

PNEUMATIC STEPPING MOTOR BPS-1623

Operating instructions



Introduction

The purpose of these operating instructions is to familiarise you with the pneumatic stepping motor BPS-1623 and its functions. These instructions contain safety information and notes about assembly, programming, operation and maintenance.

Machine safety

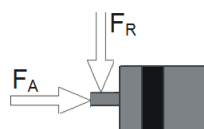
The BPS was classified as an incomplete machine according to Directive 2006/42/EC. The following risk factors must be taken into account when installing in a machine:

- Noise and vibration.
- Hot surfaces (depending on the installation, the surface may become $> 70^{\circ}\text{C}$ hot).
- Contact to rotating shaft end.

The entire machine may only be put into operation if a conformity assessment.

Technical data

Size	1623
Hollow shaft possible	yes
Protection class	55
Step angle ($^{\circ}$)	3
Repeat accuracy	$\pm 9'$
Max. moment of mass inertia ₁ (kgm^2)	0,0042
Max. torque ₁ (Nm) $\pm 10\%$	4,2
Max. speed ₂ (1/min)	24
Max. holding torque pressure less (Nm)	7
Max. holding torque 6bar (Nm)	20
Plug rotation control	M12, 5-pin
Max. FR under radial load only (kN)	1,24
Max. FA under axial load only (kN)	1,75
Air consumption (litre/turn)	0,9



1 Test conditions: 6 bars, hose length 1 m, valve retardation 40 ms

2 Test conditions: 6 bars, matrix direct, valve retardation 10 ms, without load

Installation dimension

The installation and connection dimensions can be found in the respective type drawing.

Function

The BPS-1623 enables precise rotational movements to be performed in steps of 3° . The BPS-1623 with hollow shaft and spindle generates a linear movement.

The stepping movement is achieved by pneumatic actuation of 3 pistons. Because of the self-locking function, the BPS-1623 maintains its position in the event of a power failure and no step loss occurs (considering the holding torque).

For operation without a sensor unit, the BPS-1623 continues to rotate internally if the spindle is mechanically locked.

Encoder (option): The encoder (internal rotary sensor) monitors the rotation of the rotor, thus eliminating the possibility of false or missing signals being caused during blocking, which could damage the motor.

Operating conditions

- Dried and filtered compressed air ($5\ \mu\text{m}$) at max. 6 bars (indicated by valve manufacturer).
- Ambient temperature:
stepping motor: -25°C to $+70^{\circ}\text{C}$.
Matrix valve: -10°C to $+50^{\circ}\text{C}$.
- Acids and alkaline substances may damage the motor.

For special operating conditions (temperature, contact with fluids etc), please contact your service partner to enable your particular application to be studied.

Repeat accuracy $\pm 9'$ absolute with uniform load direction.

When changing the load direction, a load alternation of $50'$ must be respected under maximum load.

When mounted on sheet metal structures, motor vibrations may cause noise to occur.

Assembly

The motor can either be fitted from the front by means of the 3 threads or else using the 3 continuous bores. With flanged matrix valve: The three through holes are not available.

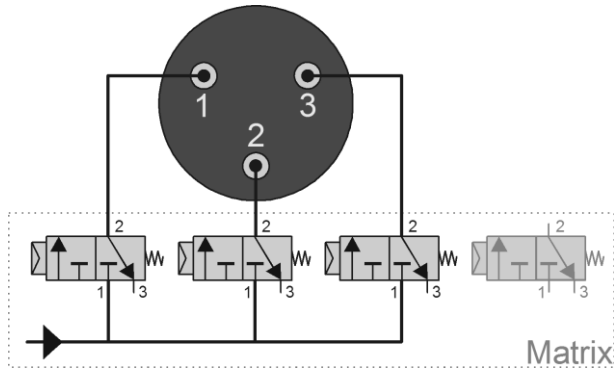
Before fitting, we advise placing the BPS-1623 under pneumatic pressure. This protects the transmission components when the motor shaft or the spindle is tightened.

When assembling the transmission components (plate, wheels etc.), please make sure that the torque applied to the drive shaft does not exceed the indicated maximum.

After installation, check the connection of the motor and valves for absence of leakage.

Actuation

3 valves (3/2 way) or a matrix valve are required for actuation.



Programming

The BPS is generally incorporated into a PLC (Programmable Logic Controller).

Program modules for the Siemens PLC are available free of charge at www.baumitech.ch.

Choose the direction of rotation

The direction of rotation of the stepper motor is determined by the command sequence of the pneumatic control.

1-2-3 = Direction of rotation forward

3-2-1 = Direction of rotation backwards

Operating with rotation control (Option)

The BPS-SE control unit is required to control the BPS-1623 with encoder.

The BPS control unit, also called BPS-SE, converts the signal of the encoder unit into three outputs that can be used as digital inputs on the PLC.

Signal logic

Valve 1 on – Sensor 1 on - Valve 1off
= Step from 3°

Valve 2 on - Sensor 2 on - Valve 2off
= Step from 3°

Valve 3 on - Sensor 3 on - Valve 3off
= Step from 3°

If all valves have switched once, this results in an angle change of 9°.

In the normal mode the BPS-SE reads in the PLC signals for the valves and hands them on to the attached valves. The motor should now respond according the updated piston position.

The Encoder attached on the motor alerts the BPS-SE via A-, B-impulses the effective angle changing of the axle of motor. It corresponds in the unencumbered state to the theoretical single step angle of the attached motor.

When the measured angle changing differs about 50% to the expected theoretical angle changing, the control unit tries to correct the angular offset. If it doesn't succeed, the BPS-SE alerts an error.

If the correction was successful or one didn't have to corrigate, the control unit of the PLC informs that the according valve has been switched.

More detailed information can be found in the BPS-SE operating manual.

Connection for rotation control

	1 brown	+24 V
	2 white	no connection
	3 blue	Ground
	4 black	B
	5 grey	A

Sensor plug on motor side M12, 5-pin A-coded

The wiring is present in the wiring diagram.

Operation

The indicated conditions and maximum torque and the maximum moment of mass inertia must not be exceeded.

Maintenance

Repairs may be performed only by authorised qualified personnel. Otherwise, the warranty claim will lapse.

To exchange wear parts, please contact your service partner.

Disposal

The BPS-1623 complies with the RoHS guideline. Materials which are no longer in service should be taken for recycling. Disposal of the BPS must comply with local specifications.

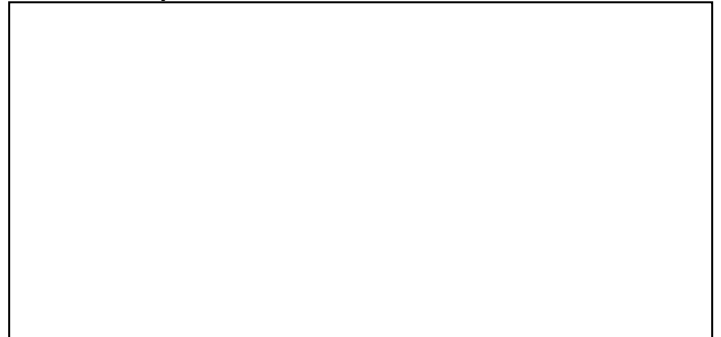
Accessories and special versions

Please contact us for special applications. We will be happy to work with you to design a solution.

Further information about our pneumatic stepping motors is available on the Internet:

www.baumitech.ch

Your service partner



Manufacturer

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