Pneumatic motors and accessories

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BIBUS - Network of competencies

We are the link between the manufacturing plants and our customers. Our many years of trading partnerships are based on continuity and trust. In this way we achieve the best possible conditions for our customers. Over 60 years of experience in the specialist areas of pneumatics, mechatronics and hydraulics have made BIBUS a leading provider in European industry.

Efficient logistics - our customers make the highest demands

We guarantee a high degree of availability for our more then 250,000 standard articles. Modern warehouse systems with barcodes and mobile data logging terminals ensure an efficient flow of goods.

We provide specific service and repairs in 18 European countries and guarantee a high degree of availability of spare parts throughout the product life cycle.

Quality

Quality and the relevant qualifications go without saying at BIBUS.

CERTIFIED IQNet MANAGEMENT SYSTEM

Zertifiziertes Managementsystem SQS Reg. No. 10338 ISO 9001:2000

CONTENT

EasyDrive

Product features

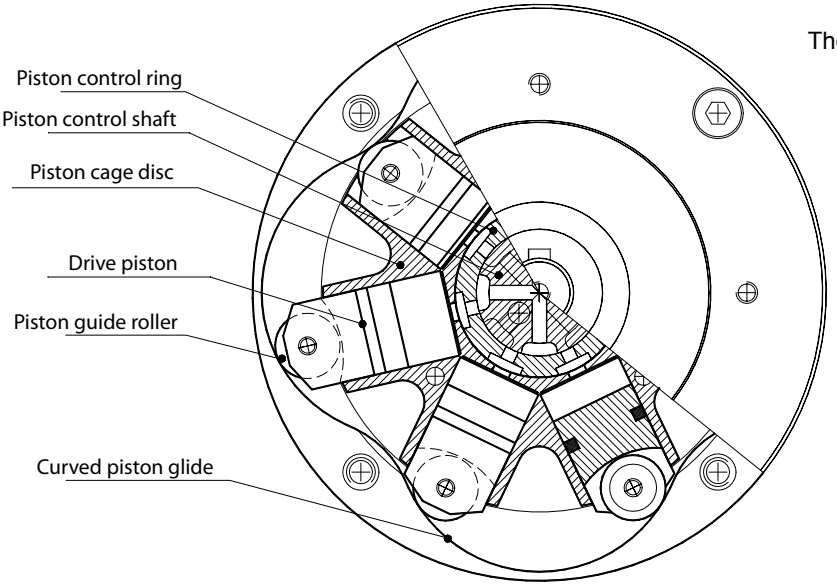
- Start / stop and shift in direction of rotation under full load possible
- Maximum torque from starting available
- Overload protected
- Maintenance free
- Low noise level
- Minimised air consumption at high performance
- Ex certification compliant to RL94/9/EG (optional)
- IP67 or IP68 and stainless steel housing (optional)

Operation Principle

The applied radial piston principle works without crankshaft or pistonrods.

The pistons are arranged in a star pattern and glide along the innercurved surface of the housing. The compressed air is being supplied from the center through the fixed piston control shaft via the floating piston control ring to the individual pistons. This ensures automatic activation of the pistons. The piston control ring is connected to the piston cage in a floating arrangement, which is based on double bearings on the piston control shaft. During rotation the air to the pistons will alternate between supply and exhaust.

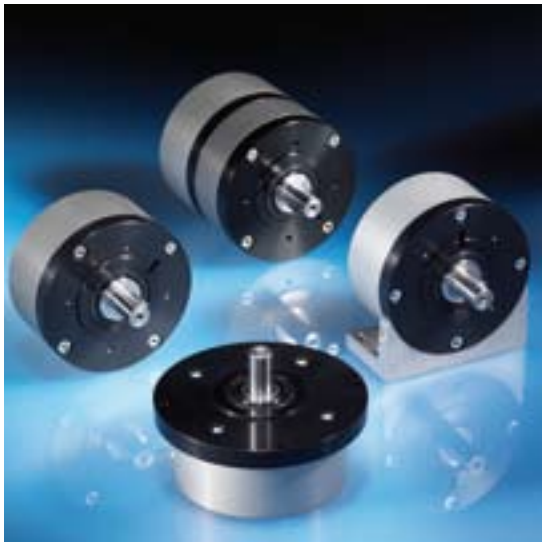
Immediate reverse rotation can be activated through directional change of the air supply.
Three of the seven pistons are always actively engaged to generate rotation and torque of the air motor. The pistons near the highest elevation of the curve will exhaust and forced to the lowest point of the curve. This represents the cycle of a simple cylinder.



The rollers of the cylinders are fabricated of high stress plastic material and run on double bearings. This allows for low friction with minimal noise and high life expectancy. Compared to standard air motors these pneumatic motors model EasyDrive have their highest torque rating at low revolutions and minimal air consumption.

PNEUMATIC RADIAL PISTON MOTOR

Product features



Five performance classes - two sizes

The modular construction of the pneumatic motors enables space-saving dimensions: They come in two sizes, the only difference being their diameters. The smaller motors have a torque of 450 or 900 Ncm while the more powerful motors achieve 1,800 Ncm, 3,600 Ncm and 7,200 Ncm.

Within the two installation sizes, in the higher performance class there is merely a deviation of 15-22 mm in the installation depth. Even when using the special EasyDrive gears, there is merely a deviation of a few centimeters in the installation depth. All other dimensions remain identical.

EasyDrive gears

Our planetary gears manufactured specifically for EasyDrive can be used as speed reductions/increases in order to adapt the rotary speed and/or torque as needed. The speed increases of 3:1 and 9:1 and a speed reduction of 1:2 are available for this. Customised gear increments are available on request.

Options

Along with the mounting holes on the engine cover, a mounting flange or a mounting bracket is optionally also available. This allows various installations of EasyDrive in the tightest space. Additional options such as the IP68 protection class or a stainless steel engine enclosure also allow installation in harsh surroundings or even under water. An Ex certificate for use in an explosive environment completes the extensive delivery programme.

Types

Materials:

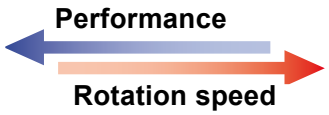
- Aluminium alloy
- Hard coated and black anodised
- Steel parts C45
- Plastics in Delrin, NBR or specials

Optional types:

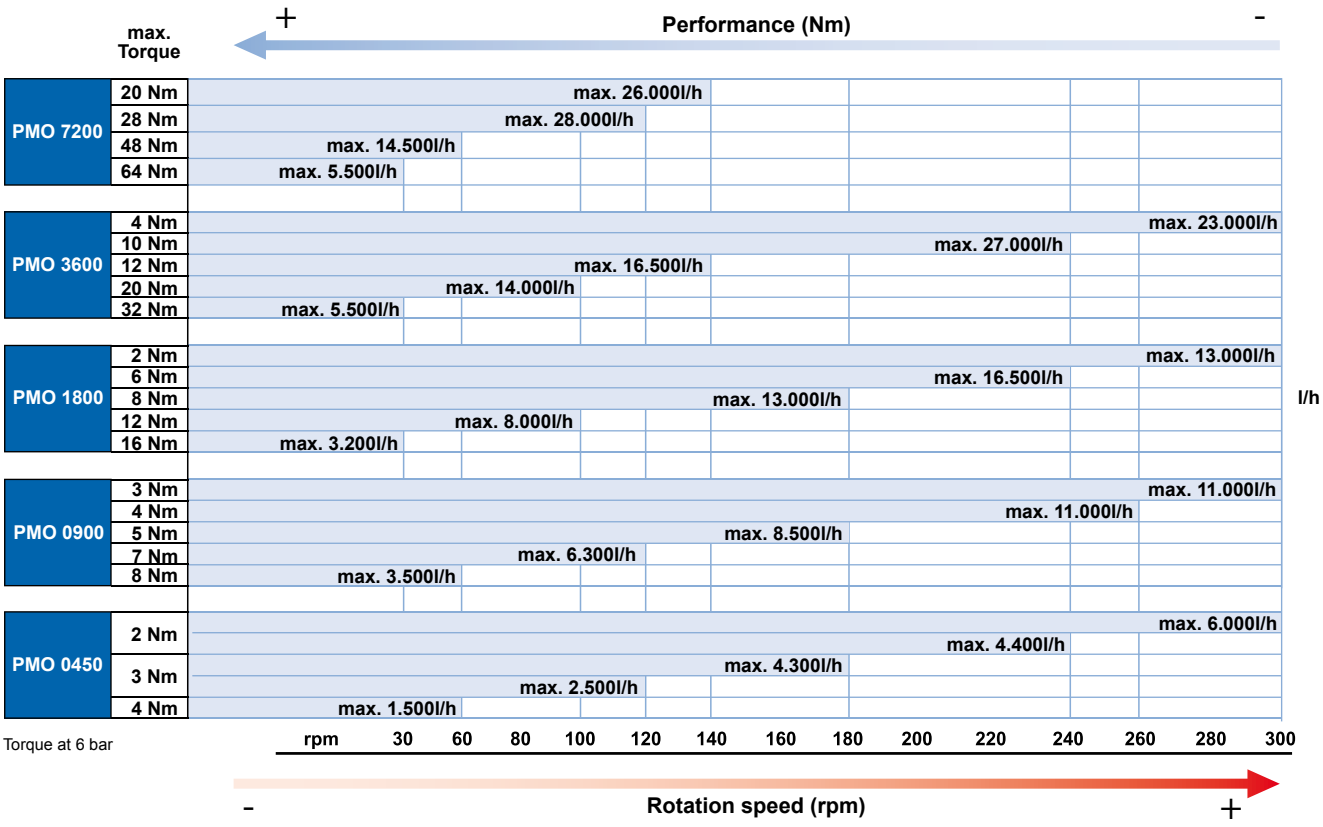
- with planetary gear set (conversion 3:1, 9:1 or 1:2)
- water resistant (IP 68), sea water resistant (IP 68, viton gasket)
- silicone free
- rust-proof
- complete stainless steel housing
- electronic speed control (+/- 10 % of the load changes)
- with hollow shaft (external)
- plastic version (without magnetic influence)
- with adapter for air connection G 1/8“ (optionally for EasyDrive 0450 and 0900)
- customized output shafts

Performance Data

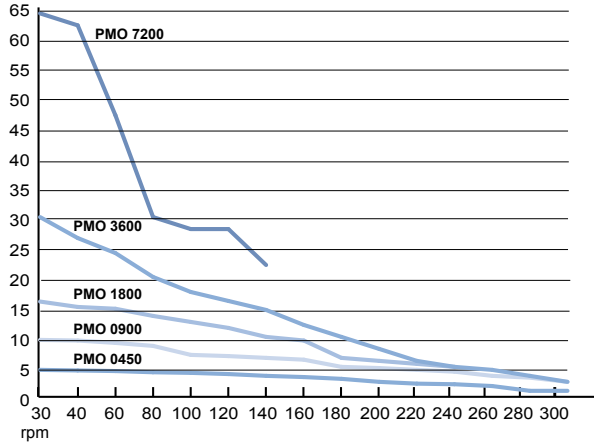
Maximum performance, minimum consumption!
Unlike conventional compressed air motors, the EasyDrive already generates its maximum torque during start with minimum air consumption. As the speed increases, the torque decreases while the air consumption increases at the same time. This means that the EasyDrive maximizes output while minimizing power consumption, which translates to a considerable advantage in terms of energy consumption.



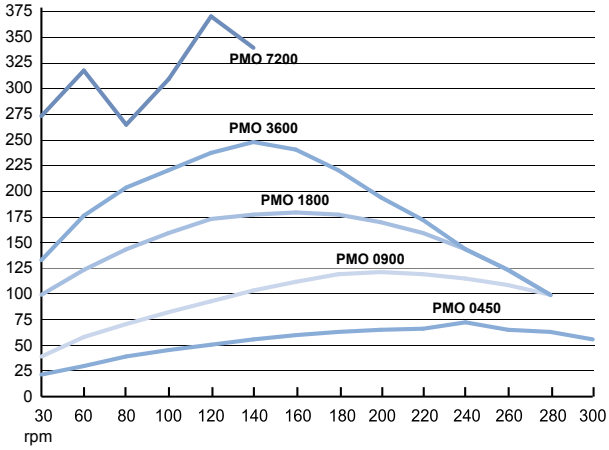
Remark:
Regarding the rpm-range, the PMO 7200 is deviant to all other models and is construed for 30-140 rpm (without gear).



Torque in Nm



Watt



PNEUMATIC RADIAL PISTON MOTOR

Technical Data

Torque

	Without gear		Reduction 3:1		Reduction 9:1		Ratio 1:2	
	min. 30 rpm	max. 300 rpm	min. 10 rpm	max. 100 rpm	min. 3.3 rpm	max. 33 rpm	min. 60 rpm	max. 600 rpm
PMO 0450	4 Nm	2 Nm	12 Nm	6 Nm	36 Nm	18 Nm	2 Nm	1 Nm
PMO 0900	8 Nm	3 Nm	24 Nm	9 Nm	72 Nm	27 Nm	4 Nm	1.5 Nm
PMO 1800	16 Nm	2 Nm	48 Nm	6 Nm	144 Nm	18 Nm	8 Nm	1 Nm
PMO 3600	32 Nm	3 Nm	96 Nm	9 Nm	288 Nm	27 Nm	16 Nm	1.5 Nm
PMO 7200	64 Nm	20 Nm (at 140 rpm)	180 Nm	60 Nm (at 45 rpm)	540 Nm	180 Nm (at 15 rpm)	32 Nm	10 Nm (at 280 rpm)

Custom gearboxes on request.

Loads

	Max. load axial	Radial dyn. C	Radial stat. C0	Max. allow. Md
PMO 0450	100 N	750 N	400 N	5 Nm
PMO 0900	100 N	750 N	400 N	5 Nm
PMO 1800	200 N	1500 N	800 N	10 Nm
PMO 3600	200 N	1500 N	800 N	10 Nm
PMO 7200	200 N	1500 N	800 N	10 Nm

Weights

	Without gear	With 3:1 gear	With 9:1 gear	With 1:2 gear
PMO 0450	1.1 kg	2.0 kg	2.8 kg	2.1 kg
PMO 0900	1.3 kg	2.2 kg	3.0 kg	2.3 kg
PMO 1800	3.4 kg	6.1 kg	7.9 kg	5.9 kg
PMO 3600	4.0 kg	6.7 kg	8.5 kg	6.5 kg
PMO 7200	6.4 kg	9.1 kg	10.9 kg	8.9 kg

Technical Information

Notes:

Flow control valve on the inlet side give best results in the reference of life time, smooth running and air consumption Flow control valve on the outlet side reduces the life time and increases the air consumption.

Simply with the air flow control, either through pressure regulator and / or flow control valve, it is possible to setup continuous the motor for each application.

The compressibility of the compressed air steps in all areas, so the EasyDrive can be started any time also under load. Different assembly possibilities are available by use of bigger flange plates or mounting bracket.

Caution:

Do not lock the M5 exhaust port of the motor housing! This exhaust is needed for possible over pressure.

Fitting position:

Any position

Temperature application range:

-10° C to +80° C

Operating medium:

Unoiled compressed air filtered to ≤ 5 µ is mandatory

Operating pressure:

6 bar / range 2 - 8 bar

Rotation direction:

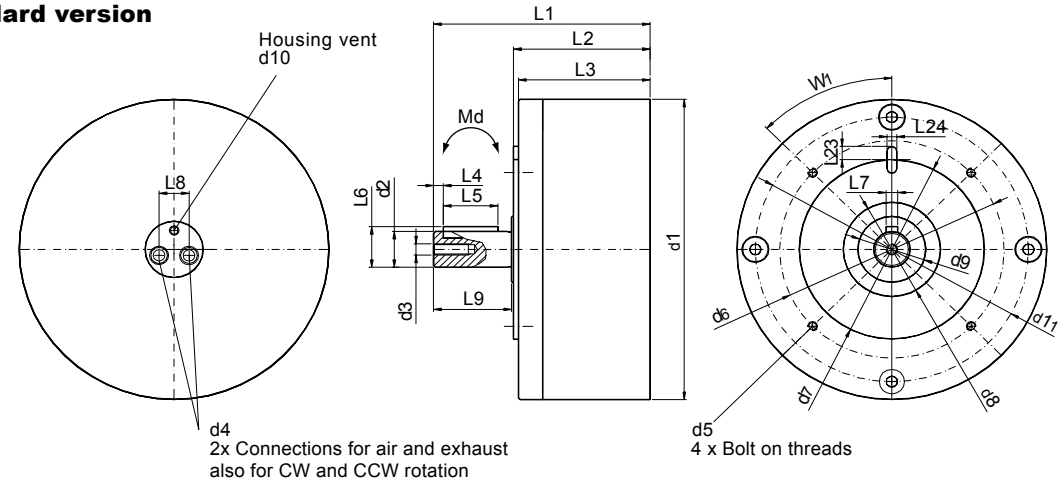
CW or CCW, very short reversing time

Maintenance:

Not required.

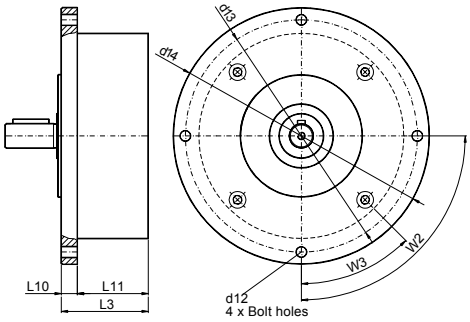
Dimensions

Standard version



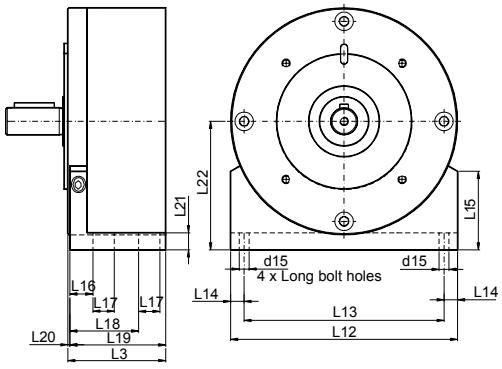
	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	L1	L2	L3	L4	L5	L6	L7	L8	L9	L23	L24	W1
PMO 0450	99	14 h6	M 4x12	M 6x0.75x8	M 4x9	67	55 h6	40	28	M 5x5	87	78	52	50.5	3	18	16	5 N9	10,6	25	6	4 N9	45°
PMO 0900	99	14 h6	M 4x12	M 6x0.75x8	M 4x9	67	55 h6	40	28	M 5x5	87	92.5	66.5	65	3	18	16	5 N9	10,6	25	6	4 N9	45°
PMO 1800	159	19 h6	M 6x18	R1/8x9	M 6x10	115	95 h6	50	35	M 5x5	140	111	70	67.5	5	28	21.5	6 N9	15.3	40	7	5 N9	45°
PMO 3600	159	19 h6	M 6x18	R1/8x9	M 6x10	115	95 h6	50	35	M 5x5	140	133	92	89.5	5	28	21.5	6 N9	15.3	40	7	5 N9	45°
PMO 7200	159	19 h6	M 6x18	R1/8x9	M 6x10	115	95 h6	50	35	M 5x5	140	194	153	150.5	5	25	21.5	6 N9	15.3	40	7	5N9	45°

Version with flange



	d12	d13	d14	W2	W3	L3	L10	L11
PMO 0450	5.4	110	120	90°	45°	50.5	11.5	39
PMO 0900	5.4	110	120	90°	45°	65	11.5	53.5
PMO 1800	8.5	180	199	90°	45°	67.5	12.5	55
PMO 3600	8.5	180	199	90°	45°	89.5	12.5	77
PMO 7200	8.5	180	199	90°	45°	150.5	12.5	138

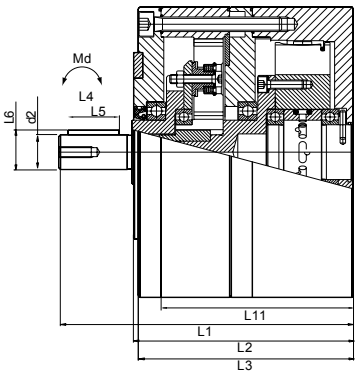
Version with installation bracket



	d15	L3	L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22
PMO 0450	5	50.5	99	89	5	40	14.5	10	36.5	50	0.5	10	58
PMO 0900	5	65	99	89	5	40	14.5	10	36.5	50	0.5	10	58
PMO 1800	7	67.5	159	140	9.5	55	16	15	48	67	0.5	12	90
PMO 3600	7	89.5	159	140	9.5	55	16	15	48	67	0.5	12	90
PMO 7200	7	150.5	159	140	9.5	55	16	15	48	67	0.5	12	90

PNEUMATIC RADIAL PISTON MOTOR

Version with gear



	gear	L1	L2	L3	L4	L5	L6	L7	L11	d2
PMO 0450	3:1	120	94	92.5	3	18	16	5 N9	81	14 h6
	9:1	146	120	118.5	3	18	16	5 N9	107	14 h6
PMO 0900	3:1	134.5	108.5	107	3	18	16	5 N9	95.5	14 h6
	9:1	160.5	134.5	133	3	18	16	5 N9	121.5	14 h6
PMO 1800	3:1	161	120	117.5	2	38	27	8N9	105	24 h6
	9:1	192.5	151.5	149	2	38	27	8N9	131.5	32 h6
PMO 3600	3:1	183	142	139.5	2	38	33	8N9	127	24 h6
	9:1	214.5	173.5	171	2	38	33	8N9	158.5	32 h6
PMO 7200	3:1	244	203	200.5	2	38	27	8N9	188	24 h6
	9:1	275.5	234.5	232	2	38	35	8N9	219.5	32 h6

Version with Jacket Va rust-proof

	d1 Va	d13 Va	d14 Va	L1 Va	L2 Va	L3 Va	L11 Va
PMO 0450	104	115	124	81	55	53.5	42
PMO 0900	104	115	124	95.5	69.5	68	56.5
PMO 1800	164	180	199	115	74	71.5	59
PMO 3600	164	180	199	137	96	93.5	81
PMO 7200	164	180	199	198	157	154.5	142

Order Code

PMO **1** — **2** — **3** — **4** — **5** **6**

Motor size
0450
0900
1800
3600
7200

Construction	
0	Shaft straight
1	Shaft with drive key
2	Flange, shaft straight
3	Flange, shaft with drive key
4	Installation bracket, shaft straight
5	Installation bracket, shaft with drive key
6	External hollow shaft
7	External hollow shaft with installation bracket

Insulation class	
0	IP 67 - standard
1	IP 68 - water resistant
2	IP 68 - seawaterresistant
3	Stainless steel housing

Gear options	
0	Standard
1	Gear with reduction 3:1
2	Gear with ratio 1:2
3	Gear with reduction 9:1
5[1]	Gear 3:1 with d2Ø 24
6[1]	Gear 9:1 with d2Ø 32

[1] only at EasyDrive 1800 / 3600 / 7200

Options	
0	Standard
1	Ex certification RL94/9/EG
2	Speed control

Specials	
0	Standard
1	Silicone free
2	Outside sealing > FPM - FKM < (Viton)
3	With special 1 and 2
4	Outside sealing > EPDM - PTFE < (Aceton resistant)
5	With special 1 and 4

Example Order Code EasyDrive

PMO 3600 - 5 - 0 - 0 - 12

Pneumatic motor, EasyDrive 3600, installation bracket, shaft with drive key, IP67 - Standard, Ex certification, Viton seal

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 ±9' angular minutes, irrespective of the number of steps or rotations!

Wide range of applications

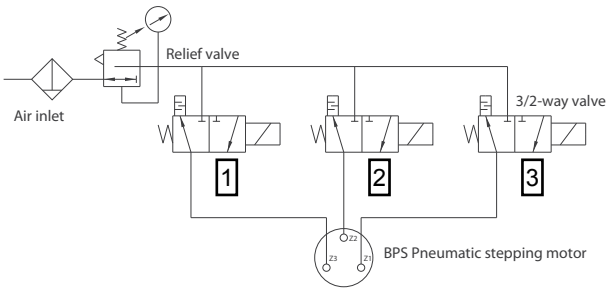
Whether dust, dirt or powerful magnetic fields, the pneumatic drive also offers trouble-free operation in extreme conditions.

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-signa l→ 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.

PNEUMATIC STEPPING MOTOR

Advantages

Extreme operating conditions

The BPS reveals its strenghts 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 optainable.

Sensor unit

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

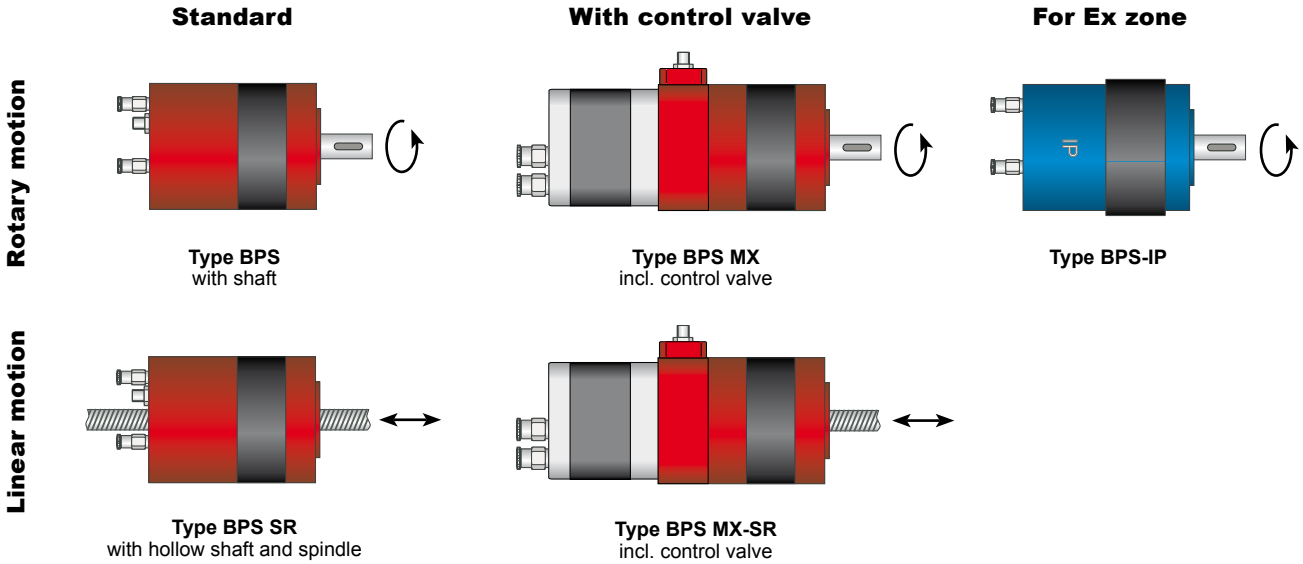
BPS IP version

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

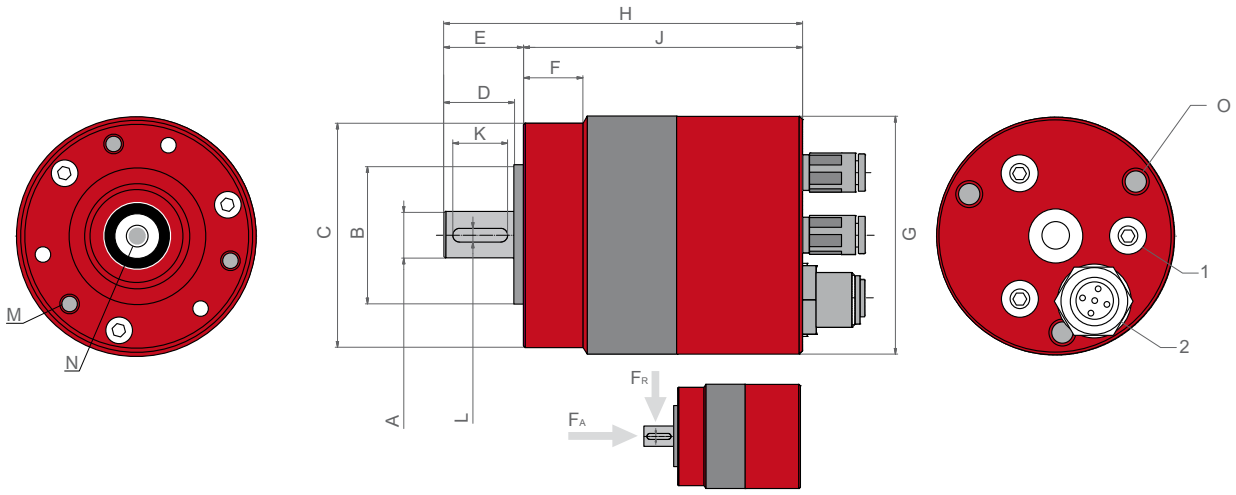
Types

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.



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 (kgm²)[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	
1216	1.7 Nm
1620	3.3 Nm
2532	10 Nm

Insulation class	
blank	IP 55
IP	IP 67 (Ex)

Sensor unit	
blank	without sensor unit
S5	with sensor unit, plug M12 (5Pol)
SA	with NAMUR sensor unit for Ex zones incl. cable 5 m

Control valve	
blank	without control valve
MX[1]	Matrix valve, without cable

[1]linear motion of spindle option is limited to 50 mm

Options	
blank	shaft end, key groove and spring
SR2[2]	with 300 mm spindle, Ø 8 mm / pitch 2.0 mm
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

[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, unscreened	868.883P	PUR cable 2 m, straight socket
BPS-W-32-05	PUR cable 2m, 90° socket, unscreened	868.884Q	PUR cable 4 m, straight socket
BPS-G-35-05	PUR cable 5m, straight socket, unscreened		
BPS-W-35-05	PUR cable 5m, 90° socket, unscreened		

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.

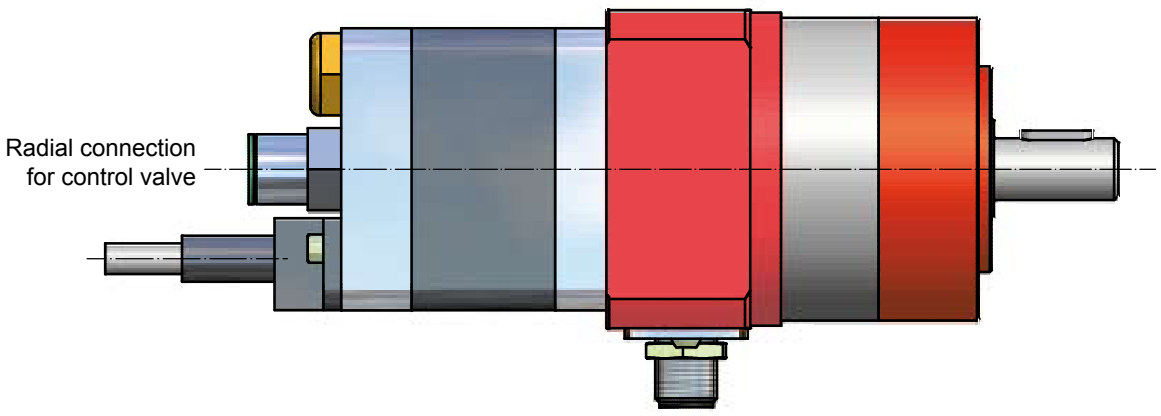
Plug-and-Play Stepping motor with control valve

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.

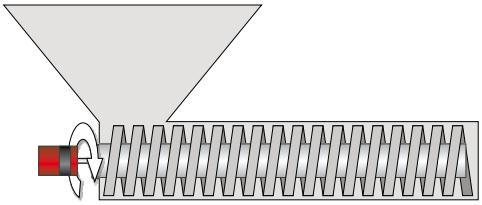
All pneumatic stepper motors are equipped with internal braking – with no step loss – in case of a power failure. This is a decisive advantage particularly for sensitive applications. The flange-mounted valve provides for a very compact unit without additional hose connections. These pneumatic stepper 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.



Applications

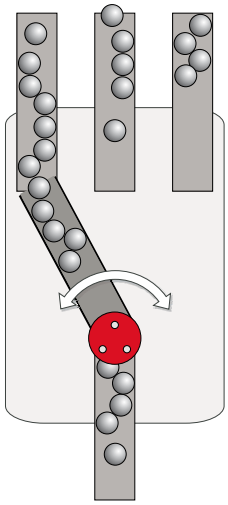
The BPS is ideal whenever high accuracy is required under difficult working conditions.

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.



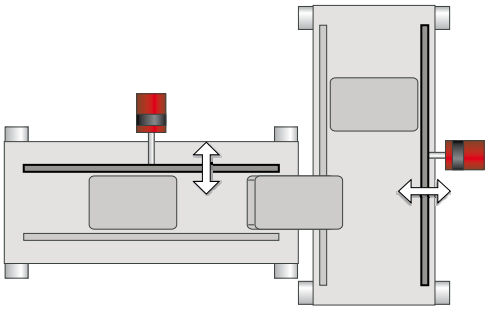
Precise dosing

Precise dosing of bulk materials with srew-type conveyors.



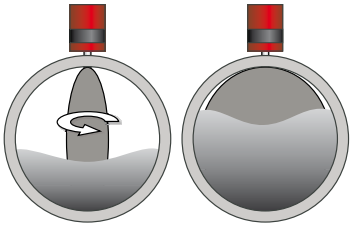
Isolating

Isolationg and combining of parts.



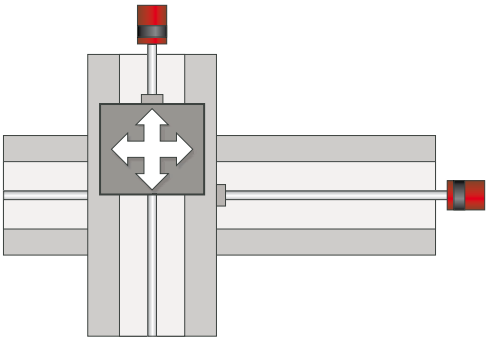
Adjustment

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.

PNEUMATIC STEPPING MOTOR

Technical Information

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

Needle valve with adjusting dial

Product characteristics

- Linear flow rate properties
- Dial indication of rotation
- Visible control of flow rates
- Unrestricted installation
- Prevent adjustment mistakes
- One-touch lock

Operation Principle

Realizing visible flow rate adjustment and control

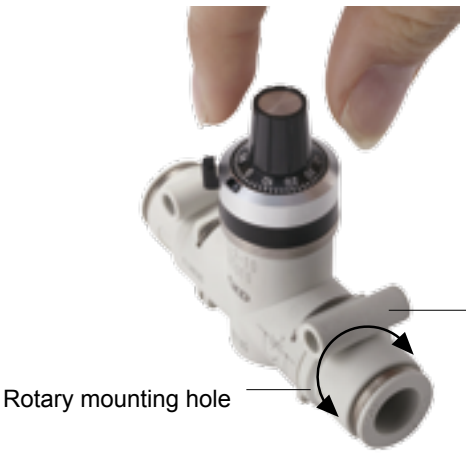
The needle valve with dial DVL-S and DVL-N uses a rotary needle valve with linear flow properties, and numerically indicates speed with a dial. Anyone can easily adjust cylinder speed and flow accurately and with good reproducibility using this needle valve.

Use as a speed controller

The standard type has a built-in check valve, and can be used as a speed adjustment valve or vacuum break valve for pneumatic cylinders. The regulating valve is recommended for the use with our EasyDrive.

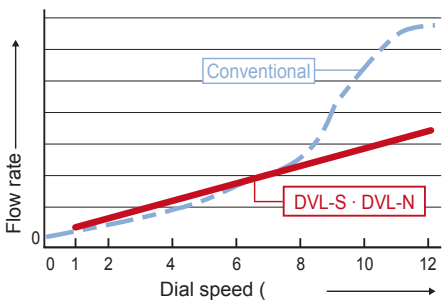
Oil-prohibited specifications available

These specifications enable use in environments susceptible to oil, in clean rooms, and in vacuum applications.



Model variations	Tube bore	Flow rate range
Check valve Standard type **DVL-S**	ϕ4 ϕ6 ϕ8 ϕ10 ϕ12	20 80 160 240 400
Needle valve Oil-prohibited type **DVL-N**	ϕ4 ϕ6 ϕ8 ϕ10 ϕ12	20 80 160 240 400

Example of flow rate properties



Air treatment

Product characteristics

- Compact modules
- Lightweight and robust
- Long life filter element
- Embedded pressure gauge for saving space
- No oil dripping during pressure drop
- Corrosion resistant bowl guard

Filter and regulators

A basic concept: with our filter and regulators we pursue high performance for all aspects, functionality, operability, serviceability, and safety.

Model number	F1000		F3000		F4000			F8000	
	-6G-F-W	-8G-F-W	-8G-F-W	-10G-F-W	-8G-F-W	-10G-F-W	-15G-F-W	-20G-F-W	-25G-F-W
Port size (inch)	G1/8	G1/4	G1/4	G3/8	G1/4	G3/8	G1/2	G3/4	G1
Maximum flow rate in l/min (ANR)	460	600	1,230	1,500	1,320	2,140	3,000	6,420	6,780
Drain capacity in cm³	12		45		80			80	
Weight in kg	0.09		0.25 (0.35)		0.45 (0.55)			1.16 (1.26)	

Model number	R1000		R3000		R4000			R8000	
	-6G-F-W	-8G-F-W	-8G-F-W	-10G-F-W	-8G-F-W	-10G-F-W	-15G-F-W	-20G-F-W	-25G-F-W
Port size (inch)	G1/8	G1/4	G1/4	G3/8	G1/4	G3/8	G1/2	G3/4	G1
Maximum flow rate in l/min (ANR)	768	1,350	1,998	2,598	2,502	4,398	4,998	13,980	10,980
Weight in kg	0.16		0.45		0.7			1.6	

Model number	W1000		W3000		W4000			W8000	
	-6G-F-W	-8G-F-W	-8G-F-W	-10G-F-W	-8G-F-W	-10G-F-W	-15G-F-W	-20G-F-W	-25G-F-W
Port size (inch)	G1/8	G1/4	G1/4	G3/8	G1/4	G3/8	G1/2	G3/4	G1
Maximum flow rate in l/min (ANR)	840	1,140	2,148	2,430	2,502	4,350	4,740	10,020	10,020
Drain capacity cm³	12		45		80			80	
Weight in kg	0.175		0.6 (0.7)		0.9 (1.0)			2.0 (2.1)	

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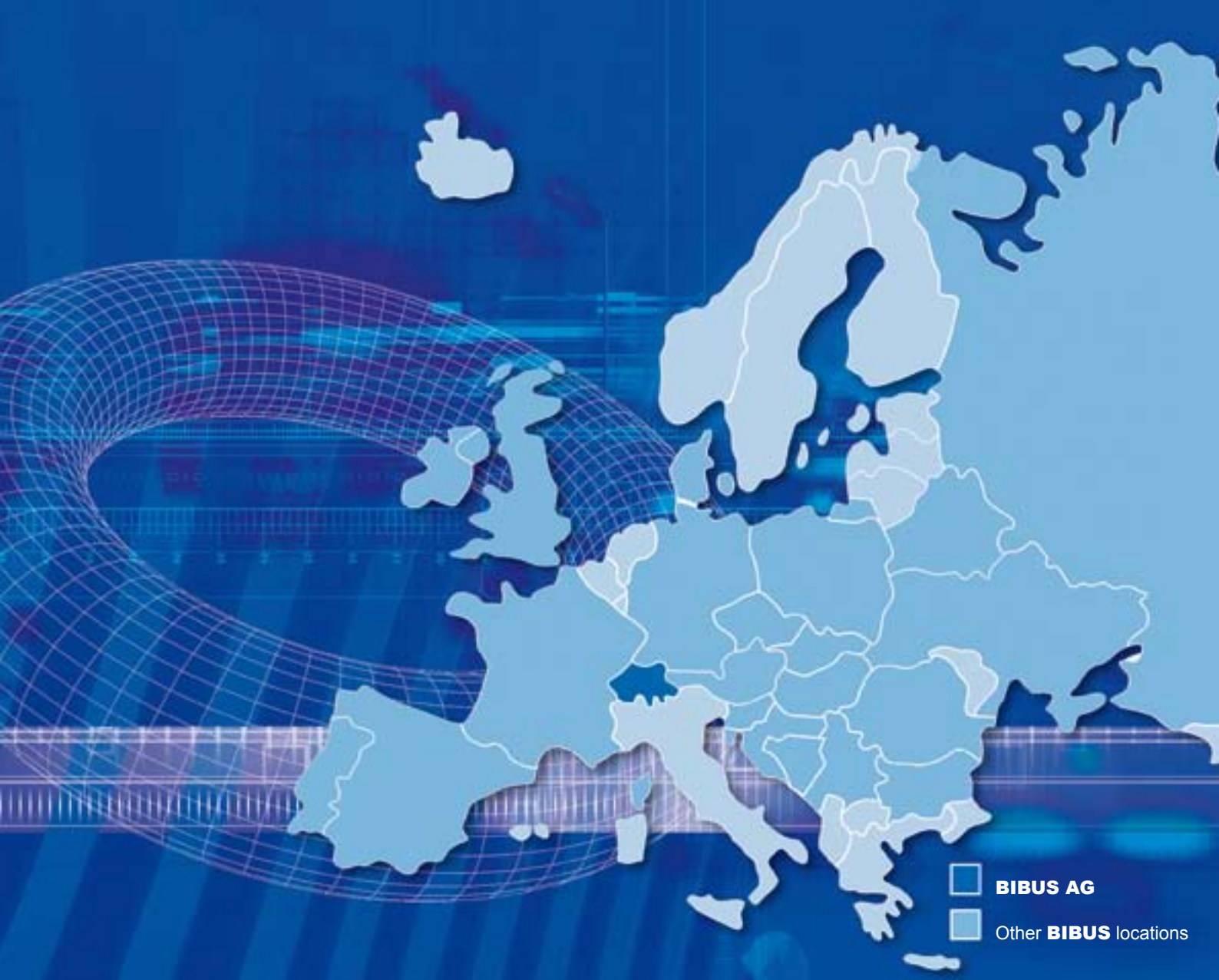

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