Pneumatic actuators type PPA04 – PPA80

PPA04 – PPA80 Single acting (FC/FO)

PPA04 – PPA80 Double-acting (DA)

Product description

The pneumatic actuators PPA04 – PPA80 are made almost entirely of plastic. Due to the realization of a special spring return unit, these actuators are very compact and light. The actuators can be connected in various ways.

A position indicator is incorporated into the NAMUR interface, greatly simplifying the installation of accessories for the pneumatic actuators PPA04 – PPA80. Furthermore, an additional NAMUR interface allows easy connection to a compressed air system without an adapter plate. The flange pattern also complies with the NAMUR standard. The PPA04 – PPA80 actuators are compatible with products from other manufacturers.

Function

Pneumatic Actuators can be used as open/close or control element for valves. The double-acting (DA) design means that the fitting is opened or closed by the actuator applying compressed air. Depending on the requirement, the springs can open or close. The single-acting actuators (FC/FO) only apply compressed air on one side, while adjustment on the other side is by spring resistance. This means that if there is air failure they return automatically to a safety position. Standard interfaces allow pilot valves, limit switches or positioners to be connected to the actuator.

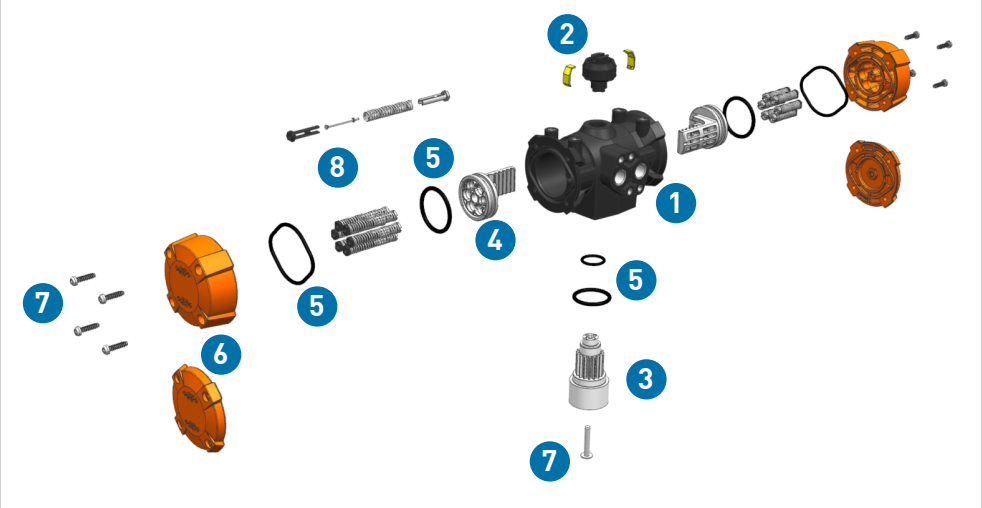
Applications

- Chemical process industry
- Water treatment
- Refrigeration
- Process Automation
- Natural resources & surface treatment
- Conventional power generation
- Photovoltaics, semiconductor & TFT/HB LED

Features/Benefits

- Robust and compact PP-GF Piping Systems housing
- Full plastic actuator
- Linear torque characteristic curves
- Optimized assignment to ball valve 546 Pro with safe and reliable torque characteristics, tested over service life
- NAMUR accessory interface according to VDE 3845 for integrated mounting of a wide range of accessories
- Flexible spring concept for low pressure operation (4.2 bar) as well as OEM solutions

Technical Data



1 Housing with inserts (PP-HGF30)
2 Display body (PBTGF30)
3 Spindle (PPT20)
4 Plunger (POM)
5 O-rings (NBR)
6 Cover (PP-HGF30)
7 Screws (steel A2)
8 If necessary, loaded spring component (POMGF, steel coated)

Technical Data		PPA04	PPA08	PPA15	PPA40	PPA80
FC/FO Standard	Torque ratings		3 Nm	8 Nm	17 Nm	40 Nm
	Minimum control pressure		5.4 bar	5 bar	4.5 bar	5.1 bar
	Max. permitted control pressure[1)]		7 bar	7 bar	7 bar	7 bar
	Number of loaded spring components		12	12	10	12
FC/FO Low pressure	Torque ratings			4.3 Nm	14.7 Nm	32.4 Nm
	Minimum control pressure			3.2 bar	4.2 bar	4.2 bar
	Max. permitted control pressure[1)]			7 bar	7 bar	7 bar
	Number of loaded spring components			8	10	10
DA doub-le-acting	Torque ratings	3 Nm	5 Nm	13 Nm	31 Nm	40 Nm
	Minimum control pressure	3.2 bar	2.3 bar	2.5 bar	3.1 bar	1.8 bar
	Max. permitted control pressure[2)]	7 bar	7 bar	7 bar	7 bar	7 bar
Control medium		Compressed air, lubricated and unlubricated Fluids on request				
Compressed air class		ISO 8573-1				
Control connection		1/4" (PPA04 DA 1/8")				
Standard connection NAMUR as per VDE 3845		optional	yes	yes	yes	yes
Mechanical interface as per ISO 5211		F03	F05	F05	F05	F07
Control volume per cycle (dm^3)	FC/FO		0.1253	0.1429	0.2899	0.6650
	DA	0.0623	0.1253	0.2774	0.5636	1.2551
Cycle time		1 - 2s, with throttle valve up to 5s				
Actuating angle		90°				
Position indicator		Optical				
Enclosure material		PP-GF (glass fiber reinforced polypropylene)				
Ambient temperature		-10 to +50°C				
Permitted air humidity		0 to 100%				
Safety Integrity Level		SIL2-compliant				

[1)] In use with GF valves. For non-GF valves 6 bar.
[2)] In use with GF valves. For non-GF valves 5 bar.

Versions

Pneumatic ball valves

The pneumatically operated ball valves are composed of the ball valve type 546 Pro and the pneumatic actuator PPA04 – PPA80.

Pneumatic actuator	Manually operated ball valve	Dimension	Materials	Standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C, ABS	ISO/DIN
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PP-H	All standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVDF	All standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C	ASTM/ANSI
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, ABS	BS
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C, PPH, PVDF	JSI

Control pressure PPA FC/FO*

	Number of springs per side	Spring torques [Nm]		Torque with control pressure [Nm]									
				Control pressure [bar]									
				3		4.2		5		5.6		6	
FC		Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open
FO		Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed
PPA08	6	3.12	6.57					6.20	2.10	7.65	3.70	8.95	4.73
	5	2.53	5.58			5.57	2.07	7.60	4.10	9.27	5.65	10.10	6.55
	4	1.54	4.16			6.30	3.45	8.40	5.50	9.70	6.90	10.70	7.91
PPA15	6	8.23	13.04			10.44	3.90	14.57	8.69	18.33	12.19	20.10	14.46
	5	6.20	10.33			11.96	7.08	16.20	11.74	19.97	15.26	21.91	17.46
	4	4.38	7.71	7.10	3.31	14.05	10.23	18.64	14.73	22.07	18.20	23.84	20.52
PPA40	6	20.16	29.00			18.27	4.57	29.44	16.25	36.35	23.25	40.51	28.41
	5	17.01	24.47			24.49	14.70	33.15	23.74	39.64	30.70	44.39	35.25
	4	12.18	19.03	16.42	6.65	29.03	21.15	37.71	29.28	43.51	36.20	49.02	40.96
PPA80	6	44.53	71.42			48.65	17.43	67.89	37.99	81.83	54.03	91.85	63.80
	5	35.47	59.82			55.10	32.40	77.01	53.53	91.57	69.25	102.42	79.81
	4	27.64	47.42	34.58	15.20	68.44	47.02	91.02	68.24	107.95	84.15	119.23	94.75

*For GF valves max. 7 bar. For valves from other manufacturers, a throttle is recommended.

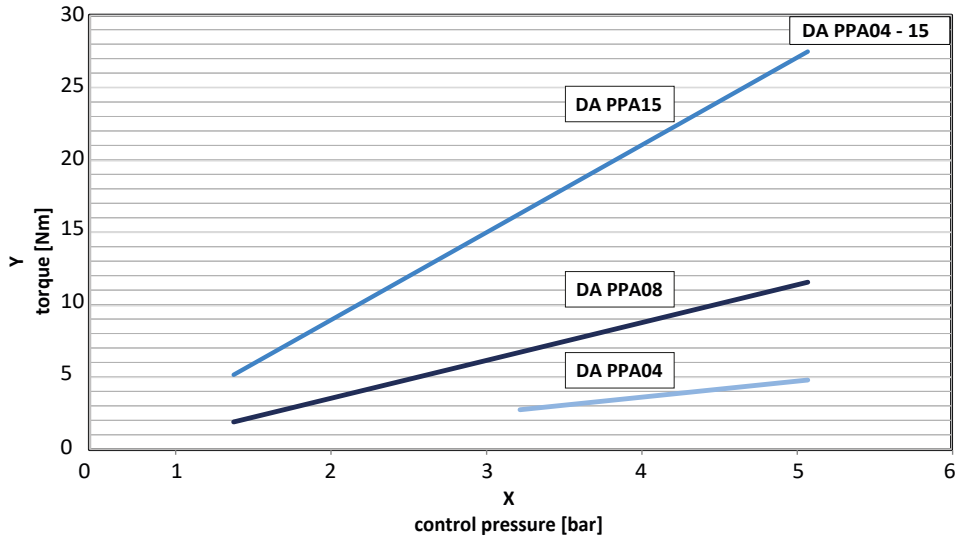
Minimum control pressure

Minimum control pressure for spring combination	Springs	Minimum spring closing torque [Nm]	Minimum control pressure for spring combination [bar]
PPA08	4	1.54	3.5
	5	2.53	4.4
	6	3.12	5.4
PPA15	4	4.38	3.2
	5	6.20	4.1
	6	8.23	5
PPA40	4	12.18	3.5
	5	17.01	4.5
	6	20.16	5.4
PPA80	4	27.64	3.5
	5	35.47	4.4
	6	40.00	5.1

Control pressure DA

	Torque with control pressure [Nm]				
	Air pressure [bar]				
	1	2	3	4.2	5
PPA04		1.98	3.02	4.42	5.31
PPA08		4.20	6.92	9.87	11.92
PPA15		10.96	16.71	23.74	28.49
PPA40	7.88	18.95	30.35	43.16	53.02
PPA80	20.88	45.82	70.70	104.17	121.36

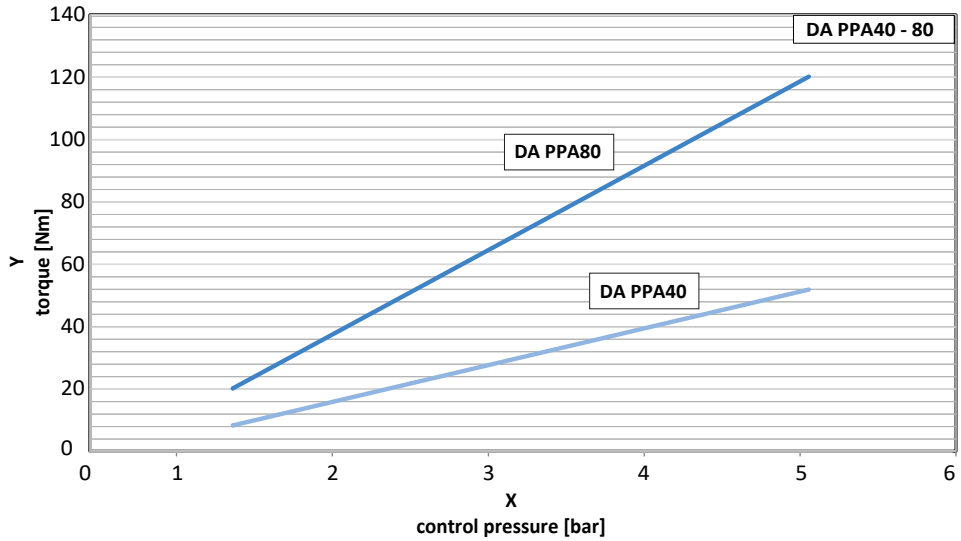
Torque PPA04-15



X Control pressure [bar]

Y Torque [Nm]

Torque PPA40-80



X Control pressure [bar]

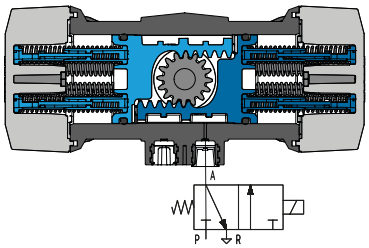
Y Torque [Nm]

Technical basis

Operating diagram FC, FO, DA and function FC, FO, DA

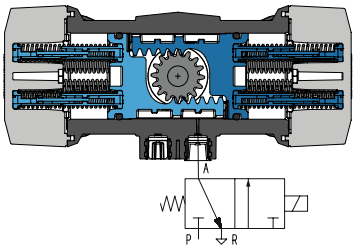
For the proper function of the actuator assembly, it is important that the position of the actuator and valve position matches.

- Actuator open – Valve open
- Actuator closed – Valve closed



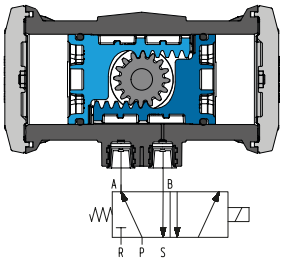
Function FC:
Spring resistance closed

Control air through 3/2 solenoid pilot valve on connection.
A turns the actuator 90° to the left.



Function FO:
Spring resistance opened

Control air through 3/2 solenoid pilot valve on connection.
A turns the actuator 90° to the right.



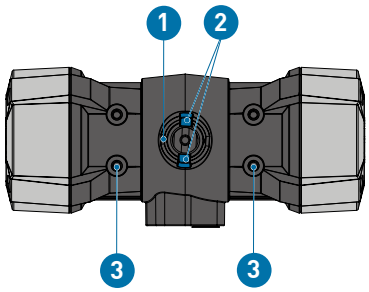
Function DA:
Double-acting

Control air through 5/2 solenoid pilot valve on connection.
A turns the actuator 90° to the right.
Control air through 5/2 solenoid pilot valve on connection.
B turns the actuator 90° to the left.

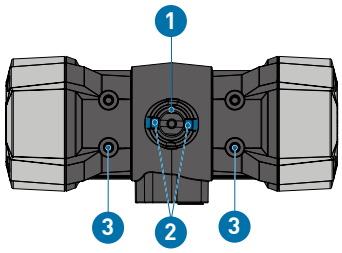
Position indicator

Valve positions can be read off at the mark on the position indicator. The NAMUR standard accessory interface is used for attaching accessories such as a position feedback device or a positioner.

CLOSED position



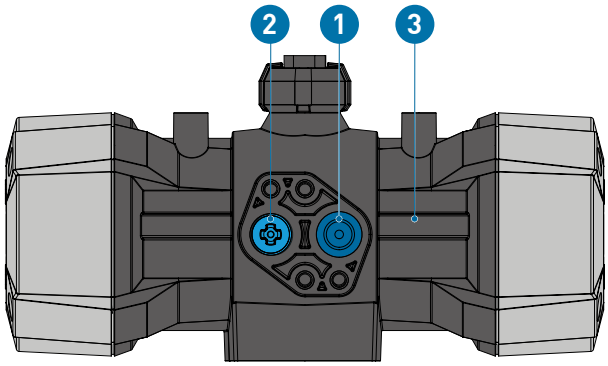
OPEN position



1 Position indicator
2 Marking position
3 Accessory interface NAMUR as per VDE 3845

Control air

Vent holes



1 Control connection
2 Venting connection
3 Laser marking mode of operation of the actuator

The control air connection are provided with laser markings indicating the effect of the control air at the respective connection. In the above example, the actuator is closed in the series state and is opened by applying compressed air through the control connection. Consequently, it is a pneumatic actuator of function FC (spring resistance closes).

In versions with the FC/FO function, the vent hole protected with the reducing plug must not be damaged or blocked, as this would obstruct the movements of the actuator.

Handling

Installation note

If the control air connections used are too long, the control air holes in the product can be blocked.

- When installing, make sure that the control air connections do not penetrate into the product housing beyond the available thread in the hole.

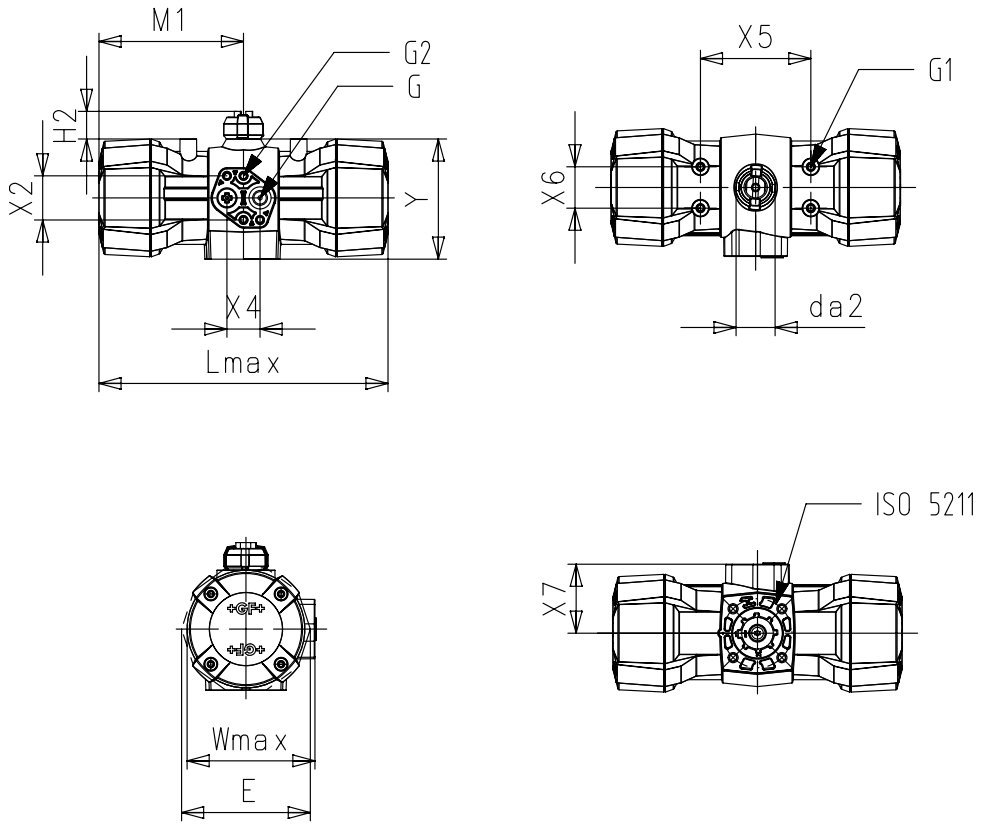
Maintenance notes

Regularly check that the actuator opens and closes correctly.

! Installation and service must be carried out as per the relevant installation instructions. Installation instructions are included with the product, see also online product catalog at www.gfps.com

Dimensions

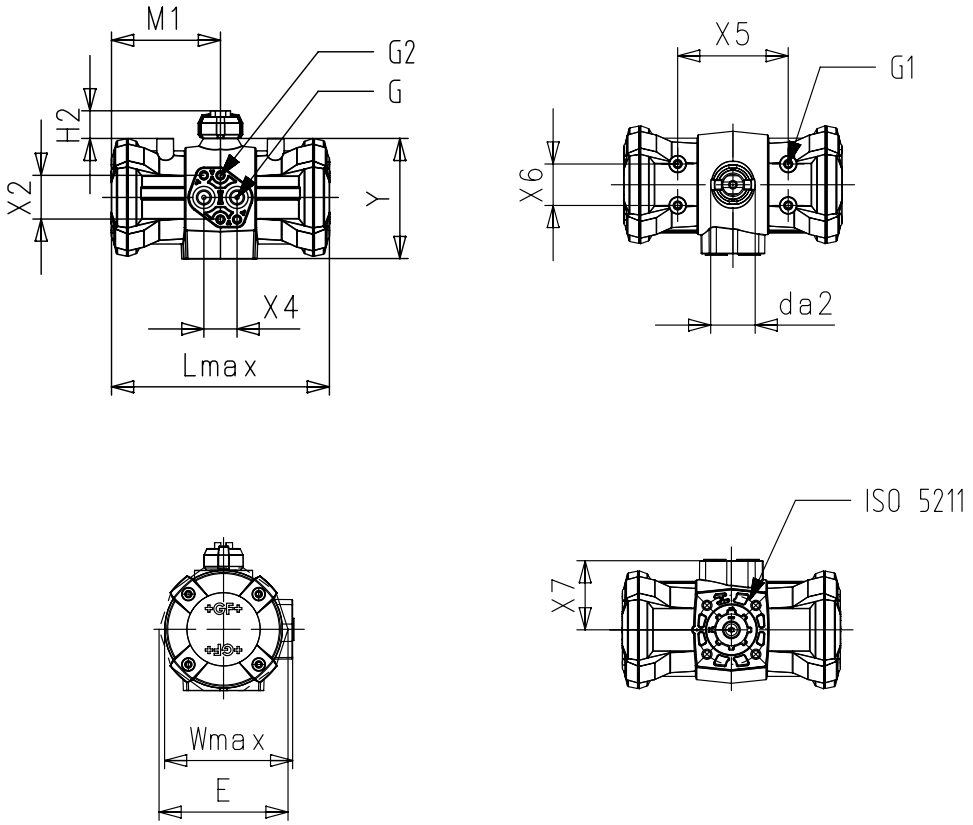
FC/FO
(Single-acting)



	G (inch)	G1 (mm)	H2 (mm)	ISO 5211	M1 (mm)	Wmax (mm)	X4 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	Y (mm)
PPA08	¼	M5	20	F05	79.5	76.5	24	80	30	43.0	75
PPA15	¼	M5	20	F05	105.5	93.0	24	80	30	50.5	88
PPA40	¼	M5	20	F05	122.8	117.0	24	80	30	62.0	111
PPA80	¼	M5	20	F07	171.5	138.5	24	80	30	74.0	131

	da2 (mm)	Lmax (mm)	X2 (mm)	E (mm)	G2 (mm)	Gewicht (kg)
PPA08	32.5	159	32	73.5	M5	0.551
PPA15	32.5	211	32	94.0	M5	1.006
PPA40	32.5	246	32	119.5	M5	1.917
PPA80	32.5	343	32	141.5	M5	3.683

DA
(Double-acting)

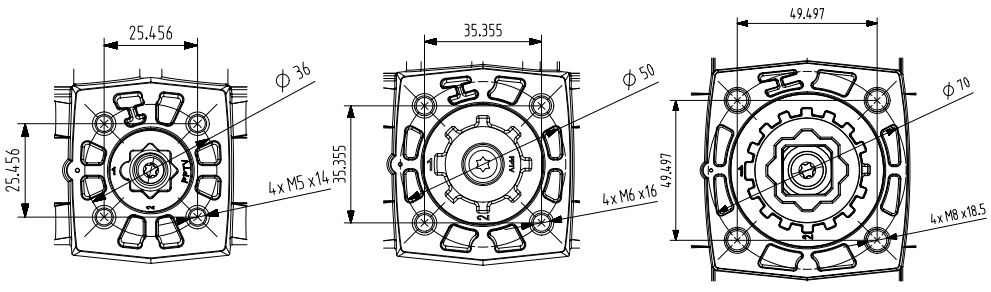


	G (inch)	G1 (mm)	H2 (mm)	ISO 5211	M1 (mm)	Wmax (mm)	X4 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	Y (mm)
PPA04	¼	M5	20	F03	51.0	63.0	24	50	25	34.0	66.0
PPA08	¼	M5	20	F05	63.8	76.5	24	80	30	43.0	75.0
PPA15	¼	M5	20	F05	82.5	93.0	24	80	30	50.5	87.5
PPA40	¼	M5	20	F05	91.8	117.0	24	80	30	62.0	111.0
PPA80	¼	M5	20	F07	130.5	138.5	24	80	30	74.0	131.0

	da2 (mm)	Lmax (mm)	X2 (mm)	E (mm)	G2 (mm)	Gewicht (kg)
PPA04	32.5	102		63.0		0.255
PPA08	32.5	128	32	73.5	M5	0.419
PPA15	32.5	165	32	94.0	M5	0.714
PPA40	32.5	184	32	119.5	M5	1.322
PPA80	32.5	261	32	141.5	M5	2.463

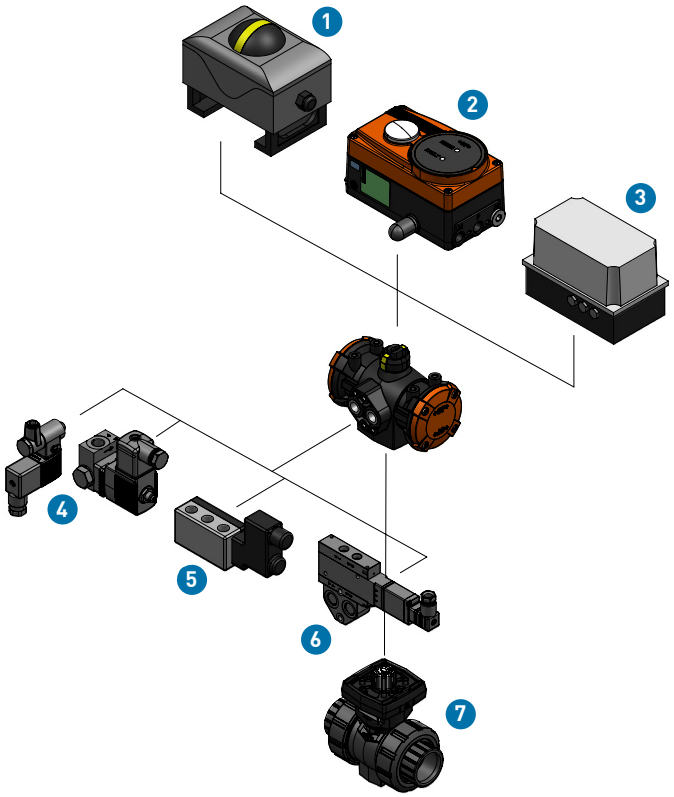
Interfaces F03-F07

F03	F05	F07
PPA04	PPA08/PPA15/PPA40	PPA80



Accessories

Peripheral overview*



* Not all accessories as shown can be used simultaneaously, e.g. Digital positioner cannot be used together with a pilot valve.

	Peripheral overview	Designation
	Accessory interface NAMUR top VDE 3845	
1	Position feedback device	Feedback box
2	Digital positioner	RPC, RPC D, RPC PID
3	AS interface	ASVC 2300
	Accessory interface NAMUR side VDE 3845	
4	3/2-way pilot valve	PV94/95
5	3/2 - 5/2 way pilot valve	MNL532
6	4/2-way pilot valve	5470
	Mechanical interface F03/F05/F07 (ISO 5211) Connection at the valve	
7	Valve	Ball valve type 546 Pro

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