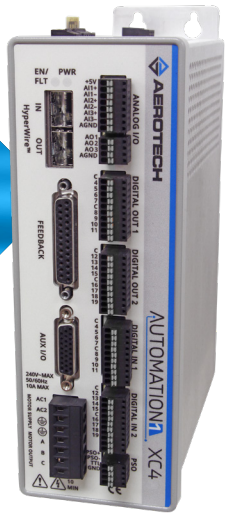
SERVOMOTOR DRIVES **AUTOMATION1-XC4**



Aerotech's XC4 next generation panel-mount controller with high-speed optical HyperWire communication bus.

The XC4 PWM digital drive is a high-performance single-axis motor drive designed for motion control applications. All versions are compatible with the Automation 3200 motion platform utilizing the HyperWire® motion bus.

The XC4 PWM amplifiers control brushless DC, brush DC, voice coil, or stepper motor types at up to 340 VDC operating voltage and 30 A peak current capability.

The current loop and servo-loop are closed digitally to ensure the highest level of positioning accuracy and rate stability. This allows loop closure rates of up to 20 kHz and allows digital and analog I/O processing, data collection, process control, and encoder multiplication tasks in real time.

Standard features for the XC4 include Safe Torque Off (STO), a data array consisting of over 4 million 32-bit elements, digital and analog I/O (see table), one-axis Position Synchronized Output (PSO), dedicated home and end-of-travel limit inputs, and an enhanced current sense device. Encoder support includes square-wave, sine-wave, and absolute encoders.

The standard XC4 accepts square-wave encoder feedback at rates of up to 40 million counts-per-second. Sine-wave encoders can be multiplied by up to 16,384, producing high-resolution position feedback with the optional encoder multiplier feature.

Each single-axis XC4 PWM digital drive has an optional I/O expansion board, greatly increasing the number of I/O points. This I/O board includes a dedicated PSO output and a PSO synchronization input, often used to synchronize process control with an external mode-locked frequency input.

PRODUCT HIGHLIGHTS

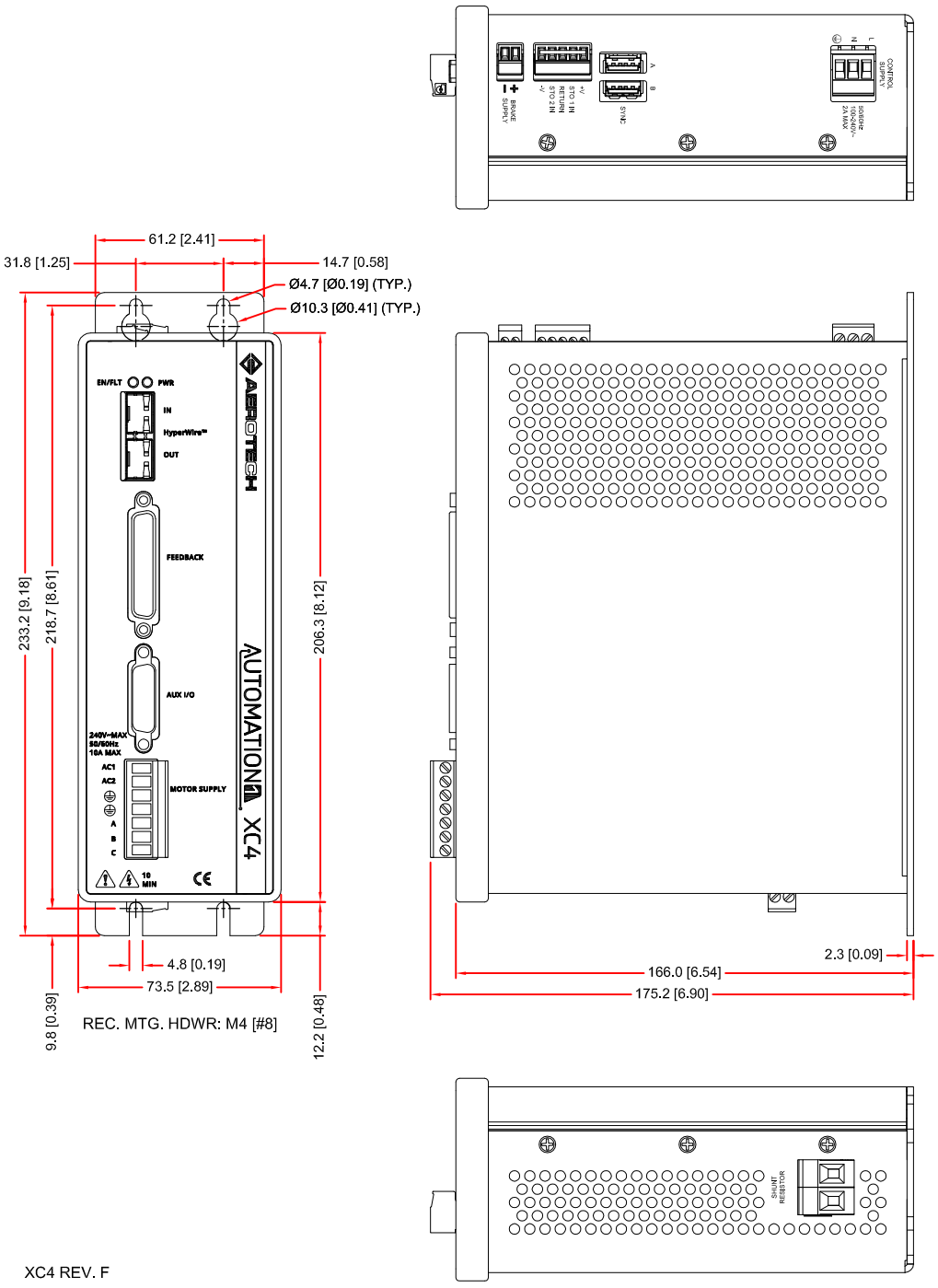
- HyperWire® fiber-optic interface
- Up to 30 A peak output current
- Drive brush, brushless, voice coil, and stepper motors
- Safe Torque Off (STO) safety circuit
- Includes single-axis Position Synchronized Output (PSO)
- I/O expansion board
- High resolution digital current, velocity, and position loops
- NRTL safety certification and CE approval; follows the 2011/65/EU RoHS 2 Directive

Automation1-XC4 **Specifications**

Specifications	10	20	30
Motor Style	Brush, brushless, voice coil, stepper[1]		
Motor Supply	Single-phase 0-240 VAC; 50/60 Hz		
Control Supply	100-240 VAC; 50/60 Hz		
Bus Voltage[2]	0-340 VDC		
Peak Output Current (1 sec)[33]	10 A_{pk}	20 A_{pk}	30 A_{pk}
Continuous Output Current[3]	5 A_{pk}	10 A_{pk}	
Digital Inputs	4x optically isolated (additional available with -EB1 I/O expansion board, see below)		
Digital Outputs	4x optically isolated (additional available with -EB1 I/O expansion board, see below)		
High-Speed Inputs	2x optically isolated		
Analog Inputs	1x 16-bit differential ±10 V (additional available with -EB1 I/O expansion board, see below)		
Analog Outputs	1x 16-bit single-ended; ±10 V (additional available with -EB1 I/O expansion board, see below)		
Position Synchronized Output (PSO)	One-axis PSO and One-axis Part-Speed PSO standard		
25-Pin Motor Feedback Connector	High-speed differential inputs (encoder sin, cos and marker)* CW and CCW limits Hall effect sensor inputs (A, B, and C) Analog motor temperature input (accepts digital) Brake output		
26-Pin Auxiliary Feedback Connector	High-speed differential inputs (encoder sin, cos and marker)* Contains the digital inputs and digital outputs listed above Contains the high-speed inputs listed above Contains the analog inputs and analog outputs listed above *This channel is bidirectional, and can be used to echo out encoder signal		
Multiplier Options	MX0; no encoder multiplier includes: • Primary encoder 40 million counts-per-second square-wave input • Auxiliary encoder 40 million counts-per-second square-wave input MX1; MX1 encoder multiplier includes: • Primary Encoder 450 kHz sine-wave input, Encoder multiplier up to x16,384* • Auxiliary Encoder 40 million samples-per-second square wave input. *Multiplied encoder cannot be echoed out.		
I/O Expansion Board (-EB1)	1x additional PSO connection point 1x PSO synchronization Input 16x digital inputs, optically isolated 16x digital outputs, optically isolated 3x analog inputs, 16-bit, differential, ±10 V 3x analog outputs, 16-bit, single-ended, ±10 V		
Drive Array Memory	4,194,304 32-bit elements		
High-Speed Data Capture	Yes (50 ns latency)		
Safe Torque Off (STO)	Yes, SIL3/PLe/Cat 4		
HyperWire Connections	2x HyperWire small form-factor pluggable (SFP) Ports		
Automatic Brake Control	Standard; 24 V at 1 A		
Absolute Encoder	Renishaw Resolute BiSS; EnDat 2.1; and EnDat 2.2		
Current Loop Update Rate	20 kHz		
Servo Loop Update Rate	8 kHz		
Power Amplifier Bandwidth	Selectable through software (85-95% efficiency) kHz		
Minimum Load Inductance	0.1 mH		
Operating Temperature	0 to 40°C		
Storage Temperature	-30 to 85°C		
Weight	2.36 kg (5.20 lb.)		
Compliance	CE approved, NRTL safety certification, 2011/65/EU RoHS 2 directive		

1 For stepper motors only, one-half of bus voltage is applied across the motor (e.g., 80 VDC supply results in 40 VDC across stepper motor).
2 Output voltage dependent upon input voltage.
3 Peak value of the sine wave; rms current for AC motors is 0.707 * A pk.

Automation1-XC4 **Dimensions**



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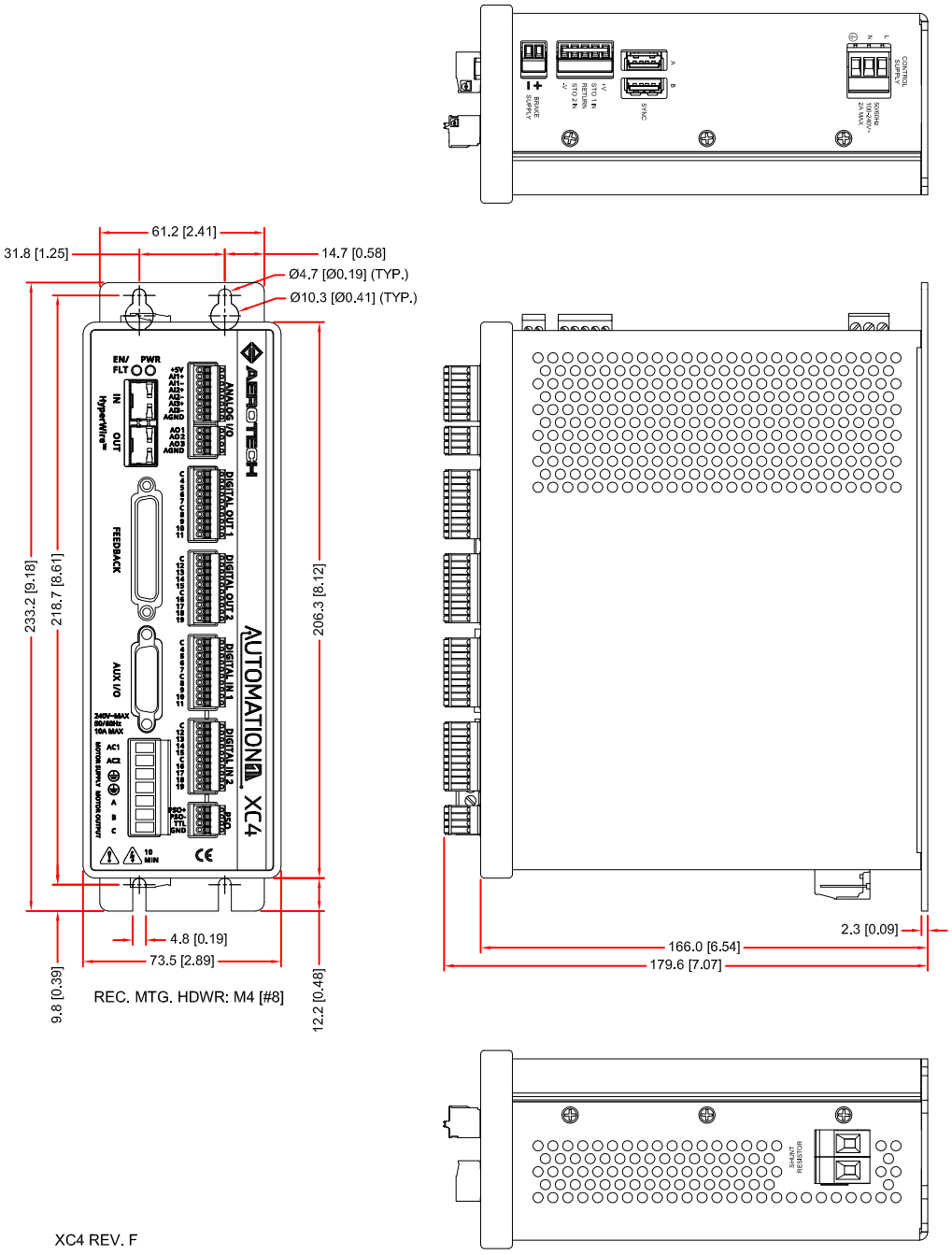

Automation1-XC4 **Ordering Information**

XC4

XC4	XC4 PWM digital drive

Peak Current

-10	10 A peak, 5 A cont. current (default)
-20	20 A peak, 10 A cont. current
-30	30 A peak, 10 A cont. current

Expansion Board

-EB0	No expansion board (default)
-EB1	IO expansion board

Multiplier

-MX0	No encoder multiplier (default)
-MX1	450 kHz x16384 multiplier (primary), no multiplier (auxiliary)

PSO

-PSO1	One-Axis PSO (default; includes One-Axis Part-Speed PSO)

External Shunt

-SX0	No 2-pin connector for external shunt (default)
-SX1	2-pin connector for external shunt