

ACSI ACTUATOR CONTROL SOLUTIONS INTEGRATED SERVO MOTOR/DRIVE/CONTROLLER



ACSI – Motor/Drive/Controller

WHAT IS THE ACSI?

The ACSI is an extremely easy-to-use integrated servo motor / drive / controller developed specifically to be used with electric actuators. Simply select the configured Tolomatic actuator in the software to automatically set-up most of the necessary parameters to create motion in the desired linear units (mm or inch) or revs.



BASIC CAPABILITIES:

- Operation Modes
 - » 4 configurable move commands (absolute, incremental, jog, velocity or home move types) with motion commanded via digital inputs.
 - » Analog input positioning mode (0-10Vdc or 4-20mA)
 - » Analog output echoing actuator position
 - » Pneumatic mode replaces pneumatic valve operation for simple motion
- Adjustable motion profile parameters. Position, velocity, accel, decel, force parameters are independently configurable for all moves.
- Force limiting
- Zone output based on position
- Configurable digital I/O (24Vdc Opto-Isolated, sourcing or sinking)
- USB configuration port

ETHERNET OPTION: EtherNet/IP, PROFINET, EtherCAT & Modbus TCP protocols

- Dual port with internal switch for daisy chaining
- Infinite positioning

EtherNet/IP™

- Rockwell Automation Add-On-Profiles & Add-On-Instructions
- ODVA conformant - Plugfest certified
- CIP I/O commands (assembly object)
- Device level ring (DLR) compatible



- Siemens Data Blocks & Function Blocks
- GSDML file
- PI certified

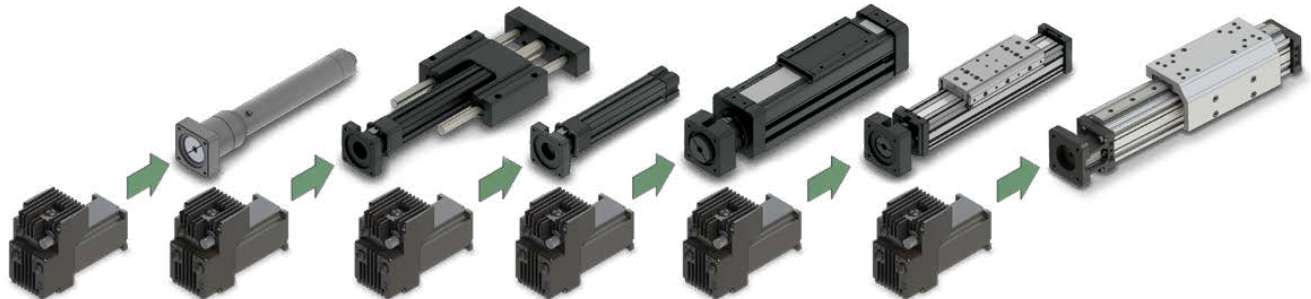


EtherCAT®

- Beckhoff TwinCAT 3.1 Library
- Beckhoff TwinCAT Sample code
- I/O commands



SMART ACTUATION SOLUTIONS COST EFFECTIVELY AUTOMATE ADDITIONAL AXES OF MOTION



- Single Source – assembled, configured, tuned and tested as a complete motion axis
- Easy integration reduces commissioning and start-up time
- Flexible Ethernet control for most PLCs/Controllers
- Integrated technology provides compact design & minimizes cabinet space requirements
- Saves cost by reducing cabling, wiring & installation time
- Compatible 10-60 Vdc power input utilizes existing machine power supplies

ACSI – Features

DIGITAL I/O

- 24 VDC Digital I/O control for flexible easy operating modes
- Opto-isolated

ANALOG IN/OUT

- 0-10VDC or
- 4-20 mA

DUAL ETHERNET PORTS

- Supports Star, Daisy Chain and Ring Topologies



ETHERNET/IP

- AOP: Add on profile
- AOI: Add on Instructions
- DLR: Device Level Ring

PROFINET



MODBUS TCP



INPUT SUPPLY

- 10 VDC to 60 VDC
- Logic & Drive Power

M12 CONNECTORS

- Industry standard connectors

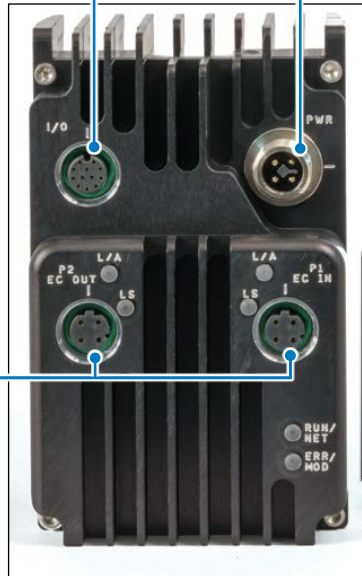
USB CONFIGURATION PORT

QUALITY TESTED

- Each ACSI is performance tested at Tolomatic before shipping
- Mounted, configured and tested on Tolomatic electric actuators

IP65

Protected against dust and low pressure water jets, limited ingress



VIBRATION & SHOCK TESTED

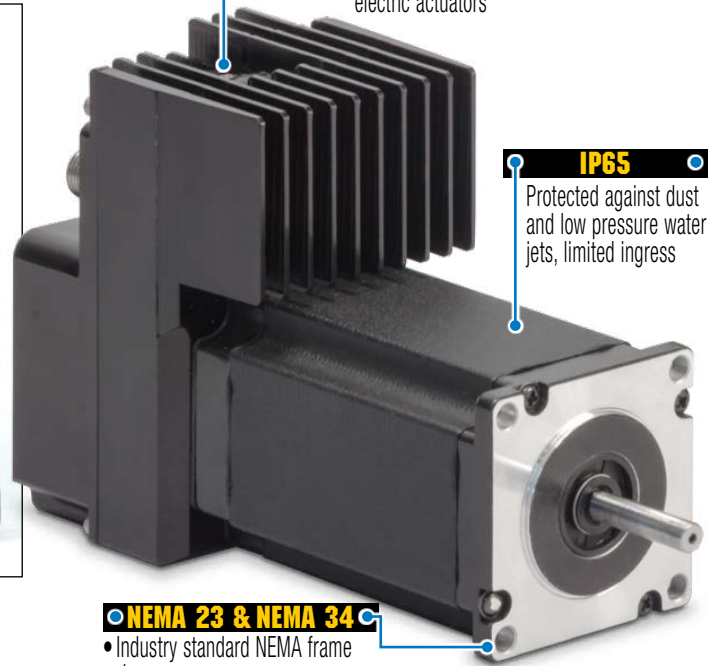
- 2 brms, 5- 500 Hz, 2 G, 3-axis, 1 hr
- 20 bpeak, half sine, 11 ms, 3-axis

ETHERCAT



NEMA 23 & NEMA 34

- Industry standard NEMA frame sizes



EASY TO USE CONFIGURATION SOFTWARE

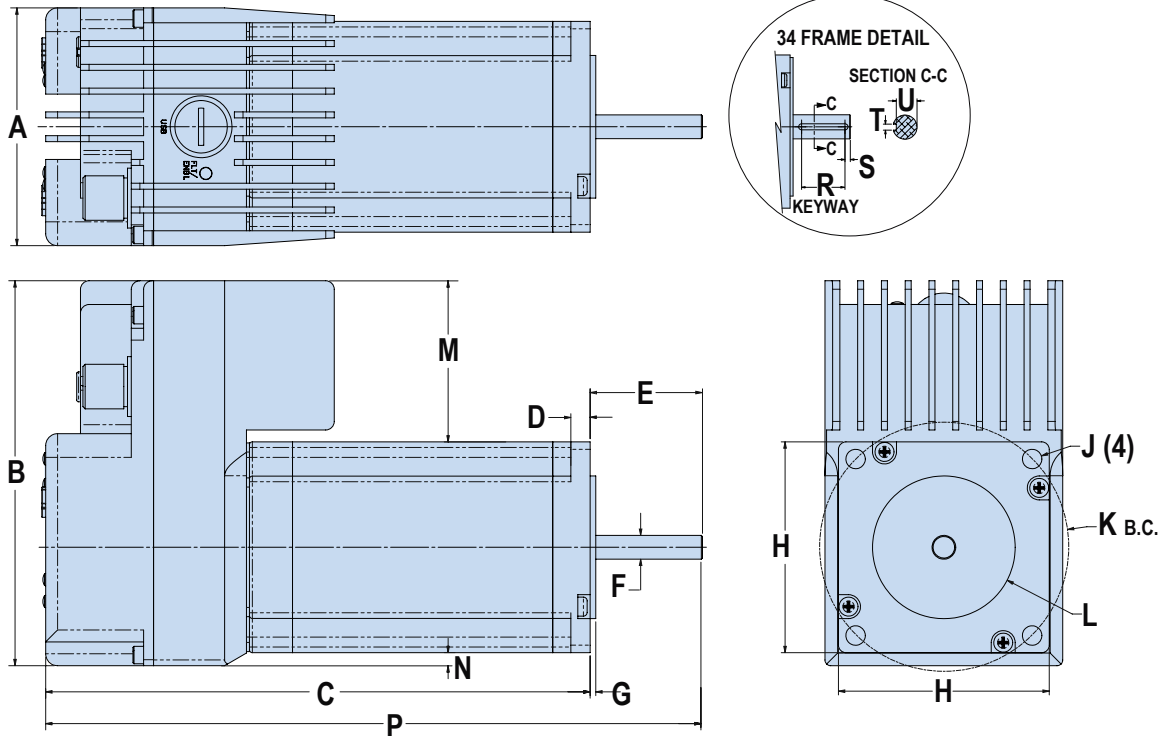
Windows® compliant

| Label | Move Type | Position (in) | Velocity (in/sec) | Accel (in/sec ²) | Decel (in/sec ²) | Force (%) |
|---------------|-----------|---------------|-------------------|------------------------------|------------------------------|-----------|
| 1 MOVE1 | Absolute | 1.000 | 1.00 | 100.0 | 100.0 | 100.0 |
| 2 MOVE2 | Absolute | 2.000 | 2.00 | 90.0 | 90.0 | 90.0 |
| 3 MOVE3 | Absolute | 3.000 | 3.00 | 80.0 | 80.0 | 80.0 |
| 4 MOVE4 | Absolute | 4.000 | 4.00 | 70.0 | 70.0 | 70.0 |
| 5 | IncPos | 0.250 | 1.00 | 100.0 | 100.0 | 100.0 |
| 6 | IncPos | 0.500 | 1.00 | 100.0 | 100.0 | 100.0 |
| 7 | IncNeg | 0.250 | 1.00 | 100.0 | 100.0 | 100.0 |
| 8 | IncNeg | 0.500 | 1.00 | 100.0 | 100.0 | 100.0 |
| 9 FASTJOGPOS | JogPos | 0.000 | 4.00 | 100.0 | 100.0 | 100.0 |
| 10 SLOWJOGPOS | JogPos | 0.000 | 1.00 | 100.0 | 100.0 | 100.0 |
| 11 FASTJOGNEG | JogNeg | 0.000 | 4.00 | 100.0 | 100.0 | 100.0 |
| 12 SLOWJOGNEG | JogNeg | 0.000 | 1.00 | 100.0 | 100.0 | 100.0 |
| 13 | Absolute | 1.500 | 1.00 | 110.0 | 110.0 | 70.0 |
| 14 | Absolute | 2.500 | 2.00 | 120.0 | 120.0 | 90.0 |
| 15 | Absolute | 3.500 | 3.00 | 130.0 | 130.0 | 80.0 |
| 16 | Absolute | 4.500 | 4.00 | 140.0 | 140.0 | 70.0 |

ACSI – Motor/Drive/Controller

DIMENSIONS  3D CAD available at www.tolomatic.com

ACSI SERVO MOTOR / DRIVE / CONTROLLER DIMENSIONS



| | 23 (C1) | 23 (C2) | 34 (D1) | 34 (D2) |
|---|---------|---------|----------------------------|----------------------------|
| A | 63.5 | 63.5 | 63.5 | 63.5 |
| B | 102.8 | 102.8 | 113.9 | 113.9 |
| C | 145.4 | 145.4 | 150.4 | 180.4 |
| D | 5.2 | 5.2 | 10 | 10 |
| E | 22.86 | 22.86 | 31.8 | 31.8 |
| F | 6.35 | 6.35 | 12.7 | 12.7 |
| G | 1.5 | 1.5 | 1.6 | 1.6 |
| H | 56.3 | 56.3 | 85.8 | 85.8 |
| J | 5.2 | 5.2 | 5.5 | 5.5 |
| K | 66.68 | 66.68 | 98.43 | 98.43 |
| L | 38.1 | 38.1 | 73.03 | 73.03 |
| M | 43.1 | 43.1 | 28.3 | 28.3 |
| N | 3.5 | 3.5 | 0 | 0 |
| P | 168.26 | 168.26 | 182.2 | 182.2 |
| R | - | - | 22.9 | 22.9 |
| S | - | - | 2.79 | 2.79 |
| T | - | - | 3.18 (+0.05, -0.00) | 3.18 (+0.05, -0.00) |
| U | - | - | 10.92 (+0.00, -0.38) | 10.92 (+0.00, -0.38) |

Dimensions in millimeters

| | 23 (C1) | 23 (C2) | 34 (D1) | 34 (D2) |
|---|---------|---------|-----------------------------|-----------------------------|
| A | 2.5 | 2.5 | 2.5 | 2.5 |
| B | 4.05 | 4.05 | 4.49 | 4.49 |
| C | 5.73 | 5.73 | 5.92 | 7.1 |
| D | 0.2 | 0.2 | 0.39 | 0.39 |
| E | 0.9 | 0.9 | 1.25 | 1.25 |
| F | 0.25 | 0.25 | 0.5 | 0.5 |
| G | 0.059 | 0.059 | 0.063 | 0.063 |
| H | 2.22 | 2.22 | 3.38 | 3.38 |
| J | 0.2 | 0.2 | 0.22 | 0.22 |
| K | 2.625 | 2.625 | 3.875 | 3.875 |
| L | 1.5 | 1.5 | 2.875 | 2.875 |
| M | 1.7 | 1.7 | 1.11 | 1.11 |
| N | 0.14 | 0.14 | 0 | 0 |
| P | 6.63 | 6.63 | 7.17 | 7.17 |
| R | - | - | 0.9 | 0.9 |
| S | - | - | 0.11 | 0.11 |
| T | - | - | 0.125 (+0.002, -0.00) | 0.125 (+0.002, -0.00) |
| U | - | - | 0.430 (+0.00, -0.38) | 0.430 (+0.00, -0.38) |

Dimensions in Inches

ACSI – Motor/Drive/Controller

ACSI SPECIFICATIONS

| OPERATING POWER | |
|--------------------------|-----------|
| Voltage Nominal | 10V - 60V |
| Over Voltage | 65V |
| Under Voltage | 9V |
| Absolute Maximum Voltage | 70V |
| Logic Current Draw (24V) | <200 mA |

| OPERATING CONDITIONS | |
|-----------------------|------------------------|
| Ambient Temperature | 25°C, 77°F Nominal |
| Operating Temperature | 0 - 40°C, 32 - 104°F |
| Storage Temperature | 0-70°C, 32-158°F |
| Humidity | 0 - 90% non-condensing |

See ACSI Hardware and Installation Guide (#3604-4185) for more details.

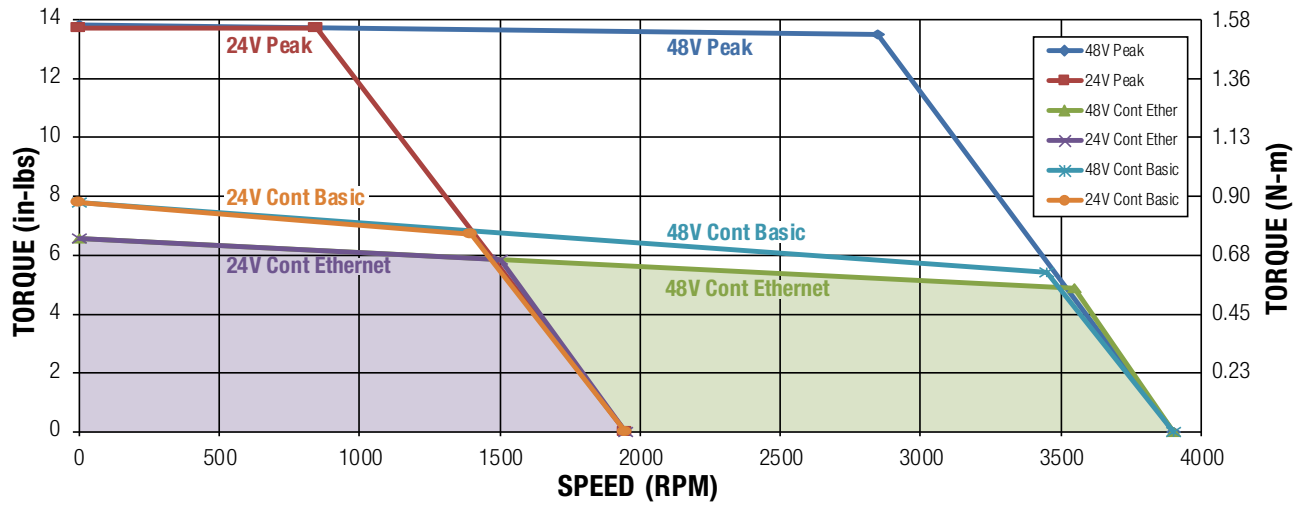
| | NEMA 23 (C1) | | NEMA 23 (C2) | | NEMA 34 (D1) | | NEMA 34 (D2) | |
|---------------------------------|--|--------------------------|--|--------------------------|--|---------------------------|--|-------------------------|
| | Basic | Ethernet | Basic | Ethernet | Basic | Ethernet | Basic | Ethernet |
| Cont. Torque | 0.61 N-m (5.4 in-lbs) | 0.55 N-m (4.9 in-lbs) | 0.38 N-m (3.375 in-lbs) | 0.34 N-m (3.0 in-lbs) | 1.53 N-m (13.6 in-lbs) | 1.32 N-m (12.0 in-lbs) | 3.28 N-m (29.0 in-lbs) | 2.82 N-m (25 in-lbs) |
| Max. Cont. Current | 11.46 Amps | 9.6 Amps | 7.7 Amps | 7.0 Amps | 12.7 Amps | 11.37 Amps | 7.0 Amps | 6.2 Amps |
| Peak Torque | 1.56 N-m (13.8 in-lbs) | | 0.99 N-m (8.75 in-lbs) | | 2.82 N-m (25.0 in-lbs) | | 5.88 N-m (52 in-lbs) | |
| Max. Peak Current | 20 Amps | | 20 Amps | | 20 Amps | | 12.72 Amps | |
| Rated Speed* | 3500 RPM | | 5800 RPM | | 1750 RPM | | 450 RPM | |
| Max. Speed* | 3850 RPM | | 6350 RPM | | 2050 RPM | | 650 RPM | |
| KT | 0.09 N-m/Arms (0.836 in-lbs/Arms) | | 0.07 N-m/Arms (0.59 in-lbs/Arms) | | 0.16 N-m/Arms (1.39 in-lbs/Arms) | | 0.573 N-m/Arms (5.07 in-lbs/Arms) | |
| KE | 10 V/kRPM | | 7.059 V/kRPM | | 16.55 V/kRPM | | 60 V/kRPM | |
| Rotor Inertia | 0.220 kg-cm ² (0.075 lb-in ²) | | 0.220 kg-cm ² (0.075 lb-in ²) | | 1.600 kg-cm ² (0.546 lb-in ²) | | 2.4 kg-cm ² (0.820 lb-in ²) | |
| Shaft Max. Radial Load** | 115 N (25.85 lb) | | 116 N (25.85 lb) | | 220 N (49.46 lb) | | 221 N (49.46 lb) | |
| Shaft Max. Axial Load** | 45 N (10.12 lb) | | 46 N (10.12 lb) | | 60 N (13.49 lb) | | 61 N (13.49 lb) | |
| Unit Weight | 1.72 kg (3.8 lb) | | 1.72 kg (3.8 lb) | | 3.27 kg (7.2 lb) | | 4.47 kg (9.85 lb) | |
| Motor Poles | 8 | | | | | | | |
| Max Case Temp | 85°C (185°F) | | | | | | | |
| Encoder | Differential 1024 lines/rev (4096 counts per rev) | | | | | | | |
| Shock | 20 gpeak, half sine, 11 ms, 3-axis, IEC 60068-2-27 | | | | | | | |
| Vibration | 2 grms, 5-500 Hz, 3-axis, 1hr, IEC 60068-2-64 | | | | | | | |

* @48VDC ** @L10 - 20,000 Hours

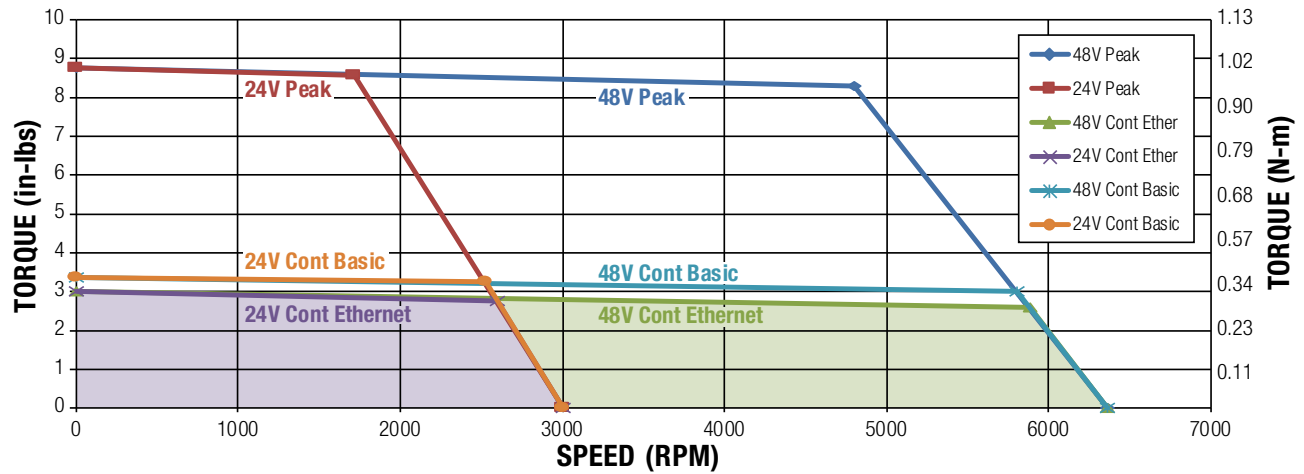
ACSI – Motor/Drive/Controller

PERFORMANCE DATA

SPEED vs TORQUE - ACSI23 (C1)



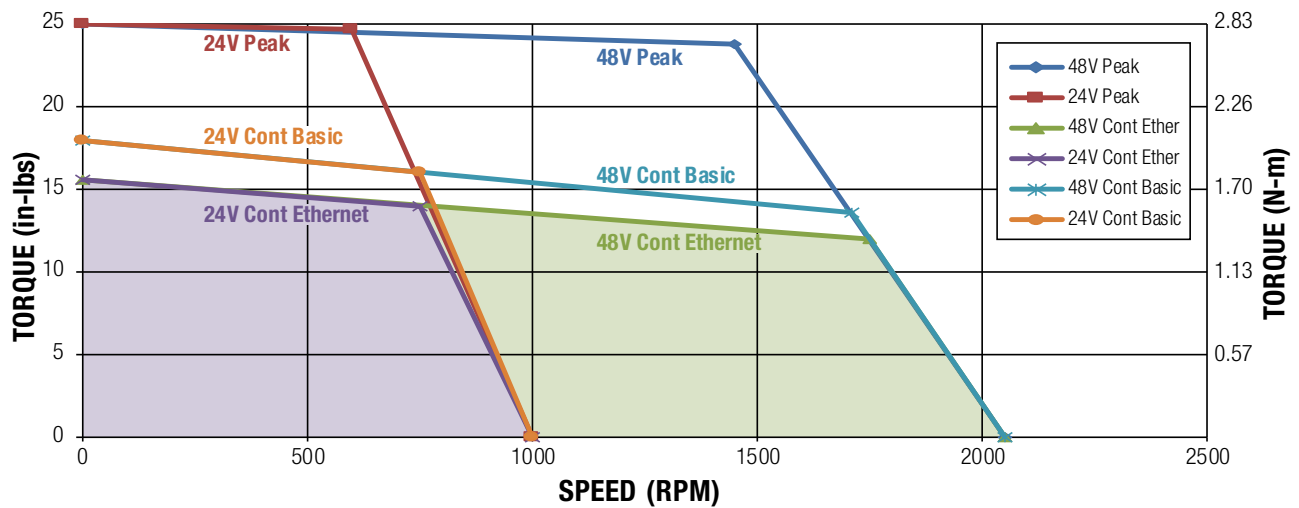
SPEED vs TORQUE - ACSI23 (C2)



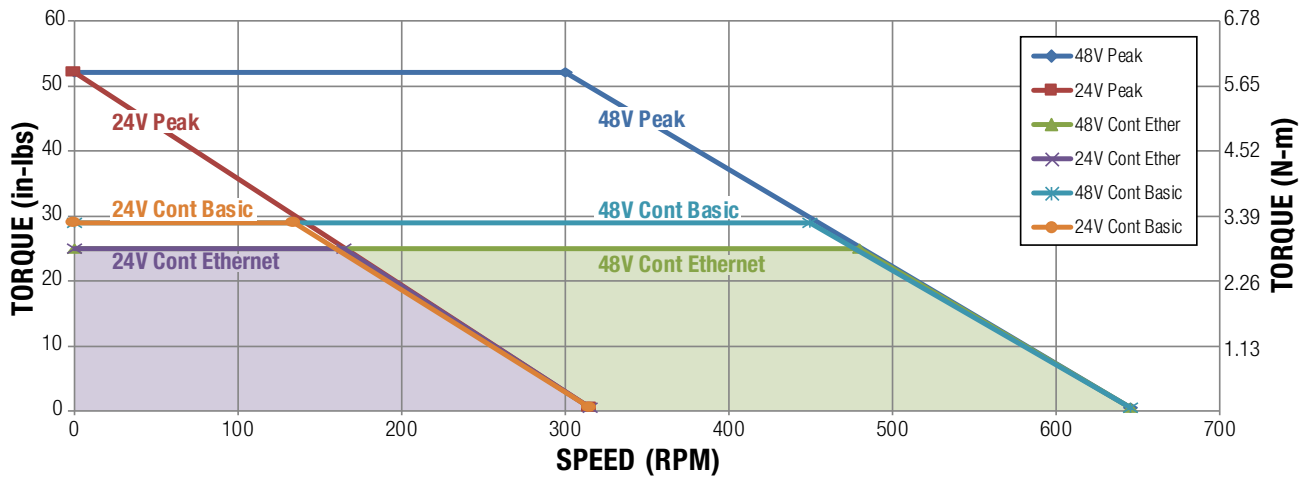
ACSI – Motor/Drive/Controller

PERFORMANCE DATA

SPEED vs TORQUE - ACSI34 (D1)



SPEED vs TORQUE - ACSI34 (D2)



Electronic Motor Brake

SPECIFICATIONS

The Electronic Motor Brake is available in NEMA 23 & 34 frame sizes.

It fits on 23 & 34 frame stepper, servo and ACSI motors see dimensional drawings to confirm shaft size and other dimensions.

The brake is recommended for vertical or inclined applications where there can be no backdrive during power off.

When 24 VDC is connected, the brake will be deactivated and the motor can turn freely. It is recommended to use the brake only as a holding brake and not as an emergency brake.

Cables for the Electronic Motor Brake are available and are included when CR_ is added to the ordering configuration. The connector on the brake is M8.



| NEMA FRAME SIZE | HOLDING TORQUE | INPUT SHAFT DIA. | OUTPUT SHAFT DIA. | CONNECTION | CURRENT @24VDC | WEIGHT (W/O CABLE) | IP RATING |
|-----------------|----------------|------------------|-------------------|------------|----------------|--------------------|-----------|
| | Nm | mm | mm | | Amp | kg | |
| | (in-lbs) | (inch) | (inch) | | | (lb) | |
| 23 | 1.5 | 6.35 | 6.35 | M8 | 0.45 Amp | 0.45 | IP55 |
| | (13.28) | (0.250) | (0.250) | | | (0.99) | |
| 34 | 1.7 | 12.7 | 12.7 | M8 | 0.23 Amp | 1.42 | IP55 |
| | (15.05) | (0.500) | (0.500) | | | (3.13) | |

Recommended torque clamping Screw 2.5 ft-lbs [3.4 Nm]

Electronic Motor Brakes are primarily sold as part of a complete assembly including actuator and motor. Tolomatic will install and test the completed actuator, Electronic Motor Brake, and motor assembly before shipping. **Call Tolomatic if you wish to install an Electronic Motor Brake on an existing actuator.**

Contact Tolomatic for other motor mounting options.

⚠ Tolomatic assumes no responsibility that an electronic motor brake will fit or perform with your motor or actuator if sold separately.)

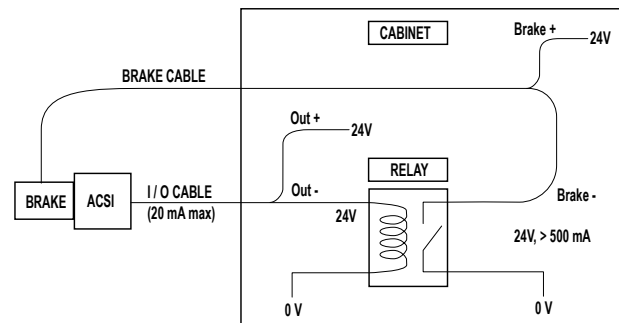
BRAKE OUTPUT

The brake output is a 20mA low current output with braking logic controlled by the drive. It obeys the timing configured using Tolomatic Motion Interface Software. The brake output requires hardware to interface it to the higher currents required to operate a brake.

BRAKE OUTPUT SPECIFICATIONS

| Parameter | Value | Units |
|-----------------------------|-------|-------|
| Input Voltage | 24 | V |
| Continuous Current (max.) | 20 | mA |
| Output Voltage Drop (20 mA) | 2 | V |

BRAKE OUTPUT WIRING DIAGRAM

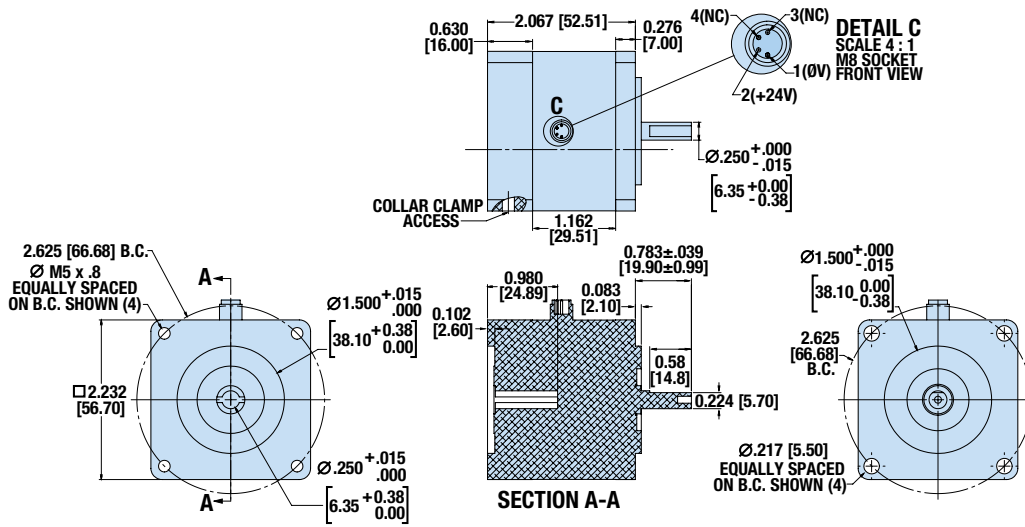


Electronic Motor Brake

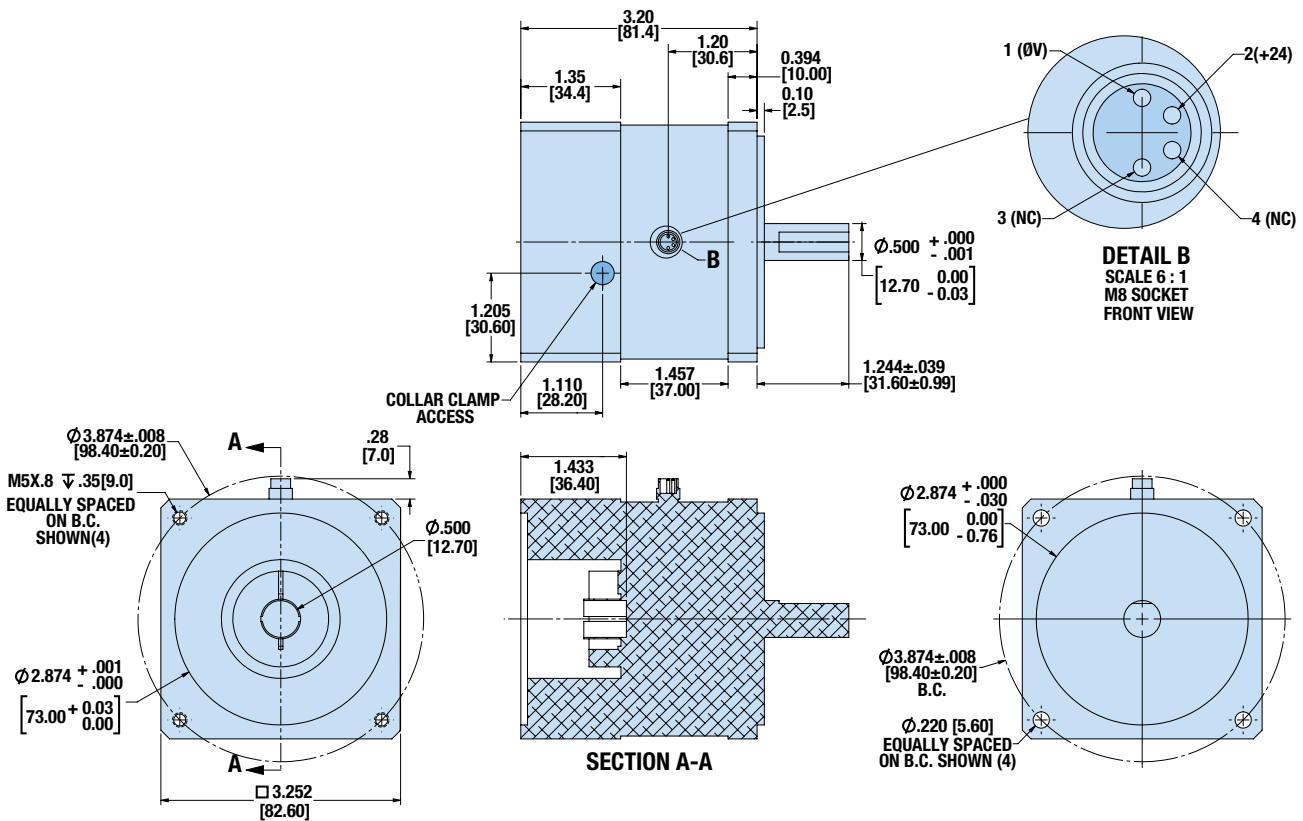
SIZE: ALL

DIMENSIONS  3D CAD available at www.tolomatic.com

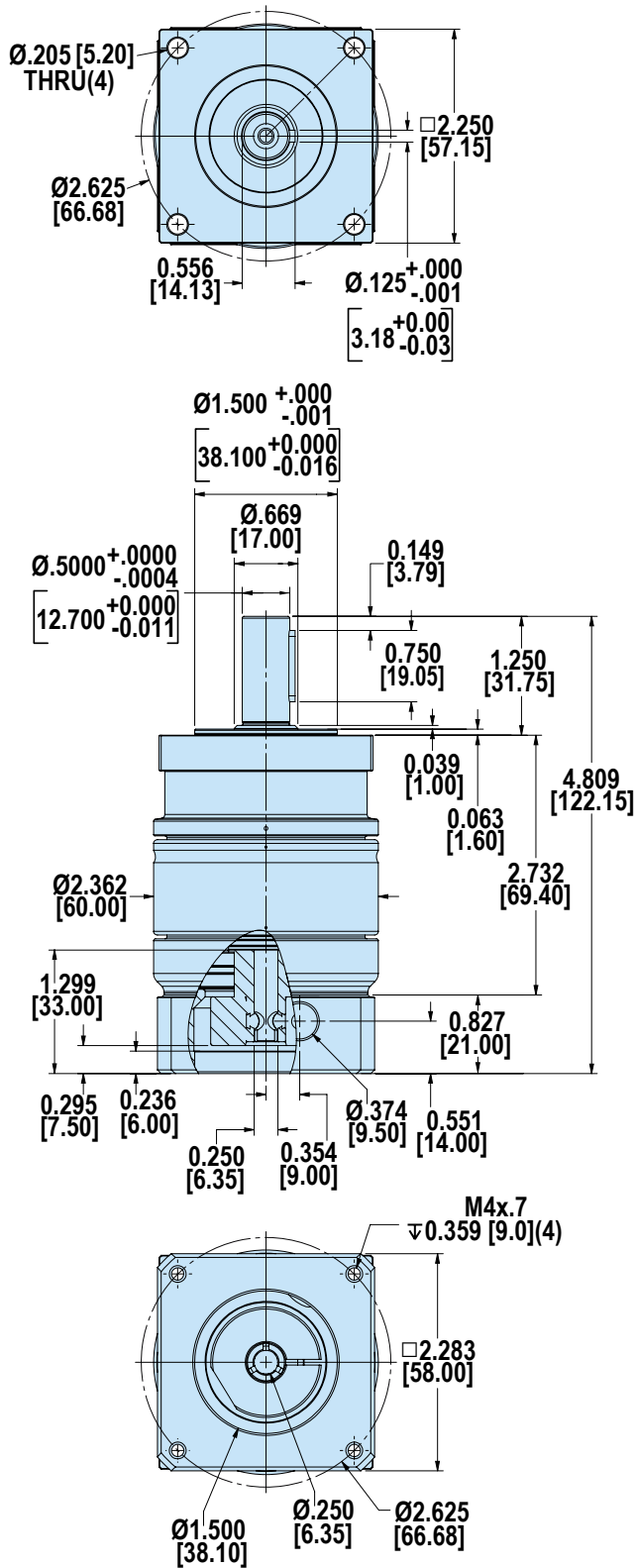
NEMA23 DIMENSIONS



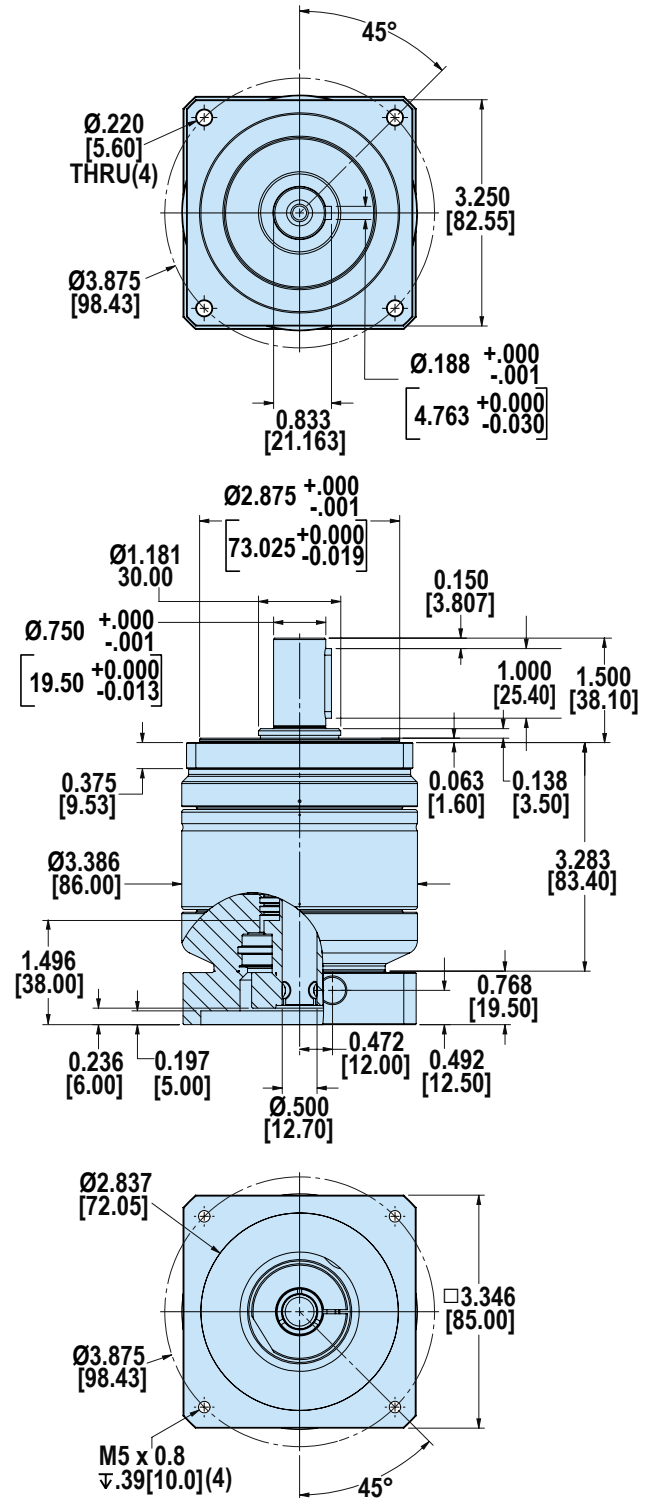
NEMA34 DIMENSIONS



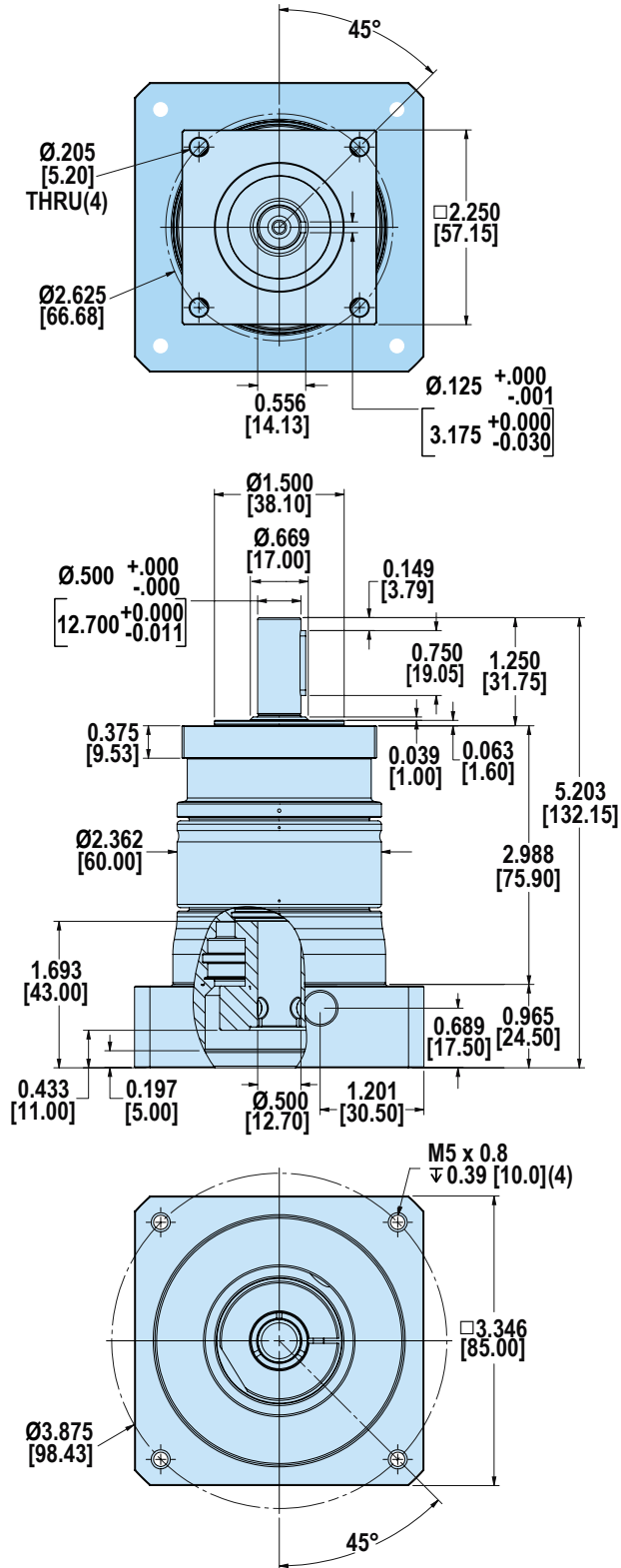
NEMA23 DIMENSIONS



NEMA34 DIMENSIONS



NEMA23/34 DIMENSIONS



ACSI – Service Parts Ordering

ACSI MOTOR/DRIVE/CONTROLLER, CABLES & REPLACEMENT PARTS

Accessory Parts

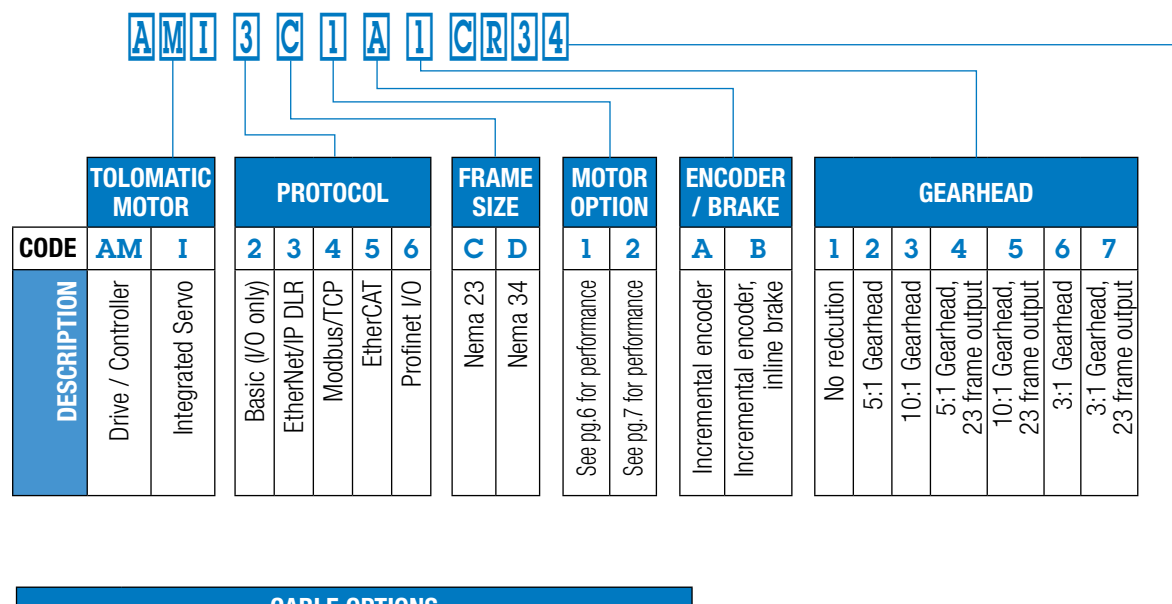
| Tolomatic ACSI Cables | | | | |
|-----------------------|--|----------|---------------|----------------|
| PART NUMBER | DESCRIPTION | LENGTH | CONNECTOR 1 | CONNECTOR 2 |
| 3604-2089 | CABLE, 3M, M12 A Code 12P/M, Digital I/O | 3 Meter | M12, 12 Pin | Flying leads |
| 3604-2090 | CABLE, 5M, M12 A Code 12P/M, Digital I/O | 5 Meter | M12, 12 Pin | Flying leads |
| 3604-2091 | CABLE, 10M, M12 A Code 12P/M, Digital I/O | 10 Meter | M12, 12 Pin | Flying leads |
| 3604-2092 | CABLE, 3M, M12 D Code 4P/M TO ETHERNET RJ45 | 3 Meter | M12, Ethernet | RJ45, Ethernet |
| 3604-2093 | CABLE, 5M, M12 D Code 4P/M TO ETHERNET RJ45 | 5 Meter | M12, Ethernet | RJ45, Ethernet |
| 3604-2094 | CABLE, 10M, M12 D Code 4P/M TO ETHERNET RJ45 | 10 Meter | M12, Ethernet | RJ45, Ethernet |
| 3604-2109 | CABLE, 1M, M12 D Code 4P/M TO ETHERNET M12 | 1 Meter | M12, Ethernet | M12, Ethernet |
| 3604-2095 | CABLE, 3M, M12 D Code 4P/M TO ETHERNET M12 | 3 Meter | M12, Ethernet | M12, Ethernet |
| 3604-2096 | CABLE, 5M, M12 D Code 4P/M TO ETHERNET M12 | 5 Meter | M12, Ethernet | M12, Ethernet |
| 3604-2097 | CABLE, 10M, M12 D Code 4P/M TO ETHERNET M12 | 10 Meter | M12, Ethernet | M12, Ethernet |
| 3604-2100 | CABLE, 3M, M12 T Code 4P/F, POWER | 3 Meter | M12, 4 Pin | Flying leads |
| 3604-2101 | CABLE, 5M, M12 T Code 4P/F, POWER | 5 Meter | M12, 4 Pin | Flying leads |
| 3604-2102 | CABLE, 10M, M12 T Code 4P/F, POWER | 10 Meter | M12, 4 Pin | Flying leads |

| ACSI Power Supplies | | |
|---------------------|------------------------------|---------|
| PART NUMBER | DESCRIPTION | VOLTAGE |
| 3604-2147 | POWER SUPPLY,48VDC,120W,2.5A | 48VDC |
| 3604-2148 | POWER SUPPLY,48VDC,240W,5A | 48VDC |
| 3604-2149 | POWER SUPPLY,48VDC,480W,10A | 48VDC |

| ACSI Accessories | |
|------------------|----------------------------------|
| PART NUMBER | DESCRIPTION |
| 2180-1163 | SHUNT REGULATOR 50W, 24-80VDC |
| 3604-2157 | 10 M BRAKE CABLE |
| 3604-2145 | CABLE,USB,2M,A MALE-MICRO B MALE |

| Tolomatic Gearheads | |
|---------------------|------------------------|
| PART NUMBER | DESCRIPTION |
| 3604-2219 | GEARHEAD 23F, 3:1 |
| 3604-2220 | GEARHEAD 23F, 5:1 |
| 3604-2221 | GEARHEAD 23F, 10:1 |
| 3604-2222 | GEARHEAD 34F, 3:1 |
| 3604-2223 | GEARHEAD 34F, 5:1 |
| 3604-2224 | GEARHEAD 34F, 10:1 |
| 3604-2225 | GEARHEAD 23F/34F, 3:1 |
| 3604-2226 | GEARHEAD 23F/34F, 5:1 |
| 3604-2227 | GEARHEAD 23F/34F, 10:1 |

ACSI Ordering



| CABLE OPTIONS | |
|---------------|---|
| CODE | DESCRIPTION |
| CR31 | CR31: Power cable, 3m |
| CR34 | CR34: Power & I/O cables, 3m |
| CR35 | CR35: I/O cable, 3m |
| CR36 | CR36: Power & M12/RJ45 Ethernet cables, 3m |
| CR37 | CR37: Power, M12/RJ45 Ethernet & I/O cables, 3m |
| CR51 | CR51: Power cable, 5m |
| CR55 | CR55: I/O cable, 5m |
| CR56 | CR56: Power & M12/RJ45 Ethernet cables, 5m |
| CR57 | CR57: Power, M12/RJ45 Ethernet & I/O cables, 5m |
| CR58 | CR58: Power & I/O cables, 5m |
| CR101 | CR101: Power cable, 10m |
| CR105 | CR105: I/O cable, 10m |
| CR106 | CR106: Power & M12/RJ45 Ethernet cables, 10m |
| CR107 | CR107: Power, M12/RJ45 Ethernet & I/O cables, 10m |
| CR108 | CR108: Power & I/O cables, 10m |

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The Tolomatic Difference Expect More From the Industry Leader:



INNOVATIVE PRODUCTS

Unique linear actuator solutions with Endurance TechnologySM to solve your challenging application requirements.



FAST DELIVERY

The fastest delivery of catalog products... Built-to-order with configurable stroke lengths and flexible mounting options.



ACTUATOR SIZING

Online sizing that is easy to use, accurate and always up-to-date. Find a Tolomatic electric actuator to meet your requirements.



YOUR MOTOR HERE

Match your motor with compatible mounting plates that ship with any Tolomatic electric actuator.



LIBRARY

Easy to access CAD files available in the most popular formats to place directly into your assembly.



TECHNICAL SUPPORT

Extensive motion control knowledge: Expect prompt, courteous replies to any application and product questions from Tolomatic's industry experts.

Also Consider These Other Tolomatic Products:

Electric Products

Rod & Guided Rod Style Actuators, High Force Actuators, Screw & Belt Drive Rodless Actuators, Motors, Drives and Controllers

"Foldout" Brochure #9900-9074



Pneumatic Products

Rodless Cylinders: Band Cylinders, Cable Cylinders, Magnetically Coupled Cylinders/Slides; Guided Rod Cylinder Slides

"Foldout" Brochure #9900-9075



Power Transmission Products

Gearboxes: Float-A-Shaft®, Slide-Rite®, Caliper Disc Brakes; Planetary Roller Screws

"Foldout" Brochure #9900-9076

Tolomatic

EXCELLENCE IN MOTION®

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =
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