

Motor Drives Training System (Stand-Alone, 120 V Version)

581526 (8036-C0)

FESTO

LabVolt Series

Datasheet



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General Description

The Motor Drives Training System is an alternative version of the Motor Drives Training System, Model 8036-A, that is designed to operate at a voltage and frequency of 120 V and 60 Hz. The system is designed to be used directly on a tabletop. Both the dc and the ac drives are connected directly to a wall outlet. This system is only available for 120 V – 60 Hz networks.

Topic Coverage:

- AC Drive
- DC Drive

List of Equipment

Qty	Description	Model number
1	Motor Drives (Instructor Guide) _____	593902 (52731-00)
1	Motor Drives (Student Manual) _____	593903 (52731-10)
1	Industrial Controls Tabletop Workstation _____	581242 (3105-00)
2	Switches _____	581250 (3112-00)
1	Emergency Button _____	581252 (3114-00)
1	Pilot Lights 24 V dc _____	8196641 (3115-B0)
1	Three-Phase Manual Starter _____	581271 (3126-00)
1	Control Relay _____	581289 (3130-20)
1	Control Transformer _____	581309 (3138-30)
1	Cam Switch _____	581320 (3140-30)
1	Inertia Wheel _____	581327 (3147-10)
1	Starting Resistors _____	581329 (3150-10)
1	Power Diodes _____	581337 (3165-10)
1	Machine Mounting Plate _____	581340 (3170-20)
1	Brake Motor _____	581341 (3176-A0)
1	DC Motor _____	581346 (3179-20)
1	AC Drive _____	592525 (3183-C0)
1	DC Drive _____	581356 (3184-00)
1	Connection Lead and Accessory Set _____	581431 (8951-H0)
1	Magnetic Labels _____	582140 (38503-00)
2	Power Cord _____	582144 (85360-00)

List of Manuals

Description	Manual number
Industrial Controls Training Systems Series 3100 (User Guide) _____	583973 (27073-E0)
Motor Drives (Workbook) _____	593902 (52731-00)
Motor Drives (Workbook (Instructor)) _____	593903 (52731-10)

Table of Contents of the Manual(s)

Motor Drives (Workbook) (593902 (52731-00))

- 1-1 AC Drive Overview
- 1-2 Volts per Hertz Characteristics
- 1-3 Ramp and Torque Boost
- 1-4 Protection

- 1-5 Braking and Jogging
- 1-6 Remote Controls
- 2-1 DC Drive Overview
- 2-2 Current Limiting and IR Compensation

System Specifications

Parameter	Value
Physical Characteristics	
Intended Location	On a table able to support the weight of the equipment
Dimensions (H x W x D)	200 x 935 x 195 mm (7.9 x 37.4 x 7.7 in)
Net Weight	TBE

Equipment Description

Industrial Controls Tabletop Workstation 581242 (3105-00)



This Industrial Controls Tabletop Workstation consists of an inclined mounting rail designed to be placed on top of a regular table. One pair of mounting rails holds the control modules firmly in place.

A safety bar is attached to the rail of the Industrial Controls Tabletop Workstation. This bar prevents students from removing modules during laboratory exercises. A padlock is provided to lock the safety bar in place once all modules are inserted in the workstation.

Manual

Description

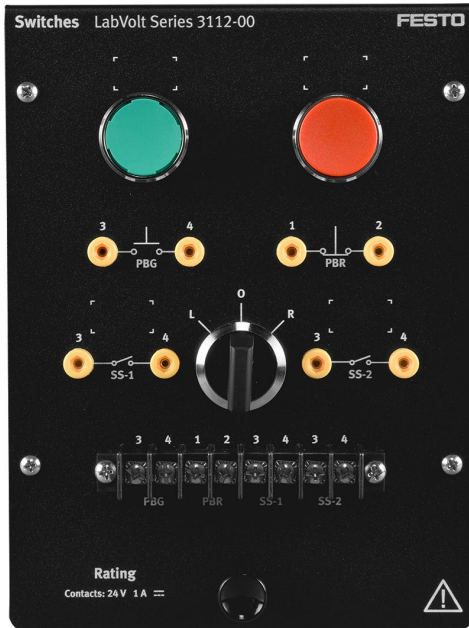
Manual number

Industrial Controls Training Systems Series 3100 (User Guide) _____ 583973 (27073-E0)

Specifications

Parameter	Value
Physical Characteristics	
Intended Location	On a table able to support the weight of the workstation and installed equipment
Dimensions (H x W x D)	200 x 935 x 195 mm (7.9 x 37.4 x 7.7 in)
Net Weight	4.5 kg (10 lb)

Switches 581250 (3112-00)



The Switches module consists of two general-purpose push buttons, one green with a normally open contact and one red with a normally closed contact, and a three-position, single-pole selector switch. Electrical connections can be made using either the banana jacks or the terminal block.

Specifications

Parameter	Value
Contact (Green Push Button)	
Type	NO contact set
Rating	1 A - 24 V dc
Contact (Red Push Button)	
Type	NC contact set
Rating	1 A - 24 V dc
Contacts (Selector Switch)	
Type	2 NO contact sets
Rating	1 A - 24 V dc
Fault Switches	4
Physical Characteristics	
Dimensions (H x W x D)	203 x 153 x 105 mm (8 x 6 x 4.1 in)
0.9 kg (2 lb)	0.9 kg (2 lb)

Emergency Button 581252 (3114-00)



The Emergency Button consists of an emergency push button with two sets of contacts, both normally closed, that can be used to control devices operating at low and high voltages. Electrical connections for the low-voltage contact can be made using either the banana jacks or the terminal block.

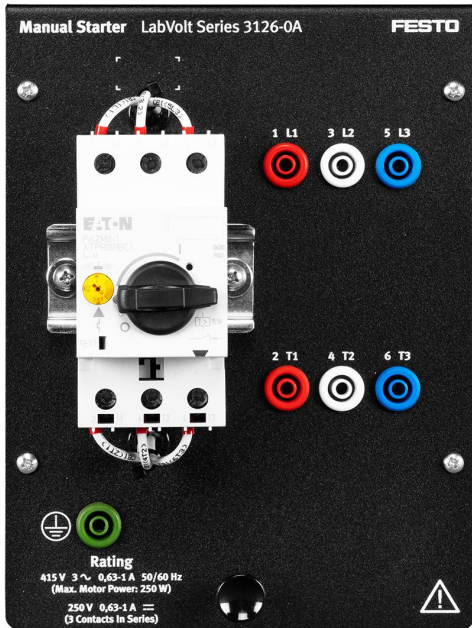
Specifications

Parameter	Value
Contacts	
Type	2 NC contact sets
Rating	3 A - 240 V ac / 1 A - 24 V dc
Fault Switches	2
Physical Characteristics	
Dimensions (H x W x D)	203 x 153 x 110 mm (8 x 6 x 4.3 in)
0.9 kg (2.0 lb)	0.9 kg (2.0 lb)

Pilot Lights 24 V dc 8196641 (3115-B0)

The Pilot Lights module consists of two low-power electric lights. One light is green while the other is red. Both lights are rated at a voltage of 24 V. Electrical connections can be made using either the banana jacks or the terminal block.

Three-Phase Manual Starter 581271 (3126-00)



The Three-Phase Manual Starter consists of a three-phase circuit breaker with thermal overload protection.

Specifications

Parameter	Value
Contacts	
Type	TPST
Rating (AC)	370 W
Rating	5 A - 250 V dc
Overload Release	1.6-2.5 A
Short Circuit Release	35 A
Fault Switches	3
Physical Characteristics	
Dimensions (H x W x D)	203 x 153 x 160 mm (8 x 6 x 6.3 in)
Net Weight	1.1 kg (2.4 lb)

Control Relay 581289 (3130-20)



The Control Relay is a general purpose, industrial-type relay with two sets of normally open (NO) contacts and two sets of normally closed (NC) contacts.

Specifications

Parameter	Value
Coil	120 V - 60 Hz / 110 V - 50 Hz
Contacts	
Type	2 NO contact sets, 2 NC contact sets
Rating	4 A - 250 V ac
Fault Switches	4
Physical Characteristics	
Dimensions (H x W x D)	203 x 153 x 155 mm (8 x 6 x 6.1 in)
Net Weight	1 kg (2.3 lb)

Control Transformer 581309 (3138-30)



The Control Transformer converts the ac power network voltage (e.g., 208 V, 380 V, 415 V) to 110/120 V. The primary windings of the transformer are fuse-protected to prevent damage to the equipment.

Specifications

Parameter	Value
Power	96 VA
Primary Winding	
Voltage	208 V
Current	0.46 A
Fuses (Class CC, Time Delay)	0.60 A
Secondary Winding	
Voltage	120 V
Current	0.80 A
Fault Switches	2
Physical Characteristics	
Dimensions (H x W x D)	203 x 228 x 172 mm (8 x 9.1 x 6.8 in)
Net Weight	3.8 kg (8.4 lb)

Cam Switch 581320 (3140-30)



The Cam Switch consists of a manually operated drum switch. The switch control lever has three positions: Off, Forward, and Reverse. The Cam Switch is suitable for both single-phase and three-phase ac motor control. It can also be used to control series and compound dc motors.

Specifications

Parameter	Value
Contacts	
Type	Reversing switch with OFF position
Rating (Alternating Current)	5 A - 230 V ac
Rating (Direct Current)	1.1 A - 125 V dc
Fault Switches	3
Physical Characteristics	
Dimensions (H x W x D)	203 x 153 x 115 mm (8 x 6 x 4.5 in)
Net Weight	0.9 kg (2 lb)

Inertia Wheel 581327 (3147-10)

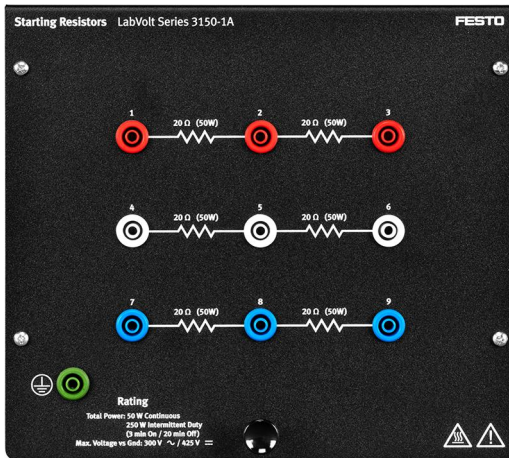


The Inertia Wheel consists of a flywheel with sufficient inertia to increase the acceleration time of the machines in the Industrial Controls Training Systems to over 1.3 s.

Specifications

Parameter	Value
Moment of Inertia	0.016 kg·m ² (0.380 lbf·ft ²)
Physical Characteristics	
Dimensions (H x W x D)	55 x 150 x 153 mm (2.2 x 5.9 x 6 in)
Net Weight	5.6 kg (12.3 lb)

Starting Resistors 581329 (3150-10)

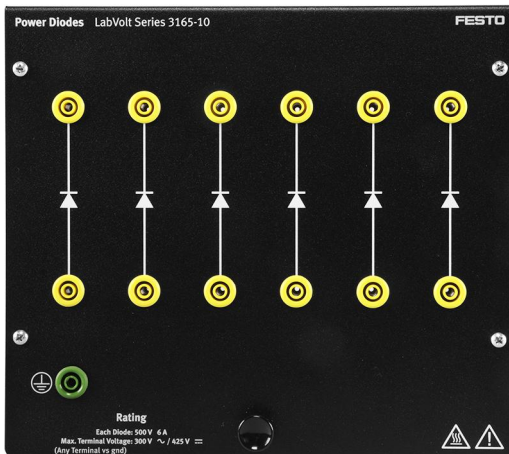


The Starting Resistors consists of six power resistors, each fitted with a 50% tap. These resistors allow dc and ac motors to be started with a reduced voltage.

Specifications

Parameter	Value
Resistors (3)	
Total Power (Continuous)	50 W
Total Power (Intermittent Duty)	250 W (3 min ON / 20 min Off)
Value	10 Ω (100W)
Tap	50%
Accuracy	±5%
Physical Characteristics	
Dimensions (H x W x D)	203 x 228 x 92 mm (8 x 9 x 3.6 in)
Net Weight	0.9 kg (2 lb)

Power Diodes 581337 (3165-10)



The Power Diodes module consists of six silicon rectifier diodes. The anode and cathode of all diodes are wired to independent front panel terminals, thereby allowing the diodes to be connected in any single-phase and three-phase rectifier configuration.

Specifications

Parameter	Value
Diodes (6)	
Peak Reverse Voltage	500 V
Average Rectified Forward Current	6 A
Physical Characteristics	
Dimensions (H x W x D)	203 x 228 x 43 mm (8 x 9 x 1.7 in)
Net Weight	0.9 kg (2 lb)

Machine Mounting Plate 581340 (3170-20)



The Machine Mounting Plate consists of a motor work surface designed to be used on top of a table (without Workstation Model 3103). The motors fix to the work surface using screws and knurled nuts. The protective guard which comes with it can also be fixed as well as the different sensors of the system.

Specifications

Parameter	Value
Physical Characteristics	
Dimensions (H x W x D)	38 x 559 x 216 mm (1.5 x 22 x 8.5 in)
Net Weight	3.6 kg (7.9 lb)

Brake Motor 581341 (3176-A0)



The Brake Motor consists of a three-phase, four-pole, squirrel-cage induction motor equipped with a spring set brake for holding and stopping (fail-safe). The motor is dual voltage and can operate at either a low-voltage or a high-voltage setting.

Specifications

Parameter	Value
Motor Ratings	
Output Power	249 W
Stator Voltage (Three-Phase)	208 V - 60 Hz
Full-Load Speed	1725 r/min
Full-Load Current	1.5 A
Brake Ratings	
Voltage	208 V - 60 Hz
Inrush Current	2.2 A
Holding Current	0.2 A
Physical Characteristics	
Dimensions (H x W x D)	200 x 235 x 415 mm (7.9 x 9.3 x 16.3 in)
Net Weight	13 kg (28 lb)

DC Motor 581346 (3179-20)



The DC Motor consists of a permanent magnet 90 V dc motor that can be used with the DC Drive, Model 3184.

Specifications

Parameter	Value
Ratings	
Output Power	249 W
Armature Voltage	90 V dc
Full-Load Speed	1750 r/min
Full-Load Current	3.6 A
Physical Characteristics	
Dimensions (H x W x D)	191 x 295 x 171 mm (7.5 x 11.6 x 6.7 in)
Net Weight	8.9 kg (19.6 lb)

AC Drive 592525 (3183-C0)



The AC Drive consists of a variable frequency speed drive with V/Hz control. The AC Drive has programmable inputs and outputs, digital and analog (for PID Control). Some electrical connections can be made using either the banana jacks or the terminal blocks.

The AC Drive is available in two versions. Model 3183-2 requires three-phase supply (208, 380, or 415 V).

Model 3183-C requires a single-phase supply (120 V - 60 Hz) and connects directly to any standard wall outlet

with a separate power cord equipped with a 5 A fuse (Model 85360). Model 3183-C is not available for 220, 240

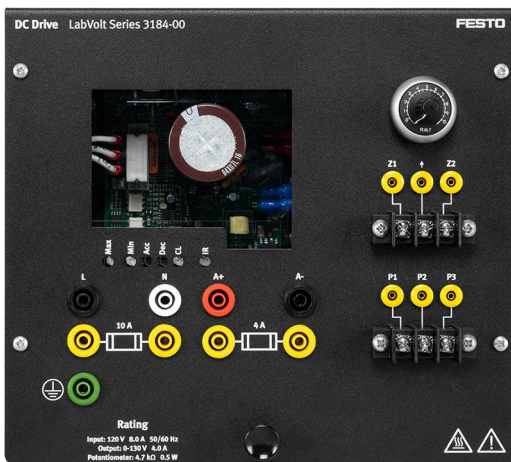
V - 50 Hz line supplies.

Specifications

Parameter	Value
Power Requirements	
Single-Phase	4.8 A - 120 V ac - 60 Hz
Power Output (Three-Phase)	
Power	400 W
Voltage	200-240 V
Frequency	0.1-580 Hz
Inputs	

Parameter	Value
Digital (7)	24 V dc
Analog (2)	0 - 10 V dc (1), 4 - 20 mA (1)
Contacts (Configurable)	
Type	SPDT
Rating	2.5 A - 250 V ac
Outputs	
Analog (1)	1 mA - 0-10 V dc
Transistor (1)	50 mA - 27 V dc
Faults	
Faults switches	4
Physical Characteristics	
Dimension (H x W x D)	TBE
Net Weight	TBE

DC Drive 581356 (3184-00)



The DC Drive consists of a pulse-width modulated (PWM) dc motor speed control with maximum and minimum speed, current limitation, and IR compensation adjustments. Some electrical connections can be made using either the banana jacks or the terminal blocks.

Specifications

Parameter	Value
Input	
Nominal Voltage	115 V \pm 10%
Maximum Current	8.0 A
Frequency	50/60 Hz
Output	
Voltage	0-130 V dc
Load Current	4.0 A dc
Speed Range	50:1
Trimpot Adjustments	Minimum and maximum speeds, current limit, IR compensation, Acceleration, Deceleration
Analog Input	0-5 V dc
Potentiometer	4.7 k Ω - 0.5 W
Fault Switches	4
Physical Characteristics	
Dimensions (H x W x D)	203 x 228 x 108 mm (8 x 9 x 4.3 in)
Net Weight	1.65 kg (3.64 lb)

Connection Lead and Accessory Set 581431 (8951-H0)

This Connection Lead and Accessory Set consists of extra-flexible leads terminated with stacking 4 mm safety banana plugs. In addition, the set includes stacking 2 mm banana plug leads of different lengths and a variety of accessories to install and align a dc motor and a brake motor.

4mm: 3 x 30 cm green, 13 x 30 cm yellow, 4 x 60 cm red, 4 x 90 cm blue 3 x 90 cm green. 2mm: 4 x 15 cm white, 15 x 60 cm red. Shims, coupling, straightedge, etc.

Specifications

Parameter	Value
4 mm Safety Banana Plug Leads Characteristics	
Cross Section	1 mm ² (1974 cmil)
Rated Current	19 A
Rated Voltage	600 V, CAT II
4 mm Safety Banana Plug Leads Quantities	
Yellow, 30 cm (12 in)	13
Green, 30 cm (12 in)	3
Red, 60 cm (24 in)	4
Blue, 90 cm (36 in)	4
Green, 90 cm (36 in)	3
2 mm Safety Banana Plug Leads Characteristics	
Cross Section	0.5 mm ² (987 cmils)
Rated Current	10 A
Rated Voltage	30 V ac / 60 V dc
2 mm Safety Banana Plug Leads Quantities	
White, 15 cm (6 in)	4
Red, 60 cm (24 in)	15
Accessories	
Includes:	Coupling
	Alignment tool
	Shims
	Allen key

Magnetic Labels 582140 (38503-00)



The Magnetic Labels kit consists of 10 x 20 mm white labels used to identify the components, as in actual control panels.

Specifications

Parameter	Value
Size	10 x 20 mm (0.4 x 0.8 in)
Quantity	46 identified labels, 34 blank labels

Power Cord 582144 (85360-00)



The Power Cord is a fuse-protected power cord that connects to the AC Drive, Model 3183-B. It can be powered from any standard wall outlet.

Specifications

Parameter	Value
Input	120 V - 60 Hz
Fuse	5 A
Length	2 m (6.56 ft)

Reflecting the commitment of Festo Didactic to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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