DelVal Series 21 Pneumatic Rack and Pinion Actuator

The DelVal DelTorq Series 21 is a pneumatic rack and pinion actuator for quarter-turn valves, built around a hard anodised, extruded aluminium body and certified to ATEX 2014/34/EU and SIL3.



Key data	
Body	Hard anodised, extruded aluminium
Travel stops	Bi-directional, adjustable ±5° in both open and closed directions
Drive insert	Double D, ISO square, round end keyed
Certifications	ATEX 2014/34/EU, SIL3

Standards and specifications

Operating conditions and standards

Item	Detail
Standard working temperature	-20°C to +80°C
Low temperatures	-40°C to +150°C (Optional)
High temperatures	-20°C to +180°C (Optional)
Maximum Working Pressure	8 bar
Operating Media	Clean dry air, nitrogen, non-corrosive gas or sweet gas
Supply pressure	3 to 8 bar
Rotation	0 +/-5° to 90 +/-5°
VDI/VDE 3845 (NAMUR) for air connection interface (solenoid valve) and top mounting interface (switch box and positioner)	
Valve interface dimension	EN ISO 5211
Enclosure Degrees of protection	IEC 60529 IP 68
Coating	Body: black, hard and anodized. Cap: epoxy powder coated blue (RAL 5010)

Dimensions and weights

Weights are approximate.

Approximate weight (kg)

Size	Double Acting	Spring Return
045	0.9	1.0
055	1.6	1.8
065	2.4	2.7
075	3.0	3.3
085	4.4	5.4
100	5.8	7.6
115	9.6	14.8
125	12	15
150	20.4	23.8
175	27.5	34.4
200	46	56

Key to dimension letters

Item	Detail
ØA	Outer mounting bolt circle diameter
ØA1	Middle mounting bolt circle diameter
ØA2	Inner mounting bolt circle diameter
ØB	Mounting tapping on ØA
ØB1	Mounting tapping on ØA1
ØB2	Mounting tapping on ØA2
C	Overall length
D	Overall width
E	Body height
F	Pinion projection above body
ØG	Pinion top diameter
ØK	Pinion shoulder diameter
L	Bottom tapped hole spacing
ØM	Shaft connection diameter
P	Shaft connection depth
Sq.	Square drive across flats
Q	Square drive depth
S	Air port size (BSP), NAMUR connection

Torque output and performance

Air volume at 1 bar (cm³)

Size	Opening	Closing
045	75	120
055	145	145
065	260	320
075	360	560
085	535	840
100	840	1220
115	1350	1955
125	1700	2700
150	2900	4465
175	4350	6800
200	6900	11000

Spring return actuator refer opening volume and double acting both opening and closing.
Air Consumption = Volume (cm³) x Air Supply Pressure (Bar).
i.e, 075 actuator at 4 bar pressure
• SR075 = 360 x 4 = 1440 cm³.
• DA075 = (360 + 560) x 4 = 3680 cm³

Operating time at 5.5 bar, 4 mm orifice (seconds)

Item	Value
Size	Open Stroke/ Close Stroke
045	0.2
055	0.3
065	0.35
075	0.45
085	0.6
100	0.8
115	1.0
125	1.3
150	1.5
175	2.0
200	3.5

Double acting torque at air supply pressure (Nm)

Size	3 bar	4 bar	5.5 bar	6 bar	7 bar	8 bar
045	9	11	16	17	20	23
055	15	20	28	31	36	41
065	25	33	46	50	59	67
075	38	51	70	76	89	102
085	55	74	101	110	129	147
100	85	113	156	170	198	226
115	140	187	257	280	327	374
125	182	243	334	364	425	486
150	315	420	577	630	735	840
175	468	623	857	935	1091	1247
200	713	950	1306	1425	1663	1900

Actual torques are in the range of ±5% of the above values.
In between torque values to be interpolated.

Materials of construction

Part list

Item	Description	*Standard Material
1	Body	ASTM B221 6063-T6
2	Left End Cap	BS1490 LM24
3	Right End Cap	BS1490 LM24
4	Piston	BS1490 LM24
5	Pinion	Bs970 EN8(080M40) + ENP
6	Cam	ASTM A747 CB7CU-1 (H1075)
****7**	Pinion Top / Bottom Thrust Bush	STANYL® TW 371
#8	Spring Cartridge Assembly	---
****9**	Piston Pad	STANYL® TW 371
****10**	Piston Band	STANYL® TW 371
****11**	Top Bush	STANYL® TW 371
****12**	Bottom Bush	STANYL® TW 371
****13**	Plug Transfer Port	Nitrile (NBR)
14	Stroke Adjustable Bolt	ISO 3506 A2-70
15	Machined Washer	ASTM A240 SS304
16	Hex Nut	ISO 3506 A2-70
17	Hex Head Bolt	ISO 3506 A2-70
18	Washer	ASTM A479 SS304

Item	Description	*Standard Material
**19	Circlip	IS 2507 70C6 SP. STEEL
**20	O-Ring (Pinion Top)	Nitrile (NBR)
**21	O-Ring (Pinion Bottom)	Nitrile (NBR)
**22	O-Ring (Piston)	Nitrile (NBR)
**23	O-Ring (End Cap)	Nitrile (NBR)
**24	O-Ring (Stroke Bolt)	Nitrile (NBR)
**25	Shim	ASTM A240 SS304
26	Plug	Plastic
27	Local Position Indicator	ABS Plastic
28	Disc	ABS Plastic
29	Soc Hd, Csk	ISO 3506 A2-70
30	Name Plate Sticker	NT Chrome Polyester
×31	Stud (Optional)	ISO 3506 A2-70
×32	O-ring (Optional)	Nitrile (NBR)
×33	Washer (Optional)	ASTM A240 SS304
×34	Nut (Optional)	ISO 3506 A2-70

*Other materials may be available upon request.
#Applicable for Spring Return Actuator only.
**Recommended spares.
× Applicable for 100% travel stop arrangement only.

Dimensions and weights

Actuator dimensions (mm) (columns 1 of 2)

Size	ØA	ØA1	ØA2	ØB	ØB1	ØB2	C	D	E	F	ØG	H
***045**	–	50	36	–	1/4"-20x9	10-24UNCx8	151.0	62.5	66.0	20	22	12
055	70	50	36	5/16"-18x12	1/4"-20x9	10-24UNCx8	168.0	73.0	75.5	20	15	12
065	70	50	–	5/16"-18x12	1/4"-20x9	–	212.5	84.5	87.8	20	18	14
075	70	50	–	5/16"-18x12	1/4"-20x9	–	235.0	93.5	98.1	20	18	14
085	70	50	–	5/16"-18x12	1/4"-20x9	–	273.7	105.5	108.7	20	21	17
100	102	70	–	3/8"-16x15	5/16"-18x12	–	294.2	122.0	125.7	20	23	17
115	125	102	70	1/2"-13x18	3/8"-16x15	5/16"-18x12	349.8	139.5	140.6	30	30	20
125	125	102	–	1/2"-13x18	3/8"-16x15	–	405.2	149.0	152.3	30	30	20
150	125	102	–	1/2"-13x18	3/8"-16x15	–	477.4	182.5	186.5	30	38	30
175	125	102	–	1/2"-13x18	3/8"-16x15	–	529.2	210.0	215.0	30	43	32
200	165	125	–	3/4"-10x30	1/2"-13x18	–	642.0	233.5	248.0	30	50	36

*045 size actuator pinion design permits pinion to be inserted from top or bottom of the actuator to use all three bolt circles for mounting.
Top mounting dimensions PCD - 42 mm, Tapping 10-24 UNC x 8mm DEEP. Bottom mounting dimensions (refer to chart).

Actuator dimensions (mm) (columns 2 of 2)

Size	J	ØK	L	ØM	N	P	Sq.	Q	S (BSP)
***045**	14	30.0	80	–	–	–	11	12	1/8
055	14	23.5	80	14	10	32.5	11	12	1/8
065	14	30.0	80	14	10	32.5	11	16	1/4
075	14	30.0	80	19	13	32.5	17	19	1/4
085	14	34.0	80	19	13	32.5	17	19	1/4
100	14	38.0	80	22	16	32.5	22	24	1/4
115	20	47.0	130	22	16	32.5	22	24	1/4
125	20	47.0	130	30	22	54.0	22	24	1/4
150	20	55.0	130	35	24	54.0	27	29	1/4
175	18	62.0	130	35	24	54.0	27	29	1/4
200	18	72.0	130	50	–	64.0	36	38	1/4

*045 size actuator pinion design permits pinion to be inserted from top or bottom of the actuator to use all three bolt circles for mounting.
Top mounting dimensions PCD - 42 mm, Tapping 10-24 UNC x 8mm DEEP. Bottom mounting dimensions (refer to chart).

Torque output and performance

Spring return torque at air supply pressure (Nm) (columns 1 of 2)

Size	Spring/piston*	3 bar / PB	3 bar / PE	4 bar / PB	4 bar / PE	5.5 bar / PB	5.5 bar / PE	6 bar / PB	6 bar / PE	7 bar / PB	7 bar / PE	8 bar / PB
045	2	5	2	8	5	12	10	13	11	16	14	19
045	3					10	6	12	8	15	11	17
045	4					8	3	10	5	13	8	16
055	3	10	6	15	11	23	19					
055	4			13	8	21	16	23	19	28	24	
055	5					19	13	21	16	27	21	32
055	6					17	10	20	13	25	18	30
065	3	16	11	25	19	37	32					
065	4			22	14	34	27	38	31	47	39	
065	5					31	22	35	26	44	35	52
065	6					28	17	33	22	41	30	49
075	3	22	13	35	26	54	45					
075	4			29	18	48	37	55	43	67	56	
075	5					43	28	49	35	62	47	75
075	6					37	20	44	26	56	39	69
085	3	33	21	51	39	79	67					
085	4			44	27	72	55	81	64	99	83	
085	5					64	44	73	53	92	71	110
085	6					57	32	66	41	84	60	103
100	3	51	31	79	59	122	on request					
100	4			68	41	111	84	125	98	153	126	
100	5					100	66	114	80	142	108	170
100	6					88	48	102	62	131	90	159
115	3	86	55	133	101	203	172					
115	4			115	73	185	143	208	166	255	213	
115	5					167	115	190	138	237	185	284
115	6					149	86	172	109	219	156	266
125	3	113	73	174	134	265	225					
125	4			151	98	242	189	272	219	333	280	
125	5					219	153	249	183	310	244	370

Size	Spring/piston*	3 bar / PB	3 bar / PE	4 bar / PB	4 bar / PE	5.5 bar / PB	5.5 bar / PE	6 bar / PB	6 bar / PE	7 bar / PB	7 bar / PE	8 bar / PB
125	6					196	116	226	147	287	207	347
150	3	178	113	283	218	441	375					
150	4			238	151	395	308	448	361	553	465	
150	5					350	241	402	293	507	398	612
150	6					304	173	357	226	462	331	567
175	3	276	181	432	337	666	571					
175	4			369	242	602	476	680	554	836	709	
175	5					539	380	617	458	772	614	928
175	6					475	285	553	363	709	519	865
200	3	420	284	658	522	1014	878					
200	4			560	379	917	735	1035	854	1273	1091	
200	5					819	592	938	711	1175	949	1413
200	6					722	449	840	568	1078	806	1315

Actual torques are in the range of ±5% of the above values.
In between torque values to be interpolated.
PB = Pneumatic Break, PE = Pneumatic end, SB = Spring Break, SE = Spring End
*e.g. For SR12 spring combination = spring/piston x number of piston = 6 x 2 =12

Spring return torque at air supply pressure (Nm) (columns 2 of 2)

Size	8 bar / PE	Spring stroke / SB	Spring stroke / SE
045	17	6	3
045	14	8	5
045	10	11	7
055		8	5
055		11	7
055	26	14	8
055	23	16	10
065		13	8
065		17	11
065	43	21	13
065	38	26	16
075		22	15
075		30	20
075	60	37	24

Size	8 bar / PE	Spring stroke / SB	Spring stroke / SE
075	52	45	29
085		31	20
085		41	27
085	89	52	33
085	78	62	40
100		49	30
100		65	40
100	136	81	50
100	118	97	60
115		77	49
115		103	65
115	231	128	81
115	203	154	97
125		98	62
125		131	83
125	304	163	104
125	268	196	125
150		182	123
150		242	164
150	503	303	205
150	436	364	246
175		258	172
175		343	229
175	770	429	287
175	674	515	344
200		386	263
200		514	351
200	1186	643	438
200	1043	771	526

Actual torques are in the range of ±5% of the above values.
In between torque values to be interpolated.
PB = Pneumatic Break, PE = Pneumatic end, SB = Spring Break, SE = Spring End
*e.g. For SR12 spring combination = spring/piston x number of piston = 6 x 2 =12

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