Data sheet



Thermal actuators

Actuator ABNM A5 LOG for AB-QM, 0-10 V Proportional

Description

The ABNM A5 0-10V thermal actuator has been specifically designed for use with AB-QM valves DN10-32/½-1¾ inch in heating and cooling applications.

Control is done by a 0-10 V signal, which isprovided either by a 3rd party room thermostator, in most cases, by a central direct digitalcontrol (DDC) system. The actuator converts the 0-10 V signal into a proportional actuator travel, which can be either linear (ABNM A5 LIN) or logarithmic/equal percentage (ABNM A5 LOG).

For fan coil unit or chilled ceiling application choice of logarithmic version is recommended (water to air heat exchanger). The result will be linear system response and thus optimal room temperature control.

Features & benefits

- Detection of AB-QM opening and closing point
- Available as normally closed (NC)
- Power consumption 1 W
- Plug-in cable
- Simple snap-on installation
- IP54 in any installation position
- First-Open function
- Compact size, small dimensions
- All round function indicator
- Noiseless and maintenance-free

Ordering

Product code numbers

Type	Supply voltage [V]	Stroke [mm]	De-energized position	Control characteristic	Code number
ABNM A5 0-10V	24 V AC	5.00	Normally closed	LOG	082F1160
ABNM A5 0-10V	24 V AC	5.00	Normally closed	LIN	082F1161
ABNM A5 0-10V	24 V AC	6.50	Normally closed	LOG	082F1162
ABNM A5 0-10V	24 V AC	6.50	Normally open	LOG	082F1163
ABNM A5 0-10V	24 V AC	6.50	Normally closed	LIN	082F1164
ABNM A5 0-10V	24 V AC	6.50	Normally open	LIN	082F1165
ABNM A5 0-10V	24 V DC	6.50	Normally closed	LOG	082F1166
ABNM A5 0-10V	24 V DC	6.50	Normally open	LOG	082F1167
ABNM A5 0-10V		5.00	Normally closed	LOG	082F1170

Accessories code numbers



082F1073

ABNM adapter for M30X1,5/11,8mm

ABNM adapter for M30X1,5/11,8mm



082F1071

ABNM adapter for RA 2000 (VA78)

ABNM adapter for RA 2000 (VA78)



082F1072

ABNM adapter for M30X1,5/9,5mm

ABNM adapter for M30X1,5/9,5mm



082F1082

Connection cable for ABNM A5, halogen-free, 5 m

Connection cable for ABNM A5, halogen-free, 5 m



082F1074

ABNM adapter for RAV

ABNM adapter for RAV



082F1081

Connection cable for ABNM A5, halogen-free, 1 m

Connection cable for ABNM A5, halogen-free, 1 m



082F1083

Connection cable for ABNM A5, halogen-free, 10 m

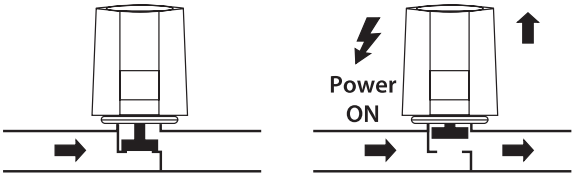
Connection cable for ABNM A5, halogen-free, 10 m

Functions

The actuator mechanism of the ABNM actuator uses a positive temperature coefficient (PTC) resistor heated wax element and a compression spring.
The wax element is heated by applying the operating voltage and moves the integrated piston. The force generated by this movement is transferred to valve spindle and thus opening or closing the valve. The actuator provides active regulation in a defined range (see characteristic curve between 0.5 V and 9.5 V). The function display (all-round display) of the ABNM shows at the first glance whether the valve is "open" or "closed".

First open function (for NC versions only)
In its delivery condition ABNM is partly open due to the first open function (filling). This enables heating/cooling operation during the carcass construction phase even when the electric wiring is not yet complete. During the later electrical start-up, the first open function is unlocked by applying the power supply for more than 6 minutes.

Version NC "normally closed"
In case of the normally closed version, valve is closed when de-energized. Valve is opened steadily upon switching on the power supply, setting control signal to 10 V and after expiry of the dead time.



Function display for NC versions extends proportionally with actuator opening from 0 mm to 5-6 mm.

Automatic initial calibration
Automatic initial calibration is done only at the first power on of the actuator (new actuator). Power supply needs to be applied for 30 min. (± 10 min.) in order to finalize calibration phase, which includes valve opening and closing point detection. This ensures an optimum match with the AB-QM valve used at any preset between 20% and 100%. Active control range is thus between 0.5 V and 9.5 V what ensures precise flow and temperature control. Automatic initial calibration stores calibration parameters directly in actuator non-volatile memory. Information remains in actuator memory also if actuator actuator power supply is disconnected.

Manual re-calibration
In case you change valve type or valve preset after initial calibration is finished, apply 0 V control voltage for 15 min. for closing point detection and 10 V control voltage for 15 min. for new opening point detection. Please note actuator stores this information in non-volatile memory 24 hours after re-calibration. If power is lost within 24 hours after re-calibration, then this information is lost, and you need to repeat the re-calibration procedure.

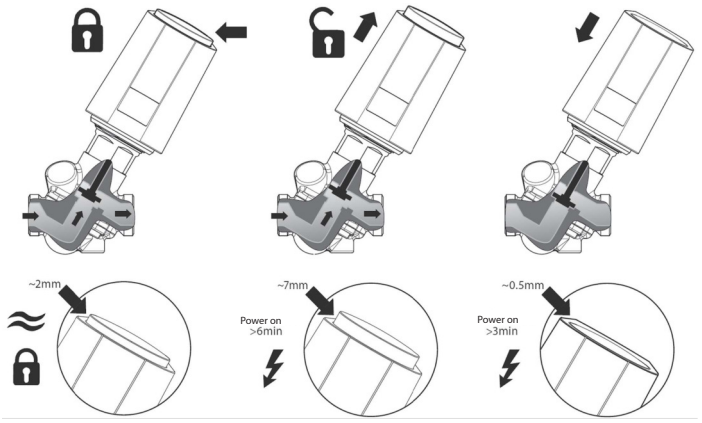
Automatic re-calibration
In case you change valve type or valve preset after initial calibration is finished and exact timing of re-calibration is not important, manual re-calibration procedure can be avoided. Controller will during normal course of operation sooner or later give control signal 0 V and 10 V. Actuator will automatically detect new closing point when control signal is 0 V for 15 min. and new opening point when control signal is 10 V for 15 min. We cannot guarantee duration of this procedure, as it depends from control signal from controller.

Operation after power-off
After power off (in case actuator was not removed from the valve) actuator will undergo normal operation within:

- 1 min. if power off was <10 s
- 15 min. if power off was >10 s

If power is lost within 24 hours after re-calibration, then you need to repeat re-calibration procedure.

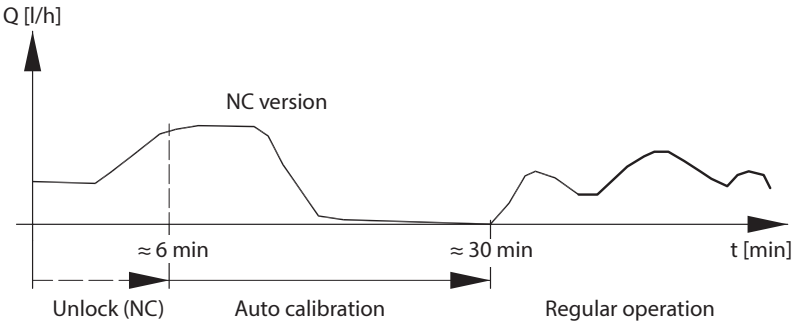
First Open Function



Presentation of First Open Function (Unlock NC version).

Operation

Calibration



Detection of open / close point

Automatic initial calibration procedure to actual preset AB-QM stroke (detection of opening and closing point). ABNM A5 actuator needs ~30 min. for first calibration (including First Open Function and valve open and close point detection. In case of power loss the actuator will remember its position and will not need recalibration.
If valve preset is changed after first calibration is finished, actuator will automatically detect new open and close point during normal operation.

In order to accelerate this process cycle voltage to 0 V for 60 min. and 10 V for 60 min. In case of power loss within 8 hours after calibration the actuator will lose its calibration parameters and initialize a new calibration when restarted. In case of power loss after 8 hours after re-calibration the actuator will remember its position and will not need recalibration.

Product details

General data

Technical Data

ABNM A5 type	5 mm versions AC	6.5 mm versions AC	6.5 mm versions DC
Versions	NC, LOG/LIN	NC/NO, LOG/LIN	NC/NO, LOG
Voltage	24 V AC 50/60 Hz (–10 % to +20 %)	24 V AC 50/60 Hz (–10 % to +20 %)	24 V DC (–10 % to +20 %)
Max. inrush current	< 300 mA for max. 2 min.	< 300 mA for max. 2 min.	< 300 mA for max. 2 min.
Operating power	1 W[1]	1.2 W [1)]	1.2 W [1)]
Control voltage	0–10 V DC	0–10 V DC	0–10 V DC
Input resistance	100 kΩ	100 kΩ	100 kΩ
Actuator travel	5 mm (–0.5 mm overclosing)	6.5 mm (–0.5 mm overclosing)	6.5 mm (–0.5 mm overclosing)
Actuating force	100 N + 10 %	125 N +5 %	125 N +5 %
Closing (NC) or opening (NO) time when de-energized	3–5 min.	3–5 min.	3–5 min.
Speed	30 s/mm [2)]	30 s/mm [2)]	30 s/mm [2)]
Calibration time (including first open for NC)	30 ± 10 min. [2)]	30 ± 10 min. [2)]	30 ± 10 min. [2)]
Delay when energized (heat up time)	2–3 min.	2–3 min.	2–3 min.
Fluid temperature	0–100 °C [2)]	0–100 °C [2)]	0–100 °C [2)]
Storage temperature	–25 to 65 °C	–25 to 65 °C	–25 to 65 °C
Ambient temperature	0 to 60 °C [2)]	0 to 60 °C [2)]	0 to 60 °C [2)]
Ambient humidity	95 % r.h., non-condensing	95 % r.h., non-condensing	95 % r.h., non-condensing
Degree/class of protection	IP54 [3)]/III safety extra-low voltage	IP54 [3)]/III safety extra-low voltage	IP54 [3)]/III safety extra-low voltage
CE conformity according to	EN60730	EN60730	EN60730
UL certification	UL60730	UL60730	UL60730
Connecting cable (no included)	3 × 0.22 mm [2)] halogen free PVC	3 × 0.22 mm [2)] halogen free PVC	3 × 0.22 mm [2)] halogen free PVC
Adapter (included)	VA 41	VA 41	VA 41
Overvoltage resistance EN60730-1	min. 1 kV	min. 1 kV	min. 1 kV
Weight	111 g	111 g	111 g
Housing material	Polyamid / white	Polyamid / white	Polyamid / white

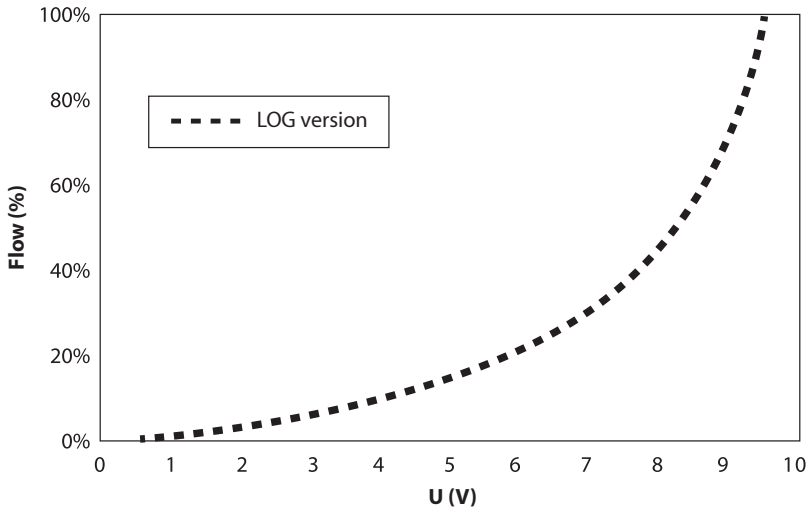
[1)] Measured with precision power meter LMG95.

[2)] Measured at ambient temperature 20°C. Due to thermal working principle of actuator some parameters vary with ambient temperature. At higher ambient temperatures actuator opening is faster and closing slower. At lower ambient temperatures actuator closing will be faster and opening slower.

[3)] In all installation positions with cable plugged in.

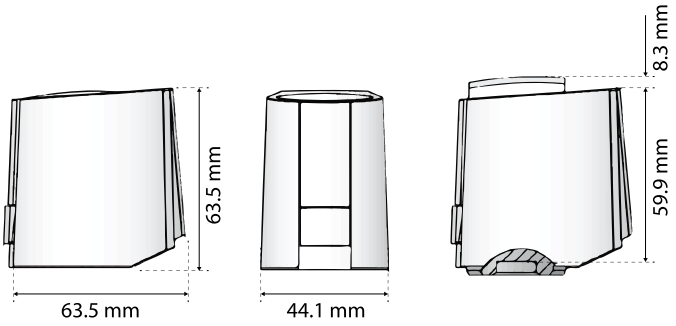
Capacity

Characteristic Curves



Control characteristics of LOG version.

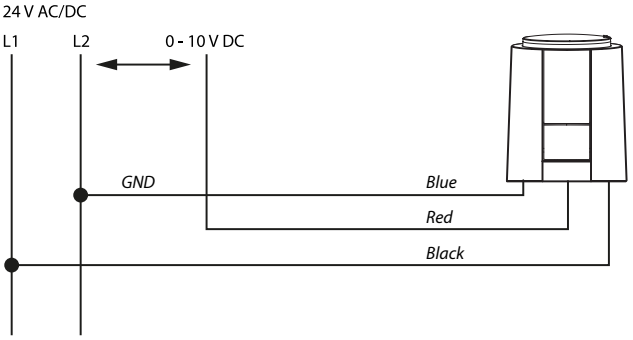
Dimensions



Dimension: 5 mm versions.

Connections

Electrical Connections



Transformer

Rule-of-the-thumb formula for dimensioning transformer:

$P_{transformer}$ = 6 W x number of ABNM actuators

Calculation of max. cable length (copper cable):

L = K x A / n

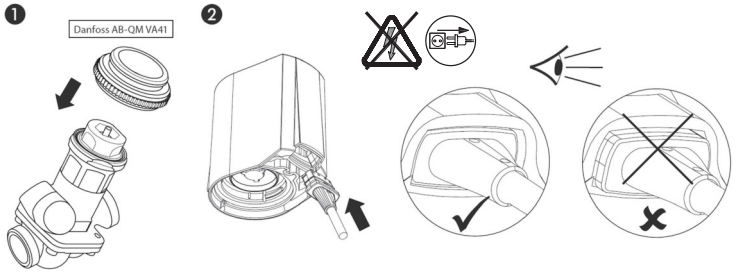
A: Conductor cross-section in mm^2

n: Number of ABNM actuators

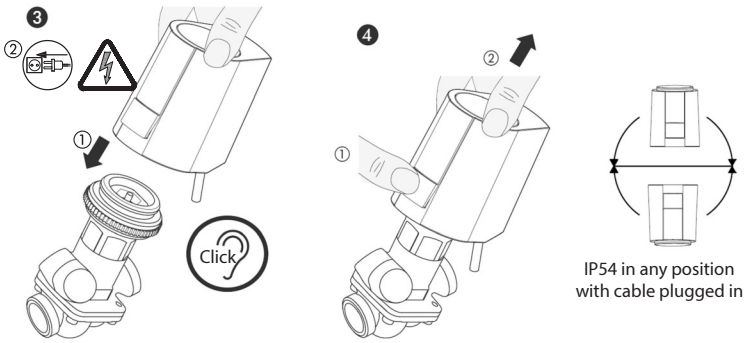
K: Constant for copper (269 m/mm^2)

L: Cable length in m

Installation



Screw the valve adapter manually onto the valve and connect cable and actuator.



Place the actuator vertically on the valve adapter. The actuator snaps onto the valve adapter with a “click” when pressed down vertically by hand.

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Issuer	Approval topic
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EU Declaration	Danfoss EU BF343634241375en-000301.02	Danfoss	MD, EMC, EU RoHS
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