

FMX

TOUGH DRIVE

TOUGH CUSTOMERS DESERVE A TOUGH DRIVE

TD 400 SERIES



Superior Design

DESIGNED FOR U.S. MARKET

TRUE 480V (480+10%)
DESIGN

FULLY RATED
@122°F (50°C)
OPERATION

2 YR
WARRANTY

USER FRIENDLY
INTERFACE

FREE TD LINK Software



Built-in Control Modes

Volts per Hertz
 ±2% Regulation

Sensorless Vector
 ±0.5% Regulation

Permanent Magnet
 ±0.5% Regulation



TOUGH CUSTOMERS DESERVE A TOUGH DRIVE

Introducing the TD400 AC Drive from FMX - the ideal user-friendly solution for demanding motor control applications. Rugged and compact, the Tough Drive is designed especially for the higher voltages of U.S. applications and can operate at higher temperatures than many other competitive drives without overheating.



DESIGNED FOR U.S. MARKET

TRUE 480V (480+10%) DESIGN

FULLY RATED @ **122°F (50°C)** OPERATION

2 YR WARRANTY

USER FRIENDLY INTERFACE



- True U.S. operating voltage design
240V Class – 200 to 240V, +10% / -15%
480V Class – 380 to 480V, +10% / -15%
- Bring on the Heat
Fully rated to operate in temperatures up to 122°F (50°C)

AC DRIVE APPLICATIONS

- Variable Torque applications:
Centrifugal Pumps, Air Handling Equipment & more
- Constant Torque applications:
Positive Displacement (Piston) Pumps, Conveyors, Lathes & more



AVAILABLE MODELS

Voltage & Phase	Horsepower															
	0.5	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	
240V 1PH/3PH					N/A											
240V 3PH	N/A												N/A			
480V 3PH	N/A															

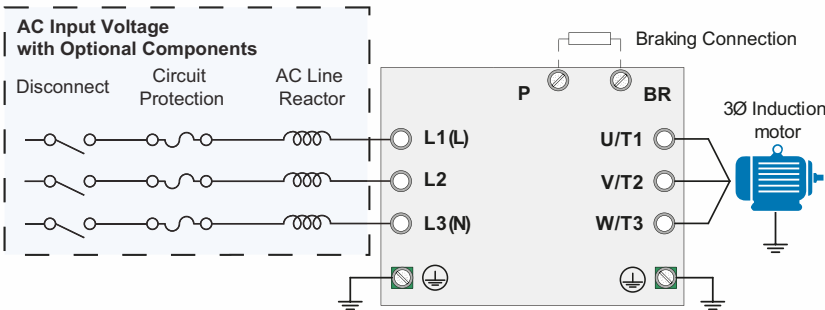
EASY WIRING

A comprehensive set of control inputs and outputs makes the TD400 a flexible choice when designing complex systems or easily integrating into an existing system.



POWER CIRCUITS

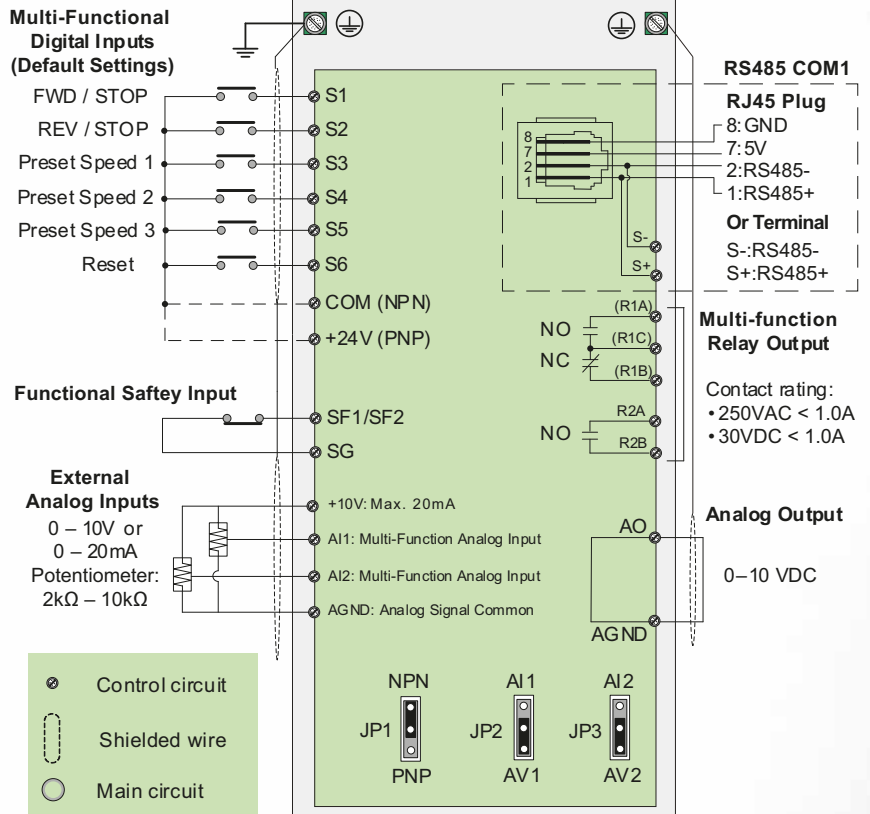
- Supports Single or Three Phase input power
- Frames 5 and 6 support Variable Torque mode allowing more power from a smaller drive
- Control a 3PH motor from 1PH source
- 240V 0.5-25HP and 480V 1-40HP have built-in braking transistor
- Braking resistor can be connected directly between P and BR. All others require braking unit and resistor



CONTROL CIRCUITS

All TD400 models come with the following control wiring options:

- 6 Digital Inputs, NPN or PNP selectable, NO/NC individually selectable
- 2 Relay Outputs, NO/NC individually selectable
- 2 Analog Inputs, 0-10VDC or 4-20mA
- 0-10VDC Analog Output (AO)
- Dedicated Safety Input locks use of the drive if switch is open (includes jumper from factory)
- Built-in RS485 communications



HARDWARE



Optional REMOTE LCD Keypad

The optional REMOTE LCD keypad features backlit, high-resolution screen for easier programming.

- Displays actual parameter names when programming, no need to remember group numbers.
- Adjustable backlight brightness
- Can function as a parameter settings copy device.



Input Voltage Models

240V (1/3PH)	0.5 to 3HP	240V (3PH)	5 to 40HP	480V (3PH)	1 to 75HP
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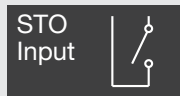
Built-in Control Modes

Volts per Hertz ±2% Regulation	Sensorless Vector ±0.5% Regulation	Permanent Magnet ±0.5% Regulation
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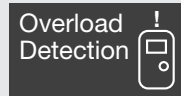
Control Features

Pulse Width Modulation	PID Control	Rated Current	2 Analog Inputs
6 Digital Inputs	1 Analog Output	2 Digital Outputs	Braking Options
Overload Protection	Ground Fault Protection	RS-485 Serial Port	Keypad POT

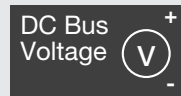
PROTECTIVE FUNCTIONS



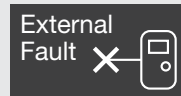
- Safe Torque Off (STO) input prevents the drive from operating if connection between the two terminals is broken (Jumper is provided from factory)
- Usage Example: A momentary pushbutton away from machine which must be held down to enable drive



- UL Listed AC Drive adjustable overload protection
- Motor overload protection prevents damage to motor from overheating
- Instantaneous trip above 200% rated current



- AC drive will automatically trip when DC is out of the adjustable range
- Overvoltage Trip:
- 240V Class: 410VDC
 - 480V Class: 820VDC
- Undervoltage Trip:
- 240V Class: 190VDC
 - 480V Class: 380VDC



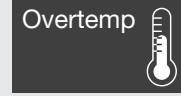
- Multifunction digital inputs can be configured to accept External Fault and External Overload signals



- AC Drive trips if leakage current is greater than 50% of rated current



- AC Drive trips when input or output power experiences phase loss

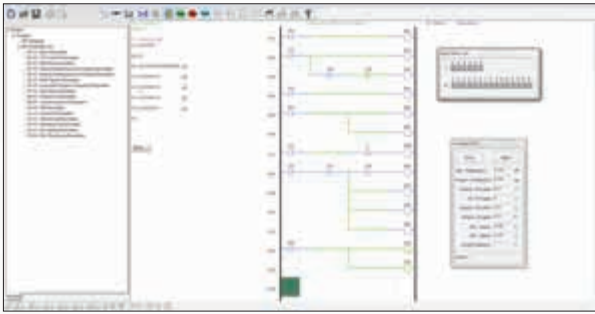


- AC Drive trips when drive heatsink overheats



- AC Drive trips when PID function loses feedback signal

FUNCTIONALITY



BUILT-IN PLC

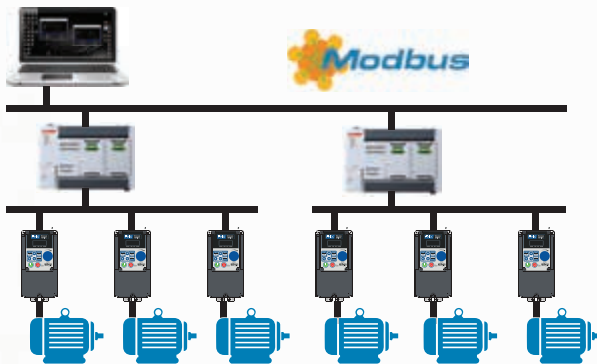
Powerful Ladder Programming

- 8 Counters
- 8 Timers
- 8 Comparators
- 8 Operation Controls
- 15 Internal Relays
- Add/Subtract and Multiply/Divide functions
- Up to 80 lines of logic with 4 instructions per line

PLC Program Simulator

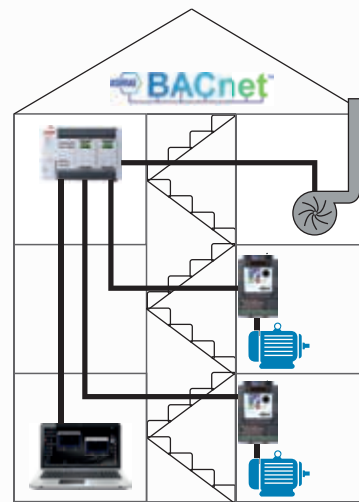
- Build and simulate a ladder logic program within TD-LINK
- Control all aspects of the program you have created using simulated digital and analog inputs
- Once program is downloaded to drive, software can be used to monitor program operation

CONNECTIVITY



Modbus RTU or ASCII

- Convenient RJ45 port for easy cabling or terminal block header for standard 485+ and 485- leads
- 4800, 9600, 19200 and 38400bps supported
- 7 or 8 bit data length
- Even, Odd and None parity
- Maximum of 31 drives can be connected simultaneously
- Monitor AC Drive signals, Read/write parameters, Reset faults and Control multi-function inputs



BACnet™

- BACnet is designed for Building Automation and Control systems and can control lighting, HVAC, security access, and fire detection systems
- TD400 AC drives fully support BACnet for easy integration into existing or new HVAC control systems
- Maximum of 127 Masters available
- Supports the following standard BACnet objects:
 - AC Drive Objects, Analog Input, Digital Input, Analog Output, Digital Output, Analog Value, Digital Value

ADVANCED MOTOR PARAMETERS



Fire Mode

- Fire Mode will allow the drive to run until possible destruction when maintaining activation is crucial to safety. Example applications: Stairway Pressurization or Smoke Extraction Fans.
- Exclusive password, motor speed, run direction, and other settings for fire mode to better manage an emergency situation
- In Fire Mode, motor run command cannot be overridden by keypad or external controls



Easy Auto Tuning

- With only 7 parameters you can easily tune the drive to your specific motor
- Rotational, Static, and Stator Resistance tunes available



Directional Jog

- Digital inputs can be set to Forward Jog or Reverse Jog simultaneously with a custom jog frequency, acceleration time, and deceleration time

FREE TD LINK Software

Fully functional TD-LINK programming software with online help. No demo time-outs. Available for free download at www.factorymation.com/software-downloads.

*TDA-USBPC communication cable required to transfer program



BUILT-IN PLC FUNCTIONALITY



Intuitive PLC Programming

- Powerful control with an easy to program interface
- Industry standard, 4-row, ladder logic programming
- Up to 80 rungs of ladder logic can be stored in PLC program
- Fully simulate program with analog and digital I/O tools before downloading to drive

PARAMETER OPTIONS



View and Edit Parameters

- Write parameter changes to drive individually, by group or all at once
- Read parameter settings already written to the drive
- Save parameter configuration for quick and easy setup of another drive
- Compare function to find which parameters have been altered from factory or from last read command
- Print a customized parameter list that shows default values and current settings

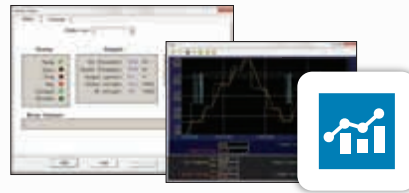
TD LINK CONTROL



Remote Drive Control

- Control all functions of the drive remotely such as: Start/Stop, Forward/Reverse, Trigger Fault, Clear Fault, Set Frequency, and Jog Forward/Reverse
- Keypad interface can simulate actual use of the drive keypad

TD LINK LIVE MONITORING



Real Time Monitoring

- See vital drive information in real time
- Plot up to 4 data points on a graph and save for future review or comparison to other logs
- View current drive status including: Run State, Direction, Set and Output Frequencies, Active Faults, Output Current and Voltage, and DC Bus Voltage



Parameter Structure Shared by Entire Tough Drive Family

The TD400's intuitive parameters structure enables users to easily navigate between parameter groups, individual parameters, and the settings for each parameter. Parameters can be programmed directly from the keypad, and the parameter groups are ordered with the most commonly used parameter groups towards the top of the list.

- Structure is same for each Tough Drive
- Common parameters are the same
- Learn one parameter structure and program any Tough Drive

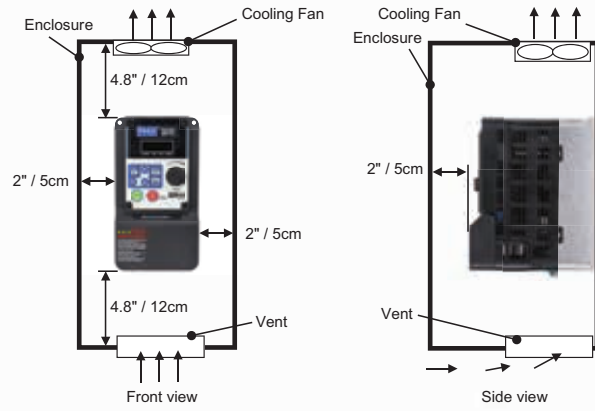
FLEXIBLE INSTALLATION

Compact Design

- Compact footprint with integrated heatsink makes it easy to fit in even the most cramped of enclosures
- A 2HP drive is less than 4" wide

Remote Mountable Keypad

- All TD400 keypads can be easily removed from the drive for remote mounting with the optional remote keypad holder and remote keypad cable.



PRODUCT LINEUP

Model Number Explanation

TD/400
AC DRIVE SERIES

TD400-2010-1PH

Input Voltage Rating		Motor Rating		Input	
2:	200-240V	0P5: 0.5 HP	015: 15 HP	1:	1 Phase
4:	380-480V	001: 1 HP	020: 20 HP	13:	1 or 3 Phase
		002: 2 HP	030: 30 HP	3:	3 Phase
		003: 3 HP	040: 40 HP		
		005: 5 HP	050: 50 HP		
		7P5: 7.5 HP	060: 60 HP		
		010: 10 HP	075: 75 HP		

Detailed Specifications

Power Supply	Rated Input Power	240V Class – 200 to 240V, +10% / -15% 480V Class – 380 to 480V, +10% / -15%	
Output Characteristics	Output Voltage Range	230V: 0–240V, 3-Phase 460V: 0–480V, 3-Phase	
	Rated Output Frequency	0–599Hz	
	Output Frequency Accuracy	0.01Hz	
	Control Mode	Sensorless Vector, V/Hz, PMSLV	
Control Characteristics	Carrier Frequency	1 to 16kHz	
	Frequency Control Range	0.01–599.00Hz	
	Speed Control Accuracy	V/Hz: +/- 2% Sensorless Vector: +/- 0.5%	
	Overload Capacity	150% Rated Output Current for 60 sec.	
	Frequency Setting Signal	0–10VDC, 4–20mA	
	Accel/Decel Time	0–3600 sec. (Independent Accel/Decel Times)	
	Number of V/F Patterns	30 Preset V/F Patterns, 2 Custom V/F Patterns	
	Braking Torque	Approximately 20%	
	Protective Functions		Stall Prevention, Instantaneous Overcurrent (200%), Motor Overload Protection, Overvoltage, Undervoltage, Momentary Power Loss, Overheat Protection, Ground Fault
	Environmental Conditions	Location	Indoor (IP20), UL Type 1 w/ optional conduit box
Ambient Temperature		14 to 122 °F (-10 to 50 °C)	
Storage Temperature		5 to 158 °F (-15 to 70 °C)	
Altitude		<1000m	
Humidity		<95% RH (Non-condensing)	
	Vibration	20HP and less: 9.8m/s ² (1.0G) 25HP and more: 5.8m/s ² (0.6G)	
Agency Approvals		UL/cUL File# E503131, RoHS, CE 61800-3, IEC 60018-2-78	

Part Number	Constant Torque		Variable Torque		Dimensions (inches)			
	HP	Amps	HP	Amps	H	W	D	Frame
230V Class: Single/Three-phase Input, Three-phase Output								
TD400-20P5-13PH	0.5	3.1	0.5	3.1	6.46	3.57	5.96	1
TD400-2001-13PH	1	4.5	1	4.5	6.46	3.57	5.96	1
TD400-2002-13PH	2	7.5	2	7.5	6.46	3.57	5.96	1
TD400-2003-13PH	3	10.5	3	10.5	7.39	5.07	6.00	2
230V Class: Three-phase Input, Three-phase Output								
TD400-2005-3PH	5	17.5	5	17.5	7.39	5.07	6.00	2
TD400-27P5-3PH	7.5	26	7.5	26	10.27	7.36	7.98	3
TD400-2010-3PH	10	35	10	35	10.27	7.36	7.98	3
TD400-2015-3PH	15	48	15	48	11.95	8.84	8.11	4
TD400-2020-3PH	20	64	20	64	11.95	8.84	8.11	4
TD400-2025-3PH	25	73	30	80	13.39	10.43	14.17	5
TD400-2030-3PH	30	85	40	110	19.88	11.28	10.62	6
TD400-2040-3PH	40	115	50	138	19.88	11.28	10.62	6
460V Class: Three-phase Input, Three-phase Output								
TD400-4001-3PH	1	2.5	1	2.5	6.46	3.57	5.96	1
TD400-4002-3PH	2	3.8	2	3.8	6.46	3.57	5.96	1
TD400-4003-3PH	3	5.3	3	5.3	7.39	5.07	6.00	2
TD400-4005-3PH	5	9.2	5	9.2	7.39	5.07	6.00	2
TD400-47P5-3PH	7.5	13	7.5	13	10.27	7.36	7.98	3
TD400-4010-3PH	10	17.5	10	17.5	10.27	7.36	7.98	3
TD400-4015-3PH	15	24	15	24	10.27	7.36	7.98	3
TD400-4020-3PH	20	32	20	32	12.66	8.84	8.11	4
TD400-4025-3PH	25	40	25	40	12.66	8.84	8.11	4
TD400-4030-3PH	30	45	40	58	14.17	10.43	9.38	5
TD400-4040-3PH	40	60	50	73	20.67	11.28	10.62	6
TD400-4050-3PH	50	75	60	88	20.67	11.28	10.62	6
TD400-4060-3PH	60	91	75	103	20.67	11.28	10.62	6
TD400-4075-3PH	75	118	100	145	20.67	11.28	10.62	6

Accessories

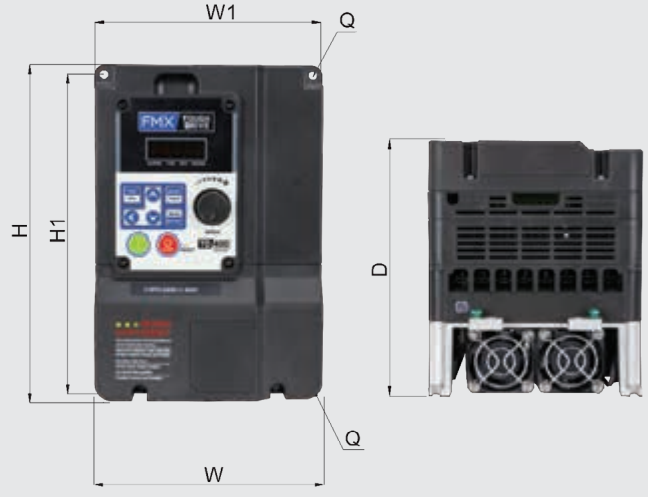
Part Number	Description
TDA-USBPC	FMX TD400 USB cable to connect TD400 to PC
TDA-LCDKPD	FMX TD400 Optional LCD keypad with Copy Unit functionality. Displays parameters in real language. Ideal for extensive programming without a PC
TD400-REMCKPH	FMX TD400 Remote Keypad Holder for LED Keypad
TDA-RKCBL-7	FMX TD400 Remote Keypad Cable 7ft.
TDA-RKCBL-15	FMX TD400 Remote Keypad Cable 15ft.
SCE-HA1010	Keypad Access Panel, 10" x 10", mounts on enclosure exterior to protect and provide access to remote keypad without opening enclosure. Up to UL Type 4 rating
SCE-HWK1212	Keypad Access Panel with Window, 12" x 12", mounts on enclosure exterior to protect and provide access to remote keypad without opening enclosure. Up to UL Type 4 rating
TD400-N1K-F1	FMX TD400 UL Type 1 Adaptor for Frame 1
TD400-N1K-F2	FMX TD400 UL Type 1 Adaptor for Frame 2
TD400-N1K-F3	FMX TD400 UL Type 1 Adaptor for Frame 3
TD400-N1K-F4	FMX TD400 UL Type 1 Adaptor for Frame 4
FM-POT6	22mm potentiometer, 10kΩ, knob operator, UL Type 4X, IP66, (includes 1-10 scale legend plate)

DIMENSIONS

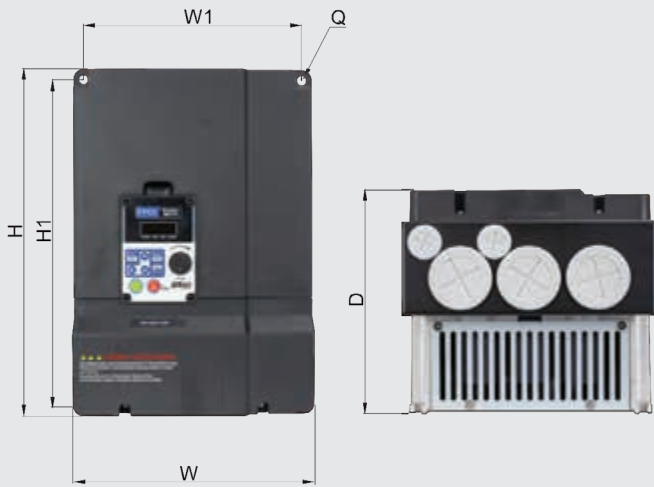
FRAME 1



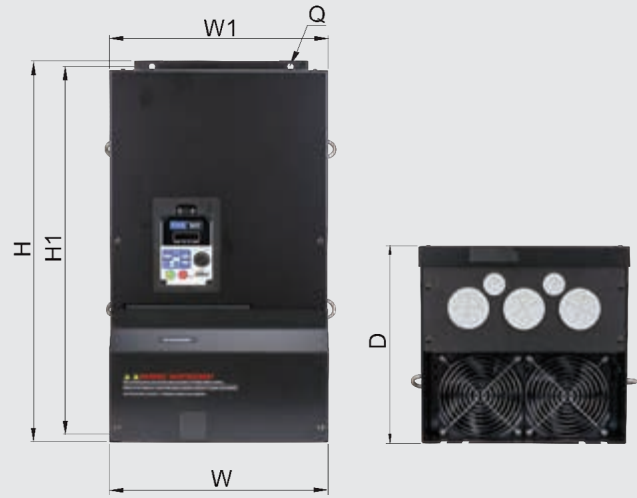
FRAME 2-4



FRAME 5



FRAME 6



Dimension	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5	Frame 6
	in (mm)					
W	3.57 (90.6)	5.07 (128.7)	7.36 (186.9)	8.84 (224.6)	10.43 (265)	11.28 (286.5)
W1	3.57 (90.6)	4.65 (118)	6.89 (175)	8.15 (207)	9.65 (245)	8.66 (220)
H	6.46 (164)	7.39 (187.6)	10.27 (260.9)	12.66 (321.6)	14.17 (360)	20.67 (525)
H1	6.02 (153)	6.99 (177.6)	9.83 (249.8)	11.95 (303.5)	13.39 (340)	19.88 (505)
D	5.96 (151.4)	6 (152.4)	7.98 (202.6)	8.11 (206.1)	9.38 (238.2)	10.62 (269.8)
Q	M4	M4	M4	M4	M8	M8
H (NEMA Kit)	7.33 (186.2)	8.41 (213.6)	11.56 (293.5)	14.3 (363.3)	-	-

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