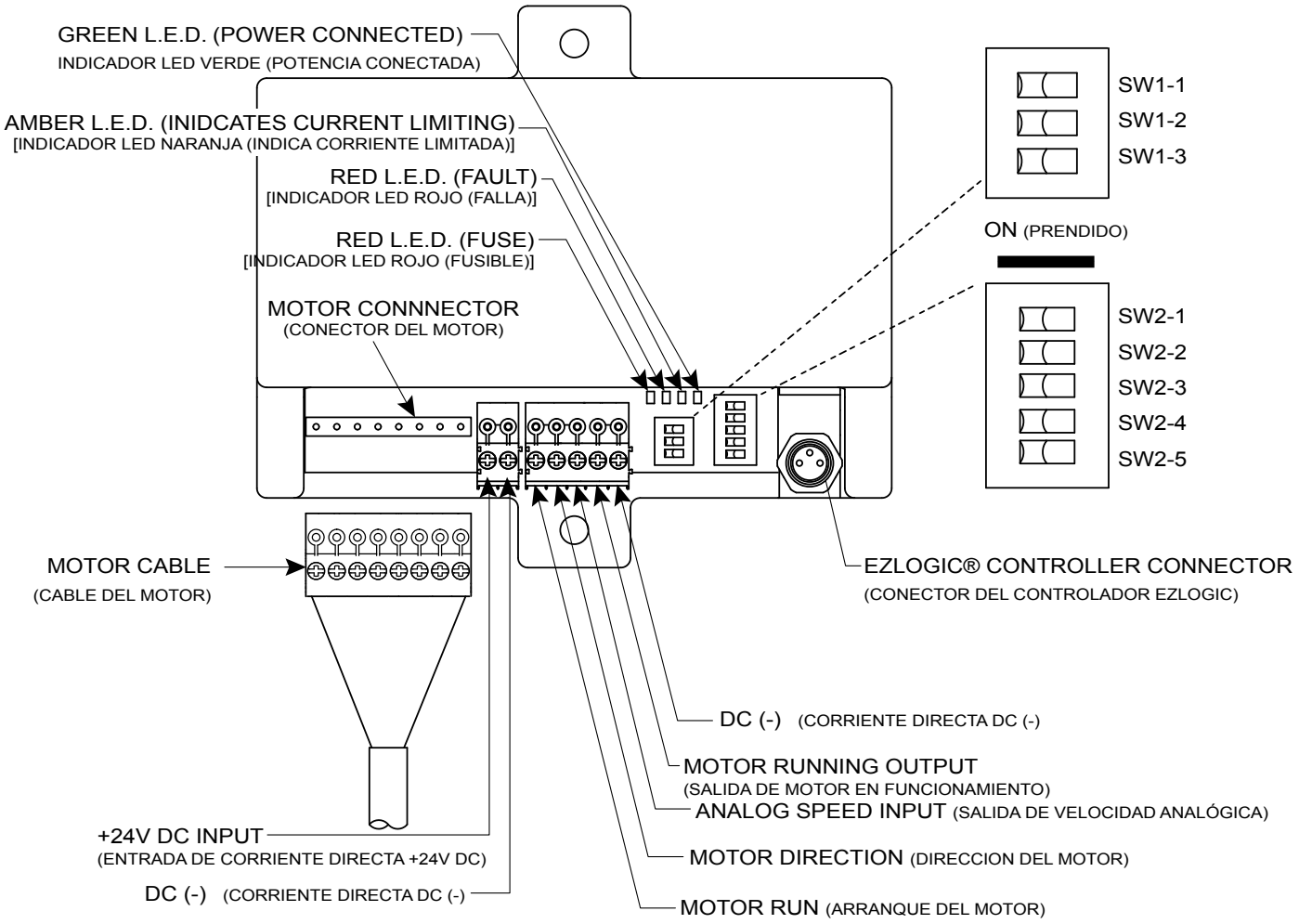
E24™ 3.0 CARD | QUICK START GUIDE

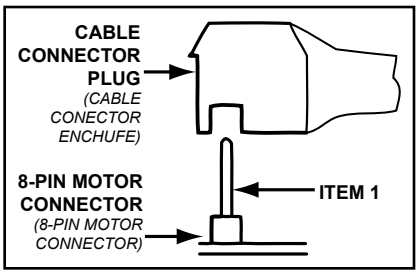


MOTOR CONNECTION HEADER

E24™ motors come with a built-in 22.0 inch or 72.0 inch connection cable, depending on the motor selected. Do not disassemble this cable. If the cable becomes damaged and on-site repairs are required, refer to the following wiring sequence from pin one (1) on the left through pin eight (8) on the right.

CAUTION: Use of extension cables may cause permanent damage and will void the product warrant.

Motor connection cable must be oriented as shown.



DC POWER INPUT HEADER

A 2-pin Phoenix PT1.2/2-PVH-3.5 plug is supplied. The Hytrol 3.0 card operates off of a +22 to +28 Volt DC power supply. The control reads the configuration switches only when the unit is powering up. Make the power connection only after all other connections have been made.

Pin:	Signal:
1	+22 to +28 Volts DC
2	DC Ground

CAUTION: Power must be applied with the proper polarity to avoid potentially damaging the controller.

NOTE: When adjacent zones are operating from separate power supplies you should connect their DC grounds. However, do not connect the positive voltage wires from separate power supplies together.

OPTIONAL INPUT-OUTPUT (I/O) CONNECTION HEADER

A 5-pin Phoenix PT1.5/5-PVH-3.5 plug is supplied. If these I/O connections are not being used, leave the connector in place to avoid accidentally shorting the pins.

NOTE: All inputs and outputs except analog are PNP only and are active at +18 VDC or higher

Pin:	Description:
1	Run (Input)
2	Reverse (Input)
3	Analog Input +
4	Running (Output)
5	DC Ground

M8 CONNECTOR FOR EZLOGIC®

This M8 connector is already configured for use with the Hytrol EZLogic® control.

MOUNTING PLATE/HEAT SINK

This component is for mounting the control assembly to the conveyor frame using two 1/4 inch, or 0.25 in, bolts while keeping the controller cooler.

CAUTION: If mounting the control on a curved section of conveyor, use washers between the mounting plate and the conveyor frame. This is to assure that the mounting plate is not distorted, causing damage to the enclosed printed circuit board assembly. For best thermal performance mount the controller on a flat surface.

CONFIGURATION SWITCHES

The controls reads the configuration switches only when the unit is powering up. To change a setting, disconnect power, set the switch, and then reconnect power. The **OFF** position is to the **LEFT**. The **ON** position is to the **RIGHT**.

This switch sets the control into a Low or High current limit mode. The current limit differs depending on which motor is selected by SW2-5.

		SW2-5	
		100W24	125W24
Limit	SW1-3	Off	On
Low	Off	1.5 A RMS	2.0 A RMS
High	On	3.0 A RMS	4.0 A RMS

Switch	Configuration Selection
1-1	CCW/CW Direction
1-2	Braking/ZMH or Coast
1-3	Current Limit Selection
2-1	Motor Speed Selection
2-2	
2-3	
2-4	
2-5	Motor Type Selection

FEEDBACK LED INDICATORS

The control board contains four (4) LED feedback indicators. These LEDs are often useful in diagnosing various wiring and connection problems. If power is connected there will always be at least one LED illuminated or flashing. When no LED is illuminated, there is no power.

- **One (1) Red Fuse LED**
  This LED is off under normal circumstances. It illuminates constantly if the 15 amp replaceable fuse is blown and power is applied with the proper polarity. The 15 amp fuse on the board is not user-accesible. If the blown fuse LED is illuminated, return the board to your Integrator for analysis or repair.
- **One (1) Red Fault LED**
  This LED is off under normal circumstances. If a problem is detected, it provides one of the following five signals:
  - **One (1) flash in 4 seconds:** The board has a hardware problem. Return it to your supplier.
  - **Two (2) flashes in 4 seconds:** The input voltage is too high. Reduce the voltage.
  - **Three (3) flashes in 4 seconds:** The input voltage is too low. Increase the voltage.
  - **Four (4) flashes in 4 seconds:** There is a problem with the motor cable or connection. Check to see that the cable is not damaged and that all of the wires are secure. If the cable has been cut or the wires disconnected refer to the Motor Connection Header.
  - **Five (5) flashes in 4 seconds:** Control over temperature.
  - **Six (6) flashes in 4 seconds:** Extreme over current.
  - **Constantly ON:** The motor is stalled or the sensor is continuously blocked. Check for mechanical obstructions.
- **One (1) Amber Motor Current Limiting LED**
  - **Four flashes in 4 seconds:** Components on the board have overheated and the circuit is limiting the power to the motor to about half (50%) of normal. This problem will correct itself when the board has cooled adequately. Check for mechanical obstructions.
  - **Constantly ON:** Motor current is at the maximum allowed and is being electronically limited. Check for mechanical obstructions.
  - **Flickering:** If the motor starts under significant load, the current may be limited briefly causing the LED to flicker. If the LED flickers constantly, this is an indication that the motor is operating at its upper limit and may never reach the full speed. This is not a cause for concern and no corrective action is required.
- **One (1) Green Power LED**
  - **Constantly ON:** Power is properly applied as long as the fuse is not blown.

COVER

The cover can help reduce the severity of damage to the controller from foreign objects.

CAUTION: Removal of the cover will void the warranty. The cover does not make the controller waterproof or dustproof.

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1. MOUNT THE CONTROL

Mount the control in a location where the motor cable reaches the connection header without putting strain on the cable connector or the header.

2. SELECT A MOTOR

Select the motor you will be using. Properly match the control settings to the motor in use to deliver the best and most predictable performance (SW2-5).
In addition to the standard 100 watt E24™ motor, this control provides maximum performance with Hytrol's 125 watt E24™ motor at its higher speed.

Current limit: This switch sets the control into a Low or High current limit mode. The current limit differs depending on which motor is selected by SW1-3

SW2-5:	Motor:	Comments:
OFF	100W24	Previously STD
ON	125W24	Previously HO

		SW2-5	
		100W24	125W24
Limit	SW1-3	Off	On
Low	Off	1.5 A RMS	2.0 A RMS
High	On	3.0 A RMS	4.0 A RMS

3. SELECT A SPEED

Four switches determine the operating speed, making it simple to match speeds in multiple zones. The actual speed selected also depends on the motor that you selected in the previous step, so set those switches first.
There is also an option to use a 0-10 VDC input for remote, dynamic speed adjustment while the system is running.

Switches				100W24			125W24		
SW2-1	SW2-2	SW2-3	SW2-4	RPM	Standard (FPM)	Speedup (FPM)	RPM	Standard (FPM)	Speedup (FPM)
OFF	OFF	OFF	OFF	280	140	200	350	175	255
ON	OFF	OFF	OFF	265	130	190	331	165	240
OFF	**ON**	OFF	OFF	250	125	180	312	155	225
ON	**ON**	OFF	OFF	235	115	170	293	145	210
OFF	OFF	**ON**	OFF	220	110	160	274	135	200
ON	OFF	**ON**	OFF	205	100	145	255	125	185
OFF	**ON**	**ON**	OFF	190	95	135	236	115	170
ON	**ON**	**ON**	OFF	175	85	125	217	105	155
OFF	OFF	OFF	**ON**	160	80	115	198	95	140
ON	OFF	OFF	**ON**	145	70	105	179	85	130
OFF	**ON**	OFF	**ON**	130	65	90	160	80	115
ON	**ON**	OFF	**ON**	115	55	80	141	70	100
OFF	OFF	**ON**	**ON**	100	50	70	122	60	85
ON	OFF	**ON**	**ON**	85	40	60	103	50	75
OFF	**ON**	**ON**	**ON**	70	35	50	84	40	60
ON	**ON**	**ON**	**ON**	55	25	40	65	30	45

4. SELECT THE BRAKING ACTION

Identify the type of braking required and then set SW1-2.

Dynamic Braking with Zero-Motion Hold	Coasting Stop:
OFF	ON

5. SELECT THE ROTATION

Identify the proper direction of rotation for the motor shaft in order to move objects from the upstream (entry) end of the conveyor towards the downstream (exit) end of the conveyor. The direction of rotation is defined when viewed from the back side of the motor with the shaft extending away from the viewer.

- For clockwise rotation, set SW1-1 to the ON position.
- For counter-clockwise rotation, set SW1-1 to the OFF position.

6. CONNECT USER I/O (OPTIONAL)

PNP Run Input: This connection is OR'ed with Hytrol EZLogic® input. When either is active the motor will run.

PNP Reverse Input: When this input is active and either the PNP Run input or the EZLogic® input is active, the motor will run in the opposite direction from the setting on SW1-1.

PNP Running Output: This output is active when either the PNP Run input or the EZLogic® input is active, regardless of the condition of the PNP Reverse input.

Analog +(0-10VDC) Input: This input may be used to override the speed set by switches SW2-1 through SW2-4.

- If the input is below 0.5 VDC, the speed defaults to that set by the switches.
  Note: The voltage drop across the return cable will cause the set voltage to vary.
- If the input is 9.0 VDC or higher, the speed will be the maximum speed for the motor type.
- If in the range of 0.5 to 9.0 VDC, the speed will be proportional to the input within the full speed range of the motor selected.

Unlike the switches, this input is dynamic and may be changed while the motors are operating.
Note: This input is referenced to the DC ground connected to pin 2 on the Power Input Connector.

DC Ground: This point is common to the DC ground on pin 2 of the Power Input Connector, should it be required for reference.

For more information, please contact your local Hytrol Integration Partner.

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