

Contrex Control Specifications



SK1670 Rev 2

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CX-1010 SPECIFICATIONS

Electrical

AC Power Input:	115 VAC + 15% -10% 48 to 62 Hz 0.250 Amps Maximum 30 Watts Maximum or [switch selectable] 230 VAC + 15% -10% 48 to 62 Hz 0.125 Amps Maximum 30 Watts Maximum
Frequency Inputs(2):	Differential Mode [26LS32]: 5 to 15 VDC Operating Voltage 200 mV Differential Input Voltage 100 mV Hysteresis Typical 2.0 kOhm, 1/8 W to 5 V Internal Pullup 0 to 180 kHz Operating Frequency Quadrature or Single-Channel Optically Isolated [Dig_Com] Single-Ended Mode: Current Sinking 5 to 15 VDC Operating Voltage 2.5 V Switching Threshold 100 mV Hysteresis Typical 2.0 kOhm, 1/8 W to 5 V Internal Pullup 0 to 180 kHz Operating Frequency Quadrature or Single-Channel Optically Isolated [Dig_Com]
Digital Inputs(16):	Single-Ended [74HC14] Current Sinking 5 to 24 VDC Operating Voltage 3.15 V Rising Edge Threshold Maximum 0.90 V Falling Edge Threshold Minimum 1.0 V Hysteresis Typical 10.0 kOhm, 1/8 W to 5 V Internal Pullup 1 mSec Response Time [DIO - DI7] 2 mSec Response Time [DI8 - DI15] Optically Isolated [Dig_Com]
Digital Outputs(8):	NPN Darlington [ULN2803] Current Sinking 50 VDC Maximum Operating Voltage 1.0 V Saturation at 200 mA Typical 0.6 V Saturation at 1 mA Typical 200 mA Continuous/Channel 500 mA Peak/Channel [50% Duty Cycle] 750 mA Continuous Total All Channels Internal Freewheeling Diodes 2 mSec Update Rate Optically Isolated [Dig_Com]

CX-1010 Specifications (continued)

Speed Command Output:	± 5 V to ± 15 V Bipolar Analog Zero/Span Software Calibration 16 Bits Bipolar Resolution [15 + Sign] 18 mA Maximum Drive Current Optically Isolated [CO-Com]
Aux. Power Output:	+ 12 VDC $\pm 5\%$ 150 mA Maximum Optically Isolated [Dig_Com]
Serial Communications:	RS485 Compatible 5 VDC Differential Operation 300 to 19200 Baud Rate Selectable Character Format Half Duplex Optically Isolated [Dig_Com]
Optional Analog I/O:	2 Input Channels/1 Output Channel 0 to 20 mA or ± 12 VDC 80 kOhm Input Resistance Voltage Mode 243 Ohm Input Resistance Current Mode 500 Ohm Max Resistance Current Output 15 mA Max Current Voltage Output 16 Bits Resolution - Analog Output 14 Bits Resolution - Analog Input $\pm 0.1\%$ Drift Error Typical [50° C Range] Zero Monotonic Error Software Calibration NOVRAM Calibration Storage Optically Isolated [Dig_Com]

Physical

Construction:	NEMA4, 4X, 12, 13 IP65 Compatible Frontpanel 14 Line by 21 Character LCD Display Sealed Membrane Keypad Polycarbonate ABS Front Bezel Paint over Zync Plate CRS Enclosure
Overall Dimensions:	19.6 cm [7.7 in] Bezel Height 10.2 cm [4.0 in] Bezel Width 17.8 cm [7.0 in] Total Depth
Panel Dimensions:	18.41 cm [7.25 in] Panel Height Cutout 9.27 cm [3.65 in] Panel Width Cutout 16.30 cm [6.30 in] Panel Inside Depth
Weight:	2.3 kilograms [5.1 Pounds]

CX-1010 Specifications (continued)

Environmental

Operating Temperature:	0° to 55° C (32° to 131° F) Int. Enclosure 0° to 40° C (32° to 104° F) Ext. Enclosure
Storage Temperature:	-25° to 70° C [-13° to 158° F]
Environment:	The CX-1010 shall be installed in a pollution degree 2 macro-environment.
Relative Humidity:	0 to 95% RH Non-condensing
Altitude:	To 3,300 Feet [1000 Meters]

Performance

Setpoint Resolution:	6 Digits in Engineering Units
Speed Regulation:	0.01 % Error in Master Modes [> 10Hz] 0.00% Error in Follower Modes [> 10Hz] [Zero Error Loop Enabled]
Accel/Decel Ramps:	Settable in Time or Rate 0.1 to 3600.0 Seconds 0.001 to 999,999 EUs/T/Second Separate for Run, Direct, Jog, H-Stop and R-Stop
Limits:	Maximum Speed Minimum Speed Trim Authority Integral Limit Positive Position Error Negative Position Error
Alarms:	Zero Speed Maximum Feedback Maximum Accel/Decel No Response Maximum Feedback Position Programmable Custom Alms [6]

CX-1010 Specifications (continued)

PLC:	64 Program Instructions Total 9 Instruction Types 8 Digital Inputs (DI8-DI15) 8 Digital Outputs (DO0-DO7) 4 Timers 4 Counters 4 Latches
Setpoint Scaling Modes:	Direct Master Inverse Master Offset Master Follower Inverse Follower Offset Follower Custom Setpoint Equation
Digital Inputs:	F-Stop R-Stop H-Stop Run Jog Forward Jog Reverse Keypad Lockout Block Select A Block Select B Block Select C Setpoint Direction [Scaled Ref. Sign] Increment Batch Counter Reset Batch Counter Remote Scroll Up Remote Scroll Down
Digital Outputs:	Zero Speed Hi Speed Alarm Low Speed Alarm Dev Alarm 1 [Ramped Ref-Feedback] Dev Alarm 2 [Scaled Ref-Feedback] Batch Done Control Output Direction Drive Enable
Control Loop Formats:	Velocity Zero Error Loop Position Open Loop
Closed Loop Algorithm:	PID + FF Adaptive or Self-Adjust Feedforward

CX-1010 Specifications (continued)

Control Loop Response:	1 mSec Speed and Position Loop 2 mSec PLC Functions
Block Parameters:	8 Switch Selectable Parameter Blocks Permissible Setpoint Mode Switching 16 Parameters per Block Full Control Parameter Selection
Device Configuration:	Parameter Load and Store PLC Program Load and Store Status Screen Configuration Serial Communications Format Selectable Keypad Lockout Normal/Reverse Video Video Contrast Adjust Annunciator Enable Std Alm Msk
Diagnostics:	Memory Test Keypad Test Video Test I/O Signal Tests Serial Communications Test Annunciator Test
Help Screens:	Help Screen for all Parameters Displays Minimum, Maximum and Default Summary of Parameter Operation Retrieve Default or Backup Values Decode/Select of Bit Mapped Parameters
Approvals:	CE Marked

M-CUT SPECIFICATIONS

Cut Length:	2,097,152 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Edge Resolution for Static Position + 1 Encoder Line for Registration Index and Home Index
Response:	Control Inputs checked every 1 mSec Registration and Home Index Input Response < 20 uSec Status Outputs Updated every 1 mSec F-Stop disables Drive Enable Output within 250 mSec
Tuning:	Separately adjustable Proportional and Integral parameters for stability and response. Adjustable Feed forward constant 1 mSec loop update
Setpoints:	Five Total: [4] Preset Engineering Unit Profiles [1] Direct Setpoint
Batch Count	1 to 999,999 Counts
Accel/Decel:	0.01 to 60.00 Seconds 0.01 Second Resolution Finite Jerk S-Curve [Enable/Disable]
Frequency Inputs:	Feedback Frequency Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible [NPN] Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Digital Inputs:	5 VDC with Pullup, 1 mSec Response V_{IN} , Max < = 24.0 VDC V_{IN} , Low < = 0.7 VDC [Logic Low] V_{IN} , High > = 4.3 VDC [Logic High] Registration Index Home Index Resume Move Move Halt F-Stop Jog Forward/Reverse Back Step Home Return Home-to-Index Home Set Profile Select A Profile Select B Batch Reset Keypad Lockout

M-Cut Specifications (continued)

Digital Outputs:	Darlington (ULN2003) Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm At-Home In-Position A In-Position B In-Position C
Speed Command:	+ 5 to + 15 VDC, Unipolar or Bipolar, Isolated Output Auto Range to Drive reference level 12 Bits resolution
+ 5V Aux Supply:	500 mA Max @ 0° to 25° C 250 mA Max @ 25° to 50° C
+ 12V Aux Supply:	200 mA Max @ 0° to 50° C
Serial Interface:	RS-422 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	115/230 VAC -10% + 15% 50/60 Hz .25 Amps Maximum
Operating Temp:	0° to 50° C (32° to 122° F)
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches high 3.9 inches wide 6.0 inches depth
Environment:	The M-Cut shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet (1000 meters)
Weight:	5.4 Pounds
Approvals:	UL and cUL Listed

M-DRIVE SPECIFICATIONS

Accuracy:	Zero Accumulative Error - Follower Format .01 % Set Speed - Master Format
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Drive Output Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Offset - Ratio plus Offset
Setpoints:	Six Total: [4] Master / Follower [1] Direct [1] Jog
Engineering Units:	Separate Calculations for Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution Ramp Disable inhibits ramp
Frequency Inputs:	Zero Cross (Magnetic Pickup) or Open-collector (Proximity or Encoder) 0 - 30 kHz Feedback & Lead Open Collector 0 - 10 kHz Offset Open Collector 0 - 10 kHz All Inputs Zero Cross
Digital Inputs:	Vin, Max < 24 VDC Vin, Low < 0.7 VDC (Logic Low) Vin, High > 4.3 VDC (Logic High) Run R-Stop F-Stop Jog Closed/Open Loop Primary/Secondary Mode Remote Scroll Up Remote Scroll Down Primary Setpoint Select Secondary Setpoint Select Setpoint Hold Keypad Lockout Local/Computer
Analog Input: [Optional]	0 to 10 VDC or 4 to 20 mA Range 12 Bit Resolution

M-Drive Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Hi Alarm Lo Alarm Ramped Error [Error Alarm 1] Scaled Error [Error Alarm 2] Zero Speed
Drive Output:	Phase Fired - Single Quadrant 0 - 90 VDC, 1/4 to 1 HP [115VAC Input] 0 - 180 VDC, 1/2 to 2 HP [230VAC Input] PM Motors or Field Wound Motors
Current Limit:	4 to 16 Amps
Field Rating:	100 Volts @ 1.2 Amps Max with 115 VAC Input 200 Volts @ 1.2 Amps Max with 230 VAC Input
+ 12 Volt Aux Supply:	150 mA, Max @ 0° to 55° C
Serial Interface:	RS422 300 to 9600 Baud Full parameter access and control
Power Requirements:	115/230 VAC -10% + 15% 50/60 Hz 0.1 Amps plus motor current $10.0\text{ W} + 3\text{ V} * \text{motor current} = \text{Total Power}$
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches height 3.9 inches width 6.0 inches depth
Environment:	The M-Drive shall be installed in a pollution degree 2 macro - environment
Altitude:	To 3,300 Feet [1000 meters]
Weight:	4.6 Pounds
Approvals:	UL and cUL Listed

M-ROTARY SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation
Setpoints:	Eleven Total: [8] Engineering Units [1] Master [1] Jog [1] Direct
Batch Count	1 to 9999 Counts
Accel/Decel:	0.1 to 600.0 seconds .1 second resolution
Frequency Inputs:	Feedback and External Reference Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Preset Select	External switch selection of 8 preset setpoints
Digital Inputs:	V_{IN} , Max \leq 24 VDC V_{IN} , Low \leq 0.7 VDC (Logic Low) V_{IN} , High \geq 4.3 VDC (Logic High) Run R-Stop F-Stop Jog Jog Forward/Reverse External Reference Sync Feedback Sync Position Reset Phase Advance Phase Retard Setpoint Select A Setpoint Select B Setpoint Select C

M-Rotary Specifications (continued)

	Batch Initiate Keypad Lockout Integral Zero
Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Run Control Batch Complete Sync Alarm Inverted Output Ext. Reference Sync Absent Alarm Feedback Sync Absent Alarm Low/High Limit Alarm
Speed Command:	+ 5 to + 15 VDC, Unipolar or Bipolar, Isolated output Auto Range to Drive reference level 12 Bits resolution
+ 5V Aux Supply:	500 mA Max @ 0° to 25° C 250 mA Max @ 25° to 50° C
+ 12V Aux Supply:	200 mA Max @ 0° to 50° C
Serial Interface:	RS-422 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	115/230 VAC -10% + 15% 50/60 Hz .25 Amps Maximum
Operating Temp:	0° to 50° C [32° to 122° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches high 3.9 inches wide 6.0 inches depth
Environment:	The M-Rotary shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet [1000 meters]
Weight:	5.4 Pounds
Approvals:	UL and cUL Listed

M-SHUTTLE SPECIFICATIONS

Sync Rate:	20 Pulses per Second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line Resolution
Response:	1 mSec Control Loop Update
Tuning:	Separately Adjustable Proportional and Integral Parameters for Stability and Response.
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Follower - Ratio Setpoint calculation
Setpoints:	Six Total: [4] Engineering Units [1] Jog [1] Direct
Batch Count:	1 to 999,999 Counts
Accel/Decel:	0 to 999,999 Engineering Units
Frequency Inputs:	Feedback and Lead Quadrature Encoder Format Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to +5V 120 kHz Maximum Frequency
Preset Select:	External Switch Selection of Four Preset Engineering Unit Setpoints
Digital Inputs:	V_{IN} , Max \leq 24 VDC V_{IN} , Low \leq 0.7 VDC (Logic Low) V_{IN} , High \geq 4.3 VDC (Logic High) Lead Sync Home/Follower Sync Setpoint Select A Setpoint Select B Home Set Home Seek Home Return Batch Reset Run Wait F-Stop Keypad Lockout Forward Limit Reverse Limit

M-Shuttle Specifications (continued)

	Jog Fwd/Rev Jog
Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm Profile Direction Output A Output B At-Home
Speed Command:	+ 5 to + 15 VDC, Unipolar or Bipolar, isolated output Auto-range to drive reference level 12 bits resolution
+ 5 Volt Aux Supply:	500 mA, max at 0° to 25° C 250 mA, max at 25° to 50° C
+ 12 Volt Aux Supply:	200 mA, max at 0° to 50° C
Serial Interface:	RS422 300 to 9600 Baud Full parameter access and control
Power Requirements:	115/230 VAC -10% + 15% 50/60 HZ .25 Amps Maximum
Operating Temp:	0° to 50° C [32° to 122° F]
Humidity:	0 to 90% RH non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches high 3.9 inches wide 6.0 inches depth
Environment:	The M-Shuttle shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet [1000 meters]
Weight:	5.4 Pounds
Approvals:	UL and cUL Listed

M-TRACK SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out [analog] Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation
Setpoints:	Eleven Total: [8] Preset [1] Master [1] Jog [1] Direct
Batch Count	1 to 999,999 Counts
Accel/Decel:	0.1 to 600.0 seconds .1 second resolution
Frequency Inputs:	Feedback and External Reference Quadrature Encoder Format- Single Ended Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Learn Mode:	Self Scaling
Preset Select	External switch selection of 8 preset setpoints
Digital Inputs:	$V_{IN}, Max \leq 24 \text{ VDC}$ $V_{IN}, Low \leq 0.7 \text{ VDC}$ [Logic Low] $V_{IN}, High \geq 4.3 \text{ VDC}$ [Logic High] Run R-Stop F-Stop Jog Align Forward/Reverse External Reference Sync Feedback Sync Ratio A [Preset Select] Ratio B [Preset Select]

M-Track Specifications (continued)

	Master/Follower Batch Initiate Phase Advance Phase Retard Keypad Lockout Position Reset
Digital Outputs:	Darlington (ULN2003) Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Run Control Batch Complete Sync Alarm Inverted Output Out A (Ext. Ref. Sync Absent) Out B (Feedback Sync Absent) Out C (Low/High Limit Alarm)
Speed Command:	+ 5 to + 15 VDC, Unipolar or Bipolar, isolated output Auto-range to drive reference level 12 bits resolution
+ 5 Volt Aux Supply:	500 mA, max at 0° to 25° C 250 mA, max at 25° to 50° C
+ 12 Volt Aux Supply:	200 mA, max at 0° to 50° C
Serial Interface:	RS422 300 to 9600 Baud Full parameter access and control
Power Requirements:	115/230 VAC -10% + 15% 50/60 HZ .25 Amps Maximum
Operating Temp:	0° to 50° C (32° to 122° F)
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches high 3.9 inches wide 6.0 inches depth
Environment:	The M-Track shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet (1000 meters)
Weight:	5.4 Pounds
Approvals:	UL and cUL Listed

M-TRAVERSE SPECIFICATIONS

Job Space	536,000,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line Resolution
Response:	1 millisecond control loop update
Tuning:	Separately adjustable Proportional and Integral parameters for stability and response
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Follower - Ratio Setpoint calculation
Setpoints:	Six Total: [4] Engineering Units [1] Jog [1] Direct
Batch Count	1 to 9999 Counts
Accel/Decel:	0 to 999,999 Engineering Counts
Frequency Inputs:	Feedback and Lead Quadrature Encoder Format Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to + 5 VDC 120 kHz maximum frequency
Preset Select:	External switch selection of four preset engineering unit setpoints
Digital Inputs:	Vin, Max < 24.0 VDC Vin, Low < 0.7 Volts minimum Vin, High > 4.3 Volts maximum Home Sync Setpoint Select A Setpoint Select B Home Set Home Seek Home Return Batch Reset Run Wait F-Stop Keypad Lockout Forward Limit Reverse Limit Jog Forward/Reverse Jog

M-Traversal Specifications (continued)

Digital Outputs:	Darlington (ULN2003) Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm Profile Direction At-Home Output A Output B
Speed Command:	+ 5 to + 15 VDC, Unipolar or Bipolar, isolated output Auto-range to drive reference level 12 bits resolution
+ 5 VDC Supply:	500 mA, max at 0° to 25° C 250 mA, max at 25° to 50° C
+ 12 Volt Aux Supply:	200 mA, max at 0° to 50° C
Serial Interface:	RS422 300 to 9600 Baud Full parameter access and control
Power Requirements:	115 /230 VAC - 10% + 15% 50/60 Hz 0.25 Amp
Operating Temp:	0° to 50° C [32° to 122° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches height 3.9 inches width 6.0 inches depth
Environment:	The M-Traversal shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet [1000 meters]
Weight	5.4 Pounds
Approvals:	UL and cUL Listed

M-TRIM SPECIFICATIONS

Accuracy:	Zero Accumulative Error - Follower Format .01 % Set Speed - Master Format
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Offset - Ratio plus analog offset
Setpoints:	Six Total: [4] Master / Follower [1] Direct [1] Jog
Engineering Units:	Separate Calculations for Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution Ramp Disable inhibits ramp
Frequency Inputs:	Zero Cross [Magnetic Pickup] or Open-collector [Proximity or Encoder] 0 - 30 kHz Feedback & Lead Open Collector 0 - 10 kHz Offset Open Collector 0 - 10 kHz All Inputs Zero Cross
Digital Inputs:	Vin, Max < 24 VDC Vin, Low < 0.7 VDC [Logic Low] Vin, High > 4.3 VDC [Logic High] Run R-Stop F-Stop Jog Closed/Open Loop Forward/Reverse Remote Scroll Up Remote Scroll Down Primary/Secondary Mode Primary Setpoint Select Secondary Setpoint Select Ramp Disable Keypad Lockout Local/Computer
Analog Input: [Optional]	0 to 10 VDC or 4 to 20 mA Range 12 Bit Resolution

M-Trim Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Hi Alarm Lo Alarm Ramped Error [Error Alarm 1] Scaled Error [Error Alarm 2] Zero Speed Positive/Inverted Output
Speed Command:	0 to + 15 VDC, Unipolar or Bipolar Auto-range to drive level
+ 12 Volt Aux Supply:	150 mA, Max @ 0° to 55° C
Serial Interface:	RS422 300 to 9600 Baud Full parameter access and control
Power Requirements:	115/230 VAC -10% + 15 % 50/60 Hz 0.1 Amp
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	1/2 DIN, NEMA 12 panel mount 7.5 inches height 3.9 inches width 6.0 inches depth
Environment:	The M-Trim shall be installed in a pollution degree 2 macro - environment
Altitude:	To 3,300 Feet [1000 meters]
Weight:	4.9 Pounds
Approvals:	UL and cUL Listed

ML-TRIM SPECIFICATIONS

Accuracy:	.01 % Set Speed
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Inverse Master - Absolute Inverse Setpoint entry Inverse Follower - Inverse Ratio Setpoint calculation
Setpoints:	Six Total: [2] Master [2] Follower [1] Direct [1] Jog
Engineering Units:	Engineering Unit Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution
Frequency Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC * Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 0 - 30 kHz Feedback & Lead 4.99 kOhm Pullup to 5V Optically Isolated
Digital Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 4.99 kOhm Pullup to 5V Optically Isolated Run R-Stop F-Stop Jog Master/Follower Setpoint Select

ML-Trim Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 400 mA Continuous/Total Internal Freewheeling Diodes Optically Isolated Drive Enable Alarm
Speed Command:	0 to 10 VDC Span Pot Adjustable, 5 to 12 VDC Optically Isolated
Aux Supply:	+ 5 VDC + 5% 150 mA, Max non-isolated
Serial Interface:	RS485 300 to 9600 Baud Full parameter access and control
Power Requirements:	115 + 15% VAC [model # 3200-1931] 230 + 15% VAC [model # 3200-1932] 50/60 Hz 0.1 Amp
I/O Power [5V_DI]:	50 mA Input Current *
Operating Temperature:	0° to 55° C [32° to 131° F] Int. Enclosure 0° to 40° C [32° to 104° F] Ext. Enclosure
Humidity:	0 to 95% RH Non-condensing
Physical Dimensions:	4.0 inches height 4.0 inches width 6.0 inches depth [Interior Panel]
Faceplate Rating:	Nema 4, 4X, 12, 13 IP65
Environment:	The ML-Trim shall be installed in a pollution degree 2 macro - environment
Altitude:	To 3,300 Feet [1000 meters]
Weight:	3.1 Pounds
Approvals:	UL, cUL Listed and CE Marked

*** Caution:**

Do not exceed +5 VDC on the I/O Power Input (J5 pins 1,2) or equipment damage will occur.

ML-DRIVE SPECIFICATIONS

Accuracy:	.01 % Set Speed
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Drive Output Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Inverse Master - Absolute Setpoint entry Inverse Follower - Ratio Setpoint calculation
Setpoints:	Six Total: [2] Master [2] Follower [1] Direct [1] Jog
Engineering Units:	Engineering Unit Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution
Frequency Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC * Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 0 - 30 kHz Feedback & Lead 4.99 kOhm Pullup to 5V Optically Isolated
Digital Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 4.99 kOhm Pullup to 5V Optically Isolated Run R-Stop F-Stop Jog Master/Follower Setpoint Select

ML-Drive Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 400 mA Continuous/Total Internal Freewheeling Diodes Optically Isolated Drive Enable Alarm
Drive Output:	Phase Fired - Single Quadrant 0 - 90 VDC, 10.0 FLA, 1/4 to 1 HP [115V version] 0 - 180 VDC, 10.0 FLA, 1/2 to 2 HP [230V version] PM Motors
Current Limit:	4.0 to 10.0 Amps RMS 4.0 to 15.0 Amps Peak
Aux Supply:	+ 5 VDC + 5 % 150 mA, Max non-isolated
Serial Interface:	RS485 300 to 9600 Baud Full parameter access and control
Power Requirements:	115 + 15 % VAC [model # 3200-1933] 230 + 15 % VAC [model # 3200-1934] 50/60 Hz 0.1 Amp + motor current
I/O Power [5V_DI]:	50 mA Input Current *
Operating Temperature:	0° to 55° C [32° to 104° F] Int. Enclosure 0° to 40° C [32° to 104° F] Ext. Ambient temperature when installed in an enclosure no smaller than 12" X 10" X 8"
Humidity:	0 to 95% RH Non-condensing
Physical Dimensions:	4.0 inches height 4.0 inches width 6.0 inches depth [Interior Panel]
Faceplate Rating:	Nema 4, 4X, 12, 13 IP65
Environment:	The ML-Drive shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet [1000 meters]
Weight:	2.9 Pounds
Approvals:	UL, cUL Listed and CE Marked

*** Caution:**

**Do not exceed + 5 VDC on the I/O Power Input (J4 pins 1,2)
or equipment damage will occur.**

MLP-TRIM SPECIFICATIONS

Accuracy:	.01 % Set Speed
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Offset - Ratio plus analog offset Inverse Master - Absolute Inverse Setpoint entry Inverse Follower - Inverse Ratio Setpoint calculation
Setpoints:	Six Total: [2] Master [2] Follower [1] Direct [1] Jog
Engineering Units:	Engineering Unit Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution
Frequency Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC * Vin, Low < 1.0 VDC (Logic Low) Vin, High > 3.5 VDC (Logic High) 0 - 30 kHz Feedback & Lead 4.99 kOhm Pullup to 5V Optically Isolated
Digital Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC Vin, Low < 1.0 VDC (Logic Low) Vin, High > 3.5 VDC (Logic High) 4.99 kOhm Pullup to 5V Optically Isolated Run R-Stop F-Stop Jog Master/Follower Setpoint Select Scroll Up Scroll Down
Analog Input:	0 - 10 VDC Range 33 kOhm Input Impedance 12 Bit Resolution + 0.1 % Linearity Error - Typical + 0.05 % Drift Error - Typical - Isolated Mode + 0.2 % Drift Error - Typical - Non-Isolated Mode

MLP-Trim Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 400 mA Continuous/Total Internal Freewheeling Diodes Optically Isolated Dig_Out1 Dig_Out2
Speed Command:	0 to 10 VDC Span Pot Adjustable, 5 to 12 VDC Optically Isolated
Aux Supply:	+ 5 VDC + 5% 150 mA, Max non-isolated
Serial Interface:	RS485 300 to 9600 Baud Full parameter access and control
Power Requirements:	115 + 15% VAC [model # 3200-1936] 230 + 15% VAC [model # 3200-1937] 50/60 Hz 0.1 Amp
I/O Power [5V_DI]:	50 mA Input Current *
Operating Temperature:	0° to 55° C [32° to 131° F] Int. Enclosure 0° to 40° C [32° to 104° F] Ext. Enclosure
Humidity:	0 to 95% RH Non-condensing
Physical Dimensions:	4.0 inches height 4.0 inches width 6.0 inches depth [Interior Panel]
Faceplate Rating:	Nema 4, 4X, 12, 13 IP65
Environment:	The MLP-Trim shall be installed in a pollution degree 2 macro - environment
Altitude:	To 3,300 Feet [1000 meters]
Weight:	3.1 Pounds
Approvals:	UL, cUL Listed and CE Marked

*** Caution:**

Do not exceed +5 VDC on the I/O Power Input (J5 pins 1,2) or equipment damage will occur.

MLP-DRIVE SPECIFICATIONS

Accuracy:	.01 % Set Speed
Response:	10 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response
Scaling Formats:	Direct - Direct set of Drive Output Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation Offset - Ratio plus analog offset Inverse Master - Absolute Setpoint entry Inverse Follower - Ratio Setpoint calculation
Setpoints:	Six Total: (2) Master (2) Follower (1) Direct (1) Jog
Engineering Units:	Engineering Unit Setpoint and Display
Accel/Decel:	0 to 600.0 seconds .1 second resolution
Frequency Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC * Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 0 - 30 kHz Feedback & Lead 4.99 kOhm Pullup to 5V Optically Isolated
Digital Inputs:	74HC14 Schmitt Trigger Vin, Max < 24 VDC Vin, Low < 1.0 VDC [Logic Low] Vin, High > 3.5 VDC [Logic High] 4.99 kOhm Pullup to 5V Optically Isolated Run R-Stop F-Stop Jog Master/Follower Setpoint Select Scroll Up Scroll Down
Analog Input:	0 - 10 VDC Range 33 kOhm Input Impedance 12 Bit Resolution ± 0.1 % Linearity Error - Typical ± 0.05% Drift Error - Typical - Isolated Mode ± 0.2% Drift Error - Typical - Non-Isolated Mode

MLP-Drive Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 400 mA Continuous/Total Internal Freewheeling Diodes Optically Isolated Dig_Out1 Dig_Out2
Drive Output:	Phase Fired - Single Quadrant 0 - 90 VDC, 10.0 FLA, 1/4 to 1 HP [115V version] 0 - 180 VDC, 10.0 FLA, 1/2 to 2 HP [230V version] PM Motors
Current Limit:	4.0 to 10.0 Amps RMS 4.0 to 15.0 Amps Peak
Aux Supply:	+ 5 VDC + 5 % 150 mA, Max non-isolated
Serial Interface:	RS485 300 to 9600 Baud Full parameter access and control
Power Requirements:	115 + 15 % VAC [model # 3200-1938] 230 + 15 % VAC [model # 3200-1939] 50/60 Hz 0.1 Amp + motor current
I/O Power [5V_DI]:	50 mA Input Current *
Operating Temperature:	0° to 55° C [32° to 131° F] Int. Enclosure 0° to 40° C [32° to 104° F] Ext. Ambient temperature when installed in an enclosure no smaller than 12" X 10" X 8"
Humidity:	0 to 95% RH Non-condensing
Physical Dimensions:	4.0 inches height 4.0 inches width 6.0 inches depth [Interior Panel]
Faceplate Rating:	Nema 4, 4X, 12, 13 IP65
Environment:	The MLP-Drive shall be installed in a pollution degree 2 macro - environment.
Altitude:	To 3,300 Feet [1000 meters]
Weight:	2.9 Pounds
Approvals:	UL, cUL Listed and CE Marked

*** Caution:**

**Do not exceed +5VDC on the I/O Power Input (J4 pins 1,2)
or equipment damage will occur.**

MB-CUT SPECIFICATIONS

Cut Length:	2,097,152 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Edge Resolution for Static Position + 1 Encoder Line for Registration Index and Home Index
Response:	Control Inputs checked every 1 mSec Registration and Home Index Input Response < 20 uSec Status Outputs Updated every 1 mSec F-Stop disables Drive Enable Output within 250 mSec
Tuning:	Separately adjustable Proportional and Integral parameters for stability and response. Adjustable Feedforward constant 1 mSec loop update
Setpoints:	Five Total: [4] Preset Engineering Unit Profiles [1] Direct Setpoint
Batch Count	1 to 999,999 Counts
Accel/Decel:	0.01 to 60.00 Seconds 0.01 Second Resolution Finite Jerk S-Curve [Enable/Disable]
Frequency Inputs:	Feedback Frequency Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible [NPN] Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Digital Inputs:	5 VDC with Pullup, 1 mSec Response V_{IN} , Max < = 24.0 VDC V_{IN} , Low < = 0.7 VDC [Logic Low] V_{IN} , High > = 4.3 VDC [Logic High] Registration Index Home Index Resume Move Move Halt F-Stop Jog Forward/Reverse Back Step Home Return Home-to-Index Home Set Profile Select A Profile Select B Batch Reset

MB-Cut Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm At-Home In-Position A In-Position B In-Position C
Speed Command:	Unipolar or Bipolar Auto Range to Drive reference level 12 Bits resolution + 5 VDC to + 9 VDC using external + 12 VDC supply + 5 VDC to + 12 VDC using external + 15 VDC supply + 5 VDC to + 15 VDC using the power supply option [7200-0920]
+ 5V Aux Supply:	450 mA @ 0° to 55° C Ambient Available with power supply option only [7200-0920]
Serial Interface:	RS-422/RS-232 [Selectable] 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	+ 5 VDC + 5% @ 450 mA maximum and isolated + 12 VDC to + 15 VDC @ 250 mA maximum or with Power Supply Option [7200-0920] 115/230 -10% + 15% VAC 50/60 Hz
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	5.9" x 8.0" x 1.65" without power supply option 5.9" x 8.0" x 2.5" with power supply option

MB-ROTARY SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out [analog] Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation
Setpoints:	Eleven Total: [8] Engineering Units [1] Master [1] Jog [1] Direct
Preset Select	External switch selection of 8 preset setpoints
Batch Count	1 to 9999 Counts
Accel/Decel:	0.1 to 600.0 seconds .1 second resolution
Frequency Inputs:	Feedback and External Reference Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible [NPN] Internal 2.7 kOhm to +5 VDC 120 kHz Maximum Frequency
Digital Inputs:	$V_{IN}, Max <= 24 VDC$ $V_{IN}, Low <= 0.7 VDC$ [Logic Low] $V_{IN}, High >= 4.3 VDC$ [Logic High] Run R-Stop F-Stop Jog Jog Forward/Reverse External Reference Sync Feedback Sync Position Reset Phase Advance Phase Retard Setpoint Select A Setpoint Select B Setpoint Select C Batch Initiate Integral Zero

MB-Rotary Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Run Control Batch Complete Sync Alarm Inverted Output Ext. Reference Sync Absent Alarm Feedback Sync Absent Alarm Low/High Limit Alarm
Speed Command:	Unipolar or Bipolar Auto Range to Drive reference level 12 Bits resolution + 5 VDC to + 9 VDC using external + 12 VDC supply + 5 VDC to + 12 VDC using external + 15 VDC supply + 5 VDC to + 15 VDC using the power supply option [7200-0920]
+ 5V Aux Supply:	450 mA @ 0° to 55° C Ambient Available with power supply option only [7200-0920]
Serial Interface:	RS-422/RS-232 [Selectable] 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	+ 5 VDC + 5% @ 450 mA maximum and + 12 VDC to + 15 VDC @ 250 mA maximum or with Power Supply Option [7200-0920] 115/230 -10% + 15% VAC 50/60 Hz
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	5.9" x 8.0" x 1.65" without power supply option 5.9" x 8.0" x 2.5" with power supply option

MB-SHUTTLE SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional and Integral parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Follower - Ratio Setpoint calculation
Setpoints:	Six Total: [4] Engineering Units [1] Jog [1] Direct
Batch Count	1 to 999,999 Counts
Accel/Decel:	0 to 999,999 Engineering Units
Frequency Inputs:	Feedback and External Reference Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Preset Select	External switch selection of four preset setpoints
Digital Inputs:	V_{IN} , Max \leq 24 VDC V_{IN} , Low \leq 0.7 VDC (Logic Low) V_{IN} , High \geq 4.3 VDC (Logic High) Lead Sync Home / Follower Sync Setpoint Select A Setpoint Select B Home Set Home Seek Home Return Batch Reset Run Wait F-Stop Forward Limit Reverse Limit Jog Forward / Reverse Jog

MB-Shuttle Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm Profile Direction Output A Output B At-Home
Speed Command:	Unipolar or Bipolar Auto Range to Drive reference level 12 Bits resolution + 5 VDC to + 9 VDC using external + 12 VDC supply + 5 VDC to + 12 VDC using external + 15 VDC supply + 5 VDC to + 15 VDC using the power supply option [7200-0920]
+ 5V Aux Supply:	450 mA @ 0° to 55° C Ambient Available with power supply option only [7200-0920]
Serial Interface:	RS-422/RS-232 [Selectable] 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	+ 5 VDC + 5% @ 450 mA maximum and isolated + 12 VDC to + 15 VDC @ 250 mA maximum or with Power Supply Option [7200-0920] 115/230 -10% + 15% VAC 50/60 Hz
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	5.9" x 8.0" x 1.65" without power supply option 5.9" x 8.0" x 2.5" with power supply option

MB-TRACK SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional, Integral and Derivative parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out [analog] Master - Absolute Setpoint entry Follower - Ratio Setpoint calculation
Setpoints:	Eleven Total: [8] Preset [1] Master [1] Jog [1] Direct
Batch Count	1 to 9999 Counts
Accel/Decel:	0.1 to 600.0 seconds .1 second resolution
Frequency Inputs:	Feedback and External Reference Quadrature Encoder Format- Single Ended Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to +5 VDC 120 kHz Maximum Frequency
Learn Mode:	Self Scaling
Preset Select	External switch selection of 8 preset setpoints
Digital Inputs:	V_{IN} , Max \leq 24 VDC V_{IN} , Low \leq 0.7 VDC (Logic Low) V_{IN} , High \geq 4.3 VDC (Logic High) Run R-Stop F-Stop Jog Align * Forward/Reverse External Reference Sync Feedback Sync Ratio A [Preset Select] Ratio B [Preset Select] Master/Follower

MB-Track Specifications (continued)

- *Batch Initiate
- *Phase Advance
- * Phase Retard
- *Position Reset

*** These inputs can also be programmed as the Learn Initiate Input.**

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Run Control Batch Complete Sync Alarm Inverted Output Out A [Ext. Ref. Sync Absent] Out B [Feedback Sync Absent] Out C [Low/High Limit Alarm]
Speed Command:	Unipolar or Bipolar Auto Range to Drive reference level 12 Bits resolution + 5 VDC to + 9 VDC using external + 12 VDC supply + 5 VDC to + 12 VDC using external + 15 VDC supply + 5 VDC to + 15 VDC using the power supply option [7200-0920]
+ 5V Aux Supply:	450 mA @ 0° to 55° C Ambient Available with power supply option only [7200-0920]
Serial Interface:	RS-422/RS-232 [Selectable] 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	+ 5 VDC + 5% @ 450 mA maximum and isolated + 12 VDC to + 15 VDC @ 250 mA maximum or with Power Supply Option [7200-0920] 115/230 -10% + 15% VAC 50/60 Hz
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	5.9" x 8.0" x 1.65" without power supply option 5.9" x 8.0" x 2.5" with power supply option

MB-TRAVERSE SPECIFICATIONS

Sync Rate:	20 Pulses per second Maximum
Job Space:	14,400,000 Encoder Lines Maximum
Accuracy:	+ 1 Encoder Line resolution
Response:	1 mSec control loop update
Tuning:	Separately adjustable Proportional and Integral parameters for stability and response.
Scaling Formats:	Direct - Direct set of Speed Command Out (analog) Follower - Ratio Setpoint calculation
Setpoints:	Six Total: [4] Engineering Units [1] Jog [1] Direct
Batch Count	1 to 999,999 Counts
Accel/Decel:	0 to 999,999 Engineering Units
Frequency Inputs:	Feedback and Lead Quadrature Encoder Format-Single Ended Open-Collector Driver Compatible (NPN) Internal 2.7 kOhm to + 5 VDC 120 kHz Maximum Frequency
Digital Inputs:	V_{IN} , Max \leq 24 VDC V_{IN} , Low \leq 0.7 VDC (Logic Low) V_{IN} , High \geq 4.3 VDC (Logic High) Home Sync Setpoint Select A Setpoint Select B Home Set Home Seek Home Return Batch Reset Run Wait F-Stop Forward Limit Reverse Limit Jog Forward / Reverse Jog

MB-Traverse Specifications (continued)

Digital Outputs:	Darlington [ULN2003] Current Sinking 50 VDC Max, 200 mA Continuous/Channel, 800 mA Continuous/Total Internal Freewheeling Diodes Drive Enable Batch Done Alarm Profile Direction At-Home Output A Output B
Speed Command:	Unipolar or Bipolar Auto Range to Drive reference level 12 Bits resolution + 5 VDC to + 9 VDC using external + 12 VDC supply + 5 VDC to + 12 VDC using external + 15 VDC supply + 5 VDC to + 15 VDC using the power supply option [7200-0920]
+ 5V Aux Supply:	450 mA @ 0° to 55° C Ambient Available with power supply option only [7200-0920]
Serial Interface:	RS-422/RS-232 [Selectable] 300 to 9600 Baud Full Parameter Access and Control
Power Requirements:	+ 5 VDC + 5% @ 450 mA maximum and isolated + 12 VDC to + 15 VDC @ 250 mA maximum or with Power Supply Option [7200-0920] 115/230 -10% + 15% VAC 50/60 Hz
Operating Temp:	0° to 55° C [32° to 131° F]
Humidity:	0 to 90% RH Non-condensing
Physical Dimensions:	5.9" x 8.0" x 1.65" without power supply option 5.9" x 8.0" x 2.5" with power supply option