Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton Motor Efficiency Controller

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ESPAÑOL

FRANÇAIS

1 DESCRIPTION

a. Reference Material

- Product Overview – Publication MEC-UM005-E

b. Description

(1) Greatly Improve Motor Efficiency

- Motor Efficiency Controller is a solid state motor controller that is designed to dynamically optimize the efficiency of a 3-phase AC electric motor.
- In constant speed variable load applications, the patented E-Save Technology™ provides precisely the right amount of power to meet the demands of your application.
- In numerous tests, performed by independent third parties, the Motor Efficiency Controller has proven to save up to 40% of the energy normally used in appropriate applications.

(2) Soft Start and Electronic Protection

- The Motor Efficiency Controller integrates soft start functionality to provide a smooth acceleration of the motor to normal operating speed.
- It also incorporates electronic overload protection to protect your valuable assets.

(3) Prolongs Motor Life

- Since the Motor Efficiency Controller provides only the voltage and current required for the application, it reduces the operating temperature of the motor, thereby extending its useful life.
- Another benefit of the soft start functionality is reduced stresses on the mechanical system which reduces costly maintenance expenses.

(4) Quick Configuration and Installation

- Designed for out of the box installation and operation, the Motor Efficiency Controller is easily configured for your application and can be installed quickly, with no external power required, thus allowing you more time to focus on other demands.

(5) Product Features:

- Selectable Timed or Current Limit Soft Start
- Selectable Timed Soft Stop
- Electronic overload protection
- Phase loss detection
- Over and under voltage detection
- Configurable outputs (Fault, Run)
- Configurable auto and manual start

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2 UNPACKING

a. Inspection Process

(1) Receiving, Inspecting and Storing

- Thoroughly inspect the controller before accepting the shipment. If any items are damaged, it is the user's responsibility to not accept delivery until the freight agent has noted the damage on the freight bill. Should the user discover any concealed damage during unpacking, it is the responsibility of the user to notify the freight agent of the damage.

- The controller should remain in its shipping packaging prior to installation. Prior to installation, the controller should be stored in a dry and clean location and within an ambient temperature range of –20°C to +70°C (–4°F to +158°F).

NOTE: After unpacking unit, inspect carefully for any damage that may have occurred during transit. Check for loose, missing, or damaged parts. Shipping damage claim must be filled with carrier."

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3 SPECIFICATIONS

a. Electrical

Power Circuit	
Rated Operational Voltage	200V – 600V (+/- 5%)
Rated Insulation Voltage	600V
Rated Impulse Voltage	6000V
Dielectric Withstand	2200V Av
AC Operating Frequency	50 / 60 Hz
Protection – Frames A – E	IP 00 , IP21 / NEMA 1, IP65 / NEMA 4
Control Circuit	
Rated Operation Voltage	20 – 50 VDC; 120 – 250VAC
Rated Insulation Voltage	300V
Rated Impulse Voltage	4000V
Rated Operation Current	0.1A @ 24VDC ; 0.02A @ 110VAC
AC Operating Frequency	50 / 60 Hz
Logic input on-state voltage minimum	20V
Logic input on-state current	>10mA
Logic input off-state voltage maximum	5V
Logic input off-state current	<3mA
Short Circuit Withstand	
Frame A	
Frame B	
Frame C and D	10KA
Frame E	18KA
Max Fuse	
Frame A	
Frame B	
Frame C	500A Class RK5
Frame D	800A Class L
Frame E	1600A Class L
Wire Size	
Frame A (L1, L2, L3, T1, T2, T3)	14 to 4 (awg) / 2.5 mm^2 to 25 mm^2
Frame B (L1, L2, L3, T1 T2, T3)	14 to 1/0 (awg) / 2.5 mm^2 to 50 mm^2
Frame A and B (IN1, IN2, OUT1, OUT 2)	22 to 12 (awg) / 0.34 mm^2 to 4 mm^2
Wire Size	
Frame C (L1, L2, L3, T1, T2, T3)	14 to 2/0 (awg) / 2.5 mm^2 to 70 mm^2
Frame D (L1, L2, L3, T1, T2, T3)	6 to 300 kcmil / 16 mm^2 to 150 mm^2
Frame E (L1, L2, L3, T1, T2, T3)	4 to 600 kcmil / 25 mm^2 to 300 mm^2

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b. Torque

Torque	
Frame A (L1, L2, L3, T1, T2, T3)	
Frame B (L1, L2, L3, T1, T2, T3)	
Frame C (L1, L2, L3, T1, T2, T3)	45 lb-in / 5.1 N-m
Frame D (L1, L2, L3, T1, T2, T3)	275 lb-in / 31 N-m
Frame E (L1, L2, L3, T1, T2, T3)	500 lb-in / 56 N-m
Frame A and B (IN1, IN2, OUT1, OUT2)	
Frame C – E (IN1, IN2, OUT1, OUT2)	8.0 lb-in / 0.90 N-m

c. Environmental

Operating Temperature	0 to 40° C / 32 to 104° F
Storage Temperature	-20 to 70° C / -4 to 158° F
Altitude	2000 m / 6560 feet
Humidity	5 to 95% (non-condensing)
Pollution Degree	2

4. DIMENSIONS

a. Dimensions and Weight

Frame	Rating	Width	Height	Depth	Weight
A	IP00	9.5" /240mm	6.0” /150mm	4.8”/120mm	7.1 lbs/ 3.2kg
A	IP21	10.6"/270mm	7.0"/ 180mm	5.6"/140mm	10 lbs./ 4.5kg
A	IP65	11.4"/290mm	9.8"/ 250mm	7.4"/190mm	8.6 lbs/ 3.9kg
B	IP00	12.0"/300mm	11.0"/280mm	6.5"/170mm	24 lbs/ 11kg
B	IP21	17.1”/430mm	12.2"/310mm	7.3"/180mm	32 lbs/ 14 kg
B	IP65	15.5”/390mm	12.8"/330mm	7.6"/190mm	27 lbs/ 12 kg
C	IP00	12.2” / 310mm	21.7” / 550mm	6.1” / 155mm	31 lbs / 14 kg
C	IP21	16.1” / 410mm	22.0” / 560mm	8.5” / 215mm	40 lbs / 18 kg
C	IP65	15.7” / 400mm	23.6” / 600mm	10.4” / 265mm	40 lbs / 18 kg
D	IP00	14.2” / 360mm	28.8” / 730mm	7.0” / 180mm	48 lbs / 22 kg
D	IP21	16.5” / 419mm	29.0” / 737mm	9.0” / 229mm	64 lbs / 29 kg
D	IP65	16.5” / 419mm	29.0” / 737mm	9.0” / 229mm	64 lbs / 29 kg
E	IP00	22.1” / 560mm	33.6” / 850mm	7.4” / 190mm	98 lbs / 45 kg
E	IP21	27.4” / 696mm	45.0” / 1143mm	10.0” / 254mm	121 lbs / 55 kg
E	IP65	27.4” / 696mm	45.0” / 1143mm	10.0” / 254mm	121 lbs / 55 kg

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5. GENERAL SAFETY INFORMATION

a. Important User Information

- Due to the vast applications that this equipment can be used, it is the user's responsibility for the application and use of this control equipment. The user should validate that the equipment meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.
- Dayton is not responsible or liable for indirect or consequential damages resulting from the use of this equipment.
- Reproduction of the contents of this manual, in whole or in part, without written permission of Dayton is prohibited.

b. Safety Guidelines

- To avoid an electric shock hazard, verify that all power sources have been disconnected and that no voltage exists on the motor terminals.
- When the Power LED is off, this is not an indication that capacitors have discharged to safe voltage levels.
- Only qualified personnel familiar with solid state starters and associated machinery should perform installation, commissioning and maintenance. Failure to comply may result in personal injury and/or equipment damage.
- Do not install power factor correction capacitors between the product and the motor.
- This product contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing or servicing.
- An incorrectly installed Dayton MEC can result in component damage or a reduction in product life. Wiring or application errors, such as, under-sizing the motor, incorrect or inadequate power supply, or excessive ambient temperatures may result in malfunction of the system.

NOTE: This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which the user may be required to take adequate mitigation measures.

NOTE: This product is tested to meet CSA B44.1 / ASME-A 17.5 and IEC/EN 60947-4-2. It is classified under the IEC standard as a Form 2 device.

Dayton Motor Efficiency Controller

E N G L I S H

Dayton Motor Efficiency Controller

6. INSTALLATION

a. Mounting

- The controller must be mounted vertically and in a position that allows air to flow from the bottom to the top of the controller.
- In addition, the controller must be mounted to have a minimum of 6 inches (15 cm) free space above and below the controller.

⚠ WARNING

WARNING: Metal surfaces on the Dayton MEC can become hot and it should be mounted to reduce the risk of harmful burns from personnel that may come in contact with any metal surface.

(1) Grounding Requirements

- This product has been designed for Class A equipment.
- The use of this product in domestic environments may cause radio interference.
- When installing the product, make sure both line and motor ground wires are connected in the controller.
- The Dayton MEC and shielded cables should always be connected to a Safety Ground (PE).
- Grounding points must comply with national or local safety regulations and electric codes.

(2) Fuses and Circuit Breakers

- This product is designed for use with upstream branch circuit protection as shown in Figure 8. Please see section 8.1 for specifications for circuit breakers and fuses.

⚠ WARNING

- All wiring of the Dayton MEC must follow local electrical code.

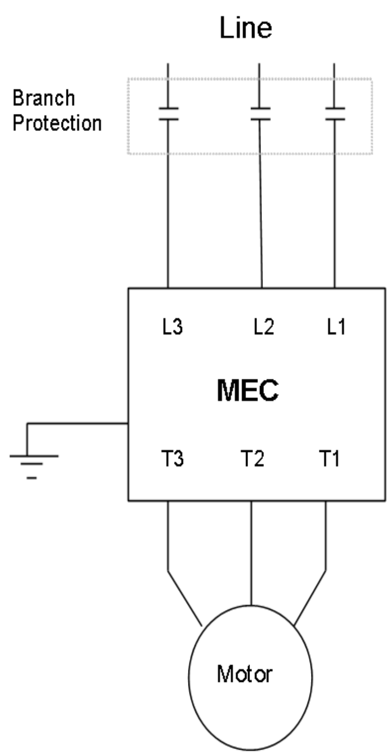

Figure 8 - Power Wiring

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b. Phase Power Wiring

- The power wiring running outside an enclosure should be run in conduit or the wiring should be shielded/armor cable.
- The power wiring should never run in the same conduit as the I/O control wiring.
- The Motor Efficiency Controller power wiring locations are shown above in Figure 8.
  - o Incoming three-phase power connections are made to terminals L1, L2, and L3.
  - o Load connections to Line motors are made to terminals T1, T2, and T3.
  - o Connections to Wye-Delta motors can also be made by using the run connection wiring diagram of the motor and connecting to terminals T1, T2 and T3.
  - o However, if the Motor Efficiency Controller is only connected to the run connection of the Wye-Delta motor, energy savings will be reduced.
  - o Therefore, for optimal energy savings, Wye-Delta motors should be wired as a Delta motor when possible.

c. I/O Wiring

- The I/O wiring should never run in the same conduit as the power wiring.
- Make I/O wiring connections as indicated in the typical connection diagrams shown in Figure 9.
- When using DC voltage the input will not function correctly if the polarity is not correct.
- The outputs should be used as typical auxiliary contacts in the system and should be wired into the fault or safety circuit as required.
- The removable terminal block supports wire sizes from 12 – 24 AWG (2.06mm -0.51mm) and it is recommended that 600V cable be used for all I/O wiring.

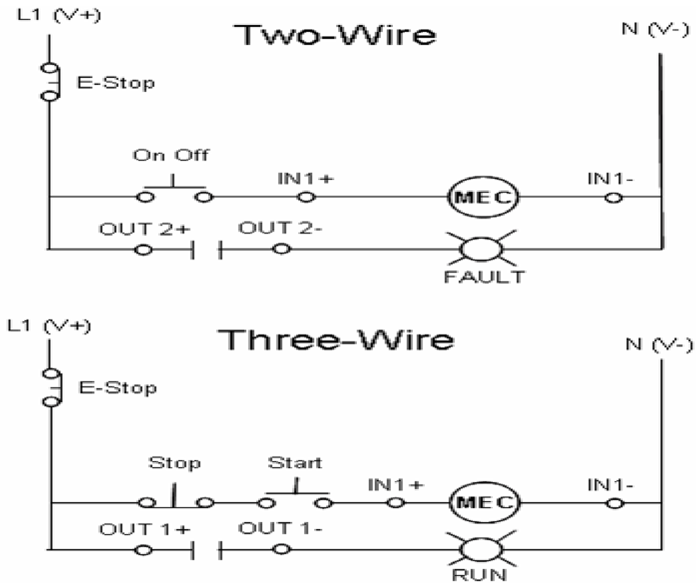

Figure 9 - I/O Wiring

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d. Voltage Selection Jumper

- The Motor Efficiency Controller supports multiple voltages, but the correct voltage must be selected prior to applying power.
- The user should select the correct voltage that will be used by placing the RED Voltage Selection Jumper (See Figure 10) in the correct location.
- See Table 3 to determine the Voltage Selection jumper for a given line power.
- The factory default is 480V

E N G L I S H

Voltage Selection Jumper Location	Line Power
200 - 240V	200V, 208V, 220V, 240V
400 - 480V	380V, 400V, 415V, 480V
575V	575V, 600V

Table 3 – Voltage Selection Jumper Locations

⚠ WARNING Disconnect Power to the Motor Efficiency Controller before removing the voltage selection jumper

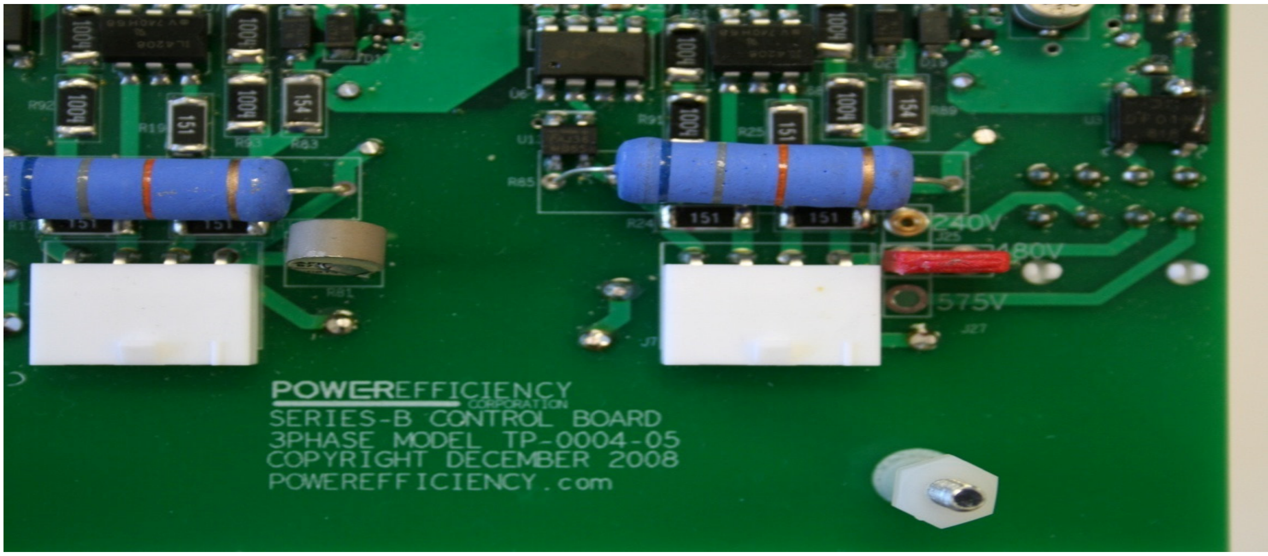

Figure 10 - Voltage Selection Jumper

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7 OPERATION

- This section describes the Operational Modes of the Dayton MEC
- This section is also a reference for the Programming section (8.) of this document.

a. Soft-Start

- The Motor Efficiency Controller provides three user selectable starting modes. These modes are:
  - Timed-Soft-Start
  - Current-Limit-Soft-Start
  - Kick-Start
- The factory default and best fit for most applications is the Timed Soft Start.
- For more information on how to select the soft start mode please see section 8. for DIP Switch settings.

NOTE: If the application is lightly loaded on start-up, the soft start mode will optimize. This could cause the controller to exit soft start early and go into Energy Savings mode. However, if this happens the motor will be up to speed.

(1) Timed-Soft-Start

- In this soft start mode, the output voltage to the motor is gradually increased during the start time (See Figure 1).
- The start time is user selectable via DIP Switches and can be set to four different times (See Table 1) depending on the current rating of the Dayton MEC .
- After the motor reaches full speed, the Dayton MEC will sense the load of the motor and it will go into energy savings mode if the motor is lightly loaded. The factory default setting is the time specified in Table 1 as T1.

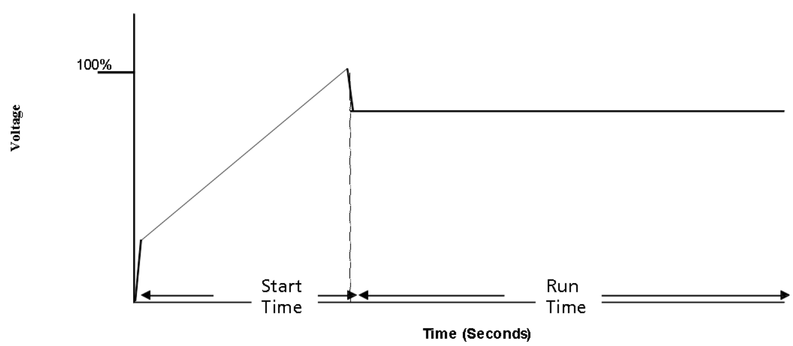

Figure 1. – Timed Soft Start

Catalog Number	Frame	Soft Start Times (seconds)			
		T1	T2	T3	T4
6EJK4 34A	A	2	5	10	15
6EJK5 80A	B	2	5	10	15
6EJK6 125A	C	10	20	30	60
6EJK7 156A	D	10	20	30	60
6EJK8 192A	D	10	20	30	60
6EJK9 240A	E	30	45	60	90
6EJKL0 300A	E	30	45	60	90
6EJKL1 380A	E	30	45	60	90

Table 1 – Soft Start Time

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(2) Current-Limit-Soft-Start

- In this soft start mode, the maximum current provided to the motor is limited to a percentage of the FLC setting (See Figure 2).
- This mode should be used when it is necessary to reduce the inrush current to the motor.
- The percentage of the current limit is selectable via DIP Switches and can be set to four different levels (See Table 2).
- After the motor reaches full speed, the Dayton MEC will sense the load of the motor and it will go into energy savings mode if the motor is lightly loaded.

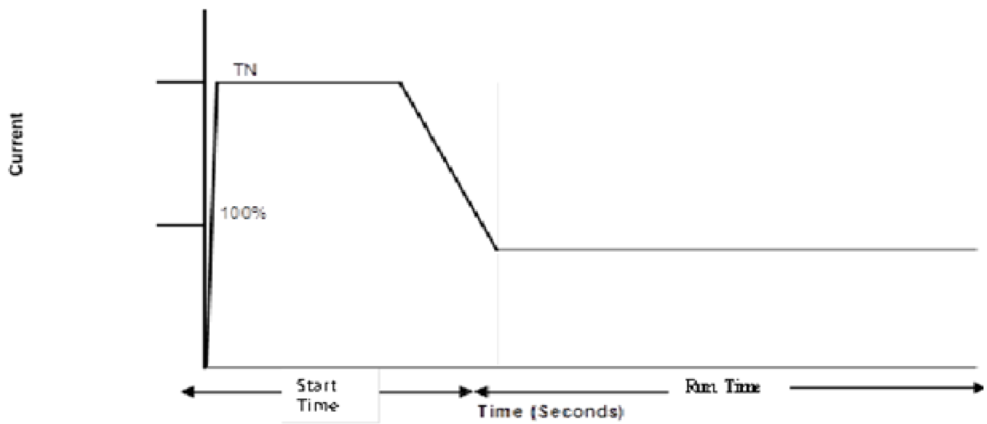

Figure 2. – Current Limit Soft Start

Current Limit (% FLC)			
T1	T2	T3	T4
200	300	400	500

Table 2 — Current Limit Levels

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(3) Kick-Start

- This soft start mode is similar to the timed soft start mode, but provides an additional boost at startup to help break away large loads (See Figure 3).
- The duration of the boost time is user selectable via DIP Switches 3 and 4.
- The duration of the boost time is selected with Dip Switch 3 and 4 to be 10% or 50% of the timed soft start that was selected with Dip Switches 1 and 2. (see Table 1).
- After the motor reaches full speed, the Dayton MEC will sense the load of the motor and it will go into energy savings mode if the motor is lightly loaded. See section 8. for more information on DIP Switch settings.

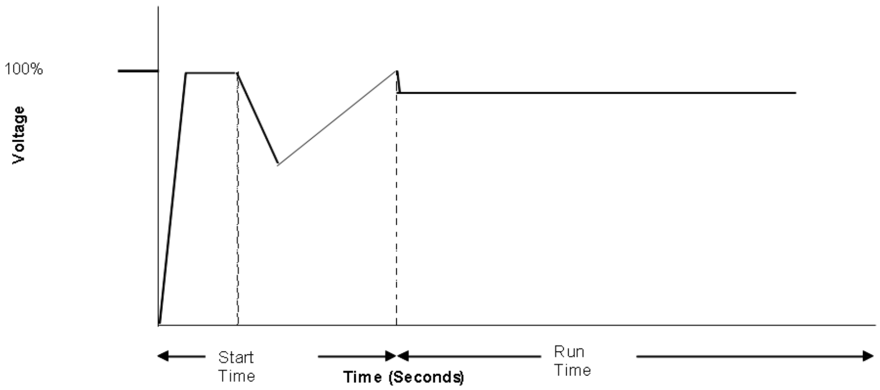

Figure 3. – Kick Start

b. Soft-Stopping

- The Dayton MEC provides a user selectable stopping mode (See Figure).
- A soft stop is selected via DIP Switch 8 and uses the same stopping duration that was selected for the timed soft start (See Table 1).
- The factory default for soft stop is disabled.
- See section 8 for information of DIP

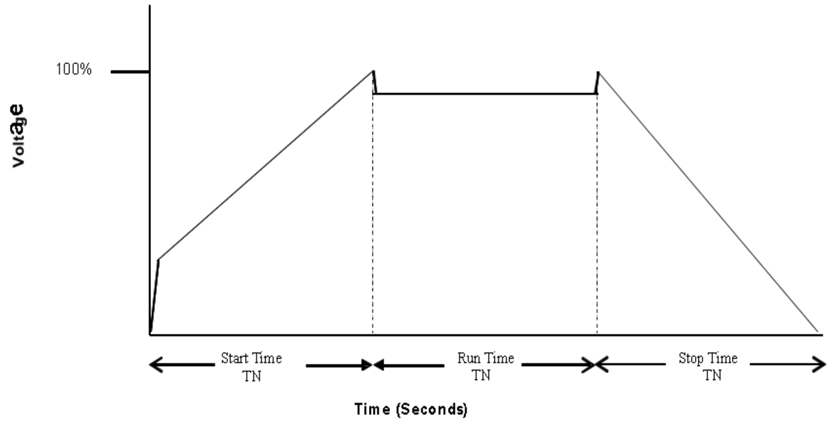

Figure 4. – Soft Stop

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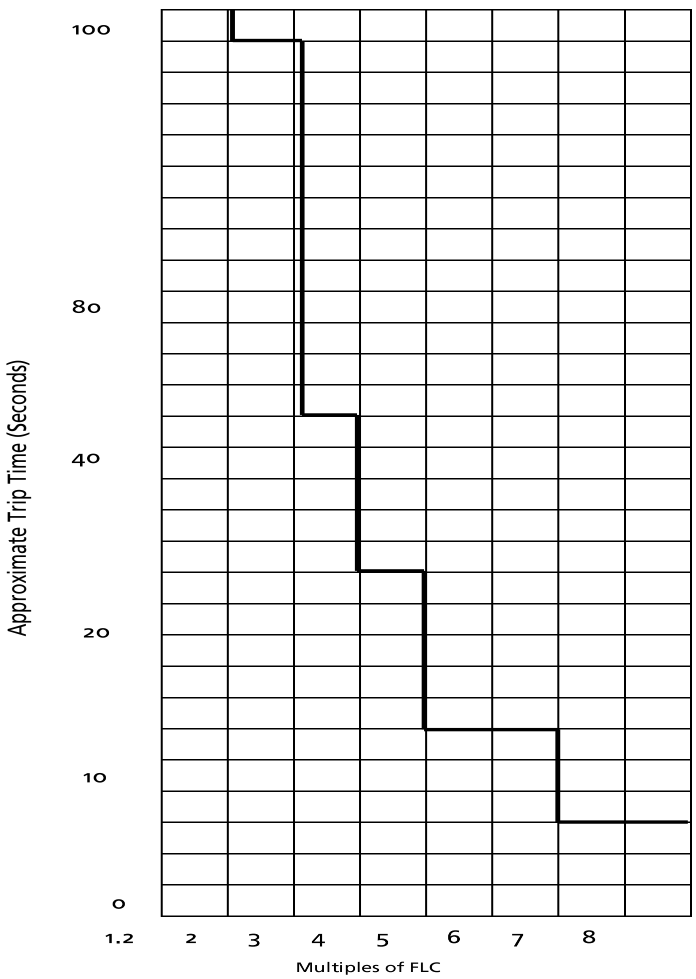
c. Start-Mode

(1) Start-from-Input

- In this start mode, Discrete Input 1 (IN 1) must be energized for the controller to start the motor.
- When IN 1 is de-energized, the controller will shut down power to the motor and it will coast to stop or soft stop.
- This mode is set via DIP Switch 5 and is the factory default.
- See Section 8.a. for more information on DIP Switch settings.



Approximate trip time for 3-phase balanced condition from Cold or Hot start, based on ambient air temperature of 0° C to 40° C.

Figure 5 – Overload Curve

(2) Auto-Start

- In this start mode, the controller will start the motor when line power is applied to the product.
- However, since the controller must power-up and run startup diagnostics, it may take up to a second for the motor to start after power is applied to the controller.

d. Motor Protection

(1) Overload / Over Current

- The Dayton MEC meets the IEC 60947-4-2 requirements as a motor overload protective device.
- The controller uses a Class 10 standard, which will fault at:
  - o 1.2 times FLC within 7000 seconds,
  - o 2 times FLC within 52 seconds,
  - o 3 times FLC within 26 seconds,
  - o 4 times FLC within 13 seconds,
  - o 6 times FLC within 6 seconds.
- The motor's full load current rating must be properly set (see Section 8.c.) to provide overload protection.
- The trip curve for the controller is shown in Figure 5.

E N G L I S H

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(2) Phase Loss
- The Dayton MEC provides phase loss protection to the motor.
- Power will be removed from the motor and the controller will fault if a single phase has a large decrease in voltage.
- The controller will fault when it detects a voltage reduction of over 45% of nominal voltage on any of the line side phase (L1, L2 or L3).
- The nominal voltage is detected at startup and the controller will select one of the following voltages: (220, 380, 480 and 575).

(3) Under-Current
- The Dayton MEC provides under current protection to the motor.
- Power will be removed from the motor and the controller will fault if the current flowing to the motor is significantly less that the FLC setting.
- To set the FLC on the Dayton MEC, see Section 8.c..
- The controller will fault when it detects current on any of the line side phases (L1, L2 or L3) of less than 5% of the FLC value.

(4) Under-Voltage
- The Dayton MEC provides under voltage protection to the motor. Power will be removed from the motor and the controller will fault if a large decrease in voltage is detected.
- The controller will fault when it detects a voltage of 75% or less of the nominal voltage.
- The nominal voltage is detected at startup and the controller will select one of the following voltages: (220, 380, 480 and 575).

(5) Over-Voltage
- The Dayton MECprovides over voltage protection to the motor. Power will be removed from the motor and the controller will fault if a large increase in voltage is detected.
- The controller will fault when it detects a voltage of 125% or more of the nominal voltage.
- The nominal voltage is detected at startup and the controller will select one of the following voltages: (220, 380, 480 and 575).

e. Energy Savings
- The Dayton MEC provides energy savings when it detects the motor has a load of less than 65%.
- When the controller is in energy savings mode, the Energy Savings LED will be ON and the controller will reduce the voltage and current to the motor.
- Energy savings will increase as the motor load decreases and can reach up to 50% when a motor has no load.
- If the motor load is higher than 65% then the motor is running very efficiently and the controller will not be able to reduce the current and voltage to the motor. In this case, the Energy Saving LED will turn off and the controller will exit energy savings mode.

f. I/O

(1) Inputs
- The Dayton MEC has two (2) discrete inputs. The two inputs are controlled at terminals IN 1 and IN 2.
- IN 1 is used for starting and stopping the motor, when the controller is in "Start from Input" mode (See section 8):
  - o The controller will start the motor when IN 1 is energized.
  - o The controller will remove power to the motor when IN 1 is de-energized.
- IN 2 is used to disable energy savings.
- Please contact technical support for the applications and conditions that would use this functionality.

Dayton Motor Efficiency Controller

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(2) Outputs

- The Dayton MEC has two (2) discrete Normally Open relay outputs.
- The two outputs are controlled at terminals OUT 1 and OUT 2. (See section 8).
- The output relays can be configured via DIP switch 9 to "Open" or "Close" upon the event. (See section 8 for more information on DIP Switch settings).
- In addition, DIP 10 indicates the content of OUT 1:
  - o If DIP 10 is OFF, then OUT 1 indicates when the Motor Efficiency Controller is running the motor.
  - o If DIP 10 is ON, then OUT 1 indicates that motor is on and it is running at full speed.
- OUT 2 indicates when the Dayton MEC has detected a fault and has stopped the motor. See section 8 for Fault-Reset information.
- See Figures 6 and 7 for the timing diagram for the outputs when configured for either "Open" or "Close" relay on event. The factory default is "Close" relay on event.

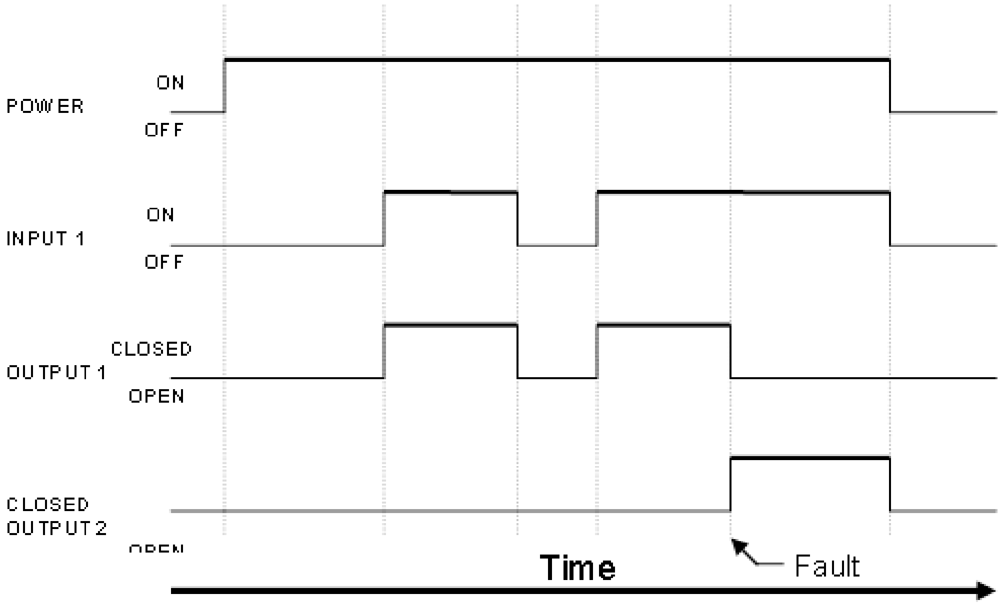

Figure 6 – Close Relay On Event

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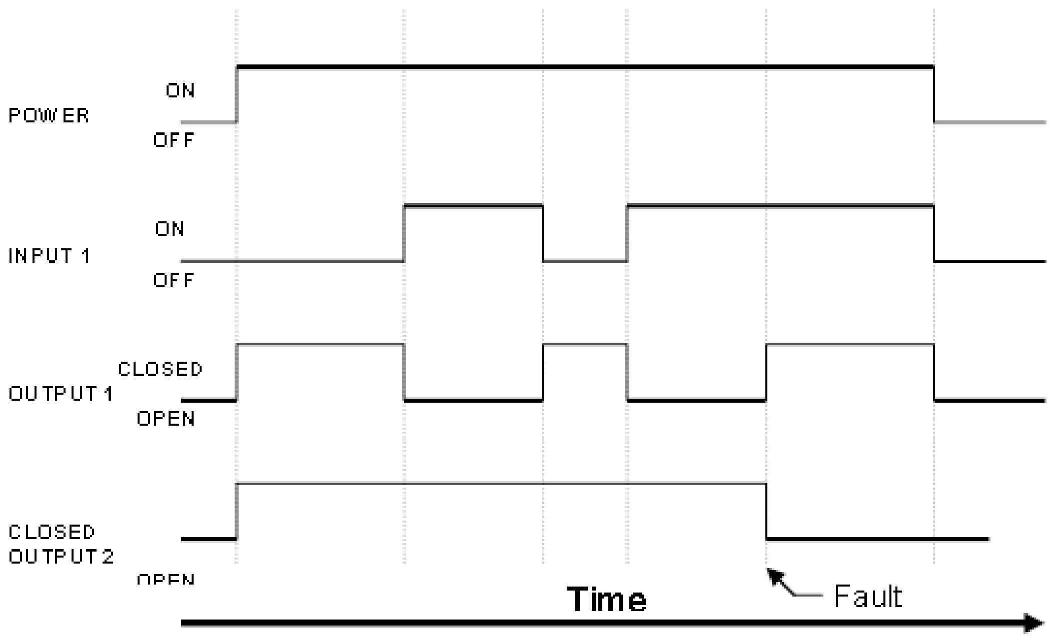

Figure 7 – Open Relay On Event

i. Start-Up

(1) Checklist

- Verify Incoming Power connections are securely connected.
- Verify Motor connections are securely connected.
- Verify incoming and motor ground connections are securely connected.
- Verify required I/O wiring is connected to the I/O plug and that this plug is inserted into the mating connection plug on the PCB.
- Verify DIP switch settings are setup for required operation.
- Verify FLC pot matches the nameplate Full Load Amperes (FLA) of the motor.
- Verify controller is securely mounted.
- Apply power and start motor to verify motor is turning in the correct direction and operates properly.

Dayton Motor Efficiency Controller

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8 PROGRAMMING

a. DIP Switch Settings

- The Dayton MEC has a set of ten DIP switches that are used to setup the functionality of the controller.
- Numbering of the DIP switches is from left to right.

b. Programming the DIP Switches

- THE FOLLOWING SETTINGS ARE CONFIGURABLE WITH THE DIP SWITCHES::

(1) Soft-Start-Time-Ramped

- DIP Switches 1 and 2 are used to change the duration of the timed soft start or the level of the current limit soft start.
- See Table 1 for specific soft start times.
- See Table 2 for specific levels of current limit.

(2) Soft Start Type

- DIP Switches 3 and 4 are used to setup the type of Soft-Start.

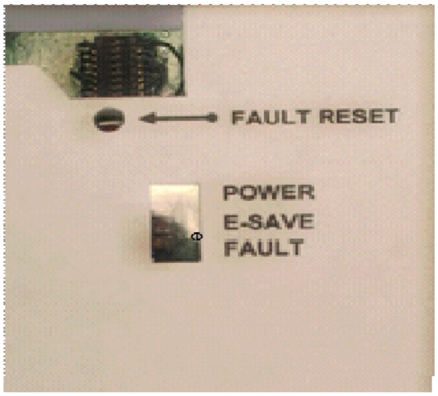

Figure 11 – Dip Switches

(3) Start Mode

- DIP Switch 5 is used to setup the start mode for either:
  - o Start-from-Input , Or
  - o Auto-Start.
- See section 7.a. for further guidance on programming Start-Mode.

(4) Regenerative Mode

- DIP Switch 6 is used to select the action the Dayton MEC will perform when it detects the motor is regenerating.
- Since in energy savings mode the voltage to the motor is reduced, in some applications it is possible to have a motor over-run. In applications, such as down escalators, this would result in a motor going into an over speed condition.
- However, by applying full voltage to the motor, the Dayton MEC will prevent this over speed condition from occurring.
- The factory default is to enable the Dayton MEC to go into full voltage mode when it detects the motor is going to regenerate.
- In applications that go into a regeneration mode with no harmful side effects, this can be disabled.
- It is recommended that you contact technical support for more information before disabling this mode.

Dayton Motor Efficiency Controller

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Dayton Motor Efficiency Controller

(5) Soft Start Mode
- DIP Switch 7 is used to enable the soft start.

(6) Soft Stop Mode
- DIP Switch 8 is used to enable the soft stop.

(7) Output Mode
- DIP Switch 9 is used to change the mode of the outputs.
- When the outputs are configured for Close relay on event, the output contacts will be open until the event occurs and then the output contact will close.
- When the outputs are configured for Open relay on event, the output contacts will be closed until the event occurs and then the output contact will open.
- When the Dayton MEC has no power, the output relays will be open in both modes.

NOTE: When shipped from the factory, all DIP switches are set to OFF.

Functionality	Settings
T1 Second Start / Level Current Limit	DIP Switch 1 = OFF, DIP Switch 2 = OFF
T2 Second Start / Level Current Limit	DIP Switch 1 = ON, DIP Switch 2 = OFF
T3 Second Start / Level Current Limit	DIP Switch 1 = OFF, DIP Switch 2 = ON
T4 Second Start / Level Current Limit	DIP Switch 1 = ON, DIP Switch 2 = ON
Timed Soft Start	DIP Switch 3 = OFF, DIP Switch 4 = OFF
Current Limited Soft Start	DIP Switch 3 = ON, DIP Switch 4 = OFF
Short Kick Start	DIP Switch 3 = OFF, DIP Switch 4 = ON
Long Kick Start	DIP Switch 3 = ON, DIP Switch 4 = ON
Start/Stop from Input 1	DIP Switch 5 = OFF
Auto-Start	DIP Switch 5 = ON
Regen Detection enabled	DIP Switch 6 = OFF
Regen Detection disabled	DIP Switch 6 = ON
Soft Start Enabled	Dip Switch 7 = OFF
Soft Start Disabled	Dip Switch 7 = ON
Soft Start Disabled	Dip Switch 8 = OFF
Soft Start Enabled	Dip Switch 8 = ON
Close relay on event	DIP Switch 9 = OFF
Open relay on event	DIP Switch 9 = ON
Output 1 = Motor Running	DIP Switch 10 = OFF
Output 1 = Soft Start Done/Up to Speed	DIP Switch 10 = ON

Dayton Motor Efficiency Controller

Dayton Motor Efficiency Controller

c. FLC Setting

- The Dayton MEC provides electronic motor overload protection to guard the motor from damage from improper voltage and current levels.
- In order for this functionality to work correctly, the FLC pot, shown in Figure 12, must be set to the motor nameplate The Full Load Amp (FLA). The FLA value will be found on the motor.
- To adjust the FLC value on the Dayton MEC, turn the dial counter clockwise until the desired current is aligned with the pointer.
- By default the FLC value is set to the max value.
- See Table 5 for minimum and maximum amperage setting by catalog number.

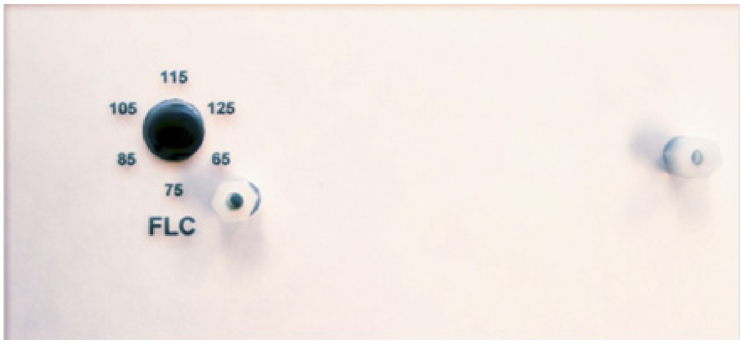

Figure 12. – FLC Pot

⚠ WARNING

- An incorrect FLC setting affects the Dayton MEC overload and under current protection.
- An elevated FLC setting will effectively defeat the overload protection and may cause damage to the motor or unwanted under current faults.
- When the FLC setting is too low, unwanted overload faults may occur.

Catalog Number	Minimum Amps	Maximum Amps
6EJK4 34A, Frame A		
6EJK5 80A, Frame B		
6EJK6 125A, Frame C	65	125
6EJK7 156A, Frame D	96	156
6EJK8 192A, Frame D	132	192
6EJK9 240A, Frame E	150	240
6EJKL0 300A, Frame E	210	300
6EJKL1 380A, Frame E	290	380

Table 5 – FLC Settings

Dayton Motor Efficiency Controller

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Dayton Motor Efficiency Controller

d. Status Indicators

- The Dayton MEC provides three LED status indicators to provide the user with the status of the controller. The location of these status indicators is shown in Figure 13.

(1) Power-Status-LED

- The Power Status LED is green and is the LED furthest to the left.
  - o This LED will be solid green when 3 phase power is supplied to the controller.
  - o This LED will be off when the controller has no 3 phase power being supplied.

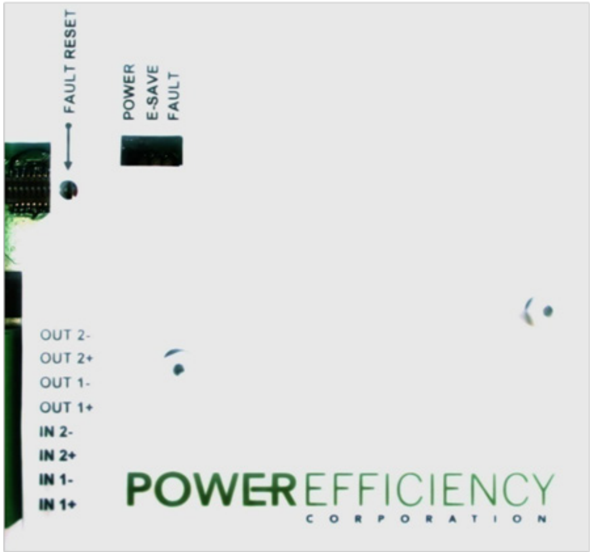

Figure 13. – Status Indicators

⚠ WARNING

- Do not use this LED as an indication of no voltage present in the controller.
- Before performing any maintenance on the controller, make sure all power source are disconnected or are off.

Dayton Motor Efficiency Controller

E N G L I S H

Dayton Motor Efficiency Controller

(2) Energy-Savings-LED

- The Energy Savings (E-Save) LED is orange and is the middle LED.
  - o This LED will be solid orange when the controller is in energy savings mode.
  - o This LED will be off when the controller is running at full power.
  - o The controller will be in energy savings mode when the motor is approximately 65% loaded or less.
  - o When a motor is running at over 65% load the motor is running very efficiently and the controller will not be able to reduce energy consumption.

(3) Fault-LED

- The Fault LED is red and is the LED furthest to the right
  - o This LED will be blinking red when the controller detects a fault.
  - o This LED will be off when the controller is running under normal
- The Fault LED blinking pattern provides the user with a visual indication of the type of fault.
- The blinking cycle last 3 seconds and will continue to repeat until:
  - o phase power is removed or
  - o The fault button is pressed for 1 second to reset the Motor Efficiency Controller.
- See Table 6 for fault condition and blinking patterns.

E N G L I S H

Fault	Number of Blinks per Cycle
Overload/Over-Current	1
Phase Loss	2
Under Current	3
Under Voltage	4
Over Voltage	5
SCR Failure	7
Temperature Failure	8

- See section 4 for troubleshooting guide for resolving conditions that can cause the controller to fault.

(4) Fault-Reset

- After the controller detects a fault:
  - o The fault LED will turn red and
  - o Power to the motor will be removed.
- In order to clear the fault and have the controller reset the user can either:
  - o Cycle power to the unit or
  - o Press the Fault Reset button (See Figure 13) for 1 second.
- The controller will fault under the circumstances outlined in section 3.5.

9 MAINTENANCE

a. Customer Maintenance

(1) The Dayton MEC is generally not serviceable by the customer, however the following parts may be available for replacement.

Dayton Motor Efficiency Controller

E
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Dayton Motor Efficiency Controller

10 TROUBLESHOOTING

- For the safety of all maintenance personnel, please follow the local safety related work practices (for example, the NFPA 70E, Part II in the United States).

- Maintenance personnel must be trained in the safety practices, procedures, and requirements that pertain to solid state motor controllers.

⚠ WARNING

- Metal surfaces on the Motor Efficient Controller can become hot during operation. Harmful burns may result from contact with any metal surface.

Dayton Motor Efficiency Controller

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action

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Dayton Motor Efficiency Controller

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Power-LED-is-not-Green	1 Open Line at L1, L2, and L3, 2 Voltage at L1, L2 and L3, 3 Wiring, 4 Voltage Selection Jumper setting	1 Check for open line and verify Voltage at L1, L2 and L3. 2 Check wiring. 3 Verify Voltage Selection Jumper is set for correct input voltage. 4 Contact Technical Support
Fault-LED-is-Blinking-RED	1 Overload / Over Current (1 blink)	1 Verify motor or equipment is not jammed. 2 Verify motor FLA matches the Motor Efficiency Controller FLC pot setting
	2 Phase Loss (2 blinks)	1 Check for open line and verify voltage at L1, L2 and L3. 2 Verify line balance on L1, L2 and L3. 3 Verify motor lines T1, T2 and T3 are connected
	3 Under-Current (3 blinks)	1 Verify FLC setting matches motor FLA. 2 Verify motor lines T1, T2 and T3 are connected. 3 Verify motor or equipment is not damaged.
	4 Under-Voltage (4 blinks)	1 Verify voltage at L1, L2 and L3. 2 Verify power system. 3 Verify soft start time is sufficient for motor load and increase soft start time if necessary.
	5 Over-Voltage (5 blinks)	1 Verify voltage at L1, L2 and L3. 2 Verify power system.
	6 SCR Failure (7 blinks)	1 Contact Technical Support
	7 Temperature Failure (8 blinks)	1 Verify the cool air flow to MEC cooling fins is sufficient. 2 Verify that the motor current load is below the full load current setting.

Dayton Motor Efficiency Controller

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Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action

Dayton Motor Efficiency Controller

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Motor-will-not-Start	1 Motor Wiring 2 Control wiring	1 Check motor wiring 2 Check control wiring. 3 Verify start mode and Voltage to Input 1. 4 Verify motor or equipment is not jammed
Motor-Stops	1 Motor Fault 2 Control and Power Wiring 3 Motor FLA	1 Check Fault LED. 2 Check control and power wiring 3 Verify motor FLA matches the Motor Efficiency Controller FLC pot setting.
Motor-doesn't-reach-full-speed-within-Soft-Start-time	1 Soft start time may need to be increased.	1 The time it takes for the motor to come up to speed may be more or less than the time programmed, depending on the size of the connected load. Therefore, the soft start time may need to be increased.
Motor-Efficiency-Controller-Time-and-Date-is-Incorrect	1 Battery not operational	1 Factory setting is set to Pacific Standard Time. 2 Battery not operational. Use caution when replacing the battery, as the battery may explode if mistreated. Never recharge, disassemble or dispose the battery of in fire. Only replace battery with Panasonic, Part No. BR1225/BE. Contact Technical Support for additional information.

Dayton Motor Efficiency Controller

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Dayton Motor Efficiency Controller