



MOTORTRONICS™

Solid State AC Motor Control

MT *Series*



High Performance AC Drive

Constant Torque Ratings from $\frac{1}{2}$ to 700 HP



*Setting the new standard
for world class performance*

Sensorless vector, closed loop vector or V/Hz control

Intuitive programming & monitoring

Easy to read multi-line LCD display Best-in-class torque performance & speed regulation

MT Series Specifications

CONTROL CHARACTERISTICS

Control Mode	Sensorless vector, closed loop vector or V/Hz control of AC induction motors
Carrier Frequency	Adjustable from 1 kHz to 16 kHz on smaller drives, 2.5 kHz to 8 kHz on larger drives
Output Frequency Range	< 37 kW = 0 - 1000 Hz > 37 kW = 0 - 500 Hz
Speed Control Range	1: 1000 in closed loop mode with incremental encoder feedback 1: 100 in open-loop mode without encoder feedback
Speed Control Accuracy	+ 0.01% of nominal speed, in closed-loop mode with encoder feedback +10% of nominal slip, without encoder feedback
Frequency Resolution	Digital: 0.1 Hz; Analog: 50 Hz/2048 (11 bit converter)
Frequency Setting Signal	Graphical display, analog inputs or multi-function logic inputs
Accel/Decel Time	Ramp profiles: • Linear, can be adjusted separately from 0.01 to 9999 seconds • S, U, or customized
Torque Overload	170% of the nominal motor torque (typical value at + 10%) for 60 seconds 220% of the nominal motor torque (typical value at + 10%) for 2 seconds 30% of the rated motor torque without braking resistor (typical value) Up to 150% with braking resistor (installed as an option)
Braking Torque	2 or 5 points
V/f Pattern for V/Hz control	Upper/lower freq. limits, programmable skip freq. & vibration control
Frequency limit function	Upper/lower freq. limits, programmable skip freq. & vibration control
Current Overload	Thermal protection integrated in drive via continuous I ² t calculation • The motor thermal state is saved when the drive is powered down • Function can be modified via operator dialog terminals, depending on the type of motor (force air-cooled or non-ventilated) Protection against motor phase loss, PTC inputs
Motor Overload Protection	200V range: 200V -15%; 240V +10% 400V range: 380V -15%; 480V +10% DC Bus overvoltage Protected by thermister/thermostat Calculated IGBT Temperature Standard on all units Stall prevention for Acceleration/Deceleration while running

PROTECTION FUNCTIONS

Input voltage range	200V range: 200V -15%; 240V +10% 400V range: 380V -15%; 480V +10%
DC Bus Protection	DC Bus overvoltage
Heat Sink Fin Overheat	Protected by thermister/thermostat
Power Stage Protection	Calculated IGBT Temperature
Ground Fault Protection	Standard on all units
Stall Prevention	Stall prevention for Acceleration/Deceleration while running

OPERATION CONDITIONS

Digital Inputs	L11 - L15	5 programmable logic inputs, 24VDC, compatible with Level 1 PLC Impedance: 3.5 Ω Maximum voltage: 30VDC Max. sampling time: 2ms + 0.5ms Multiple assignment allows configuration several functions via one input
	L16	1 logic input, switch-configurable as logic input or as input for PTC probes Logic input, characteristics identical to inputs L11 - L15 Input for a maximum of 6 PTC probes mounted in series:
	Positive logic (Source)	State 0 if < 5VDC or logic input not wired, state 1 if > 11VDC
	Negative logic (Sink)	State 0 if > 16VDC or logic input not wired, state 1 if < 10 VDC
	Other inputs	See option cards
Digital Relay Outputs	R1A, R1B, R1C	1 relay logic output, one NC contact and one NO contact with common point Minimum switching capacity 3 mA for 24VDC Maximum switching capacity • Resistive load (cos φ = 1): 5A for 250VAC or 30VDC • Inductive load (cos φ = 0.4 and L/R = 7ms): 2A for 250VAC or 30VDC Max response time: 7ms + 0.5ms Electrical service life: 100,000 operations
	R2A, R2B	1 relay logic output, one "N/O" contact Minimum switching capacity 3 mA for 24VDC Maximum switching capacity • Resistive load (cos φ = 1): 5 A for 250VAC or 30VDC • Inductive load (cos φ = 0.4 and L/R = 7ms): 2A for 250VAC or 30VDC Max response time: 7ms + 0.5ms Electrical service life: 100,000 operations
	Other outputs	See option cards

OPERATION CONDITIONS

Built-in Functions

Torque regulation, torque/speed regulation switching, torque limitation, current limitation, reference switching, operations on the reference, S and customized ramps, ramp switching, Jog, preset speeds, PID regulation, auto/manual, preset PID references, brake sequence, high speed hoisting, brake contact feedback processing, weight measurement processing, limit switch management, load balancing, multi-motors, multi-configurations, motor fluxing, + speed / - speed with single or 2-stage pushbuttons, reference saving, automatic DC injection, configuration of type of stop (freewheel, fast stop, DC injection, etc), configurable undervoltage management, line contactor control, downstream contactor control, downstream contactors integrity check, fault reset, fault inhibition, automatic restart, multiparameters, auto-tuning and more.

Analog Inputs

AI1-/AI1+

1 bipolar differential analog input + 10VDC (max safe voltage 24VDC)
 Max. sampling time: 2 ms + 0.5 ms
 Resolution 11 bits + 1 sign bit
 Accuracy + 0.6% for a temperature variation of 60° C
 Linearity + 0.15% of the maximum value

AI2

1 software-configurable voltage or current analog input:
 • Voltage analog input 0 - 10 V impedance 30kΩ (max. safe voltage 24VDC)
 • Current analog input X - Y mA by programming X and Y from 0 to 20 mA, with impedance 242Ω
 Max. sampling time: 2 ms + 0.5 ms
 Resolution 11 bits
 Accuracy + 0.6% for a temperature variation of 60° C
 Linearity + 0.15% of the maximum value

Analog Output

A01

1 analog output configurable for voltage or current:
 • Voltage analog output 0 - 10V minimum load impedance 470Ω
 • Current analog output X-Y mA by programming X and Y from 0 to 20mA, maximum load impedance 500Ω
 Max. sampling time: 2ms + 0.5 ms
 Resolution: 10 bits
 Accuracy: +1% for a temperature variation of 60° C
 Linearity: + 0.2%

Display function

24 character, 8 line display; 6 languages available including English, Chinese, French, Spanish, German, Italian; storage of 4 configurations for upload from keypad to MT drives and remote mount option.

Communications

Modbus and CANopen communication protocols as standard via 2 RJ45 connector ports; optional deviceNet, Ethernet TCP/IP, Profibus DP, Interbus-S, Modbus Plus

Standard Enclosure

IP20 Protected Chassis, IP00 on large drives (optional NEMA1 Kit available for all frame sizes)

Altitude

Up to 3,300 feet (derating required at higher altitudes)

Ambient Temperature

-10° C to 50° C (14° F to 122° F)
 Operation up to 60° C with derating or use of ventilation control kit

Storage Temperature

-25° C to 70° C (-13° F to 115° F)

Humidity

5 - 95% non-condensing, conforming to IEC 60068-2-3

Vibration

< 75 kW

1.5mm peak to peak, 3-13Hz, 1gn from 13-200 Hz (IEC/EN 60068 2-6)

>90kW

1.5mm peak to peak, 3-10Hz, 0.06gn from 10-200Hz (IEC/EN 60068 2-6)

Shock resistance

< 75 kW

15gn for 11ms (IEC/EN 60068-2-27)

>90kW

7gn for 11 ms (IEC/EN 60068-2-27)

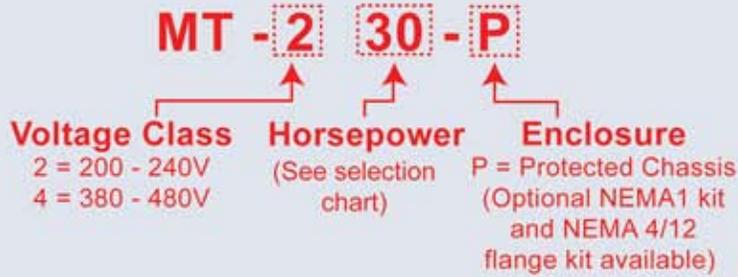
EMC

Emissions: IEC/EN 61800-3, environments 1 & 2, categories C1, C2, C3
 Immunity: IEC/EN 61000-4-2, -3, -4, -5, -6, and-11

LVD / Approvals

EN 50178 and IEC 529 / UL, CE, CSA, NOM 117, C-Tick

ENVIRONMENTAL CONDITIONS AND APPROVALS



Consult Factory for Variable Torque Drives

MT Series

Input Voltage	Model Number (1)	Rated Output Current	HP	kW	Frame Size	Dimensions "			Shipping (lbs) Weight
						H	W	D	
200-240V	MT-2P5-P	3	0.5	0.37					
	MT-201-P	4.8	1	0.75	2	9.06	5.12	6.89	6.61
	MT-202-P	8	2	1.5					
	MT-203-P	11	3	2.2	3	10.24	6.10	7.36	8.82
	MT-205-P	17.5	5	4					
	MT-207-P	27.5	7.5	5.5	4	11.61	6.89	7.36	12.13
	MT-210-P	33	10	7.5	5A	11.61	8.27	8.39	15.43
	MT-215-P	54	15	11	5B	15.75	9.06	8.39	19.84
	MT-220-P	66	20	15					
	MT-225-P	75	25	18.5	6	16.54	9.45	9.29	66.14
	MT-230-P	88	30	22					
	MT-240-P	120	40	30	7B	21.65	12.60	10.47	81.57
380-480V	MT-401-P	2.3	1	0.75	2	9.06	5.12	6.89	6.61
	MT-402-P	4.1	2	1.5					
	MT-403-P	5.8	3	2.2	3	10.24	6.10	7.36	8.82
	MT-405-P	10.5	5	4					
	MT-407-P	14.3	7.5	5.5	4	11.61	6.89	7.36	12.31
	MT-410-P	17.6	10	7.5					
	MT-415-P	27.7	15	11	5A	11.61	8.27	8.39	15.43
	MT-420-P	33	20	15	5B	15.75	9.06	8.39	19.84
	MT-425-P	41	25	18.5					
	MT-430-P	48	30	22	6	16.54	9.45	9.29	66.14
	MT-440-P	66	40	30	7A	21.65	9.45	10.47	81.57
	MT-450-P	79	50	37					
	MT-460-P	94	60	45					
	MT-475-P	116	75	55	8	24.80	12.60	11.42	99.21
	MT-4100-P	160	100	75					
	MT-4125-P	179	125	90	9B	26.77	12.20	15.43	132
	MT-4150-P	215	150	110	10A	30.79	13.78	15.43	163
	MT-4200-P	259	200	132	11A	46.85	13.39	15.43	255
	MT-4250-P	314	250	160	12A	46.85	17.32	15.43	358
	MT-4300-P	387	300	200					
MT-4400-P	481	400	250	13	46.85	23.43	15.43	455	
MT-4450-P	550	450	280						
MT-4500-P	616	500	310						
MT-4600-P	759	600	400	14A	54.72	35.04	15.43	704	
MT-4700-P	941	700	500	15A	54.72	44.09	15.43	957	

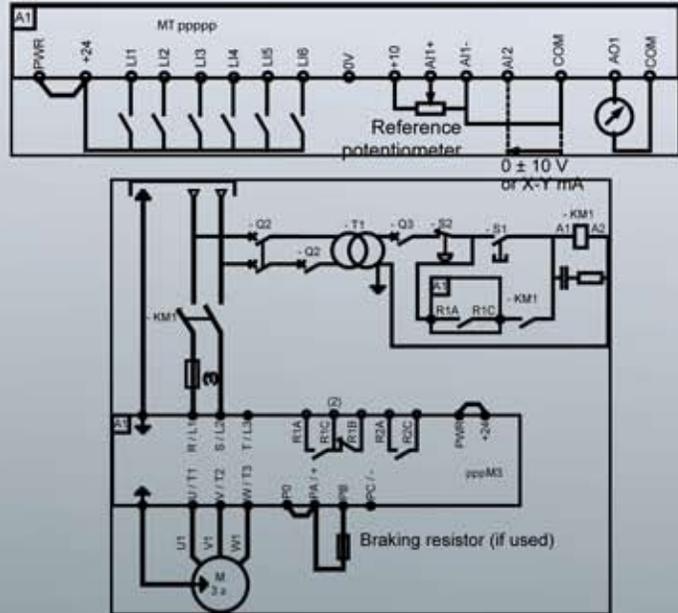
KEY DESIGN FEATURES

MT Series • .5 to 700HP

- Custom ramps
- accepts up to 50% line voltage drop
- 150 programmable functions
- Fast top / freewheel to stop
- 16 preset speeds
- frequency, current, thermal state, high
- Summing reference speed attained reference
- +/- speed
- catch on-the-fly
- Jog
- defeatable faults stored in EEPROM
- Reference switching
- reverse operation inhibit
- Ramp switching
- DC braking
- 2 or 3 wire control
- PID control
- Integrated Modbus® & CANopen Port

TYPICAL WIRING DIAGRAM

Wiring the MT Series drive to your motor is easy. Simply decide how you want to control it, how the field connections should be terminated and program the drive to suit your needs.



Consult Factory for Variable Torque Drives

The Power of Performance

UNIQUE FEATURES FOR MAXIMUM FLEXIBILITY

- Built-in "macro" configurations for start / stop, material handling, hoisting, PID control, communications control and master / slave applications.
- DC Bus chokes standard (integral up to 100HP and shipped loose above 125HP)
- Load sharing using multiple drives of similar size by connecting them in parallel via the DC bus connection (ideal for oil rigs, mining and aggregate industry use).
- Non-linear reference signal adjustability for fine tuning critical applications (high speed packaging, etc) for servo-like performance.
- Addition, multiplication & division of input signals.
- Motor Fluxing for improved starting torque (pre-fluxing the motor) that can also be used as a motor winding heater.
- Custom ramp profiles with multiple time and speed set points.
- End-of-travel positioning for use with limit switches. Allows you to select different accel / decel profiles for positioning applications.
- Line and load contactor control easily configurable for installations that require line isolation or to make sure load contactors open only under no-load condition.
- Basic, Standard, Advanced & Expert programming levels for protection against unauthorized use or changes.
- 2-level thermal alarm management with restart protection for both the motor & drive



MT Series

World Class Products & Service

Other drive products available from Motortronics



ME2 Series

- Micro AC Drive
- 0.25 - 3 HP

Key Features

- Compact Size
- Easy to operate
- Built-in EMI Filter
- Din Rail Adapter Option
- User Friendly Keypad
- Priced to Compete



VCM Series

- V/Hz or Sensorless Vector AC Drive
- 0.5 - 40 HP at 230V
- 1 - 75HP at 460V

Key Features

- Simplicity by design
- 150% Starting Torque
- Built-in speed pot
- Full protection
- Flexible I/O
- PID Function
- RS485 communications

CORPORATE HEADQUARTERS

Motortronics / Phasetronics

1600 Sunshine Drive
Clearwater, Florida 33765
Tel: 727.573.1819 or 888.767.7792
Fax: 727.573.1803 or 800.548.4104
E-mail: sales@motortronics.com
www.motortronics.com

INTERNATIONAL LOCATIONS

Motortronics Int'l Korea Co Ltd

601, Daeryung Techno Tower 5-cha
Gasan-dong, Geumcheon-gu
Seoul, Korea 9153-774
Tel: 82-2-867-5808 / Fax: 82-2-867-6004
www.motortronics-korea.com



MOTORTRONICS™

Solid State AC Motor Control

M & P Machinery & Electronics Control

113 Zaoshan Road
Qingdao, China 266100
Tel: 86-532-87660633
Fax: 86-532-87660733
www.mp-cn.com

PN: MT112711