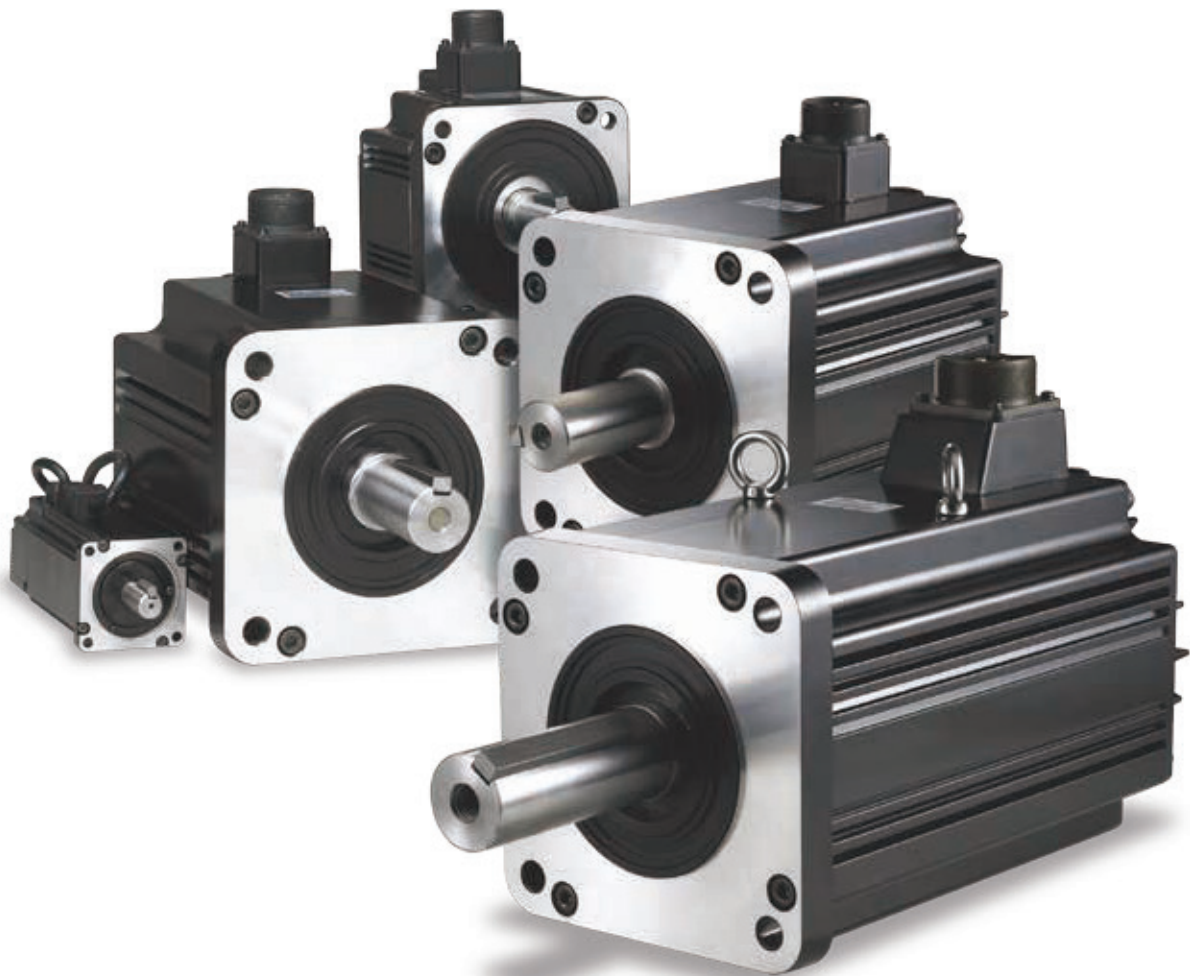


## Servo Motor Features

**ECMA** series servo motors are permanent AC servo motors, capable of combining with 200 to 230V ASDA-A2 220V series AC servo drives from 50 W to 15 kW and 380V to 480V ASDA-A2 400V series AC servo drives from 750 W to 7.5 kW.


For the 220V series, there are 40 mm, 60 mm, 80 mm, 86 mm, 100 mm, 130 mm, 180 mm, and 200 mm eight kinds of frame sizes available. The motor speed is from 1000 r/min to 5000 r/min and the torque output is from 0.477 N-m to 224 N-m.

For the 400V series, there are 60 mm, 80 mm, 86 mm, 100 mm, 130 mm, 180 mm, six kinds of frame sizes available. The motor speed is from 1500 r/min to 5000 r/min and the torque output is from 3.82 N-m to 119.36 N-m. In terms of optional configurations, ECMA series provides brake and oil seal to fully support our customers' needs. It also offers two different shaft selections, round shaft and keyway, for various applications.



# Servo Motor Specifications

## Low Inertia Series- 220V Series


ECMA Series	C104	C Δ 04	C Δ 06		C Δ 08		C Δ 09		C Δ 10		C Δ 13
	0F	01	02	04 □ S	04	07	07	10	10	20	30
Rated output power (kW)	0.05	0.1	0.2	0.4	0.4	0.75	0.75	1.0	1.0	2.0	3.0
Rated torque (N-m) <sup>1</sup>	0.159	0.32	0.64	1.27	1.27	2.39	2.39	3.18	3.18	6.37	9.55
Maximum torque (N-m)	0.477	0.96	1.92	3.82	3.82	7.16	7.14	8.78	9.54	19.11	28.65
Rated speed (r/min)	3000						3000		3000		3000
Maximum speed (r/min)	5000						3000		5000		4500
Rated current (A)	0.69	0.90	1.55	2.6	2.6	5.1	3.66	4.25	7.3	12.05	17.2
Maximum current (A)	2.05	2.70	4.65	7.8	7.8	15.3	11	12.37	21.9	36.15	47.5
Power rating (kW/s)	12.27	27.7	22.4	57.6	24.0	50.4	29.6	38.6	38.1	90.6	71.8
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )	0.0206	0.037	0.177	0.277	0.68	1.13	1.93	2.62	2.65	4.45	12.7
Mechanical time constant (ms)	1.2	0.75	0.80	0.53	0.74	0.63	1.72	1.20	0.74	0.61	1.11
Torque constant-KT (N-m/A)	0.23	0.36	0.41	0.49	0.49	0.47	0.65	0.75	0.44	0.53	0.557
Voltage constant-KE (mV/(r/min))	9.8	13.6	16	17.4	18.5	17.2	24.2	27.5	16.8	19.2	20.98
Armature resistance (Ohm)	12.7	9.30	2.79	1.55	0.93	0.42	1.34	0.897	0.20	0.13	0.0976
Armature inductance (mH)	26	24.0	12.07	6.71	7.39	3.53	7.55	5.7	1.81	1.50	1.21
Electrical time constant (ms)	2.05	2.58	4.3	4.3	7.96	8.36	5.66	6.35	9.3	11.4	12.4
Insulation class	Class A (UL), Class B (CE)										
Insulation resistance	100MΩ , DC 500V above										
Insulation strength	1.8k Vac, 1 sec										
Weight (kg)(without brake)	0.42	0.5	1.2	1.6	2.1	3.0	2.9	3.8	4.3	6.2	7.8
Weight (kg)(with brake)	--	0.8	1.5	2.0	2.9	3.8	3.69	5.5	4.7	7.2	9.2
Max. radial shaft load (N)	78.4	78.4	196	196	245	245	245	245	490	490	490
Max. thrust shaft load (N)	39.2	39.2	68	68	98	98	98	98	98	98	98
Power rating (kW/s)(with brake)	--	25.6	21.3	53.8	22.1	48.4	29.3	37.9	30.4	82	65.1
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	--	0.04	0.19	0.30	0.73	1.18	1.95	2.67	3.33	4.95	14.0
Mechanical time constant (ms)(with brake)	--	0.81	0.85	0.57	0.78	0.65	1.74	1.22	0.93	0.66	1.22
Brake holding torque [Nt-m (min)] <sup>2</sup>	--	0.3	1.3	1.3	2.5	2.5	2.5	2.5	8	8	10.0
Brake power consumption (at 20°C)[W]	--	7.3	6.5	6.5	8.2	8.2	8.2	8.2	18.7	18.7	19.0
Brake release time [ms (Max)]	--	5	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	--	25	70	70	70	70	70	70	70	70	70
Vibration grade (μm)	15										
Operating temperature (°C)	0°C to 40°C										
Storage temperature (°C)	-10°C to 80°C										
Operating humidity	20 to 90%RH (non-condensing)										
Storage humidity	20 to 90%RH (non-condensing)										
Vibration capacity	2.5G										
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))										
Approvals											

\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:

ECMA---04 / 06 / 08: 250 mm x 250 mm x 6 mm  
 ECMA---10: 300 mm x 300 mm x 12 mm  
 ECMA---13: 400 mm x 400 mm x 20 mm  
 ECMA---18: 550 mm x 550 mm x 30 mm  
 ECMA---22: 650 mm x 650 mm x 35 mm  
 Material type : Aluminum – F40, F60, F80, F100, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

## Medium Series- 220V Series

ECMA Series	E $\Delta$ 13				E $\Delta$ 18		
	05	10	15	20	20	30	35
Rated output power (kW)	0.5	1.0	1.5	2.0	2.0	3.0	3.5
Rated torque (N-m) <sup>*1</sup>	2.39	4.77	7.16	9.55	9.55	14.32	16.71
Maximum torque (N-m)	7.16	14.3	21.48	28.65	28.65	42.97	50.13
Rated speed (r/min)	2000						
Maximum speed (r/min)	3000						
Rated current (A)	2.9	5.6	8.3	11.01	11.22	16.1	19.2
Maximum current (A)	8.7	16.8	24.9	33.03	33.66	48.3	57.6
Power rating (kW/s)	7.0	27.1	45.9	62.5	26.3	37.3	50.8
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(without brake)	8.17	8.41	11.18	14.59	34.68	54.95	54.95
Mechanical time constant (ms)	1.91	1.51	1.10	0.96	1.62	1.06	1.08
Torque constant-KT (N-m/A)	0.83	0.85	0.87	0.87	0.85	0.89	0.87
Voltage constant-KE (mV/(r/min))	30.9	31.9	31.8	31.8	31.4	32.0	32
Armature resistance (Ohm)	0.57	0.47	0.26	0.174	0.119	0.052	0.052
Armature inductance (mH)	7.39	5.99	4.01	2.76	2.84	1.38	1.38
Electrical time constant (ms)	12.96	12.88	15.31	15.86	23.87	26.39	26.39
Insulation class	Class A (UL), Class B (CE)						
Insulation resistance	100M $\Omega$ , DC 500V above						
Insulation strength	1.8k Vac,1 sec						
Weight (kg)(without brake)	6.8	7.0	7.5	7.8	13.5	18.5	18.5
Weight (kg)(with brake)	8.2	8.4	8.9	9.2	17.5	22.5	22.5
Max. radial shaft load (N)	490	490	490	490	1176	1470	1470
Max. thrust shaft load (N)	98	98	98	98	490	490	490
Power rating (kW/s)(with brake)	6.4	24.9	43.1	57.4	24.1	35.9	48.9
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	8.94	9.14	11.90	15.88	37.86	57.06	57.06
Mechanical time constant (ms)(with brake)	2.07	1.64	1.19	1.05	1.77	1.10	1.12
Brake holding torque [Nt-m (min)] <sup>*2</sup>	10.0	10.0	10.0	10.0	25.0	25.0	25.0
Brake power consumption (at 20°C)[W]	19.0	19.0	19.0	19.0	20.4	20.4	20.4
Brake release time [ms (Max)]	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70
Vibration grade ( $\mu$ m)	15						
Operating temperature (°C)	0°C to 40°C						
Storage temperature (°C)	-10°C to 80°C						
Operating humidity	20 to 90%RH (non-condensing)						
Storage humidity	20 to 90%RH (non-condensing)						
Vibration capacity	2.5G						
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))						
Approvals							

\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:

ECMA-\_\_04 / 06 / 08: 250 mm x 250 mm x 6 mm

ECMA-\_\_10: 300 mm x 300 mm x 12 mm

ECMA-\_\_13: 400 mm x 400 mm x 20 mm

ECMA-\_\_18: 550 mm x 550 mm x 30 mm


ECMA-\_\_22: 650 mm x 650 mm x 35 mm

Material type : Aluminum – F40, F60, F80, F100, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

# Servo Motor Specifications

## Medium-High Inertia Series- 220V Series

ECMA Series	F $\Delta$ 13				F $\Delta$ 18				F122	
	05	08	13	18	30	45	55	75	1B	1F
Rated output power (kW)	0.5	0.85	1.3	1.8	3.0	4.5	5.5	7.5	11	15
Rated torque (N-m) <sup>1</sup>	3.18	5.41	8.34	11.48	19.10	28.65	35.01	47.74	70	95.4
Maximum torque (N-m)	8.92	13.8	23.3	28.7	57.29	71.62	87.53	119.36	175	224.0
Rated speed (r/min)	1500									
Maximum speed (r/min)	3000								2000	
Rated current (A)	3.9	7.1	12.6	13	19.4	32.5	40.0	47.5	51.8	67
Maximum current (A)	12.1	19.4	38.6	36	58.2	81.3	100.0	118.8	129.5	162
Power rating (kW/s)	9.8	21.52	34.78	52.93	66.4	105.5	122.9	159.7	144.9	201.8
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(without brake)	10.3	13.6	20	24.9	54.95	77.75	99.78	142.7	338	451
Mechanical time constant (ms)	2.8	2.43	1.62	1.7	1.28	0.92	0.96	0.63	1.38	1.23
Torque constant-KT (N-m/A)	0.82	0.76	0.66	0.88	0.98	0.88	0.88	1.01	1.37	1.42
Voltage constant-KE (mV/(r/min))	29.5	29.2	24.2	32.2	35.0	32.0	31.0	35.5	49	50
Armature resistance (Ohm)	0.624	0.38	0.124	0.185	0.077	0.032	0.025	0.015	0.026	0.0184
Armature inductance (mH)	7	4.77	1.7	2.6	1.27	0.89	0.60	0.40	0.65	0.48
Electrical time constant (ms)	11.22	12.55	13.71	14.05	16.5	27.8	24.0	26.7	24.79	26.09
Insulation class	Class A (UL), Class B (CE)									
Insulation resistance	100M $\Omega$ , DC 500V above									
Insulation strength	1.8k Vac, 1 sec									
Weight (kg)(without brake)	6.3	8.6	9.4	10.5	18.5	23.5	30.5	40.5	56.4	75
Weight (kg)(with brake)	7.7	10.0	10.8	11.9	22.5	29	36	46	68.4	87
Max. radial shaft load (N)	490	490	490	490	1470	1470	1764	1764	3300	3300
Max. thrust shaft load (N)	98	98	98	98	490	490	588	588	1100	1100
Power rating (kW/s)(with brake)	8.8	19.78	32.66	50.3	63.9	101.8	119.4	156.6	141.4	197.1
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	11.5	14.8	21.3	26.2	57.06	80.65	102.70	145.55	346.5	461.8
Mechanical time constant (ms)(with brake)	3.12	2.65	1.73	1.79	1.33	0.96	0.99	0.64	1.41	1.25
Brake holding torque[Nt-m(min)] <sup>2</sup>	10	10.0	10.0	10.0	25.0	55.0	55.0	55.0	115	115
Brake power consumption (at 20°C)[W]	19	19.0	19.0	19.0	20.4	19.9	19.9	19.9	28.8	28.8
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70	70	70
Vibration grade ( $\mu$ m)	15									
Operating temperature (°C)	0°C to 40°C									
Storage temperature (°C)	-10°C to 80°C									
Operating humidity	20 to 90%RH (non-condensing)									
Storage humidity	20 to 90%RH (non-condensing)									
Vibration capacity	2.5G									
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))									
Approvals										


\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:

ECMA-\_\_04 / 06 / 08: 250 mm x 250 mm x 6 mm  
 ECMA-\_\_10: 300 mm x 300 mm x 12 mm  
 ECMA-\_\_13: 400 mm x 400 mm x 20 mm  
 ECMA-\_\_18: 550 mm x 550 mm x 30 mm  
 ECMA-\_\_22: 650 mm x 650 mm x 35 mm

Material type : Aluminum – F40, F60, F80, F100, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

## High Inertia Series- 220V Series

ECMA Series	C $\Delta$ 06	C $\Delta$ 08	G $\Delta$ 13		
	04 $\square$ H	07 $\square$ H	03	06	09
Rated output power (kW)	0.4	0.75	0.3	0.6	0.9
Rated torque (N-m) <sup>*1</sup>	1.27	2.39	2.86	5.73	8.59
Maximum torque (N-m)	3.82	7.16	8.59	17.19	21.48
Rated speed (r/min)	3000		1000		
Maximum speed (r/min)	5000		2000		
Rated current (A)	2.6	5.1	2.5	4.8	7.5
Maximum current (A)	7.8	15.3	7.5	14.4	22.5
Power rating (kW/s)	21.7	19.63	10.0	39.0	66.0
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(without brake)	0.743	2.91	8.17	8.41	11.18
Mechanical time constant (ms)	1.42	1.6	1.84	1.40	1.06
Torque constant-KT (N-m/A)	0.49	0.47	1.15	1.19	1.15
Voltage constant-KE (mV/(r/min))	17.4	17.2	42.5	43.8	41.6
Armature resistance (Ohm)	1.55	0.42	1.06	0.82	0.43
Armature inductance (mH)	6.71	3.53	14.29	11.12	6.97
Electrical time constant (ms)	4.3	8.36	13.5	13.50	16.06
Insulation class	Class A (UL), Class B (CE)				
Insulation resistance	100M $\Omega$ , DC 500V above				
Insulation strength	1.8k Vac,1 sec				
Weight (kg)(without brake)	1.8	3.4	6.8	7.0	7.5
Weight (kg)(with brake)	2.2	3.9	8.2	8.4	8.9
Max. radial shaft load (N)	196	245	490	490	490
Max. thrust shaft load (N)	68	98	98	98	98
Power rating (kW/s)(with brake)	21.48	19.3	9.2	35.9	62.1
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	0.751	2.96	8.94	9.14	11.9
Mechanical time constant (ms)(with brake)	1.43	1.62	2.0	1.51	1.13
Brake holding torque [Nt-m (min)] <sup>*2</sup>	1.3	2.5	10.0	10.0	10.0
Brake power consumption (at 20°C)[W]	6.5	8.2	19.0	19.0	19.0
Brake release time [ms (Max)]	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70
Vibration grade ( $\mu$ m)	15				
Operating temperature (°C)	0°C to 40°C				
Storage temperature (°C)	-10°C to 80°C				
Operating humidity	20 to 90%RH (non-condensing)				
Storage humidity	20 to 90%RH (non-condensing)				
Vibration capacity	2.5G				
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))				
Approvals					

\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:


ECMA-\_\_ 04 / 06 / 08: 250 mm x 250 mm x 6 mm  
 ECMA-\_\_ 10: 300 mm x 300 mm x 12 mm  
 ECMA-\_\_ 13: 400 mm x 400 mm x 20 mm  
 ECMA-\_\_ 18: 550 mm x 550 mm x 30 mm  
 ECMA-\_\_ 22: 650 mm x 650 mm x 35 mm

Material type : Aluminum – F40, F60, F80, F100, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

# Servo Motor Specifications

## Low / Medium Series- 400V Series

ECMA Series	J $\Delta$ 06	J $\Delta$ 08	J $\Delta$ 09		J $\Delta$ 10		J $\Delta$ 13	K $\Delta$ 13				K $\Delta$ 18
	04	07	07	10	10	20	30	05	10	15	20	20
Rated output power (kW)	0.4	0.75	0.75	1	1.0	2.0	3.0	0.5	1.0	1.5	2.0	2.0
Rated torque (N-m) <sup>1</sup>	1.27	2.39	2.39	3.18	3.18	6.37	9.55	2.39	4.77	7.16	9.55	9.55
Maximum torque (N-m)	3.82	7.16	7.14	8.78	9.54	19.1	28.65	7.16	14.32	21.48	28.65	28.65
Rated speed (r/min)	3000		3000		3000		3000	2000				
Maximum speed (r/min)	5000		3000		5000		4500	3000				
Rated current (A)	1.62	3.07	2.16	2.4	4.15	7.09	9.8	1.7	3.52	5.02	6.66	6.6
Maximum current (A)	4.85	9.5	6.37	7.17	12.46	21.28	29.99	5.2	10.56	15.06	19.98	19.88
Power rating (kW/s)	58.2	50.4	29.6	38.6	38.2	91.2	71.8	6.99	27.1	45.9	62.5	26.3
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(without brake)	0.277	1.13	1.93	2.62	2.65	4.45	12.7	8.17	8.41	11.18	14.59	34.68
Mechanical time constant (ms)	0.47	0.66	1.56	1.06	0.77	0.58	0.99	2.08	1.80	1.24	1.04	1.74
Torque constant-KT (N-m/A)	0.79	0.78	1.12	1.29	0.77	0.9	0.97	1.41	1.35	1.43	1.43	1.45
Voltage constant-KE (mV/(r/min))	30.6	28.24	42	50.9	29.0	34.4	37.3	51.5	53.2	55	55	54.0
Armature resistance (Ohm)	3.95	1.22	3.62	2.58	0.617	0.388	0.269	1.76	1.47	0.83	0.57	0.376
Armature inductance (mH)	21.3	10.68	21.2	15.28	6.03	4.62	3.55	22.4	17.79	11.67	8.29	7.87
Electrical time constant (ms)	5.39	8.75	5.85	5.93	9.77	11.9	13.2	12.73	12.04	14.04	14.39	20.9
Insulation class	Class A (UL), Class B (CE)											
Insulation resistance	100M $\Omega$ , DC 500V above											
Insulation strength	2.3k Vac, 1 sec											
Weight (kg)(without brake)	1.6	3.0	2.9	3.8	4.3	6.2	7.8	6.8	7.0	7.5	7.8	13.5
Weight (kg)(with brake)	2	3.8	-	-	4.7	7.2	9.2	8.2	8.4	8.9	9.2	17.5
Max. radial shaft load (N)	19.6	245	245	245	490	490	490	490	490	490	490	1176
Max. thrust shaft load (N)	68	98	98	98	98	98	98	98	98	98	98	490
Power rating (kW/s)(with brake)	53.8	48.4	29.3	37.9	30.4	82	65.1	6.39	24.9	43.1	59.7	24.1
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	0.3	1.18	1.95	2.67	3.33	4.95	14.0	8.94	9.14	11.90	15.88	37.86
Mechanical time constant (ms)(with brake)	0.52	0.65	1.57	1.08	0.96	0.65	1.09	2.28	1.96	1.32	1.13	1.9
Brake holding torque [Nt-m (min)] <sup>2</sup>	1.3	2.5	2.5	2.5	8.0	8.0	10.0	10.0	10.0	10.0	10.0	25.0
Brake power consumption (at 20°C)[W]	6.5	8.5	8.2	8.2	18.5	18.5	19.0	19.0	19.0	19.0	19.0	20.4
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70	70	70	70	70
Vibration grade ( $\mu$ m)	15											
Operating temperature (°C)	0°C to 40°C											
Storage temperature (°C)	-10°C to 80°C											
Operating humidity	20 to 90%RH (non-condensing)											
Storage humidity	20 to 90%RH (non-condensing)											
Vibration capacity	2.5G											
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))											
Approvals												

\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:

ECMA-\_\_08: 250 mm x 250 mm x 6 mm


ECMA-\_\_13: 400 mm x 400 mm x 20 mm

ECMA-\_\_18: 550 mm x 550 mm x 30 mm

Material type : Aluminum – F80, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

## Medium-High / High Inertia Series- 400V Series

ECMA Series	L $\Delta$ 13			L $\Delta$ 18				L122		M $\Delta$ 13
	05	08	13	30	45	55	75	1B	1F	09
Rated output power (kW)	0.5	0.85	1.3	3.0	4.5	5.5	7.5	11	15	0.9
Rated torque (N-m) <sup>*1</sup>	3.18	5.39	8.34	19.10	28.65	35.0	47.74	70	95.4	8.59
Maximum torque (N-m)	8.92	13.8	23.3	57.29	71.62	87.53	119.36	175	224	21.48
Rated speed (r/min)	1500							1500		1000
Maximum speed (r/min)	3000							2000		2000
Rated current (A)	2.1	3.4	5.02	11.53	20.8	22.37	27.3	27.2	41.6	4.4
Maximum current (A)	6.1	8.85	15	34.6	52	56	68.3	68	100	13.1
Power rating (kW/s)	7.72	17.0	29.47	66.4	105.5	122.9	159.7	145	201.8	66
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(without brake)	13.1	17.1	23.6	54.95	77.75	99.78	142.7	338	451	11.18
Mechanical time constant (ms)	2.3	1.76	1.44	1.11	0.94	0.88	0.77	1.42	1.34	1.21
Torque constant-KT (N-m/A)	1.5	1.59	1.66	1.66	1.38	1.56	1.75	2.57	2.29	1.95
Voltage constant-KE (mV/(r/min))	55.5	58.9	61.1	64.4	53	58.9	66.4	96	83.9	71.7
Armature resistance (Ohm)	1.41	0.92	0.59	0.21	0.09	0.07	0.06	0.0994	0.0545	1.45
Armature inductance (mH)	20	14.1	9.54	4.94	2.36	2.2	1.7	2.51	1.43	23.3
Electrical time constant (ms)	14.1	15.33	16.17	23.97	28.07	27.6	28.29	25.25	26.26	16.07
Insulation class	Class A (UL), Class B (CE)									
Insulation resistance	100M $\Omega$ , DC 500V above									
Insulation strength	2.3k Vac, 1 sec									
Weight (kg)(without brake)	6.8	8.6	10.7	18.5	23.5	30.5	40.5	56.4	75	7.5
Weight (kg)(with brake)	-	10	--	22.5	29	36	46	68.4	87	8.9
Max. radial shaft load (N)	490	490	490	1470	1470	1764	1764	3300	3300	490
Max. thrust shaft load (N)	98	98	98	490	490	588	588	1100	1100	98
Power rating (kW/s)(with brake)	7.02	14.82	27.82	63.9	101.8	119.4	156.6	141.4	197.1	62
Rotor moment of inertia (x10 <sup>-4</sup> kg-m <sup>2</sup> )(with brake)	14.4	19.6	25	57.06	80.65	102.70	145.5	346.5	461.8	11.9
Mechanical time constant (ms)(with brake)	2.54	2.02	1.52	1.16	0.95	0.91	0.79	1.46	1.37	1.29
Brake holding torque [Nt-m (min)] <sup>*2</sup>	10.0	10.0	10.0	25.0	55.0	55.0	55.0	115	115	10.0
Brake power consumption (at 20°C)[W]	19.0	19.0	19.0	20.4	19.9	19.9	19.9	28.8	28.8	19.0
Brake release time [ms (Max)]	10	10	10	10	10	10	10	10	10	10
Brake pull-in time [ms (Max)]	70	70	70	70	70	70	70	70	70	70
Vibration grade ( $\mu$ m)	15									
Operating temperature (°C)	0°C to 40°C									
Storage temperature (°C)	-10°C to 80°C									
Operating humidity	20 to 90%RH (non-condensing)									
Storage humidity	20 to 90%RH (non-condensing)									
Vibration capacity	2.5G									
IP Rating	IP65 (when waterproof connectors are used, or when an oil seal is used to be fitted to the rotating shaft (an oil seal model is used))									
Approvals										

\*1. Rate torque values are continuous permissible values at 0 ~ 40°C ambient temperature when attaching with the sizes of heatsinks listed below:

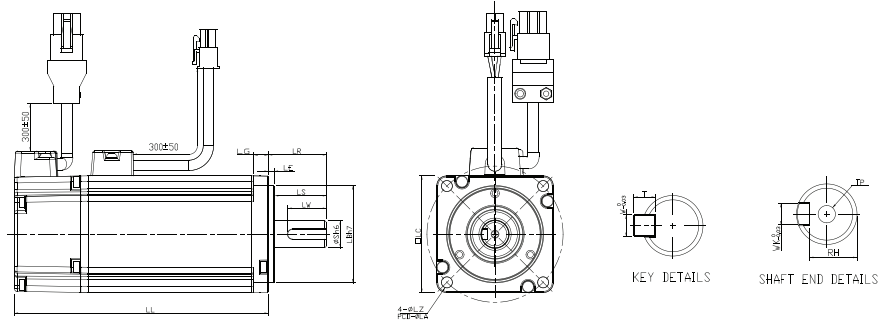
ECMA\_ \_ 08: 250 mm x 250 mm x 6 mm  
 ECMA\_ \_ 13: 400 mm x 400 mm x 20 mm  
 ECMA\_ \_ 18: 550 mm x 550 mm x 30 mm  
 ECMA\_ \_ 22: 650 mm x 650 mm x 35 mm  
 Material type : Aluminum – F80, F130, F180, F220

\*2. The holding brake is used to hold the motor shaft, not for braking the rotation. Never use it for decelerating or stopping the machine.

# Servo Motor Dimensions

## 220V Series

### Frame Size 86mm and below

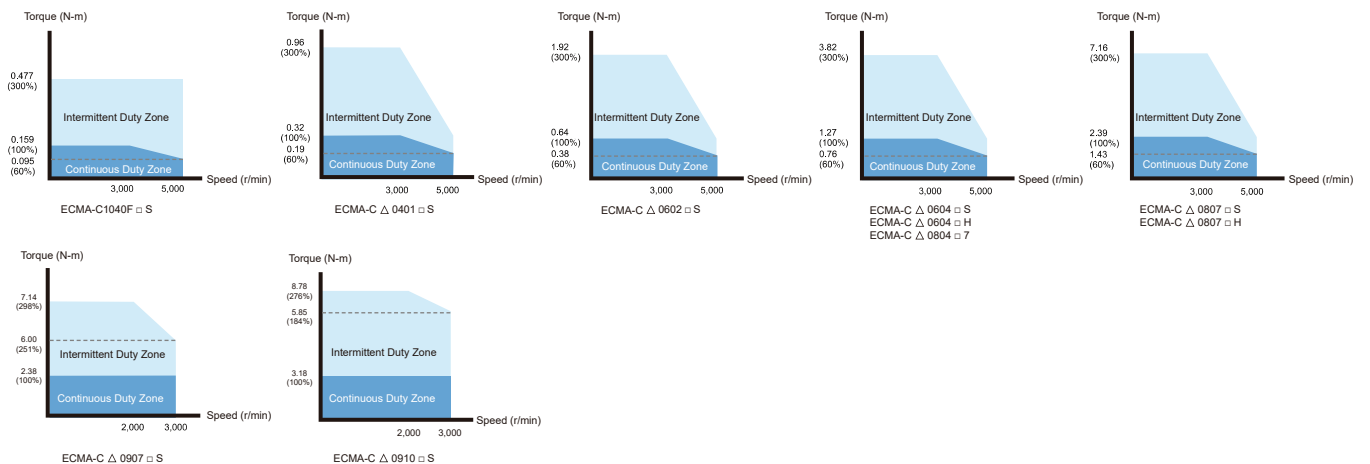


Units: mm

Model	C1040F □ S	C △ 0401 □ S	C △ 0602 □ S	C △ 0604 □ S	C △ 0604 □ H	C △ 0804 □ 7	C △ 0807 □ S	C △ 0807 □ H	C △ 0907 □ S	C △ 0910 □ S
<b>LC</b>	40	40	60	60	60	80	80	80	86	86
<b>LZ</b>	4.5	4.5	5.5	5.5	5.5	6.6	6.6	6.6	6.6	6.6
<b>LA</b>	46	46	70	70	70	90	90	90	100	100
<b>S</b>	8 (+0 / -0.009)	8 (+0 / -0.009)	14 (+0 / -0.011)	14 (+0 / -0.011)	14 (+0 / -0.011)	14 (+0 / -0.011)	19 (+0 / -0.013)	19 (+0 / -0.013)	16 (+0 / -0.011)	16 (+0 / -0.011)
<b>LB</b>	30 (+0 / -0.021)	30 (+0 / -0.021)	50 (+0 / -0.025)	50 (+0 / -0.025)	50 (+0 / -0.025)	70 (+0 / -0.030)	70 (+0 / -0.030)	70 (+0 / -0.030)	80 (+0 / -0.030)	80 (+0 / -0.030)
<b>LL ( without brake )</b>	79.1	100.6	105.5	130.7	145.8	112.3	138.3	154.8	130.2	153.2
<b>LL ( with brake )</b>	--	136.8	141.6	166.8	176.37	152.8	178	187.8	161.3	184.3
<b>LS</b>	20	20	27	27	27	27	32	32	30	30
<b>LR</b>	25	25	30	30	30	30	35	35	35	35
<b>LE</b>	2.5	2.5	3	3	3	3	3	3	3	3
<b>LG</b>	5	5	7.5	7.5	7.5	8	8	8	8	8
<b>LW</b>	16	16	20	20	20	20	25	25	20	20
<b>RH</b>	6.2	6.2	11	11	11	11	15.5	15.5	13	13
<b>WK</b>	3	3	5	5	5	5	6	6	5	5
<b>W</b>	3	3	5	5	5	5	6	6	5	5
<b>T</b>	3	3	5	5	5	5	6	6	5	5
<b>TP</b>	M3 Depth 8	M3 Depth 8	M4 Depth 15	M4 Depth 15	M4 Depth 15	M4 Depth 15	M6 Depth 20	M6 Depth 20	M5 Depth 15	M5 Depth 15

- NOTE**
- 1) Dimensions are in millimeters.
  - 2) Dimensions of the servo motors may be revised without prior notice.
  - 3) The boxes ( □ ) in the model names are for optional configurations(keyway, brake and oil seal).
  - 4) The boxes ( △ ) in the model names are for encoder resolution types. ( △ =1: Incremental encoder, 20-bit; △ =2: Incremental encoder, 17-bit; △ =A: Absolute type)

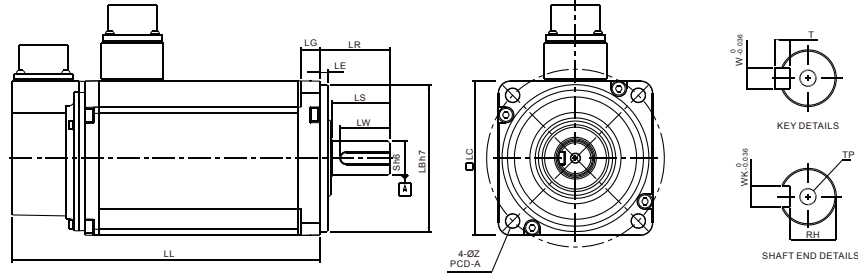
## Speed-Torque Curves (T-N Curves)





# 220V Series

## Frame Size 100mm and 130mm



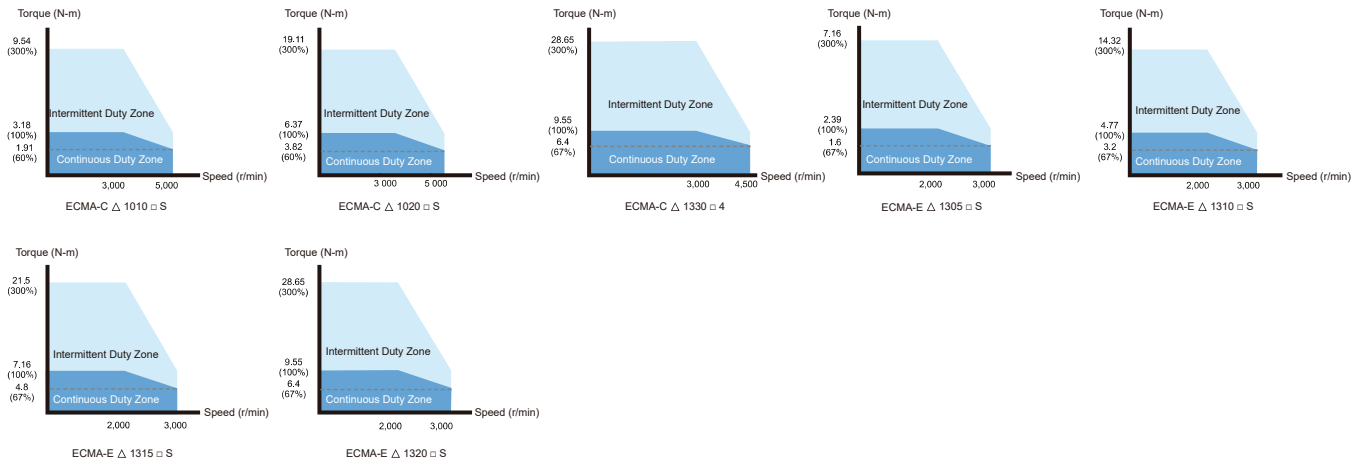
Units: mm

Model	C $\Delta$ 1010 $\square$ S	C $\Delta$ 1020 $\square$ S	C $\Delta$ 1330 $\square$ 4	E $\Delta$ 1305 $\square$ S	E $\Delta$ 1310 $\square$ S	E $\Delta$ 1315 $\square$ S	E $\Delta$ 1320 $\square$ S
LC	100	100	130	130	130	130	130
LZ	9	9	9	9	9	9	9
LA	115	115	145	145	145	145	145
S	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	24 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )
LB	95 ( $^{+0}_{-0.035}$ )	95 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )
LL ( without brake )	153.3	199	187.5	147.5	147.5	167.5	187.5
LL ( with brake )	192.5	226	216	183.5	183.5	202	216
LS	37	37	47	47	47	47	47
LR	45	45	55	55	55	55	55
LE	5	5	6	6	6	6	6
LG	12	12	11.5	11.5	11.5	11.5	11.5
LW	32	32	36	36	36	36	36
RH	18	18	20	18	18	18	18
WK	8	8	8	8	8	8	8
W	8	8	8	8	8	8	8
T	7	7	7	7	7	7	7
TP	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20



- 1) Dimensions are in millimeters.
- 2) Dimensions of the servo motors may be revised without prior notice.
- 3) The boxes (  $\square$  ) in the model names are for optional configurations(keyway, brake and oil seal).
- 4) The boxes (  $\Delta$  ) in the model names are for encoder resolution types. (  $\Delta$  =1: Incremental encoder, 20-bit;  $\Delta$  =2: Incremental encoder, 17-bit;  $\Delta$  =A: Absolute type)

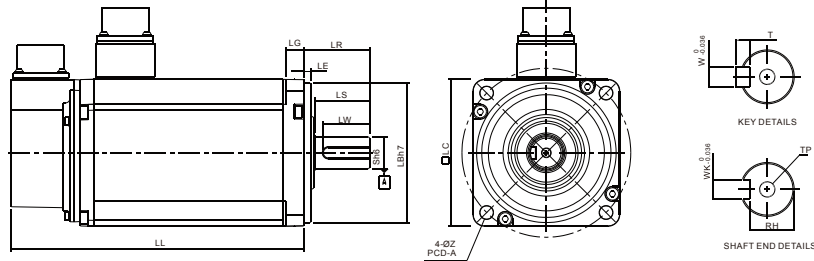
## Speed-Torque Curves (T-N Curves)



# Servo Motor Dimensions

## 220V Series

### Frame Size 100mm and 130mm

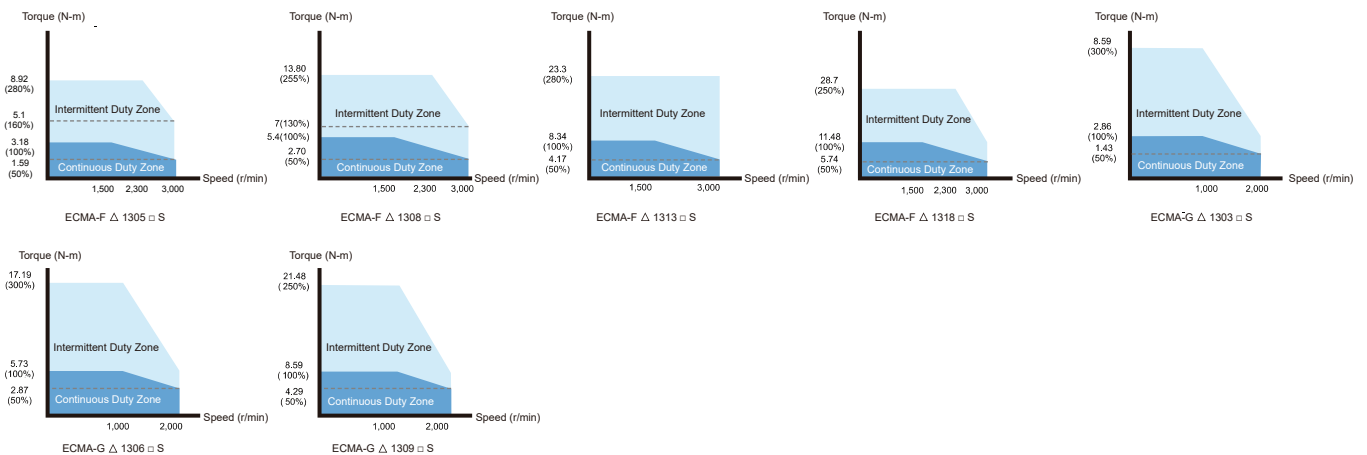


Units: mm

Model	F $\Delta$ 1305 $\square$ S	F $\Delta$ 1308 $\square$ S	F $\Delta$ 1313 $\square$ S	F $\Delta$ 1318 $\square$ S	G $\Delta$ 1303 $\square$ S	G $\Delta$ 1306 $\square$ S	G $\Delta$ 1309 $\square$ S
LC	130	130	130	130	130	130	130
LZ	9	9	9	9	9	9	9
LA	145	145	145	145	145	145	145
S	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )	22 ( $^{+0}_{-0.013}$ )
LB	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )
LL ( without brake )	139.5	147.5	187.5	202	147.5	147.5	163.5
LL ( with brake )	168	183.5	216	230.7	183.5	183.5	198
LS	47	47	47	47	47	47	47
LR	55	55	55	55	55	55	55
LE	6	6	6	6	6	6	6
LG	11.5	11.5	11.5	11.5	11.5	11.5	11.5
LW	36	36	36	36	36	36	36
RH	18	18	18	18	18	18	18
WK	8	8	8	8	8	8	8
W	8	8	8	8	8	8	8
T	7	7	7	7	7	7	7
TP	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20	M6 Depth 20

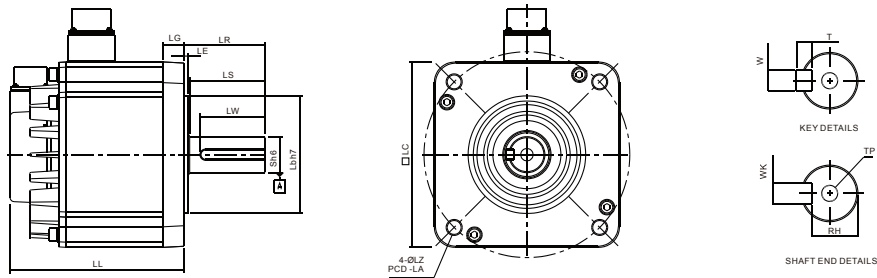
- NOTE**
- 1) Dimensions are in millimeters.
  - 2) Dimensions of the servo motors may be revised without prior notice.
  - 3) The boxes (  $\square$  ) in the model names are for optional configurations (keyway, brake and oil seal).
  - 4) The boxes (  $\Delta$  ) in the model names are for encoder resolution types. (  $\Delta$  =1: Incremental encoder, 20-bit;  $\Delta$  =2: Incremental encoder, 17-bit;  $\Delta$  =A: Absolute type)

## Speed-Torque Curves (T-N Curves)



## 220V Series

### Frame Size 180mm



Units: mm

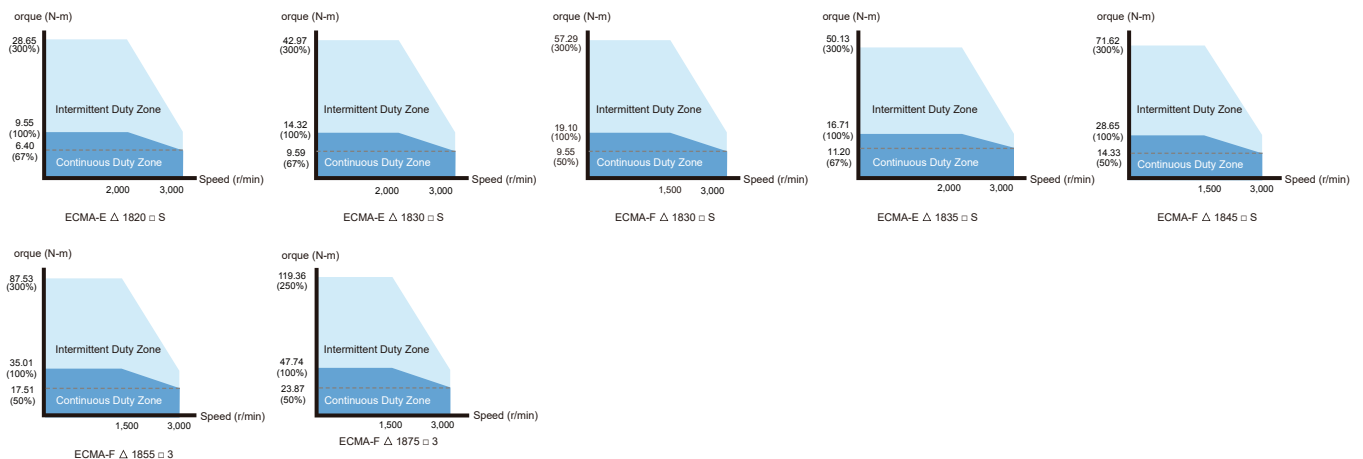
Model	E △ 1820 □ S	E △ 1830 □ S	E △ 1835 □ S	F △ 1845 □ S	F △ 1855 □ 3	F △ 1875 □ 3
LC	180	180	180	180	180	180
LZ	13.5	13.5	13.5	13.5	13.5	13.5
LA	200	200	200	200	200	200
S	35 (+0/-0.016)	35 (+0/-0.016)	35 (+0/-0.016)	35 (+0/-0.016)	42 (+0/-0.016)	42 (+0/-0.016)
LB	114.3 (+0/-0.035)	114.3 (+0/-0.035)	114.3 (+0/-0.035)	114.3 (+0/-0.035)	114.3 (+0/-0.035)	114.3 (+0/-0.035)
LL ( without brake )	169	202.1	202.1	235.3	279.7	342.0
LL ( with brake )	203.1	235.3	235.3	279.3	311.7	376.1
LS	73	73	73	73	108.5	108.5
LR	79	79	79	79	113	113
LE	4	4	4	4	4	4
LG	20	20	20	20	20	20
LW	63	63	63	63	90	90
RH	30	30	30	30	37	37
WK	10	10	10	10	12	12
W	10	10	10	10	12	12
T	8	8	8	8	8	8
TP	M12 Depth 25	M12 Depth 25	M12 Depth 25	M12 Depth 25	M16 Depth 32	M12 Depth 32



#### NOTE

- 1) Dimensions are in millimeters.
- 2) Dimensions of the servo motors may be revised without prior notice.
- 3) The boxes (□) in the model names are for optional configurations(keyway, brake and oil seal).
- 4) The boxes (△) in the model names are for encoder resolution types. (△=1: Incremental encoder, 20-bit; △=2: Incremental encoder, 17-bit; △=A: Absolute type)

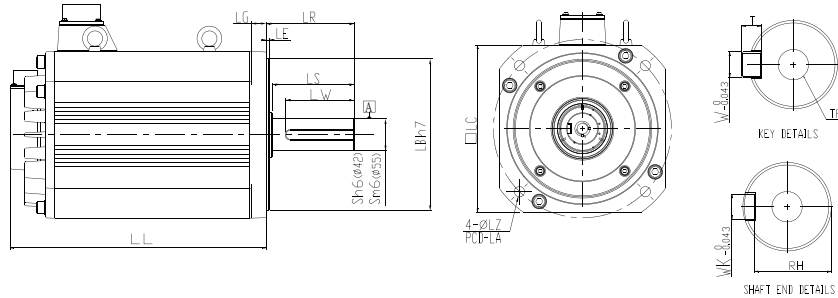
## Speed-Torque Curves (T-N Curves)



# Servo Motor Dimensions

## 220V / 400V Series

### Frame Size 220mm and above



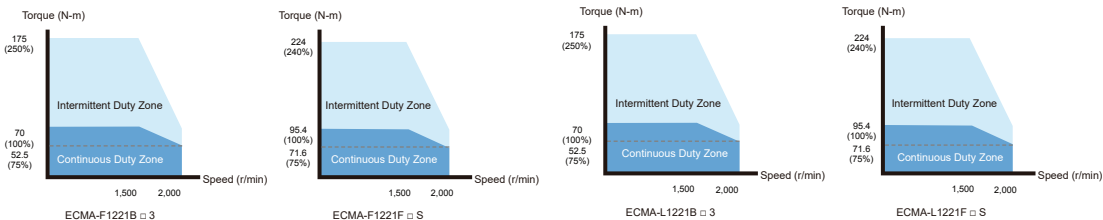
Units: mm

Model	F1221B □ 3	F1221F □ S	L1221B □ 3	L1221F □ S
LC	220	220	220	220
LZ	13.5	13.5	13.5	13.5
LA	235	235	235	235
S	42 (+0 -0.016)	55 (+0.03 -0.011)	42 (+0 -0.016)	55 (+0.03 -0.011)
LB	200 (+0 -0.046)	200 (+0 -0.046)	200 (+0 -0.046)	200 (+0 -0.046)
LL ( without brake )	371.4	453.4	371.4	450.4
LL ( with brake )	434.4	513.4	434.4	513.4
LS	108	108	110	110
LR	116	116	116	116
LE	4	4	4	4
LG	20	20	20	20
LW	90	90	90	90
RH	37	49	37	49
WK	12	16	12	16
W	12	16	12	16
T	8	10	8	10
TP	M16 Depth 32	M20 Depth 40	M16 Depth 32	M20 Depth 40



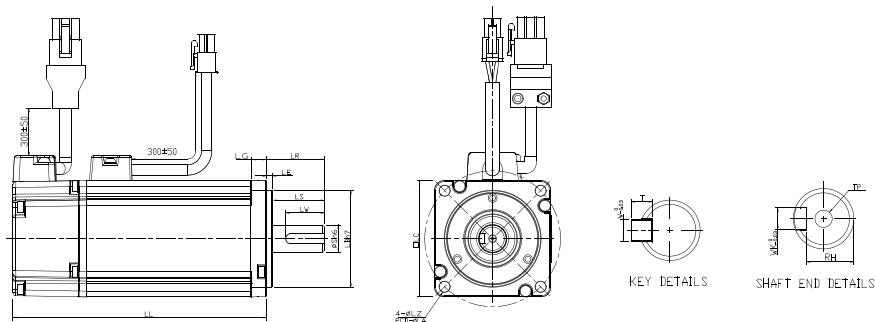
- 1) Dimensions are in millimeters.
- 2) Dimensions of the servo motors may be revised without prior notice.
- 3) The boxes ( □ ) in the model names are for optional configurations (keyway, brake and oil seal).

## Speed-Torque Curves (T-N Curves)



## 400V Series

### Frame Size 80mm and below



Units: mm

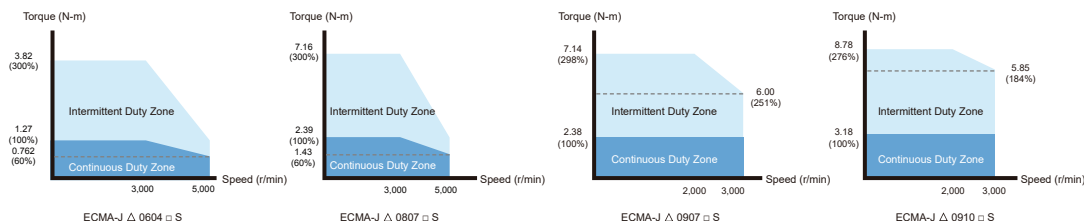
Model	J $\Delta$ 0604 $\square$ S	J $\Delta$ 0807 $\square$ S	J $\Delta$ 0907 $\square$ S	J $\Delta$ 0910 $\square$ S
LC	60	80	86	86
LZ	5.5	6.6	6.6	6.6
LA	70	90	100	100
S	14 <sup>(+0/-0.011)</sup>	19 <sup>(+0/-0.013)</sup>	16 <sup>(+0/-0.011)</sup>	16 <sup>(+0/-0.011)</sup>
LB	50 <sup>(+0/-0.025)</sup>	70 <sup>(+0/-0.030)</sup>	80 <sup>(+0/-0.030)</sup>	80 <sup>(+0/-0.030)</sup>
LL ( without brake )	130.7	138.3	130.2	153.2
LL ( with brake )	166.8	178	161.3	184.3
LS ( without oil seal )	27	32	30	30
LS ( with oil seal )	--	29.5	30	30
LR	30	35	35	35
LE	3	3	3	3
LG	7.5	8	8	8
LW	20	25	20	20
RH	11	15.5	13	13
WK	5	6	5	5
W	5	6	5	5
T	5	6	5	5
TP	M4 Depth 15	M6 Depth 20	M5 Depth 15	M5 Depth 15



#### NOTE

- 1) Dimensions are in millimeters.
- 2) Dimensions of the servo motors may be revised without prior notice.
- 3) The boxes ( $\square$ ) in the model names are for optional configurations (keyway, brake and oil seal).
- 4) The boxes ( $\Delta$ ) in the model names are for encoder resolution types ( $\Delta$  =1: Incremental encoder, 20-bit;  $\Delta$  =2: Incremental encoder, 17-bit);  $\Delta$  =A: Absolute type

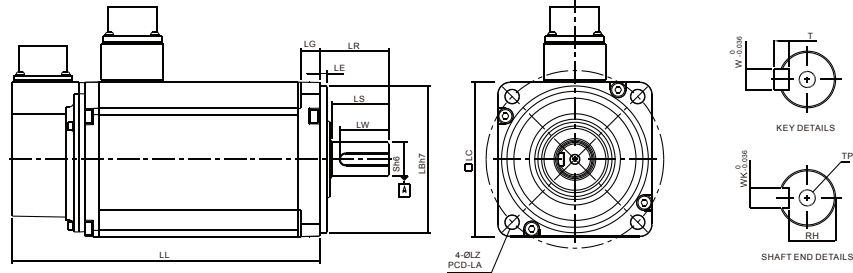
## Speed-Torque Curves (T-N Curves)



# Servo Motor Dimensions

## 400V Series

### Frame Size 100mm and 130mm

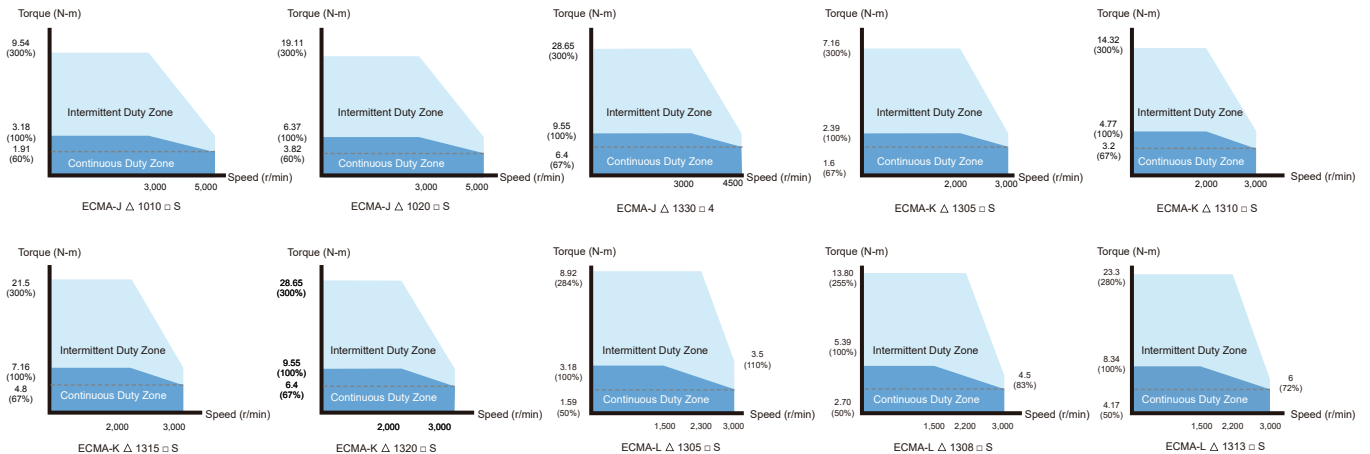


Units: mm

Model	J $\Delta$ 1010 $\square$ S	J $\Delta$ 1020 $\square$ S	J $\Delta$ 1330 $\square$ 4	K $\Delta$ 1305 $\square$ S	SK $\Delta$ 1310 $\square$ S	SK $\Delta$ 1315 $\square$ S	SK $\Delta$ 1320 $\square$ S	L $\Delta$ 1305 $\square$ S	L $\Delta$ 1308 $\square$ S	L $\Delta$ 1313 $\square$ S
LC	100	100	130	130	130	130	130	130	130	130
LZ	9	9	9	9	9	9	9	9	9	9
LA	115	115	145	145	145	145	145	145	145	145
S	22 (+0 / -0.013)	22 (+0 / -0.013)	24 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)	22 (+0 / -0.013)
LB	95 (+0 / -0.035)	95 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)	110 (+0 / -0.035)
LL ( without brake )	153.3	199	187.5	139.5	147.5	167.5	187.5	147.5	163.5	194.5
LL ( with brake )	192.5	226	216.0	168	183.5	202	216	168.0	181	223
LS	37	37	47	47	47	47	47	47	47	47
LR	45	45	55	55	55	55	55	55	55	55
LE	5	5	6	6	6	6	6	6	6	6
LG	12	12	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
LW	32	32	36	36	36	36	36	36	36	36
RH	18	18	20	18	18	18	18	18	18	18
WK	8	8	8	8	8	8	8	8	8	8
W	8	8	8	8	8	8	8	8	8	8
T	7	7	7	7	7	7	7	7	7	7
TP	MP6 Depth 20	MP6 Depth 20	MP6 Depth 20	MP6 Depth 20	MP6 Depth 20	MP6 Depth 20	MP6 Depth 20	M8 Depth 25	MP6 Depth 20	MP6 Depth 20

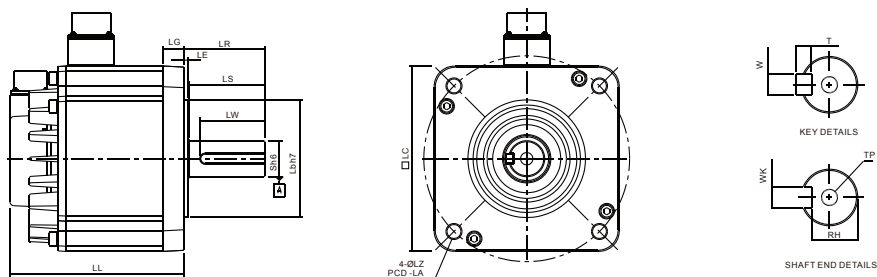
- NOTE**
- 1) Dimensions are in millimeters.
  - 2) Dimensions of the servo motors may be revised without prior notice.
  - 3) The boxes (  $\square$  ) in the model names are for optional configurations (keyway, brake and oil seal).
  - 4) The boxes (  $\Delta$  ) in the model names are for encoder resolution types (  $\Delta$  =1: Incremental encoder, 20-bit;  $\Delta$  =2: Incremental encoder, 17-bit);  $\Delta$  =A: Absolute type

## Speed-Torque Curves (T-N Curves)



## 400V Series

### Frame Size 180mm and above



Units: mm

Model	K $\Delta$ 1820 $\square$ S	L $\Delta$ 1830 $\square$ S	L $\Delta$ 1845 $\square$ S	L $\Delta$ 1855 $\square$ 3	L $\Delta$ 1875 $\square$ S	M $\Delta$ 1309 $\square$ S
LC	180	180	180	180	180	130
LZ	13.5	13.5	13.5	13.5	13.5	9
LA	200	200	200	200	200	145
S	35 ( $^{+0}_{-0.016}$ )	35 ( $^{+0}_{-0.016}$ )	35 ( $^{+0}_{-0.016}$ )	42 ( $^{+0}_{-0.016}$ )	42 ( $^{+0}_{-0.016}$ )	22 ( $^{+0}_{-0.013}$ )
LB	114.3 ( $^{+0}_{-0.035}$ )	114.3 ( $^{+0}_{-0.035}$ )	114.3 ( $^{+0}_{-0.035}$ )	114.3 ( $^{+0}_{-0.035}$ )	114.3 ( $^{+0}_{-0.035}$ )	110 ( $^{+0}_{-0.035}$ )
LL ( without brake )	169	202.1	235.3	279.7	342.0	163.5
LL ( with brake )	203.1	235.3	279.3	311.7	376.1	198
LS	73	73	73	108.5	108.5	47
LR	79	79	79	113	113	55
LE	4	4	4	4	4	6
LG	20	20	20	20	20	11.5
LW	63	63	63	90	90	36
RH	30	30	30	37	37	18
WK	10	10	10	12	12	8
W	10	10	10	12	12	8
T	8	8	8	8	8	7
TP	M12 Depth 25	M12 Depth 25	M12 Depth 25	M16 Depth 32	M16 Depth 32	M6 Depth 20



#### NOTE

- 1) Dimensions are in millimeters.
- 2) Dimensions of the servo motors may be revised without prior notice.
- 3) The boxes (  $\square$  ) in the model names are for optional configurations (keyway, brake and oil seal).
- 4) The boxes (  $\Delta$  ) in the model names are for encoder resolution types (  $\Delta$  =1: Incremental encoder, 20-bit;  $\Delta$  =2: Incremental encoder, 17-bit);  $\Delta$  =A: Absolute type

## Speed-Torque Curves (T-N Curves)

