

Ajusto-Spede® Controllers

CONTROLLER INTRODUCTION

Models FAS, 3000, 4000, 4050, DSI-700, PDC-2000, EC-2000 and Mark III



Dynamatic® adjustable speed drives and brakes require a separate controller to provide the DC excitation for their coil. A feedback signal from an internal tachometer generator is compared to a reference signal within the controller to maintain accurate speed control. Eight different controllers are available. They are the Fractional HP Ajusto-Spede® (a.k.a. FAS or FD), Model 3000, 4000, 4050, DSI-700, PDC-2000, EC-2000 and Mark III Controllers. Although there is considerable overlap of controller capability for any given drive, there are reasons of commonality at existing installations, different

features and customer benefits that continue to support the need for more than one type of controller. Operator devices for the controllers are as specified in this section. These controllers do not include motor starters. Please refer to the following pages for the Drive/Controller Compatibility and Selection Chart that show which controller model can be used with the mechanical units shown previously in this catalog. After determining which controllers are compatible to your drive, refer to the description and specification pages on each individual controller before making your final selection.

Ajusto-Spede® Controllers

Controller Specifications

Drive/Controller Compatibility & Selection Chart

This chart has three designations: YES, NO and Consult Factory^①; YES designates compatibility between the mechanical unit and the controller; NO indicates that this arrangement is not compatible under any circumstances; Consult Factory signifies that this arrangement is possible, but will require factory consultation.

Mechanical Models			Controller Models Output Rating						
			FAS	3000	4000	4050	EC-2000 ^①	DSI-700 ^①	PDC-2000 ^{①②}
Model Number	HP Ranges	Coil Voltage	40V, 1.25A	45V, 5.5A & 90V 4.3A	45V, 4.3A	45V, 8.0A	45V & 90V, 8A	45V & 90V, 5.5A	
FD- 2541,3 5021,3 5041,3 7521,3 7541,3 9923 9941,3 9523	.25 .50 .50 .75 .75 1 1 1.5	40 V 90 V	YES NO	YES YES	YES NO	YES NO	YES YES	NO NO	NO NO
AS - 14 18 21 25	1 - 2 1 - 5 2 - 10 5 - 20	45 V 90 V	NO NO	YES YES	YES NO	YES NO	YES YES	YES YES	YES YES
AS- 27	10 - 40	45 V 90 V	NO NO	NO YES	NO NO	YES NO	YES YES	YES YES	YES YES
AT - 280 320 360 440	20 - 50 20 - 75 40 - 125 60 - 200	45 V 90 V	NO NO	NO YES	NO NO	YES NO	YES YES	YES YES	YES YES
DCD - 132 160 180 225	3 - 10 7.5 - 25 15 - 50 30 - 75	45 V 90 V	NO NO	NO NO	NO NO	NO NO	YES YES	YES YES	YES YES
AS Brakes 701 703, 705 704, 706 707, 708	5 - 100 HP Dissipation	45 V 90 V	NO NO	YES YES	YES NO	YES NO	C/F ^①	C/F ^①	C/F ^①
WC Brakes 620 630 640	40 - 100 HP Dissipation	45 V 90 V	NO NO	YES YES	YES NO	YES NO	YES YES	YES YES	C/F ^①

- ① C/F – Consult Factory
- ② Only with special coil – requires at least 45 VDC coil

Ajusto-Spede® Controllers

Controller Specifications

Drive/Controller Compatibility & Selection Chart

This chart designates compatibility between different sized Mark III Controllers and mechanical units; Consult Factory signifies that this arrangement is possible, but will require factory consultation.

Mark III Controllers	45 VDC Coil
Size 1 - 45 VDC, 5.5 A	Fractional Drives - .25 - 1.5 HP AS-14 - AS-25 - .75 - 20 HP AT-140 – AT-280 AS-703 WC 620 - WC 630
Size 2 - 45 VDC, 11 A	AS-25 - AS-27 - 25 - 30 HP AT-320 - AT-440 - 25 - 200 HP AS-703 - AS-705 WC-640
Size 3 - 45 VDC, 19 A	AS-706 - AS-708
MARK III CONTROLLERS	90 VDC COIL
Size 5 - 90 VDC, 5.5 A	Fractional Drives - .25 - 1.5 HP (Special) AS-14 - AS-25 - .75 - 20 HP AT-140 – AT-280 AS-703 WC 620 - WC 630
Size 6 - 90 VDC, 11 A	AS-25 - AS-27 - 25 - 30 HP AT-320 - AT-440 - 25 - 200 HP AS-703 - AS-705 WC-640
Size 7 - 90 VDC, 19 A	AS-706 - AS-708
Mark III Controllers	Special Coil Voltages
Special - 75 VDC to 230 VAC, 2.5 A to 50 A	CONSULT FACTORY
Size 4 - 45 VDC, 25 A	CONSULT FACTORY
Size 8 - 90 VDC, 30 A	CONSULT FACTORY
Size 9 - 90 VDC, 50 A	CONSULT FACTORY
Size 10 - 180 VDC, 50 A	CONSULT FACTORY

Ajusto-Spede® Controllers

FAS CONTROLLERS (15-47 & 15-80)



Description:

A Model 15-47 Speed Controller is integrally mounted to the side of the standard fractional horsepower mechanical units. The component parts of the controller are contained on a plug-in type printed circuit board. Power for the controller is obtained from a motor winding in the Fractional HP M-4 Ajusto-Spede® Drive. The operator's station for these controllers consists of a Speed potentiometer and an On/Off switch mounted in a general-purpose enclosure that can be remote mounted.

A Model 15-80 Speed Controller is the wall-mounted version of the 15-47 integrally mounted controller. It has a general purpose enclosure and is available in two configurations:

1. Complete with a Speed potentiometer and On/Off switch mounted on the enclosure cover.
2. Remote mounted controller only (plain cover) requiring a separate operator's station.

Features	Customer Benefits
Operator's station can be mounted up to 500 feet from drive in hard to get at locations.	Remote operators station capability for ease of installation.
If line power is interrupted to the drive, the On/Off switch on the operator's station must be reset before the drive will restart.	Unattended start protection for operator's safety.
Controller has single main PCB and single PCB modifications.	Fewer spare parts required.
Integrally mounted or wall mounted controllers available.	Wide range of installation and application adaptability.

Ajusto-Spede® Controllers

FAS Controllers (15-47 & 15-80)

Specifications

<p>FAS Controllers</p>	<p>Units used with</p> <p>Horsepower range</p> <p>Input power, maximum</p> <p>Output power, maximum</p> <p>Speed regulation, no load to full load change</p> <p>Enclosures</p> <p>Built-in modifications</p> <p>Field modifications (1 per unit)</p> <p>Controller protective features</p> <p>Minimum regulated speed range</p> <p>Maximum ambient</p> <p>One-year warranty</p>	<p>Fractional HP Drives and AS-701 brake</p> <p>.25 to 1.5 HP</p> <p>80 VAC, 1 phase, 50/60 Hz (Input power is typically provided by a transformer winding imbedded in the drive motor)</p> <p>40 VDC, 1.25 A</p> <p>2% - Standard</p> <p>Integral to mechanical unit - Standard General Purpose Enclosure - Optional</p> <p>None</p> <p>Linear acceleration, log acceleration, adjustable braking, tachometer follower, torque control</p> <p>Input fuses</p> <p>50 RPM</p> <p>104° F (40° C) enclosed</p> <p>Standard</p>
-------------------------------	---	---

Ajusto-Spede® Controllers

Ordering Information

The controllers below produce 40 VDC output voltage for use with the .25 to 1.5 HP fractional drives. The model 15-47 integral controller is included with all mechanical units as standard. The optional controllers listed below can be used to replace the standard Fractional Controller.

Fractional Controller Selection Table

Controller Description	Input Voltage	Part Number
Basic Speed Controller (included with complete drive) – ready for mounting in the conduit box on side of Ajusto-Spede® fractional unit (can be sold separately).	80	15-000047-0025
Basic Speed Control (PCB).	80	15-000046-0017
Basic Speed Control with Operator's devices on the cover.	80	15-000080-0030
	230/460	15-000080-0031
	115/208/390/575	15-000080-0032
Basic Speed Control for use with separate Operator's Station, not included.	80	15-000080-0033
	230/460	15-000080-0034
	115/208/390/575	15-000080-0035
Torque Control.	230/460	15-000080-0109
Torque Control.	115/208/390/575	15-000080-0110

Ajusto-Spede® Controllers

MODEL 3000 CONTROLLERS



Description

The Model 3000 Dynamatic® Analog Controller is a complete controller on one printed circuit board. Input is 115 VAC, 1 phase, 50/60 Hz. Output is 5.5 Amp, 45 VDC and is available for use with Dynamatic® Air-Cooled Drives rated .25 through 20 horsepower; or 4.3 Amp, 90 VDC which is available for use with Dynamatic® Air-Cooled Drives rated .25 through 200 horsepower. The controller will provide either speed control or torque control, depending on the positioning of an on-board jumper. To accommodate

a wide range of drive sizes and time constants the controller is manufactured in two separate versions to optimize performance: one for integral horsepower drives and the other for fractional horsepower drives. While this controller is not available with modifications, there are a number of standard features included. Not recommended for continuous low speed operation. This controller is the most basic controller we build and it has limited stability at lower than 200 RPM.

Features	Customer Benefits
Linear acceleration circuit, adjustable from 1 to 30 seconds.	Provides soft starts.
Closed loop control keeps drive output speed within 0.5% for load changes from 0 to 100%.	Accurate speed control.
On-board, selectable speed or torque voltage control.	Application versatility.
Stopping brake circuit, adjustable from 0 to 45 VDC.	Controlled braking capability is added.
Small wall mount enclosure is complete with operator's elements.	Easy to understand, install, operate and maintain.
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.
Custom "state-of-the-art" integrated circuits.	Longer controller life.
Compatible with existing wiring and plant power.	Low installation cost.
Controller and operator's station can be mounted up to 500 feet from drive when proper wire size and type is used.	Dynamatic® controllers are capable of remote mounting for drives mounted in hard to get at locations.
Long Life.	Controllers are built to give long, reliable, low cost life in diverse applications.

Ajusto-Spede® Controllers

Model 3000 Controllers

Specifications

<p>3000 Controller</p>	<p>Units used with 45 VDC, 5.5 Amp</p> <p>90 VDC, 4.3 Amp</p> <p>Horsepower range</p> <p>Input power, maximum</p> <p>Output power, maximum</p> <p>Speed regulation, no load to full load change</p> <p>Enclosures</p> <p>Built-in modifications</p> <p>Field modifications</p> <p>Controller protective features</p> <p>Line regulation for +/-10% input line voltage change</p> <p>Thermal drift per degree C</p> <p>Minimum regulated speed range</p> <p>Maximum ambient</p> <p>Operator devices (on controller cover)</p> <p>Standards</p>	<p>Fractional HP Drives AS-14 - 25 Drives AT-140 – 280 Drives</p> <p>AS-14 - 27 Drives AT-140 - 440 Drives</p> <p>.25 - 20 HP - 45 VDC .75 - 200 HP - 90 VDC</p> <p>115 VAC +/- 10%, 1 phase, 50/60 Hz, 575 VA</p> <p>45 VDC, 5.5 A, 248 watts, or 90 VDC, 4.3 A, 387 watts</p> <p>0.5% Standard</p> <p>NEMA 1- Standard, panel mount -Optional</p> <p>Linear acceleration, adjustable braking, torque control</p> <p>Not available</p> <p>Input fuses, low line voltage, line transients, isolated signal circuits, output over-current.</p> <p>+/-1.0%</p> <p>+/-0.05%</p> <p>50 RPM</p> <p>113° F (45° C) enclosed 149° F (65° C) panel mount</p> <p>Start pushbutton, Stop pushbutton, adjustable speed potentiometer -Standard</p> <p>CSA approved</p>
------------------------	---	---

Ajusto-Spede® Controllers

Ordering Information

The Model 3000 Controller includes a single printed circuit board, rated for a 115 VAC, 1 phase, 50/60 Hz input and a 45 volt, 5.5 Amp, 248 watt or 90 volt, 4.3 Amp, 387 watt output with or without operator's elements (Start and Stop pushbuttons and Run Speed potentiometer). Separate configurations are available for fractional horsepower models (FAS) and integral horsepower models (AS & AT). If the mechanical unit includes a spring set brake a larger controller must be used (4000, 4050, Mark III or EC-2000).

3000 Controller Selection Table

Description	45 VDC Part Number	90 VDC Part Number <i>See Note #1</i>
Model AS & AT NEMA 1 Enclosure with Operator Elements	15-000595-0001	15-000889-0001
Model AS & AT, Panel Mount without Operator Elements	15-000588-0002	15-000888-0001
Model FD, NEMA 1 Enclosure with Operator Elements	15-000595-0003	--
Model FD, Panel Mount without Operator Elements	15-000588-0004	--

Note #1: Limited Availability, 90VDC Units. For applications not requiring braking, use DSI-700. For applications that require braking, consult factory.

Ajusto-Spede® Controllers

MODEL 4000 CONTROLLERS



Description

The Model 4000 Dynamatic® Analog controller is a complete controller on one printed circuit board. Input is 115 VAC, CT., 1 phase, 50/60 Hz. Output is 4.3 Amp, 45 VDC. It is available for use with Dynamatic® Air-Cooled Drives, rated .25 through 20 horsepower. This controller has a power relay and several "on-board" modifications as standard. They are speed and torque control, fixed and spring set braking and linear acceleration. An on-board 4-element DIPswitch programs these modifications. Optional field

modifications are available (one per controller) either factory installed or to be added later in the field as required. They include brake circuits, cascade, follower circuits, jogging, threading, torque/speed control, current limit, dancer and Mutuatrol®. These additional boards are simply added by the use of standoffs and a ribbon connector with plug. The controller is available in a NEMA 13 oil-tight enclosure with operator's elements or as an open panel mounting without operator's elements.

Features	Customer Benefits
Linear acceleration circuit, adjustable from 3 to 90 seconds.	Provides soft starts.
Closed loop control keeps drive output speed within 0.5% for load changes from 0 to 100%.	Accurate speed control.
0.5% speed regulation is standard.	Ensures consistent operation.
On-board selectable programmable modifications.	Application versatility.
Small wall mount enclosure is complete with operator's elements or panel mount.	Easy controllers to understand, install, operate and maintain.
Loss of reference protection.	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.
Long Life.	Controllers are built to give long, reliable, low cost life in diverse applications.

Ajusto-Spede® Controllers

Model 4000 Controllers

Specifications

<p>4000 Controller</p>	<p>Units used with</p> <p>Horsepower range</p> <p>Input power, maximum</p> <p>Output power, maximum</p> <p>Speed regulation, no load to full load change</p> <p>Enclosures</p> <p>Built-in modifications</p> <p>Field modifications (1 per unit)</p> <p>Operator devices (on controller)</p> <p>Closed loop speed control</p> <p>Controller protective features</p> <p>Line regulation for +/-10% input line voltage change</p> <p>Thermal drift per degree C</p> <p>Minimum regulated speed range</p> <p>Maximum ambient</p> <p>Standards</p>	<p>Fractional HP Drives AS-14 - 25 Drives AT-140 -250</p> <p>.25 - 20 HP - Standard</p> <p>115 VAC -10%, +20%, Center Tapped (CT), 1 phase, 50/60 Hz, 460 VA</p> <p>45 VDC, 4.3 Amps, 194 watts</p> <p>0.5% Standard</p> <p>NEMA 13 - Standard, panel mount - Optional</p> <p>Linear acceleration, fixed braking, torque control</p> <p>Brake circuits, cascade, follower circuits, jogging, threading, torque/speed control, current limit, dancer and Mutuatrol® - Optional</p> <p>Start and Stop pushbuttons and Run Speed potentiometer - Standard</p> <p>Standard</p> <p>Input fuses, low line voltage, line transients, isolated signal circuits, output over-current</p> <p>+/-0.1%</p> <p>+/-0.05%</p> <p>50 RPM</p> <p>104° F (40° C) enclosed 149° F (65° C) panel mount</p> <p>CSA approved</p>
-------------------------------	--	--

Ajusto-Spede® Controllers

Ordering Information

Completely Assembled Controllers

The Model 4000 Controller is supplied as a panel-mounted controller or in a NEMA 13 enclosure. A power relay with a set of NO contacts, wired to a terminal strip for customer use, is a standard feature. The input power to the controller is provided either by a motor winding in the drive or a separate 115 VAC, CT input transformer. The Model 4000 controller has the operator controls mounted on the cover of the enclosure. Separate operator's stations can be found on Page 117 for panel mount controllers. The modified controllers below include the basic speed controller and mounting of the modification board. The controllers below are completely assembled. For applications where downtime is critical, spare modification board part numbers are also supplied on the next page.

A complete NEMA 13 enclosed controller consists of a NEMA 13 Enclosure with cover and, when applicable, a modification board. The base is an enclosure containing the basic printed circuit board. The cover includes oil-tight operator's elements when required. **NOTE: MODIFIED CONTROLLERS INCLUDE THE BASIC SPEED CONTROLLER**

4000 Controller Selection Table

Description	Complete Controllers & Modifications	
	Open Panel Mount	NEMA 13 Enclosure
	Part Number	Part Number
Basic Speed Controller	15-000533-1001	15-000551-1001
Main Control – PCB Only – Unassembled	Not Panel Mounted	15-000530-1005
Modified Controllers:		
Accel/Decel, Linear	15-000533-1025	15-000551-1025
Accel/Decel, Linear & Separately Adjustable Jog	15-000533-1025	15-000551-1026
Braking, Adjustable	15-000533-1002	15-000551-1002
Braking, Adjustable & Jog at Run Speed	15-000533-1004	15-000551-1004
Cascade, Man/Auto	15-000533-1008	15-000551-1008
Dancer Position (Potentiometer sold separately (See Page 114))	15-000533-1016	15-000551-1016
Dancer Position & Mutuatrol	15-000537-1001	NA
Follower, Instrument Signal, Man/Auto		
a. Ratio pot internal	15-000533-1010	15-000551-1010
b. Ratio pot external	15-000533-1011	15-000551-1011
Follower, Tachometer, Man/Auto	15-000533-1009	15-000551-1009
Jog at Run Speed	15-000533-1003	15-000551-1003
Jog, Separately Adjustable	15-000533-1005	15-000551-1005
Mutuatrol	15-000533-1017	15-000551-1017
Mutuatrol & Jog at Run Speed	15-000533-1018	15-000551-1018
Threading		
a. Thread pot internal	15-000533-1006	15-000551-1006
b. Thread pot external	15-000533-1007	15-000551-1007
Torque Control	15-000533-1012	15-000551-1012
Torque/Speed Control	15-000533-1013	15-000551-1013
Torque Limit (includes 15-203-3 Current Transformer)	15-000533-1014	15-000551-1014
Torque Limit & Jog at Run Speed	15-000533-1015	15-000551-1015
Blank Cover Control	NA	15-000551-1030

**Ajusto-Spede® Controllers
Ordering Information**

Spare Modification Boards Selection Table

Description	Modification Board Part Number
Basic Speed Controller	--
Accel/Decel, Linear	15-000446-1004
Accel/Decel & Adjustable Jog	15-000446-1004
Braking, Adjustable	15-000444-1004
Braking, Adjustable & Jog at Run Speed	15-000444-1004
Cascade, Man/Auto	15-000444-1003
Dancer Position (order Dancer Pot, No.15-393-715)	15-000444-1007
Follower, Instrument Signal, Man/Auto	
a. Ratio pot internal	15-000446-1005
b. Ratio pot external	15-000446-1005
Follower, Tachometer, Man/Auto	15-000444-1001
Jog at Run Speed	NA
Jog, Separately Adjustable	15-000444-1003
Mutuatrol	15-000446-1002
Mutuatrol & Jog at Run Speed	15-000446-1002
Threading	
a. Thread Pot Internal	15-000444-1003
b. Thread Pot External	15-000444-1003
Torque Control	NA
Torque/Speed Control	15-000444-1005
Torque Limit (includes a 15-203-3 Current Transformer)	15-000445-1001
Torque Limit & Jog at Run Speed	15-000445-1001
Blank Cover Controller	--

Ajusto-Spede® Controllers

MODEL 4050 CONTROLLERS



Description

The Model 4050 Dynamatic® Analog controller is a complete controller. Input is 115 VAC, CT., 1 phase, 50/60 Hz. Output is 8.0 Amp, 45 VDC. It is suitable for use with drives rated .25 through 200 HP. This controller has a power relay and several "on-board" modifications as standard. They are speed and torque control, fixed and spring set braking and linear acceleration. These modifications are programmed by an on-board, 4 element DIPswitch. Optional field modifications are available (one per controller) either

factory installed or to be added later in the field as required. They include brake circuits, cascade, follower circuits, jogging, threading, torque/speed control, current limit and dancer. These additional boards are simply added by the use of standoffs and a ribbon connector with plug. The controller is supplied as a panel mounted controller. This controller requires a separately mounted operator's station with a Run Speed potentiometer and Start/Stop pushbutton.

Features	Customer Benefits
Linear acceleration circuit, adjustable from 3 to 90 seconds.	Provides soft starts.
Closed loop control keeps drive output speed within 0.5% for load changes from 0 to 100%.	Accurate speed control.
0.5% speed regulation is standard.	Ensures consistent operation.
On-board programmable modifications.	Application versatility.
Small panel mount that uses a remote operator's station.	Easy controllers to understand, install, operate and maintain.
Loss of reference protection.	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.
Long Life.	Controllers are built to give long, reliable, low cost life in diverse applications.

Ajusto-Spede® Controllers

Model 4050 Controllers

Specifications

<p>4050 Controller</p>	<p>Units used with</p> <p>Horsepower range</p> <p>Input power, maximum</p> <p>Output power, maximum</p> <p>Speed regulation no load to full load change</p> <p>Enclosures</p> <p>Built-in modifications</p> <p>Field modifications</p> <p>Operator devices (on a separate operator's station)</p> <p>Closed Loop speed control</p> <p>Controller protective features</p> <p>Line regulation for +/-10% input line voltage change</p> <p>Thermal drift per degree C</p> <p>Minimum regulated speed range</p> <p>Maximum ambient</p> <p>Standards</p>	<p>Fractional HP Drives AS-14 - 27 Drives AT-140 - 440 Drives AS-705 Brakes</p> <p>.25 - 200 HP – Standard</p> <p>115 VAC, -10%, +20%, Center Tapped (CT), 1 phase, 50/60 Hz, 800 VA</p> <p>45 VDC, 8.0 Amps, 360 watts</p> <p>0.5% - Standard</p> <p>NEMA 13 - Standard, panel mount - Optional</p> <p>Linear acceleration, fixed braking, torque control</p> <p>Brake circuits, cascade, follower circuits, jogging, threading, torque/speed control, current limit and dancer – Optional</p> <p>Start and Stop pushbutton and Run Speed potentiometer – Standard</p> <p>Standard</p> <p>Input fuses, low line voltage, line transients, isolated signal circuits, output over-current.</p> <p>+/-0.1%</p> <p>+/-0.05%</p> <p>50 RPM</p> <p>104° F (40° C) enclosed 149° F (65° C) panel mount</p> <p>CSA approved</p>
-------------------------------	---	--

Ajusto-Spede® Controllers

Ordering Information

Completely Assembled Controllers

The Model 4050 Controller is supplied as a panel-mounted controller or in a NEMA 13 enclosure. A power relay with a set of NO contacts, wired to a terminal strip for customer use, is a standard feature. The input power to the controller is provided either by a motor winding in the drive or a separate 115 VAC, CT input transformer. The Model 4050 controller requires a separate operator's station that is sold separately on Page 117. The modified controllers below include the basic speed controller and mounting of the modification board. The controllers below are completely assembled. For applications where downtime is critical, part numbers for spare modification boards are supplied on the next page.

4050 Controller Selection Table

Description	Complete Controllers	
	Open Panel Mount	NEMA 13 Enclosure
	Part Number	Part Number
Basic Speed Controller	15-000539-0001	15-000553-0001
Modified Controllers:		
Accel/Decel, Linear	15-000539-0025	15-000553-0025
Accel/Decel, Linear & Separately Adjustable	15-000539-0025	15-000553-0025
Jog		
Braking, Adjustable	15-000539-0002	15-000553-0002
Braking, Adjustable & Jog at Run Speed	15-000539-0004	15-000553-0004
Cascade, Man/Auto	15-000539-0008	15-000553-0008
Dancer Position (order Dancer Position Pot No.15-393-715)	15-000539-0016	15-000553-0016
Follower, Instrument Signal, Man/Auto		
a. Ratio Pot Internal	15-000539-0010	15-000553-0010
b. Ratio Pot External	15-000539-0011	15-000553-0011
Follower, Tachometer, Man/Auto	15-000539-0009	15-000553-0009
Jog at Run Speed	15-000539-0003	15-000553-0003
Jog, Separately Adjustable	15-000539-0005	15-000553-0005
Mutuatrol (4.3 ADC maximum output for Brake)	15-000539-0017	15-000553-0017
Threading		
a. Thread Pot Internal	15-000539-0006	15-000553-0006
b. Thread Pot External	15-000539-0007	15-000553-0007
Torque Control	15-000539-0012	15-000553-0012
Torque/Speed Control	15-000539-0013	15-000553-0013
Torque Limit (includes 15-203-3 Current Transformer)	15-000539-0014	15-000553-0014
Torque Limit (without Current Transformer)	--	--
Torque Limit & Jog at Run Speed	15-000539-0015	15-000553-0015

Ajusto-Spede® Controllers

Ordering Information

Spare Modification Boards Selection Table

Description	Modification Board Part Number
Basic Speed Controller Accel/Decel, Linear Accel/Decel, Linear & Separately Adjustable Jog Braking, Adjustable	-- 15-000446-1004 15-000446-1004 15-000444-1004
Braking, Adjustable & Jog at Run Speed Cascade, Man/Auto Dancer Position (order Dancer Position Pot, No.15-393-715)	15-000444-1004 15-000444-1003 15-000444-1007
Follower, Instrument Signal, Man/Auto a. Ratio Pot Internal b. Ratio Pot External	15-000446-1005 15-000446-1005
Follower, Tachometer, Man/Auto Jog at Run Speed Jog, Separately Adjustable	15-000444-1001 NA 15-000444-1003
Mutuatrol (4.3 ADC maximum output for Brake) Threading a. Thread Pot Internal b. Thread Pot External	15-000446-1002 15-000444-1003 15-000444-1003
Torque Control Torque/Speed Control Torque Limit (includes 15-203-3 Current Transformer) Torque Limit (without Current Transformer) Torque Limit & Jog at Run Speed	NA 15-000444-1005 15-000445-1001 15-000444-1002 15-000445-1001

Ajusto-Spede® Controllers

Model EC-2000 Controllers



Description

The Dynamatic® EC-2000 Digital Controller consists of a single printed circuit board rated for 115 VAC, 1 phase, 60 Hz input. It has the flexibility of 45 or 90 VDC coil voltage at 8 Amps and is available for use with a wide range of drives and brakes rated 1 through 200 horsepower and high powered applications up to 2,000 horsepower. Please consult factory for high-powered applications. A power relay is a standard feature. The basic circuit board includes provisions for many control functions. Some of these functions are multiple cascading, linear accel/decel, manual or auto signal follower. The EC-2000 can also be run in speed mode or in torque mode. Selection of these options is made through the soft touch keypad. Many other modifications are included. This controller is designed to offer all standard industrial modifications without the need for auxiliary modification boards. An optional 230/460 VAC, 1 phase transformer is also available.

Features	Customer Benefits
0.1% Speed Regulation	Precise speed control standard. No over-speed trips.
Digital Processing.	Easy repeatable setup and control.
Parameter Setup.	PC computer programming capability.
Dual Output Voltage.	Compatible with 45, 90, 180 & 220 VDC and auto 45 VDC forcing.
Low Power Requirements.	Virtually no electrical noise created plant power-friendly.
No Line Harmonic Distortion.	High PF and standard power company correction compatible.
High Starting Torque.	Idle motor start with 250% starting torque capability.
Wide Speed Range.	No additional cost for low speed operation.
Loss of Feedback Protection.	No speed runaway.
Loss of Reference Protection.	Choice continuation or stop at loss of reference.
Loss of Coil Continuity.	Automatic troubleshooting of coil loss.
Long Life.	Controllers are built to give long, reliable, low cost life in diverse applications.

Ajusto-Spede® Controllers

Model EC-2000 Controllers

Specifications

<p>EC-2000 Controller</p>	<p>Units used with</p> <p>Horsepower range</p> <p>Digital</p> <p>Input, power maximum</p> <p>Standard Output, power maximum</p> <p>High Power</p> <p>Speed regulation 25% to full load change</p> <p>Regulated speed range</p> <p>Enclosure</p> <p>Operator devices (Keypad)</p> <p>Built-in modifications</p> <p>Field modifications</p> <p>Closed Loop speed control</p> <p>Controller protective features</p> <p>Line regulation for +/-10% input line voltage change</p> <p>Thermal drift per degree C</p> <p>Minimum regulated speed range</p> <p>Maximum ambient</p>	<p>Fractional HP Drives AS-14 - 27 Drives AT-140 - 440 Drives DCD-132 - 225 Drives AS-703 - 705 (45 or 90 VDC) AS-706 - 707 (90 VDC only) Air-Cooled Brakes WC-620 - WC-640 Water-Cooled Brakes</p> <p>1-200 HP - Standard</p> <p>Standard</p> <p>115 VAC, +/- 10%, 1 Ph, 50/60 Hz, 285 to 1295 watts</p> <p>45 VDC, 8 Amps; 90 VDC, 8 Amps</p> <p>45 VDC, 20 Amps; 45 VDC, 50 Amp; 90 VDC, 20 Amps; 90 VDC, 50 Amps – Consult Factory for other ratings</p> <p>0.1% - Standard</p> <p>68:1 - Standard</p> <p>NEMA 1 - Standard</p> <p>Run & Jog operation, Stop button and Run Speed settable reference from the keypad - Standard</p> <p>Linear accel/decel, torque control, 0.01% regulation, adjustable braking, spring set braking (relay contacts available), signal follower input, adjustable jog, torque/speed control and threading - Standard</p> <p>None</p> <p>Standard</p> <p>Input fuses, low line voltage, line transients, isolated signal circuits output over-current, trip or indication only</p> <p>+/-0.3%</p> <p>0%</p> <p>25 RPM</p> <p>104° F (40° C) enclosed 149° F (65° C) panel mount</p>
----------------------------------	--	---

Ajusto-Spede® Controllers

Pricing & Ordering Information

The Model EC-2000 Controller can be provided as a panel mount, or it can be provided in a NEMA 1 or NEMA 12 Enclosure. The NEMA 1 and NEMA 12 enclosures include the installed keypad. The panel mount versions do not include the keypad, cable or mounting hardware, but may be ordered loose (see below). A power relay is built in. Optional current transformers are required for torque limit operation and are priced starting on Page 124. Input transformers are not required, but are available. Please contact the factory for further information.

EC-2000 Controller Pricing & Selection Table - 8 A

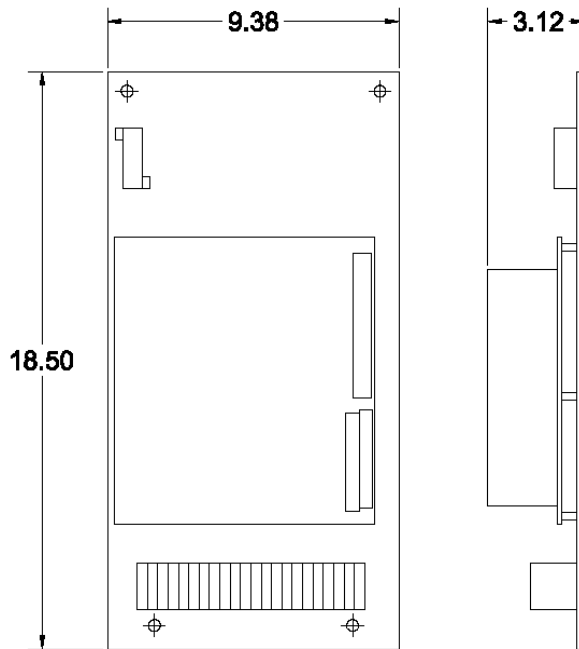
Description	Part Number
Panel Mount Control w/o Keypad	15-002000-0100
Panel Mount Replacement for Mark III Control w/o Keypad (Dimensional Replacement)	15-002000-0200
Includes NEMA 1 Enclosure and Keypad	15-002000-0300
Includes NEMA 12 Enclosure and Keypad	15-002000-0400
Press Drive Control (keypad not included, CT extra)	15-002000-0500
Keypad Kit with Cable & Mounting Hardware	37-000544-0100
Current Transformer 0 to 70 Amps	15-000203-0003
Power Transformer 230/460V Primary 8.0 Amp	15-000361-0001

NOTE 1 - Panel mount, NEMA 1 and NEMA 12 are standard designs, 45VDC/90VDC programmable, see below for large Higher Power Eddy Current units. For Specials, consult factory.

Ajusto-Spede® Controllers

STANDARD CONTROLLER ENGINEERING INFORMATION

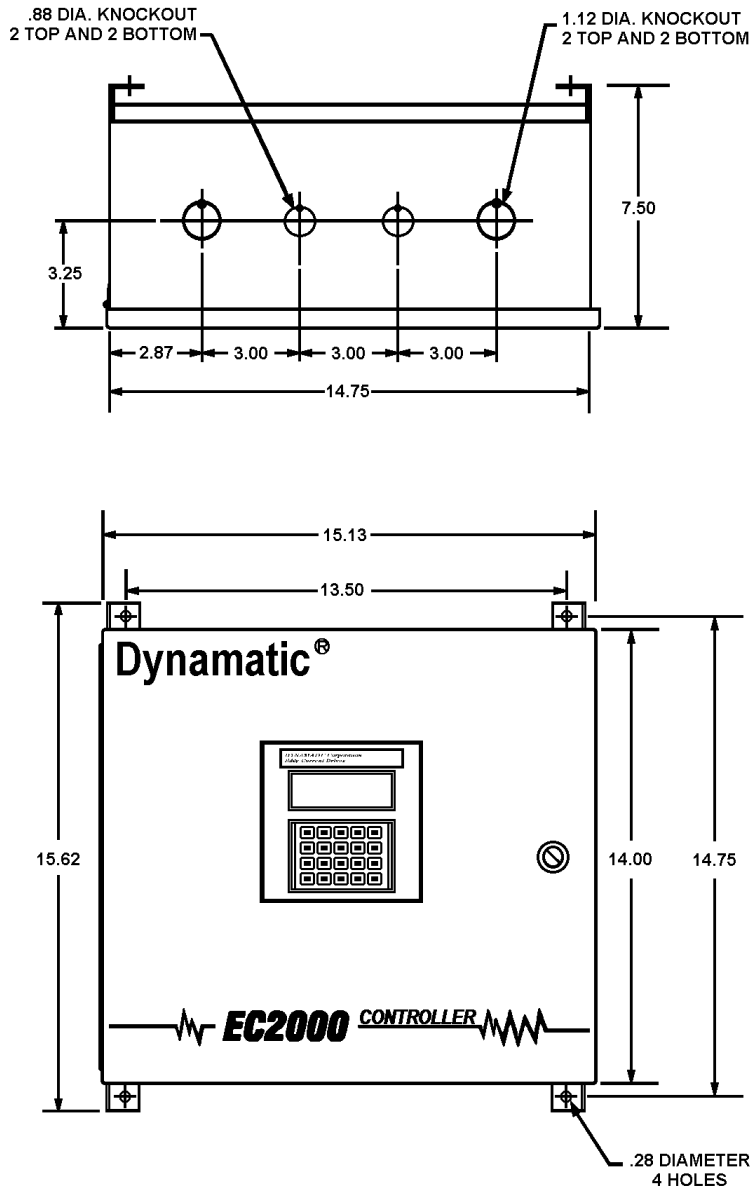
Standard EC-2000 Open Panel Outline Drawing



DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

Standard EC-2000 NEMA-1 Enclosure Outline Drawing (31-606-3 B)



DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

EC-2000 HIGH POWER CONTROLLERS**Description**

The EC-2000 power control board has been designed to allow the use of off-board power conversion assemblies for other output voltages and current ratings. A complete open sub panel design, based on the standard Mark-III base, has been assembled into a compact basic controller that can be used for applications requiring output currents of up to 32-amperes at voltages of 50-, 100-, or 200-volts. These standard panels may also be supplied in NEMA enclosures, or used as a basis for special engineered applications. These assemblies may be used as direct replacements for many standard and pre-engineered Mark-III and 4-58 controllers. Special high voltage, low current units are also available for replacement of the old V3A4, MA-440 and Louis Allis MD-9S controllers, permitting operation with coils rated to 220-volts at 2-amperes.

Ajusto-Spede® Controllers

STANDARD EC-2000 CONTROL FUNCTIONS

The control features provided in the standard EC-2000 8-amp version are also available in the high power series. These include:

- Speed – Torque Mode Select
- Manual – Automatic Signal Follower
- Local – Remote Operation
- Separately Adjustable Jog Input
- Two Channel Analog Signal Output
- Programmable Control parameters
- Manual Reference Potentiometer
- Digital Reference from Local Keypad
- Preset Control References
- Torque Limit Motor Protection
- Two Channel Meter Functions
- Password Security Protection

Ajusto-Spede® Controllers
STANDARD CONFIGURATIONS

1000-SERIES STANDARD OPEN PANEL SUB ASSEMBLIES

The EC-2000-HP control panels listed above are configured as open sub panel assemblies. The base panel measures 18.50-inches high by 9.38-inches wide by 6.12-inches deep, and is physically interchangeable with the Mark-III size 1, 2, 5, and 6 controllers. The basic 32-amp control units are jumper programmable for maximum output current ratings of 32-, 24-, and 16-amps, while the 8-amp units may be jumpered for 8-, 5.5-, and 4-amps maximum output current, expanding the list to fifteen standard sub panel controllers.

2000-SERIES AUGMENTED OPEN PANEL ASSEMBLIES

The standard sub panel controller may be mounted on the large Mark-III panel with an isolation step down transformer and a customer terminal block. This panel measures 23.00-inches high by 22.00-inches wide and is physically interchangeable with the Mark-III size 3, 4, 7, and 8 controllers. These assemblies are limited to controllers with ratings of 4-kva or less.

3000-SERIES NEMA-12 ENCLOSED ASSEMBLIES WITHOUT TRANSFORMERS

All standard sub panel controllers may be mounted in a NEMA-12 enclosure. All enclosed units are shipped complete with a door mounted, gasketed keypad/display unit. This 3000-series assembly does not include any step down or isolation transformer.

4000-SERIES NEMA-12 ENCLOSED ASSEMBLIES WITH TRANSFORMERS

All standard sub panel units may be mounted in a NEMA-12 enclosure, complete with a door mounted, gasketed keypad/display unit, and a properly sized step down isolation transformer. Smaller transformers are panel mounted. Transformers above 4-kva are mounted on the enclosure floor. Larger enclosures may be fitted with floor mounting kits.

5000-SERIES SPECIAL ENGINEERED ASSEMBLIES

Controllers for application-specific functions, or those requiring modifications to the standard features, are specified by adding an "E" prefix to the standard catalog number, along with a description of the required control functions. Part numbers indicating a 5000-series engineered controller will be assigned by our engineering department.

ORDERING CURRENT TRANSFORMERS AND STEP-DOWN TRANSFORMERS

Current transformers and step-down power transformers must be specified and purchased as separate line items when specifying a 1000-series or 3000-series control assembly. A step-down isolation transformer is included as part of a standard 2000-series open panel assembly, 4000-series NEMA-12 enclosed assembly, or 5000-series engineered package when the transformer is part of the specification. The cost of the included step down transformer is included in the selling price of the controller. However, the current transformer must be specified and purchased as a separate line item, specifying the motor current rating.

Ajusto-Spede® Controllers

STANDARD CONTROL ASSEMBLIES

FULL WAVE BRIDGE CONFIGURATION

These complete controllers provide for the most economical solution by connecting directly to 120-VAC or 240-VAC power mains without the use of transformers. **The 50-VDC controller is not available in the bridge configuration.**

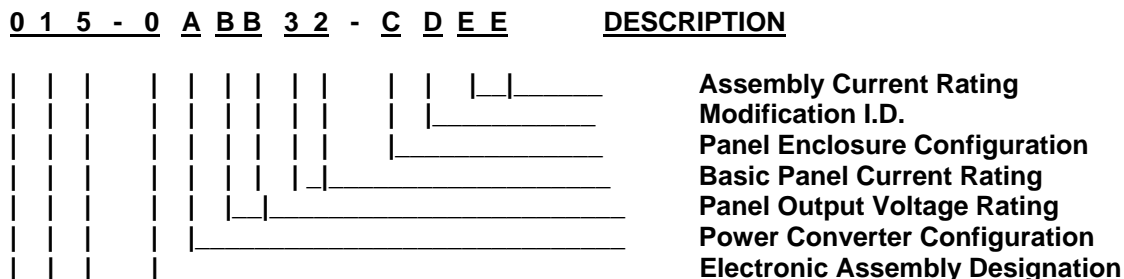
<u>BASIC PANEL</u>	<u>VOLTS IN</u>	<u>VOLTS OUT</u>	<u>AMPS OUT</u>
EC-42008-1000	240 VAC	200 VDC	4, 5.5, 8 ADC
EC-41032-1000	120 VAC	100 VDC	16, 24, 32 ADC
EC-42032-1000	240 VAC	200 VDC	16, 24, 32 ADC

FULL WAVE CENTER-TAPPED CONFIGURATION

These controllers require the use of a center-tapped transformer and feature the same power conversion scheme as the original Mark-III. The transformer provides step down and complete isolation from the high line mains, allowing the power assembly to be grounded.

<u>BASIC PANEL</u>	<u>VOLTS IN</u>	<u>VOLTS OUT</u>	<u>AMPS OUT</u>
EC-20532-1000	120 V CT	50 VDC	16, 24, 32 ADC
EC-21032-1000	240 V CT	100 VDC	16, 24, 32 ADC

EC-2000-HP Part Number Structure



- A:** Number of controlled SCR's: "2" indicates Center-Tap configuration, "4" is Bridge configuration
- B:** "05" = 50-VDC, "10" = 100-VDC, "20" = 200-VDC
- C:** "1" = Standard Mark-III type open sub panel assembly
 "2" = Standard sub panel assembly mounted on Large Mark-III panel with Transformer and Terminal Block
 "3" = Standard sub panel assembly mounted in NEMA-12 Enclosure WITHOUT Transformer
 "4" = Standard sub panel assembly mounted in NEMA-12 Enclosure WITH Transformer
 "5" = Special Engineered assembly per specification
- D:** "0" = Standard universal configuration
- E:** "16" = 16-amperes, "24" = 24-amperes, "32" = 32-amperes

Ajusto-Spede® Controllers

STANDARD CONTROLLER ENGINEERING INFORMATION

PREFERRED CONFIGURATIONS:	50-VDC Output:	EC-20532-1000
	100-VDC Output:	EC-41032-1000
	200-VDC Output:	EC-42008-1000
		EC-42032-1000

NEMA-12 ENCLOSURE SIZES & TRANSFORMERS

FULL WAVE BRIDGE CONFIGURATION

<u>BASIC PANEL</u>	<u>PANEL P/N</u>	<u>DCV OUT</u>	<u>DCA OUT</u>	<u>ENCLOSURE SIZE AND (TRANSFORMER)</u>		
EC-41032-1000	015-041032-1016	100-VDC	16-ADC	1 None	3	64-429
EC-41032-1000	015-041032-1024	100-VDC	24-ADC	2 None	4	64-401
EC-41032-1000	015-041032-1032	100-VDC	32-ADC	3 None	*	64-402
EC-42008-1000	015-042008-1004	200-VDC	4-ADC	1 None	2	64-362
EC-42008-1000	015-042008-1006	200-VDC	5.5-ADC	1 None	3	64-428
EC-42008-1000	015-042008-1008	200-VDC	8-ADC	1 None	3	64-428
EC-42032-1000	015-042032-1016	200-VDC	16-ADC	2 None	*	64-431
EC-42032-1000	015-042032-1024	200-VDC	24-ADC	3 None	*	(2) 64-401
EC-42032-1000	015-042032-1032	200-VDC	32-ADC	3 None	*	(2) 64-402

FULL WAVE CENTER-TAPPED CONFIGURATION

<u>BASIC PANEL</u>	<u>PANEL P/N</u>	<u>DCV OUT</u>	<u>DCA OUT</u>	<u>ENCLOSURE SIZE AND (TRANSFORMER)</u>		
EC-20532-1000	015-020532-1016	50-VDC	16-ADC	1 (None)	2	64-429
EC-20532-1000	015-020532-1024	50-VDC	24-ADC	1 (None)	3	64-430
EC-20532-1000	015-020532-1032	50-VDC	32-ADC	1 (None)	4	64-401
EC-21032-1000	015-021032-1016	100-VDC	16-ADC	1 (None)	3	64-431
EC-21032-1000	015-021032-1024	100-VDC	24-ADC	1 (None)	4	64-431
EC-21032-1000	015-021032-1032	100-VDC	32-ADC	2 (None)	*	64-432

<u>ENCL. SIZE</u>	<u>AREA (SQ.IN.)</u>	<u>SIZE (H-W-D)</u>	<u>DSI PART NO.</u>
1	1840	24x20x10	31-672
2	2304	24x24x12	31-662
3	3744	36x30x12	31-630
4	6144	48x36x16	31-647

* Consult factory for alternate cooling options

Ajusto-Spede® Controllers

STANDARD CURRENT TRANSFORMERS FOR USE WITH THE EC-2000 AND EC-2000-HP

Drive Source International, Inc. offers four standard motor current transformer assemblies for use with the EC-2000 and EC-2000-HP controllers for motors with full load current ratings to 500-amperes. These current transformers may also be used with the 4000/4050 and DSI-700 controllers.

<u>Current Transformer p/n</u>	<u>Motor FLA</u>
015-000203-0003	0 to 70 amps
015-000203-0125	60 to 125 amps
015-000203-0250	125 to 250 amps
015-000203-0500	250 to 500 amps

The motor full load current rating is necessary to order the proper current transformer. The actual motor full load amps (FLA) may be obtained from the motor name plate. If this information is not available, enter the "TYPICAL MOTOR FULL LOAD CURRENT" table below with the motor horsepower rating and line voltage to determine the typical motor current .

Specify actual line voltage and motor HP when ordering. (Example: 230V or 460V, not 230/460V)

Typical Motor Full Load Current

3 Phase AC Induction Type – Squirrel Cage and Wound Rotor				
HP	200V	230V	460V	575V
½	2.3	2	1	0.8
¾	3.2	2.8	1.4	1.1
1	4.15	3.6	1.8	1.4
1½	6	5.2	2.6	2.1
2	7.8	6.8	3.4	2.7
3	11	9.6	4.8	3.9
5	17.5	15.2	7.6	6.1
7½	25	22	11	9
10	32	28	14	11
15	48	42	21	17
20	62	54	27	22
25	78	68	34	27
30	92	80	40	32
40	120	104	52	41
50	150	130	65	52
60	177	154	77	62
75	221	192	96	77
100	285	248	124	99
125	358	312	156	125
150	415	360	180	144
200	550	480	240	192

Ajusto-Spede® Controllers

EC2000 High Power Pump Controller Selection Table

Full Wave Center Tapped Configuration				
Rating	Model	Part #	Enclosure	XFMR #
50VDC 16A	EC-20532-1000	015-020532-1016	Chassis	64-429
50VDC 24A	EC-20532-1000	015-020532-1024	Chassis	64-430
50VDC 32A	EC-20532-1000	015-020532-1032	Chassis	64-401
100VDC 16A	EC-21032-1000	015-021032-1016	Chassis	64-431
100VDC 24A	EC-21032-1000	015-021032-1024	Chassis	64-431
100VDC 32A	EC-21032-1000	015-021032-1032	Chassis	64-432

Full Wave Bridge Configuration				
100VDC 16A	EC-41032-1000	015-041032-1016	Chassis	64-429
100VDC 24A	EC-41032-1000	015-041032-1024	Chassis	64-401
100VDC 32A	EC-41032-1000	015-041032-1032	Chassis	64-402
200VDC 4A	EC-42008-1000	015-042008-1004	Chassis	64-362
200VDC 5.5A	EC-42008-1000	015-042008-1006	Chassis	64-428
200VDC 8.0A	EC-42008-1000	015-042008-1008	Chassis	64-428
200VDC 16A	EC-42032-1000	015-042032-1016	Chassis	64-431
200VDC 24A	EC-42032-1000	015-042032-1024	Chassis	(2) 64-401
200VDC 32A	EC-42032-1000	015-042032-1032	Chassis	(2) 64-402

Keypad			
Keypad Kit with cable & Mounting Hardware	037-000544-0100	NEMA 4	

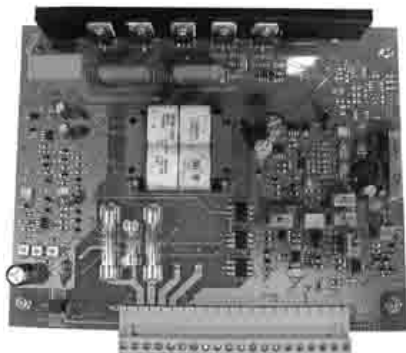
Current Transformers For EC-2000-HP & EC-2000			
0 to 70 Amp		015-000203-0003	Open
60 to 125 Amp		015-000203-0125	Open
125 to 250 Amp		015-000203-0250	Open
250 to 500 Amp		015-000203-0500	Open

Ajusto-Spede® Controllers

MODEL DSI-700 CONTROLLERS

(Eddy Current Control with torque limit)

Open Chassis



NEMA 4/12



Description

The Model DSI-700 Dynamatic® Analog controller is a high quality, high performance universal eddy-current drive controller capable of providing excitation for the Dynamatic® brand Eddy Current drives as well as similar drives manufactured by others. The DSI-700 may be used with drives ranging from the Fractional Horsepower (FAS) drives from ¼ to 1½ HP, to the complete Ajusto-Spede® AS brand of integral motor-clutch drives from 1- through 40 HP, as well as the full line of Ajusto-Spede® AT brand drives up to 200 HP. The DSI-700 is offered in an Original Equipment Manufacturers' (OEM) package as a basic, central control unit to provide maximum

performance at the lowest possible price. It features single circuit board construction with integral heat dissipater for the power components. Only the topside of the circuit board is populated, using hybrid surface-mount as well as through-hole technologies. The controller board is conformally coated to protect components from damage in harsh environments. The controller may be mounted to a substrate panel using four (4) standoff insulators and mounting screws, provided. This allows for easy Integration Into larger systems with the addition of the appropriate supporting controls such as starters, switches, and interlocks, on/off controls as required.

Features	Customer Benefits
Selectable input voltage 115/230 VAC single phase 50 Hz or 60 Hz.	Compatible with existing installations.
Adjustable/selectable 45-, 90-, or 180-VDC output voltage.	One control for all types of Eddy Current Drives.
Adjustable Torque Limit.	Enables safe starting of high inertia loads.
Single PC surface mount construction with low-component count.	Easily integrated into modern PLC controlled systems.
Conformal coating.	Protection for harsh environments and overall reliability.
Interchangeable with other obsolete Eddy-current controllers.	Small, easily retrofitted package.
Factory set-up.	Easy Start-up.
24 HR service and support.	Minimize downtime.

Ajusto-Spede® Controllers

Model DSI-700 Controllers

(Eddy Current Control with Torque Limit)

Specifications

<p>DSI-700 Controller</p>	<p>Units used with</p> <p>Horsepower range</p> <p>Input power, maximum</p> <p>Output power, maximum</p> <p>Speed regulation, for 75% load change</p> <p>Enclosures</p> <p>Built-in Features</p> <p>Field modifications</p> <p>Operator devices (on controller)</p> <p>Closed loop speed control</p> <p>Controller protective features</p> <p>Line regulation for +/-6% input line voltage change</p> <p>Thermal drift</p> <p>Minimum regulated speed</p> <p>Maximum ambient</p>	<p>AS-14 - 27 Drives AT-140 – 440 Drives DCD-132 - DCD-225 Drives AS-703 – AS-705 Brakes</p> <p>.25 - 200 HP - Standard</p> <p>115/230 VAC, 1 phase, 50/60 Hz</p> <p>90/180 VDC, 5.5 Amps</p> <p>0.5% Standard</p> <p>Panel mount and NEMA 13</p> <p>Log acceleration/deceleration, current (voltage) limit, PID adjustments, torque limit (with external current transformer), remote 0-10 volt and 4-20mA input signal, 0-10 VDC and 4-20 mA speed output signal, activity indicator.</p> <p>None</p> <p>Open Panel - None NEMA-13 – Start, Stop pushbuttons and Run Speed potentiometer – Standard, RPM Indicator - Optional</p> <p>Standard</p> <p>Input fuses, line transient protection, isolated signal circuits, torque limit.</p> <p>+/-0.1%</p> <p>+/-0.05% per degree, C</p> <p>50 RPM</p> <p>104° F (40° C) 158° F (65° C)</p>
----------------------------------	---	--

Ajusto-Spede® Controllers

Ordering Information

The Model DSI-700 brand is a high quality, high performance universal eddy-current drives controller capable of providing excitation for the Dynamatic® brand Eddy Current drives as well as similar drives manufactured by others. The DSI-700 may be used with drives ranging from the Fractional Horsepower FAS brand of drives from ¼ to 1½ HP, to the complete Ajusto-Spede® AS brand of integral motor-clutch drives from 1- through 40 HP, as well as the full line of Ajusto-Spede® AT brand drives up to 200 HP.

The DSI-700 is offered in an Original Equipment Manufacturers' (OEM) package as a basic, central control unit to provide maximum performance at the lowest possible price. It features single circuit board construction with integral heat dissipater for the power components. Only the topside of the circuit board is populated, using hybrid surface-mount as well as through-hole technologies. The controller board is conformally coated to protect components from damage in harsh environments. The controller may be mounted to a substrate panel using four (4) standoff insulators and mounting screws, provided in a plastic pouch. This allows for easy Integration Into larger systems with the addition of the appropriate supporting controls such as starters, switches, and interlocks, as required.

DSI-700 Controller Selection Table

Description	Part Number
Universal Eddy-Current Controller - includes Controller PCB, mounting hardware and Instruction Manual	15-000700-0001
Universal Eddy Current Controller – includes Controller PCB, NEMA 13 Enclosure and Instruction Manual (Operator Elements are not included)	15-000700-0002
Universal Eddy Current Controller – includes Controller PCB, NEMA 13 Enclosure and Instruction Manual (Operator Elements: Jog-Run, Potentiometer)	15-000700-0401
Universal Eddy Current Controller – includes Controller PCB, NEMA 13 Enclosure and Instruction Manual (Operator Elements: Jog-Run, Potentiometer RPM Meter)	15-000700-0402
Current Transformer for Torque Limit. Adjustable 7-70A (for higher currents consult factory)	15-000203-0003

Ajusto-Spede® Controllers

MODEL MARK III CONTROLLERS



Description

The Mark III Dynamatic® 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 horsepower. 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 Controllers do. Because the controller is provided with a built-in transformer, a motor transformer winding is not required. Selection for the various sizes of Mark III Controllers, along with various input voltages, is provided on Page 96.

Features	Customer Benefits
Linear acceleration circuit, adjustable from 6 to 60 seconds.	Provides soft starts.
0.5% closed loop speed regulation is standard, 0.25% is optional.	Ensures consistent operation and accurate speed control.
On-board configurable modifications.	Application versatility.
Wall mount enclosure that uses a remote operator's station.	Easy controllers to understand, install, operate and maintain.
Loss of reference protection.	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.	Easy to adapt to stringent application requirements.
Long Life.	Controllers are built to give long, reliable, low cost life in diverse applications.

Ajusto-Spede® Controllers
Model Mark III Controllers

Specifications

Mark III Controller	Units used with Size 1, 45 VDC, 5.5A	Fractional HP Drives AS-14 - 25 Drives, AT-140 -440 Drives AS-703 Brakes WC-620 - 630 Brakes
	Size 2, 45 VDC, 11 A	AS-27 & AT-320 - 440 Drives AS-703 - 705 Brakes WC-640 Brakes
	Size 3, 45 VDC, 19 A	AS-706 -707 Brakes
	Size 4, 45 VDC, 25 A	Large WC drives without motor
	Size 5, 90 VDC, 5.5 A	AS-703 - 705 Brakes (with 90 VDC coil)
	Size 6, 90 VDC, 11 A	AS-706 - 707 Brakes (with 90 VDC coil)
	Size 7, 90 VDC, 19 A	AS-708 Brakes
		Large WC drives without motor
	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	NEMA 1 - Standard
	Operator devices (separate operator's station)	Run/Jog roto-push operator's, Stop pushbutton 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	
Standards	CSA approved	

Ajusto-Spede® Controllers

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.

Mark III 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

Input Voltage; 1 Phase

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

Ajusto-Spede® Controllers

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 pushbutton de-energizes the clutch coil and applies an independent adjustable emergency stop deceleration braking. Depressing the Stop pushbutton will immediately de-energize the clutch coil and provide an adjustable brake excitation. A special operator's station, part number CD-000400-0001 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, NEMA 12 - Consult factory.

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 (part number 28-000348-0004). 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.

Jog, Separately Adjustable - With this modification the Jog Speed is separately adjustable from Run Speed. The Run/Jog roto-pushbutton is removed and separate Run and Jog pushbuttons are added to the operator's station. A special operator's station, part number 28-000203-0005, 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.

Protection, Fungus - This modification provides all printed circuit boards with an application of a protective coating to prevent damage from moisture or airborne contaminants.

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-pushbutton and Run/Stop pushbutton. Linear Acceleration cannot be provided with this modification. A special operator's station, part number 28-000203-0003 is required, sold separately.

Ajusto-Spede® Controllers

Torque/Speed Control - Use this modification when a combination of Torque Control and Speed Control is required. A special operator's station, part number 28-000204-0018 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

Ajusto-Spede® Controllers

MODEL PDC 2000 DIGITAL PRESS DRIVE CONTROLLER



Description

The Model PDC-2000 Dynamatic® Digital Complete Closed Loop Power Press Variable Speed Control System with the optional automatic counter balance pressure adjustment feature is specifically designed to operate eddy current drives on metal forming and powdered metal presses. It is a new concept in eddy current control. Its user-friendly design emerges from years of press control experience by its designers and a desire to continuously improve performance, simplify operation and setup of press drive power controllers. The PDC-2000 is designed to be

powered at all times and merely accept a signal from the AC motor, which indicates that the motor contactor has been closed. The PDC-2000 has programmable time to determine when the AC motor is up to speed. The controller can identify a problem during AC motor start such as a stalled AC motor or a locked up clutch. This intelligent function helps protect your AC motor and limit the damage to the eddy current drive should there be a problem with the motor or the eddy current clutch assembly.

Features	Customer Benefits
Fully digital microprocessor based.	One controller for all types of Eddy-Current drives up to 200 HP.
Universal power input with programmable tachometer input and coil voltage output.	Interchangeable with any Eddy-Current press drive controller.
Modulated coil voltage output with a motor current feedback cut-off control.	No potentiometers to adjust or test equipment needed.
Optional Automatic counter balance pressure adjustment feature based on motor current.	Passive or active counter balance control or display.
Intelligent 2 line by 20 digital fluorescent display for system performance, programming, error messages and status.	No special protection, line reactors, cooling fans or large enclosures.
Local remote or Optional RS-232 input command control of variable speed Eddy-Current drive.	Apply to any kind of control interface.
Main motor monitor, standard clutch-brake engagement, Drive & Motor Fault Detection.	Built in diagnostics, self-test and safe shutdown.
Programmable motor current monitor and clutch current monitor limits for start-up and continuous operation.	Programmable motor HP and strokes per minute calibration for optimum performance.
Drive start-up interlock and press interlocks standard. Adjustable Acceleration and torque limit.	Control flywheel acceleration to limit motor start current.
All parameters programmable from removable keypad provided.	Fail safe design features.
Low frequency IGBT output.	Modern technology.
Clutch/Brake output.	Can be used for eddy current brake control.

Ajusto-Spede® Controllers

Model PDC-2000 Digital Press Drive Controllers

Specifications

PDC-2000 Controller	Units used with	AS-14 - 27 Drives AT-280 - 440 Drives DCD-132 - DCD-225 Drives
	Horsepower range	1-200 HP - Standard
	Digital	Standard
	Input, power maximum	120 volts Standard 240 volts optional
	Output, power maximum	45 VDC, 11 Amps, 90 VDC, 11 Amps, OC to 15 Amps
	Speed regulation 25% to full load change	0.1% - Standard
	Regulated speed range	6:1 - Standard
	Enclosure	NEMA 12 Optional - Chassis Standard
	Operator devices (Keypad)	Run, Stop button and Run Speed settable reference from the display - Standard
	Built-in modifications	Speed control 0.1% regulation, Torque limit, accel/decel - Standard
	Field modifications	Counter balance press adjustment – Optional
	Closed Loop speed control	Standard
	Controller protective features	Input fuses, low line voltage, line transients, isolated signal circuits output over-current, trip on fault
	Line regulation for +/-10% input line voltage change	+/-0.3%
	Thermal drift per degree C	0%
	Minimum regulated speed range	17% of max SPM
	Maximum ambient	104° F (40° C) enclosed 149° F (65° C) panel mount

Ajusto-Spede® Controllers

Ordering Information

The Model PDC-2000 Digital Complete Closed Loop Power Press Variable Speed Control System with the Optional Automatic Counter Balance pressure adjustment feature is specifically designed to operate eddy current drives on metal forming and powdered metal presses. It is a new concept in eddy current control. Its user-friendly design emerges from years of press control experience by its designers and a desire to continuously improve performance, simplify operation and setup of press drive power controllers.

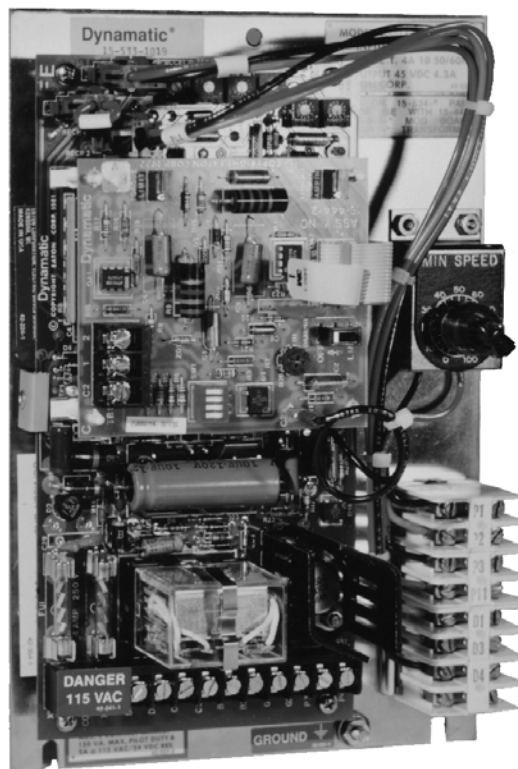
The PDC-2000 is designed to be powered at all times and merely accept a signal from the AC motor, which indicates that the motor contactor has been closed. The PDC2000 has a programmable time delay to determine when the AC motor is up to speed. The controller can enunciate a problem during AC motor start such as a stalled AC motor or a locked up clutch. This intelligent function helps protect your AC motor and limit the damage to the eddy current drive should there be a problem with the motor or the eddy current clutch assembly. There are many built-in diagnostics, which help increase press up-time and reduced maintenance expense!

PDC-2000 Controller Selection Table

Description	Part Number
PDC-2000 Digital Press Drive Controller Closed Loop System - includes Controller Assembly, Programmer with DIN Connector, Fluorescent Display for panel mounting, Display Ribbon Cable and Instruction Manual.	15-002500-0100
PDC-2000 Same as 15-2500-0100 installed in NEMA 12 Enclosure	15-002500-0400
Current Transformers - One Required For Torque Limit Model MI-100 - 0-100 Amp Current Transformer Model MI-500 - 101-500 Amp Current Transformer	15-000394-2000 15-000394-2001
Peripherals & Components Control Chassis Only Hand-Held Programmer with Din Plug Fluorescent Display Unit (AKA Operator Panel) Ribbon Cable (18") - between Display and Controller CPU	15-002000-0001 15-002500-0101 15-002500-0102 15-002500-0103
Power Transformer (optional)	64-000400-0001
Counter Balance Control (optional)	15-002500-0002

Ajusto-Spede® Controllers

MODEL 4000 PRESS DRIVE CONTROLLER
Ordering Information



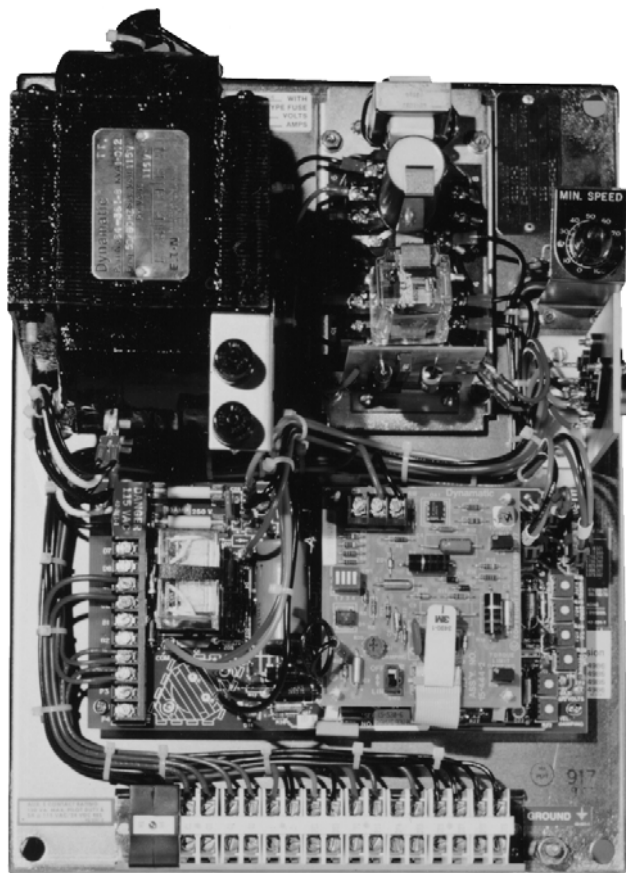
The 4000 Press Drive Controllers are panel mounted and shock resistant. A loose Input Power Transformer is included for customer mounting, along with the following modifications: Torque Limit with loose Current Transformer (part number 15-000203-0003; specify single line voltage and motor HP when ordering), Minimum Speed Potentiometer and an “E” Relay. Select model required for available input voltage from table below. The Model 4000 controller and its modifications are supplied on an open shock resistant sub-panel. See the Auxiliary Devices Section for descriptions of separate Run Speed Potentiometer and Stroke Per Minute (SPM) Meter.

4000 Press Drive Controller Selection Table

Part Number	Description	Modifications
CD-000533-4000	115 V CT, 1 phase, 60 Hz. Input, 45 VDC, 4.3 Amps	Torque limit, Minimum Speed Pot and “E” Relay
CD-000533-2019	230/460 V, 1 phase, 60 Hz. Input, 45 VDC, 4.3 Amps	Torque limit, Minimum Speed Pot and “E” Relay

Ajusto-Spede® Controllers

MODEL 4050 PRESS DRIVE CONTROLLER
Ordering Information



The 4050 Press Drive Controller is panel mounted and shock resistant. A factory mounted Input Power Transformer is included along with the following modifications: Torque Limit with loose Current Transformer (part numbers are located on Page 104; specify single line voltage and motor HP when ordering), Low Speed Trip❶, Minimum Speed Potentiometer, and an “E” Relay❶. Select model required for available input voltage from table below. Model 4050 Controllers and their modifications are mounted and wired on an open shock mounted sub-panel. See the Auxiliary Devices Section for descriptions of separate Run Speed Potentiometer and Stroke Per Minute (SPM) Meter.

4050 Press Drive Controller Selection Table

Part Number	Description	Modifications
15-000539-0019	115 V, 1 phase, 60 Hz. Input, 45 VDC, 8.0 Amps	Torque Limit and Minimum Speed Pot
CD-000541-0001	115 V, 1 phase, 60 Hz. Input, 45 VDC, 8.0 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and “E” Relay
CD-000541-0004	230/460 V, 1 phase, 60 Hz. Input, 45 VDC, 8.0 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and “E” Relay

❶ Not included on the 15-000539-0019.

Ajusto-Spede® Controllers

**MODEL MARK III PRESS DRIVE CONTROLLER
Ordering Information**



The Mark III Press Drive Controller is panel mounted and shock resistant. A factory mounted Input Power Transformer is included along with the following modifications: Torque Limit with loose Current Transformer (part numbers are located on Page 104; specify single line voltage and motor HP when ordering), Low Speed Trip, Minimum Speed Potentiometer, and an "E" Relay. Select model required for mechanical unit being used from table below. Model Mark III Controllers and their modifications are mounted and wired on an open shock mounted sub-panel. See the Auxiliary Devices Section for descriptions of separate Run Speed Potentiometer and Stroke Per Minute (SPM) Meter.

Mark III Press Drive Controller Selection Table

Part Number	Mark III Controller Description	Modifications
CD-000251-3585	Size 1 230/460 V, 1 phase, 60 Hz. input 45 VDC, 5.5 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000252-3104	Size 2 230/460 V, 1 phase, 60 Hz. input 45 VDC, 11 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000253-3267	Size 3 230/460 V, 1 phase, 60 Hz. input 45 VDC, 19 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000255-3063	Size 5 230/460 V, 1 phase, 60 Hz. input 90 VDC, 5.5 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000256-3021	Size 6 230/460 V, 1 phase, 60 Hz. input 90 VDC, 11 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000257-3069	Size 7 230/460 V, 1 phase, 60 Hz. input 90 VDC, 19 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000283-3226	Special 230/460 V, 1 phase, 60 Hz. input 110 VDC, 2.5 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay
CD-000260-0841	Special 230/460 V, 1 phase, 60 Hz. input 220 VDC, 5.5 Amps	Torque Limit, Low Speed Trip, Minimum Speed Pot and "E" Relay

Ajusto-Spede® Controllers
CONTROLLER ENGINEERING INFORMATION

Current Transformer Assemblies

Using the "TYPICAL MOTOR FULL LOAD CURRENT" table, find the appropriate motor full load current based upon motor HP and input voltage. Using this current value, the standard current transformer assembly Page 105 can be identified based upon the controller model. (If open sub-panel assemblies are required, see optional current transformer assemblies starting on Page 124 for part numbers).

Specify single line voltage and motor HP when ordering.
(Example: 230V or 460V not 230/460)

Typical Motor Full Load Current

3 Phase AC Induction Type – Squirrel Cage and Wound Rotor				
HP	200V	230V	460V	575V
½	2.3	2	1	.8
¾	3.2	2.8	1.4	1.1
1	4.15	3.6	1.8	1.4
1½	6	5.2	2.6	2.1
2	7.8	6.8	3.4	2.7
3	11	9.6	4.8	3.9
5	17.5	15.2	7.6	6.1
7½	25	22	11	9
10	32	28	14	11
15	48	42	21	17
20	62	54	27	22
25	78	68	34	27
30	92	80	40	32
40	120	104	52	41
50	150	130	65	52
60	177	154	77	62
75	221	192	96	77
100	285	248	124	99
125	358	312	156	125
150	415	360	180	144
200	550	480	240	192

Note: Not for use with PDC-2000

Ajusto-Spede® Controllers

Ordering Information

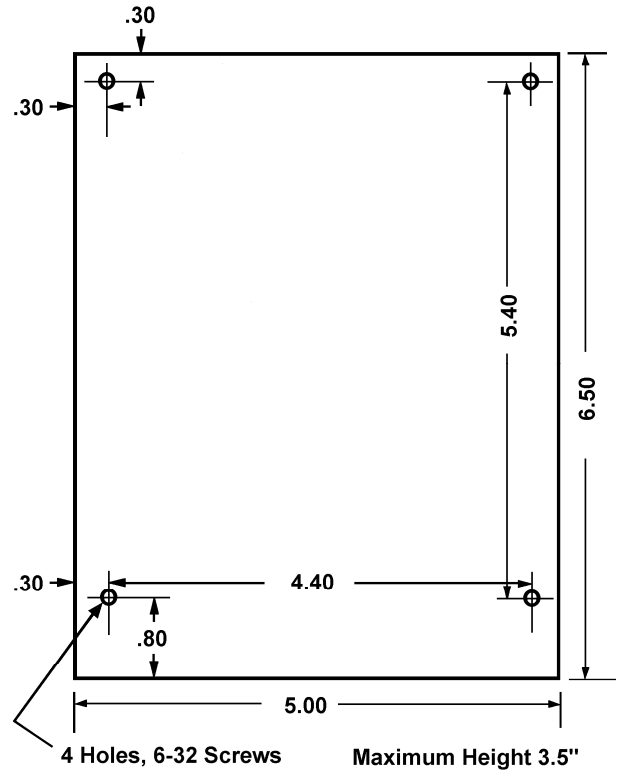
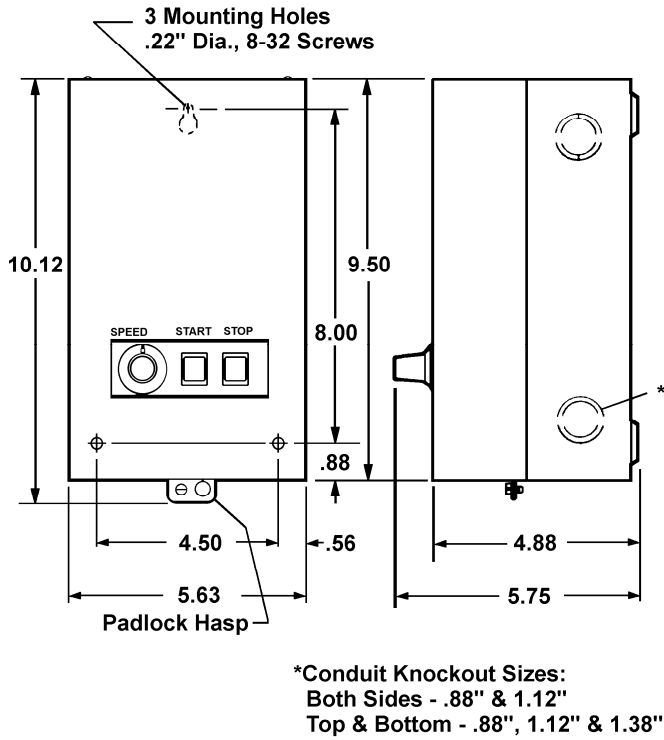
**Standard Current Transformer Assemblies
(Included with Press Drive Controller)**

Full Load Motor Amps	Current Transformer Assemblies			
	Model 4000	Model 4050		Mark III
	Encapsulated Coil	Encapsulated Coil	Open Sub-Panel	Open Sub-Panel
5	15-000203-0003	15-000203-0003	See Table below	15-000018-0005
48	15-000203-0003	15-000203-0003	See Table below	15-000018-0048
60	15-000203-0003	15-000203-0003	See Table below	15-000018-0060
72	NA	NA	15-000018-0072	15-000018-0072
90	NA	NA	15-000018-0090	15-000018-0090
120	NA	NA	15-000018-0120	15-000018-0120
180	NA	NA	15-000018-0180	15-000018-0180
200	NA	NA	15-000018-0200①	15-000018-0200①
250	NA	NA	15-000018-0250①	15-000018-0250①
300	NA	NA	15-000018-0300①	15-000018-0300①
400	NA	NA	15-000018-0400①	15-000018-0400①
500	NA	NA	NA	15-000018-0500①
600	NA	NA	NA	15-000018-0600①
800	NA	NA	NA	15-000018-0800①

All current transformer assemblies are capable of 150% overload and use 1 secondary turn except those marked with ①

Ajusto-Spede® Controllers

Model 3000 Enclosure Outline Drawings



MODEL 3000 - NEMA 1 ENCLOSURE

PANEL MOUNT

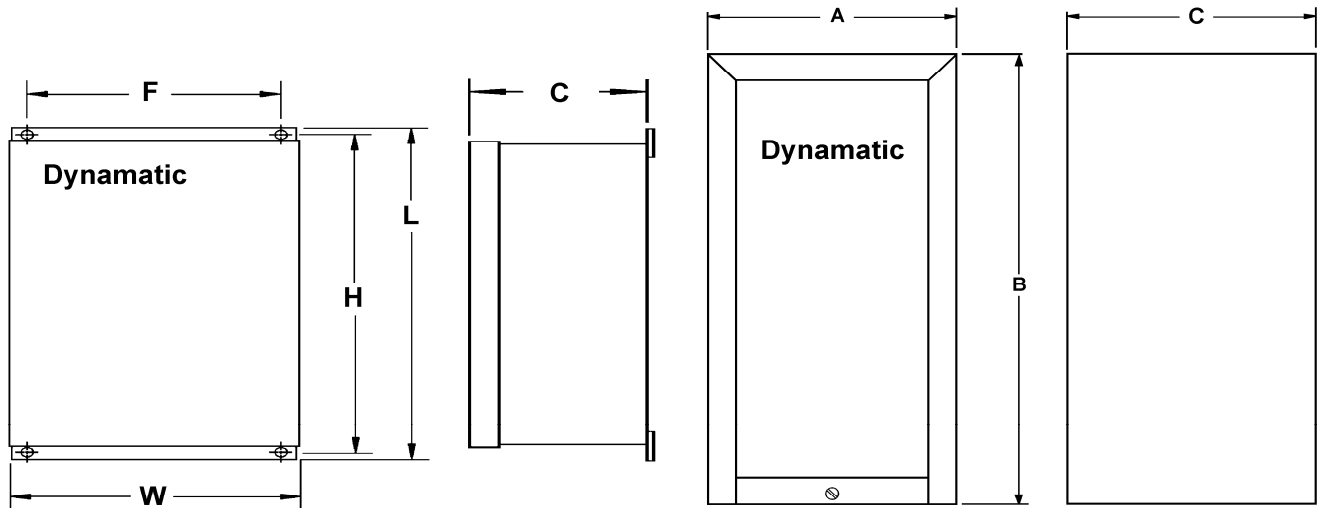
Approximate Shipping Weights for the Model 3000 Controller:

NEMA 1	5 lbs.
Panel Mount	3 lbs.

DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

Models 4000, 4050, DSI-700 and Mark III Enclosure Outline Drawings



**MODEL 4000, 4050 & DSI-600
WALL MOUNTING
NEMA 13**

**MODEL MARK III (GENERAL PURPOSE)
WALL MOUNTING (SIZES 1 THROUGH 9)
FREE STANDING (SIZE 10)**

Controller Enclosures

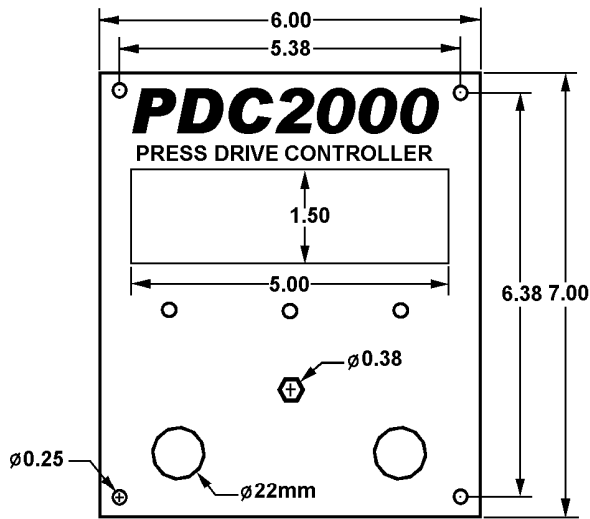
Model	Type/Size Controller	A	B	C	F	H	L	W	Weight (Lbs.) ❶
4000	Panel Mount	--	--	--	--	--	--	--	5
	NEMA 13	--	--	5.00	8.00	12.25	12.75	10.25	8
4050	Panel Mount	--	--	--	--	--	--	--	6
	NEMA 1	--	--	6.00	12.00	16.25	16.75	14.25	16
DSI-700	Panel Mount	--	--	--	--	--	--	--	5
	NEMA 13	--	--	5.00	8.00	12.25	12.75	10.25	8
Mark III	1, 2, 5	9.50	18.56	9.50	--	--	--	--	60
	3, 4, 6, 7	22.16	23.09	12.00	--	--	--	--	140
	8	24.00	25.00	14.25	--	--	--	--	300
	9	30.00	40.00	14.25	--	--	--	--	320
	10	36.00	52.00	14.25	--	--	--	--	640

❶ Approximate shipping weights

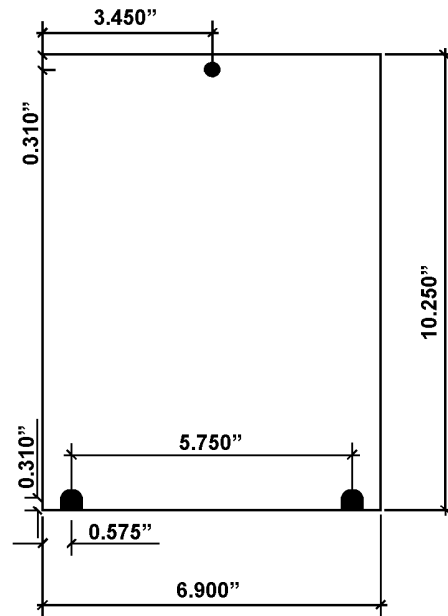
DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

PDC-2000 Outline Drawings



PDC2000 FLUORESCENT DISPLAY MOUNTING DIMENSIONS

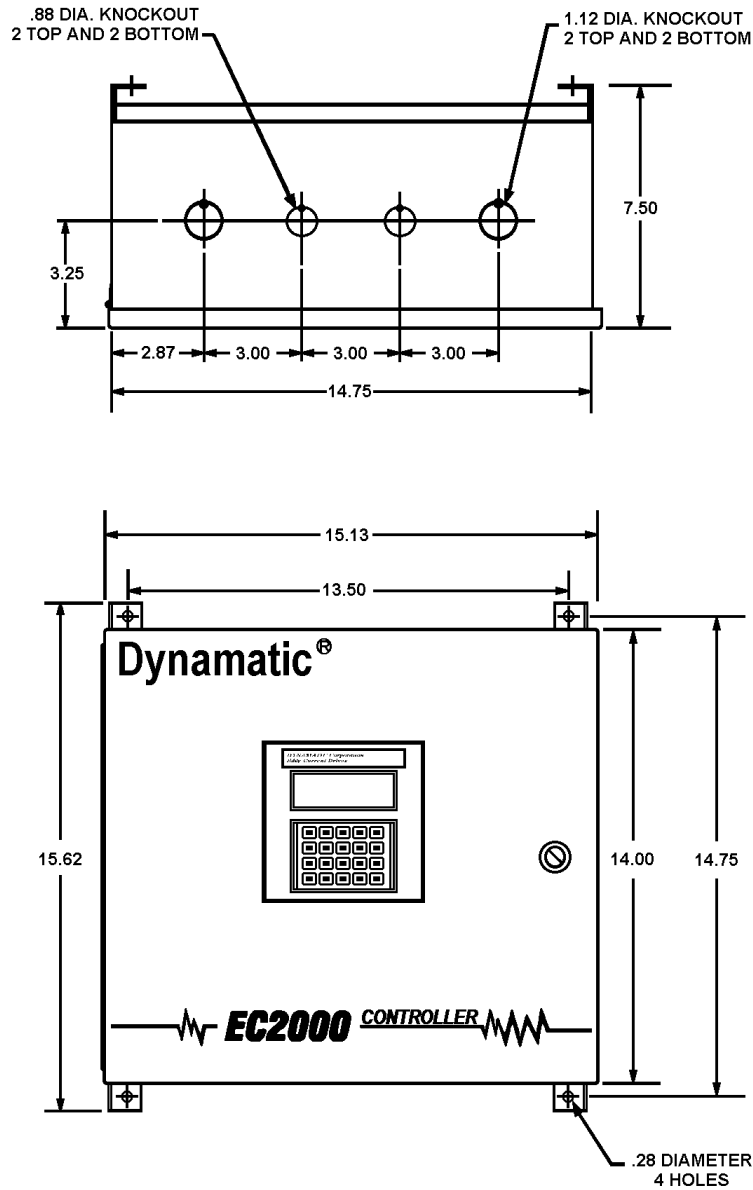


PDC2000 CONTROLLER MOUNTING DIMENSIONS

DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

Model EC-2000 Enclosure Outline Drawings

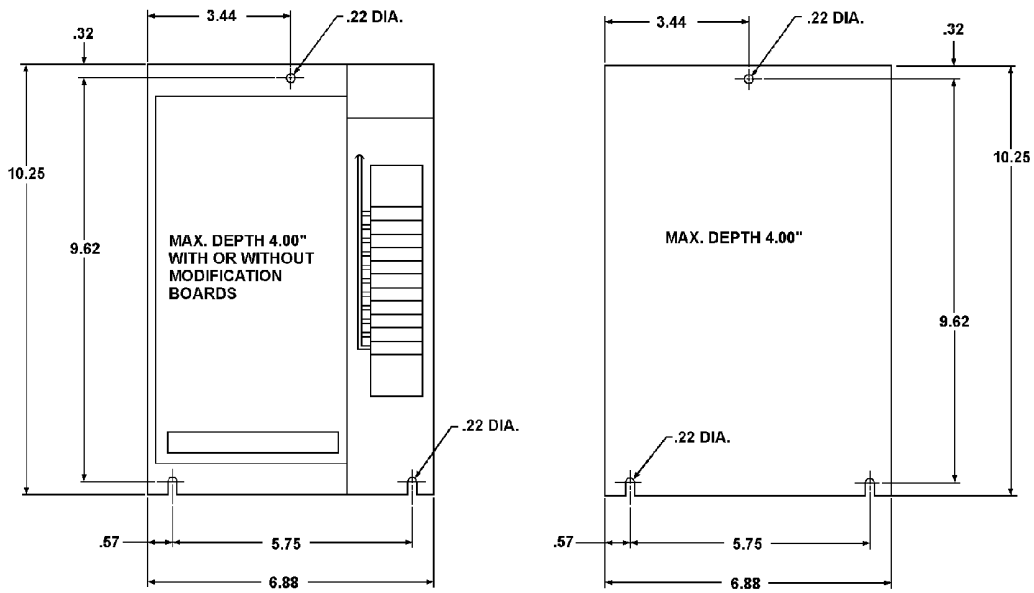


31-606-3 B

DIMENSIONS ARE IN INCHES

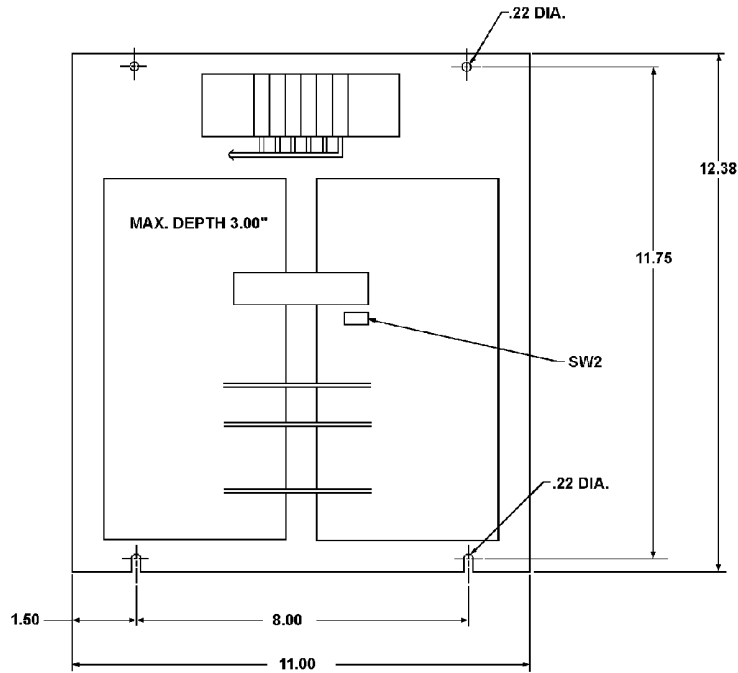
Ajusto-Spede® Controllers

Models 4000 and 4050 Panel Mount Outline Drawings



MODEL 4000

MODEL 4050

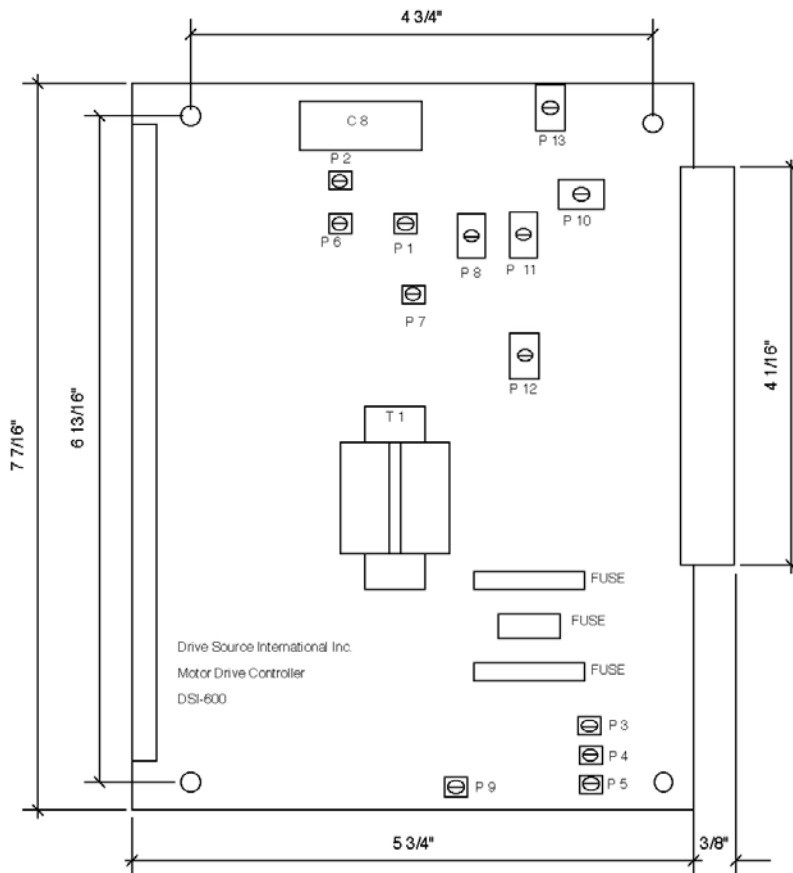


**MODEL 4000
WITH DANCER POSITION & MUTUATROL**

DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

DSI-700 Panel Layout



***Mounting studs included but are not shown.

DIMENSIONS ARE IN INCHES

Ajusto-Spede® Controllers

OBSOLETE CONTROLLER REPLACEMENTS

Many types of controllers have been furnished in the past for use with the various Ajusto-Spede® Drives. The following is a cross reference of these controllers and the basic up to date replacement. To make modifications to the controllers listed below, use the appropriate modifications found on Page 96 for a Size 1 controller, unless otherwise noted.

Obsolete Controllers				Dynamatic® Replacement Controllers			
Model Number	DC Volts	DC Amps	Manufacturer	Model	Part Number	DC Volts	DC Amps
5500	45	5.5	Dynamatic®	Mark III	15-251-1410	45	5.5
4-58	45	5.5	Dynamatic®	Mark III	15-251-1410	45	5.5
8A220	110	2	Dynamatic®	Mark III	15-283-1410②	100	2.5
A4A220	110	2	Dynamatic®	Mark III	15-283-1410②	100	2.5
V3A2	110	2	Dynamatic®	Mark III	15-283-1410②	100	2.5
K2 (2-9)	110	2	Dynamatic®	Mark III	15-283-1410②	100	2.5
H2 (2-12)	110	2	Dynamatic®	Mark III	15-283-1410②	100	2.5
V3A1	125	1	Dynamatic®	Mark III	15-255-3181	125	5.5
8A440	220	2	Dynamatic®	Mark III	15-260-239	220	5.5
A4A440	220	2	Dynamatic®	Mark III	15-260-239	220	5.5
V3A4	220	2	Dynamatic®	Mark III	15-260-239	220	5.5
H8	220	4	Dynamatic®	Mark III	15-260-239	220	5.5
MBD-2/MDB-2L	90	2.5	Louis Allis	Mark III/EC-2000	15-283-1410②/15-2000-1	100	2.5
MDB-5	90	5.5	Louis Allis	Mark III/EC-2000	15-255-1410/15-2000-1	100	5.5
MD-9, MDB-9	90	10	Louis Allis	Mark III/EC-2000	15-256-1410①/15-2000-1	100	11.0
MD8-18	90	20	Louis Allis	Mark III/EC-2000	15-257-1410②/15-2000-1	100	19.0
MA-220	110	2	Louis Allis	Mark III/EC-2000	15-283-1410②/15-2000-1	100	2.5
TD-220	110	2	Louis Allis	Mark III/EC-2000	15-283-1410②/15-2000-1	100	2.5
MD-2, MD-25	110	2	Louis Allis	Mark III/EC-2000	15-283-1410②/15-2000-1	100	2.5
MA-440	220	2	Louis Allis	Mark III/EC-2000	15-260-239/15-2000-1	220	5.5
MD-9S	220	2	Louis Allis	Mark III/EC-2000	15-260-239/15-2000-1	220	5.5
MD-9S	220	4	Louis Allis	Mark III/EC-2000	15-260-239/15-2000-1	220	5.5

Controller Ratings

Model	Size	Output Voltage	Output Amperes	Wattage
4000	.5	45	3.5	158
3000	1	45	5.5	248
Mark III	1	45	5.5	248
4050	1.5	45	8.0	360
Mark III	2	45	11.0	495
Mark III	3	45	19.0	855
Mark III	4	45	25.0	1125
Mark III	5	90	5.5	495
Mark III	6	90	11.0	990
Mark III	7	90	19.0	1710
Mark III	8	90	30.0	2700
EC-2000	--	90	8.0	800
EC-2000 HP	--	250	100	25000
Mark III	9	90	50.0	4500
Mark III	10	180	50.0	9000
Mark III	Spl.	100	2.5	250

- ① Use Size 6 info.
- ② Use Size 7 info.
- ③ If basic speed control only is required, a Model 3000 Controller with 90 VDC output will work.

NOTE: We can also replace Louis Allis MOD 7 (MC and HC and Series) Controllers. Please check with the factory for assistance in selecting a replacement controller for these models.