



## MDII Series

# Programmable Digital Closed Loop DC Speed Control with P-I-D and RS Communication

The MDII Series digital motor speed controls, employing an advanced 16-bit microprocessor, is designed for digital closed loop operation of up to 2 horsepower DC permanent magnet motors. This control features a true P-I-D algorithm, for extremely responsive and precise control over a wide variety of desired speeds and applications. **The MDII Series is designed as a companion or direct replacement control to the MD Series, while offering significantly improved performance.**

Set or actual speed is displayed directly in RPM, FPM, PROCESS TIME, or other engineering units. Field programming permits customizing specific operating parameters.

The integrated RS485/RS422/RS232 serial interface port is perfect for monitoring or control using almost any computer or process controller. Units can even be attached in a Local Area Network, and can then be controlled and programmed either individually or all at once. Multiple programs allow the user to choose between a "menu" of up to six programmed configurations.

The MDII series is the ultimate answer for precise, responsive, cost-effective and flexible closed loop motor speed control.

## COMMUNICATION FEATURES

- RS485; RS422; RS232 serial interface port for remote monitoring/control/programming allows the following:
  - Continuous output of actual shaft speed
  - Remote speed setting
  - Programming or listing of all field programmable parameters
  - Dartnet network allows multiple controls to be attached via one cable. Controls can be individually programmed or integrated.
  - Programmable communication baud rate - 300 to 9600 baud
- Network Follower mode allows widely remote controls to be followed together over single RS485 twisted pair wire or over existing network

- Compact 1/8 or 1/4 DIN sturdy aluminum housing for panel mounting; or NEMA 4/12 enclosure
- Microprocessor based; utilizes powerful 16-bit Motorola C68HC11
- Field Programmable operating parameters
- Displays actual or desired speed directly in RPM, FPM, process time, or other engineering units
- P-I-D digital closed loop control; gains settable for optimum system performance; Fast settling time
- Accuracy  $\pm 1/2$  RPM of set speed
- Master/Follower operation
- Variety of pick-up inputs; hall-effect, photoelectric, or any TTL; control accepts up to 1.2 million pulses/min. max
- Non-volatile memory retains speed setting and all field programmable parameters
- Internal A/D interface permits using potentiometer, 4 to 20mA or 0 to +5 VDC signal in lieu of digital pick-up signal or to control target speed, current program or frequency generator output
- Inhibit circuit permits start and stop without breaking AC lines; pre-selecting speed, or simultaneous start-up of multiple control units
- Up/down pushbuttons for set points - slow-fast sweep; front panel lockout prevents accidental setting changes
- Self-contained power supply for transducer (+5V, 25mA)
- Transient voltage protection
- Exclusive user assignable outputs - to drive relays, alarms, etc. Can be activated by any combination of conditions; upper speed limit exceeded, etc.
- Independent frequency generator allows units to produce own leader frequency.
- Barrier type terminal strip
- G.E. Lexan™ membrane seals faceplate from environment
- Multi-mode of operation allows multiple constants, settings, and upper/lower limits. Up to six different configurations can be selected from the front panel via the up/down pushbutton switches
- The MD20P is "cUL Recognized" - File # E78180

## PROGRAMMING FEATURES

- All programming from front panel "Menu Driven"
- User selectable "programming protect" prevents unauthorized access
- LED function indicators
- Programmable parameters include:
  - Lower/upper limits for speed setting
  - Accel/decel 0 to 30 seconds for 0-1000 RPM change
  - Pick-up pulses per revolution
  - P-I-D gain settings
  - Constants to allow display in desired user engineering units - rate or time
  - Decimal point or colon
  - "Stall detector" time-out for annunciation and shutdown
  - Multiple programs permit up to six different desired set-ups to be programmed
  - Selectable display blanking point
  - Operation mode (master rate, master time, standard follower, Network Follower)
  - Unit address for multiple control networking
  - Selectable serial communication rate
  - Front panel lockout for speed setting and/or program changes
  - Numerous other features

## MDII SERIES SELECTION GUIDE

MAX H.P	MAX. ARM <sup>1</sup> DC AMPS	MODEL NUMBER	STANDARD SPEED RANGE
<i>120 VAC Single Phase Input, 0-90 VDC Output</i>			
1/3	4	MD20P	Field Programmable <sup>2</sup>
1	10	MD30P	Field Programmable <sup>2</sup>
1	10	MD30E	Field Programmable <sup>2</sup>
<i>240 VAC Single Phase Input, 0-180 VDC Output</i>			
2/3	4	MD20P-5	Field Programmable <sup>2</sup>
2	10	MD30P-5	Field Programmable <sup>2</sup>
2	10	MD30E-5	Field Programmable <sup>2</sup>

Requires Dart PU-E or other pick-up.

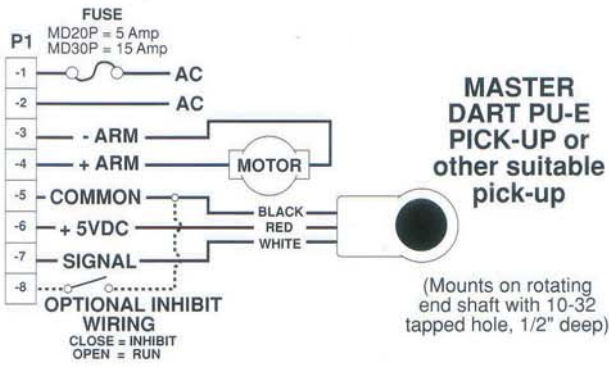
1 - Minimum output current of 150mA.

2 - Shipped set for 0-3600 RPM with one pulse per revolution

## OPTION DESCRIPTION

**OPTION** Auto-Off-Manual control for 4-20mA or 0-5 VDC analog signal input (MD30E and MD30E-5 only) ..... **SUFFIX** -7

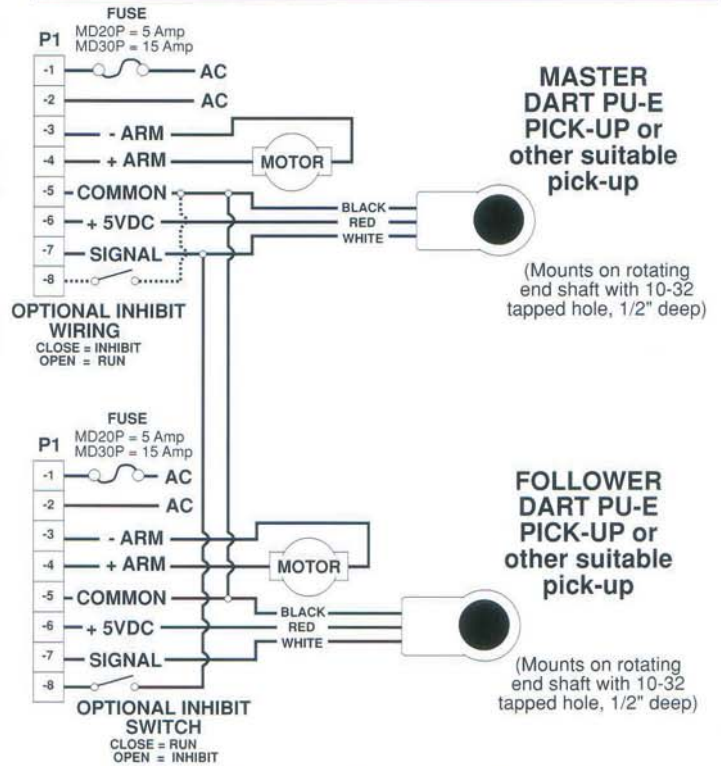
## WIRING DIAGRAM - MASTER



## OPERATING SPECIFICATIONS

Temperature ..... -10° to +45° C.  
 AC Input Voltage ..... ±10% Rated Line Voltage  
 Input Frequency ..... 50/60 Hz.  
 Overload Capacity ..... 200% for 1 minute  
 Transducer Signal Input .... 0-5 to 0-25 VDC square wave

## WIRING DIAGRAM—MASTER/FOLLOWER



\* MD30E uses a 15 Amp fuse and internally mounted on-off switch. No external fusing or switch needed.

## MOUNTING DIMENSIONS - MD30E



## DIMENSIONAL SPECIFICATIONS

MODEL	WIDTH	HEIGHT	DEPTH	WEIGHT
<i>MD20P Inches (centimeters)</i>				
Housing	3.62 (9.2)	1.66 (4.3)	5.05 (12.8)	16.56 oz
Lens	4.42 (11.3)	2.25 (5.7)	0.25 (00.6)	
<i>MD30P Inches (centimeters)</i>				
Housing*	4.00 (10.2)	3.50 (8.9)	6.40 (16.3)	35.60 oz
Lens	3.80 (9.6)	3.80 (9.6)	0.42 (01.1)	

\* Includes clamp into housing dimension

## MOUNTING DIMENSIONS - MD20P / MD30P

