

Operating & Installation Manual



**Fixed Speed AC Motors, 0 to 1½ hp (1.2 kw)
230/460 VAC, 50/60 Hz, Three-Phase**

**Models: 711-1231 & 711-1232
711-1431 & 711-1432**

Table of Contents

1.0	Safety Considerations	3
1.1	Grounding	3
1.2	Fusing	3
1.3	Power Wiring to Controller	3
2.0	Introduction	3
3.0	Product Description	3
4.0	Product Specifications	4
5.0	Conveyor Controller Installation	5
5.1	Inspecting the Controller	5
5.2	Mounting the Controller	5
5.3	Power Connections to Controller	6
5.4	Motor Overload Setting and Checking	6
5.5	Controller Power-up Testing	6
5.6	Motor Connections to Conveyor Controller	6
5.7	Motor and Conveyor Controller Power-up Testing	6
6.0	Implementing Conveyor Control Applications	7
7.0	Operating the Conveyor Controller	9
7.1	Starting the Controller	9
7.2	Stopping the Controller	9
7.3	Controller Reset	9
8.0	Troubleshooting	10
9.0	Replacement Parts List	11



impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

1.0 Safety Considerations

	WARNING	
Disconnect power at source before opening door of <i>impac</i> 100 Conveyor Controller.		



— 1.1 Grounding

	WARNING	
Both control enclosure and motor must be securely mounted and properly grounded. Failure to properly ground either device may cause injury to personnel.		



— 1.2 Fusing

	WARNING	
If fuses need to be replaced, they must always conform to the values and ratings specified on the controls labels.		

— 1.3 Power Wiring to Controller

	WARNING	
The branch circuit, which provides power to this control, must be protected. The circuit protection must be properly sized to meet the current requirements and must comply with all applicable codes.		

2.0 Introduction

	WARNING	
Read this Manual completely and carefully. Pay special attention to the Warnings, Precautions, and Safety Rules listed. Failure to follow the instructions could produce Safety Hazards to personnel or lead to damage of the Conveyor Controller and/or the optional Accessory Kits. Due to the wide variety of setups & applications, guarding is the responsibility of the end user.		

This manual contains the information needed to install, operate, and troubleshoot the Dorner *impac* 100 Conveyor Controller. It is organized in a step-by-step fashion so that the Conveyor Controller may be safely set-up, in the shortest possible time.

3.0 Product Description

The *impac* 100 Conveyor Controller is a low-cost Industrial Multi-Purpose Application Controller that can be used to control a Conveyor motor on/off operation as well as vary the speed of the motor. The Conveyor Controller is user-installable with control options that allow it to meet the needs of a wide range of Conveyor control applications (indexing, jogging, accumulation, variable speed, automatic end-stop, emergency-stop, clutch-brake, merging of Conveyors, linking multiple Conveyors, ...etc.). The Conveyor Controller can be ordered for Conveyors with fixed or variable speed AC or DC motors.

The *impac* 100 Conveyor Controller's motor control circuit is designed to support electrical interconnections to a variety of accessory kits (photo-eyes, E-stops, jog buttons, foot switches, E-stop pull cord units, process machine/PLC/PC dry contact interface, and more). Each kit includes brackets for mounting the unit to a Dorner 2100/3100 conveyor, cabling to wire the unit to an *impac* 100 Conveyor Controller, and instructions for mounting/wiring/operating the unit. The kits are connected to the *impac* 100 Conveyor Controller using convenient terminal point connections, inside the Controller. This allows the user to configure the kits to fit specific application needs and to re-configure the kits to perform new functions.

The *impac* 100 Conveyor Controller comes with mounting hardware to allow mounting to a Dorner 2100 or 3100 Conveyor side rail (or Conveyor stand). The unit is housed in an NEMA 12/IP54 enclosure with Power "ON" and Motor "RUNNING" LED's, a locking "ON/OFF" switch, a 24 volts D.C. power supply, adjustable motor overloads with manual reset, and pre-wired motor and AC line cords. The Conveyor Controller supports both fixed and variable speed AC motors using 115/230/460 volts A.C., 50/60Hz, 1-3 Phase, and variable speed 130/180 volts D.C. motors (with 115/230 volts A.C. input).

Overall Conveyor system reliability is enhanced by the *impac* 100 design features. Components meet applicable ANSI/NEC/IEC machine safety standards. Local on/off control and built-in motor & circuit overload protection enhance operator and application safety. Low voltage (24 volts D.C.) control circuits reduce installation and maintenance time as well as increase safety. A complete Conveyor Controller wiring schematic and troubleshooting guide are attached to the inside of the Conveyor Controller cover.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

4.0 Product Specifications

<i>impac</i> 100	711-1231	711-1232	711-1431	711-1432
Input Voltage	230 volts A.C. \pm 10% 50/60 Hz		460 volts A.C. \pm 10% 50/60 Hz	
Input Line Fuse	(3) 5 Ampere	(3) 10 Ampere	(3) 5 Ampere	(3) 5 Ampere
Input Current	4 Amperes	6 Amperes	2 Amperes	4 Amperes
Overload Relay	Class 10 Protection, Phase Loss Detection (for 3-Phase <i>impac</i> 100's) Visible Trip Indication, External Reset Button			
Overload Range	0.9 to 2.9 Amperes	1.5 to 4.8 Amperes	0.32 to 1.0 Amperes	0.9 to 2.9 Amperes
Motor Range	1/2 HP & Below 374 Watts & Below	Above 1/2 to 1-1/2 HP 375 Watts to 1.2 Kilowatts	1/3 HP & Below 249 Watts & Below	Above 1/3 to 1-1/2 HP 0.25 to 1.2 Kilowatts
Operating Temperature	0 to 40° C to 95% Humidity (Non-condensing)			
A.C. Line Cord	8 Ft (2.4 m) Pre-Wired with NEMA L15-20P Plug		8 Ft (2.4 m) Pre-Wired with NEMA L16-20P Plug	
Motor Cord	5 Ft (1.5 m) Pre-Wired with NEMA L15-20C Receptacle		5 Ft (1.5 m) Pre-Wired with NEMA L16-20C Receptacle	
Enclosure	NEMA Type 12 / IP54 Continuous Hinge, Weight: 21 lb (9.5 kg) Dimensions: 12" (305 mm) High x 10" (254 mm) Wide x 5" (127 mm) Deep			
Internal Power Supply	24 volts D.C. 1.1 Ampere Over-current and Short Circuit-protected			
Standard Features	<ul style="list-style-type: none"> ● Lockable Disconnect Switch ● Line Fuses(s) ● Angled Terminal Block for Easy Field Connections ● 24 volt D.C. Power Supply Rated @ 1.1 Amperes for Field Devices ● Power "ON" and Motor "RUNNING" Indicator Lights ● Mounting Brackets and Hardware ● Pre-wired Motor and AC Line Cords ● Schematic Diagram Inside of Door ● Two (2) 1/2" Holes at Bottom of Enclosure with NEMA 12 Plugs 			

NOTE:

For additional information, refer to the following Dorner Publications:

- *impac* 100 Catalog (Dorner Publication # 851-151)
- *impac* 100 Accessory Kits Setup & Installation Guides (Dorner Publication # 851-108 through # 851-123)
- *impac* 100 Application Guide (Dorner Publication # 851-124)

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

5.0 Conveyor Controller Installation

— 5.1 Inspecting the Controller

Carefully examine your Controller (and any option kits, if ordered), for shipping damage. Check to be certain that the controller you ordered is the one you received. Also check any optional accessory kits which you received.

— 5.2 Mounting the Controller

Select the desired location and mount the *impac* 100 enclosure to the conveyor T-slot channel (Figure 2) or an aluminum support stand leg (Figure 3) or steel support stand leg (Figure 4), using the hardware provided.

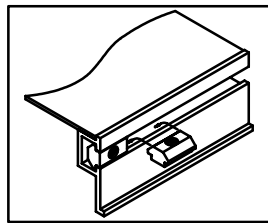
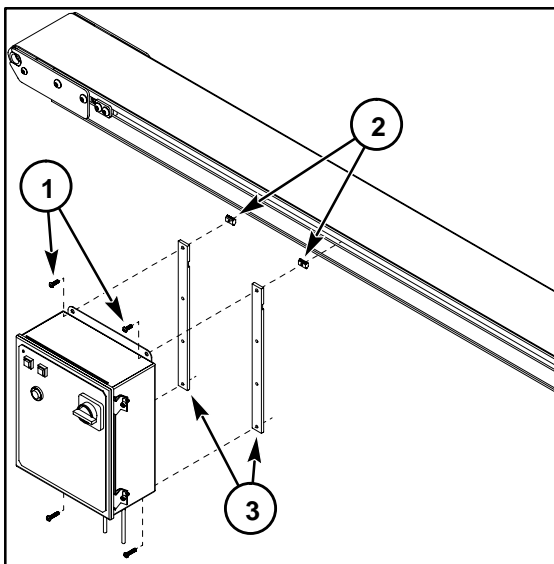


Figure 1: Drop-in T-bar Installation Detail

Mounting in Conveyor T-slot

- Insert the two Single Drop-in T-bars into conveyor T-slot by rolling each one into position (Figure 1).
- Select the desired location and attach the *impac* 100 enclosure (in the same way it was packaged, when shipped) to the conveyor T-slot in the manner shown in Figure 2 using the two (2) M6 x 8 mm Button Head Cap Screws through the clearance hole in each Mounting Bar. Tighten the Screws with a 4 mm Hex Key Wrench.

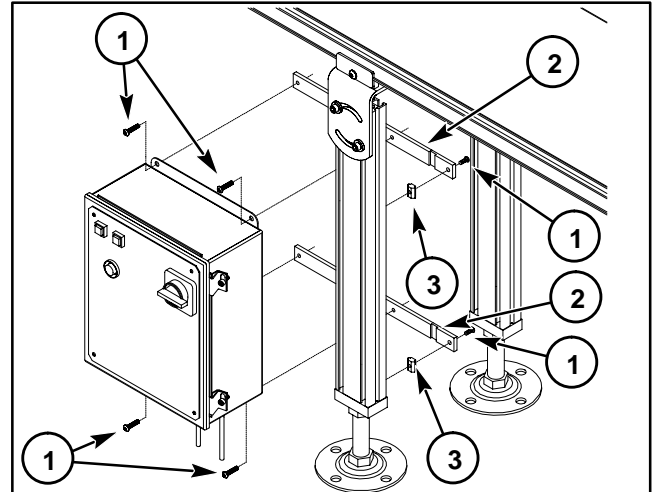


- 1– M6 x 8 mm Button Head Cap Screws (2 each)
- 2– Single Drop-in T-bars (2 each)
- 3– Mounting Bars (2 each)

Figure 2: Conveyor T-slot Attachment Detail

Mounting to Aluminum Support Stand Leg

- For an Aluminum Support Stand Leg, refer to Figure 3 and detach, rotate and re-attach the Mounting Bars to the *impac* 100 enclosure in the horizontal position.
- Select the desired mounting location and insert the two Single Drop-in T-bars into Leg channel by rolling each of them into position (see Figure 1).
- Then, attach the *impac* 100 enclosure to the two Single Drop-in T-bars, using the M6 x 8 mm Button Head Cap Screws. Tighten Screws with a 4 mm Hex Key Wrench.

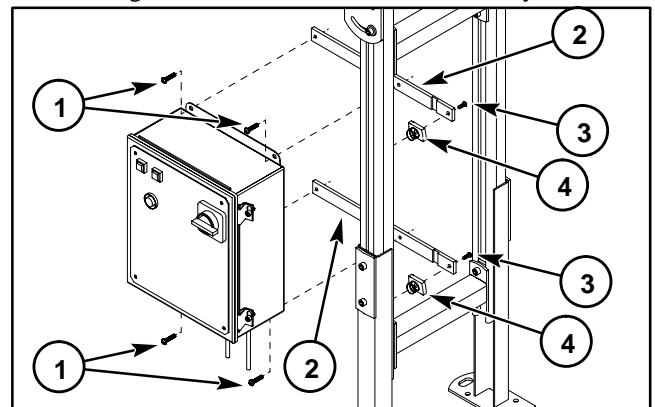


- 1– M6 x 8 mm Button Head Cap Screws (6 each)
- 2– Mounting Bars (2 each)
- 3– Single Drop-in T-bars (2 each)

Figure 3: Aluminum Leg Attachment Detail

Mounting to Steel Support Stand Leg

- For the Steel Support Stand Leg, refer to Figure 4 and detach, rotate and re-attach the Mounting Bars to the *impac* 100 enclosure in the horizontal position.
- Then, attach the *impac* 100 enclosure to the M6 Spring Nuts, using the M6 x 18 mm Button Head Cap Screws through the clearance hole in each Mounting Bar. Tighten the Screws with a 4 mm Hex Key Wrench.



- 1– M6 x 8 mm Button Head Cap Screws (4 each)
- 2– Mounting Bars (2 each)
- 3– M6 x 18 mm Button Head Cap Screws (2 each)
- 4– M6 Spring Nuts (2 each)

Figure 4: Steel Leg Attachment Detail

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

5.3 Power Connections to Controller

Each Conveyor Controller has a pre-wired plug for power. The type of plug is dependent on the Controller voltage.

WARNING

Disconnect power, at power source, before opening the door of the *impac* 100 Conveyor Controller and attempting to make any electrical connections. Connections to the power source should always be the very last connections made.

5.4 Motor Overload Setting and Checking

When the *impac* 100 was factory tested, the motor overload was set up in one of the following configurations:

1. If a motor was ordered with the *impac* 100, then the motor overload was set to match that motor.
2. If the *impac* 100 was ordered without a motor, then the overload was set to a minimum value and the Conveyor Controller was tagged informing the user that the overload has not been set.

NOTE:

BE SURE to verify that the motor nameplate ampere rating matches the setting on the overload relay.

3. Look at the AMPERE rating on the motor nameplate. Be sure to select the rating based on the correct motor voltage.

Example:

- c. If the nameplate reads “VOLTS: 230/460 AMPS: 0.84/0.52”, then the Motor Amp rating is 0.84 Amps at 230 Volts. (listed first in each category) and 0.52 Amp at 460 Volts. (listed second in each category).
- d. Examine the setting on the motor overload relay. The overload relay is located inside the Conveyor Controller. The overload setting is the blue dial on the left side of the relay, the arrow should point to the value found on the motor nameplate. If the settings do not match, turn dial to the correct value.

5.5 Controller Power-up Testing

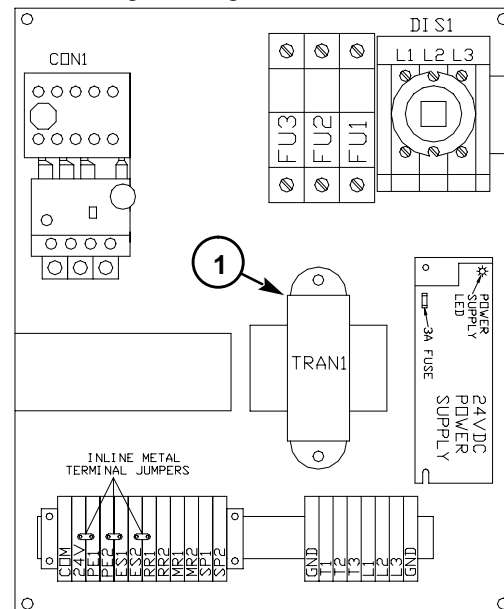
Test the Conveyor Controller before the motor is connected, and before any *impac* accessory kits are installed. Plug the Controller into the appropriate power source and turn the Controller disconnect switch ON. The Power “ON” and the Motor “RUNNING” indicator lights, on the front of the *impac* Conveyor Controller, should illuminate.

5.6 Motor Connections to Conveyor Controller

WARNING

Remove power from the *impac* 100 Conveyor Controller.

Plug the motor cord into the *impac* Conveyor Controller receptacle cord. Each Conveyor Controller has a pre-wired cord with a receptacle for a motor. The type of receptacle is dependent on the Controller voltage. If a motor was ordered along with the Controller, then the motor was pre-wired with a mating power plug. The motor can also be hard-wired to the Controller by first removing the receptacle and wiring directly to the terminals “T1”, “T2”, “T3”, and “GND”, inside the Controller. See the Controller panel layout (Figure 5) and the schematic diagrams (Figures 6 & 7) for more information.



1— 460 VAC unit only

Figure 5: Sample Control Panel Layout

5.7 Motor and Conveyor Controller Power-up Testing

WARNING

When power is supplied to the *impac* 100 Conveyor Controller and the disconnect switch is turned “ON”, the Conveyor belt will begin to move.

After motor connections are made to the *impac* Conveyor Controller, plug the Controller into the appropriate power source and turn the Controller disconnect switch ON. The motor should run and the conveyor belt will move. The Power “ON” and the Motor “RUNNING” indicator lights, on the front on the Controller, should illuminate.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

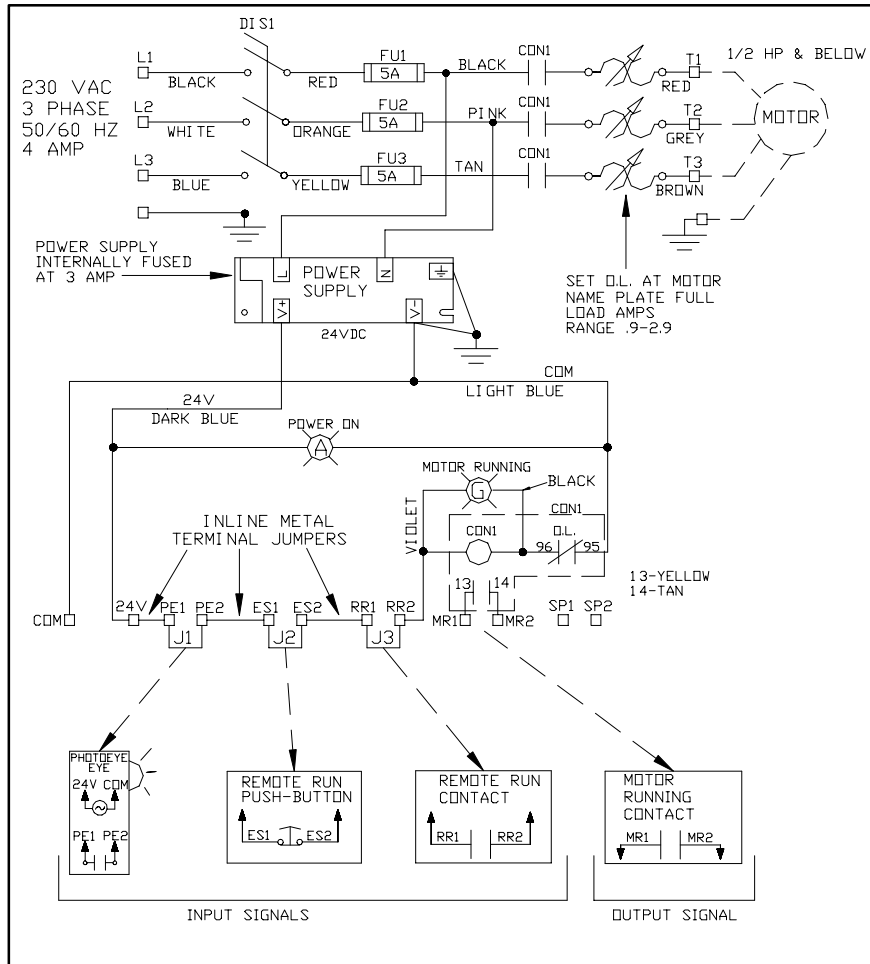


Figure 6: Schematic Diagram for 230 volts A.C. Controller

6.0 Implementing Conveyor Control Applications

The *impac* 100 control circuit is designed to support electrical interconnections to a variety of accessory kits (photo-eyes, E-stops, jog buttons, foot switches, E-stop pull cord units, process machine/PLC/PC dry contact interface, and more). The kits are connected to the *impac* 100 using convenient terminal point connections inside the controller. This allows the user to interconnect the kits to fit specific application control needs.

A simplified version of the *impac* 100 control circuit is shown in figure 4. Four groupings of terminal point connections have been provided for connecting all *impac* accessory kits.

1. The first group (COM-24V) provides 24 volts D.C. power for any accessory kits that need power (photo-eyes, illuminated pushbuttons, etc.).
2. The next group (PE1-PE2, ES1-ES2, and RR1-RR2) provide three sets of control points for wiring accessory kits into the *impac* 100 control circuit. Each group is configured with a jumper when the *impac* 100 controller is shipped. When an accessory kit is to be installed the jumper is removed and the kit connected. Each set of

control points represents a “series” connection to the *impac* 100 control circuit. When accessory kits are wired in “series” it means that all connected accessories must be “on” for the conveyor to run. For example, if an accessory kit is wired to PE1-PE2 and another accessory kit is wired to ES1-ES2, then both accessories must be “on” for the conveyor to run.

The *impac* 100 controller also supports wiring *impac* accessory kits in “parallel”. When an accessory kit is wired in “parallel” it means “if either” accessory kit is “on” the conveyor will run. Accessories connected in parallel are connected to the same *impac* 100 terminal points.

For example, if two accessory kits are wired to PE1-PE2 then when either kit is “on” the conveyor will run. Any number of *impac* accessories can be configured in any of the above series and parallel combinations.

3. The third group of terminals (MR1-MR2) provide an output contact (dry contact) that is closed when the conveyor is running. This can be used to link multiple conveyor operations together or to provide status back to a host controller.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

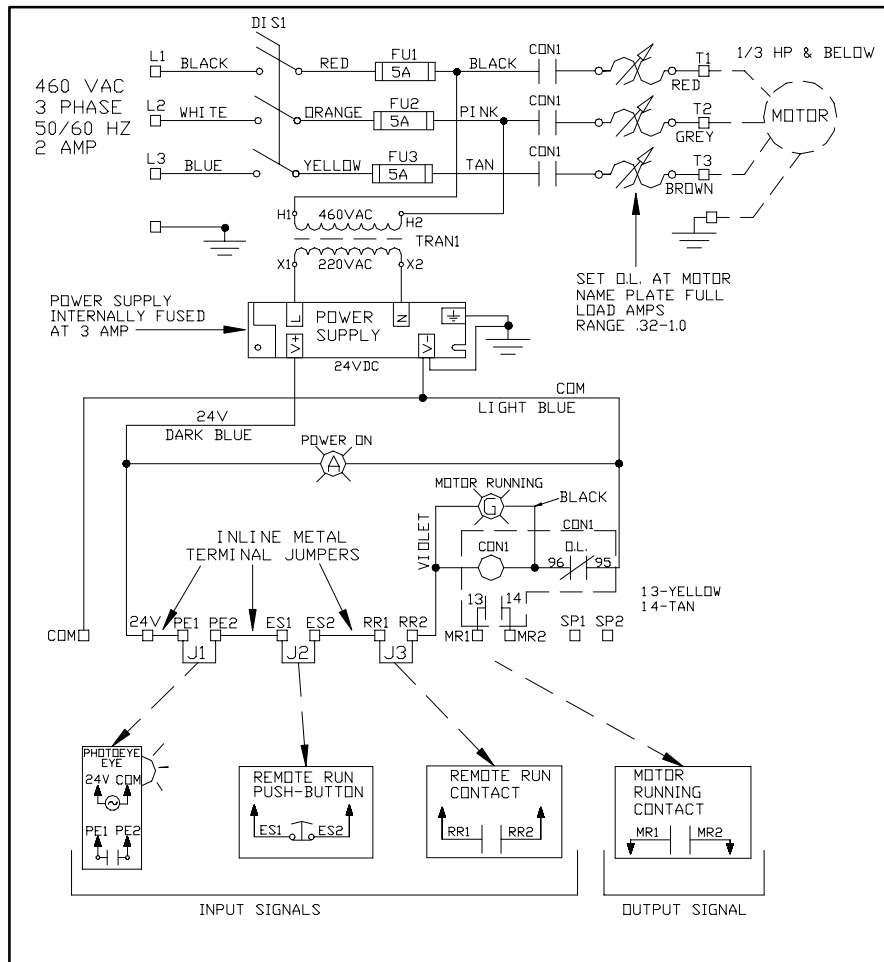


Figure 7: Schematic Diagram for 460 volts A.C. Controller

4. The last group of terminals (SP1-SP2) are two spare terminal points that the user can use for extra termination points for accessory kit wiring.

To select, configure, and implement a conveyor control application using the *impac* 100 Conveyor Controller and *impac* Accessory Kits the user should use the following steps.

1. Remove power to the *impac* Conveyor Controller.

Before installing and wiring any accessory kits, Remove power to the *impac* controller by unplugging the *impac* controller from the power source.

2. Select Desired Control Application from the *impac* 100 Application Guide.

Included with the *impac* 100 Application Guide are a list of conveyor control application examples that detail the following for many different conveyor control applications:

- A description of the conveyor application control

requirements

- An illustration of the conveyor with the *impac* 100 controller and *impac* accessory kits mounted
- A list of hardware required to implement the control application described
- A description of the conveyor operation
- Detailed conveyor control setup instructions
- Illustration that shows how all accessory devices are connected to the *impac* 100 controller

Based on review of the *impac* 100 Application Guide select the application example that meets the needs of the end-user application. If required, make any final adjustments to the application accessory kit control connections needed by your particular application.

3. Install all required *impac* accessory kits

Install all accessory kits required for the application. The selected Application Example in the *impac* 100 Application Guide will show the general area of where the kits are to be located on the conveyor. Follow the *impac* Accessory kit Setup & Installation Guide for mounting and cable routing details.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

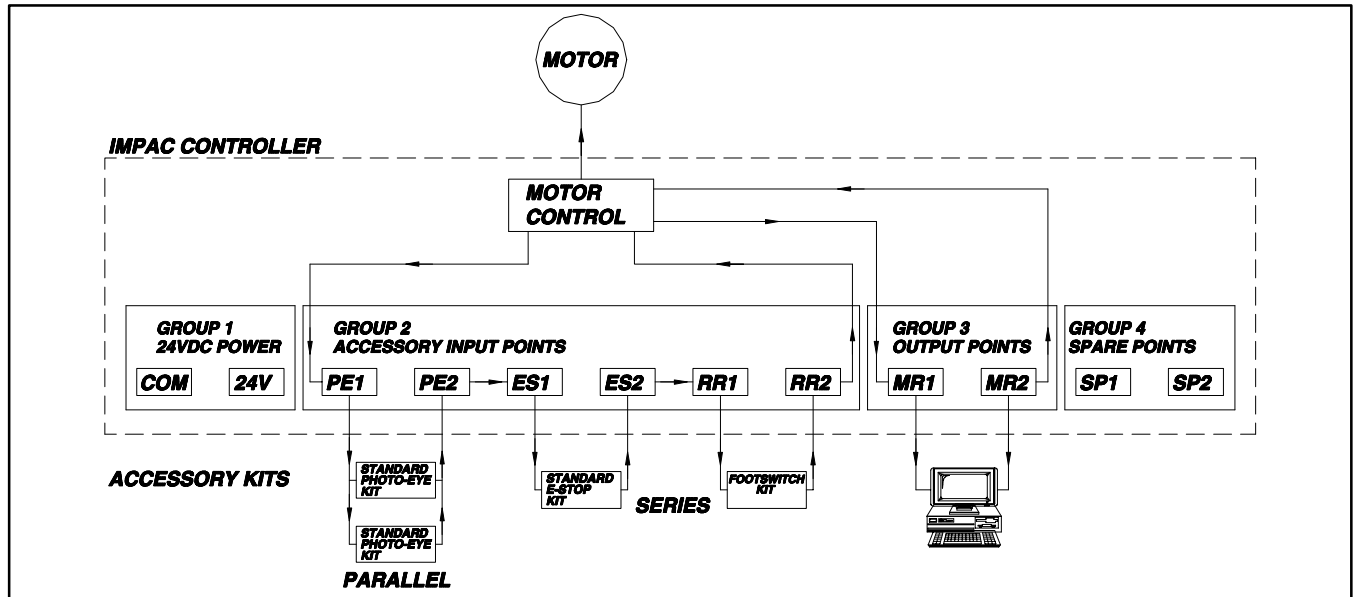


Figure 8: Simplified impac 100 Control Circuit

!
WARNING
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Before installing and wiring any accessory kits, remove power to the *impac* 100 Conveyor Controller by unplugging the *impac* Conveyor Controller from the power source.

Each *impac* accessory kit includes: Setup & Installation Guide; brackets for mounting; cabling to wire the unit to an *impac* 100 controller; and instructions for mounting/wiring/operating the unit. There are two 1/2" holes available for accessory kit installation at the bottom on the controller. Remove the rubber seal, and install the accessory kit cable using the cord grip provided with the kit. The only wiring that is required will be at the accessory terminal block inside the controller. A 1/8" (3 mm) flat blade screwdriver is shipped with the controller for wiring to the terminal block.

4. Connect the *impac* accessory kits to the *impac* 100 Conveyor Controller

From the selected Application Example in the *impac* 100 Application Guide Connect the *impac* accessory kit cables to the *impac* controller terminal block as detailed in the application "Setup" description.

5. Verify proper conveyor operation

Test and operate the application based on the information detailed in the selected application "Operation & Test" description.

6. File copy of the Control Application Documentation

Place a copy of the Conveyor Control Application Example, that was used in step 4, inside *impac* 100 controller.

7.0 Operating the Conveyor Controller

— 7.1 Starting the Controller

The conveyor will be "ready to run" when the *impac* ON/OFF disconnect switch is turned ON. The Power "ON" light will be ON whenever power is applied to the Conveyor Controller and the ON/OFF disconnect switch is turned ON. If there are no *impac* accessory kits installed, the conveyor will run. If there is(are) any installed accessory kit(s), the conveyor may run depending on the "on/off" state of the accessory kits. When an accessory kit or kits allow the conveyor to run, the Motor "RUNNING" light will be ON and the motor will run.

— 7.2 Stopping the Controller

The conveyor will be stopped when the *impac* ON/OFF disconnect switch is turned OFF. The Power "ON" light will be OFF whenever power is removed from the Conveyor Controller or the ON/OFF disconnect switch is turned OFF. If there are installed accessory kit(s), the conveyor may stop running, depending on the state of the accessory kits. When an accessory kit prohibits the conveyor from running, the Motor "RUNNING" light will turn OFF and the motor will stop.

— 7.3 Controller Reset

If a motor overload condition exists or the motor overload is set incorrectly, the overload relay will trip. The Power "ON" light will remain ON, and the Motor "RUNNING" light will turn OFF. Pressing the "RESET" button, on the front of the Conveyor Controller, will reset the overload relay. Before resetting, wait a few minutes to allow the relay to "cool" after the overload relay trips.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

8.0 Troubleshooting

PROBLEM	CAUSE	CORRECTION
Motor will not run and Motor "RUNNING" indicator is ON and "POWER" indicator is illuminated	Open wiring connection between <i>impac</i> 100 & motor. Motor Cord is not connected to motor Defective motor	Remove any power and, using appropriate means, check continuity and integrity of wiring. Properly connect motor cord. Replace motor.
Motor will not run and Motor "RUNNING" indicator is OFF, "POWER" indicator is illuminated and Power Supply LED is ON.	Motor overload has tripped. One or more accessory kits are not working properly and thus causing an OPEN contact. One or more accessory kit jumpers, at <i>impac</i> 100 are removed and kit Devices are not installed, or incorrectly installed.	Depress <i>impac</i> 100 "RESET" button to reset breaker. Check and properly install and wire accessory kits per the Setup & Installation Guide information provided with kit. Properly install and wire accessory kits per the Setup & Installation Guide information provided with kit.
Motor will not run and Motor "RUNNING" indicator is OFF, "POWER" indicator is illuminated and Power Supply LED is OFF.	Power supply fuse has blown. One or more accessory kits are incorrectly installed and thus shutting-down the power supply.	Replace with correct amperage and type of fuse. Properly install and wire accessory kits per the Setup & Installation Guide information provided with kit.
Motor will not run and Motor "RUNNING" indicator is OFF and "POWER" indicator is not illuminated.	No power to <i>impac</i> 100 or <i>impac</i> 100 is not plugged-in. Blown line fuse FU1, FU2 and/or FU3.	Check all related wiring and make sure <i>impac</i> 100 power cord is plugged-in. Replace with correct amperage and type of fuse.
Motor runs unexpectedly and Motor "RUNNING" indicator is ON and "POWER" indicator is illuminated.	One or more accessory kits are incorrectly installed. One or more accessory kit jumpers, at <i>impac</i> 100, are not correctly installed.	Properly install and wire accessory kits per the Setup & Installation Guide information provided with kit. Properly install and wire appropriate jumpers per the Setup & Installation Guide information provided with kit.

impac 100 Operating & Installation Manual

Fixed Speed AC Motors, Three-Phase

9.0 Replacement Parts List

Item	Description	Dorner Part Number
1	Power Supply	831-110
2	Terminal Block Assembly	679235P
3	Contactor	805-800
4	Motor Overload model 711-1431	805-801
	model 711-1231, model 711-1432	805-802
	model 711-1232	805-803
5	Fuse Holder	819-132
6	Fuse model 711-1232	819-113
	model 711-1231, model 711-1431 & model 711-1432	819-129
7	Disconnect Switch	805-724
8	Amber Pilot Light Assembly	830-133
9	Green Pilot Light Assembly	830-134
10	Reset Pushbutton	830-125
11	Transformer model 711-1431 & model 711-1432	831-113
12	Male Cord Ass'y model 711-1231 & model 711-1232	679229
	model 711-1431 & model 711-1432	679243
13	Female Cord Ass'y model 711-1231 & model 711-1232	679231
	model 711-1431 & model 711-1432	679244

RETURN POLICY

No returns will be accepted without prior written factory authorization. When calling for authorization, please have the following information ready for the Dorner Factory representative or your local distributor:

1. Name and address of customer.
2. Item(s) being returned.
3. Reason for return.
4. Customer's original order number used when ordering the item(s).
5. Dorner or distributor invoice number.

A representative will discuss action to be taken on the Returned items and provide a Returned Goods Authorization Number to reference.

There will be a 15% restocking charge on all new items returned for credit where Dorner was not at fault. These will not be accepted after 60 days from original invoice date. The restocking charge covers inspection, cleaning, disassembly, and reissuing to inventory.

If a replacement is needed prior to evaluation of returned item, a purchase order must be issued. Credit (if any) is issued only after return and evaluation is complete.

- Dorner has representatives throughout the world. Feel free to contact Dorner for the name of your local representative. Our technical sales and service staff will gladly help with your questions on Dorner products.

Standard Available IMPAC Accessory Kits

- Standard Photo-Eye Kit, Fixed Mount (75-30)
- Standard Photo-Eye Kit, Adjustable Mount (75-31)
- Timing Photo-Eye Kit, Fixed Mount (75-32)
- Timing Photo-Eye Kit, Adjustable Mount (75-33)
- Emergency Stop Kit, Illuminated (75-40)
- Emergency Stop Kit, Non-Illuminated (75-41)
- Emergency Stop Kit, Pull Cord (75-42)
- Jog Kit (75-10)
- Foot Switch Kit (75-20)
- Start/Stop Kit (75-70)
- Electric Clutch/Brake Kit (75-60)
- Controller to Controller Linking Cable Kit (75-80)
- Wire Way Trough Kits
6-ft (1829 mm) (75-85-6)
12.5-ft (3810 mm) (75-85-12)
- T-slot Extension Kit (307000M)
- Light Duty End Stop Kits
2100 Series (215502M – 215524M)
3100 Series (315504M – 315540M)
- Adjustable Stop Kits
(307602M – 307640M)



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