

Solid and Hollow Shaft - L, LSV Configurations

Frame Size	Units	Note	55	75	90	115	55	75	90	115
Ratio	i		3/4/5/6/8/10				12/15			
Nominal Output Torque	T2N [Nm]	*1	35	70	140	260	25	50	95	180
Maximum Acceleration Torque	T2B [Nm]	*2	53	105	210	390	38	75	143	270
Emergency Stop Torque	T2Not [Nm]	*3	70	140	280	520	50	100	190	360
Nominal Input Speed	n1N [rpm]	*4	3100	2400	2100	1820	3800	2900	2600	2250
Maximum Input Speed	n1max [rpm]	*5	6000	6000	5000	4000	6000	6000	5000	4000
Maximum Radial Load	F2Rmax [N]	*6	3300	4900	7200	10000	3300	4900	7200	10000
Maximum Axial Load	F2Amax [N]	*7	2650	2450	3600	5000	1650	2450	3600	5000
Moment of Inertia (Ratio 3)	[kgcm ²]		0.376	0.958	2.35	6.82	-	-	-	-
Moment of Inertia (Ratio 4)	[kgcm ²]		0.275	0.715	1.73	4.92	-	-	-	-
Moment of Inertia (Ratio 5)	[kgcm ²]		0.224	0.577	1.41	3.84	-	-	-	-
Moment of Inertia (Ratio 6)	[kgcm ²]		0.217	0.529	1.42	3.62	-	-	-	-
Moment of Inertia (Ratio 8)	[kgcm ²]		0.177	0.440	1.13	2.84	-	-	-	-
Moment of Inertia (Ratio 10)	[kgcm ²]		0.157	0.396	0.99	2.47	-	-	-	-
Moment of Inertia (Ratio 12)	[kgcm ²]		-	-	-	-	0.146	0.366	0.91	2.27
Moment of Inertia (Ratio 15)	[kgcm ²]		-	-	-	-	0.135	0.345	0.85	2.10
Efficiency	h [%]	*8	> 96	> 96	> 96	> 96	> 93	> 93	> 93	> 93
Torsional Rigidity	Ct21 [Nm/arcmin]	*9	2.1	4.2	10.5	23.4	2.1	4.2	10.5	23.4
Maximum Torsional Backlash	jt [arcmin]	*10	≤ 6	≤ 5	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Noise Level	LpA [dB(A)]	*11	< 66	< 66	< 68	< 68	< 66	< 66	< 68	< 68
Ambient Temperature	[°C]	-	-10 to 90							
Permitted Housing Temperature	[°C]	-	90							
Protection Class	-	-	IP64							
Lubrication	-	-	Synthetic Oil [ISO VG-Class 150]							
Service Life	SL [h]	*12	30,000							
Weight	m [kg]	-	2.9	4.8	8.6	13.3	2.9	4.8	8.6	13.3

*1) At nominal input speed, service life is 20,000 hours

*2) The maximum torque when starting or stopping operation. Permitted 1,000 cycles/hour

*3) The maximum torque allowed under a stress situation. Permitted 1,000 times during service life

*4) The average input speed at nominal input torque. Maintain housing temperature below permitted value

*5) The maximum intermittent input speed

*6) The maximum radial load the gearbox can accept. Measured at center of output shaft at 400rpm output

*7) The maximum axial load the gearbox can accept. Measured at center of output shaft at 400rpm output

*8) The efficiency at full load

*9) At nominal output torque. Does not include lost motion

*10) Measured at output, 2% load and max 10Nm

*11) Measured at 3,000 rpm input

*12) Based on S5 duty cycle <60% and <20 minute run time

Units and Symbols

Maximum Motor Acceleration Torque	T1BMot	Nm
Nominal Output Torque	T2N	Nm
Maximum Acceleration Torque	T2B	Nm
Emergency Stop Torque	T2Not	Nm
Nominal Input Speed	n1N	rpm
Maximum Input Speed	n1max	rpm
Maximum Input Radial Load	F1Rmax	N
Maximum Output Radial Load	F2Rmax	N
Maximum Input Axial Load	F1Amax	N
Maximum Output Axial Load	F2Amax	N
Mass Moment of Inertia	I1	kgcm ²
Efficiency at Full Load	η	%
Torsional Rigidity	Ct21	Nm/arc-min
Maximum Torsional Backlash	jt	arc-min
Noise Level	LpA	dB(A)
Service Life	Lh	h
Run time	RT	min
Duty cycle	DC	%
Ambient Temperature	ta	°C
Thermal Performance Limit	Ptherm	kW
Performance	P	kW
Weight	m	kg

Planetary Solid Shaft and Robot Flange - PLS, PLT Configurations

Frame Size	Units	Note	Ratio	55	75	90	115
Nominal Output Torque	T2N [Nm]	*1	16	80	200	380	850
Maximum Acceleration Torque	T2B [Nm]	*2		165	390	840	1850
Emergency Stop Torque	T2Not [Nm]	*3		250	625	1250	2750
Nominal Output Torque	T2N [Nm]	*1	20	86	220	410	910
Maximum Acceleration Torque	T2B [Nm]	*2		165	390	840	1850
Emergency Stop Torque	T2Not [Nm]	*3		250	625	1250	2750
Nominal Output Torque	T2N [Nm]	*1	25	106	280	590	1100
Maximum Acceleration Torque	T2B [Nm]	*2		165	390	840	1850
Emergency Stop Torque	T2Not [Nm]	*3		250	625	1250	2750
Nominal Output Torque	T2N [Nm]	*1	28/35/40/50/70	118	280	590	1300
Maximum Acceleration Torque	T2B [Nm]	*2		165	390	840	1850
Emergency Stop Torque	T2Not [Nm]	*3		250	625	1250	2750
Nominal Output Torque	T2N [Nm]	*1	100	88	220	440	930
Maximum Acceleration Torque	T2B [Nm]	*2		112	292	610	1350
Emergency Stop Torque	T2Not [Nm]	*3		200	500	1000	2200
Nominal Input Speed	n1N [rpm]	*4	16-100	2700	2700	2600	2100
Maximum Input Speed	n1max [rpm]	*5	16-100	8000	8000	7000	6000
Maximum Radial Load (PLS)	F2Rmax [N]	*6	16-100	4300	7000	10000	19000
Maximum Axial Load (PLT)	F2Amax [N]	*7	16-100	3900	6300	9000	17000
Maximum Radial Load (PLS)	F2Rmax [N]	*6	16-100	3300	12000	19000	40000
Maximum Axial Load (PLT)	F2Amax [N]	*7	16-100	1700	8800	14000	30000
Moment of Inertia (PLS)	[kgcm ²]	-	16	0.302	0.829	2.20	6.43
	[kgcm ²]	-	20	0.241	0.649	1.71	4.81
	[kgcm ²]	-	25	0.238	0.629	1.65	4.57
	[kgcm ²]	-	28	0.292	0.772	2.00	5.74
	[kgcm ²]	-	35	0.235	0.613	1.58	4.37
	[kgcm ²]	-	40	0.182	0.462	1.20	3.11
	[kgcm ²]	-	50	0.160	0.410	1.03	2.64
	[kgcm ²]	-	70	0.160	0.406	1.02	2.59
	[kgcm ²]	-	100	0.159	0.404	1.01	2.57
Moment of Inertia (PLT)	[kgcm ²]	-	16	0.321	0.904	2.44	8.19
	[kgcm ²]	-	20	0.253	0.698	1.86	5.93
	[kgcm ²]	-	25	0.246	0.666	1.76	5.33
	[kgcm ²]	-	28	0.298	0.804	2.09	6.38
	[kgcm ²]	-	35	0.239	0.634	1.64	4.77
	[kgcm ²]	-	40	0.185	0.476	1.24	3.41
	[kgcm ²]	-	50	0.162	0.419	1.06	2.84
	[kgcm ²]	-	70	0.161	0.411	1.03	2.70
	[kgcm ²]	-	100	0.160	0.407	1.02	2.63
Efficiency	h [%]	*8	16-100	> 94	> 94	> 94	> 94
Torsional Rigidity (PLS)	Ct21 [Nm/arcmin]	*9	16-100	10	31	60	175
Torsional Rigidity (PLT)	Ct21 [Nm/arcmin]	*9	16-100	27	64	143	430
Maximum Torsional Backlash (Standard)	jt [arcmin]	*10	16-100	≤ 5	≤ 4	≤ 4	≤ 4
Noise Level	LpA [dB(A)]	*11	16-100	< 68	< 68	< 70	< 70
Ambient Temperature	[°C]	-	-10 to 90				
Permitted Housing Temperature	[°C]	-	90				
Protection Class	-	-	IP64				
Lubrication	-	-	Synthetic Oil [ISO VG-Class 150]				
Service Life	SL [h]	*12	20,000				
Weight (PLS)	m [kg]	-	16-100	5.0	9.9	19.5	38.0
Weight (PLT)	m [kg]	-	16-100	5.2	9.7	18.0	41.0

*1) At nominal input speed, service life is 30,000 hours

*2) The maximum torque when starting or stopping operation. Permitted 1,000 cycles/hour

*3) The maximum torque allowed under a stress situation. Permitted 1,000 times during service life

*4) The average input speed at nominal input torque. Maintain housing temperature below permitted value

*5) The maximum intermittent input speed

*6) The maximum radial load the gearbox can accept. Measured at center of output shaft at 400rpm output

*7) The maximum axial load the gearbox can accept. Measured at center of output shaft at 400rpm output

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