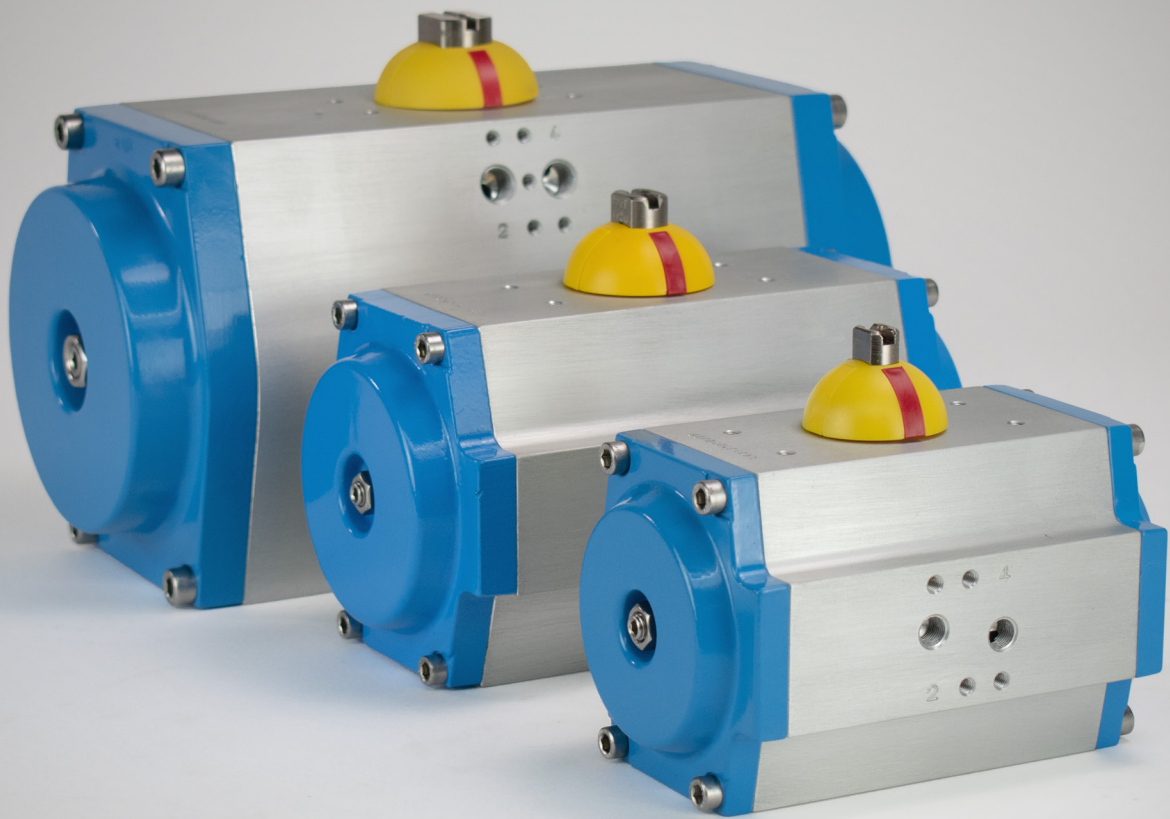


PROTACT



PNEUMATIC ACTUATOR

PRD series

Description

Our Pneumatic Actuator Series PRD/PRE combines a number of custom-required features and based on its large and finely subdivided torque bandwidth it is the perfect solution for nearly all requirements in the field of valve automation.

The well proven rack&pinion construction ensures a durable and reliable usage in continuous operation even in harshest conditions and is the key to process reliability for decades. It provides maximum torque output in combination with compact and weight-saving design.

Through the structural design with internal slide-bearings, actuators of the PR series are completely maintenance free. All requirements of a simple service are

achieved by the working principle and pre-loaded safety springs.

Thanks to the consideration of all common standards in respect of connection interfaces, PRD/PRE-actuators provide maximum modularity in terms of combination with valves and accessories such as solenoid valves, position feedback systems or positioners.

Based on the usage of high quality aluminum alloys and an additional powder coating, the actuators provide the highest level of corrosion-resistance and can be easily used in demanding environments.

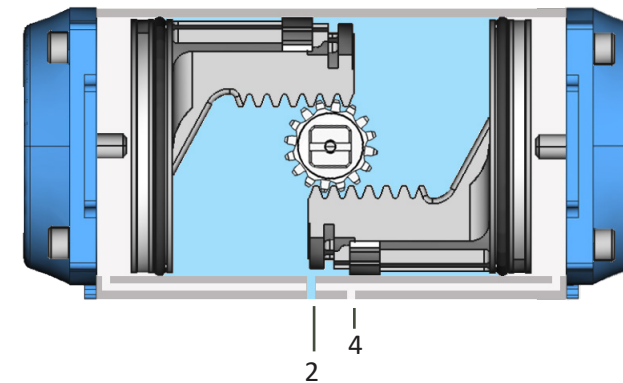
Function

Actuators of the PRD/PRE series are pneumatic double-piston rotary actuators, which are primarily used for the automation of quarter-turn valves such as ball valves, butterfly valves or plug valves. They are generally provided in two different functions: single acting and double-acting.

Double-acting function

In the double-acting actuator version, the movement in both directions gets generated by the control pressure.

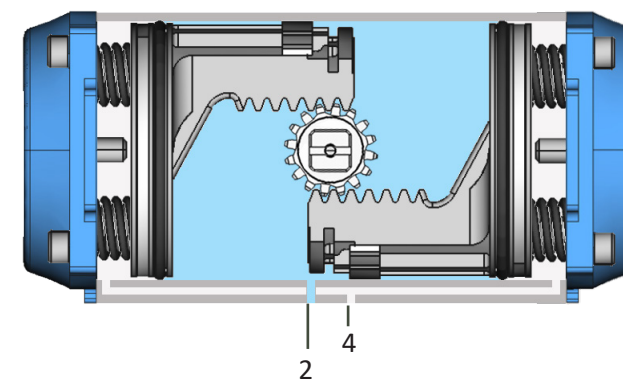
Via connection port "2" the pressure chamber between the two pistons gets pressurized and the pistons move out. The resulting force is transmitted to the pinion and effect a rotational movement.



Single-acting function

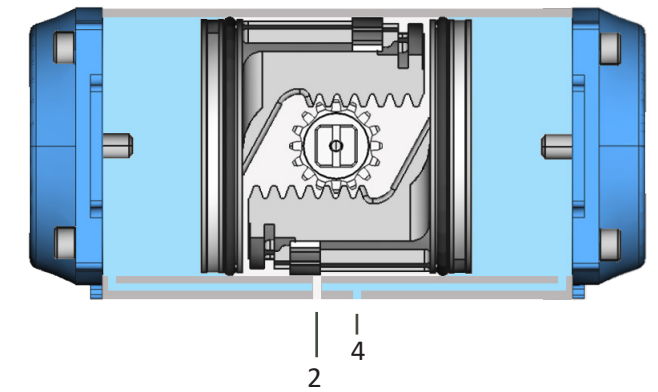
In the single-acting actuator version, the movement into one rotation direction gets generated by the control pressure and the movement of the reverse rotation by integrated safety springs.

Via connection port "2" the pressure chamber between the two pistons gets pressurized, the pistons move out and compress the integrated spring cartridges. At the



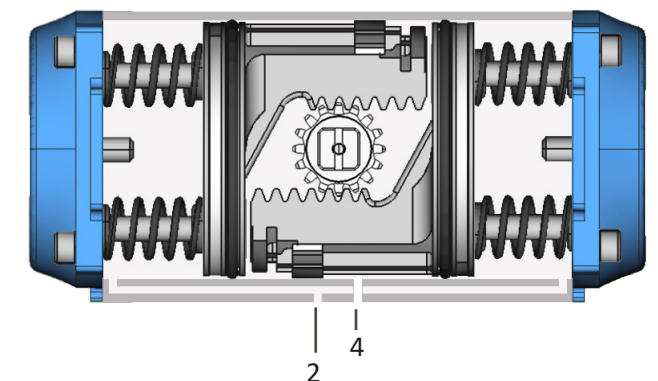
Double piston principle means that two pistons create two pressure chambers. By inflating one of these chambers the pistons are moved into opposite directions either towards or away from each other. The resulting force is provided to the central actuator pinion via toothed racks which are connected with the pistons and so creates a constant torque over the entire pivoting angle.

Once the outer pressure chamber is pressurized via connection port "4", the pistons move towards each other again and the rotation process is reversed.



same time the force resulting at the pistons is transmitted to the pinion and effect a rotational movement. Once the pressure chamber is vented via port "4", the springs push the pistons towards each other and the rotation process is reversed.

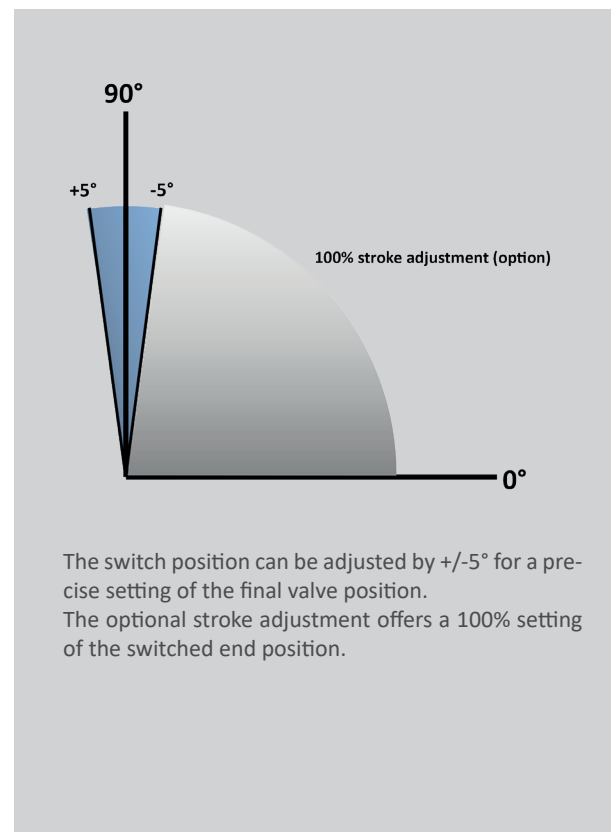
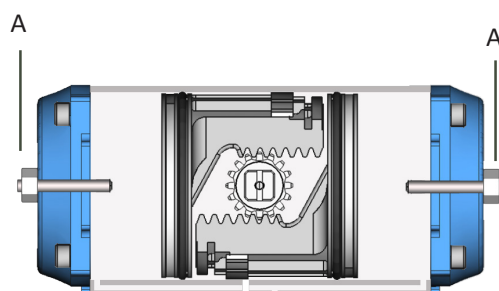
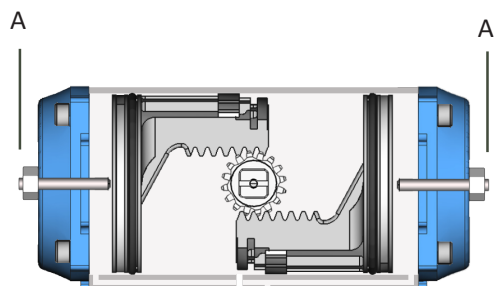
The single acting actuator version thereby provides a safety function for the case of pressure loss.



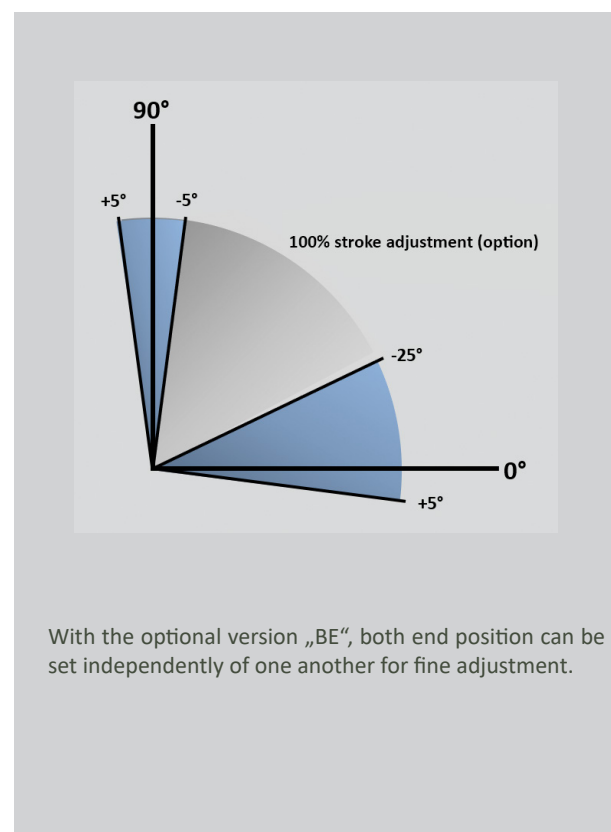
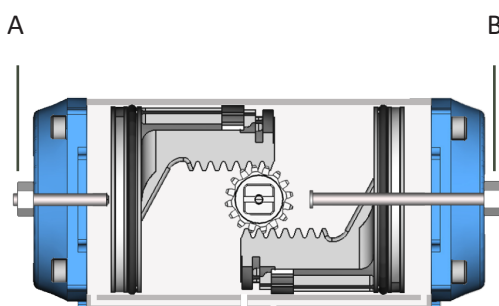
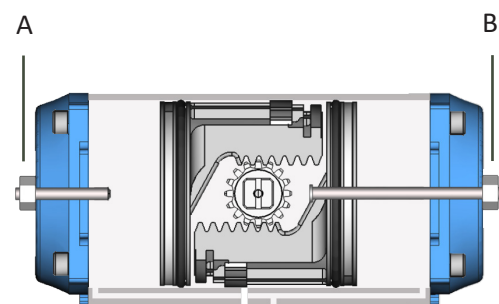
Pivoting angle adjustment

End stop adjustment

Version "Standard"



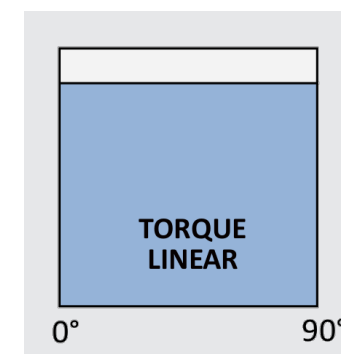
Version "BE"



Torque

Torque diagram double acting

Die doppelwirkende Antriebsausführung liefert ein über den kompletten Schwenkwinkel gleiches, lineares Drehmoment in beide Schwenkrichtungen.



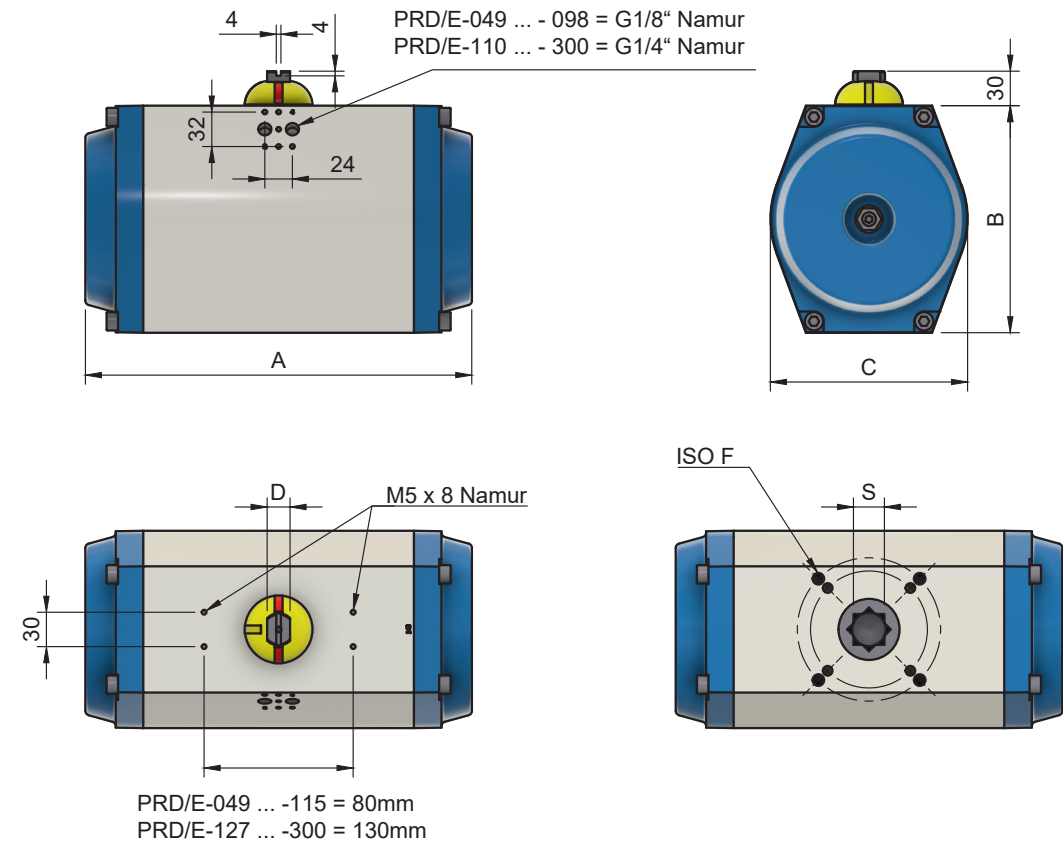
Torque table double-acting

Type	Torque in Nm at Control Pressure in bar (g)											
	2 bar	2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.5 bar	6 bar	6.5 bar	7 bar	8 bar
049	4,7	5,8	7,0	8,2	9,4	10,5	11,7	13,1	14,0	15,2	16,4	18,7
058	7,8	9,7	11,7	13,6	15,6	17,5	19,5	21,8	23,4	25,3	27,3	31,2
068	11,6	14,5	17,4	20,3	23,2	26,1	29,0	32,5	34,8	37,7	40,6	46,4
078	20,0	25,0	30,0	35,0	40,0	45,0	50,0	56,0	60,0	65,0	70,0	80,0
088	29,0	36,2	43,5	50,7	58,0	65,2	72,5	81,2	87,0	94,2	101,5	116,0
098	40,0	50,0	60,0	70,0	80,0	90,0	100,0	112,0	120,0	130,0	140,0	160,0
110	58,0	72,5	87,0	101,5	116,0	130,5	145,0	162,4	174,0	188,5	203,0	232,0
115	86,0	107,5	129,0	150,5	172,0	193,5	215,0	240,8	258,0	279,5	301,0	344,0
127	116,0	145,0	174,0	203,0	232,0	261,0	290,0	324,8	348,0	377,0	406,0	464,0
143	186,0	232,5	279,0	325,5	372,0	418,5	465,0	520,8	558,0	604,5	651,0	744,0
163	230,0	287,5	345,0	402,5	460,0	517,5	575,0	644,0	690,0	747,5	805,0	920,0
185	400,0	500,0	600,0	700,0	800,0	900,0	1.000	1.120	1.200	1.300	1.400	1.600
210	480,0	600,0	720,0	840,0	959,9	1.080	1.200	1.344	1.440	1.560	1.680	1.920
230	690,5	863,1	1.035	1.208	1.381	1.553	1.726	1.933	2.071	2.244	2.416	2.762
250	920,0	1.150	1.380	1.610	1.840	2.070	2.300	2.576	2.760	2.990	3.220	3.680
254	1.160	1.450	1.740	2.030	2.320	2.610	2.900	3.248	3.480	3.770	4.060	4.640
300	1.600	2.000	2.400	2.800	3.200	3.600	4.000	4.480	4.800	5.200	5.600	6.400

Torque

Size	Spring set	Torque spring Stroke in Nm		Torque pneumatic stroke in Nm at Control Pressure in bar (g)															
				2 bar		3 bar		4 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar	
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
230	2	167,7	230,6	524,4	462,2	869,7	807,4	1.214	1.152	1.56	1.498	1.767	1.705	1.905	1.843	2.25	2.188	2.596	2.533
	4	335,5	461,2	358,3	233,8	703,6	579,1	1.048	924,4	1.394	1.269	1.601	1.476	1.739	1.614	2.084	1.96	2.429	2.305
	6	503,2	691,8	-	-	537,5	350,8	882,8	696,1	1.228	1.041	1.435	1.248	1.573	1.386	1.918	1.731	2.263	2.077
	8	671,0	922,5	-	-	371,5	122,5	716,7	467,7	1.062	813,0	1.269	1.020	1.407	1.158	1.752	1.503	2.097	1.848
	10	838,7	1.153	-	-	-	-	550,6	239,4	895,9	584,7	1.103	791,8	1.241	929,9	1.586	1.275	1.931	1.62
	12	1.006	1.383	-	-	-	-	-	-	729,8	356,4	937,0	563,5	1.075	701,6	1.420	1.046	1.765	1.392
250	2	238,1	321,3	674,8	589,1	1.135	1.049	1.595	1.509	2.055	1.969	2.331	2.245	2.515	2.429	2.975	2.889	3.435	3.349
	4	476,3	642,7	429,5	258,1	889,6	718,2	1.350	1.178	1.81	1.638	2.086	1.914	2.27	2.098	2.73	2.558	3.19	3.018
	6	714,4	964,0	-	-	644,3	387,2	1.104	847,2	1.564	1.307	1.84	1.583	2.024	1.767	2.484	2.227	2.945	2.687
	8	952,5	1.285	-	-	-	-	859,1	516,2	1.319	976	1.595	1.252	1.779	1.436	2.239	1.896	2.699	2.356
	10	1.191	1.607	-	-	-	-	613,8	185,2	1.074	645	1.35	921	1.534	1.105	1.994	1.565	2.454	2.025
	12	1.429	1.928	-	-	-	-	-	-	829	314	1.105	590	1.289	774	1.749	1.234	2.209	1.694
254	2	272,2	406,1	880	742	1.460	1.322	2.040	1.902	2.620	2.482	2.968	2.830	3.200	3.062	3.780	3.642	4.360	4.222
	4	544,4	812,2	599	323	1.179	903	1.759	1.484	2.339	2.640	2.687	2.412	2.919	2.644	3.499	3.224	4.079	3.804
	6	816,6	1.218	-	-	899	485	1.479	1.065	2.059	1.645	2.407	1.993	2.639	2.225	3.219	2.805	3.799	3.385
	8	1.089	1.624	-	-	-	-	1.199	647	1.779	1.227	2.127	1.575	2.359	1.807	2.939	2.387	3.519	2.967
	10	1.361	2.031	-	-	-	-	918	229	1.498	809	1.846	1.157	2.078	1.389	2.658	1.969	3.238	2.549
	12	1.633	2.437	-	-	-	-	-	-	1.218	390	1.566	738	1.798	970	2.378	1.55	2.958	2.130
300	2	272	406	1.320	1.182	2.120	1.982	2.920	2.782	3.720	3.582	4.200	4.062	4.520	4.382	5.320	5.182	6.120	5.982
	4	544	812	1.039	763	1.839	1.563	2.639	2.363	3.439	3.163	3.919	3.643	4.239	3.963	5.039	4.763	5.839	5.563
	6	817	1.218	759	345	1.559	1.145	2.359	1.945	3.159	2.745	3.639	3.225	3.959	3.545	4.759	4.345	5.559	5.145
	8	1.089	1.624	-	-	1.278	727	2.078	1.527	2.878	2.327	3.358	2.807	3.678	3.127	4.479	3.927	5.279	4.727
	10	1.361	2.031	-	-	998	309	1.798	1.109	2.598	1.909	3.078	2.389	3.398	2.709	4.198	3.509	4.998	4.309
	12	1.633	2.437	-	-	-	-	1.518	690	2.318	1.49	2.798	1.97	3.118	2.290	3.918	3.09	4.718	3.890
	14	1.906	2.843	-	-	-	-	1.237	272	2.037	1.072	2.517	1.552	2.837	1.872	3.637	2.672	4.437	3.472
	16	2.178	3.249	-	-	-	-	-	-	1.757	654	2.237	1.134	2.557	1.454	3.357	2.254	4.157	3.054

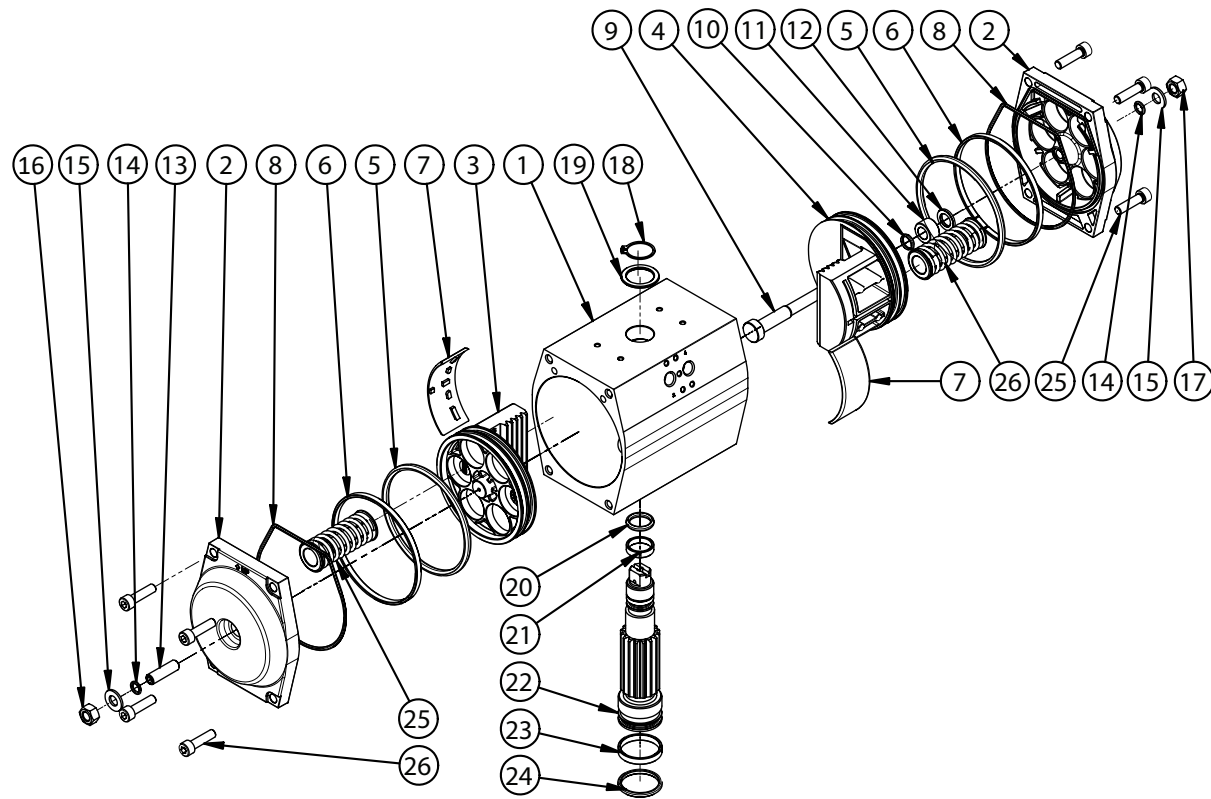
Dimensional drawing



Type	Dimensions in mm								Volume (N.lt)				Weight in kg			
	90°	120°	180°	B	C	D	S	ISO-F	90°	120°	180°	90°(1)	90°	120°	180°	90°(1)
49	116	-	-	65	61.50	10	9/11	F04	0.10	0.18	-	-	0.66	0.60	-	-
58	133	151	195	74	68.50	10	14	F03/F05	0.13	0.25	0.28	0.46	1.00	0.90	1.10	1.30
68	137	155	200	88	80	10	14	F05/F07	0.21	0.40	0.45	0.74	1.62	1.45	1.70	2.00
78	161	183	237	100	92.50	10	17	F05/F07	0.32	0.60	0.68	1.12	2.45	2.10	2.46	2.90
88	180	205	268	108	99.50	10	17	F05/F07	0.45	0.88	1.00	1.63	2.95	2.50	2.95	3.50
98	209	239	310	117	110.50	14	17	F05/F07	0.62	1.20	1.35	2.25	4.00	3.40	4.00	4.60
110	223	253	323	140	120	14	22	F07/F10	0.98	1.90	2.15	3.52	6.20	5.20	6.10	7.20
115	293	345	429	140	120	20	22	F07/F10	1.40	2.70	3.05	5.00	8.35	7.10	8.00	9.70
127	301	353	453	160	137	20	22	F07/F10	2.00	3.65	4.10	6.80	10.70	9.00	10.00	12.50
143	337	387	488	198	172	20	27	F10/F12	2.50	4.60	6.12	9.20	15.80	12.40	14.00	16.00
163	379	444	570	198	172	28	27	F10/F12	3.80	7.00	8.00	13.00	20.1	16.40	18.80	26.00
185	422	-	-	255	224	28	36	F14	6.50	12.50	-	-	37.80	28.00	-	-
210	468	544	696	255	224	32	36	F14	8.00	15.00	17.00	21.50	39.60	31.80	37.40	49.20
230	524	600	751	302	272	32	46	F16	10.00	19.20	22.00	29.00	56.00	44.00	50.00	63.00
250	609	711	911	302	272	32	46	F16	14.00	27.00	31.50	41.00	70.60	55.5	66.50	79.80
254	689	815	-	302	272	32	46	F16	17.00	32.00	38.00	-	84.30	69.20	77.00	-
300	689	814	-	360	360	32	46	F16	25.00	46.00	68.00	-	107.10	92.00	105.00	-

Components

Technical Data



General Specification

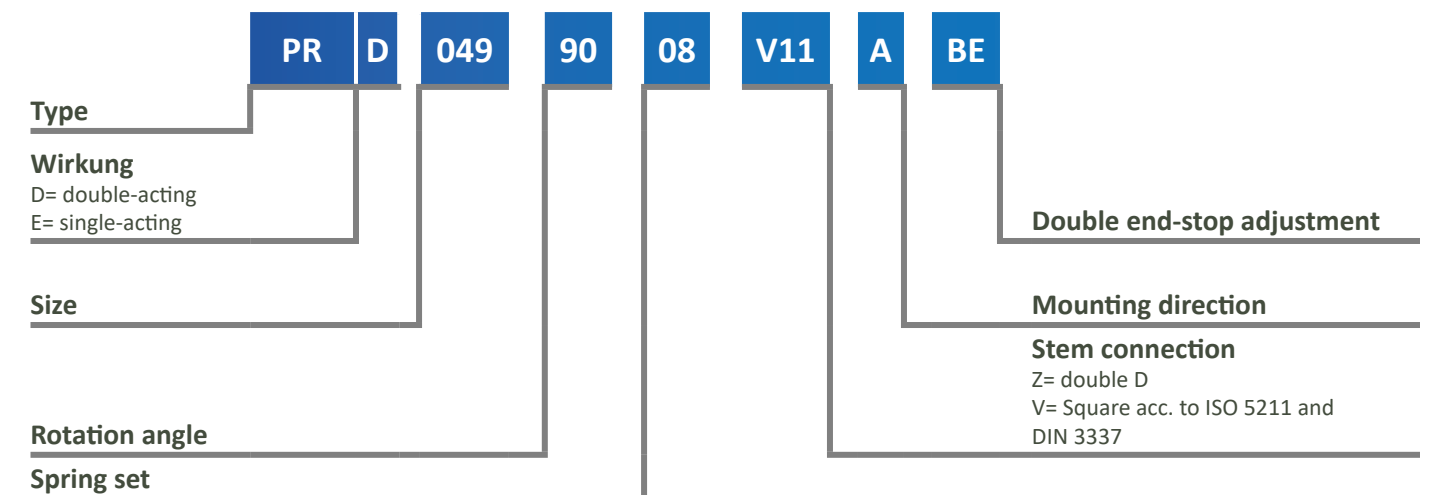
Construction principle	Pneumatic double-piston rotary actuator in rack&pinion-design with self-centering pistons; double- and single-acting execution	
Temperature range	Standard:	-50°C bis +70°C (NBR)
	Lowtemperature:	-15°C bis +160°C (Viton)
	Hightemperature:	-60°C bis +80°C (Silikon)
Control pressure	2 to 8 bar	
Pressure media	dry, filtered air or inert gases in respect of remaining oil-, dust and water-content according to DIN ISO 8573-1 / class 4, maximum particle diameter 30µm, dew point minimum 10°C below ambient temperature	
Nominal rotation angle	90°, 120°, 180° resp. 240°	
	Adjustable in one end position +/-5° (optional 100% stroke adjustment) Version BE: Adjustable in both end positions	
Torque range	to 6.400 Nm (double-acting) to 4.157 Nm (single-acting)	
Standards	ISO 5211, VDI/VDE 3845 resp. NAMUR	
Materials	Housing: Anodised aluminum ASTM 6083, UNI 4522 Cap: Aluminum UNI 5076, epoxy resin coated Piston: Aluminum UNI 5076 Pinion: Steel, nickel-plated (optional: stainless steel) Bearings: POM Sealings: NBR, optional: FKM or silicone	

No.	Description	Quantity	Spare parts set							
			Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8
1	Actuator body	1	-	-	-	-	-	-	-	-
2	Actuator end cap	2	1	-	-	-	-	-	-	-
3	Blind piston	1	-	1	-	-	-	-	-	-
4	Drilled piston	1	-	-	1	-	-	-	-	-
5	Piston sealing O-Ring	2	-	1	1	-	-	-	2	-
6	Piston guide ring	2	-	1	1	-	-	-	-	2
7	Piston guide skate	2	-	1	1	-	-	-	-	2
8	End cap sealing O-Ring	2	1	-	-	-	-	-	2	-
9	Internal travel stop rod	1	-	-	-	-	1	-	-	-
10	Internal travel stop rod sealing O-Ring	1	-	-	-	-	1	-	1	-
11	Internal stop rod guide bush	1	-	-	-	-	1	-	-	-
12	Rod guide bush stop washer	1	-	-	-	-	1	-	-	-
13	External travel stop screw	1	1	-	-	-	-	1	-	-
14	Stop sealing O-Ring	2	1	-	-	-	-	1	2	-
15	O-Ring stop washer	2	1	-	-	-	-	1	-	-
16	External stop nut	1	1	-	-	-	-	1	-	-
17	Internal stop nut (yellow)	1	-	-	-	-	1	-	-	-
18	Pinion stop circlips	1	-	-	-	1	-	-	-	-
19	Upper pinion washer	1	-	-	-	1	-	-	-	1
20	Upper pinion O-Ring sealing	1	-	-	-	1	-	-	1	-
21	Upper pinion guide ring	1	-	-	-	1	-	-	-	1
22	Pinion	1	-	-	-	1	-	-	-	-
23	Lower pinion guide ring	1	-	-	-	1	-	-	-	1
24	Lower pinion O-Ring sealing	1	-	-	-	1	-	-	-	-
25	End cap screws	8	4	-	-	-	-	-	-	-
26	Spring cartridges	0 - 12	-	-	-	-	-	-	-	-

Set 1 = Cap, complete
 Set 2 = Blind piston, complete
 Set 3 = Drilled piston kit, complete
 Set 4 = Shaft complete

Set 5 = Internal stop kit, complete
 Set 6 = External stop kit, complete
 Set 7 = Seal kit
 Set 8 = Guide kit

Type code



ProtACT GmbH
Märkerstraße 18
56307 Dernbach

Tel: +49 (0) 2605 96 25 19-0
Fax: +49 (0) 2605 96 25 19-6
Email: protact@protact-gmbh.de

Website: www.protact-gmbh.de