following features and characteristics:

- The assembly consisting of the following components: pressure-independent balancing and control valve (PICV), 6-way changeover valve, test plug for flow validation.
- Valve assembly shut-off via 6-way changeover valve and pressure-independent control valve (PICV)
- Pressure rating PN 16.
- Leak tested.
- Adjustable direction (up to 90°) of the connecting pipes to the heating/cooling ceiling
- Flexible assembly and disassembly of the connected pipes by means of "click-fit" hairpin connections.
- Pipe made of stainless steel, diameter 18mm, connection suitable for press fittings or with Rp 1/2" female thread.
- Installation height including actuators 125 mm

The Pressure Independent Control Valve (PICV) with the following features and properties:

- Flow limitation function
- Linear Control Characteristics
- Control ratio 1:1000
- Modulate below 1% of the set flow, regardless of the presetting.
- Presetting range 10 ... 100 %
- Adjustment scale as a percentage of flow
- Valve authority a=1 at all settings
- Minimum differential pressure 16 kPa (LF/NF version), 25 kPa (HF version)
- Max. differential pressure via control valve 600 kPa (6 bar)
- Closing pressure 16 bar, pressure rating PN 25
- **Class IV Leak Rate**
- Test plugs for flow measurement and pump optimization
- Conversion of the characteristic curve from linear to equal percent by adjusting the actuator
- Material valve body: brass, dezincification resistant (DZR)
- Temperature range (-10°C) +2°C ... +95°C

The 6-Way Valve Changeover Valve (CO⁶) with the following features and properties:

- No crossflow between the heating and cooling circuits
- Blocking of all 6 ports in the middle position
- Closing pressure 8 bar, pressure rating PN 16
- Total kvs value = $2.4 \text{ m}^3/\text{h}$
- Max. differential pressure for DN15 is <7.3 kPa (for 650 l/h), for DN15LF <0.7 kPa (for 200 l/h)
- Material valve body: brass, dezincification resistant (DZR)
- Temperature range 0°C ... +90°C

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