

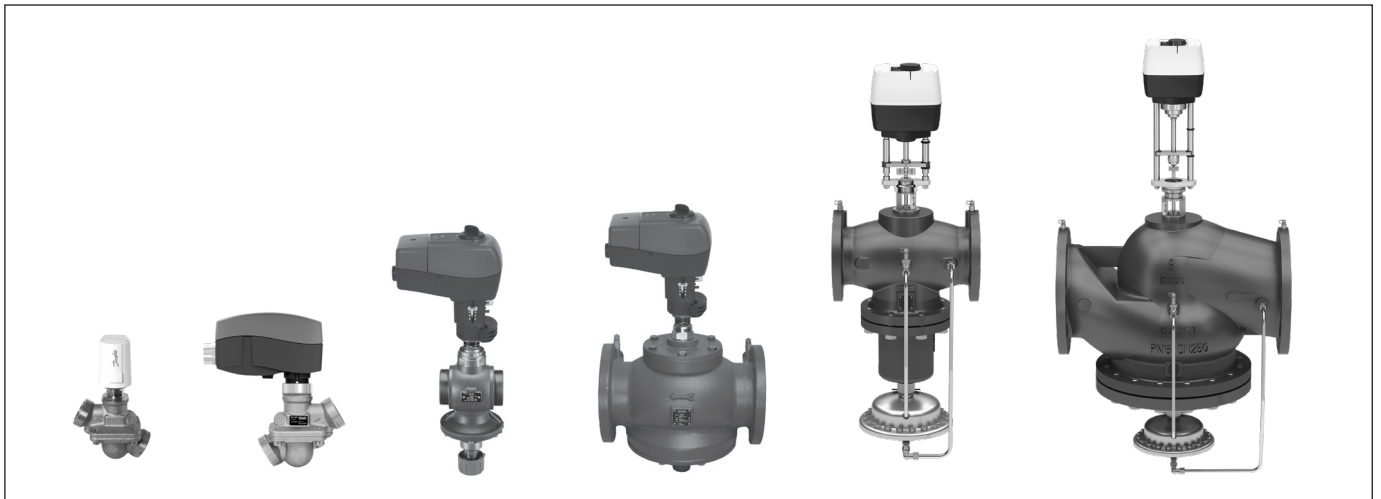
Data sheet

Pressure Independent Control Valve AB-QM,

½" thru 2"

2½" thru 4"

5" thru 10" Valve Size



Features and Benefits

The AB-QM temperature control valve provides pressure independent regulation of flow while also providing flow limiting system balance. The valve internally contains a unique differential pressure regulator which automatically adjusts to normal changes in system pressure from valves opening and closing or changing of pump speed. As a result of maintaining a constant pressure for the temperature control valve, valve authority is maintained at 100%. This allows for precise interaction with the temperature controller and unparalleled system operation as indicated by assuring the highest possible coil log mean temperature difference (ΔT). The valve is easily set and adjusted to provide the precise flow required for each terminal unit. Design calculation and commissioning effort normally required for its control and balance valves are virtually eliminated because of the built in automatic pressure control regulator. A wide selection of actuators are available for the AB-QM providing further control features for the valve, making it an ideal selection for the simplest of two position control strategies to the precision required for modulating control and variable speed pump optimization.

Features:

- AB-QM maintains a stable flow through its range of operation unaffected by changes in system differential pressure period. 100% valve authority allows lower pump head than traditional valves and reduces energy consumption which increases ΔT

- Three required valve functions; temperature control, balance and flow limitation in one compact valve design
- Flow parameter is the only consideration, reducing valve selection engineering
- Constant flow regulation limitation through independent pressure balancing
- User adjustable flow setting for maximum flow limitation
- Maintains linear characteristic of flow when installed with a Danfoss proportional actuator. Actuator options with equal percentage flow characteristics.

Benefits:

- Flow will match the load
- Eliminate coil over flows
- Reduced installation time and materials
- Simple flow setting procedure; reduced time involved for field commissioning
- Valve allows maximum coil and system differential temperature drops for optimum efficiency
- Operation costs reduced as much as 90 % or more when properly applied with variable speed pumping
- "Plug and Play" for quick setup for balancing allowing immediate start up of unit
- Commissioning accomplished without use of specialized equipment
- Compact design allows installations in areas with limited space such as stand alone fan coils

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Technical Data:

Nominal Diameter	1/2" LF	1/2" HF	3/4" HF	1" HF	1 1/4" HF	1 1/2"	2"	
Max flow (GPM)	1.2	5	7.5	12	17.5	33	55	
Setting range ¹⁾	20-100 %						40-100 %	
Diff. pressure (PSI) ^{2),3)}	2.3-60	5-60				4.4-60		
Connection	Male NPSM							
Control valve characteristic	Linear							
Control valve accuracy	± 5% of set point							
Max. differential pressure (across the valve)	90 psi (6.2 bar)							
Max. close off pressure (regardless of actuator)	232 psi (16 bar)					250 psi (17.2 bar)		
Medium temperature	15 °F to 250 °F (-10 °C to 120 °C)							
Allowable Fluid	Water and secondary refrigerant additives such as glycol							
Leakage	Class 4, metal to metal							

Nominal Diameter	2 1/2"	3"	4"	5"	6"	8"	10"	2 1/2" HF	3" HF	4" HF	5" HF	6" HF	8" HF	10" HF	
Max flow (GPM)	85	120	165	395	640	830	1,235	110	176	260	485	830	1,100	1,600	
Setting range ¹⁾	40-100 %														
Diff. pressure (PSI) ^{2),3)}	4.4-60							8.7-60							
Connection	ANSI Flange (ANSI Standard B16.1)					ISO Flange & Gasket (ISO Flange EN 1092-2)		ANSI Flange (ANSI Standard B16.1)					ISO Flange & Gasket (ISO Flange EN 1092-2)		
Connection rating	ANSI Class 125														
Control valve characteristic	Linear														
Control valve accuracy	± 5% of set point														
Max. differential pressure (across the valve)	90 psi (6.2 bar)														
Max. close off pressure (regardless of actuator)	232 psi (16 bar)														
Medium temperature	15 °F to 250 °F (-10 °C to 120 °C)														
Allowable Fluid	Water and secondary refrigerant additives such as glycol														
Leakage	Class 4, metal to metal														

¹⁾ Factory setting of the valve is done at 100%.


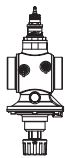
²⁾ Regardless of the flow limitations valve can modulate till 0.1% of the nominal flow.

³⁾ $\Delta p = (P1 - P3) \text{ min-max}$

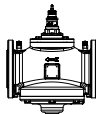
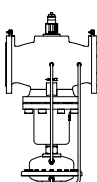
According suitability and usage especially in not oxygen tight systems please mind the instructions given by the coolant producer. Available AB-QM valves with low minimum Δp in sizes 1/2" to 1 1/4". Contact Danfoss for further information.

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Ordering Information:

 <i>AB-QM (1/2" - 1 1/4") Without P/T Plugs</i>	 <i>AB-QM (1 1/2"-2") With P/T Plugs</i>	Code No.	Size	Max. Flow (GPM)
		003Z1321	1/2" LF	1.2
		003Z1332	1/2" HF	5
		003Z1333	3/4" HF	7.5
		003Z1334	1" HF	12
		003Z1335	1 1/4" HF	17.5
		003Z0780	1 1/2"	33.0
003Z0781	2"	55.0		

Contact Danfoss for lower Δp valve bodies in sizes from 1/2" to 1 1/4"

 <i>AB-QM (2 1/2"-4") With P/T Plugs</i>	 <i>AB-QM (5"-6") With P/T Plugs</i>	Code No.	Size	Max. Flow (GPM)
		003Z0783	2 1/2"	85
		003Z0784	3"	120
		003Z0785	4"	165
		003Z0905	5"	395
		003Z0906	6"	640
		003Z0707	8"	830
		003Z0708	10"	1235
		003Z0983	2 1/2" HF	110
		003Z0984	3" HF	176
		003Z0985	4" HF	260
		003Z0915	5" HF	485
		003Z0916	6" HF	830
		003Z0717	8" HF	1100
		003Z0718	10" HF	1600

Accessories

Code No.	Description
003Z0695	Brass handle for AB-QM 1 1/2" thru 4", required if without assembled motor actuator
003Z0696	Brass handle for AB-QM 5" thru 6", required if without assembled motor actuator
003Z0697	Brass handle for AB-QM 8" thru 10", required if without assembled motor actuator
003Z0230	Brass shut-off & protection cap, Max 232psi (16 bar) (for use with 1/2" to 1 1/4" AB-QM valve)
003Z0236	Locking Ring - installed to inhibit the unintentional changing of the AB-QM valve setting, 5pcs. (for use with 1/2" to 1 1/4" AB-QM valve)

Note: For insulation kits contact Danfoss

MNPT THREADED TAILPIECE KIT (two kits required per valve)

Code No.	Size	Connection Type	Description
003Z0282	1/2"	NPT (Male)	One Nut + One Tailpiece + One Gasket
003Z0283	3/4"		
003Z0284	1"		
003Z0285	1 1/4"		
003Z0286	1 1/2"		
003Z0287	2"		

SWEAT TAILPIECE KIT (two kits required per valve)

Code No.	Size	Connection Type	Description
003Z0292	1/2"	Sweat (Female)	One Nut + One Tailpiece + One Gasket
003Z0293	3/4"		
003Z0294	1"		
003Z0295	1 1/4"		
003Z0296	1 1/2"		
003Z0297	2"		

ISO FLANGES & GASKETS, for 8" & 10" VALVES (2pcs per valve)

Code No.	Size	Connection Type	Description
D2576-16-200	8"	ISO PN 16	ISO flat face slip on weld flange, EN 1092-2
GASKET AB-QM 8"	8"	Gasket	8" gasket for ISO flange
D2576-16-250	10"	ISO PN 16	ISO flat face slip on weld flange, EN 1092-2
GASKET AB-QM 10"	10"	Gasket	10" gasket for ISO flange

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Electric Actuator

Selection Information:

Refer to electric actuator data sheet for further information.

For Valve Sizes 1/2" to 1 1/4"

Style	Note	Code No.	Power	Input Signal			Position Feedback	Safety Function	
				On/Off	Floating	Modulating		Up	Down
ABN A5	³⁾	082F1150	24Vac	•					•
	³⁾	082F1151		•				•	
	³⁾	082F1154	120Vac	•			•		•
	³⁾	082F1156		•					•
	³⁾	082F1157		•				•	
AMI 120 NL-1	²⁾	082H5003	24Vac	•			•		
AMV 120 NL-1		082H5005	24Vac		•		•		
AME 13 SU-1	¹⁾	082H5006	24Vac		•	•	•	•	
AME 13 SD-1	²⁾	082H5007	24Vac		•	•	•	•	
ABNM A5 (Equal Percentage)	³⁾	082F1163	24Vac			•		•	
ABNM A5 (Equal Percentage)	³⁾	082F1160	24Vac			•		•	
ABNM A5 (Linear)	³⁾	082F1165	24Vac			•		•	
ABNM A5 (Linear)	³⁾	082F1161	24Vac			•		•	
AME 120 NLX-1		082H5004	24Vac			•	•		

¹⁾ Included required **003Z3960** adapter

²⁾ Included required spacer **003Z0257**

³⁾ Require cable ordered as separate Code no.

For Valve Sizes 1 1/2" to 4"

Style	Code No.	Power	Input Signal			Position Feedback	Safety Function	
			On/Off	Floating	Modulating		Up	Down
AME435 QM	082H0171	24Vac			•	•		
AMV 435	082H0162		•			•		
AME 25SU ¹⁾	082H3041		•	•		•	•	
AME 25SD ¹⁾	082H3038		•	•		•		•

¹⁾ Adapter required, ordered separately. Part # **003Z0694**

For Valve Sizes 5" to 6"

Style	Code No.	Power	Input Signal			Position Feedback	Safety Function	
			On/Off	Floating	Modulating		Up	Down
AME 655-1	082H5010	24Vac		•	•	•		
AME 658 SD-1	082H5011		•	•		•		•
AME 658 SU-1	082H5012		•	•		•	•	

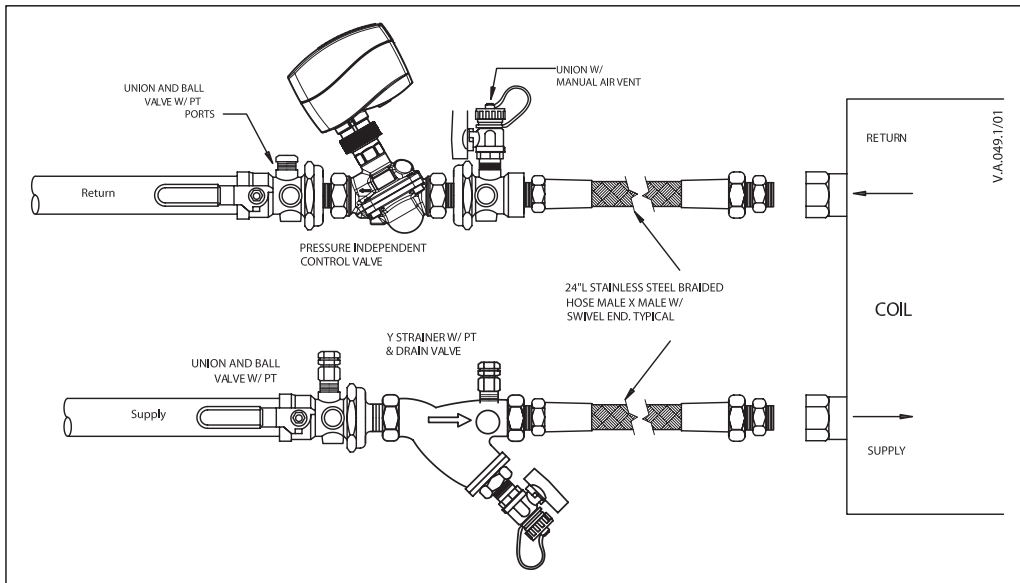
For Valve Sizes 8" to 10"

Style	Code No.	Power	Input Signal			Position Feedback	Safety Function
			On/Off	Floating	Modulating		
AME 685-1	082H5013	24Vac		•	•	•	¹⁾

Digital actuators available, refer to Novocon series data sheet for ABQM valves for further information.

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Application:



The AB-QM is a versatile device that can be used as an actuated or non-actuated balance valve / flow limiter. With an actuator mounted to the AB-QM valve, the assembly is a pressure independent control valve. Utilizing a proportioning controller, the AB-QM creates a robust and stable energy management sub system using only the required flow and energy to offset facility heat transfer gains and losses.

The integrated AB-QM differential pressure regulator virtually eliminates the problem of fluctuating pressures on control valve performance. The AB-QM regulator immediately reacts to all changes in system pressure creating the stability to make the valve flow and control predictable and controllers and valves work as intended. Energy is saved taking advantage of the greatly reduced amount of flow required for heat transfer of full valve authority for an air handling unit (AHU), fan coil, etc. With the AB-QM the required design flow to the AHU is met, subsequently simplifying the balancing of the system. Air handling units react quickly to changes in the building load and simple proportional control will not accurately regulate these systems. Using control integral action to adjust for this requires skill and extra commissioning to properly match the required

setting to the applications, sometimes over several seasons of operation. The AB-QM differential pressure regulator acts as an extra sub-master controller and makes tuning the main controllers easier and less time consuming. Smaller building HVAC sub-systems such as fan coil units, or terminal unit heating coils and newer modern designs such as chilled beams or radiant cooling panels greatly benefit from AB-QM application even when applied with simple thermostatic operation. No pressure calculations are required, valve authority doesn't need to be calculated and no calculations have to be performed to pre-set a balancing valve. If extra flow is determined to be required while tuning the installation, it's easy for the commissioning agent to reset the AB-QM for any flow up to the rated range of the valve. The HVAC units and controllers will benefit from greatly enhanced ability to control, with no overflow. AB-QM allows hydronic HVAC systems to achieve the green and sustainable performance envisioned by their designers and owners. Owners benefit in significant reductions in commissioning time, energy cost in operation from reduced flow and reduced complaints associated with improper temperatures within the building.

Minimum Pressure Drop

To verify that an installation functions according to the design specifications checking the critical valve in the installation is needed. The critical valve is the furthest valve away on the branch or loop and has the lowest available differential pressure. The AB-QM maintains a constant differential pressure across temperature control

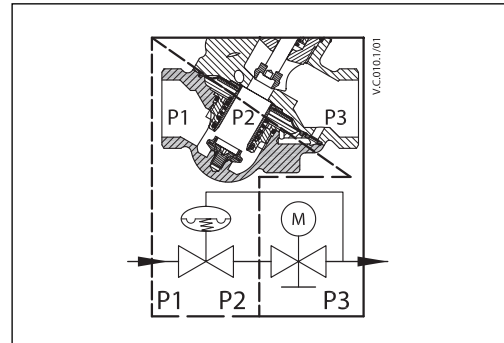
valve and any excess pressure will automatically be throttled by the regulator. If there is not enough differential pressure the valve cannot reach the set flow. Therefore the critical valve must have the minimum differential pressure for the pressure regulator to properly operate, all prior AB-QM valves will function properly.

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Function

The AB-QM combines aspects of both a differential pressure controller for balancing and a temperature control into a single valve.

- P1** Available Pressure
- P2** Regulated inlet pressure to temperature control valve
- P3** Exit pressure of valve



Differential Pressure Regulator

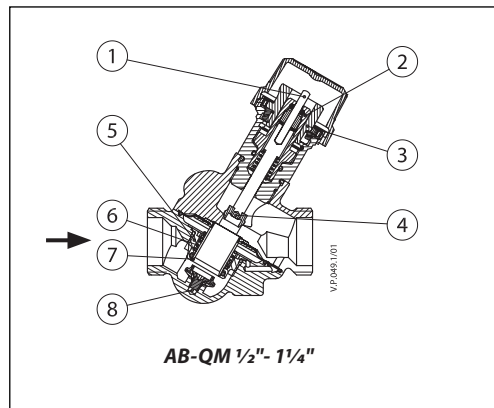
Flow enters the valve through the differential pressure regulator, which maintains a constant pressure difference across the temperature control valve orifice. As entering pressure increases or decreases in reaction to changes in flow and pump speed in the piping system, the regulator diaphragm is balanced with the force of the spring keeping a constant pressure difference (P2-P3) between the water entering the temperature control valve and the leaving side of the valve. As a result the differential pressure across the temperature control valve (P2-P3) is at a constant level.

A nominal 5 psi differential is required from P1 to P3 for the valve and flow regulator operation. The regulator controls the range of system differential pressure to 60 psi (140 FOH). Under normal system operation such as in variable speed pumping, as system flow is reduced, controlled pump speed reduces the system differential pressure (head) of the pump. In constant speed pumping applications reductions in system flow may result in increased system differential pressure (head) of the pump.

Valve Operation / Design

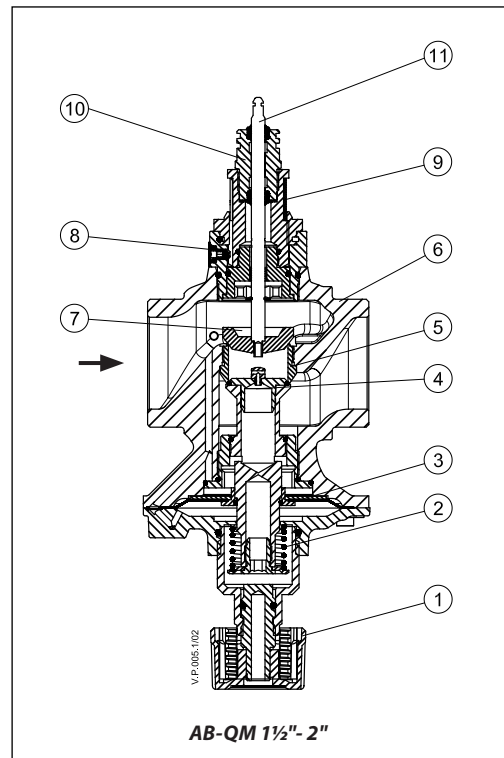
AB-QM 1/2" - 1 1/4"

- 1. Stuffing box
- 2. Spindle
- 3. Plastic ring
- 4. Control valve plug
- 5. Diaphragm
- 6. Regulator spring
- 7. Regulator cone
- 8. Regulator seat



AB-QM 1 1/2" - 2"

- 1. Shut off screw
- 2. Main spring
- 3. Membrane
- 4. DP cone
- 5. Seat
- 6. Valve body
- 7. Control valves cone
- 8. Locking screw
- 9. Scale
- 10. Stuffing box
- 11. Spindle

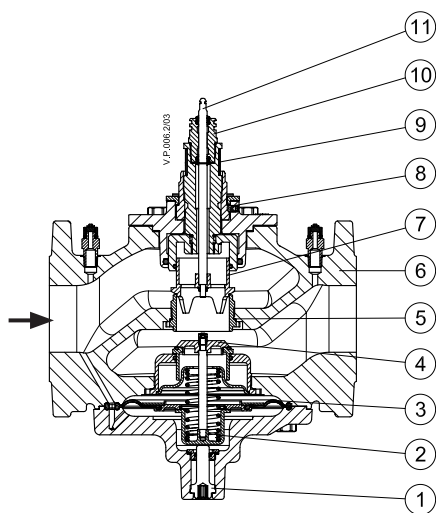


**Pressure Independent Control Valve AB-QM,
 1/2" thru 2"
 2 1/2" thru 4"
 5" thru 10" Valve Size**

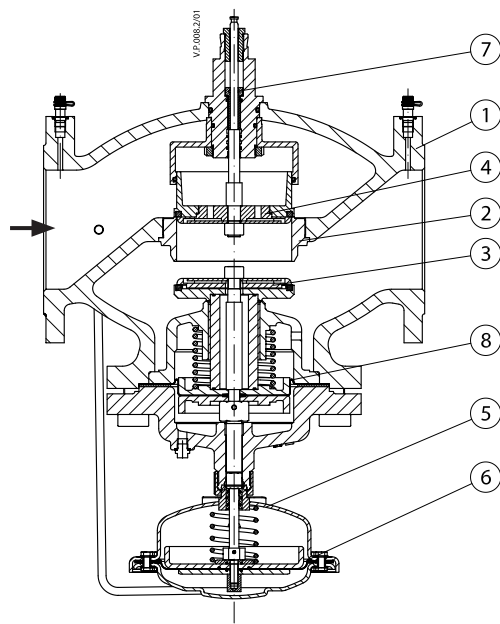
Valve Operation / Design
(continuous)

AB-QM 2 1/2"- 4"

1. Shut off screw
2. Main spring
3. Membrane
4. DP cone
5. Seat
6. Valve body
7. Control valve cone
8. Locking screw
9. Scale
10. Stuffing box
11. Spindle



AB-QM 2 1/2"- 4"



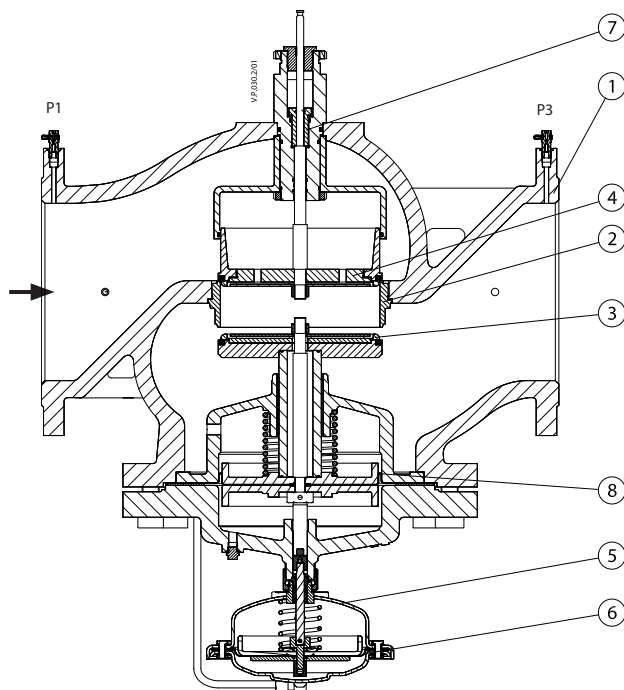
AB-QM 5"-6"

AB-QM 5"-6"

1. Valve body
2. Valve seat
3. DPC cone
4. Cv cone
5. Controller casting
6. Rolling diaphragm
7. Adjusting screw
8. Bellow for pressure relief on DPC cone

AB-QM 8"-10"

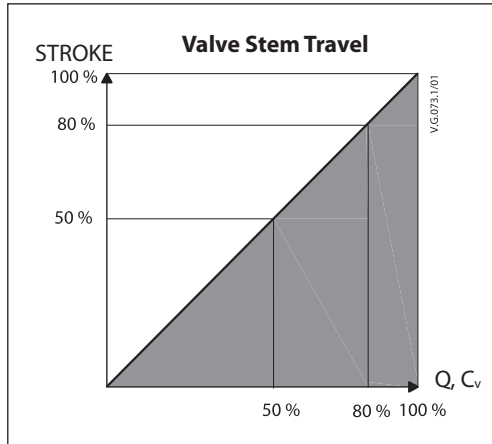
1. Valve body
2. Valve seat
3. DPC cone
4. CV cone
5. Controller casting
6. Rolling diaphragm
7. Adjusting screw
8. Bellow for pressure relief on DPC cone



AB-QM 8"-10"

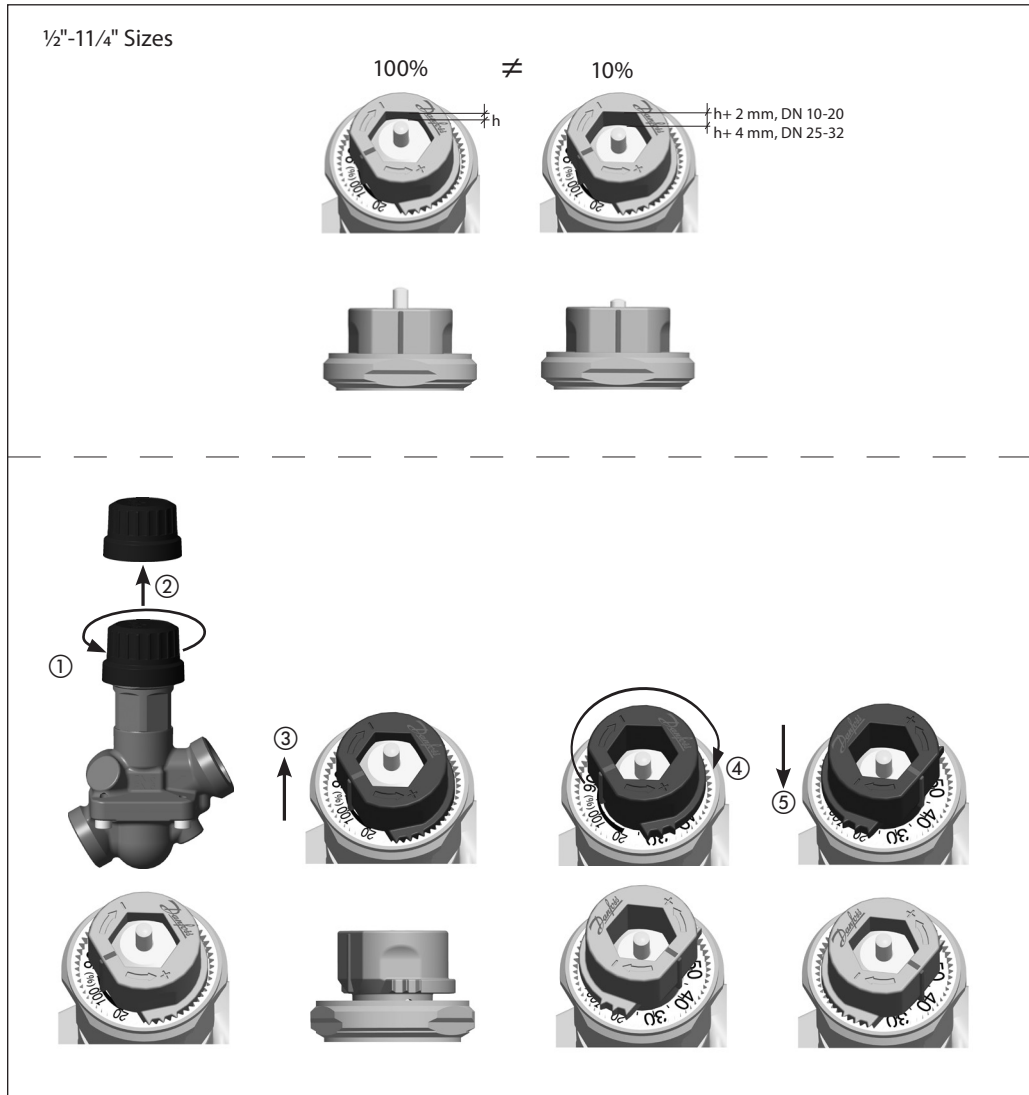
**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

**Control Valve Flow
Coefficient and
Characteristic, Cv**



The globe style temperature control valve has a linear characteristic allowing for application flexibility. The adjustment to the maximum flow alters the stem travel of the valve, yet this adjustment of the stem travel does not compromise the control performance. On-Off controls will cycle between full and no flow positions, and proportional control actuators upon reset will self calibrate to the new adjusted stem travel, and still utilize the entire input signal range. Maintaining a linear characteristic allows for the predictability required to characterize the control signal when needed in an application. Signal characterization is optimally done in the controller, but may be done through an available actuator which allows matching to the terminal unit characteristic.

Flow Adjustment



**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Flow Adjustment
(continuous)

1 1/2"-4" Sizes

Note: 1 turn = 10%
For 1 1/2" to 4" Valves:
Requires adjustment with crescent wrench or allen key.

5"-10" Sizes

Note: 1 turn = 5.0 %

The setting of the flow limitation requirement of the valve is based upon a percentage of the maximum flow for the valve body.

Example:

Required flow rate:
100 GPM

Selected valve size:
4" Maximum flow (Q_{max}) = 165 GPM
Therefore, $100/165 = 0.6 \rightarrow 60\%$

Set the valve to 60% to achieve 100 GPM through the valve.

Danfoss recommends a presetting range from 20% to 100%. Factory presetting is 100%.

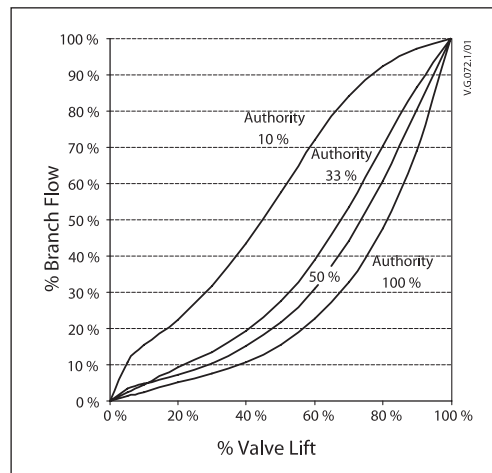
By turning the grey collar counter clockwise would increase while clockwise would decrease the flow. When valve is set to 80% or more the red line becomes visible.

Valve Authority

Valve authority can be generally defined as a measure of the change in differential pressure across a control valve during operation. This value is calculated by dividing the pressure drop of the control valve (Δp_{Valve}) by the sum of the pressure drop of the control valve (Δp_{Valve}) and system (Δp_{System}) it serves e.g. the pipes, fittings, coil, and other devices that become part of the system.

$$A = \frac{\Delta p_{\text{Valve}}}{\Delta p_{\text{Valve}} + \Delta p_{\text{System}}}$$

The calculated result is expressed as a percent ratio, with 100 % authority being an ideal scenario achieved in laboratory conditions. Within a lab, a constant differential pressure is maintained across the control valve and as a result an equal or linear relationship is achieved between the flow requirements and control valve's position. In reality in meeting the output requirements in a variable flow system the resulting reaction between the terminal and the control valve performance can be less than ideal. The dynamic variations (Δp) within the entire system e.g. other actuating control valves, create fluctuations to the differential pressure across the control valve resulting in a lower valve authority percentage. The lower the valve authority, the worse the controllability is between the terminal and control valve resulting in inconsistent room temperature.



The interaction of Δp_{System} on the control valve can significantly hinder the control valve's effectiveness. The design of the AB-QM's internal differential pressure regulator address this by counteracting the inlet Δp_{System} fluctuations, and as a result a constant differential pressure across the control valve is achieved.

With a constant differential pressure across the inlet and outlet of the control valve portion of the AB-QM, a more ideal scenario is approached. The result is the AB-QM valve assembly operates at 100 % valve authority.

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Typical Specification

Revised Construction Specifications Institute standard numbering is utilized. The Specifier is advised to coordinate product provisions with other speciality specification areas as more than one may apply. The model for this specification and suggested placement is based on the "Unified Facilities Guide Specifications" downloadable from the Whole Building Design Guide web site (www.wbdg.org) and found under the "Documents & References" specifications library. The WBDG web site is offered as an assistance to the building community by the National Institute of Building Sciences (NIBS) through funding support of several US government agencies.

SECTION 23 09 13

INSTRUMENTATION AND CONTROL DEVICES FOR HVAC

PART 2 PRODUCTS

2.5 Automatic Control Valves

Valves shall have stainless-steel stems and stuffing boxes with extended necks to clear the piping insulation. Valves bodies shall meet ASME B16.34 or ASME B16.15 pressure and temperature class ratings based on the design operating temperature and 150 percent of the system design operating pressure.

Unless otherwise specified or shown, valve leakage shall meet FCI 70-2 Class IV leakage rating (0.01 percent of valve Kv). Unless otherwise specified or shown, valves shall be two way pressure independent globe-style bodies. Unless otherwise specified:

- a. bodies for valves 2 inches and smaller shall be brass or bronze, with union ends
- b. bodies for valves 2 to 3 inches shall be of brass, bronze or iron.
- c. bodies of valves 2 1/2 inches and larger shall be provided with flanged-end connections
- d. valve and actuator combination shall be normally open or normally closed as shown

2.5.7 Two-Way Pressure Independent Globe Valves

Two-way modulating valves used for liquids. The valve shall be two way globe style with integrated differential pressure control regulator. Where indicated modulating proportional valve application shall utilize controller or actuator to match required control signal to complement controlled coil heat transfer characteristic for linear control, the valve shall:

- a. provide integrated pressure regulator; regulator to control pressure across control valve orifice
- b. provide regulator incorporating EPDM diaphragm, stainless steel spring and pressure control disc. Pressure control seat shall be brass construction with vulcanized EPDM
- c. provide counterbalance of supply pipe pressure to return pipe pressure across diaphragm to prevent diaphragm damage when control valve is closed
- d. provide user adjustable maximum flow within valve control range; Adjustment method shall indicate percentage of valve flow range and utilize spring locked method of adjustment
- e. regulate internal control valve differential pressure to provide 100 % control valve authority
- f. shall have linear flow characteristic
- g. provide back seated globe design to allow service of packing under pressure without leakage
- h. provide entering to leaving (P1-P3) pressure control across valve 1/2" in size from 2.3-60 PSI
- i. provide entering to leaving (P1-P3) pressure control across valves 1/2"-1 1/4" in size from 5-60PSI
- j. provide entering to leaving (P1-P3) pressure control across valves 1 1/2"-10" in size from 4-60PSI
- k. provide entering to leaving (P1-P3) pressure control across valves 2.5"HF -10"HF in size from 8.7-60PSI
- l. provide union connections
- m. utilize stainless steel internal trim with brass globe seat
- n. utilize threaded actuator connection
- o. flow requirements shall be sized to provide nominal body selection no more than one size smaller to corresponding nominal pipe connection
 - a. 1/2" bodies shall be utilized for 1/2" pipe and may be utilized for 3/4" pipe connection and flow less than 5 GPM
 - b. 3/4" bodies may be utilized for 3/4" pipe and may be applied to 1" pipe connection with flow less than 7.5 GPM
 - c. 1" bodies may be utilized for 1" pipe and may be applied to 1 1/4" pipe connection with flow less than 12 GPM
 - d. 1 1/4" bodies may be utilized for 1 1/4" and may be applied to 1 1/2" pipe connection with flow less than 17.5 GPM
 - e. 1 1/2" bodies may be utilized for 1 1/2" pipe and may be applied to 2" pipe connection with flows less than 33 GPM
 - f. flows less than 55 GPM may use 2" bodies
 - g. flows less than 85 GPM may use 2 1/2" bodies
 - h. flows less than 120 GPM may use 3" bodies
 - i. flows less than 165 GPM may use 4" bodies
 - j. flows less than 395 GPM may use 5" bodies

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Typical Specification

(continuous)

- k.** flows less than 640 GPM may use 6" bodies
- l.** flows less than 836 GPM may use 8" bodies
- m.** flows less than 1232 GPM may use 10" bodies
- n.** flows less than 110 may use 2 1/2" HF bodies
- o.** flows less than 176 may use 3" HF bodies
- p.** flows less than 260 may use 4" HF bodies
- q.** flows less than 484 GPM may use 5" HF bodies
- r.** flows less than 836 GPM may use 6" HF bodies
- s.** flows less than 1100 GPM may use 8" HF bodies
- t.** flows less than 1629 GPM may use 10" HF bodies

2.5.8 Duct-Coil and Terminal-Unit-Coil; Hot and Chilled Water Systems

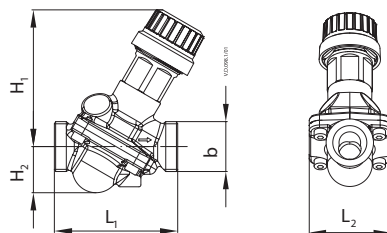
Control valves utilized for controlled flows shall be proportionally modulated. Control valve shall be integrated into coil assembly package. Coil assembly package shall conform to requirements of other common valves as specified in Section 23 05 15 Common Piping For HVAC. Coil assembly package shall:

- a.** provide integrated ball valve and wye pattern strainer. Strainer shall be #20 mesh. Strainer valve shall provide pressure and temperature measurement port with integrated positive shutoff gland seal. Strainer valve shall have plugged 1/4" female NPT accessory port. Strainer valve shall provide integrated 1/4" ball drain valve with cap and common hose connection. Strainer valve shall provide integrated union connection and tailpiece. Strainer valve shall be provided to match flow requirements for connected control valve.
- b.** provide union connection entering and leaving piping of coil. Union connection fitting shall include three accessory 1/4" female NPT tapped ports for test and other HVAC devices. Provide pressure and temperature measurement ports with integrated positive shutoff gland seal in unions entering and leaving coil. Provide manual air vent in union leaving coil. Provide 1/4" threaded plugs in all unused union ports. Provide union nut, tailpiece and o-ring seal, or appropriate connectors to flexible piping.
- c.** provide ball shutoff valve with integrated union. Valve shall provide pressure and temperature measurement port with integrated positive shutoff gland seal. Valve shall have plugged 1/4" female NPT accessory port. Provide union nut, tailpiece and o-ring seal, or appropriate connectors to flexible piping.
- d.** provide flexible piping for connection to coil. Piping shall be configured such that unions are hard mounted to coil either directly or with elbows as appropriate to allow straight flexible connection without ninety degree change in direction. Flexible pipe shall be mounted between coil union and control valve or strainer valve.

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Dimensions

AB-QM 1/2"-1 1/4"

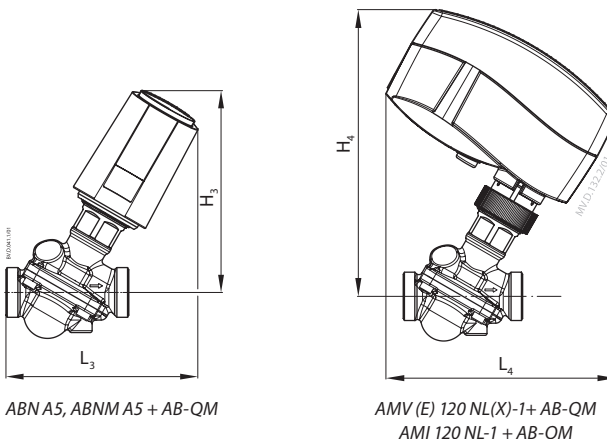


Valve type	Dimensions, inches (mm)						Weight lb (kg)	
	L ₁	L ₁ + tailpieces		L ₂	H ₁	H ₂		b
		MNPT	F. Solder					
1/2" LF	2.56 (65)	4.69 (119)		1.8 (45)	3.11 (79)	0.98 (25)	3/4" NPSM	1.06 (0.50)
1/2" HF				3.18 (81)				
3/4"	3.23 (82)	5.6 (142)		2.2 (56)	3.18 (81)	1.3 (33)	1" NPSM	1.43 (0.65)
3/4" HF				3.26 (83)				
1" HF	4.09 (104)	6.82 (173)		2.8 (71)	3.5 (88)	1.65 (42)	1 1/4" NPSM	3.20 (1.45)
1 1/4" HF	5.12 (130)	8.12 (206)		3.5 (90)	4.02 (102)	1.97 (50)	1 1/2" NPSM	4.87 (2.20)

* Dimensions shown are approximated and should be verified.

Contact With Water

- Body Brass CuZn36Pb2As - CW 617N;
Dezinc resistant brass
- O-Ring EPDM
- Spring W.Nr.1.4568, W.Nr 1.4310; Stainless steel
- Cone (Pc) W.Nr.1.4305; Stainless steel
- Seat (Pc) EPDM
- Plug (Cv) CuZn40Pb3 - CW 614N; Wrought copper
- Seat (Cv) CuZn40Pb2 - CW 617N; Die forged brass
- Screw Stainless steel (A2)
- Flat NBR
- Sealing Agent Dimethacrylate Ester



Valve type	Dimensions, inches (mm)			
	L ₃	L ₄	H ₃	H ₄
1/2"	4.33 (110)	4.57 (116)	4.25 (108)	5.55 (141)
3/4"	4.72 (120)	4.92 (125)	4.41 (112)	5.63 (143)
1"	5.59 (142)	5.59 (142)	4.88 (124)	6.10 (155)
1 1/4"	6.06 (154)	6.30 (160)	5.35 (136)	6.54 (166)

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Dimensions (continuous)

AB-QM 1 1/2"-2"

AME(V) 435 QM + AB-QM

Valve type	Dimensions, inches (mm)							Weight lb (kg)
	L ₁	L ₁ + NPT Tailpieces	L ₁ + Solder Tailpieces	H ₁	H ₂	H ₃	b (NPSM thread)	
1 1/2"	4.33 (110)	8.30 (211)	7.28 (185)	7.69 (170)	6.65 (174)	11.02 (280)	1 1/2 - 1 1/2	13.22 (6.9)
2"	5.11 (130)	9.40 (239)	8.70 (221)	7.69 (170)	6.65 (174)	11.02 (280)	2 - 1 1/2	17.19 (7.8)

Contact With Water

- Body: Ductile iron EN-GJL-250 (GG25)
- Membrane: EPDM
- Diaphragm: EPDM
- O-Ring: EPDM
- Springs: W.Nr.1.4568, W.Nr.1.4310; Stainless Steel
- Cone (Pc): CuZn40Pb3 - CW 614N, W.Nr.1.4305; Wrought copper, Stainless steel
- Seat (Pc): W.Nr.1.4305; Stainless Steel
- Cone (Cv): CuZn40Pb3 - CW 614N; Wrought copper
- Seat (Cv): W.Nr.1.4305; Stainless steel
- Screw: Stainless Steel (A2)
- Flat Gasket: NBR

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Dimensions *(continuous)*

AB-QM 2 1/2"-4"

Valve type	Dimensions, inches (mm)				a (ANSI, B16.1)	Weight lb (kg)
	L ₁	H ₁	H ₂	H ₃		
2 1/2" & 2 1/2" HF	11.42 (290)	8.66 (220)	6.77 (172)	12.99 (330)	7.08 (180)	83.77 (38)
3" & 3" HF	12.20 (310)	8.85 (225)	6.96 (177)	13.18 (335)	7.48 (190)	99.20 (45)
4" & 4" HF	13.78 (350)	9.44 (240)	7.36 (187)	13.77 (350)	9.05 (230)	125.66 (57)

Contact With Water

Valve bodies	Grey cast iron A48 No.35A
Membranes	EPDM
Bellows	EPDM
O-rings	EPDM
Springs	ASTM-631, ASTM-301
Cone (Pc)	C37710. ASTM-303
Seat (Pc)	ASTM-303
Cone (Cv)	C37710
Seat (Cv)	ASTM-303
Screw	Stainless Steel (A2)
Flat	NBR

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Dimensions (continuous)

AB-QM 5"

AB-QM 6"

AME 655-1, AME658-1 + AB-QM 5"

AME 655-1, AME658-1 + AB-QM 6"

Valve type	Dimensions, inches (mm)				a (Flange) (ANSI, B16.1)	Weight lb (kg)
	L ₁	H ₁	H ₂	H ₃		
5" & 5" HF	15.74 (400)	10.70 (272)	20.39 (518)	19.96 (507)	-	187.39 (85)
6" & 6" HF	18.89 (480)	12.12 (308)	18.30 (465)	20.39 (518)	-	304.23 (138)

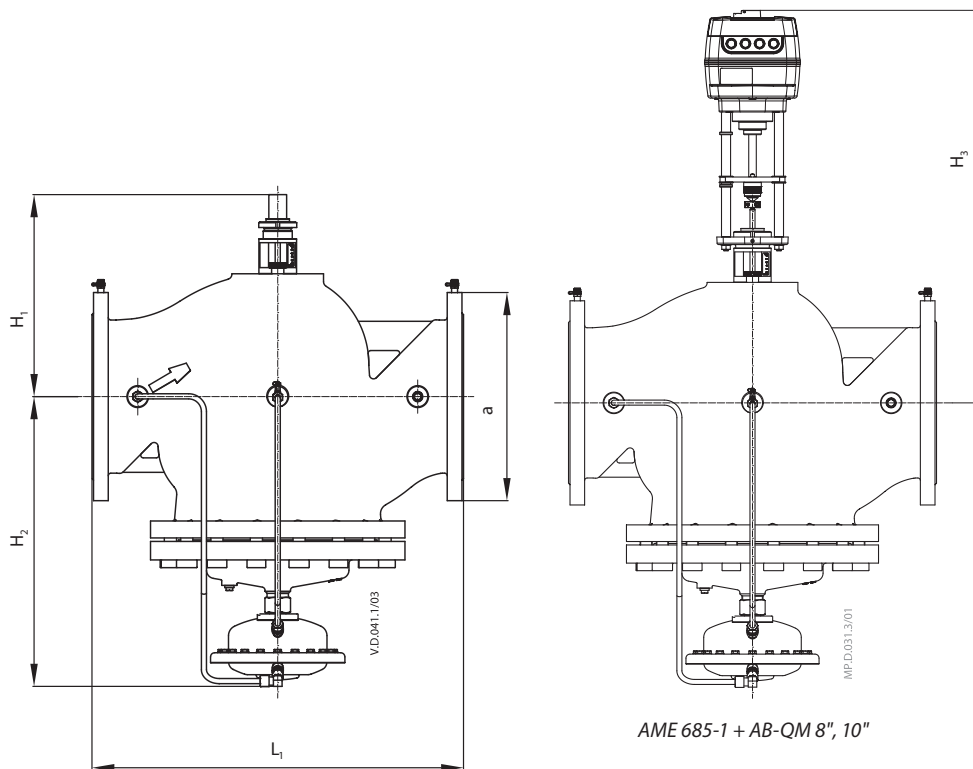
Contact With Water

- Body Grey cast iron A48 No. 35A
- Membrane EPDM
- Diaphragm EPDM
- O-ring EPDM
- Springs ASTM-316N
- Cone (Pc) ASTM-316L
- Seat (Pc) ASTM-420
- Plug (Cv) ASTM-316L
- Seat (Cv) ASTM-420
- Screw ASTM-1055
- Flat Gasket Non asbestos

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Dimensions *(continuous)*

AB-QM 8" & 10"



Valve type	Dimensions, inches (mm)				a (Flange) (EN 1092-2)	Weight lb (kg)
	L ₁	H ₁	H ₂	H ₃		
8" & 8" HF	23.62 (600)	19.01 (483)	19.01 (483)	24.33 (618)	13.38 (340)	482.81 (219)
10" & 10" HF	28.74 (730)	15.62 (533)	20.98 (533)	27.87 (708)	15.94 (405)	753.98 (342)

Contact With Water

- Body Ductile iron EN-GJL-250 (GG25)
- Membrane EPDM
- Diaphragm EPDM
- O-ring EPDM
- Springs W.Nr.4310; Stainless Steel
- Cone (Pc) W.Nr.1.4021; Stainless Steel
- Seat (Pc) W.Nr.1.4027; Stainless Steel
- Cone (Cv) W.Nr.1.4021; Stainless Steel
- Seat (Cv) W.Nr.1.4027; Stainless Steel
- Screw W.Nr.1.1181; Stainless Steel
- Flat Gasket Non asbestos



Data sheet

**Pressure Independent Control Valve AB-QM,
1/2" thru 2"
2 1/2" thru 4"
5" thru 10" Valve Size**

Danfoss A/S

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