

Data sheet

Thermal Actuator TWA-Q

Description



Danfoss thermal actuator TWA-Q is used with Danfoss Pressure Independent Control Valves (PICV) type AB-QM DN10-32.

The actuator can be controlled with an on/off controller, pulse width modulation (PWM), or switch.

These provide a cost effective solution for the control of hot and /or chilled water for fan coil units, small reheaters and recoolers in temperature control systems.

Main features:

- 24 V AC/DC or 230 V AC supply
- Position indicator
- Normally closed (NC) or normally opened (NO) version
- Max. medium temperature 95 °C
- Cable included, halogen free optional

Ordering

Type	Supply voltage	Cable length	Cable material	Code No.
TWA-Q NC	230V AC	1.2 m	PVC	082F1600
TWA-Q NO			PVC	082F1601
TWA-Q NC	24V AC/DC		PVC	082F1602
TWA-Q NO			PVC	082F1603
TWA-Q NC	230V AC	5 m	PVC	082F1604
TWA-Q NC	24V AC/DC		PVC	082F1605
TWA-Q NC	230V AC	2 m	Halogen free	082F1610
TWA-Q NC	24V AC/DC		Halogen free	082F1611

Technical Data

Power supply	V	24 AC/DC, +25%/-20%	230 AC, ± 15%
Max. inrush current	A	<0.25 (for <60 sec.)	<0.25 for (<1 sec.)
Power consumption	W	< 2	
Frequency	Hz	50/60	
Control input	On/off and PWM		
Closing force	N	110±10	
Min. stroke	mm	5.0	
Full stroke time ¹⁾	min.	< 3	
Max. medium temperature	°C	95	
Ambient temperature		2 ... 60	
Storage and transport temperature		-40 ... 70	
Ambient humidity	95% r.h., non-condensing (according to EN 60730-1)		
Protection class	III		II
Grade of enclosure	IP 54		
Valve connection	mm	M30 × 1.5	
Cable length	m	1.2m or 5m PVC or 2m Halogen free	
Weight	kg	0.15	

¹⁾ at room temperature.

Operation

TWA-Q actuator works on the thermal expansion principle:

- moves actuator stem in one direction in case of heating of the actuator and
- moves actuator stem in another direction in case of no heating of the actuator

Two versions of actuators are available:

- TWA-Q NC version, in the non-energized state actuator's stem is extracted
- TWA-Q NO version, in the non-energized state actuator's stem is retracted

Both versions are available in 24V (SELV) or 230V.

The TWA-Q NC has an internal spring, which is factory fixed with a split ring (Fig.1) to hold the spring retracted in its off-the-shelf state.

The use of split ring allows the actuator to be easy mounted on the valve. Once mounted, the split ring has to be removed.

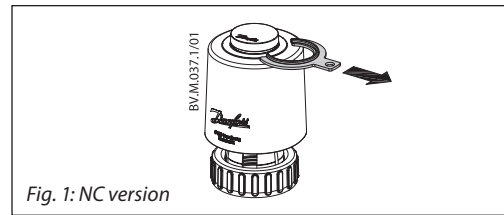


Fig. 1: NC version

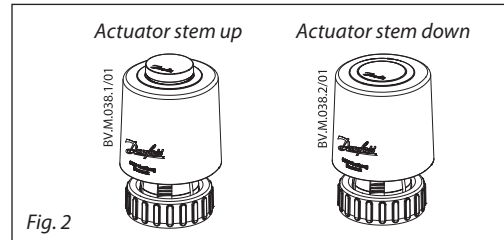


Fig. 2

Note:

In case the actuator has been dismantled and split ring removed, split ring can be added back to the actuator after the heating of the actuator.

The actuator is equipped with a position indicator to show the position of the actuator stem (Fig.2).

The AB-QM valve is closed in stem down position. Without the actuator the force in the AB-QM internal spring opens the valve.

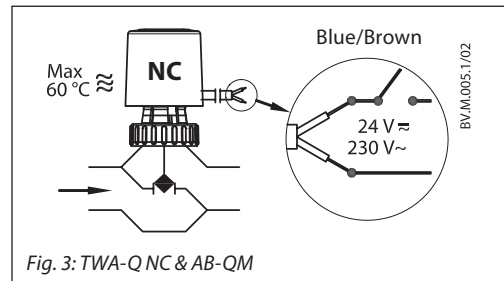


Fig. 3: TWA-Q NC & AB-QM

Combination, TWA-Q NC & AB-QM (Fig.3 & 5)

- in the non-energized state the valve is closed
- in the energized state the valve is open.

The valve starts to open after preheating the actuator for approx. 1.5 min. if the heating element is switched on in a cold state (room temperature), and achieves the maximum stroke after another approx. 1.5 min. At power-off, the wax element cools down and the valve will be closed.

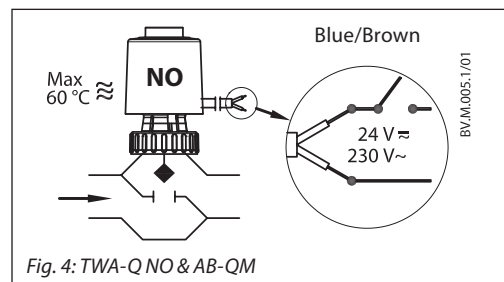


Fig. 4: TWA-Q NO & AB-QM

Combination, TWA-Q NO & AB-QM (Fig.4 & 6)

- in the non-energized state the valve is open
- in the energized state the valve is closed

The valve starts to close after preheating the actuator for approx. 1.5 min. if the heating element is switched on in a cold state (room temperature), and closes the valve after another approx. 1.5 min. At power-off, the wax element cools down and the valve will be open.

The Thermal Actuator TWA-Q are noise-free and maintenance-free. When the control signal is applied to the actuator, the temperature of the heating element rises, which causes the wax element to expand, which transfer the stroke to the installed valve.

Some controllers drive the actuators with a PWM (Pulse Width Modulation) signal. This improves the response time.

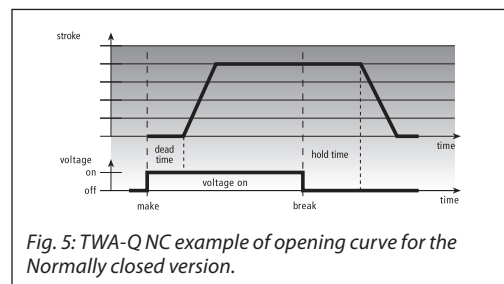


Fig. 5: TWA-Q NC example of opening curve for the Normally closed version.

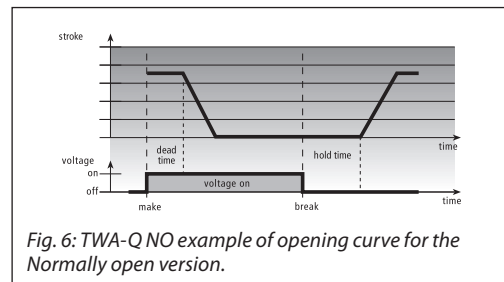
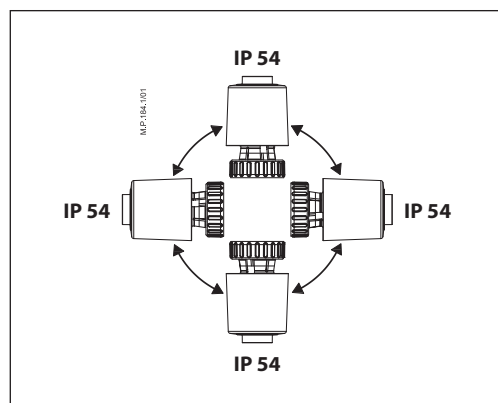


Fig. 6: TWA-Q NO example of opening curve for the Normally open version.

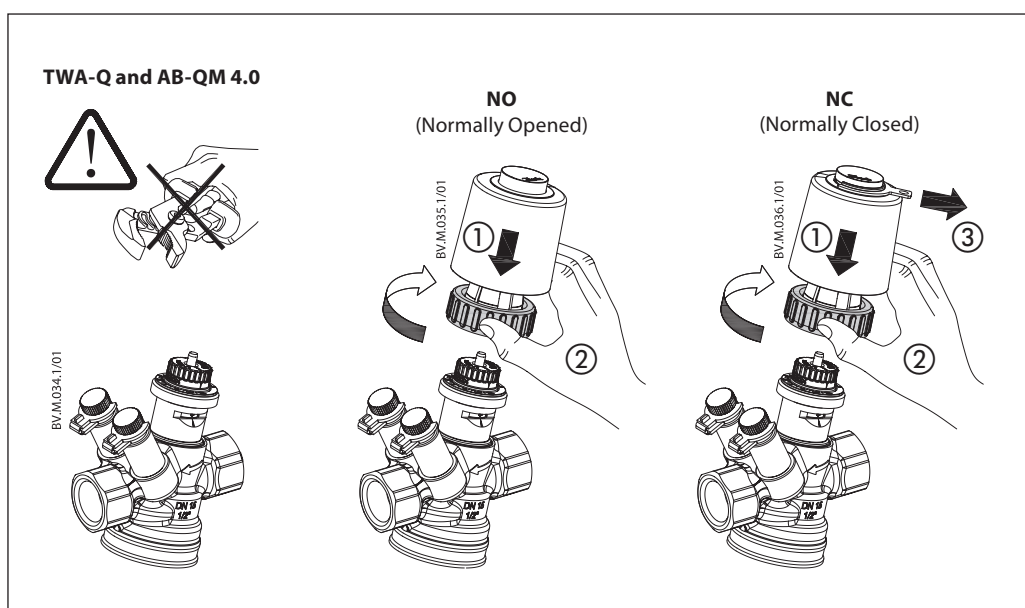
Installation

Mechanical

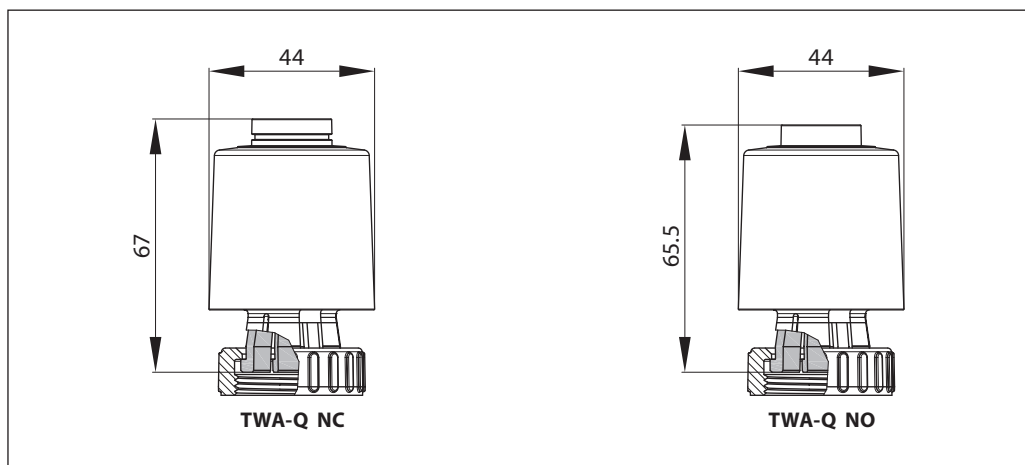
Installation of the valve with the actuator is allowed in all positions.



Actuator / Valve assembly



Dimensions



Disposal

The actuator must be dismantled and the elements sorted into various material groups before disposal.