energetx

BA6008

Thermoelectric actuators, type BA6008

AC 24 Volt

3P or split range

- **Power supply Uv : AC 24 Volt**
- **Control signal Y : 0(2) .. 10Vdc (D/I) or split range**
- **Stroke : max. 4,5mm**
- **Force : max. 115N**
- **Normally closed version (NC)**
- **Mounting: with universal 1-for-all valve adapter**
- **Automatic compensation of the closing extent with the *Auto-Fit* function**
- **Electrical connection via 3-wire connection cable (pluggable)**
- **Quiet operation (0dbA) and no maintenance required**
- **Position indicator ↺ 360°**
- **OEM- version normally open (NO) on request**

Advantages

- Easy mounting
- 1-for-all valve adapter concept
- *Auto-Fit* of valve closing dimension
- low power consumption
- modular system cable with connector
- NC (normally closed) or NO
- ↺ 360° position indicator
- long life span
- absolutely quiet operation

Description

The thermoelectric actuators, series BA6008, have been developed for energy efficient readjustment in various HVAC applications like heating and cooling applications, IRC individual room control or zone control.

The actuators can be used for the efficient control of systems with an average inertia, such as radiators, cooling beams and radiation cooling ceilings, as well as for inert systems such as climate ceilings and cooling systems or thermoactive building systems (TABS). With the application of the right control strategy, these actuators contribute to energy savings.

These actuators use a PTC resistor heated wax element and a spring loaded piston. The wax element is heated up by applying the power supply, and is then moving the internal piston. The force generated by this movement is transferred to the stem of the valve, thus opening or closing the valve. The actuator operates silently and is maintenance-free.

The position of the actuator is steplessly regulated by an external proportional control signal Y:0..10Vdc. The position is continuously measured through an inductive sensor, the actuator continuously positions the valve and stops once the desired position is reached. The control signal is linear in relation to the valve stroke of the valve.

The BA6008 series (NC) offers a positioning force of 115N for a traveling stroke of 4,5mm. The mechanical position indication offers a clear ↺ 360° view on the open or closed position of the valve.

Content

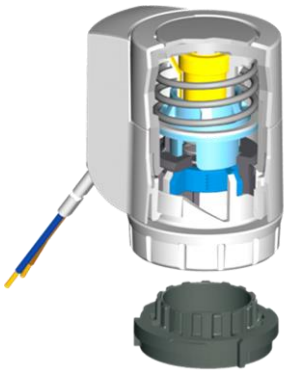
Nomenclature

BA	6	0	0	8	80	01	-			
								Type of actuator		
BA								**BA**	Belparts Actuator for thermal controls	▲
								Power supply & control signal		
	2							2	AC 230 Volt	*(datasheet 6.108)*
	4							4	AC/DC 24 Volt	*(datasheet 6.118)*
	6							**6**	**AC 24 Volt, Y: 0(2)..10Vdc**	▲
								Stroke & behavior (NC/NO)		
		0						**0**	**NC, max. 4,5mm**	▲
		1						1	NO, max. 4,5mm	△
								Various versions		
			0					**0**	**Complete actuator**	▲
			1					1	Compose your own actuator	△
								***Auto-Fit* function**		
				8				**8**	**with *Auto-Fit* function**	▲
								Valve adapter [1]		
					80			**80**	with AV80, universal 1-for-all valve adapter	▲
								Cable length [2]		
						00		00	Delivery without cable (to be ordered separately)	
						02		**02**	**Cable length 2m (PVC)**	△
								Options		
							-	-	No special options	
							HF	HF	Halogen-free cable	△

Remark : for a complete list of existing types, see “Overview”, page 7

[1] overview of alternative valve adapters : see page 8
[2] cables to be ordered separately available on request

▲ default
△ on request



F2018100100 5

Technical data

Power supply U_v		AC 24 Volt
Tolerance		-20%..+20%, 50/60 Hz
Control		proportional
Power consumption		3W (when on)
Start-up	**consumption**	5W / 5VA
	current	220 mA
Current	**Stand-by**	max. 6 mA
	In operation	max. 90 mA
Stroke		max. 4,5mm (adjustable)
Running time		approx. 30 s/mm
Control signal Y		0..10Vdc or split-range (adjustable)
Input resistance		Ri ≥ 100kΩ
Control range		0..10Vdc or 2..10Vdc (adjustable)
Operating direction		directly or indirectly (adjustable)
Force	**BA6008 (NC)**	max. 115N
	BA6108 (NO)	max. 110N
Housing		white (RAL 9010)
Electrical wiring [1)]		3x 0,22mm², PVC, 2m, plug-in
Degree of protection		IP54 (EN 60529)
Protection class		III (EN 60730-1, 60730-2, 60730-14)
CE conformity		*EMC Directive* 2014/30/EU EN 61000-6-1/EN 61000-6-2 EN 61000-6-3/EN 61000-6-4
Temperature	**stock keeping**	-25..+70°C
	ambient	0..+50°C
	medium	0..+100°C max.
Relative humidity		85% rH, condensation-free
Maintenance		No maintenance required
Weight		210 g (2m cable included)

1) other cable lengths or halogen-free cables available on request

6

Settings via DIP-switch

F2018100300 4

DIP-switch	Setting		Operation	Remarks
1	ON		Y: working indirectly 10..0Vdc	Operating mode 2
	OFF	●	Y: working directly 0..10Vdc	Operating mode 1
2	ON		stroke 3mm (0..10Vdc)	
	OFF	●	stroke 4,5mm (0..10Vdc)	
3	ON		split-range Y = on	
	OFF	●	split-range Y = off	
4	ON		Y: split-range 5,5..10Vdc (0..100%)	10..5,5Vdc if DIP 1 = ON
	OFF	●	Y: split-range 0..4,5Vdc (0..100%)	4,5..0Vdc if DIP 1 = ON
3	OFF		Control range Y: 2..10Vdc (0..100%)	10..2Vdc if DIP 1 = ON
4	ON			

- default settings ex works

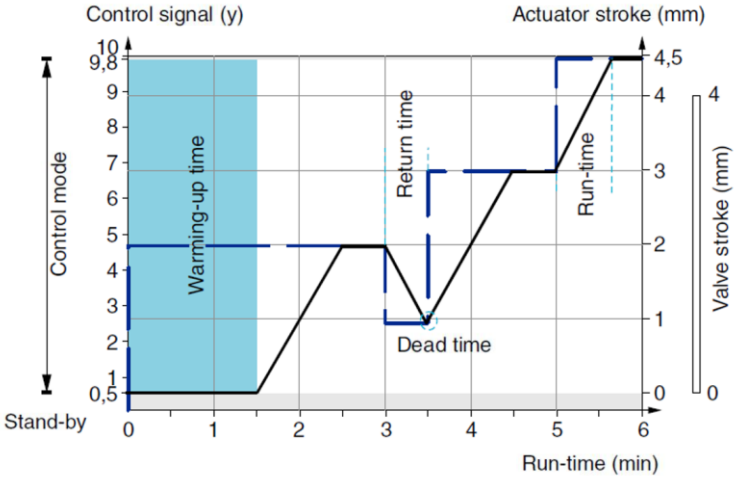
These settings apply for the NC as well as the NO versions.

Functional diagram

When the power of the actuator is switched on in 'cold condition' (ambient temperature approx. +25°C), the valve starts to open after a warming-up time of approx. 2,4 minute.

After an additional period of approx. 2,7 minutes, the actuator has executed a stroke of 4,5 mm. An adjustment (warming up of the thermal element) of the stroke with 1mm is carried out in approx. 30s.

When the power of the actuator is switched off, the expansion element cools down and the valve is closed by the internal piston.



0...10 V
0...100 %

Working directly or indirectly

Depending on the setting of DIP-switch 1, the actuator can be used with a 0...10Vdc control signal (operating mode 1) or a 10...0Vdc control signal (operating mode 2).

10...0 V
0...100 %

Stand-by mode

The actuator passes into stand-by mode when the control voltage is less than 0.5 V (operating mode 1). If operating mode 2 has been set (via DIP-switch) the actuator will pass into stand-by mode when the control voltage is higher than 9,5 V. The actuator requires a warming-up time of approx. 2,4 min. in 'cold condition'. The same time is needed when the actuator stays in stand-by mode for longer than 6 minutes.

Zero-point calibration

When the cable is connected, the actuator takes over the factory settings of the electrical zero-point. The first position detection (calibration) is performed when the actuator first reaches stand-by mode. At that moment, the current position is set as the new zero-point.

In order to compensate for a possible shift of the mechanical zero-point by aging in the soft seal of the valve fitting, an automatic recalibration is always performed when the actuator remains in stand-by mode for 17 minutes.

Cable for electrical wiring

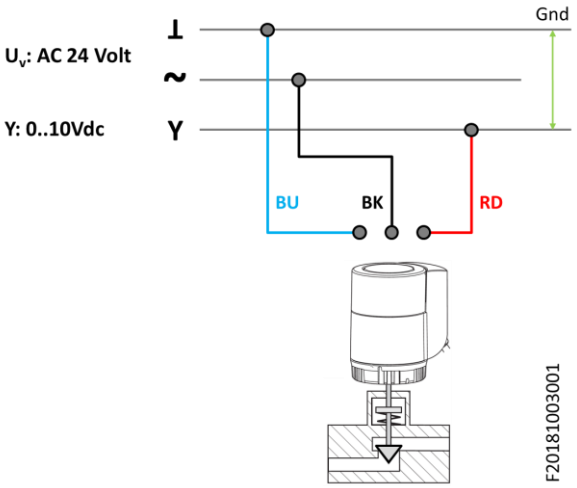
The BA6008 actuators are provided by default with a plug-in connection cable in PVC, length 2m (3x0,22mm ²).

The plug-in cable (with plug) simplifies the custom-made adjustment and allows the actuator to be fitted with the cable length of choice (max.7m). Halogen-free connection cables can also be supplied on request.

NC – Normally closed (default version)

After mounting the actuator on the control valve, the control valve will be closed when in 'idle state'.
Operating mode 1 (working directly) – When the control signal augments, the actuator shaft moves inwards and the valve shaft extends outwards while the control valve opens.
Operating mode 2 (working indirectly) - When the control signal augments, the actuator shaft extends outwards and the valve shaft moves inwards while the control valve closes.
Valve position in combination with actuator with power off: CLOSED.

BA6008 (NC)

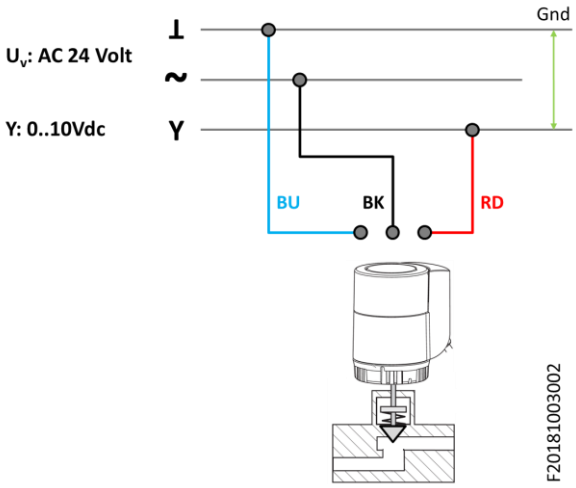


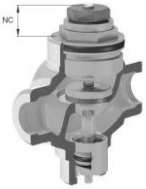
With control valve type : NO

NO – Normally open (OEM version) [1)]

After mounting the actuator on the control valve, the control valve will be open when in 'idle state'. When the power of the actuator is switched on, the actuator shaft extends outwards and the valve shaft moves inwards while the control valve closes. Valve position in combination with actuator with power off: OPEN.

BA6108 (NO)





With control valve type : NC

[1)] on request

BU = blue / BN = brown / RD = red

Dimensioning

A safety transformer must always be used in accordance with EN61558-2-6. The dimensioning of the transformer is based on the starting current of the actuator.

Rule of thumb : $P_{transfo}$ **= 6W x n**

n : number of transmissions

The following cable is recommended for 24 Volt installations:

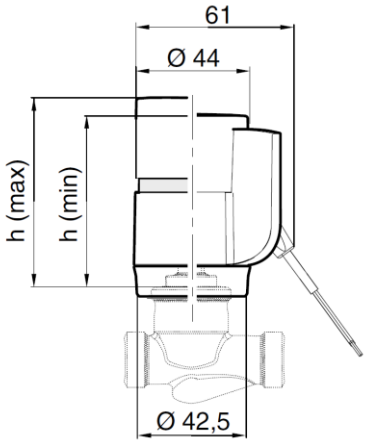
- J-Y(ST)Y 0,8mm²
- NYM 1,5mm²
- NYIF 1,5mm²

Rule of thumb, with regard to losses in the pipes (copper pipes), for calculating the maximum length in a 24 Volt installation:

L = K x A / n

with L : cable length [m]
K : constant (269 m/mm²)
A : cable section [mm²]
n : number of transmissions, type BA..

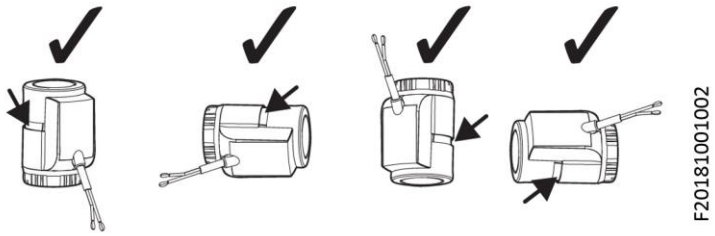
Dimensions



	BA6008	BA6108
	NC	NO
h min	59	59
h max	66	64

Mounting

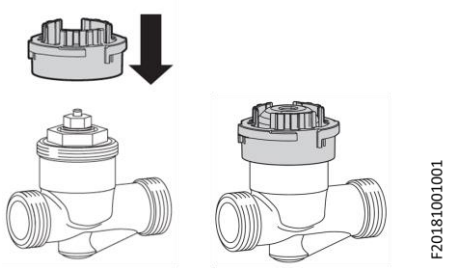
IP54
EN60730



Auto-Fit function

1-for-all : only one valve adapter for all valves

Due to the ***Auto-Fit*** function, the closing extent of the valve will be automatically, mechanically compensated. This has the great advantage that the same valve adapter can be used for various control valves.

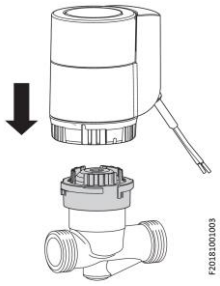


With the AV80 valve adapter supplied by default, the actuator can compensate for a closing extent from 8.5 mm to 13.5 mm and can therefore be combined with the most common control valves on the market.

When the valve adapter is rotated, a compensation pin is released in the actuator.

Simple tension-free mounting

In addition, the actuator can be mounted tension-free on the control valve thanks to the unique LFL locking technology (LFL: low force locking).



When the actuator is removed from the control valve, the closing extent and pre-tension are released once again. The actuator is then in the state as delivered ex works and can be reused with full LFL functionality.

Closing dimensions

Interface	Color	Closing size			
		standard AV	AV_H		
			-	N-insert	S-insert
*In combination with **NC**-actuator*					
M30 x 1	white	8.5 mm .. 13.5 mm	13.5 mm .. 18.5 mm	8.5 mm .. 13.5 mm	4.5 mm .. 9.5 mm
M30 x 1,5	black				
M28 x 1,5	grey				
*In combination with **NO**-actuator*					
M30 x 1	white	12.5 mm .. 17.5 mm	17.5 mm .. 22.5 mm	12.5 mm .. 17.5 mm	8.5 mm .. 13.5 mm
M30 x 1,5	black				
M28 x 1,5	grey				

Overview

Standard actuators AC 24 Volt with *Auto-Fit*, 115N, 4.5mm NC, modulating 0..10Vdc

Type		NC	NO	with *Auto-Fit* function	with plug-in cable	with 1x limit switch	length cable	with valve adapter AV80
BA6008.80.00	△	●	-	●	●	-	[1]	M30x1,5
BA6008.80.02	▲	●	-	●	●	-	2m	M30x1,5
BA6018.80.02	△	●	-	●	[2]	-	2m	M30x1,5

Special versions actuators AC 24 Volt with *Auto-Fit*, 110N, 4.5mm NO, modulating 0..10Vdc

Type		NC	NO	with *Auto-Fit* function	with plug-in cable	with 1x limit switch	length cable	with valve adapter AV80
BA6108.80.00	△	-	●	●	●	-	[1]	M30x1,5
BA6108.80.02	△	-	●	●	●	-	2m	M30x1,5

▲ default
△ on request

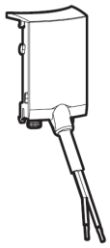
NC : normally closed
NO : normally open
AV.. : valve adapter

[1] to be ordered separately (see pag.8)

[2] connection cable 2m supplied unmounted

6

Accessories



Connection cables as accessories for electrical connection

Type		Description		
AS8NC.3.02000	▲	connection cable 3x 0,22mm² for BA6008 actuators (NC)	L :	2m
AS8NC.3.05000	△	connection cable 3x 0,22mm² for BA6008 actuators (NC)	L :	5m
AS8NC.3.07000	△	connection cable 3x 0,22mm² for BA6008 actuators (NC)	L :	7m
AS8NO.3.02000	▲	connection cable 3x 0,22mm² for BA6008 actuators (NO)	L :	2m
AS8NO.3.05000	△	connection cable 3x 0,22mm² for BA6008 actuators (NO)	L :	5m
AS8NO.3.07000	△	connection cable 3x 0,22mm² for BA6008 actuators (NO)	L :	7m
AS8NC.3.02000.HF	△	connection cable 3x 0,22mm² for BA6008 actuators (NC)	L : halogen-free	2m
AS8NC.3.05000.HF	△	connection cable 3x 0,22mm² for BA6008 actuators (NC)	L : halogen-free	5m

Valve adapters as accessories [1)]

Type		Description	Interface	N-insert	S-insert
AV39H	△	valve adapter, type AV39H	M30 x 1	●	●
AV80	▲	valve adapter, type AV80	M30 x 1,5	-	-
AV80H	△	valve adapter, type AV80H	M30 x 1,5	●	●
AV70H	△	valve adapter, type AV70H	M28 x 1,5	●	●

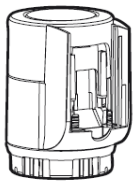
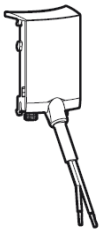
Other adapters such as for Giacomini R450, R452, R546 and the 60 series of Danfoss RA, RAV, RAVL available on request.

▲ default
△ on request

Ordering example

Qty	Type	Description
1x	**BA6008.80.02**	Thermoelectric actuator with *Auto-Fit*, 4.5mm NC, AC 24 Volt, 115N, modulating control 0..10Vdc, with (plug-in) connection cable 2m and universal valve adapter type AV80.

Scope of supply

Qty	Type	Description	
1x	**BA6008.00.02**	Thermoelectric actuator with *Auto-Fit* 4.5mm NC AC/DC 24 Volt 115N control: modulating 0..10Vdc	
		+	
		With plug-in connection cable 2m (pre-mounted)	
		+	
1x	**AV80**	Valve adapter type AV80 (separate delivery)	

6