P3
Servomotors

Capacity
30 to 750W(6 types)

Features
Low inertia /high power rate

Best suited for high-response applications with light-load low machine inertia levels

Faster servos

Maximum rotating speed of 4,500min^{-1} for quick

Uses
Small simple robots
Semiconductor-making machines
Mounters and inserters
Wafer transfer

Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 M or more
Protection system	Fully closed, self-cooling IP40
Presence/lack of seal	No
Ambient temperature	0 to 40
Storage temperature	20 to 65
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V15
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet type
Installation method	Flange type

Standard specifications

200 VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P30B04003DXS	P30B04005DXS
Sq. flange size in	Condition	Symbol	Unit	40	40
Rated output		P_R	W	30	50
Rated rotating speed		N_R	min ^{1}	3,000	
Maximum rotating speed		Nmax	min ^{1}	4,500	
Rated torque		T_R	N m	0.098	0.157
Continuous stall torque		T_S	N m	0.108	0.167
Instantaneous maximum stall torque		T_P	N m	0.322	0.49
Rated armature current		I_R	Arms	0.54	0.74
Continuous stall armature current		I_S	Arms	0.56	0.75
Instantaneous maximum stall armature current		I_P	Arms	1.79	2.4
Torque constant		K_T	N m/Arms	0.20	0.235
Induced voltage constant		K_E	mV/min ^{1}	7.1 10%	8.2 10%
Phase armature resistance		R		12.5	9.1
Rated power rate		Q_R	kW/S	4.9	9.3
Electric time constant		te	ms	1.2	1.2
Mechanical time constant (w/o sensor)		tm	ms	1.8	1.3
Rotor inertia (INC)		J_M	kg m^2 GD^2/4	0.024 10 ^{4}	0.031 10 ^{4}
Rotor inertia (ABS-RII / RIII)		J_M	kg m^2 GD^2/4	0.021 10 ^{4}	0.028 10 ^{4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	0.3	0.35
Brake holding torque		T_B	N m	0.098	0.157
Brake excitation voltage		V_B	V	90 24	
Brake excitation current		I_B	A	0.07 0.26	
Brake inertia		J_B	kg m^2 GD^2/4	0.0078 10 ^{4}	
Brake mass		W	kg	0.24	
Motor operating temperature and humidity				Temperature: 0 to 40 , humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0A015- PZ0A015-
Amplifier power supply		200 to 230V AC 10% 15% 50/60Hz 1
Amplifier operating temperature and humidity		Temperature: 0 to 55 , humidity: 90% or less (non-condensing)
Power capacity (at rating)	kVA	0.2
Amplifier mass	kg	0.85

100VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P30B04003PXS	P30B04005PXS
Sq. flange size in	Condition	Symbol	Unit	40	40
Rated output		P_R	W	30	50
Rated rotating speed		N_R	min ^{1}	3,000	
Maximum rotating speed		Nmax	min ^{1}	4,500	
Rated torque		T_R	N m	0.098	0.157
Continuous stall torque		T_P	N m	0.322	0.49
Instantaneous maximum stall torque		I_R	Arms	1.0	1.5
Rated armature current		I_P	Arms	3.6	5.1
Continuous stall armature current		K_T	N m/Arms	0.1	0.113
Instantaneous maximum stall armature current		K_E	mV/min ^{1}	3.65 10%	3.93 10%
Torque constant		R		3.04	2.25
Induced voltage constant		Q_R	kW/S	4.9	9.3
Phase armature resistance		te	ms	1.2	1.3
Rated power rate		tm	ms	1.6	1.4
Electric time constant		J_L	kg m^2 GD^2/4	0.24 10 ^{4}	0.31 10 ^{4}
Mechanical time constant (w/o sensor)			P/R	2,000	
Rotor inertia (INC)		J_M	kg m^2 GD^2/4	0.024 10 ^{4}	0.031 10 ^{4}
Rotor inertia (ABS-RII / RIII)		W_E	kg	0.3	0.35
Detector wiring-saving INC			P/R	8,192	
Detector ABS-RII / RIII		J_M	kg m^2 GD^2/4	0.021 10 ^{4}	0.028 10 ^{4}
Mass including wiring-saving INC		W_E	kg	0.39	0.44
Brake holding torque		T_B	N m	0.098	0.157
Brake excitation voltage		V_B	V	90 24	
Brake excitation current		I_B	A	0.07 0.26	
Brake inertia		J_B	kg m^2 GD^2/4	0.0078 10 ^{4}	
Brake mass		W	kg	0.24	
Motor operating temperature and humidity				Temperature: 0 to 40 , humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0B015-
Amplifier power supply		200 to 230V AC 10% 15% 50/60Hz 3Hz single-phase
Amplifier operating temperature and humidity		Temperature: 0 to 55 , humidity: 90% or less (non-condensing)
Power capacity (at rating)	kVA	0.2
Amplifier mass	kg	0.85

Notes:1. means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. means values when the windings are at 20 . The values are typical.

	P30B04010DXS 40	P30B06020DXS 60	P30B06040DXS 60	P30B08075DXS 80	Symbol
	100	200	400	750	P_R
	3,000				N_R
	4,500				Nmax
	0.32	0.637	1.274	2.38	T_R
	0.353	0.686	1.372	2.55	T_S
	0.98	1.96	3.82	7.15	T_P
	1.1	2.2	2.7	4.6	I_R
	1.3	2.3	2.8	4.8	I_S
	4.1	7.5	8.6	15.0	I_P
	0.292	0.316	0.533	0.565	K_T
	10.2 10%	11.0 10%	18.6 10%	19.74 10%	K_E
	4.3	1.5	1.4	0.52	R
	22.0	29.0	64.0	92.0	Q_R
	1.4	3.8	4.6	8.3	te
	0.7	0.63	0.38	0.3	tm
	0.051 10 $^{-4}$	0.144 10 $^{-4}$	0.255 10 $^{-4}$	0.635 10 $^{-4}$	J_M
	0.048 10 $^{-4}$	0.141 10 $^{-4}$	0.252 10 $^{-4}$	0.647 10 $^{-4}$	J_M
	2,000				
	8,192				
	0.5	1.15	1.7	3.3	W_E
	0.32	0.637	1.274	2.38	T_B
	90 24				V_B
	0.07 0.26	0.07 0.31		0.08 0.37	I_B
	0.0078 10 $^{-4}$	0.06 10 $^{-4}$		0.343 10 $^{-4}$	J_B
	0.24	0.44		0.8	W
	Temperature: 0 to 40 , humidity: 90% or less (non-condensing)				

	PU0A015- PZ0A015-		PU0A030- PZ0A030-		
	200 to 230V AC 10% 15% 50/60Hz 1				
	Temperature: 0 to 55 , humidity: 90% or less (non-condensing)				
	0.3	0.5	1.0	1.7	
	0.85		1.1		

	P30B04010PXS 40	P30B06020PXS 60	Symbol
	100	200	P_R
	3,000		N_R
	4,500		Nmax
	0.32	0.637	T_R
	0.98	1.96	T_P
	2.2	4.6	I_R
	7.4	15.8	I_P
	0.162	0.151	K_T
	5.63 10%	5.28 10%	K_E
	1.58	0.39	R
	22.0	29.0	Q_R
	1.3	3.6	te
	0.8	0.71	tm
	0.51 10 $^{-4}$	1.44 10 $^{-4}$	J_L
	2,000		
	0.051 10 $^{-4}$	0.144 10 $^{-4}$	J_M
	0.5	1.15	W_E
	8,192		
	0.048 10 $^{-4}$	0.141 10 $^{-4}$	J_M
	0.59	1.35	W_E
	0.32	0.637	T_B
	90 24		V_B
	0.07 0.26	0.07 0.31	I_B
	0.0078 10 $^{-4}$	0.06 10 $^{-4}$	J_B
	0.24	0.44	W
	Temperature: 0 to 40 , humidity: 90% or less (non-condensing)		

	PU0B015-	PU0B030-	
	200 to 230V AC 10% 15% 50/60Hz 3Hz single-phase		
	Temperature: 0 to 55 , humidity: 90% or less (non-condensing)		
	0.3	0.5	
	0.85	1.1	

Planetary gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute		N m	N m	min-1	mm
P30B04010DXS A	100	1/3	30	75	0.7	2.2	1,000	54 54mm
P30B04010DXS B		1/5		80	1.3	3.9	600	
P30B04010DXS C		1/9	42		2.3	7.1	333	
P30B04010DXS D		1/15			3.8	11.8	200	
P30B04005DXS E	50	1/25		70	2.9	8.9	120	
P30B06040DXS A	400	1/3	24	75	2.9	8.6	1,000	78 78mm
P30B06040DXS B		1/5			4.8	14.3	600	
P30B06040DXS C		1/9	30		8.5	25.8	333	
P30B06040DXS D		1/15			14.3	43.0	200	
P30B06020DXS E	200	1/25			11.9	36.8	120	
P30B08075DXS A	750	1/3	24		5.4	16.1	1,000	
P30B08075DXS B		1/5			8.9	26.8	600	
P30B08075DXS C		1/9	30	70	15.0	45.0	333	96 96mm
P30B08075DXS D		1/15			25.0	75.1	200	

Flat gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute		N m	N m	min-1	mm
P30B04005DXS J	50	1/5	60	95	0.75	1.8	600	60 60mm
P30B04005DXS K		1/10		90	1.4	3.4	300	
P30B04005DXS L		1/15			2.1	5.2	200	
P30B06020DXS J	200	1/5		95	3.0	6.0	600	82 82mm
P30B06020DXS K		1/10		90	5.7	11.4	300	
P30B04010DXS L	100	1/15			4.3	8.6	200	
P30B04010DXS J	400	1/5		95	6.0	12.0	600	102 102mm
P30B04010DXS K		1/10		90	11.5	23.0	300	
P30B06020DXS L	200	1/15			8.6	25.2	200	
P30B08075DXS J	750	1/5		80	9.5	19.0	600	120 120mm
P30B08075DXS K		1/10			19.0	38.0	300	

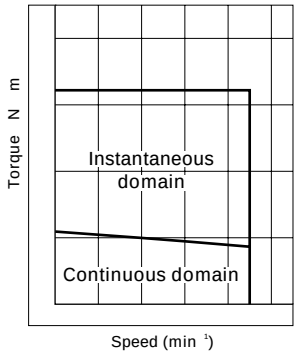
Note: To protect the gears, limit the torques to double their ratings.
Amplifiers can be delivered with different internal settings if you specify them when placing an order.

Backlash-less planetary gears

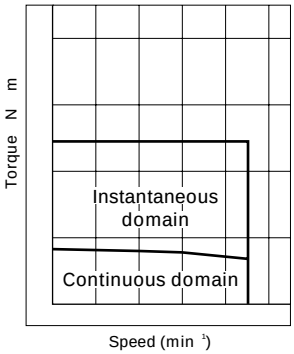
Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute		N m	N m	min-1	mm
P30B04010DXS S	100	1/5	2	75	1.2	3.7	600	70 70mm
P30B04010DXS T		1/11	3	80	2.8	8.6	273	
P30B04005DXS U	50	1/21			2.7	8.2	143	
P30B04005DXS V		1/33			4.2	12.9	91	
P30B06040DXS S	400	1/5	2	75	4.8	14.3	600	90 90mm
P30B06040DXS T		1/11	3		10.5	31.5	273	105 105mm
P30B06020DXS U	200	1/21			10.0	30.9	143	
P30B06020DXS V		1/33			15.8	48.5	91	
P30B08075DXS S	750	1/5	2	70	8.3	25.0	600	
P30B08075DXS T		1/11	3		18.3	55.1	273	120 120mm

"P3" + "PZ" system: characteristics of torque versus rotating speed

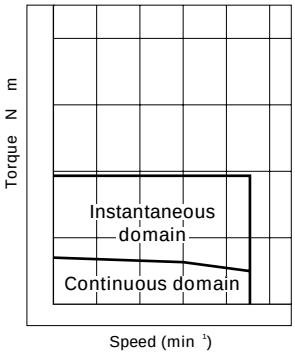
200 VAC type



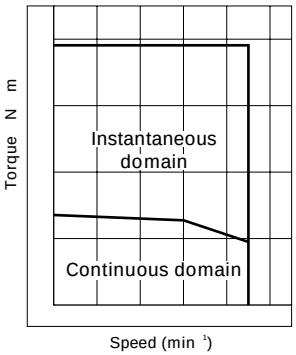
P30B04003D 30W



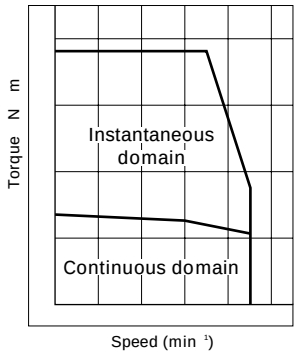
P30B04005D 50W



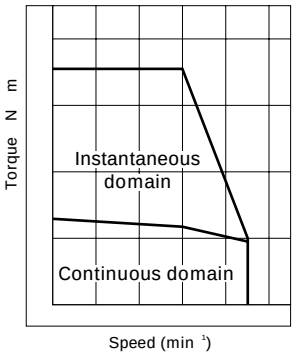
P30B04010D 100W



P30B06020D 200W



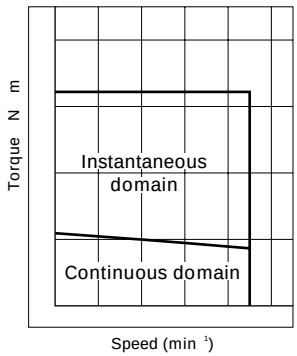
P30B06040D 400W



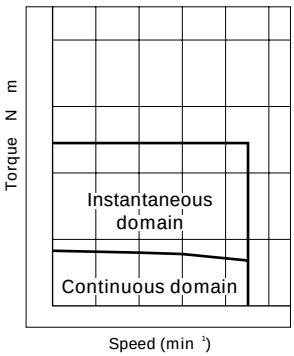
P30B08075D 750W

"P3" + "PU" system: characteristics of torque versus rotating speed

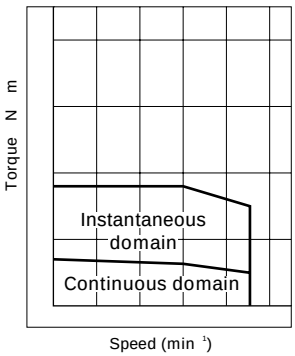
100 VAC type



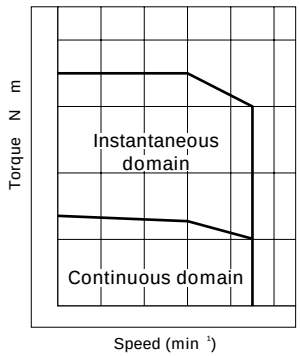
P30B04003P 30W



P30B04005P 50W

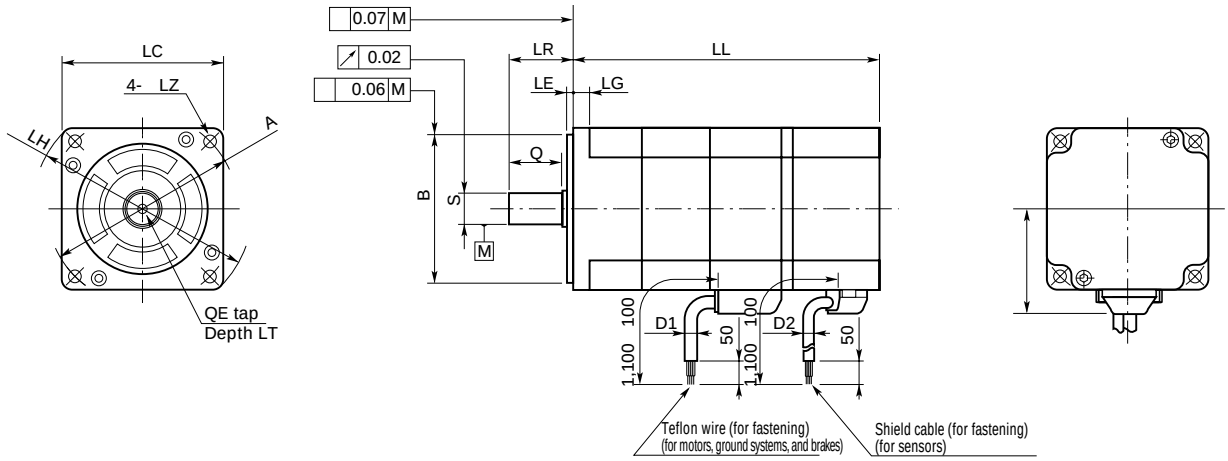


P30B04010P 100W



P30B06020P 200W

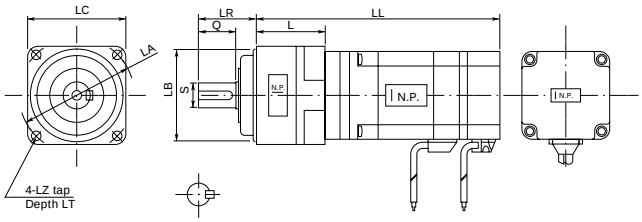
Dimensions unit:mm



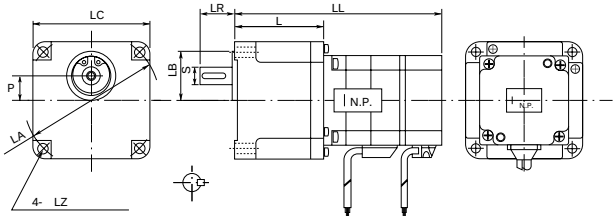
MODEL	Incremental		ABS-R		LG	KL	LA	LB	LE	LH	LC	LZ	LR	S	Q	QE	LT	D1	Incremental D2	ABS-R D2
	w/o brake LL	w/ brake LL	w/o brake LL	w/ brake LL																
P30B04003	64	102.5	70	108.5	5	30	46	30 0 -0.021	2.5	54	40	4.5	25	6 0 -0.008				6	4.7	5.1
P30B04005	70	108.5	76	114.5																
P30B04010	88	126.5	94	132.5										8 0 -0.009						
P30B06020	95.5	133.5	101	139	6	41	70	50 0 -0.025	3	81	60	5.5	30	14 0 -0.011		M5	12	6.7		
P30B06040	123.5	161.5	129	167																
P30B08075	140	180.5	145	185.5	8	52	90	70 0 -0.030	3	107	80	6.6	40	16 0 -0.011	35					7.9

Note: ABS-E and ABS-RIII come with sensors having different dimensions.

Planetary gears



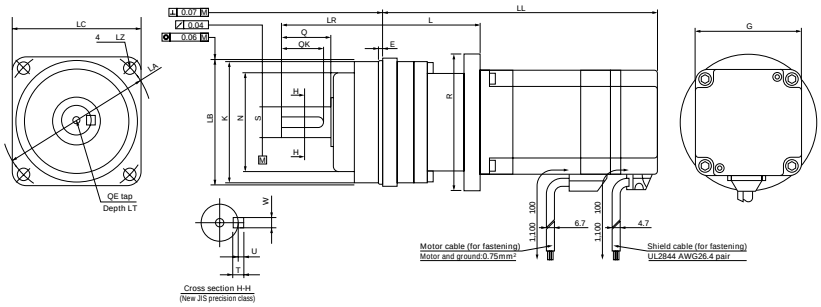
Flat gears



Planetary gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	Q mm	LZ mm	LT mm	Mass kg
P30B04010DXS A	138	50	60	50	54	12	32	20	M5	10	0.5
P30B04010DXS B											
P30B04010DXS C	153	65									0.65
P30B04010DXS D											
P30B04005DXS E	135										
P30B06040DXS A	191	67	90	70	78	19	50	30	M6	12	1.85
P30B06040DXS B											
P30B06040DXS C	211	87									2.3
P30B06040DXS D											
P30B06020DXS E	183										
P30B08075DXS A	208	68									1.85
P30B08075DXS B											
P30B08075DXS C	242	102	115	90	96	24	61	40	M8	16	3.5
P30B08075DXS D											

Flat gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	Q mm	LZ mm	LT mm	Mass kg
P30B04005DXS J	117	47	70	18	60	8	32	5	10	4.5	0.4
P30B04005DXS K											
P30B04005DXS L											
P30B06020DXS J	147	51	94	44	82	12	26.5	5	15	6.5	0.7
P30B06020DXS K											
P30B04010DXS L	139										
P30B06040DXS J	202	78	120	40	102	15	32	3	20	6.5	1.3
P30B06040DXS K											
P30B06020DXS L	174										
P30B08075DXS J	220	80	146	50	120	19	35	5	25	9	1.5
P30B08075DXS K											

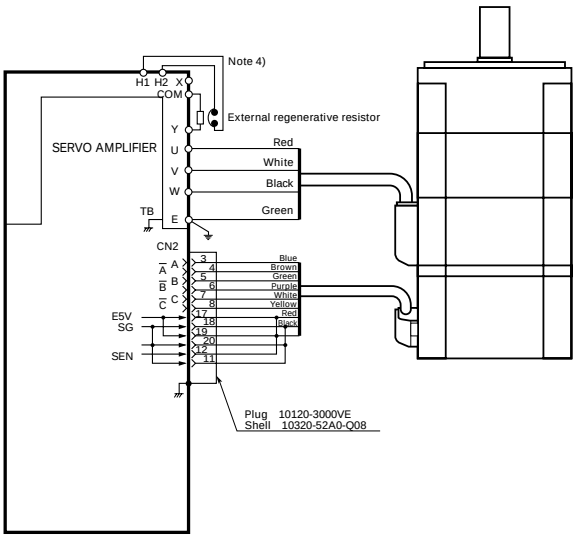
Backlash-less planetary gears



Backlash-less planetary gear	LL	L	LA	LB	E	LC	LR	G	S	QK	Q	K	N	R	LZ	QE	LT	KL	W	T	U	Mass
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg
P30B04010DXS S	127	57	80	65	8	70	60	40	16	25	28	64.5	50	72	6.6	M4	8	38	5	5	2	0.8
P30B04010DXS T	154	66																				
P30B04005DXS U	136																					
P30B04005DXS V																						
P30B06040DXS S	192	68	105	85	10	90	74	60	20	32	36	83	60	104	9	M5	10	50	6	6	2.5	1.6
P30B06040DXS T	211	87	120	100	12	105	84		25	36	42	96	70			M6	12		8	7	3	2.4
P30B06020DXS U	183																					
P30B06020DXS V																						
P30B08075DXS S	216	76	120	100	12	105	84	80	25	36	42	96	70	116	9	M6	12	55	8	7	3	2.4
P30B08075DXS T	236	96	135	115	14	120	105		32	50	58	112	90	120	11	M8	16		10	8		3.9

External connection diagram for “P3”

Incremental encoder



Absolute sensor (ABS-R)