Applied Motion Products
404 Westridge Dr. • Watsonville, CA 95076
831/761-6555 • 800/525-1609 • FAX 831/761-6544
www.appliedmotionproducts.com

Si5580 Programmable Step Motor Drive

Si5580 Programmable Step Motor Drive



Features

- *Si™*, Si Command Language (SCL) or SiNet Hub programming languages included with drive
- AC input 110V or 220V switch selectable, 50-60 Hz
- DC bus voltage 75 VDC full load, 80 VDC nominal
- Software selectable motor current from 0.5 – 5.5 amps/phase
- Software selectable motor resolution from 2,000 to 50,800 steps per revolution
- Software selectable idle current reduction 0, 25%, 50% or 100%
- Eight optically isolated programmable inputs 5 – 24 VDC. 2,200 ohms internal resistance. Can be configured for sinking (NPN) or sourcing (PNP) signals.
- Three optically isolated programmable outputs 12 – 24 VDC, 100mA maximum
- One optically isolated output 5 VDC dedicated to fault out
- RS-232 for PC/MMI communications
- Over current and over temperature protection
- 440 watts of usable power
- Screw terminal connectors
- Dual, MOSFET H-bridge, 3 state, pulse width modulated amplifier switching at 20 – 30 KHz
- Ideal for 4, 6 or 8 leaded step motors NEMA sizes 23 & 34
- Optional Man Machine Interface (MMI) allows machine operator to enter specific motion parameters
- CE and TUV compliant

Description

The Si5580 is a programmable stepper drive/indexer packaged in a rugged steel case painted black with white epoxy silkscreen. Integral heat sink, mounting brackets, switch covers and connectors are included with each Si5580. The drive/indexer has been matched with twelve recommended NEMA 23 & 34 motors and comes with all operating software necessary to create a complete stepper motion solution.

The Si5580 includes Applied Motion Products', Microsoft Windows based, *Si™* software language for quick set up and ease of use. The *Si™* is ideal for standalone operation. For more experienced users, with software development expertise, the Si5580 also comes with Applied's Si Command Language (SCL) programming instruction set. SCL allows for control of the *Si™* drive from a host PC or PLC thus permitting the user to perform a variety of motion, I/O tasks and system status retrieval via the host.

Multiple axis applications are handled by our SiNet™ Hub Programmer, which gives you the ability to control up to 8 *Si™* drives, either stepper or servo on the same hub. Not only can you coordinate up to eight motors, the hub also has access to the inputs and outputs of all the drives, providing your program with up to 64 inputs and 24 outputs. You can also use Applied's MMI which allows the machine operator to enter specific motion commands.

Factory set to operate at 110-volt input; the Si5580 can be set by the user to operate at 220-volt input by a simply switch selection.

Pluggable screw terminal blocks are provided for the I/O, motor and AC power inputs. Mating connectors, programming cable with computer interface connector as well as all operating software are provided with each *Si™* drive.

The Si5580 is both CE and TUV compliant.

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Si5580 Technical Specifications

POWER AMPLIFIER (MOTOR DRIVE):

AMPLIFIER TYPE	MOSFET, dual H-Bridge.
CURRENT CONTROL	3 state, pulse width modulated, switching at 20–30 KHz.
OUTPUT CURRENT	0.5–5.5 amps, software selectable.
POWER SUPPLY	Linear, toroidal transformer based for high reliability and low noise. 110 or 220 VAC input, switch selectable. 50/60 Hz.
DC BUS VOLTAGE	DC voltage at nominal line voltage: 75 VDC full load, 90 VDC no load.
AC INPUT VOLTAGE	110 or 220 VAC (switch selectable) 50/60 Hz.
MAXIMUM OUTPUT POWER	440 watts.
IDLE CURRENT REDUCTION	0%, 25%, 50%, or 100% software selectable.
MOTOR RESOLUTION	13 resolutions. Steps per revolution with 1.8° motor: 2000, 5000, 10000, 12800, 18000, 20000, 21600, 25000, 25400, 25600, 36000, 50000, 50800, software selectable.
STATUS LED'S	AC power (red) Over Temperature (yellow) Over Current (yellow)

CONTROLLER (INDEXER) SECTION:

SERIAL COMMUNICATION	RS-232 programming port.
INPUTS	8 user programmable inputs. Can be used for triggering, sensing, homing, branching, jogging or limits, optically isolated 5-24 VDC.
OUTPUTS	3 general purpose, optically isolated 12–24 VDC outputs for interfacing to other equipment. Open collector and emitter. 100 mA max.
PARAMETER RANGES	Distance: 1 to 16,000,000 steps. Speed: .025 to 50 revolutions per second (in any microstep resolution). Acceleration: 1 to 3,000 rev/sec/sec. Deceleration: 1 to 3,000 rev/sec/sec (set independently from acceleration). Time Delays: 0.01 to 300 seconds. Output Pulse Widths: 2 to 500 milliseconds. Iterations per repeat loop: 1 to 65,535.
OPTIONAL OPERATOR INTERFACE (MMI)	NEMA 4/12 rated (splash proof & dust proof). 4 x 20 characters liquid crystal display (LCD)standard or backlit. 20 key membrane keypad. Overall size: 4.9 x 4.9 x 1.42 inches.

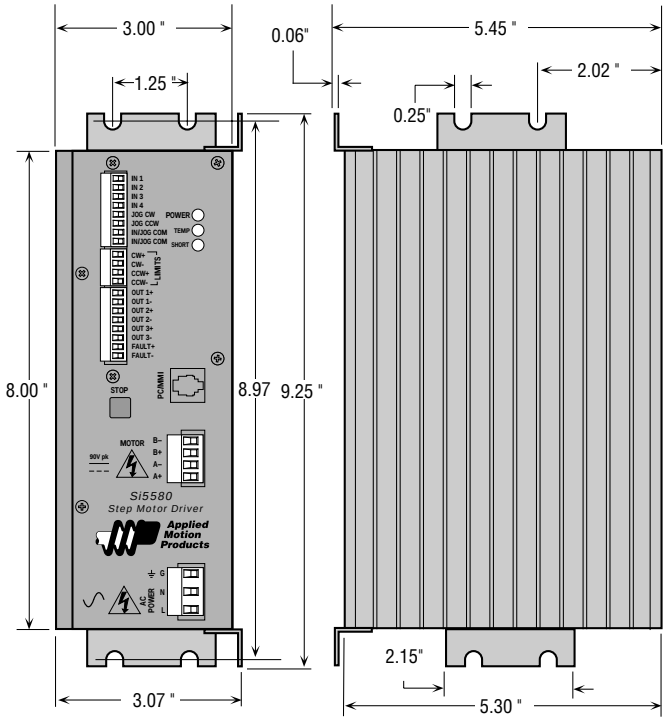
SYSTEM SPECIFICATIONS:

OVERALL SIZE	3.0 x 5.3 x 8.0 inches.
CHASSIS MATERIAL	Aluminum, black anodized with integral heat sink.
WEIGHT	7.8 lbs.
AMBIENT TEMPERATURE	0˚ to 50˚C (32˚ to 122˚F).
HUMIDITY	Maximum of 90% non-condensing.
CONNECTORS	Screw terminal connectors for input power and motor, and I/O signals.
MOTORS	Can drive 4, 6 or 8 lead motors, NEMA sizes 11, 14, 17, 23 & 34.
CASE	Steel with black paint and white epoxy silk screen. Includes switch covers.
AGENCY APPROVAL	CE & TUV.

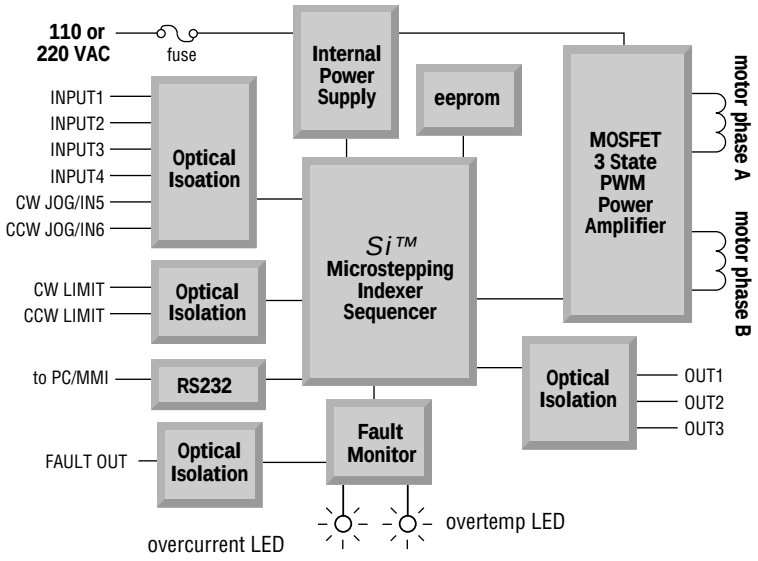
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Si5580 Technical Specifications

MECHANICAL OUTLINE

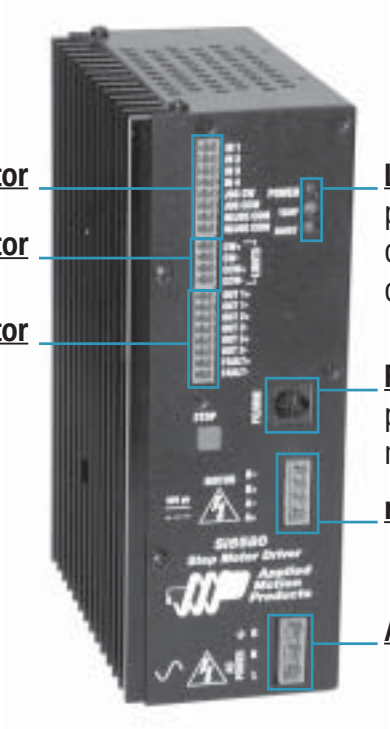


BLOCK DIAGRAM



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Si5580 Connectors and Switches



I/O

position no.	
1	in 1
2	in 2
3	in 3
4	in 4
5	jog cw
6	jog ccw
7	in/jog com
8	in /jog ccw
9	cw+
10	cw–
11	ccw+
12	ccw–
13	out 1+
14	out 1–
15	out 2+
16	out 2–
17	out 3+
18	out 3–
19	fault+
20	fault–

LIMITS

MOTOR

position no.	
1	B–
2	B+
3	A–
4	B+

AC POWER

position no.	
1	G
2	N
3	L

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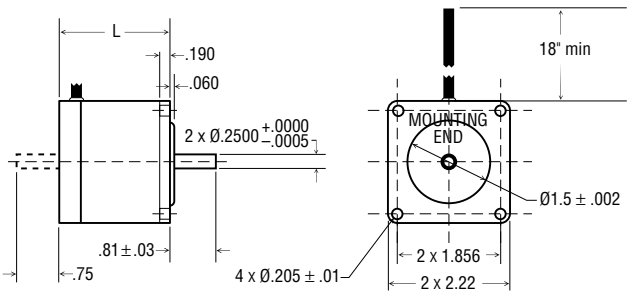
NEMA 23 Motor Data

FEATURES	RECOMMENDED MOTORS FOR Si5580					
Motor P/N:	23122	23123	23124	23395	23398	23401
Motor Current amps	2.00	2.50	3.50	4.24	4.24	4.24
Resistance Ohms	1.24	1.18	0.82	0.32	0.38	0.50
Holding Torque oz-in	98	158	225	77	177	264
Rotor Inertia oz-in^2	0.55	1.14	1.72	0.66	1.64	2.62
Bearings						
Thrust Load (lbs)	25	25	25	25	25	25
Radial Load (lbs)	15	15	15	15	15	15
Radial Play inch/lbs	.001 max @ 1 lb	.001 max @ 1 lb	.001 max @ 1 lb	.001 max @ 1 lb	.001 max @ 1 lb	.001 max @ 1 lb
End Play inch/lbs	.001 max @ 9 lbs	.001 max @ 9 lbs	.001 max @ 9 lbs	.003 max @ 2.2 lbs	.003 max @ 2.2 lbs	.003 max @ 2.2 lbs
Weight lbs.	1.17	2.00	2.80	1.00	1.54	2.20

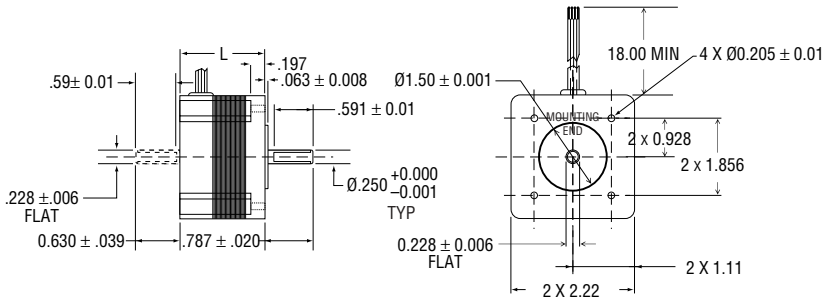
Motor current, resistance and torque ratings are with parallel connection

NEMA 23 Motor Dimensions

Model	L
23122	2.00″
23123	3.00″
23124	4.00″



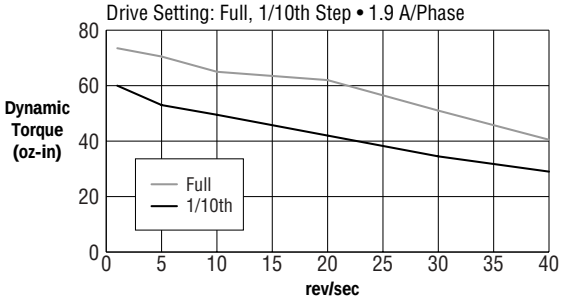
Model	L
23395	1.54″
23398	2.13″
23401	2.99″



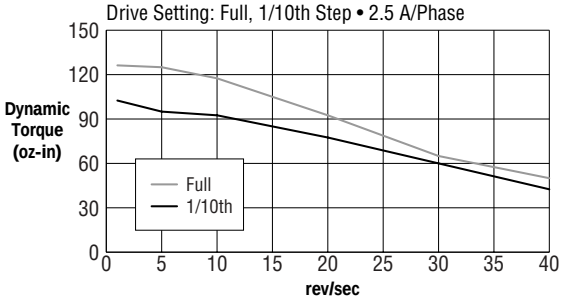
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Torque Curves
Si5580 with NEMA 23 Step Motors

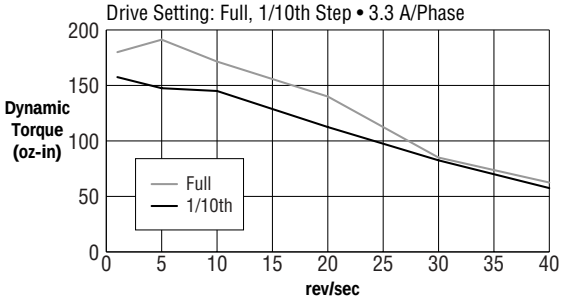
23122 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 1.9 A/Phase



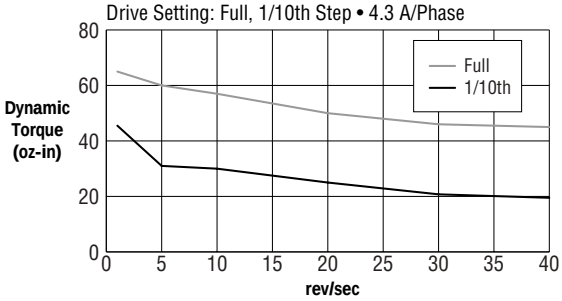
23123 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 2.5 A/Phase



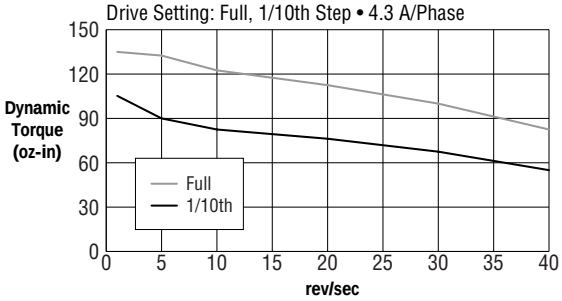
23124 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 3.3 A/Phase



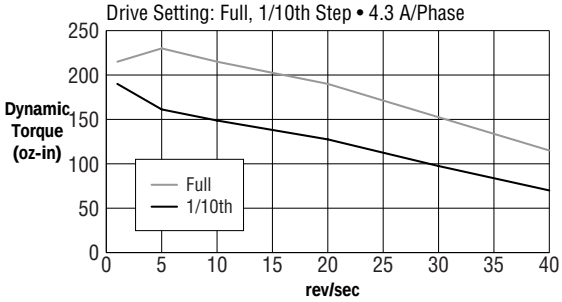
23395 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 4.3 A/Phase



23398 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 4.3 A/Phase



23401 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 4.3 A/Phase



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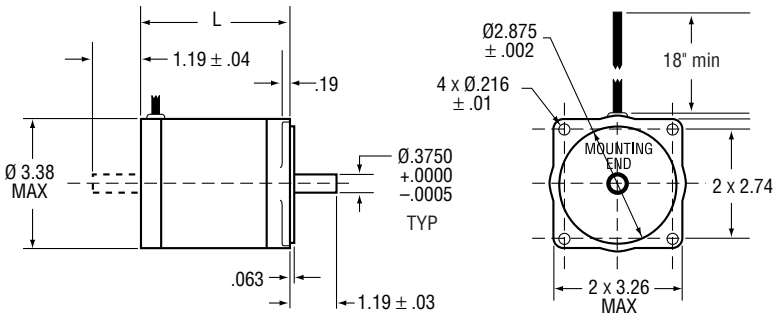
NEMA 34 Motor Data

FEATURES	RECOMMENDED MOTORS FOR Si5580					
Motor P/N:	34348	34349	34350	34474	34476	34478
Motor Current amps	4.84	7.07	8.34	6.35	6.35	5.64
Resistance Ohms	0.30	0.25	0.20	0.24	1.50	0.49
Holding Torque oz-in	212	424	636	389	861	1292
Rotor Inertia oz-in^2	3.66	6.72	10.20	7.65	14.80	21.90
Bearings						
Thrust Load (lbs)	50	50	50	35	35	35
Radial Load (lbs)	25	25	25	30	30	30
Radial Play inch/lbs	.001 max @ 1 lb	.001 max @ 1 lb	.001 max @ 1 lb	.0008 max @ 1 lb	.0008 max @ 1 lb	.0008 max @ 1 lb
End Play inch/lbs	.001 max @ 15 lbs	.001 max @ 15 lbs	.001 max @ 15 lbs	.003 max @ 1 lbs	.003 max @ 1 lbs	.003 max @ 1 lbs
Weight lbs.	3.00	5.40	7.70	3.86	6.18	8.66

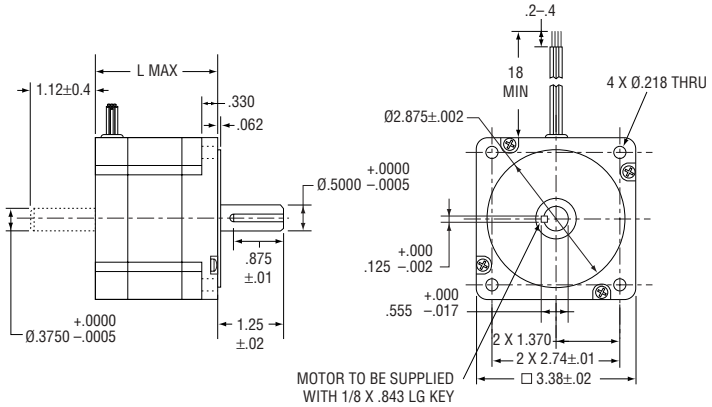
Motor current, resistance and torque ratings are with parallel connection

NEMA 34 Motor Dimensions

Model	L
34348	2.50″
34349	3.70″
34350	5.10″



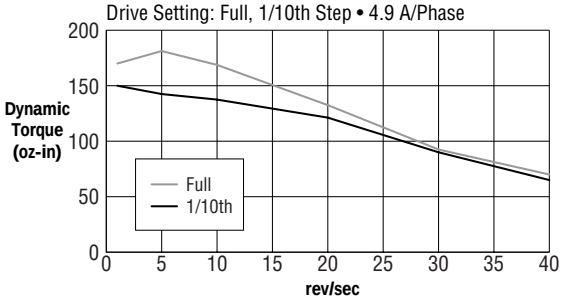
Model	L
34474	2.60″
34476	3.78″
34478	4.96″



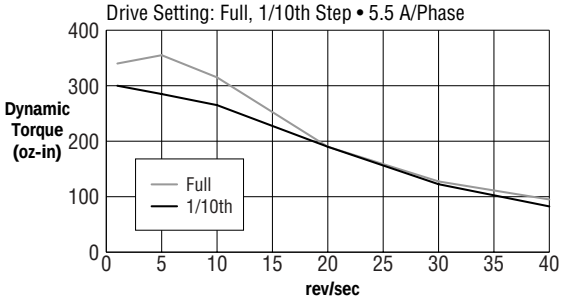
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Torque Curves
Si5580 with NEMA 34 Step Motors

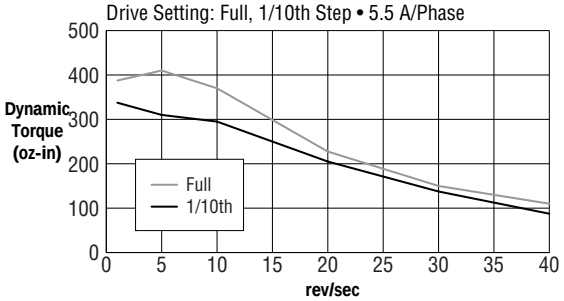
34348 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 4.9 A/Phase



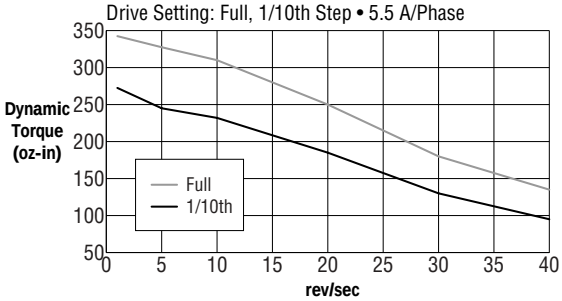
34349 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 5.5 A/Phase



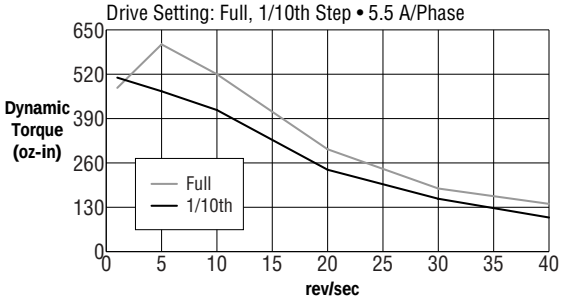
34350 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 5.5 A/Phase



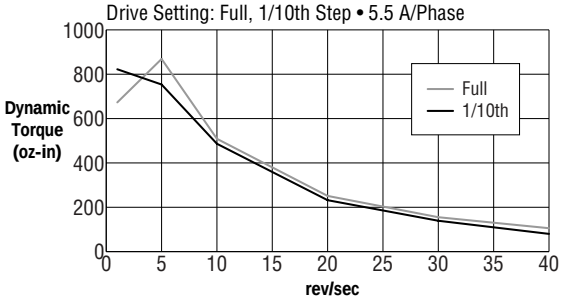
34474 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 5.5 A/Phase



34476 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 5.5 A/Phase



34478 MOTOR
Motor Connection: Parallel
Drive Setting: Full, 1/10th Step • 5.5 A/Phase



Si5580 Ordering Information

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COMPLETE SYSTEM ORDERING

Drive Type	Motor System Number	Step Motor Description
PDO 5580	23122	NEMA 23 one stack
Si5580	23123	NEMA 23 two stack
	23124	NEMA 23 three stack
	23395	NEMA 23 high torque one stack
	23398	NEMA 23 high torque two stack
	23401	NEMA 23 high torque three stack
	34348	NEMA 34 one stack
	34349	NEMA 34 two stack
	34350	NEMA 34 three stack
	34474	NEMA 34 high torque one stack
	34476	NEMA 34 high torque two stack
	34478	NEMA 34 high torque three stack

System Ordering Example: Si5580 - 23122

DRIVE ONLY ORDERING

Drive Type	Description
PDO 5580	Packaged 5.5 amps, 80 VDC, 110/220 VAC input. Microstepping pulse & direction/oscillator drive.
Si5580	Packaged 5.5 amps, 80 VDC, 110/220 VAC input. Microstepping fully programmable drive/indexer with *Si™* software.

OPTIONAL ACCESSORIES

Type	Description
MMI-01	Standard man-machine interface.
MMI-02	Man-machine interface with backlit display.