

CONTROLLERS

Model Mark III



Description

The Mark III Dynumatic Controller consists of a single printed circuit board rated for 230/460 VAC, 1 phase, 60 Hz input. Optional output voltages are available depending on the controller selected from 10 available sizes. It has the flexibility of 45, 90, 180 or 220 VDC coil voltages from 5.5 to 50 Amps maximum and is available for use with a wide range of drives and brakes rated 1 through 5,000 HP. An input transformer and power relay are standard features. The basic circuit board includes provisions for eight separate control functions. They are multiple cascading, linear acceleration, log accel/decel, current control, tachometer follower (Auto), 0.25% regulation, dancer position and DC tachometer feedback. Selection of one or more options is made by plugging jumpers in the proper positions. Many other modifications are available as options. A variety of operator's stations are available containing required elements for specific applications. This controller offers more available modifications than the Model 4000 or 4050. Because the controller is provided with a built-in transformer, a motor transformer winding is not required.

**For new applications, consult the section for the EC-2000 Controller.*

Features & Benefits

- Linear acceleration circuit is adjustable from 6-60 seconds and provides soft starts.
- Ensures consistent operation and accurate speed control with a standard 0.5% closed loop speed regulation. 0.25% is optional.
- Onboard configurable modifications are available.
- Wall mount enclosure that can use a remote operator's station.
- Loss of reference protection which prevents runaway speeds.
- Short circuit and ground fault protection by fused input. Isolates controller components from short circuits.
- Transient suppression by input suppressor prevents controller damage due to transient spikes.
- Numerous customizing options available, easily modified for application versatility.

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Specifications

Mark III Controller	Units used with 45 VDC, 5.5 amp – 25 amp	AS-14 - 27 Drives AT-140 - 440 Drives AS-703 - 708 Brakes WC-620 Brakes All Water-Cooled Drives
	90 VDC, 5.5 amp – 25 amp	AS-703 - 708 Brakes (with 90 VDC coil)
	Horsepower range	1-200 HP - Standard
	Input, power maximum	230/460 VAC, +/- 10%, 1 Ph, 60 Hz, 285 to 1295 watts
	Output, power maximum	45 VDC, 5.5, 11, 19 or 25 A, 248 to 1125 watts; 90 VDC, 5.5, 11, 25 A, 495 to 990 watts Consult factory for special voltages
	Speed regulation 25% to full load change	0.5% - Standard, 0.25% - Optional
	Regulated speed range	34:1 - Standard
	Enclosure	Consult factory for NEMA options.
	Operator devices (separate operator's station)	Run/Jog roto-push operator's, Stop push button and Run Speed pot - Standard
	Built-in modifications	Linear acceleration, log accel/decel, torque control, tachometer follower (auto), 0.25% regulation, dancer position and DC tachometer feedback - Standard
	Optional modifications	Linear accel/decel, adjustable braking, spring set braking, signal follower, tachometer follower, adjustable jog, Mutuatrol, torque speed control and threading - Optional
	Closed Loop speed control	Standard
	Controller protective features	Input fuses, low line voltage, line transients, isolated signal circuits output over-current
	Line regulation for +/-10% input line voltage change	+/-0.3%
	Thermal drift per degree C	+/-0.12%
	Minimum regulated speed range	50 RPM
	Maximum ambient	104° F (40° C) enclosed 149° F (65° C) panel mount

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Ordering Information

The Mark III Controller is supplied as a panel-mounted controller or in a NEMA 1 enclosure. A power relay and input transformer is built in; so a motor winding or loose input transformer are not required. Eight built-in control functions can be obtained through the connection of jumper wires. The Mark III Controller requires a separate operator's station Page 117. To order a Mark III Controller, locate the Part Number from the table below based on the type of mechanical unit used and the size controller required. If a question exists, refer to the Drive/Controller Compatibility and Selection Chart listed on Pages 70 and 71 of this section. To order a separate operator's station, locate the part number from Page 117, depending on the operator's elements required.

Input Voltage; 1 Phase

115V, 208V, 230V/460V or 575V; 60 Hz 380V, 230V/460V or 575V; 50

Selection Table

Basic Speed Controller	Size	Part Number
Air-Cooled Mechanical	1	CD-000251-1000
	2	CD-000252-1000
	3	CD-000253-1000
	4	CD-000254-1000
	5	CD-000255-1000
	6	CD-000256-1000
	Spl.	CD-000283-1000 (100 VDC @ 2.2 A)
	Spl.	15-000260-0905 (225 VDC @ 5.5 A)
Water-Cooled Mechanical	1	CD-000251-2000
	2	CD-000252-2000
	3	CD-000253-2000
	4	CD-000254-2000
	5	CD-000255-2000
	6	CD-000256-2000
	7	CD-000257-2000
	8	CD-000258-2000
	9	CD-000259-2000
	10	CD-000260-2000

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Mark III Modifications

Accel/Decel, Linear - Acceleration is controlled at a constant rate. At any rate setting, 50% Run Speed is attained in half the set time, 25% Run Speed in one-fourth the set time, etc. plus Linear Deceleration. The time to reach maximum speed is adjustable (please specify).

Braking, Adjustable - Braking of the drive is adjustable by means of a potentiometer, which sets a value of brake excitation. This feature may be used with an adjustable torque or friction brake.

Braking, Emergency Stop - Depressing the Emergency Stop push button de-energizes the clutch coil and applies an independent adjustable emergency stop deceleration braking. Depressing the Stop push button will immediately de-energize the clutch coil and provide an adjustable brake excitation. A special operator's station is required, sold separately.

Breakaway, with Pilot Relay - Breakaway provides an additional "kick" in clutch coil excitation to overcome a high static friction load on starting. A momentary pulse is applied to the clutch coil and then normal acceleration takes over. A pilot relay is supplied to initiate this circuit. The four NO and NC contacts (Form C) are wired to a terminal strip and are rated at 1A @ 115 VAC.

Dancer Position w/Mutuatrol - The Position Control adjusts the speed of the drive to maintain the position of the dancer. The dancer applies the tension to the material. The Dancer Position is set by the operator's reference potentiometer. Mutuatrol type braking is supplied and requires the use of an Adjustable Torque Brake on the drive. The Dancer potentiometer is not included but can be specified from Auxiliary Section of this catalog.

Dancer Position without Mutuatrol - The Position Control adjusts the speed of the drive to maintain the position of the dancer. The dancer applies the tension to the material. The Dancer Position is set by the operator's reference potentiometer. The Dancer potentiometer is not included but can be specified from Auxiliary Section of this catalog.

Drive Speed Output Signal, Isolated - This modification supplies a 4-20 mA signal, proportional to speed, into a maximum of 500 ohms impedance.

Enclosure - Consult factory for NEMA ratings.

Follower, Instrument Signal, Automatic - This modification permits the controller to accept and follow an input signal from the customer's instrumentation. Manual speed control is not included. Impedance must be given when ordering.

Follower, Instrument Signal, Man/Auto - This modification includes the same features as the Automatic Follower features plus a manual mode of operation. A Man/Auto selector switch is added to the operator's station. Impedance must be given when ordering.

Follower, Tachometer, Man/Auto - Includes above Automatic Follower features plus a manual mode of operation. A Man/Auto selector switch and a trim potentiometer are added to the operator's station. If other than a Dynamatic tachometer is used, impedance must be less than 10K and signal input must be 0-60 VAC maximum with a 33 VAC per 1000 RPM gradient.

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Mark III Modifications, Continued

Jog, Separately Adjustable - With this modification the Jog Speed is separately adjustable from Run Speed. The Run/Jog roto-push button is removed and separate Run and Jog push buttons are added to the operator's station. A special operator's station is required, sold separately. If this modification is specified with Linear Acceleration or Linear Accel/Decel, the jog function will bypass the linear ramp circuit. Control Jog potentiometers are mounted internally.

Mutuatrol® - For drives with an adjustable torque brake, this modification allows the drive and brake to be mutually regulated. The primary purpose is accurate speed control using driving or braking torque as required. Adjustable Braking is included.

Threading - This feature allows the operator to run the drive at a Thread Speed separately adjustable from Run Speed. The operator's station requires a Run pot, Jog/Thread roto-push button and Run/Stop push button. Linear Acceleration cannot be provided with this modification. A special operator's station is required, sold separately.

Torque/Speed Control - Use this modification when a combination of Torque Control and Speed Control is required. A special operator's station is required, sold separately. The operator's station consists of Torque/Speed selector switch, Speed and Torque potentiometer and Run/Stop elements.

Torque Limit - The motor is protected from damaging overloads by a signal from the input current of the induction motor to automatically limit the output of the clutch whenever motor current becomes excessive. The price includes a current transformer. The Torque Limit adjustment potentiometer is on the printed circuit board. The limit point is adjustable from 50-150% of full load motor torque. Current transformers supplied with Mark III controls are supplied in a NEMA 12 enclosure. **Use of this modification requires the motor horsepower and single motor voltage to be specified at time of order entry to permit selection of the current transformer ampere rating.**

Trip Circuit Speed - This modification includes a circuit that is used to change the state of a relay when a preset speed is achieved compared to the signal from the drive's tachometer generator. 1 NO and 1 NC set of relay contacts rated 1 Amp, 115 VAC (resistive) are wired out to terminal blocks for customer connection.

Spare Modification Boards Selection Table

Description	Modification Board Part Number
Basic Speed Controller	N/A
Accel/Decel, Linear	15-000242-0001
Braking, Adjustable	15-000240-0002
Braking, Emergency Stop	15-000240-0002
Breakaway, with Pilot Relay	15-000240-0007
Follower, Instrument Signal, Man/Auto	15-000240-0103
Follower, Tachometer, Man/Auto	15-000240-0010
Jog, Separately Adjustable	15-000240-0006
Threading	15-000240-0006
Torque/Speed Control (includes both Mod Boards)	15-000240-0005 & 15-000240-0600
Torque Limit (includes Current Transformer)	15-000240-0008
Trip Circuit Speed	15-000242-0002