

SW - SERIES

Wash Down Servo Motor
7" Frame

Motor Data (230V)

Performance Data (40 °C)	Symbol	Unit	M471-H	M473-B	M473-C	M474-A	M474-C
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	70.0 [7.91]	167.3 [18.91]	167.3 [18.91]	225.0 [25.42]	225.0 [25.42]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	9.80	10.00	12.60	8.41	17.70
Max. Continuous Power	P _{max}	HP [kW]	2.89 [2.16]	3.00 [2.24]	3.76 [2.80]	2.20 [1.64]	4.98 [3.72]
Torque @ Max. Power	T _p	lb-in [Nm]	55.2 [6.24]	135.1 [15.26]	135.4 [15.30]	173.3 [19.58]	179.4 [20.27]
Current @ Maximum Power	I _p	Amps (RMS)	9.70	9.00	11.34	7.57	15.94
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	3300	1400	1750	800	1750
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	3539	1671	2162	1081	2201
Maximum Current (RMS)	I _m	Amps (RMS)	39.20	40.00	50.38	33.64	70.84
Peak Torque	T _{pk}	lb-in [Nm]	210.0 [23.73]	501.9 [56.73]	501.9 [56.73]	675.0 [76.26]	675.0 [76.26]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.0151 [0.00171]	0.0454 [0.00513]	0.0454 [0.00513]	0.066 [0.0074]	0.0659 [0.0074]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	7.14 [0.81]	16.73 [1.89]	13.28 [1.50]	26.75 [3.02]	12.70 [1.43]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	58.78 [0.56]	124.47 [1.19]	96.19 [0.92]	192.37 [1.84]	94.50 [0.90]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	1.78	1.32	0.84	2.42	0.60
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	6.48	6.83	4.37	12.60	3.11
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	18486 [14548]	14728 [14258]	14728 [14258]	13657 [13353]	12895 [12139]
Thermal Time Constant [brake]	T _{th}	minute	35 [38]	40 [43]	40 [43]	45 [48]	45 [48]
Electrical Time Constant	T _e	msec	3.64	5.19	5.21	5.21	5.18
Mechanical Time Constant [brake]	T _m	msec	6.72 [8.54]	3.01 [3.11]	3.12 [3.22]	3.24 [3.32]	3.45 [3.67]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	25 [11.3]	50 [22.68]	50 [22.68]	60 [27.2]	60 [27.2]
Line Voltage	V	VAC	230	230	230	230	230

Performance Data (40 °C)	Symbol	Unit	M476-A	M476-B	M476-C	M477-A	M477-B
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	328.1 [37.07]	328.1 [37.07]	328.1 [37.07]	372.2 [42.06]	372.2 [42.06]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	12.26	18.40	25.66	14.31	20.45
Max. Continuous Power	P _{max}	HP [kW]	2.90 [2.16]	4.25 [3.17]	6.11 [4.56]	3.70 [2.76]	5.75 [4.29]
Torque @ Max. Power	T _p	lb-in [Nm]	243.7 [27.54]	232.9 [26.32]	226.5 [25.6]	335.0 [37.87]	315.1 [35.61]
Current @ Maximum Power	I _p	Amps (RMS)	11.03	16.56	23.10	12.88	18.41
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	750	1150	1700	750	1150
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	1081	1622	2234	1112	1589
Maximum Current (RMS)	I _m	Amps (RMS)	49.04	73.60	102.65	57.24	81.80
Peak Torque	T _{pk}	lb-in [Nm]	984.2 [111.21]	984.2 [111.21]	984.1 [111.21]	1116.7 [126.18]	1116.7 [126.18]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.0909 [0.010]	0.0909 [0.010]	0.0909 [0.010]	0.1060 [0.012]	0.1060 [0.012]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	26.76 [3.02]	17.83 [2.01]	12.78 [1.44]	26.01 [2.94]	18.20 [2.06]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	192.37 [1.84]	128.25 [1.22]	93.10 [0.89]	187.03 [1.79]	130.92 [1.25]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	1.36	0.56	0.35		0.51
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	8.04	3.58	2.04		3.15
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	14439 [14204]	14439 [14204]	14439 [13815]	14043 [13847]	14043 [13847]
Thermal Time Constant [brake]	T _{th}	minute	55 [58]	55 [58]	55 [58]	60 [63]	60 [63]
Electrical Time Constant	T _e	msec	5.91	10.21	5.83		6.16
Mechanical Time Constant [brake]	T _m	msec	2.51 [2.56]	1.46 [1.48]	2.73 [2.80]		2.38 [2.41]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	80 [36.3]	80 [36.3]	80 [36.3]	90 [40.8]	90 [40.8]
Line Voltage	V	VAC	230	230	230	230	230

Brake Information:

Fail safe, Electric release

Rated Holding Torque	T _s	lb-in [Nm]	354 [40]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.62
Inertia	J _b	lb-in-sec ² [kg-m ²]	0.0024 [0.00023]
Weight Adder	W	lb [kg]	7.2 [3.3]

Motor Data (230V)

Performance Data (40 °C)	Symbol	Unit	M477-C	M479-A	M479-B	M479-C
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	372.2 [42.06]	440.4 [49.76]	440.4 [49.76]	440.4 [49.76]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	28.95	16.46	26.34	35.00
Max. Continuous Power	P _{max}	HP [kW]	8.08 [6.03]	4.70 [3.51]	8.00 [5.97]	10.74 [8.01]
Torque @ Max. Power	T _p	lb-in [Nm]	339.7 [38.38]	410.2 [46.35]	310.0 [35.00]	410.2 [46.35]
Current @ Maximum Power	I _p	Amps (RMS)	26.06	14.81	23.71	31.50
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	1500	750	1250	1650
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	2222	1081	1730	2162
Maximum Current (RMS)	I _m	Amps (RMS)	115.81	65.84	105.38	140.00
Peak Torque	T _{pk}	lb-in [Nm]	1116.7 [126.18]	1321.2 [149.3]	1321.2 [149.3]	1321.2 [149.3]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.1060 [0.012]	0.1363 [0.0154]	0.1363 [0.0154]	0.1363 [0.0154]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	12.86 [1.45]	26.76 [3.02]	16.72 [1.89]	13.86 [1.57]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	93.60 [0.89]	192.37 [1.84]	120.23 [1.15]	96.20 [0.92]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	0.26		0.31	0.37
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	1.64		2.03	1.30
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	14043 [13520]	12922 [12545]	12922 [12545]	12922 [12545]
Thermal Time Constant [brake]	T _{th}	minute	60 [63]	70 [73]	70 [73]	70 [73]
Electrical Time Constant	T _e	msec	6.31		6.48	6.49
Mechanical Time Constant [brake]	T _m	msec	2.4 [2.49]		2.21 [2.24]	2.15 [2.17]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	90 [40.8]	110 [49.9]	110 [49.9]	110 [49.9]
Line Voltage	V	VAC	230	230	230	230

Brake Information:

Fail safe, Electric release

Rated Holding Torque	T _s	lb-in [Nm]	354 [40]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.62
Inertia	J _b	lb-in-sec ² [kg-m ²]	0.0024 [0.00023]
Weight Adder	W	lb [kg]	7.2 [3.3]

SW - SERIES

Wash Down Servo Motor
7" Frame

Motor Data (460V)

Performance Data (40 °C)	Symbol	Unit	M471-H	M473-B	M473-C	M474-A	M474-C
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	70.0 [7.91]	167.3 [18.91]	167.3 [18.91]	225.0 [25.42]	225.0 [25.42]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	4.90	5.00	6.30	4.21	8.85
Max. Continuous Power	P _{max}	HP [kW]	2.89 [2.16]	3.00 [2.24]	3.76 [2.80]	2.20 [1.64]	4.98 [3.72]
Torque @ Max. Power	T _p	lb-in [Nm]	55.2 [6.24]	135.1 [15.26]	135.4 [15.30]	173.3 [19.58]	179.4 [20.27]
Current @ Maximum Power	I _p	Amps (RMS)	4.85	4.50	5.67	3.79	7.53
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	3300	1400	1750	800	1750
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	3539	1671	2162	1081	2201
Maximum Current (RMS)	I _m	Amps (RMS)	19.60	20.00	25.19	16.82	35.40
Peak Torque	T _{pk}	lb-in [Nm]	210.0 [23.73]	501.9 [56.73]	501.9 [56.73]	675.0 [76.26]	675.0 [76.26]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.0151 [0.00171]	0.0454 [0.00513]	0.0454 [0.00513]	0.066 [0.0074]	0.0659 [0.0074]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	17.20 [1.94]	33.46 [3.78]	28.14 [3.18]	53.50 [6.04]	25.40 [2.86]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	117.56 [1.12]	248.94 [2.38]	192.38 [1.84]	384.74 [3.68]	189.00 [1.80]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	3.56	2.64	1.68	4.84	1.20
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	12.96	13.66	8.74	25.20	6.22
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	18486 [14548]	14728 [14258]	14728 [14258]	13657 [13353]	12895 [12139]
Thermal Time Constant [brake]	T _{th}	minute	35 [38]	40 [43]	40 [43]	45 [48]	45 [48]
Electrical Time Constant	T _e	msec	3.64	5.19	5.21	5.21	5.18
Mechanical Time Constant [brake]	T _m	msec	6.72 [8.54]	3.01 [3.11]	3.12 [3.22]	3.24 [3.32]	3.45 [3.67]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	25 [11.3]	50 [22.68]	50 [22.68]	60 [27.2]	60 [27.2]
Line Voltage	V	VAC	460	460	460	460	460

Performance Data (40 °C)	Symbol	Unit	M476-A	M476-B	M476-C	M477-A	M477-B
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	328.1 [37.07]	328.1 [37.07]	328.1 [37.07]	372.2 [42.06]	372.2 [42.06]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	6.13	9.20	12.83	7.16	10.23
Max. Continuous Power	P _{max}	HP [kW]	2.90 [2.16]	4.25 [3.17]	6.11 [4.56]	3.70 [2.76]	5.75 [4.29]
Torque @ Max. Power	T _p	lb-in [Nm]	243.7 [27.54]	232.9 [26.32]	226.5 [25.6]	335.0 [37.87]	315.1 [35.61]
Current @ Maximum Power	I _p	Amps (RMS)	5.52	8.28	11.55	4.61	9.21
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	750	1150	1700	1150	1150
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	1081	1622	2234	1589	1589
Maximum Current (RMS)	I _m	Amps (RMS)	24.52	36.80	51.33	20.45	40.90
Peak Torque	T _{pk}	lb-in [Nm]	984.2 [111.21]	984.2 [111.21]	984.1 [111.21]	1116.7 [126.18]	1116.7 [126.18]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.0909 [0.010]	0.0909 [0.010]	0.0909 [0.010]	0.1060 [0.012]	0.1060 [0.012]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	53.52 [6.04]	35.66 [4.02]	25.56 [2.88]	52.02 [5.88]	36.40 [4.12]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	384.74 [3.68]	256.50 [2.44]	186.20 [1.78]	374.06 [3.58]	261.84 [2.50]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	2.72	1.12	0.70	2.04	1.02
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	16.08	7.16	4.08	12.60	6.30
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	14439 [14204]	14439 [14204]	14439 [13815]	14043 [13847]	14043 [13847]
Thermal Time Constant [brake]	T _{th}	minute	55 [58]	55 [58]	55 [58]	60 [63]	60 [63]
Electrical Time Constant	T _e	msec	5.91	10.21	5.83	6.16	6.16
Mechanical Time Constant [brake]	T _m	msec	2.51 [2.56]	1.46 [1.48]	2.73 [2.80]	2.38 [2.41]	2.38 [2.41]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	80 [36.3]	80 [36.3]	80 [36.3]	90 [40.8]	90 [40.8]
Line Voltage	V	VAC	460	460	460	460	460

Brake Information:

		Fail safe, Electric release	
Rated Holding Torque	T _s	lb-in [Nm]	354 [40]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.62
Inertia	J _b	lb-in-sec ² [kg-m ²]	0.0024 [0.00023]
Weight Adder	W	lb [kg]	7.2 [3.3]

SW - SERIES

Wash Down Servo Motor
7" Frame

Motor Data (460V)

Performance Data (40 °C)	Symbol	Unit	M477-C	M479-A	M479-B	M479-C
Continuous Rated Torque (Stall)	T _c	lb-in [Nm]	372.2 [42.06]	440.0 [49.76]	440.0 [49.76]	440.0 [49.76]
Continuous Rated Current (RMS)	I _c	Amps (RMS)	14.48	8.23	14.40	17.50
Max. Continuous Power	P _{max}	HP [kW]	8.08 [6.03]	10.74 [8.01]	8.00 [5.97]	10.74 [8.01]
Torque @ Max. Power	T _p	lb-in [Nm]	339.7 [38.38]	396.58 [44.76]	310.0 [35.00]	410.2 [46.35]
Current @ Maximum Power	I _p	Amps (RMS)	13.03	7.41	11.86	15.75
Speed @ Max. Power (Amp. Dependent)	N _p	RPM	1500	750	1250	1650
Max. Continuous Speed (Amp. Dependent)	N _{max}	RPM	2222	1081	1730	2162
Maximum Current (RMS)	I _m	Amps (RMS)	57.91	32.92	57.60	70.00
Peak Torque	T _{pk}	lb-in [Nm]	1116.7 [126.18]	1321.2 [149.3]	1321.2 [149.3]	1321.2 [149.3]
Rotor Inertia	J _m	lb-in-sec ² [kg-m ²]	0.1060 [0.012]	0.1363 [0.0154]	0.1363 [0.0154]	0.1363 [0.0154]
Torque Constant (@ Max. Winding Temp.)	K _t	lb-in/Amps [Nm/Amp]	25.72 [2.90]	53.52 [6.04]	33.68 [3.80]	27.72 [3.14]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K _e	V/KRPM [V*Sec/Rad]	187.20 [1.78]	384.74 [3.68]	240.46 [2.30]	192.40 [1.84]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R _a	Ohm	0.52		0.62	0.74
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L _a	millihenry	3.28		4.06	2.60
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	14043 [13520]	12922 [12545]	12922 [12545]	12922 [12545]
Thermal Time Constant [brake]	T _{th}	minute	60 [63]	70 [73]	70 [73]	70 [73]
Electrical Time Constant	T _e	msec	6.31	6.49	6.48	6.49
Mechanical Time Constant [brake]	T _m	msec	2.4 [2.49]	2.15 [2.17]	2.21 [2.24]	2.15 [2.17]
Static Friction	T _f	lb-in [Nm]	10 [1.13]	10 [1.13]	10 [1.13]	10 [1.13]
Weight	W	lb [kg]	90 [40.8]	110 [49.9]	110 [49.9]	110 [49.9]
Line Voltage	V	VAC	460	460	460	460

Brake Information:

Fail safe, Electric release

Rated Holding Torque	T _s	lb-in [Nm]	354 [40]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.62
Inertia	J _b	lb-in-sec ² [kg-m ²]	0.0024 [0.00023]
Weight Adder	W	lb [kg]	7.2 [3.3]

SW - SERIES

Wash Down Servo Motor
7" Frame

Connection Data

Motor Connector PT02E-14-5P

PIN	AWG	FUNCTION
A	10	ØA
B	10	ØB
C	10	ØC
D	10	GROUND

Inc. Encoder Connector PT02E-14-18P

PIN	AWG	FUNCTION
X	24	+VDC
X	24	COMMON
X	24	OUTPUT A
X	24	OUTPUT A'
X	24	OUTPUT B
X	24	OUTPUT B'
X	24	OUTPUT Z
X	24	OUTPUT Z'
X	24	OUTPUT U
X	24	OUTPUT U'
X	24	OUTPUT V
X	24	OUTPUT V'
X	24	OUTPUT W
X	24	OUTPUT W'
X	24	CASE GND (NOT USED)
X	24	SHIELD
X	18	BRAKE (+) Optional
X	18	BRAKE (-) Optional
X	18	OTL
X	18	OTL

Abs. Encoder Connector PT02E-14-18P

PIN	AWG	FUNCTION
X	24	+VDC
X	24	COMMON
X	24	+SIN
X	24	REFSIN
X	24	+COS
X	24	REFCOS
X	24	DATA +
X	24	DATA -
X	24	SHIELD
X	18	BRAKE (+) Optional
X	18	BRAKE (-) Optional
X	18	OTL
X	18	OTL

Resolver Connector PT02E-14-18P

PIN	AWG	FUNCTION
A	24	R1 (+REF)
B	24	R2 (-REF)
C	24	S1 (+COSINE)
D	24	S3 (-COSINE)
N	24	S2 (+SINE)
P	24	S4 (-SINE)
R	24	SHIELD
G	18	BRAKE (+) Optional
H	18	BRAKE (-) Optional
E	18	OTL
F	18	OTL

SW - SERIES

Wash Down Servo Motor
7" Frame

Motor Dimensions

Model	"A"	"B"	"C"	"D"	"E"	"F"	"G"
M471	Ø 1.375	3.125	2.50	1.201	0.3125	1.00	0.13
	1.374						
	Ø 32.018						
M473	32.002	58	50 (captive)	26.79	9.985	25.4	4
	Ø 1.375						
	1.374						
M474	Ø 32.018	58	50 (captive)	26.79	9.985	25.4	4
	32.002						
	Ø 1.375						
M476	1.374	3.125	2.50	1.201	0.3125	1.00	0.13
	Ø 32.018						
	32.002						
M477	Ø 1.375	58	50 (captive)	26.79	9.985	25.4	4
	1.374						
	Ø 32.018						
	32.002						

Model	"H"	"J"	"K"	"L"	"L" w/BRAKE	M	N
M471	Ø 4.500	Ø0.531	Ø7.875	10.69	12.72	2.88	1.45
	4.498						
	Ø 180.014						
M473	179.989						
	Ø 4.500	Ø0.531	Ø7.875	13.69	15.72	2.88	1.45
	4.498						
M474	Ø 180.014						
	179.989	Ø0.531	Ø7.875	15.19	17.22	2.88	1.45
	Ø 4.500						
M476	4.498						
	Ø 180.014	Ø0.531	Ø7.875	18.19	20.22	2.88	1.45
	179.989						
M477	Ø 4.500						
	4.498	Ø0.531	Ø7.875	19.69	21.72	2.88	1.45
	Ø 180.014						
	179.989						

Model	"P"	"Q"	"R"	"S"	"T"	"U"	"V"
M471	Ø7.00	4.15	3.16	R0.42	Ø9.49	3/8-16 UC-2B 0.56 DEEP	Ø5.875
	Ø177.8					N.A.	N.A.
M473	Ø7.00	4.15	3.16	R0.42	Ø9.49	3/8-16 UC-2B 0.56 DEEP	Ø5.875
	Ø177.8					N.A.	N.A.
M474	Ø7.00	4.15	3.16	R0.42	Ø9.49	3/8-16 UC-2B 0.56 DEEP	Ø5.875
	Ø177.8					N.A.	N.A.
M476	Ø7.00	4.15	3.16	R0.42	Ø9.49	3/8-16 UC-2B 0.56 DEEP	Ø5.875
	Ø177.8					N.A.	N.A.
M477	Ø7.00	4.15	3.16	R0.42	Ø9.49	3/8-16 UC-2B 0.56 DEEP	Ø5.875
	Ø177.8					N.A.	N.A.