



BA6022F.10.01

### Thermic actuators, series BA6022F\_

- Power supply Uv: AC 24 Volt or DC 24 Volt
- Control signal: 0(2)..10Vdc
- Control range: 4,0mm
- Force: 110N
- Normally closed version (NC)
- First-Open (FO) function, with Re-Open function
- Mounting: with swivel nut M30x1,5
- Electrical connection via 3-wire connection cable: 1m
- Quiet operation (0dbA) and no maintenance required
- Clear position indicator

24 Volt



0(2)..10Vdc



#### Advantages

- ✓ Easy mounting
- ✓ First-open & re-open function
- ✓ Very low power consumption
- ✓ Very low inrush current
- ✓ Normally closed (NC)
- ✓ Clear position indication
- ✓ IP54
- ✓ Long life span
- ✓ Absolutely quiet operation (0dBA)

#### Description

The Belparts® thermic actuators, series BA6022F\_, are designed for energy efficient valve control in various HVAC heating and cooling applications, radiator valves, manifolds, terminal control valves IRC individual room control, zone control, etc.

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 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 actuator comes in a First-Open (FO) position, which ensures that the valve is open during initial commissioning, even without applying the power supply.

The BA6022F\_ thermic actuators (NC) with valve adapter system and First-Open function, offer a positioning force of 110N for a control range of 4,0mm. The actuator closes the valve when de-energized. The mechanical position indication offers a clear view on the position of the valve. The actuator operates silently and is maintenance-free.

#### Content

1.	Nomenclature .....	2
2.	Technical data .....	3
3.	Operation.....	4
4.	Adapt closing dimension .....	5
5.	Position indication.....	5
6.	Electrical connection.....	6
7.	Functional diagram .....	7
8.	Dimensions.....	8
9.	Mounting.....	8
10.	Intellectual property .....	9
11.	Overview .....	10
12.	Ordering example 1 .....	11
13.	Ordering example 2 .....	12

1. Nomenclature

BA	6	0	22F	10	01		
actuator series		version					
BA							<b>Product</b>
							<b>B</b> Belparts® thermic actuators for terminal controls
							<b>Power supply U<sub>v</sub></b> <b>Control signal</b>
	6						<b>6</b> U <sub>v</sub> : AC 24 Volt <b>modulating 0(2)..10Vdc</b> ▲
	4						4 U <sub>v</sub> : AC/DC 24 Volt      On/Off or PWM
	2						2 U <sub>v</sub> : AC 230 Volt      On/Off or PWM
							<b>Position when de-energized</b>
		0					<b>0</b> normally closed (NC) ▲
							<b>Valve adaption</b>
			22F				<b>22F</b> with fixed swivel nut M30x1,5 ▲
							<b>Valve adaption</b>
				10			<b>10</b> closing dimension standard 10,8mm <sup>1)</sup>
							<b>Standard cable 3x 0,25mm<sup>2</sup></b>
					01		<b>01</b> 1m length, white ▲
							<b>Special options</b>
							- no special options
						DC	<b>D</b> U <sub>v</sub> : DC 24 Volt <b>modulating 0(2)..10Vdc</b> △

<sup>1)</sup> the closing dimension can be changed to 10,2mm or 8,4mm using the spacer (included in the delivery).

▲ standard  
△ on request

2. Technical data		BA6022F_		
<b>Power supply</b>	<b>U<sub>v</sub></b>	AC 24 Volt ± 20%, 50-60Hz DC 24 Volt ± 20% <sup>1)</sup>		
<b>Power consumption</b>	<b>P</b>	1,1W (24 V ~/=)		
<b>Inrush power</b>		4,8W (24 V ~/=)		
<b>Inrush current</b>		200mA (24 V ~/=)		
<b>Control signal</b>	<b>Y</b>	0..10Vdc		
<b>Control range</b>		2..10Vdc		
<b>Position without power</b>		normally closed (NC)		
<b>Force</b>	<b>F</b>	110N		
<b>Stroke</b>		4,0mm		
<b>Valve connection</b>		swivel nut M30x1,5 female		
<b>Closing dimension</b>		no spacer	spacer A	spacer B
		10,8mm	10,2mm	8,4mm
<b>First-open function</b>		yes, automatic disengagement after power-up		
<b>Position at delivery</b>		in first-open position		
<b>Re-open function</b>		yes, adjustable		
<b>Detection of closing point</b>		automatic		
<b>Electrical connection</b>		cable 3x0,25mm <sup>2</sup> , 1m, white		
<b>Insulation class</b>		III (EN60730-1, with 24 V ~/=)		
<b>Degree of protection</b>		IP54 (EN60730-1)		
<b>CE conformity</b>		<ul style="list-style-type: none"> <li>• Low Voltage Directive 2014/35/EU EN 60730-1, EN 60730-2-14</li> <li>• EMC Directive 2014/30/EU EN 60730-1</li> <li>• RoHS Directive 2011/65/EU EN IEC 63000</li> </ul>		
<b>Temperature</b>	ambient	0°C .. +50°C		
	valve	max. +100°C		
	storage	-25°C .. +70°C		
<b>Humidity</b>		maximum 85% rH, non-condensing		
<b>Dimensions</b>	H x B x L	68mm x 40mm x 56mm		
<b>Weight</b>		120g		

<sup>1)</sup> Note : only for article reference number: BA6022F.10.01.DC

### 3. Operation

#### Modulating control

The Belparts<sup>®</sup> thermic BA6022F\_ actuator converts the electrical signal received from into a valve stroke to control the set temperature via the flow through the valve. The BA6022F\_ actuators can be used with a modulating 0(2)..10Vdc control signal.

The actuator converts the electrical 0(2)..10Vdc control signal from the external controller into a valve stroke 0..4,0mm.

#### First-Open function

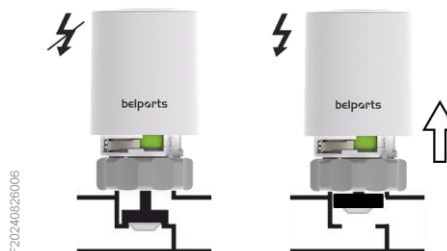
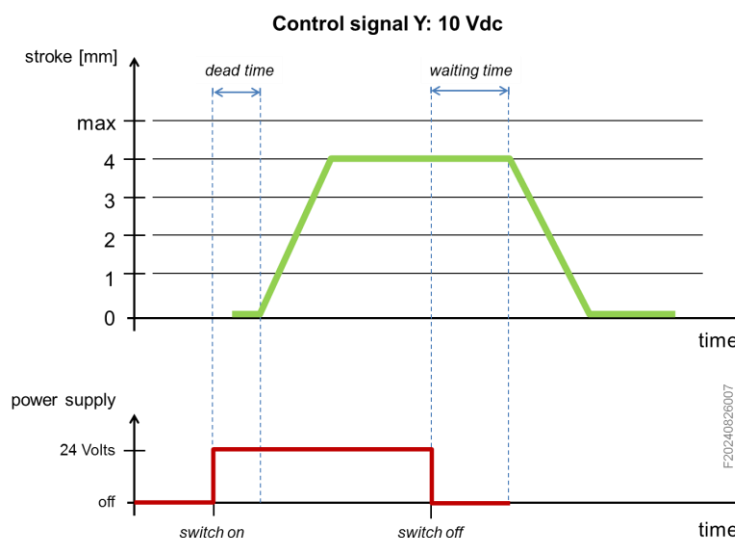
The actuator is delivered in opened position (First-Open function), which means that the valve remains open during initial start-up. This makes it easier to mount the actuators onto the valve and to fill and flush the system since the control system is usually not yet in operation now.

The First-Open function (FO) is automatically disengaged as soon as the actuator is electrically connected and is fully opened. Alternatively, the FO-function can be deactivated manually by lifting the stroke indicator with a screwdriver. When the stroke indicator is raised, the "Re-Open" spring clip is released, thus disabling the FO function.

For service purposes, the actuator factory setting "open" can be restored at any time via the spring clip without electrical power. To do this, the stroke indicator is lifted until the spring clip can be pushed under the stroke indicator. The compression of the stroke indicator holds the spring clip in position and the FO function is active again.

The slim design (housing diameter 40 mm) allows for installation to manifolds with a heating circuit distance of 40 mm.

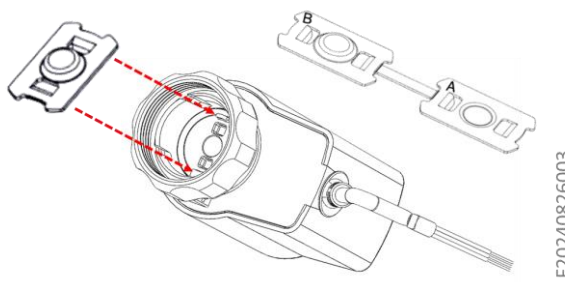
#### Operating diagram



#### 4. Adapt closing dimension

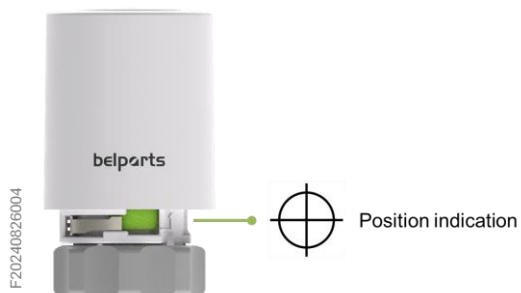
The Belparts® thermic BA6022F\_ actuator NC-version comes standard with a fixed swivel nut M30 x 1,5mm (female) with standard closing dimension of 10,8mm.

By using the optional spacer, the closing dimension can be reduced to 10,2mm (spacer A) or 8,4mm (spacer B).



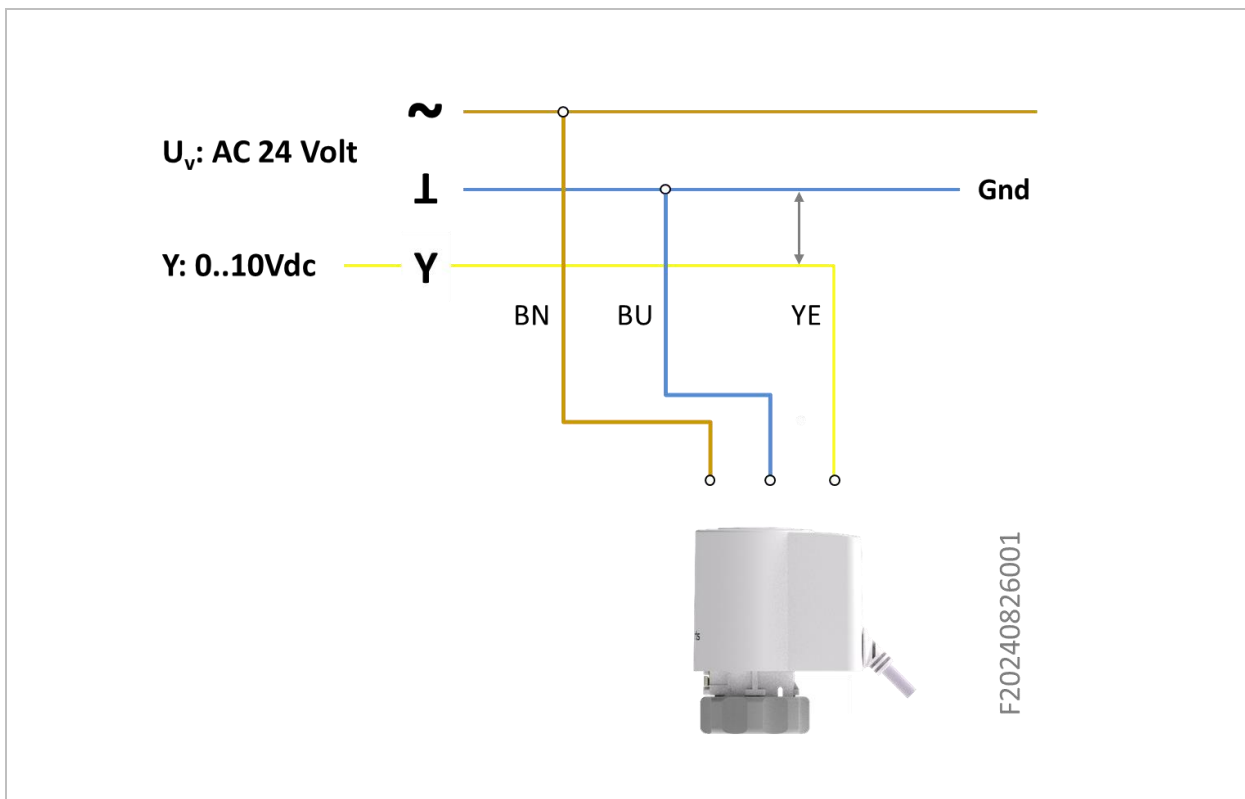
no spacer	spacer A	spacer B
10,8mm	10,2mm	8,4mm

#### 5. Position indication



6. Electrical connection

BA6022F\_



WH	BN	GN	YE	BU	PK	GY
white	brown	green	yellow	blue	pink	grey
wit	bruin	groen	geel	blauw	roos	grijs
blanc	brun	vert	jaune	bleu	rose	gris
weiß	braun	grün	gelb	blau	pink	grau

*Individual wires are color coded, no numbering. Color coding according DIN 47100.*

- i** Make sure that the power supply is turned off while the connections are being made.
- i** Make and verify electrical connections before powering the system. Short circuits or improperly connected cables can cause damage.

7. Functional diagram

BA6022F

**Normally closed (NC)**

Once the actuator is mounted on the control valve and the first-open function is disabled, the valve stays closed when idle. It remains shut until activated (normally closed: NC).

When the actuator power is on and the control signal Y (0..10Vdc) increases, the actuator shaft retracts, causing the valve shaft to extend and open the control valve.

This direct-working function means that as the control signal rises, the actuator shaft pulls back, the valve shaft extends, and the valve opens. As the control signal decreases, the valve closes. The actuator goes to stand-by mode when the control signal Y is less than 2Vdc.




Example: construction of the control valve

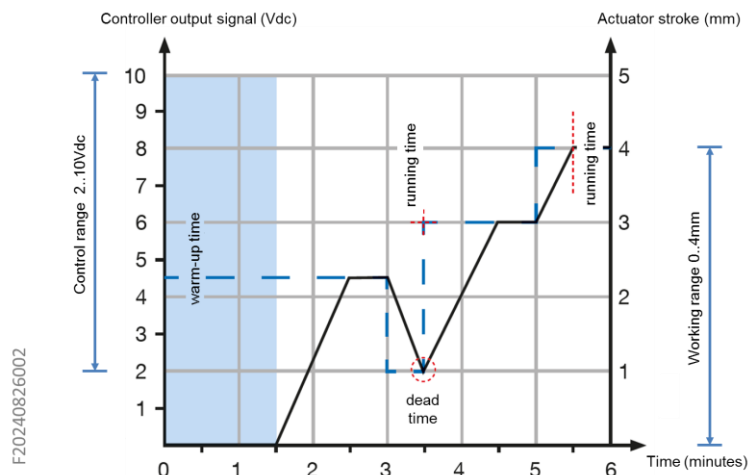
Without an actuator, the control valve remains open, allowing water to pass through.

Position of the valve when paired with an actuator and the power is turned off: CLOSED

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. 1,5 minutes.

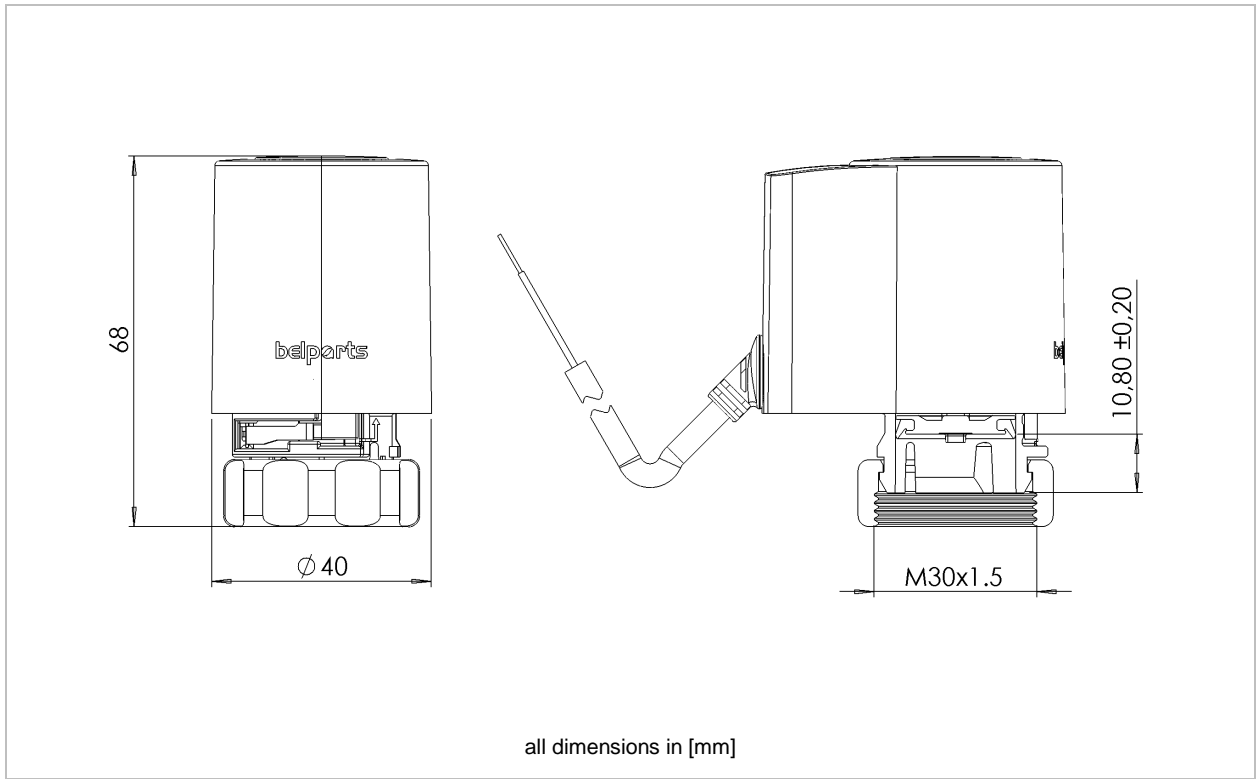
After an additional period of approx. 2,5 minutes, the actuator has executed a stroke of 4mm. When the power of the actuator is switched off, the expansion element cools down and the valve is closed by the internal piston.

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



8. Dimensions

BA6022F



9. Mounting





## 10. Intellectual property

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11. Overview

BA6022F\_



Thermic actuators AC or DC 24 Volt with fixed swivel nut M30x1,5 female | 110N | 4,0mm | 0(2)..10Vdc | NC-version

Type	U <sub>v</sub> [Volt]	NC	NO	stroke [mm]	running time [min]	closing dimension			cable length [m]	PU MOQ [pcs]
						spacer				
						-	A	B		
BA6022F.10.01	▲ AC 24V ±20%	●	-	4,0	4,5	10,8	10,2	8,4	1	8
BA6022F.10.01.DC	△ DC 24V ±20%	●	-	4,0	4,5	10,8	10,2	8,4	1	8

Note: The "closing dimension" refers to the closing dimension of the actuator. This dimension is important to match the correct valve adapter to the closing dimension of the valve used.

**Legend**

**U<sub>v</sub>** power supply  
**NC** normally closed  
**NO** normally open

**MOQ** minimum order quantity  
**PU** packaging unit  
**req** on request

▲ standard  
△ on request

12. Ordering example 1



Qty	Type	Description
1.200 pcs	BA6022F.10.01	Thermoelectric actuator BA6022F_ , 4,0mm NC, AC 24 Volt, 110N, control signal Y: (0)2..10Vdc, with connection cable 1m and with fixed swivel nut M30 x 1,5 female (standard closing dimension 10,8mm).

Scope of delivery

Qty	Type	Description
1.200 pcs	BA6022F.10.01	Thermoelectric actuator BA6022F_ , 4,0mm NC, AC 24 Volt, 110N, control signal Y: (0)2..10Vdc, 1m cable length, fixed swivel nut M30 x 1,5 female, standard closing dimension 10,8mm.



Packaging

Type	minimum packaging unit	maximum number of actuators per pallet
BA6022F.10.01	 8 pcs	 1.200 pcs ✓

13. Ordering example 2



Qty	Type	Description
8 pcs	<b>BA6022F.10.01.DC</b>	Thermoelectric actuator BA6022F_ , 4.0mm NC, DC 24 Volt, 110N, control signal Y: (0)2..10Vdc, with connection cable 1m and with fixed swivel nut M30 x 1,5 female (standard closing dimension 10,8mm).

Scope of delivery

Qty	Type	Description
8 pcs	<b>BA6022F.10.01.DC</b>	Thermoelectric actuator BA6022F_ 4,0mm NC DC 24 Volt 110N control signal Y: (0)2..10Vdc 1m cable length fixed swivel nut M30 x 1,5 female standard closing dimension 10,8mm



Packaging

Type	minimum packaging unit	maximum number of actuators per pallet
<b>BA6022F.10.01.DC</b>	<p>F20230123003</p>  <p>8 pcs</p> <p>✓</p>	 <p>1.200 pcs</p>