

PNEUMATIC STEPPING MOTOR



BPS Pneumatic stepping motor

Product characteristics

- For set and adjustments
- Compact and powerful
- Stays in position when power line fails
- Optional with confirmation of position (internal sensors)

Operation Principle

Functionality and Precision

The BPS stepping motor creates rotation by means of a pneumatic activation of three internal pistons. Depending on the switching sequence of the control valves, a precise left/right 3° rotation is performed. The BPS can also be provided with a hollow shaft and spindle in order to generate a linear movement. Thanks to its unique construction, the BPS offers a maximum of precision. The tolerance is always $\pm 9'$ angular minutes, irrespective of the number of steps or rotations!

Wide range of applications

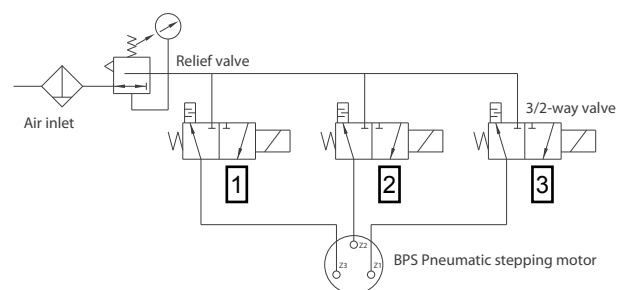
Whether dust, dirt or powerful magnetic fields, the pneumatic drive also offers trouble-free operation in extreme conditions.

Compact powerhouse with self-retention

Even the smallest series of BPS stepping motors is certain to impress with a torque of 1.7 Nm and compact diameter of only 52 mm. The self-retention mechanism keeps the BPS in its position even in the event of a power failure. This means that there is no step loss, thus allowing the BPS to serve as an absolute measuring system as well.

Simplest control

Only 3 x 3/2-way valves are needed to drive the BPS. The BPS can easily be integrated into a PLC. Complete program modules for the Siemens S7-300 are available.



Example:

The direction of rotation is determined by the sequence of the drive.

1-2-3 = Left rotation

3-2-1 = Right rotation

Function with sensors:

Step 1: Valve 1 ON → sensor 1 back-signal → Valve 1 OFF

Step 2: Valve 2 ON → sensor 2 back-signal → Valve 2 OFF

Step 3: Valve 3 ON → sensor 3 back-signal → Valve 3 OFF

Step 4: Valve 1 ON → sensor 1 back-signal → Valve 1 OFF

Step 5: ...

The operation can be repeated any number of times until the desired position is achieved.

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Advantages

Extreme operating conditions

The BPS reveals its strengths in the presence of dust, dirt or strong magnetic fields: pneumatic actuation permits smooth operation even under the most difficult conditions (operating temperature -25 ° to +70 °C, IP 55). The BPS only offers limited suitability for direct drive of rotating parts with high mass.

Small but powerful

Even the smallest model series produces a convincing torque of 1.7 Nm with a compact 52 mm diameter.

Self-locking

Even in the event of a power failure, the BPS maintains its position – No step loss occurs. A major advantage for tough applications.

Precision

With its unique design, the BPS ensures maximum accuracy. The tolerance amounts to a constant ± 9 minutes of angle, regardless of the number of steps!

Easy actuation

Directly via the Matrix valve with 3 valves (3/2-way), with or without sensors: the BPS can be incorporated without great complexity into a stored program control. For the “Siemens S7-300” SPC, free program modules are obtainable.

Sensor unit

All types are available with a sensor unit, reporting the end position of the pistons to a SPC.

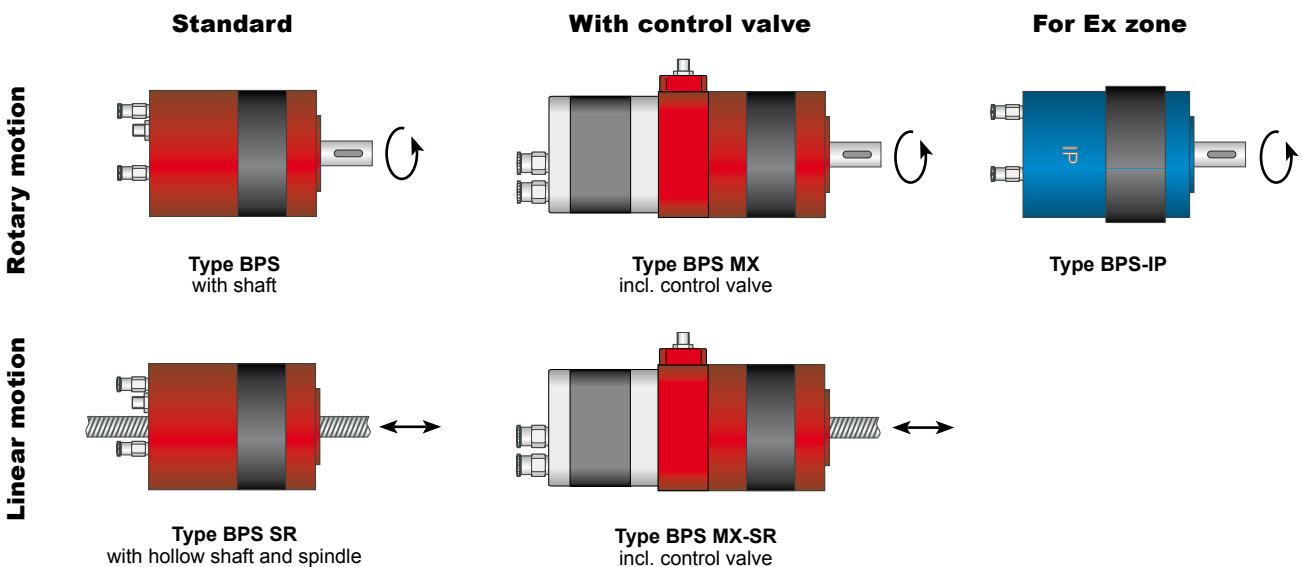
BPS IP version

Specially protected motor housing for operation in Ex zones. Certificated for Ex zones 1, 2, 21 and 22.

Types

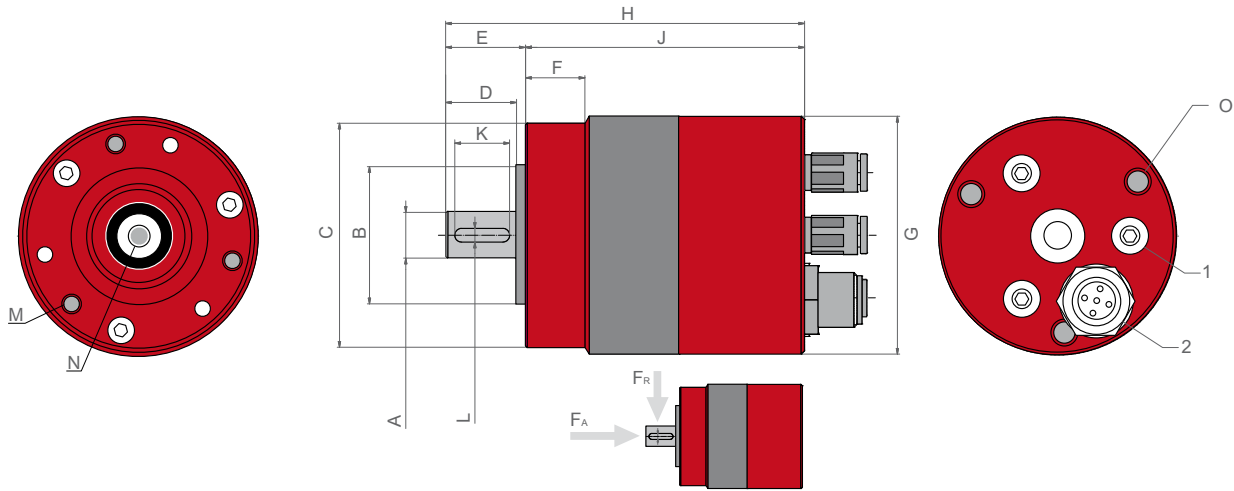
The right design for every application. The built-in Matrix valve provides a central supply for all pistons and a maximum stepping speed.

We would be happy to assist you in the selection of the appropriate motor.



PNEUMATIC STEPPING MOTOR

Technical Data



Typ	1216	1620	1620IP	1620 Tesla	2532
IP insulation class	IP 55	IP 55	IP 67 for Ex zones	IP 55	IP 55
Step angle (°)	3°	3°	3°	3°	3°
Max. moment of mass inertia (kgm ²) ¹	0.002	0.0042	0.0042	0.0042	0.01
Max. torque (Nm) ¹	1.7	3.3	3.3	3.3	10
Max. speed (1/min) ²	24 / 7	24 / 7	24 / 7	24 / 7	20 / 6
Ø A (g6, concentricity 0.02 mm)	10	12	12	12	19
Ø B (h7)	30	40	40	40	60
Ø C	49	59	59	59	96
D	15.5	24.2	24.2	24.2	37.5
E	17.1	26.7	26.7	26.7	40.5
F	13	19.5	19.5	19.5	14.5
Ø G	52	61	61	61	61
H	78.5	99.7	99.7	99.7	149.5
J	61	72.5	72.5	72.5	108.5
K	12	14	14	14	25
L	3	4	4	4	6
M	M4	M4	M4	M4	M6
N	M5	M5	M5	M5	M8
Ø O	3.3	4.5	4.5	4.5	6.5
Pos. 1: pneumatic coupling (3 pieces)	Ø 4 (M5)	Ø 4 (M5)	Ø 4 (M5)	Ø 4 (M5)	Ø 8 (1/4")
Pos. 2: sensor plug (IP: NAMUR, P + F) ³	M12 (5Pol)	M12 (5Pol)	wires 5m	-	M12 (5Pol)
Weight (g)	380 - 720	520 - 1000	550	650	2400 - 2700
Max. F _R under radial load only (kN)	0.7	1.24	1.24	1.24	1.75
Max. F _A under axial load only (kN)	1.0	1.75	1.75	1.75	2.45

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

² Test conditions: 6 bar, matrix direct, valve retardation 10 ms, without load / hose length 1 m, valve retardation 40 ms, 2/3 load

³ Direct output, PUR cable 5 m, EU design model test certificate No PTB 00 ATEX 2032 X

CAD data for all motors available.

PNEUMATIC STEPPING MOTOR

Order Code

Motors BPS — 1 — 2 — 3 — 4 — 5

Motor size		Insulation class		Sensor unit		Control valve		Options	
1216	1.7 Nm	blank	IP 55	blank	without sensor unit	blank	without control valve	blank	shaft end, key groove and spring
1620	3.3 Nm	IP	IP 67 (Ex)	S5	with sensor unit, plug M12 (5Pol)	MX ¹	Matrix valve, without cable	SR2 ²	with 300 mm spindle, Ø 8 mm / pitch 2.0 mm
2532	10 Nm			SA	with NAMUR sensor unit for Ex zones incl. cable 5 m			SR30 ²	with 300 mm spindle, Ø 8 mm / pitch 30.0 mm
								SR4 ³	with 300 mm spindle, Ø 12 mm / pitch 4.0 mm
								SR45 ³	with 300 mm spindle, Ø 12 mm / pitch 45.0 mm

¹linear motion of spindle option is limited to 50 mm

² available for BPS-1620
³ available for BPS-2532

Accessories

Spindles			
BPS-1620 (Ø 8 mm)		BPS-2532 (Ø 12 mm)	
BPS-8-SR2	300 mm spindle with 2.0 mm pitch	BPS-12-SR4	300 mm spindle with 4.0 mm pitch
BPS-8-SR30	300 mm spindle with 30.0 mm pitch	BPS-12-SR45	300 mm spindle with 45.0 mm pitch

Cables			
Sensor cable IP 65		Valve cable IP 65	
BPS-G-32-05	PUR cable 2m, straight socket, unshielded	868.883P	PUR cable 2 m, straight socket
BPS-W-32-05	PUR cable 2m, 90° socket, unshielded	868.884Q	PUR cable 4 m, straight socket
BPS-G-35-05	PUR cable 5m, straight socket, unshielded		
BPS-W-35-05	PUR cable 5m, 90° socket, unshielded		

Example Order Code



BPS-2532-SR4
 Stepping motor with 10.0 Nm, 300 mm spindle Ø 12 mm / pitch 4.0 mm



BPS-1620-MX
 Stepping motor with 3.3 Nm, shaft end, key groove, spring and with Matrix valve



BPS-1620IP-SA
 Stepping motor with 3.3 Nm, shaft end, key groove, spring and NAMUR sensor unit for Ex zones, cable 5 m

More special designs are possible.
Feel free to contact us.

PNEUMATIC STEPPING MOTOR



Plug-and-Play Stepping motor with control valve

Product characteristics

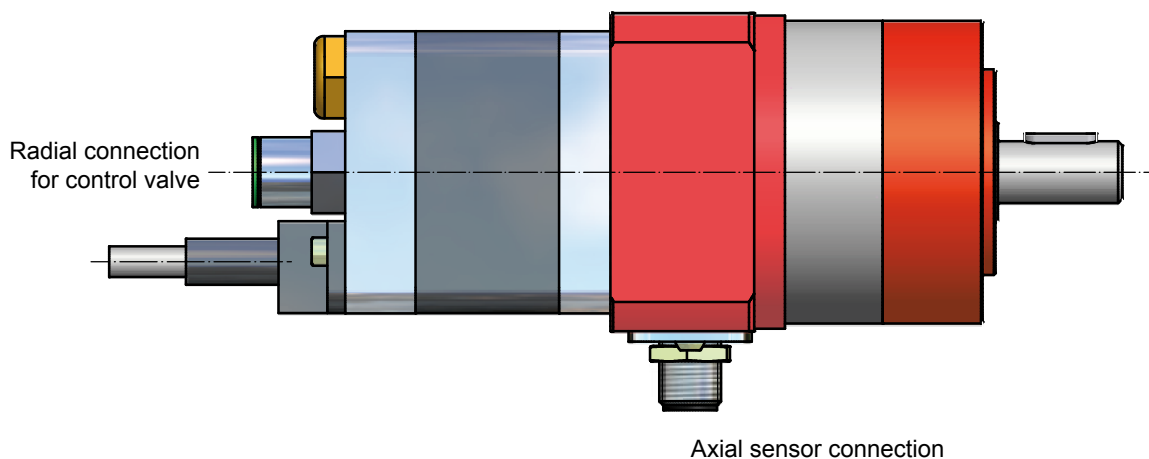
- Compact motor / valve unit
- Up to 10 Nm torque
- Protection class: IP 55

Technical Information

The pneumatic stepper motor offers several advantages over electric versions. High torques are achieved even with small dimensions and without a reduction gear thanks to the pneumatic drive.

All pneumatic stepper motors are equipped with internal braking – with no step loss – in case of a power failure. This is a decisive advantage particularly for sensitive applications. The flange-mounted valve provides for a very compact

unit without additional hose connections. These pneumatic stepper motors are used wherever precision under difficult conditions is demanded. In dusty or dirty environments or in the presence of strong magnetic fields as well the pneumatic stepper motor really shows its strengths. The motor features versatile and simple control and there is a suitable type for every application, e.g. classic with an output shaft or with a spindle for linear motions.

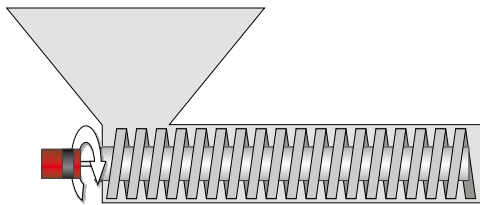


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Applications

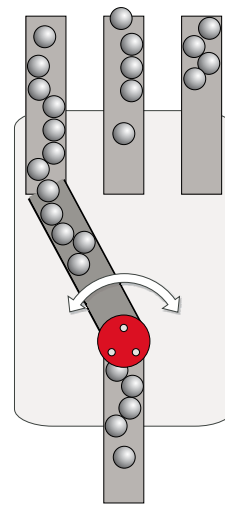
The BPS is ideal whenever high accuracy is required under difficult working conditions.

The shaft version is used for rotary movements. Linear motions are possible with a hollow shaft type. The pneumatic stepping motor is available with or without attached Matrix valve.



Precise dosing

Precise dosing of bulk materials with screw-type conveyors.

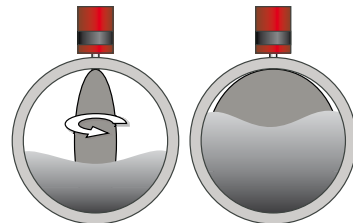


Isolating

Isolating and combining of parts.

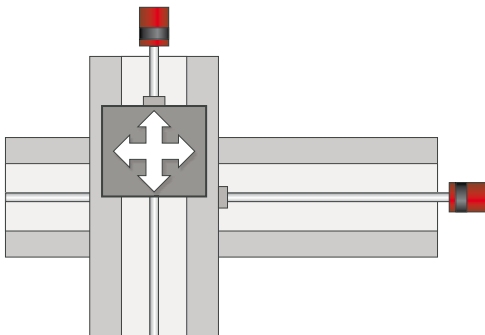
Adjustment

Adjustment of limit stops and guides for change of format on machines.



Proportional remote adjustment

Proportional remote adjustment of valves, flap valves and cocks.



Positioning

Positing of tables in the X and Y axes.

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Operating conditions

- Dried, oil-free and filtered compressed air (5 µm) at max. 8 bars (indicated by valve manufacturer)
 - The ambient temperature of the stepping motor is -25 °C to +70 °C
 - Acids and alkaline substances may damage the motor.
- For special operating conditions (temperature, fluids etc.), please contact us to enable your particular application to be studied.

Assembly

The motor can either be fitted from the front by means of the 3 threads or else using the 3 continuous bores (see dimensioned drawing). Before fitting, we advise placing the motor under pneumatic pressure. This protects the transmission components when the centric screw N is tightened (see page 12). 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) are required for actuation.

Programming

The BPS-IP is generally incorporated into an SPC (Stored Program Control). In the event of operation with sensors, these report the current position of the three pistons to the control.

Operation

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

Accessories and special versions

Please contact us for special applications.

We will be happy to work with you to design a solution.

Easy and intelligent stepping motor control

The three pistons of the stepping motor have to be piloted by magnet valves. We provide an easy control which substitutes or discharges superior devices such as a SPC.



Inlet

Floating engage or proximity switch, every pulse actuates one to three steps

Buttons

One step forward, one step backward, more steps forward or backward (as long as the button is pressed)

Display

Rotating direction (by 3 LEDs), number of steps per pulse