Data sheet

Actuator 0-10 V Proportional
Type ABNM

Application



The ABNM actuator is thermoelectric actuator for opening and closing valves and is used in the fields of heating, ventilation and air conditioning systems.
Control is by a 0-10 V signal which is provided either by a room thermostat or, in most cases, by a central DDC system. The actuator converts the 0-10 V signal into a proportional actuator travel.

- For actuating valves on heating circuit distributors, radiators, convectors and similar units.
- Ideal use in fast heating/cooling systems (e.g. fan coils, air conditioner boxes etc.)
- In combination with central DDC systems in building services managemant systems

Function

The actuator mechanism of the ABNM-Actuator uses a PTC resistorheated wax element and a compression spring.
The closing force of the compression spring (90 N actuating force) is matched to the closing force of the valves and keeps the valve closed when de-energized. When the control voltage is applied (0-10 V), the wax element is heated under electronic control.
The actuator provides active regulation only in a defined range (see characteristic curve between 2 V and 10 V). Between 0 V and 2 V, the ABNM-Actuator is in a quiescent state in order to be able to ignore any possible ripple voltage occurring in the lower control voltage range in long cables.

When the operating voltage is applied, the ABNM-Actuator carries out one full valve open/close cycle. This unlocks the First Open function and determines the maximum actuator travel position and the closing point when the valve is closed, This ensures an optimum match with the specific valve used.
The relation between control voltage and actuator travel is balanced by optical path measurement, allowing very accurate positioning,
When the control voltage is outside of the active range, the valve is kept closed by the closing force of the compression spring.

Ordering

Actuator with adapter for Danfoss RA 2000 valves

Type	Supply voltage	Control voltage	Valve function	**Code no.**
ABNM	24 V AC	0-10 V DC	NC (normally closed)	**082F1091**

Actuator without valve adapter

Connection cable length	**Code no.**
1 m	**082F1094**
5 m	**082F1095**
8 m	**082F1096**

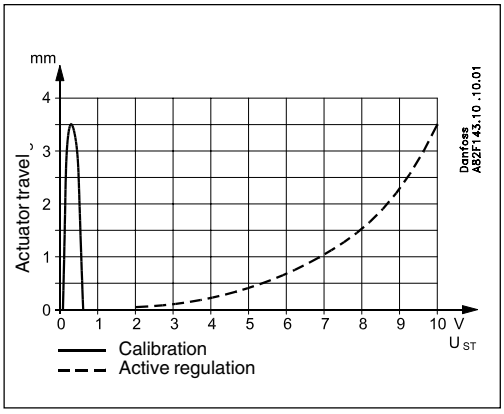
Valve adapters

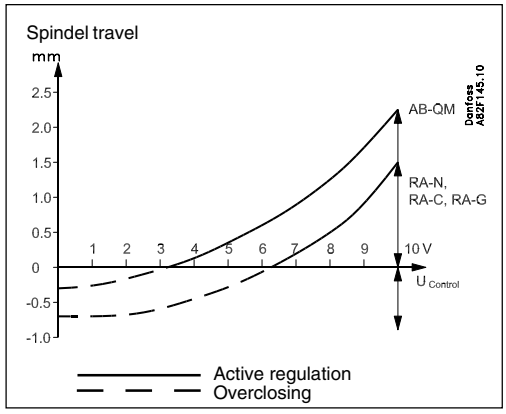
Connection	**Code no.**
Danfoss RA 2000	**082F1071**
Danfoss AB-QM	**082F1072**
M30x1.5 Heimeier, MNG, Oventrop	**082F1073**
Danfoss RAV	**082F1074**

Data

Version	Closed when de-energized
Voltage	24 VAC 50/60 Hz (+20% to -10%)
Max. inrush current	250 mA during approx. 2 min.
Operating current	63 mA
Operating power	1.5 W
Control voltage	0-10 V DC
Proportional conversion range of control voltage	2-10 V DC.
Input resistance	100 kohm *(10 kohm for 082F1091)*
Actuator travel	3.5 mm
Average actuation delay	30 s/mm
Actuating force	90 N
Operating temperature	0 - 50 °C
Fluid temperature	0 - 100 °C
Storage temperature	-25 to +60 °C
Ambient temperature	0 to +50 °C
Relative humidity	80% max. 11
Degree / class of protection	IP 40 / Safety extra-low voltage
CE conformity according to	EN 55014/60730/60335
Housing / housing colour	Polyamid / white
Weight	75 g without adapter and cable
Connecting cable / cable length	3 x 0.22 mm² PVC, white, 1.5 or 8 meter

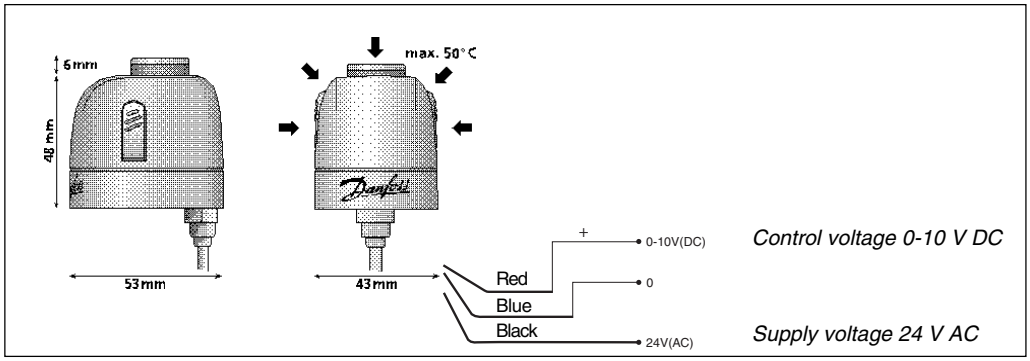
Characteristic curves





ABNM actuator
The actuator converts the 0-10 V signal into a proportional actuator travel of 0-3.5 mm

Dimensions
Connection



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

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

Calculation of maximum cable length (copper cable) **L = K x A / n**

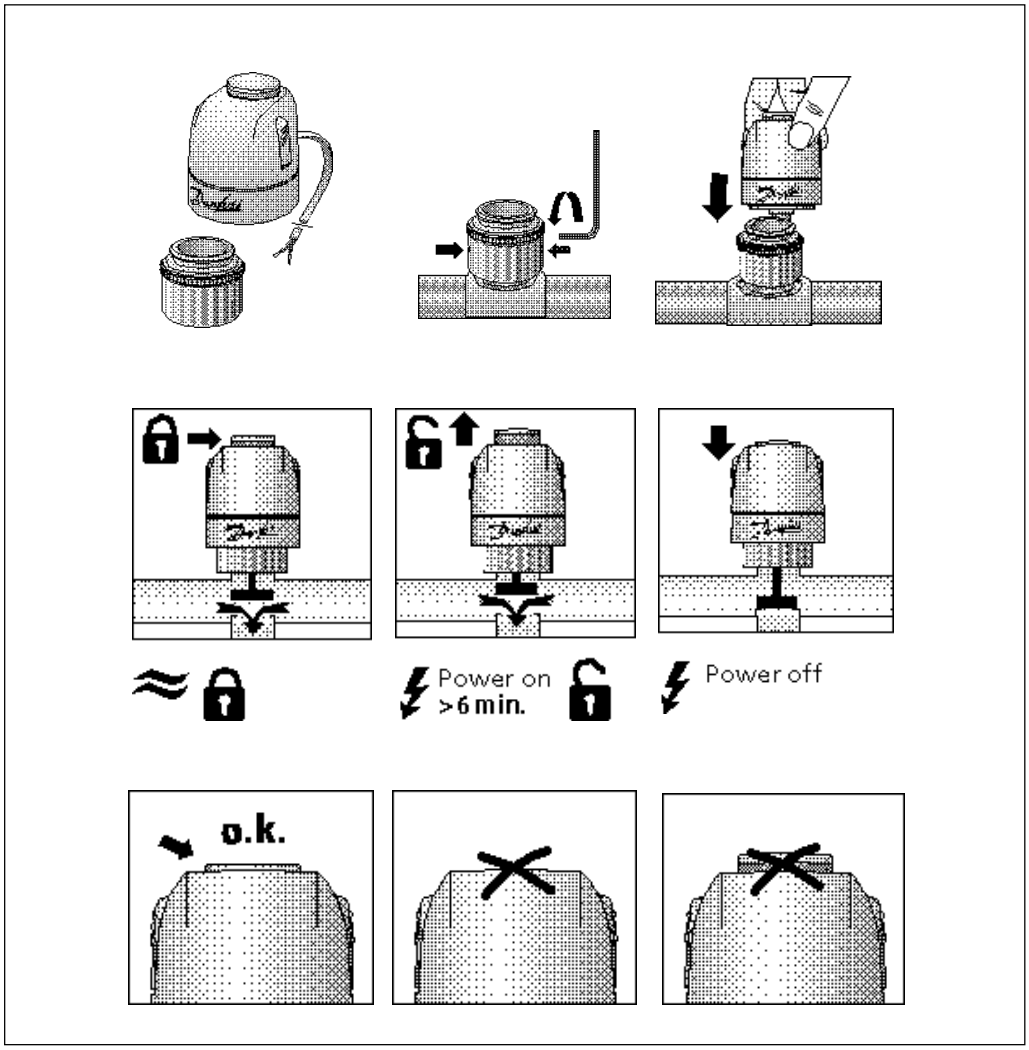
A Conductor cross-section in mm²
n Number of ABNM actuators
K Constant for cobber (269 m/mm²)
L Cable length in m

Installation

Vertical or horizontal installation is recommended. Upside down installation is possible, but we cannot give any warranty for this installation position. A 2 mm Allen key is used to fit valve adapter.

First-Open function
In its delivery condition, the ABNM-Actuator is open when de-energized due to the First Open function. This enables heating operation during the carcass construction phase even when the electric wiring of the single room control is not yet complete. When commissioning the system at a later date, the First Open function is automatically unlocked by applying the operating voltage (for more than 6 minutes) and the actuator is fully operable.

Function Display
The function display of the ABNM-Actuator (all-round display) allows identifying the operating condition (valve open/closed and intermediate positions) at a glance.



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