



**MCH Series D  
1 - 250**

**DESCRIPTION**

The MCH Series variable frequency drive has been specifically designed for HVAC such as fans, pumps and cooling towers. The application specific keypad offer operation. Features especially useful for fan or pump applications include:

- HOA keys to mimic traditional Hand, Off, and Auto functions
- PID set point control
- Hour and kWh meters
- 32 character plain English backlit LCD display with adjustable viewing angle

The MCH Series is available as a basic drive by itself or as part of a package with such as Bypass, input disconnect switch, input fuses, input line reactor, etc. Please to the Option Box and Bypass package data sheets listed below for more information optional configurations:

MCH Series Drive/Option Box Package #DS-MHOB-OBOC  
MCH Series Drive/Bypass Package #DS-MHBP-OBOC

**GENERAL MCH FEATURES**

**DESIGN FEATURES**

- 32 character, plain English, backlit LCD display with adjustable contrast
- Keypad with HOA functionality
- Speed reference sources:
  - 0-10 VDC (scalable)
  - 4-20 mA (scalable)
  - speed pot (scalable)
  - preset speeds (4 available)
- keypad
- Loss of follower: fault or go to preset speed
- Analog outputs: two available
  - 0-10 VDC or 2-10 VDC (scalable)
  - proportional to speed and load
- Digital outputs:
  - one Form C relay (option for 2nd relay)
  - two open-collector outputs
- PID setpoint control
- RS-485 serial comm. (Modbus RTU)
- Password protection of parameters
- Surface mount technology
- UL, cUL, and CSA listed

**PERFORMANCE FEATURES**

- Ratings:
  - 1 to 60 Hp at 240/200 Vac
  - 1 to 250 Hp at 480/400 Vac
  - 1 to 200 Hp at 590/480 Vac
- Accel time: 0.1 to 3600 seconds
- Decel time: 0.1 to 3600 seconds
- Current limit: adjustable up to 120%
- Carrier frequency: 2.5 kHz to 14 kHz
- Sleep Mode with adjustable threshold and time
- Adjustable Volts/Hz ratio
- DC injection braking: adjustable voltage and time
- Skip frequencies: two available with adjustable bandwidth (up to 10 Hz)
- Output frequency: 0-120 Hz
- Starting torque boost: adjustable
- Start options:
  - Start upon application of power
  - Auto restart after fault (5 attempts)
  - Flying restart to catch a spinning motor
- 500 ms power loss ride-through

**PROTECTIVE FEATURES**

- 120% overload capacity for 60 s
- Overvoltage & undervoltage fault
- Output short circuit fault
- Phase to ground fault
- Phase to phase fault
- Electronic thermal overload
- Current limit: adjustable up to 1
- Overtemperature fault
- External fault input for safety interlock

**ELECTRICAL SPECIFICATION**

- Input voltage ratings: 240/200 V, 480/400 Vac, 590/480 Vac
- Input voltage tolerance: +10%, -
- Input frequency tolerance: 48 to
- Input phase sequence insensitive
- Output frequency: 0-120 Hz
- Output wave form: Sine-coded F
- Efficiency: > 97% over speed range
- Power factor (displacement): >

**SERVICE CONDITIONS**

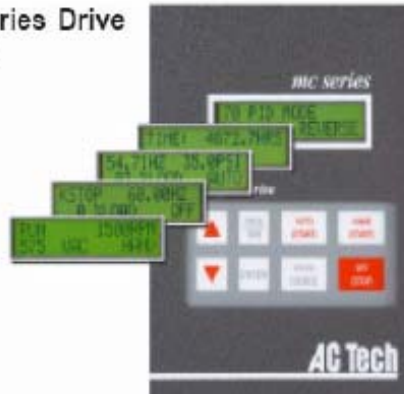
- Enclosure: NEMA Type 1
- Storage Temperature: -20°C to 70°C
- Ambient Operating Temp: -10°C to 40°C
- Ambient Humidity: Up to 95% (non-condensing)
- Altitude: 3300 ft/1000 m above sea level (higher with derating)

**DRIVE OPTIONS**

- Door interlocked disconnect switch or circuit breaker
- Input fuses
- Input line reactor (std on some models)
- 2nd programmable Form C relay
- Popular protocols such as MetaSys, LONWorks, and Siemens P1
- 12 pulse input (50 Hp and larger)

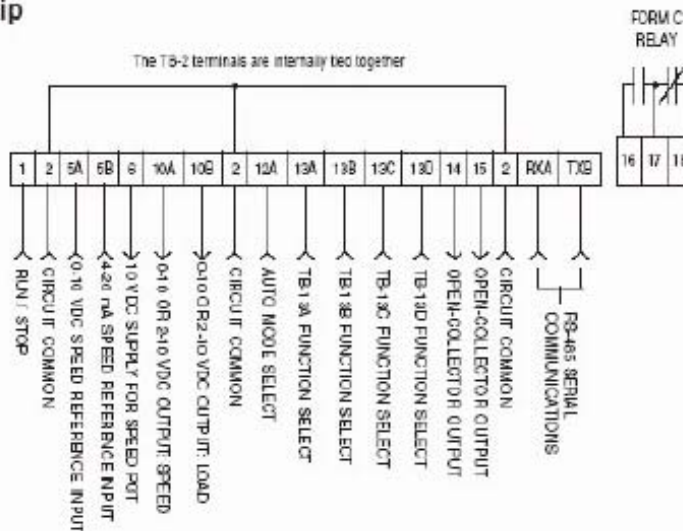
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**MCH Series Drive Keypad**



- The MCH keypad has the following features:
- 2 line, 32 character backlit LCD display
  - Plain English display makes monitoring and programming simple and intuitive
  - In Run mode, simultaneous display of:
    - Drive Status (RUN, STOP, FAULT, etc)
    - Speed Command or PID Setpoint
    - Percent Load or Output Voltage
    - Hand, Off, or Auto status
  - Elapsed Time Display shows total run time
  - kWh meter
  - 8 button keypad has the following functions:
    - Hand, Off, and Auto select buttons
    - Speed Source button to change speed reference
    - Program/Run button to toggle between Program mode and Run mode (Program mode is password protected)
    - ▲ and ▼ buttons to edit parameters and change speed
    - Enter button to confirm changes and store settings

**Terminal Strip**



**Parameter Summary**

- Automatic line voltage calibration
- Four programmable preset speeds
- Two skip frequencies with adjustable bandwidth
- Independent accel and decel rates up to 3600 seconds
- Minimum and maximum frequency
- DC braking with adjustable voltage and time
- Dynamic braking enable/disable
- Current limit from 25-120%
- Motor overload from 25-100%
- Base frequency adjustable to match motor
- Voltage boost for increased starting torque
- Carrier frequency from 2.5-14 kHz
- Auto mode speed source
- Hand mode speed source
- Start method: normal, start on power-up, or flying restart
- Stop method: ramp or coast
- Display units for speed: Hz, RPM, %, units per second, units per minute, units per hour
- Display units for PID: %, PSI, CFM, GPM, IN, units per second, units per minute, units per hour
- Display units scaling
- LCD contrast adjustment to optimize viewing angle
- Sleep Mode threshold frequency
- Sleep Mode time
- Speed at minimum signal and speed at maximum signal to set speed range
- Analog input filter time
- Analog speed output with scaling
- Analog load output with scaling
- Four programmable inputs
- Three programmable digital outputs for drive status indication
- Loss of follower action: fault or go to preset speed
- Loss of serial link action: fault or go into Auto mode
- Serial communications enable/disable
- Serial address from 1-247
- Password adjustable from 0000-9999
- Factory reset for 50 Hz or 60 Hz defaults
- PID mode enable/disable for direct or reverse acting systems
- PID feedback source: 0-10 V or 4-20 mA
- PID minimum and maximum feedback settings to match transducer
- P, I, and D gains
- PID minimum and maximum feedback alarms
- Fault history stores last eight fault messages and drive status

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