TECO MA7200 +PLUS

NEMA 4
(Indoor Use)

NEMA 1

TECO Westinghouse

ANAB ACCREDITED

SGS

Features and Benefits

- **Pump Talk Software -** The MA7200 Plus has the features that provide a complete package for pump controls. These features include both a PID control package for the motor, as well as an external PID function for a related plant process.
- **Sensorless Vector –** The MA7200 Plus has precise speed and torque control for the most demanding system performance and simple set-up through an auto-tuning function. It can be operated in sensorless vector or V/Hz mode to match the user's specific application.
- **Graphical LCD Operator -** The MA7200 Plus offers easily read parameters and status in plain English text on a 2 line by 20 character lighted LCD, eliminating the need to memorize parameters. Straight forward monitoring of drive status through the LCD user-friendly operator is also available, which simplifies set-up and troubleshooting.
- **Parameter Copy -** No extra hardware is required on this drive. The copy feature is included as standard in the keypad. Simple cloning of the drive program is available, making it perfect for the OEM.
- **Flexible Input/ Output Options -** The MA7200 Plus offers sink or source selectable digital inputs* - 4 Preset, 4 User Programmable, 16 Preset Speeds, 2 Analog Inputs, 2 Analog Outputs, 3 Multi-Function Output Contacts - 1 Form C Relay, 1 Form A Relay, and 1 Open Collector Output.
- **Two Built-in PID Control Loops -** Revised Powerful Programming Options - The MA7200 Plus allows the user to set up basic parameters for simple tasks or take advantage of advanced features for demanding applications.
- **Communications -** The MA7200 Plus has Modbus RTU protocol as standard. The user can control, program, and monitor the drive(s) over an industrial network. Other protocols are also available (see MA7200 Plus Options).
- **Performance -** User Selectable V/F Curves + S Curves are available.
- **Motor/ Drive Systems -** Pair the MA7200 Plus with a TECO-Westinghouse motor for single source reliability.

*1-2 hp models are sink mode only.

NEMA 4/12 Features and Benefits

- **Industry applications** include: bottling, chemical processing, food processing, waste-water, pumping, refrigeration, and more. The MA7200 Plus NEMA 4/12 resists the effects of high pressure water, dust, dirt, and chemicals found in these industries.
- **Ratings available** from 1 - 20 hp CT, 1 - 25 hp VT, 230V and 460V
- **Easy to use input -** Front cover keypad or front cover potentiometer
- **Potentiometer -** Mounted and wired as standard on all NEMA 4 models.
- **Washdown Duty -** NEMA 4 and NEMA 12 rated (indoor use only)
- Resists high pressure water, dust, dirt, chemicals and more

LEDs indicate mode sequence

Easy to read 2 line x 20 character display

Can display engineering units

Dual function keypad and parameter copy unit

Extra large keys for entering and editing drive parameters

Can be programmed as a local/ remote or jog function

LED pilot lighted drive start and stop functions

Removable for remote mounting

Specifications

Output Characteristics	MA7200 Plus NEMA 1	208 - 230V	1 - 50 hp Variable Torque; 1- 40 hp Constant Torque
		380 - 460V	1 - 100 hp Variable Torque; 1- 100 hp Constant Torque*
		500 - 600V	1 - 10 hp Constant Torque
	MA7200 Plus NEMA 4 (Indoor Use Only)	208 - 230V	1 - 25 hp Variable Torque; 1 - 20 hp Constant Torque
		380 - 460V	1 - 25 hp Variable Torque; 1 - 20 hp Constant Torque
	Maximum Voltage	230 Volt	3-Phase, 208 - 230V
		460 Volt	3-Phase, 380 - 460V
		575 Volt	3-Phase, 500/550 - 600V
	Rated Output Frequency	0 - 400 Hz	
	Output Frequency Resolution	0.01 Hz	
Power Supply	Rated Input Voltage & Frequency	230 Volt	1 - 3 hp: 1/3-Phase, 208 - 230V, 50/60Hz
			5 - 50 hp: 3-Phase, 208 - 230V, 50/60Hz
		460 Volt	1 - 100 hp: 3-Phase, 380 - 460V, 50/60Hz*
			1 - 10 hp: 3-Phase, 575V, 50/60Hz
	Voltage Fluctuation		+10%, -15%
	Frequency Fluctuation		±5%
Control Characteristics	Control Mode	Selectable Sensorless Vector, V/Hz, V/Hz with PG Feedback	
	Operation Mode	English LCD Display	
	Programmable Carrier Frequency	2.5 - 15 kHz	
	Frequency Control Range	0.5 - 400 Hz	
	Frequency Accuracy	Digital Command: ±0.01% (+14°F - 104°F)	
		Analog Command: ±1% (77°F +/- 14°F)	
	Speed Control Accuracy	±0.5% (Sensorless Vector) ±2% V/Hz	
		±0.1% (V/Hz with PG Feedback)	
	Frequency Command	Digital Command: 0.01 Hz	
	Resolution	Analog Command: 0.06/60 Hz	
	Overload Capacity	Constant Torque: 150% Rated Output Current for 60 Sec.	
		Variable Torque: 110% Rated Output Current for 60 Sec.	
	Frequency Setting Signal	0 - 10 VDC, 4 - 20 mA; ±10VDC	
	Accel/ Decel Time	0.0 - 6000 Sec. (Independent Accel/ Decel Time Settings)	
	Number of V/F Patterns	15 Preset V/F Patterns, 1 Custom V/F Pattern	
	Braking Torque	Approximately 20%	
Protective Functions	Stall Prevention	Stall Prevention at Acceleration/ Deceleration and Constant Speed Operation	
	Instantaneous Overcurrent	200% of Rated Output Current	
	Motor Overload Protection	Electronic Overload Protection	
	Overvoltage (230V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Exceeds 410 VDC	
	Overvoltage (460V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Exceeds 820 VDC	
	Overvoltage (575V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Exceeds 1050 VDC	
	Undervoltage (230V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Drops to 200 VDC or Below	
	Undervoltage (460V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Drops to 400 VDC or Below	
	Undervoltage (575V Series)	Motor Coasts to a Stop if Inverter Bus Voltage Drops to 546 VDC or Below	
	Momentary Power Loss	Motor Coasts to a Stop after Momentary Power Loss Lasting over 15 ms	
	Overheat Protection	Protected by Thermistor	
	Ground Fault	Protected by DC Current Sensor	
	Power Charge Indication (LED)	Charge Lamp Stays On Until Bus Voltage Drops Below 50 VDC	

*100 hp constant torque with a nominal 460V 4-Pole motor.

Specifications

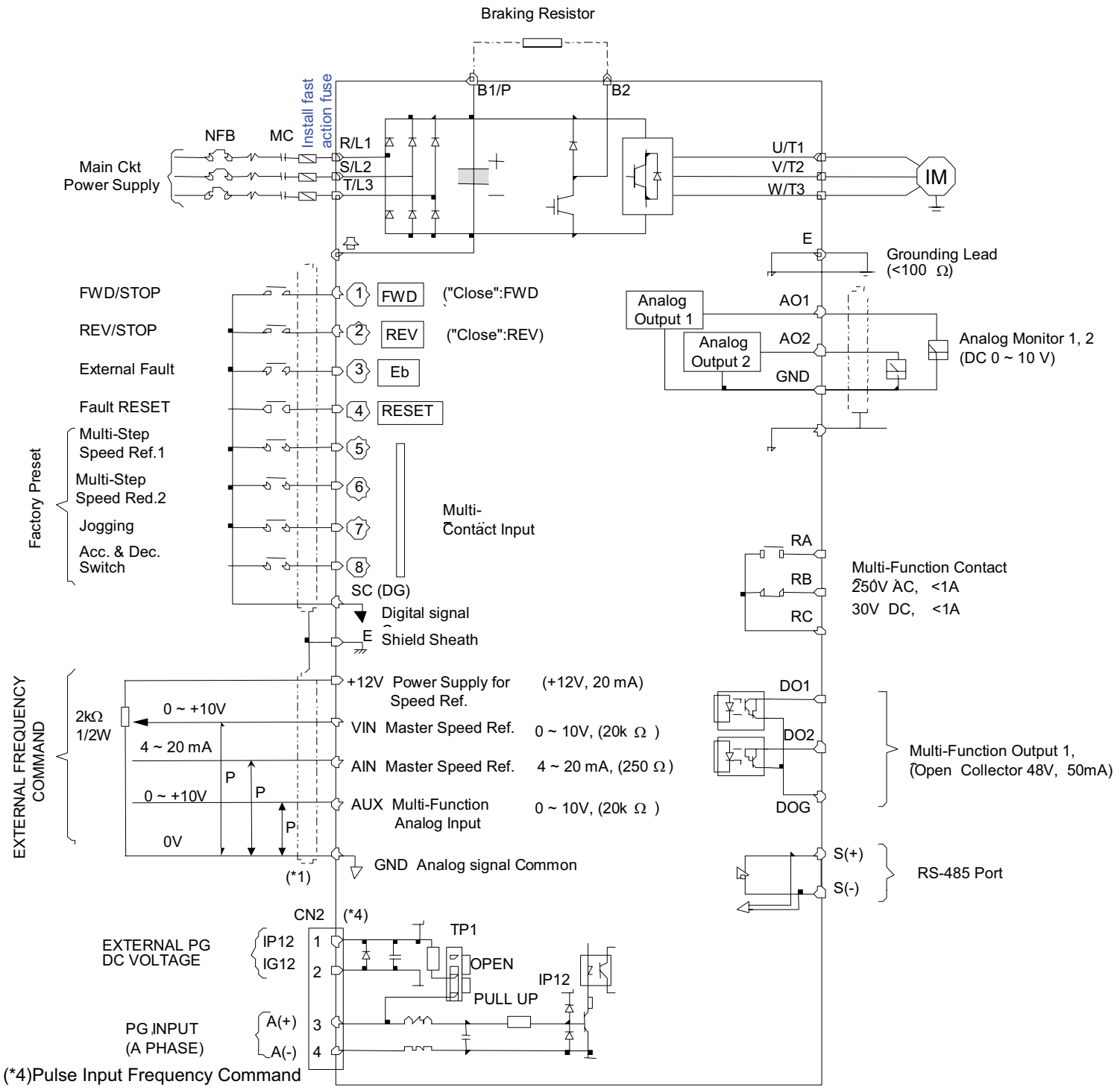
Control Connections	Control Power	24 VDC
	Speed Reference Supply	12 VDC, 20 mA
	Analog Input	0 - 10 VDC, Input Impedance 20k Ohms (Can be configured for ±10VDC)
		4 - 20mA, Input Impedance 250 Ohms
		External Speed Potentiometer, 0 - 10VDC,
		2k Ohms Minimum, 0.5 Watt
	Auxiliary Analog Input	1 Programmable, 0 - 10 VDC, Input Impedance 20k Ohms
	Analog Outputs	2 Programmable, 0 - 10 VDC
	Digital Inputs	8 Digital Inputs (4 Programmable): Positive or Negative Control Logic
	Digital Outputs	1 Programmable Form C Relay, 250 VAC, 1 Amp or 30 VDC, 1 Amp*, Form A Relay, Programmable Open Collector, 48 VDC, 50 mA**
	Serial Communications	RS-485 Port, MODBUS Protocol
Environmental Conditions	Location	Indoor (Protected from Dust and Corrosive Gases)
	Ambient Temperature	+14 to 104°F (Not Frozen)
	Storage Temperature	-4 to 140°F
	Humidity	<90% RH (Non-Condensing)
	Vibration	<1000 m, 5.9 m/s^2 (0.6 G)
Certifications/ Compliance	UL, cUL, CE	
	EN50081-2	(Requires External EMI/RFI Filter)
	EN50082-2	

*Not available for 1 or 2 hp models

**Qty 2 available for 1 and 2 hp models

A Complete Line of Accessories for the MA7200 Plus:
Noise Filter, AC Reactor, PROFIBUS Board, BACnet/ Metasys Board, Braking Resistor, Analog Operator, Keypad Extension Cable.

MA7200 Plus Standard Connection Diagram 230/460V, 1 to 2 hp



(*4)Pulse Input Frequency Command

(*1) Shield Wire P Shielded Twisted Wire

(*2) The terminal arrangement

DG	1	3	5	7	VIN	AIN	AUX	DO1	DO2	DOG	S(-)
E	2	4	6	8	+12V	GND	GND	AO1	AO2	S(+)	E

RA	RB	RC

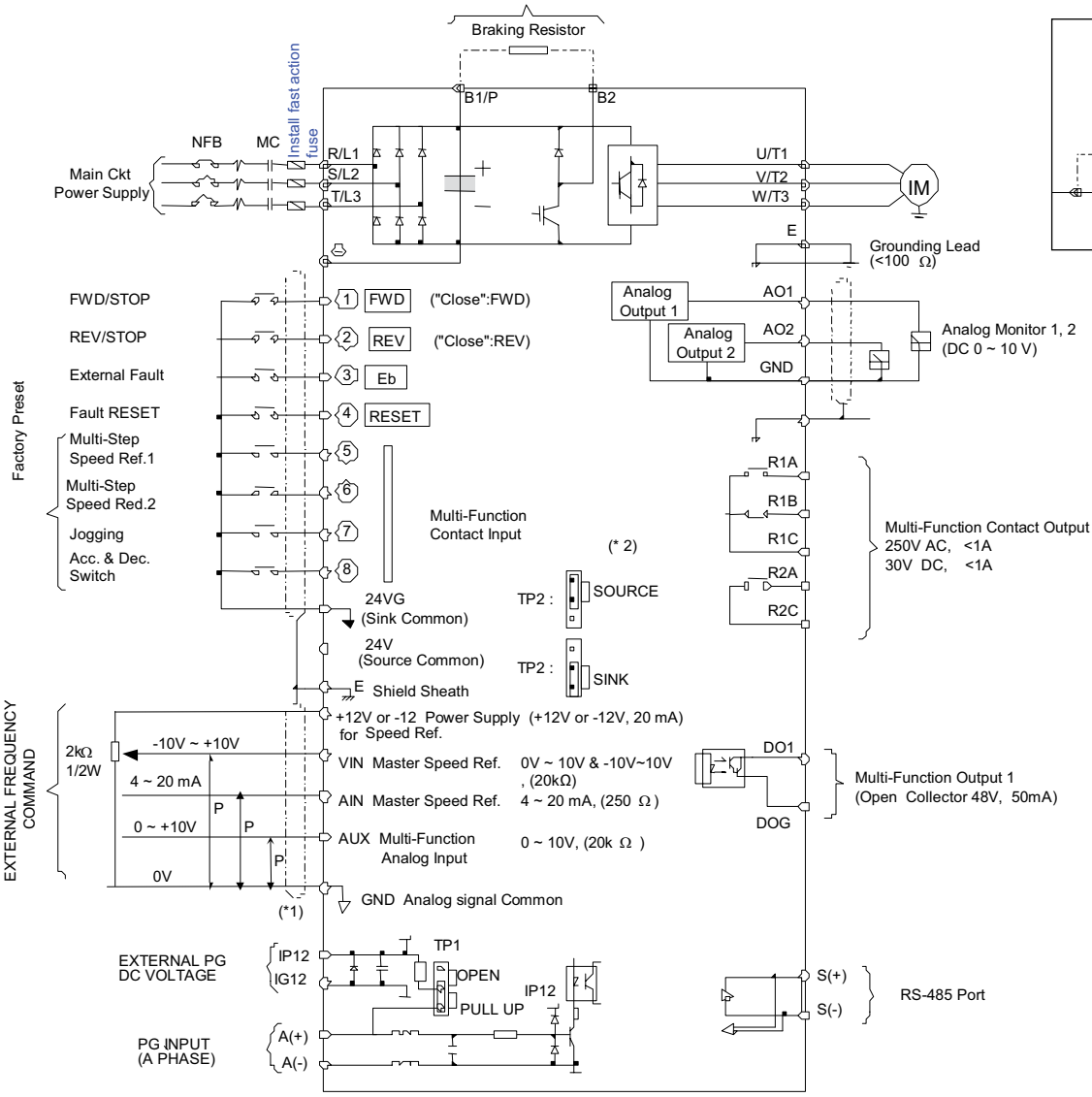
(*3) The control board code No. : 4P101C0040001

(*4) The CN2 wire code No. : 4H339D0250001

MA7200 Plus Standard Connection Diagram

230V 3-50 hp, 460V 3-100 hp, 575V 1-10 hp

Note: This applies for all models rated at 3-20 hp 230/460V and 1-10 hp 575V. See Figure A for higher Ratings



230V, 25-50 hp
460V, 25-100 hp

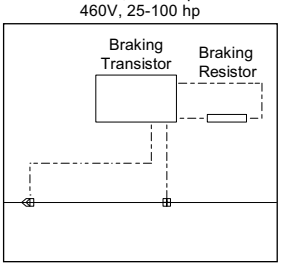


Figure A

(*1) Shield Wire Shield Twisted Wire

(*2) The terminal ① and ⑧ can be set as SINK or SOURCE type input interface, when setting ①~⑧ as sink type input, the short jumper of TP2 must be set to SINK position, and set to SOURCE position for source type input.

(*3) For 220V: 25-40 hp, 440V: 25-75 hp inverters, VIN Ref. can be set in two input methods as 0~10V or -10~+10V

(*4) The terminal A(+), A(-) can be the output terminal of Pulse Input Frequency Command, and the jumper of TP1 must be set to OPEN position.

(*5) Pulse Input Frequency Command: 50Hz~32KHz, 3~12V High Voltage Level, input resistor 2.7KΩ

(*6) The terminal arrangement

24VG	1	3	5	7	24V	VIN	AIN	AUX	DO1	DOG	IP12	A(+)	A(-)
E	2	4	6	8	+12V	-12V	GND	AO1	AO2	E	IG12	S(+)	S(-)

R2A	R2C	R1A	R1B	R1C

The control board code No.: 4P101C0060002 (220V 3-20 hp, 440V 3-20 hp), 4H300D6740006 (220V 25 hp, 440v 25-30 hp)
4H300D6750001 (220V 30-40 hp, 440V 40-75 hp)

Dimensions and Output Characteristics For NEMA 1 and 4

230V 1/3-Phase

ENCLOSURE RATING	MODEL NO.	HP CT / VT	DRIVE AMPS CT / VT	DIMENSIONS (Inches)			APPROX. WT. (lbs.)
				HEIGHT	WIDTH	DEPTH	
NEMA 1	MA7200-2001-N1	1 / 1	4.8 / 5.6	8.54	5.20	5.65	6
NEMA 4	MA7200-2001-N4	1 / 1	4.8 / 5.6	13.19	7.80	8.54	17
NEMA 1	MA7200-2002-N1	2 / 2	6.4 / 7.6	8.54	5.20	5.65	6
NEMA 4	MA7200-2002-N4	2 / 2	6.4 / 7.6	13.19	7.80	8.54	17
NEMA 1	MA7200-2003-N1	3 / 3	9.6 / 9.8	11.00	5.51	6.95	9
NEMA 4	MA7200-2003-N4	3 / 3	9.6 / 9.8	13.19	7.80	8.54	17

230V 3-Phase

NEMA 1	MA7200-2005-N1	5 / 5-7.5	17.5 / 22.7	11.00	5.51	6.95	9
NEMA 4	MA7200-2005-N4	5 / 5-7.5	17.5 / 22.7	13.19	7.80	8.54	17
NEMA 1	MA7200-2007-N1	7.5 / 10	24 / 32	11.81	8.32	8.46	13
NEMA 4	MA7200-2007-N4	7.5 / 10	24 / 32	18.11	8.78	9.65	36
NEMA 1	MA7200-2010-N1	10 / 10	32 / 32	11.81	8.32	8.46	13
NEMA 4	MA7200-2010-N4	10 / 10	32 / 32	18.11	8.78	9.65	36
NEMA 1	MA7200-2015-N1	15 / 15-20	48 / 56.7	14.17	10.43	8.86	27
NEMA 4	MA7200-2015-N4	15 / 15-20	48 / 56.7	18.11	8.78	9.65	36
NEMA 1	MA7200-2020-N1	20 / 25	64 / 70.9	14.17	10.43	8.86	27
NEMA 4	MA7200-2020-N4	20 / 25	64 / 70.9	18.11	8.78	9.65	36
NEMA 1	MA7200-2025-N1	25 / 30	80 / 80	14.17	10.43	8.86	29
NEMA 1	MA7200-2030-N1	30 / 40	96 / 108	25.45	10.60	10.91	67
NEMA 1	MA7200-2040-N1	40 / 50	130 / 130	25.45	10.60	10.91	67

460V 3-Phase

NEMA 1	MA7200-4001-N1	1 / 1	2.6 / 2.9	8.54	5.20	5.65	6
NEMA 4	MA7200-4001-N4	1 / 1	2.6 / 2.9	13.19	7.80	8.54	17
NEMA 1	MA7200-4002-N1	2 / 2	4 / 4.6	8.54	5.20	5.65	6
NEMA 4	MA7200-4002-N4	2 / 2	4 / 4.6	13.19	7.80	8.54	17
NEMA 1	MA7200-4003-N1	3 / 3	4.8 / 4.9	11.00	5.51	6.95	9
NEMA 4	MA7200-4003-N4	3 / 3	4.8 / 4.9	13.19	7.80	8.54	17
NEMA 1	MA7200-4005-N1	5 / 5-7.5	8.7 / 12.5	11.00	5.51	6.95	9
NEMA 4	MA7200-4005-N4	5 / 5-7.5	8.7 / 12.5	13.19	7.80	8.54	17
NEMA 1	MA7200-4007-N1	7.5 / 10	12 / 15.4	11.81	8.32	8.46	13
NEMA 4	MA7200-4007-N4	7.5 / 10	12 / 15.4	18.11	8.78	9.65	36
NEMA 1	MA7200-4010-N1	10 / 15	15 / 22.7	11.81	8.32	8.46	13
NEMA 4	MA7200-4010-N4	10 / 15	15 / 22.7	18.11	8.78	9.65	36
NEMA 1	MA7200-4015-N1	15 / 20	24 / 30.3	14.17	8.32	8.86	27
NEMA 4	MA7200-4015-N4	15 / 20	24 / 30.3	18.11	8.78	9.65	36
NEMA 1	MA7200-4020-N1	20 / 25	32 / 38	14.17	10.43	8.86	27
NEMA 4	MA7200-4020-N4	20 / 25	32 / 38	18.11	8.78	9.65	36
NEMA 1	MA7200-4025-N1	25 / 30	40 / 44	14.17	10.43	8.86	29
NEMA 1	MA7200-4030-N1	30 / 30	48 / 48	14.17	10.43	8.86	29
NEMA 1	MA7200-4040-N1	40 / 40-50	64 / 71	25.45	10.60	10.91	67
NEMA 1	MA7200-4050-N1	50 / 60	80 / 80	25.45	10.60	10.91	67
NEMA 1	MA7200-4060-N1	60 / 75	96 / 108	29.39	12.13	11.11	102
NEMA 1	MA7200-4075-N1	75-100* / 100	128 / 140	29.39	12.13	11.11	102

575V 1/3-Phase

NEMA 1	MA7200-5001-N1	1 / 1	1.7 / 1.7	11.00	5.51	6.95	10
NEMA 1	MA7200-5002-N1	2 / 2	3.0 / 3.0	11.00	5.51	6.95	10
NEMA 1	MA7200-5003-N1	3 / 3	4.2 / 4.2	11.00	5.51	6.95	10
NEMA 1	MA7200-5005-N1	5 / 5	6.6 / 6.6	11.81	8.31	8.46	13
NEMA 1	MA7200-5007-N1	7.5 / 7.5	9.9 / 9.9	11.81	8.31	8.46	13
NEMA 1	MA7200-5010-N1	10 / 10	12.2 / 12.2	11.81	8.31	8.46	13

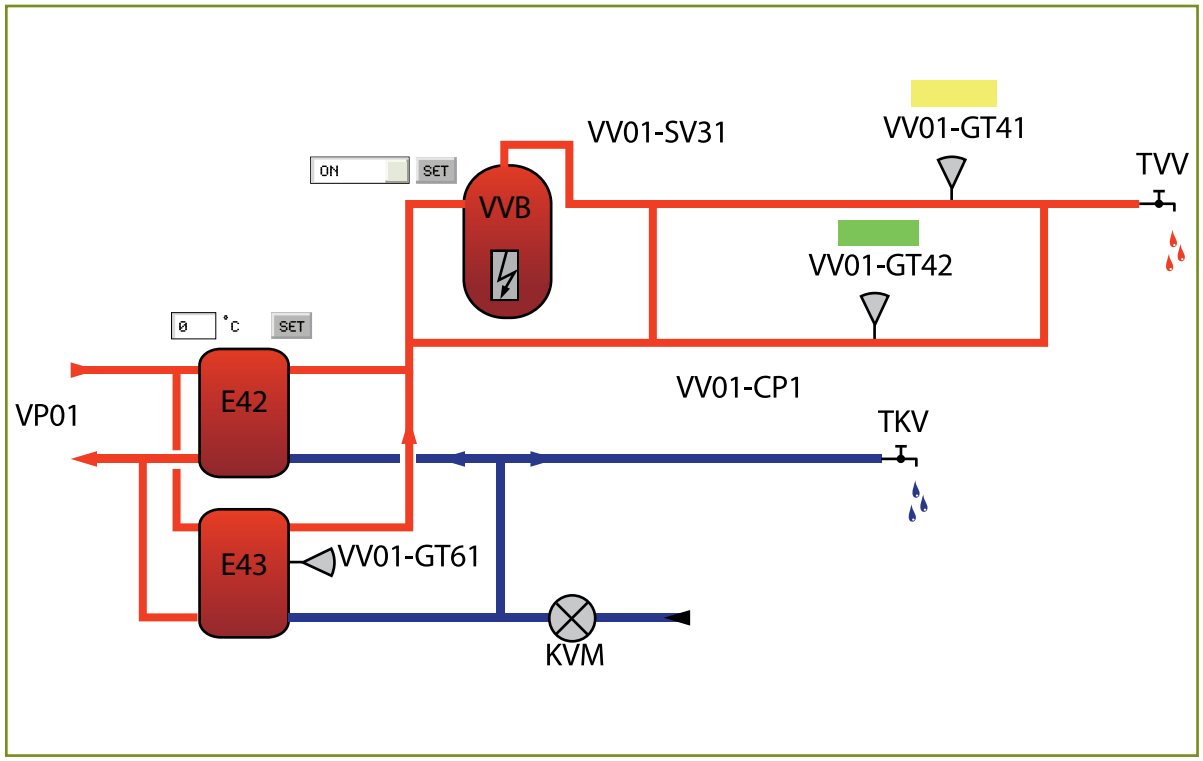
*100 hp with a nominal 460V, 4 pole motor

MA7200 Plus Options

The MA7200 Plus has a variety of optional kits to provide users with comprehensive packages. The major options include:

- **Extension Cable Kits for Remote LCD Mounting**
- **Fieldbus Communications Interfaces**
  - Modbus RTU
  - N2 - Metasys
  - P1
  - BACnet
  - Profibus
  - Devicenet
  - Ethernet
- **Analog Operator Station for Remote Installation**
- **Power - Matched Dynamic Braking Resistor and Transistor Kits**
- **Power - Matched Input Line and Output Load Reactors**
- **Packaged Drive Solutions for Integrated Users that Include any of the Following**
  - NEMA 1, NEMA 12, NEMA 3R, NEMA 4, Custom Enclosures
  - Multiple Input Disconnect Options Available
  - 2 and 3 Contactor Bypass Transfer designs
  - Dual Motor Outputs
  - Multi-Pump Transfer
  - Disconnect Packages
  - Packages with Power Quality Equipment Designed to meet IEEE - 519 Directives

SCADA Package



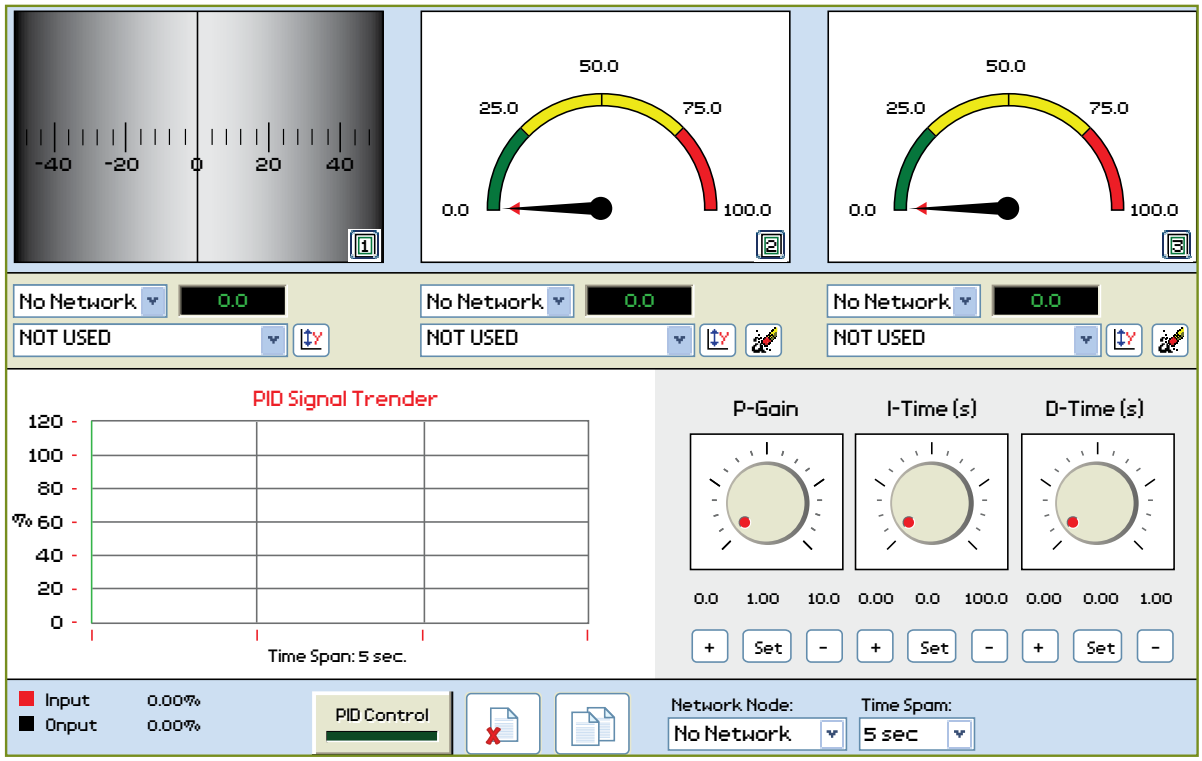
The HVAC~SCADA TW1 module acts as a bridge from Modbus TCP to Modbus RTU, making it possible for a Modbus TCP based controller to connect with Modbus RTU based devices. The HVAC~SCADA TW1 is a device that is not only designed to provide the bridging function, but to also handle alarm management and data-logging, as well as providing a web-based user interface for accessing data.

Features

- Graphical interface that is easy to work with
- Support for device templates to allow easy and flexible management of configurations
- Advanced modem handling, with support for GSM/GPRS modems as well as analog (PSTN) modems
- Improved alarm handling, now with alarm history and SNMP support
- Language support
- Support for sending log-files with email or FTP
- Support for the HVAC~SCADA TW1 portal

The HVAC~SCADA TW1 Modbus Gateway supports an RS-232 connection through a 9-PIN DSUB or RS-485 through an RJ12 connector. It also supports 10/100Mbps Ethernet through a standard Ethernet connector (RJ-45).

It can be configured via a user-friendly web-interface, or by using the HVAC~SCADA TW1 configuration utility.



TECO-Link is a complete drive programming and monitoring program that provides control of TWMC's entire family of drives. In addition to emulating standard keypad interface functions, the program furnishes a variety of powerful diagnostic, monitoring, and data archiving tools to aid in troubleshooting and drive management.

System Overview Screen

TECO-Link graphically displays the status of each drive at a glance. Up to 15 parameters can be continuously monitored at once. The list of parameters that are displayed can be chosen for each drive independently.

Keypad Control

TECO-Link simulates the interfaces of all TWMC drives, allowing the user to remotely access all of the features and functions normally available at the drives themselves. Keypad control is accessible at any time from any screen.

Meter Screen

TECO-Link provides a graphical portrayal of drive data with the look and feel of a meter panel. Four meters can be viewed at a time, each of which can be configured to reflect a wide variety of readout or parameter values.

Graph Display Screen

TECO-Link provides a trend recorder which allows users to monitor and record data much like a graph recorder. Data can be stored and analyzed in either raw or graphical formats. Sampling rates can be varied to meet short and long-term monitoring requirements.

Data Archiving

TECO-Link provides a data-archiving feature that lets users manage the drive's parameter set. With the single click of a button, a complete record of every parameter can be captured for safekeeping on disk, for printing, or for editing offline. Data can be quickly restored in case of emergency, or copied to another drive for quick setup. Archives can also be compared to determine which parameters have changed.

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D-MA7200 10-10