

## Data Sheet

# Actuator ABNM A5 0-10 V Proportional

For Use with RA2000 Valves

### Application



- First-Open function (NC versions)
- Compact size, small dimensions
- 24V AC power source
- Position indicator
- Noiseless and maintenance-free

Control is done by a 0-10 V signal, which is provided either by a 3rd party room thermostat or, in most cases, by a central direct digital control (DDC) system. The actuator converts the 0-10 VDC signal into a proportional actuator travel to the RA2000 or RA-C series of valves.

The ABNM A5 0-10V thermal actuator is designed for use with RA2000 Thermostatic Radiator Valves in heating and cooling applications.

Suitable applications for the ABNM A5 actuator can include fan coil units, chilled ceiling applications, radiant floor heating or radiator valves. It is not recommended that the ABNM A5 actuator be used on low pressure steam applications due to the increased temperature environment that the actuator is exposed to.

#### Features include:

- Safety function of normally closed (NC) actuator during power failure
- Low power consumption 1W
- Removable plug-in cable
- Simple snap-on installation
- Actuator orientation in any installation position

### Ordering

Type	Supply voltage	Stem Travel	Position during power loss	Input Signal	Code no.
ABNM A5, for RA2000	24 V AC	4 mm	NC	0 - 10 VDC	<b>082F1111</b>

### Spare Parts

Description	Code no.
Mounting base adapter	<b>VA78</b>
<b>Cables</b>	<b>Code no.</b>
3 feet (1 meter)	<b>082F1081</b>
16 feet (5 meters)	<b>082F1082</b>
32 feet (10 meters)	<b>082F1083</b>

**Function**

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).

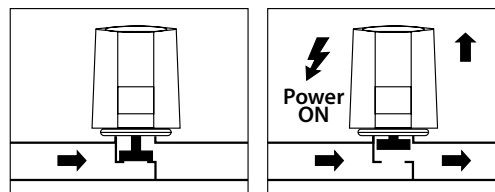
The function display (all-round display) of the ABNM shows at the first glance whether the valve is "open" or "closed".

**First open function**

In its delivery condition ABNM is partly open due to the first open function (filling). This enables heating/cooling operation during the 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.

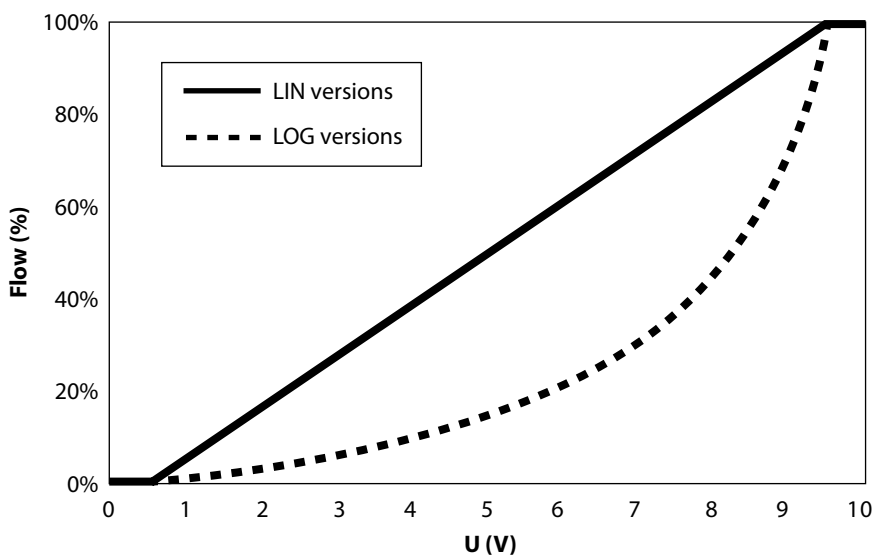
**Technical Specifications**

Operating voltage	24 V AC 50/60 Hz (-10% to +20%)
Max. inrush current	< 300 mA for max. 2 min.
Operating power	1 W <sup>1)</sup>
Control voltage	0-10 V DC
Input resistance	100 kΩ
Actuator travel	4 mm
Actuating linear force	100 N ± 5%
Closing (NC) or opening (NO) time when de-energized	3-5 min.
Travel speed	30 s/mm <sup>2)</sup>
Calibration time (including First Open for NC)	> 6min. <sup>2)</sup>
Delay when energized (heat up time)	2-3 min.
Fluid temperature	32 to 212°F (0 to 100° C) <sup>2)</sup>
Storage temperature	-13 to 149°F (-25 to 65°C)
Ambient temperature	32 to 140°F (0 to 60° C)
Suitable applications	Hot or chilled water
Degree/class of protection	NEMA 3 (IP54 <sup>3)</sup> /III safety extra-low voltage)
Connecting cable	3 x 0.22 mm <sup>2</sup> , halogen free
Mounting Adapter (included)	VA 78
Weight	0.24 lb (111 g)
Housing material	Polyamid / white

<sup>1)</sup> Measured with precision power meter LMG95.

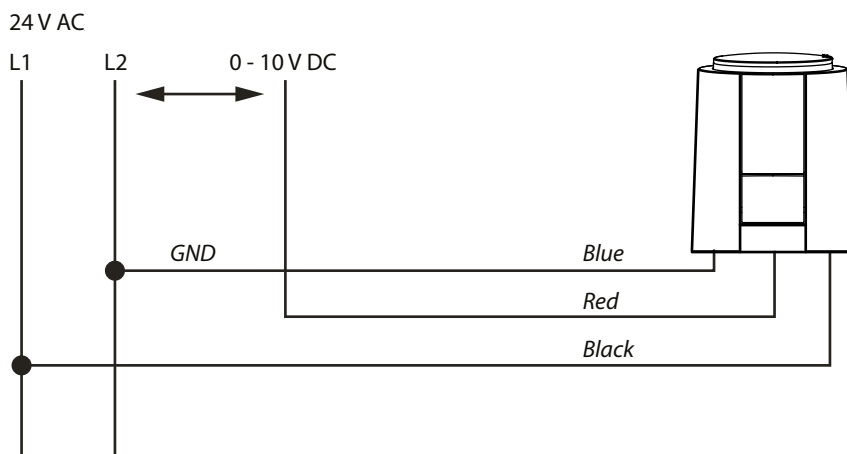
<sup>2)</sup> Measured at ambient temperature 68°F (20°C). Due to thermal working principle of actuator some parameters vary with ambient temperature. At higher ambient temperatures actuator opening is faster and closing slower. At lower ambient temperatures actuator closing will be faster and opening slower.

Characteristic Curves



Control characteristics of LOG and LIN versions.

Electrical Connections



**Transformer**

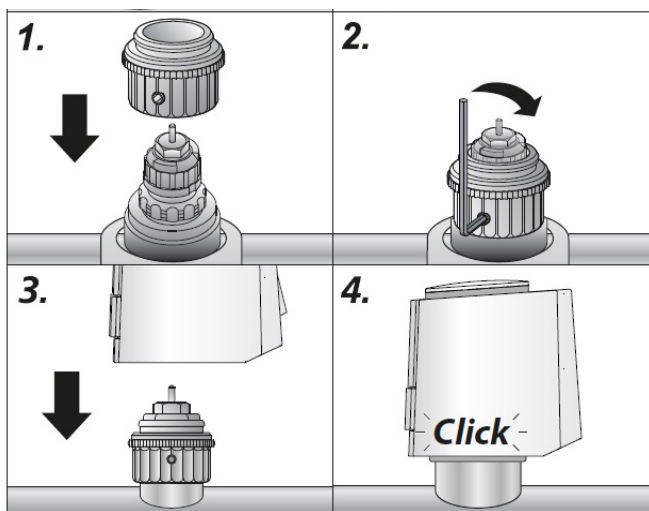
Rule-of-the-thumb formula for dimensioning transformer:  
 $P_{\text{transformer}} = 6 W \times \text{number of ABNM actuators}$

**Calculation of max. cable length (copper cable):**

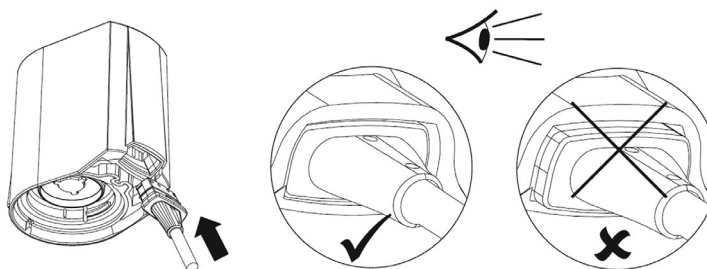
$$L = K \times A / n$$

A: Conductor cross-section in  $\text{mm}^2$   
 n: Number of ABNM actuators  
 K: Constant for copper ( $269 \text{ m/mm}^2$ )  
 L: Cable length in m

Installation

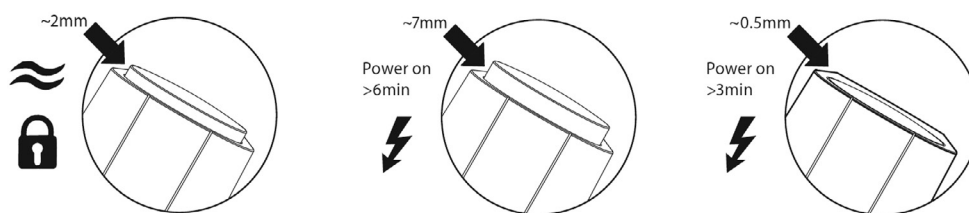


- 1) Full mount the adapter to the valve body.
- 2) Tighten the Allen screws on the adapter.
- 3) Align the actuator head to the adapter and push down.
- 4) There should be an audible to indicate the actuator is fully mounted to the adapter.



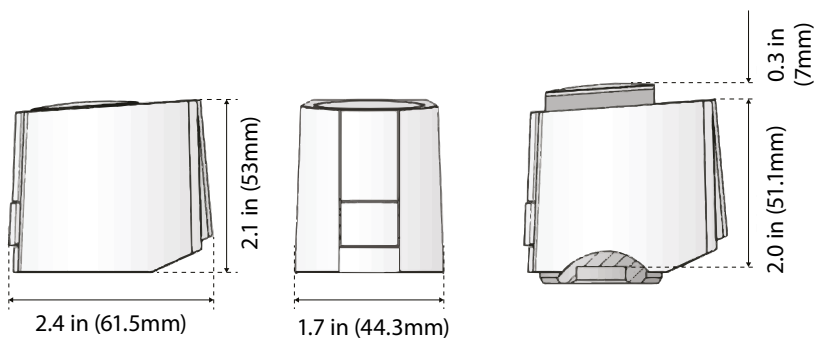
Fully push the cable plug into the actuator.

First Open Function



Presentation of First Open Function (Unlock NC version).

Dimensions



Danfoss can accept no responsibility for possible errors in printed materials and reserves the right to alter its products without notice. All trademarks in this material are property of the respective companies. Danfoss and Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.



**Danfoss**  
Toronto, ON  
Tel.: 866-375-4822, Fax: 416-352-5981  
[www.na.heating.danfoss.com](http://www.na.heating.danfoss.com)

**Danfoss**  
Baltimore, MD  
Tel.: 443-512-0266, Fax: 443-512-0270  
[www.na.heating.danfoss.com](http://www.na.heating.danfoss.com)