CONTROL TECHNIQUES

DC DRIVES

MENTOR MP & QUANTUM MP
HIGH PERFORMANCE DC SOLUTIONS

DRIVE OBSESSED

MENTOR MP

OPTIMUM PERFORMANCE, FLEXIBLE SYSTEM

The ultimate DC drive

As a world leader in DC drive technology, our innovative products are used in the most demanding applications requiring performance, reliability & energy efficiency.

Mentor MP integrates the control platform from the world's leading intelligent AC drive technology making it one of the most flexible DC drives available. With optimum performance and flexible system interfacing capability, the Mentor MP drive allows you to maximize motor performance & enhance system reliability. Interface digitally with modern control equipment using Ethernet & fieldbus networks. It is very easy to retrofit from Mentor II & for high power configuration.

Benefits:

- Easy to set-up and commission
- Drive intelligence and system integration
- Machine communications flexibility

QUANTUM MP

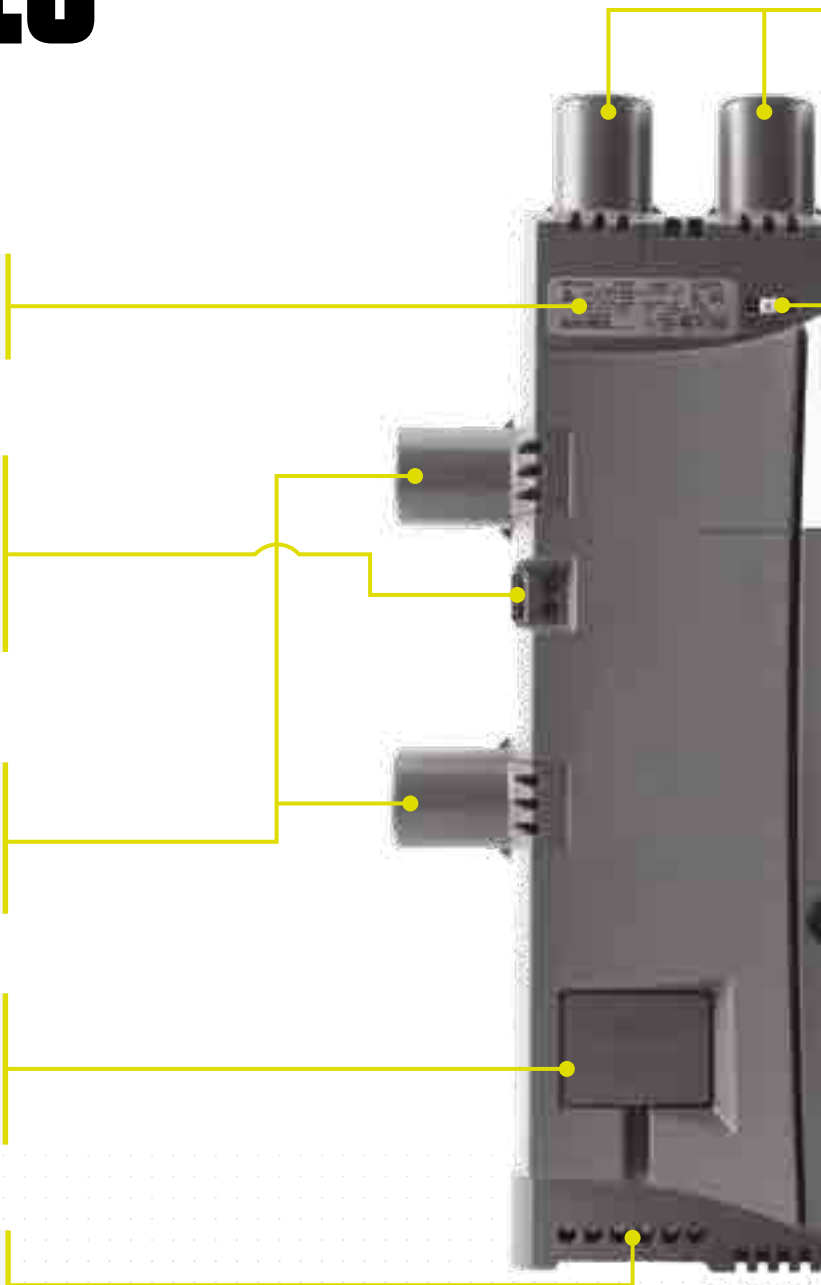
PACKAGED MENTOR MP DC DRIVE SYSTEM

The packaged Mentor MP drive

The Quantum MP is a packaged Mentor MP that integrates the control functionality of the Mentor MP with a design that incorporates a DC loop contactor, high-speed input fuses, 120 Vac control logic and DC output fuses (on all regenerative models). A dynamic braking contactor is also included in drives up to and including 350 A models. The Quantum MP saves engineering time and panel space.

Existing Mentor II and Quantum III customers can easily migrate to the new MP platform. All Mentor MP power terminal locations and mounting points are the same as those of the Mentor II. Similarly, all Quantum MP control terminals are the same format as the Quantum III. Both drives include complimentary software tools to assist in transferring drive parameters and programs from older products to new ones.

MENTOR MP & QUANTUM MP
KEY FEATURES



Drive rating label

Armature voltage feedback for use with DC contactor and inverter common DC bus systems

Output power connections to motor with removable covers

Fuses for field protection
(removable cartridge)

Integrated field controller

AC supply input connections with removable safety covers

Drive identification marker rail

Optional keypad, available as high brightness LED or multilanguage LCD with plain text

Smartcard for parameter and custom application program storage

Standard onboard Modbus communications port for PC programming & device interfacing

Safety terminal cover

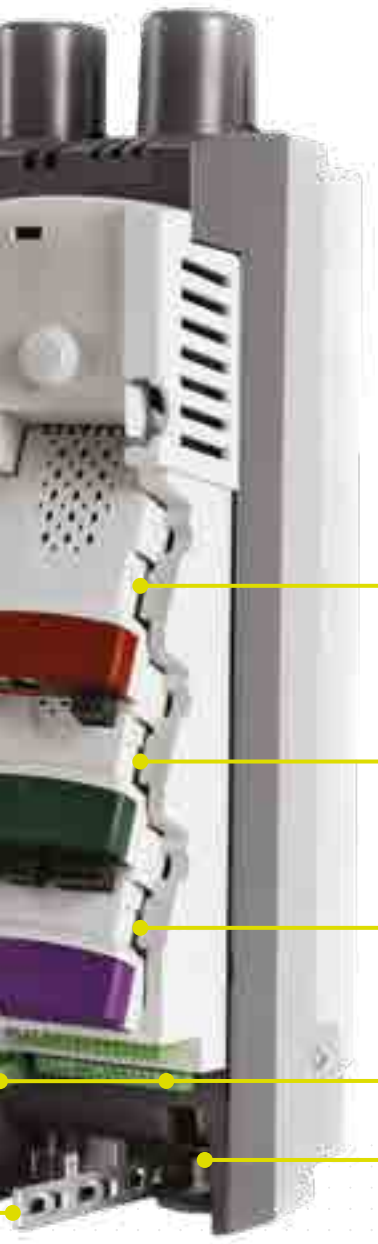
Safety finger guard

MENTOR MP & QUANTUM MP
KEY FEATURES

Modbus Communications port for PC programming and device interfacing

Communications port for external field controller

Sturdy cable management system providing a grounding point for shielded control cables



3 universal option module slots for communications, I/O, additional feedback devices and automation / motion controllers

Pluggable terminals for I/O, relays, tach feedback, encoder and a current feedback test pin for fine tuning armature current loop

Communication ports for paralleling drives (Size 2 only)

ADDITIONAL QUANTUM MP
KEY FEATURES

Motor armature connections

Control power supply

AC supply fuses

Customer 120 Vac control connections

EASY SET-UP OF ENHANCED CONTROL AND MONITORING

Greater motor field control

Built in field controller as standard

- Gives excellent field control for the majority of DC motors
- Reduces the need for external components

Enhanced field control with FXMP25

- The optional FXMP25 may be controlled digitally by using a standard RJ45 connection, allowing set-up by standard drive parameters
- The FXMP25 can also function in standalone mode using its integrated keypad and display

Enhanced system design

- The heatsink cooling fans are intelligently controlled and only run when required, thus increasing reliability and reducing maintenance
- Eighteen different option modules allow customisation of the drive, including fieldbus, Ethernet, I/O, extra feedback devices and motion controllers
- The drive system designer is able to embed automation and motion control within the drive, eliminating communications delays that reduce performance

Fast set-up, configuration and monitoring

- Quick and easy to set-up
- Can be configured using optional removable keypads
- Advanced auto-tune features help you get the best performance from your machine

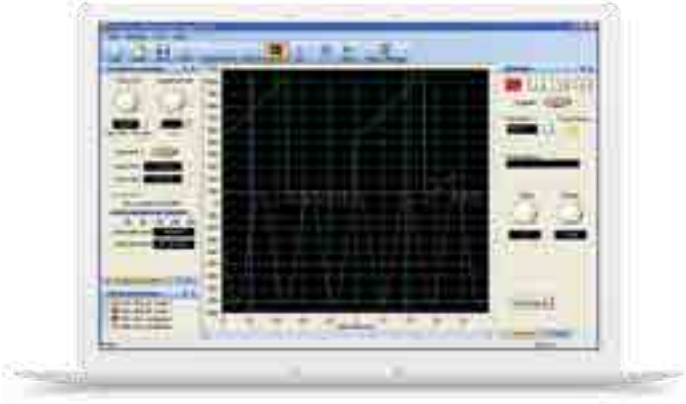
PC SOFTWARE & SMARTCARD TOOLS:
RAPID COMMISSIONING

Control Techniques' software makes it easy to access the drive's feature set. It allows you to optimize drive tuning, back-up the configuration and set-up a communications network.

CTScope

Drive oscilloscope software for viewing & analysing changing values within the drive.

- The time base can be set to give high speed capture for tuning or for longer term trends
- Based on a traditional oscilloscope, making it easy to use for all engineers



Smartcard

The smartcard is a backup memory device that brings the following benefits:

- Parameter and program storage
- Simplify drive maintenance and commissioning
- Quick set-up for sequential build of machines
- Machine upgrades can be stored on a smartcard & sent to the customer for installation

CTSoft

Our drive configuration tool for commissioning, optimising and monitoring allows you to:

- Use configuration wizards to commission your drive
- Read, save and load drive configuration settings
- Manage the drive's smartcard data
- Visualize and modify the configuration with live animated diagrams
- All motor data is entered in real units and the current limit window will calculate parameter settings based on ambient temperature and required overload rating

Unrivalled integration flexibility

Control Mode

Estimated speed Feedback

Tacho Feedback

Encoder Feedback

Field Control

Options

Standard

Mentor MP in field mode greater than 25 A

FXMP25 Field Control up to 25 A

Integrated Field Control Size 1: 8 A | Size 2: 20 A

Drive Programming and Operator Interface

Options

Standard

Operator Interface

Free Software

CTSoft

CTScope

CTOPCserver

MP-Keypad LCD with MP firmware

SM-Keypad LED standard

Smartcard

Interconnect Cable

Standard

Options

Input / Output

SM–I/O 32

SM–I/O Plus

SM–I/O Lite

SM–I/O Timer

SM–I/O 120V

SM–PELV

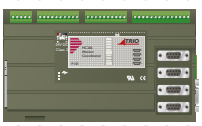
REMOTE I/O

7 Digital I/O
5 Analog I/O
2 Form C relays

6 Digital inputs (120 Vac)
1 Form A relay
Quantum MP only Additional I/O

Centralized PLC/Motion Control

Motion Controller



PLC

USB Port-to-Drive Serial Interface Cable CT-USB-CABLE

PC

Dynamic Braking Options

Dynamic Brake Resistors
E-Stop or Cyclic Duty

Applications with PLC or Motion functionality

Standard | Options

Onboard PLC

Easy to use onboard ladder logic PLC at zero cost, ideal for simple applications requiring extra drive functionality Configured using SyPTLite software

SM–Applications Lite V2

Powerful automation controller using a dedicated microprocessor giving full drive parameter access Configured using SyPTLite or SyPTPro software

SM–Applications Plus

Powerful automation controller with drive-to-drive networking and full motion capability Configured using SyPTPro software

SM–Register

High speed motion and registration control Configured using SyPTPro software

SyPTLite SyPTPro CTNET CTSYNC

SOFTWARE INCLUDED

Communications

Standard | Options

Modbus RTU

SM–EtherCAT

SM–Profibus DP-V1

SM–Interbus

SM–DeviceNet

SM–Ethernet

SM–CANopen

SM-PROFINET

Feedback

Standard | Options

Armature Voltage
AC or DC Tach
Encoder

SM–Universal Encoder Plus

Accepts or replicates all standard feedback types, Input and output

SM–Encoder Plus

Incremental input

SM–Encoder Output Plus

Incremental encoder input / buffered output

MP SERIES

DRIVE INTELLIGENCE & SYSTEM INTEGRATION

Inbuilt controller programmable with SyPTLite

- Mentor MP has an inbuilt programmable controller. It is configured using SyPTLite, an easy to use ladder logic program editor, suitable for replacing relay logic or a micro PLC for simple drive control applications.

Develop tailored solutions for applications modules with SyPTPro

- SyPTPro is a fully featured automation development environment that can be used for developing tailored solutions for single or multiple drive applications.
- The programming environment fully supports three industry standard languages: Function Block, Ladder and Structured Text. Motion control is configured using the new PLCopen motion language, supporting multiple axes.

Create an intelligent networked system with CTNet

- CTNet, a high-speed, deterministic drive-to-drive network links the drives, SCADA and I/O together to form an intelligent networked system, with SyPTPro managing both the programming and communications.

SyPTLite

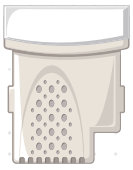
SyPTPro

High performance automation

Control Techniques' SM-Applications option modules contain a separate high performance microprocessor enabling the execution of application programs. This leaves the drive's own processor to give the best possible motor performance.

The SM-Application modules include the SM-Application Plus and the SM-Application Lite V2 variants.

- Both modules can be used to tackle automation problems from simple start/stop sequencing with a single drive to more complex machine and motion control application.
- The SM-Applications modules give you real-time access to all of the drive's parameters, plus access to data from I/O and other drives.



SM-Applications Lite V2

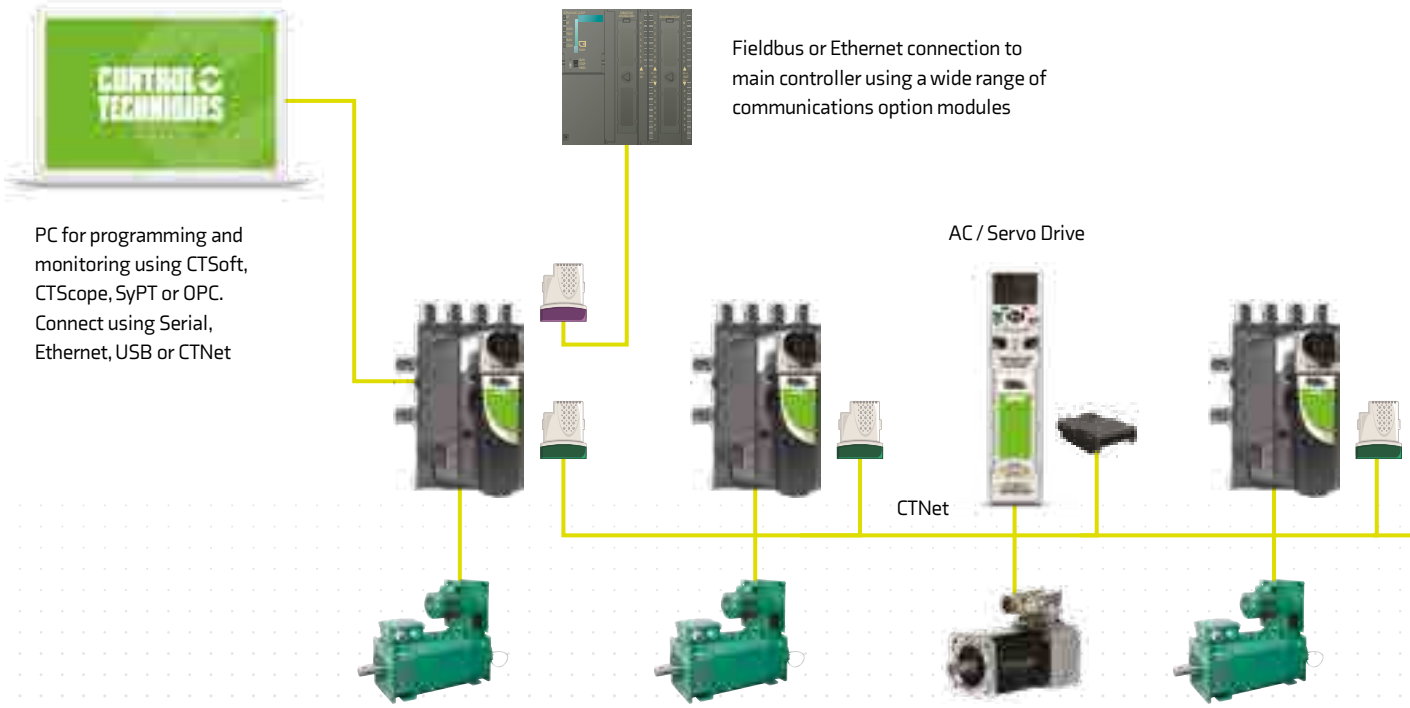
SM-Applications Plus

SM-Applications Plus adds:

- Inputs/Outputs – The module has two digital inputs and two digital outputs for high-speed I/O operations such as position capture and actuator firing.
- High speed serial port – The module features a serial communications port supporting a number of built-in protocols for connection to external devices such as operator interface panels. These are CT-ANSI slave,
- Modbus RTU in master and slave modes, Modbus ASCII in master and slave modes and 3 user modes. Both two and four wire configurations are possible.
- Drive-to-drive communications – SM-Applications Plus option modules include a high speed drive-to-drive network called CTNet. This network is optimized for intelligent drive systems offering flexible peer-to-peer communications.

MP SERIES MACHINE

COMMUNICATIONS FLEXIBILITY



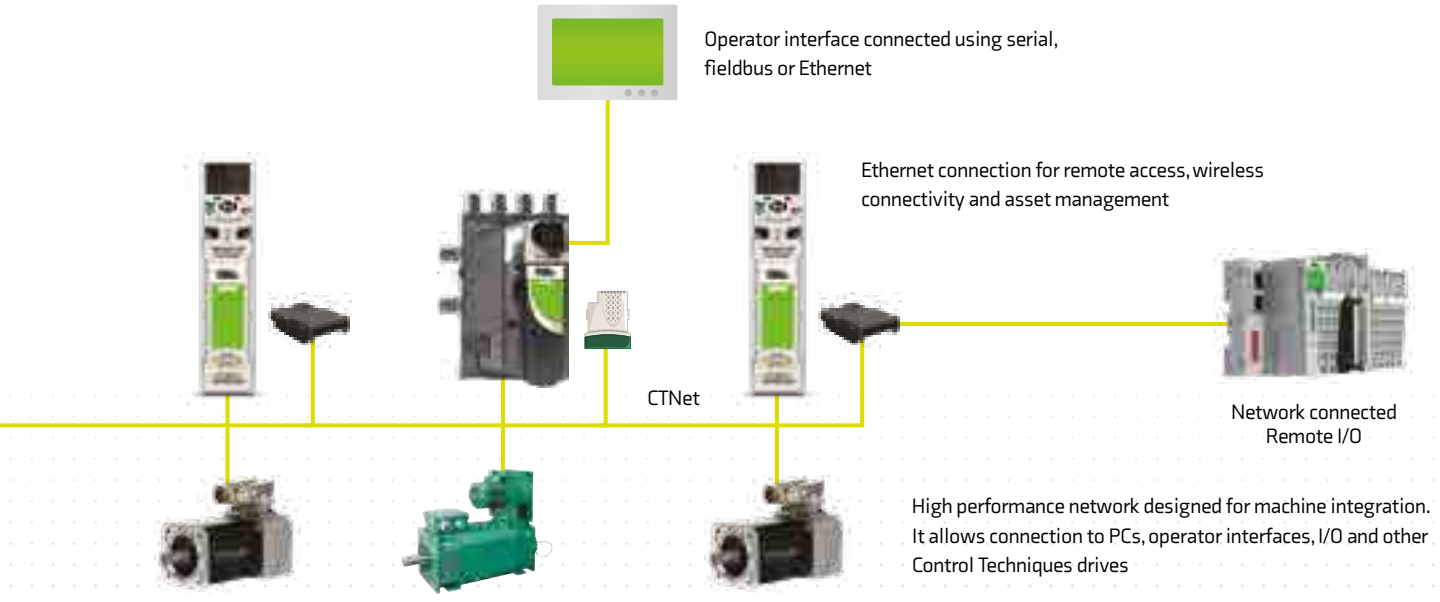
Fieldbus communications

Option modules for all common Industrial Ethernet fieldbus networks such as Ethernet IP & ProfiNet. Servo networks such as Ethercat are also available.

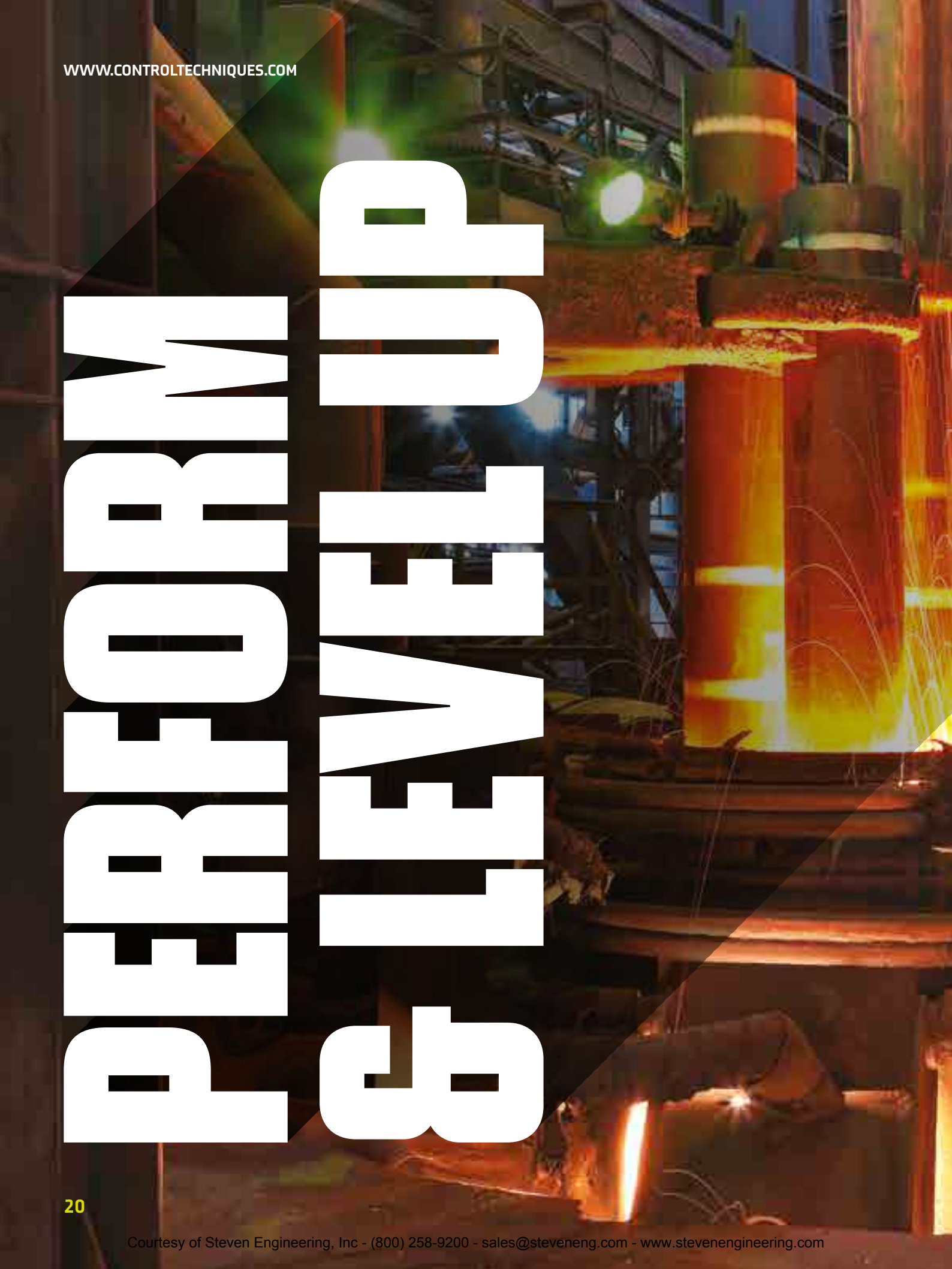
Easy gateway

SM-Applications & CTNet allow machine designers to design an easy gateway into which customers are able to interface using their preferred fieldbus or Ethernet interface. This solution improves the machine performance, simplifies the problem of being able to meet customer specifications for different fieldbus communications & helps to protect your intellectual property.

	Onboard PLC	SM-Applications Lite V2	SM-Applications Plus
Intellectual property protection	●	●	●
SyPTLite Programming	●	●	
SyPTPro Programming		●	●
Multi-tasking environment		●	●
Motion control capabilities		●	●
CTNet drive-to-drive network			●
Serial port			●
High Speed I/O			●



PERFORM & LEVEL UP



MENTOR MP

SECURE PLANT AVAILABILITY

Mentor II has had its day and the simplest way to secure plant availability is to level up with Mentor MP.

Retro-fit projects

- We ensure easy integration with your existing motor, power supply, application equipment and communication networks from the design stage
- Mentor MP brings performance and possibilities to your application with minimum migration costs

Motor field control

- Built in field controller as standard in every Mentor MP
  i. Gives excellent field control for the majority of DC motors
  ii. Reduces the need for external components

We recommend an external motor field controller when:

- The required field current is greater than that offered by the standard drive, up to 25 A. For example, older motors with low field voltages
- The field needs to be forced down more quickly than a standard half controlled field bridge can manage
- Applications can be implemented with simple field current reversal, without armature reversal, if machine dynamics can still be met

Ease of migration

- Mentor MP is designed for existing Mentor II customers to easily migrate to the new platform
- All power terminal locations and mounting points have been retained
- At 900 A, Mentor MP has a much smaller frame size than Mentor II with smaller cable requirements. This allows for high power density paralleled configurations without custom-made bus bars.
- CT Soft has a built in migration wizard to assist with the transfer of drive parameters and programs.

Note:

The control section of Mentor MP frame 2C and 2D is 90 mm deeper than Mentor II.

If a depth extension is not possible, then for other solutions, please contact your Control Techniques supplier.

MENTOR MP
TECHNICAL DATA

Environment

Ambient Operating	32 to 131 °F (0 to 55 °C) Some models are derated above 104 °F (40 °C)
Cooling Method	MP25-MP45 natural convection; MP75 and larger forced convection
Humidity	90% relative humidity at 122 °F (50 °C)
Storage Temperature	-40 to 131 °F (-40 to 55 °C)
Altitude	0 to 9,842 ft (0 to 3,000 m), derate 1% per 328 ft (100 m) between 3,280 ft (1,000 m) and 9,842 ft (3,000 m)
Enclosure	MP25-MP210: IP20; MP350 to MP900 = IP10; MP1200 and larger = IP00

AC Supply Requirements

SCR Supply Voltage	24 to 480 Vac -20% +10%, MP500 to 575 Vac, 500 to 690 Vac ±10%, 3Ø
Frequency	45 to 65 Hz
Supply Fault Current	100 kA
Auxiliary Supply Voltage	208 to 480 Vac ±10%, 1Ø
Armature Voltage (max.)	2-quadrant drives 1.35 X input Vac; 4-quadrant drives 1.15 X input Vac
Field Voltage (max.)	0.9 X input Vac with 1Ø input MP in field mode - 1.35 X input Vac with 3-phase input

Control

Analog Inputs	Qty 1, high precision differential voltage ± 10 V, 14 bit + sign Qty 2, general purpose voltage or current ± 10 V, 0 to 20 mA, 4 to 20 mA, thermistor (analog 3 only), 10 bit + sign
Analog Outputs	Qty 2, ±10 V, 0 to 20 mA, 4 to 20 mA, 10 bit + sign
Digital I/O	Qty 3, 24 Vdc inputs Qty 3, 24 Vdc input/outputs
Drive Enable	Digital input 24 Vdc
Relays	Qty 2, 5 A @240 Vac, 5 A @30 Vdc resistive, 0.5 A @30 Vdc inductive (L/R = 40 ms)
Speed Loop	250 µs loop update
Current Loop	35 µs current sampling time
Feedback Methods	Encoder (resolution 0.01%) DC tach (resolution 0.1%); AC tach (resolution 1%) (300 V max.) Armature voltage (resolution 5%) Qty 3, optional additional incremental & absolute encoders
Field Control	Current regulated with flux control MP25-MP210 8 A MP350-MP1850 20 A MP optional FXMP25 25 A
Serial Communications	2- or 4-wire RS422 or RS485, optically-isolated Protocol is ANSI x 3.28-2.54-A4 or Modbus RTU Baud rate is 300 to 115,200

Protection and Diagnostics

Control	Patent-pending galvanic electrical isolation, 24 Vdc power supply
Supply	Loss, undervoltage, overvoltage, transient suppression
Armature	Open circuit, I^2t overload, instantaneous overcurrent, semiconductor fuse (regen only)
Field	Loss, overcurrent
Motor	Motor overtemperature switch or thermistor overtemperature trips
Drive Thermal	Heatsink, SCR junction, control board and option module(s)
Current Loop Loss	Loss of analog current reference

Order String

DC Drive

MP 1200A 4 R

- **MP** — Mentor Platform
- **1200A** — Maximum continuous armature current
- **4** — Supply Voltage:
  - 4 = 480 V 24 V to 480 V -20 % +10 %
  - 5 = 575 V 500 V to 575 V -10 % +10 %
  - 6 = 690 V 500 V to 690 V -10 % +10 %
- **R** — R - 4 quadrant operation; Blank - 2 quadrant operation

External Field

FX MP 25

- **FX** — External Field
- **MP** — Mentor Platform
- **25** — Maximum Field Current (A)

Note: At the time of ordering, please select the required interface option. Order strings do not include drive keypad.
Refer to page 14 for keypad order codes.

Ratings

Frame	Order Code	Input Voltage						Armature Current (A)*	Field Current (A)	Quadrants of Operation
		230 V	460 V	575 V		690 V				
		Motor (HP)		Order Code	Motor (HP)	Order Code	Motor (HP)			
		240 Vdc	500 Vdc		600 Vdc		700 Vdc			
1A	MP25A4(R)	5	10	MP25A5(R)	15	n/a		25	8	2 and 4
	MP45A4(R)	10	25	MP45A5(R)	30			45		
	MP75A4(R)	20	40	MP75A5(R)	50			75		
1B	MP105A4(R)	30	60	MP105A5(R)	75	n/a		105	8	2 and 4
	MP155A4(R)	40	75	MP155A5(R)	100			155		
	MP210A4(R)	60	125	MP210A5(R)	150			210		
2A	MP350A4(R)	100	200	MP350A5(R)	250	MP350A6(R)	300	350	20	2 and 4
	MP420A4(R)	125	250	n/a		n/a		420		
		n/a		MP470A5(R)	350	MP470A6(R)	400	470**		
	MP550A4(R)	150	300	n/a		n/a		550		
2B	MP700A4(R)	200	400	MP700A5(R)	500	MP700A6(R)	600	700	20	2 and 4
	MP825A4(R)	225	500	MP825A5(R)	600	MP825A6(R)	700	825**		
	MP900A4(R)	250	550	n/a		n/a		900		
2C	MP1200A4	350	750	MP1200A5	900	MP1200A6	1000	1200	20	2
	MP1850A4	550	1150	MP1850A5	1400	MP1850A6	1600	1850		
2D	MP1200A4R	350	750	MP1200A5R	900	MP1200A6R	1000	1200	20	4
	MP1850A4R	550	1150	MP1850A5R	1400	MP1850A6R	1600	1850		

7030 A is achieved by parallel connection of Mentor MP drives

* Current ratings are at 104°F (40°C) with 150% overload for 30s.

** For this rating at 575 V and 690 V, 150% overload time is 20s at 104°F (40°C) and 30s at 95°F (35°C).

(R) indicates optional order code for 4-quadrant operation.

HP provided for convenience. Always size drive based on motor Amps.

MENTOR MP
TECHNICAL DATA

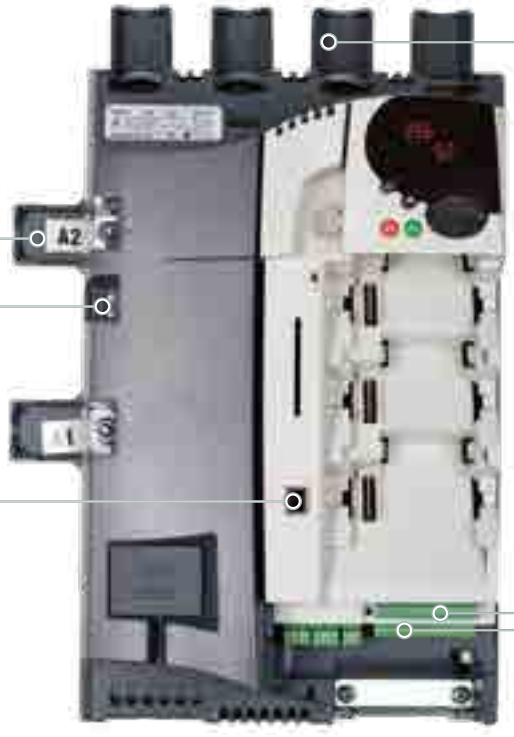
Dinmensions

Frame Size	Height (H)*		Width (W)		Depth (D)	
	in	mm	in	mm	in	mm
1A	17.5	444	11.5	293	8.7	222
1B	17.5	444	11.5	293	9.9	251
2A	25.2	640	19.5	495	11.9	301
2B	25.2	640	19.5	495	11.9	301
2C	41.3	1050	21.9	555	24.1	611
2D	59.4	1510	21.9	555	24.1	611

* Height including optional fit exhaust duct cover is:
49.29 in (1252 mm) for size 2C and 67.40 in (1712 mm) for size 2D.

All Mentor MP and Quantum MP DC drives up to 575 V ratings are cULus certified. These drives are the most flexible DC drive available today.

Mentor MP Terminal Connections



Power - Armature

Pin #	Function
A1	Armature +
A2	Armature -

Motor Armature Voltage Feedback

Pin #	Function
MA1	Armature +
MA2	Armature -

RS485

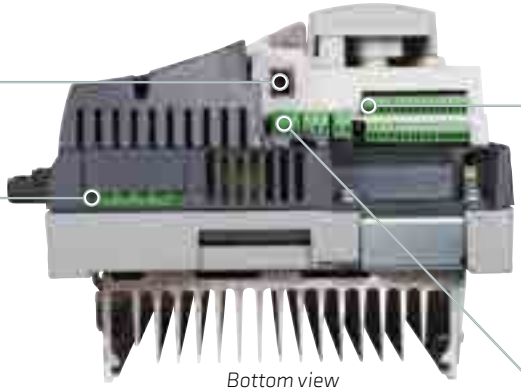
Pin #	Function
1	120Ω Termination Resistor
2	RX TX
3	Isolated 0 V
4	+24 V (100 mA)
5	Isolated 0 V
6	TX Enable
7	RX\ TX\
8	RX\ TX\ (if termination resistors are required, link to pin 1)
Shell	Isolated 0 V

External Field Supply RS485

Pin #	Function
1	120Ω Termination Resistor
2	RX TX
3	Isolated 0 V
4	+24 V (100 mA)
5	Isolated 0 V
6	TX Enable
7	RX\ TX\
8	RX\ TX\ (if termination resistors are required, link to pin 1)
Shell	Isolated 0 V

Power - Field

Pin #	Function
E1	Control Electronics Supply
E3	Control Electronics Supply
L12	Field On/Off
L11	Field On/Off
F+	Field +
F-	Field -



Bottom view

Frame Size 1 layout
Refer to the product User Guide for other sizes

Power - Line

Pin #	Function
L1	Line In
L2	Line In
L3	Line In
⏚	Ground Connection

Control Terminals - Top Row

Pin #	Function
1	0 V Common
2	24 Vdc External Input
3	0 V Common
4	10 Vdc Source, 10 mA
5	Analog Input 1 +
6	Analog Input 1 -
7	Analog Input 2
8	Analog Input 3
9	Analog Output 1
10	Analog Output 2
11	0 V Common

Control Terminals - Bottom Row

Pin #	Function
21	0 V Common
22	24 Vdc Output, 200 mA
23	0 V Common
24	Digital I/O 1
25	Digital I/O 2
26	Digital I/O 3
27	Digital Input 4
28	Digital Input 5
29	Digital Input 6
30	0 V Common
31	Drive Enable

Control Terminals - Encoder Feedback

Pin #	Function
A	Channel A
A\	Channel A\
B	Channel B
B\	Channel B\
Z	Marker Pulse Z
Z\	Marker Pulse Z\
+	Encoder Supply
0 V	Encoder 0 V

Control Terminals - Relays & Tach Feedback

Pin #	Function
51	Relay 1 Common
52	Relay 1 N/C Contact
53	Relay 1 N/O Contact
61	Relay 2 Common
62	Relay 2 N/C Contact
63	Relay 2 N/O Contact
41	Tach +
42	Tach -

QUANTUM MP
TECHNICAL DATA

Environment

Ambient Operating	32 to 131 °F (0 to 55 °C)
	Some models are derated above 104 °F (40 °C)
Cooling Method	QMP45 natural convection; QMP75 and larger forced convection
Humidity	90% relative humidity at 122 °F (50 °C)
Storage Temperature	-40 to 131 °F (-40 to 55 °C)
Altitude	0 to 9,842 ft (0 to 3,000 m), derate 1% per 328 ft (100 m) between 3,280 ft (1,000 m) and 9,842 ft (3,000 m)
Enclosure	IP00

AC Supply Requirements

SCR Supply Voltage	208 to 480 Vac -20% +10%, 3Ø
Frequency	48 to 65 Hz
Supply Fault Current	QMP45-QMP210 = 30kA; QMP350 and larger = 5 kA
Auxiliary Supply Voltage	208 to 480 Vac ±10%, 1Ø
Armature Voltage (max.)	2-quadrant drives 1.35 X input Vac; 4-quadrant drives 1.15 X input Vac
Field Voltage (max.)	0.9 X input Vac with 1Ø input

Control

Analog Inputs	Qty 1, high precision differential voltage ± 10 V, 14 bit + sign
	Qty 2, general purpose voltage or current ± 10 V, 0 to 20 mA, 4 to 20 mA, thermistor (analog 3 only), 10 bit + sign
Analog Outputs	Qty 2, ±10 V, 0 to 20 mA, 4 to 20 mA, 10 bit + sign
	Qty 1, instantaneous armature current feedback pin, 10 V = 2x motor rated current
Digital I/O	Qty 3, 24 Vdc inputs
	Qty 3, 24 Vdc input/outputs
	Qty 7, 120 Vac Inputs
Drive Enable	Digital input 24 Vdc
Relays	Qty 2, 5 A @240 Vac, 5 A @30 Vdc resistive, 0.5 A @30 Vdc inductive (L/R = 40 ms) Qty 1, 120 Vac
Speed Loop	250 µs loop update
Current Loop	35 µs current sampling time
Feedback Methods	Encoder (resolution 0.01%)
	DC tach (resolution 0.1%); AC tach (resolution 1%) (300 V max.)
	Armature voltage (resolution 5%)
	Qty 3, optional additional incremental and absolute encoders
Field Control	Current regulated with flux control
	QMP25-QMP210 8 A
	QMP350-QMP700 20 A
	QMP Optional FXMP25 25 A
Serial Communications	2- or 4-wire RS422 or RS485, optically-isolated
	Protocol is ANSI x 3.28-2.54-A4 or Modbus RTU Baud rate is 300 to 115,200

Protection and Diagnostics

Control	Patent-pending galvanic electrical isolation, 24 Vdc power supply
Supply	Loss, undervoltage, overvoltage, transient suppression, semiconductor fuses
Armature	Open circuit, I^2t overload, instantaneous overcurrent, semiconductor fuse (regen only)
Field	Loss, overcurrent
Motor	Motor overtemperature switch or thermistor overtemperature trips
Drive Thermal	Heatsink, SCR junction, control board and option module(s)
Current Loop Loss	Loss of analog current reference

Order String

DC Drive

External Field

QMP **700A** **4** **R** **FX** **MP** **25**

QMP - Quantum Package

Maximum continuous armature current

Supply Voltage: 4 = 208 to 480 Vac

R - Regenerative
Blank - Non-Regenerative

Quantum Platform

External Field

Maximum Field Current (A)

Note: At the time of ordering, please select the required interface option. Order strings do not include drive keypad.
Refer to page 14 for keypad order codes.

Ratings

Frame	Order Code	Input Voltage		Armature Current (A)*	Field Current (A)	Quadrants of Operation
		230 V	460 V			
		Motor (HP)				
		240 Vdc	500 Vdc			
1A	QMP25A4(R)	5	10	25	8	2 and 4
	QMP45A4(R)	10	25	45		
	QMP75A4(R)	20	40	75		
1B	QMP155A4(R)	40	75	155	8	2 and 4
	QMP210A4(R)	60	125	210		
2A	QMP350A4(R)	100	200	350	20	2 and 4
2B	QMP550A4(R)	150	300	550	20	2 and 4
	QMP700A4(R)	200	400	700		

* Current ratings are at 40°C with 150% overload for 30s.

(R) indicates optional order code for 4-quadrant operation.

Horsepower (HP) provided for reference - always size drive based on motor Amps.

** For this rating at 575 V and 690 V, 150% overload time is 20s at 40°C and 30s at 35°C.

QUANTUM MP
TECHNICAL DATA

Dinmensions

Frame Size	Height (H)*		Width (W)		Depth (D)	
	in	mm	in	mm	in	mm
1A	22.6	573	13.0	330	8.7	272
1B	22.6	578	13.0	330	9.9	251
2A	38.5	978	20.3	516	13.5	343
2B	43.0	1092	20.3	516	13.5	343

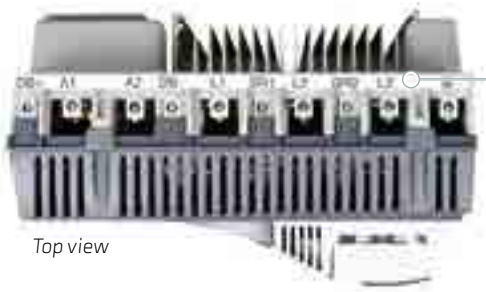
Frame Size 1

Quanum MP 350 A
Frame Size 2

The Quantum MP packages are designed for easy system integration into new or existing DC motor applications.

Quantum MP Terminal Connections

RS485	
Pin	**Function**
1	120Ω Termination Resistor
2	RX TX
3	Isolated 0 V
4	+24 V (100 mA)
5	Isolated 0 V
6	TX Enable
7	RX\ TX\
8	RX\ TX\ (if termination resistors are required, link to pin 1)
Shell	Isolated 0 V



Top view

Power - Line & Armature	
Pin #	**Function**
DB+*	Dynamic Braking Resistor +
A1	Armature +
A2	Armature -
DB-*	Dynamic Braking Resistor -
L1	AC Line
SR1	Line Suppressor Resistor
L2	AC Line
SR2	Line Suppressor Resistor
L3	AC Line
GND	Ground Connection

Power - Field	
Pin #	**Function**
E1	Control Electronics Supply
E3	Control Electronics Supply
L12	Field On/Off
L11	Field On/Off
F+	Field +
F-	Field -

Control Terminals - Top Row	
Pin #	**Function**
1	0 V Common
2	24 Vdc External Input
3	0 V Common
4	10 Vdc Source
5	Analog Input 1 +
6	Analog Input 1 -
7	Analog Input 2
8	Analog Input 3
9	Analog Output 1
10	Analog Output 2
11	0 V Common

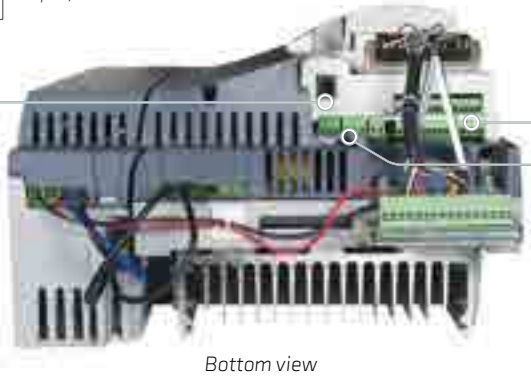
Control Terminals - 120 Vac		
Pin #	**Function**	
C1	120 Vac Supply	User Output
C2	E-Stop	Input
C3	120 Vac Supply	Feed from C2
C4	System Interlocks	Input
C5	120 Vac Supply	User Output
C6	Digital Input1 (Stop)	Input
C7	120 Vac Supply	Feed from C6
C8	Digital Input2 (Start)	Input
C9	120 Vac Supply	Feed from C6
C10	Digital Input3 (Jog)	Input
C11	120 Vac	User Output
C12	Digital Input4 (Fwd/Rev)	Input
C13	120 Vac	User Output
C14	Digital Input5 (Reset)	Input
C15	120 Vac	Relay Common
C16	Relay Output (Drive On)	Relay Output

Control Terminals - Bottom Row	
Pin #	**Function**
21	0 V Common
22	24 Vdc Output, 200 mA
23	0 V Common
24	Digital I/O 1
25	Digital I/O 2
26	Digital I/O 3
27	Digital Input 4
28	Digital Input 5
29	Digital Input 6
30	0 V Common
31	Drive Enable

*See Mentor MP terminal connections on page 29 for specific terminal location.

Control Terminals - Encoder Feedback	
Pin #	**Function**
A	Channel A
A\	Channel A\
B	Channel B
B\	Channel B\
Z	Marker Pulse Z
Z\	Marker Pulse Z\
+	Encoder Supply
0 V	Encoder 0 V

External Field Supply RS485	
Pin #	**Function**
1	120Ω Termination Resistor
2	RX TX
3	Isolated 0 V
4	+24 V (100 mA)
5	Isolated 0 V
6	TX Enable
7	RX\ TX\
8	RX\ TX\ (if termination resistors are required, link to pin 1)
Shell	Isolated 0 V



Bottom view

Control Terminals - Relays & Tach Feedback	
Pin #	**Function**
51	Relay 1 Common
52	Relay 1 N/C Contact
53	Relay 1 N/O Contact
61	Relay 2 Common
62	Relay 2 N/C Contact
63	Relay 2 N/O Contact
41	Tach +
42	Tach -

Frame Size 1 layout
Refer to the product User Guide for other sizes

*NOTE: Dynamic braking terminals not included in models QMP550A4(R) and AMP700A4(R).

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70
Countries

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Employees	Group Sales	Countries	Companies

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