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Powered Flex Conveyor

Operation and Maintenance Manual



DO NOT OPERATE BEFORE READING

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General Overview



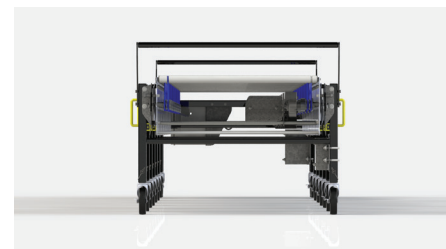
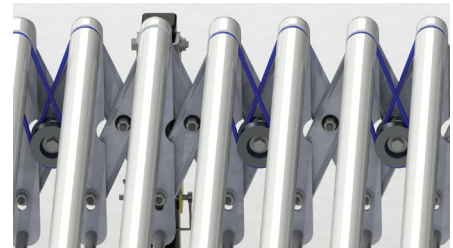
NAC Powered Flex Conveyor is a flexible, expandable, portable, powered roller conveyor that will stretch or bend to fit your available space and is ideal for truck loading and unloading areas, distribution centers or portable assembly lines.

Accumulation Style: Each zone contains a sensor array, motor and smart conveyor control logic. Zones run on demand only when the downstream zone is unoccupied. Packages accumulate at the end of a conveyor or in the zones prior to a full zone.

Transportation Style: Conveyor is always on, transporting packages continuously at a constant speed.

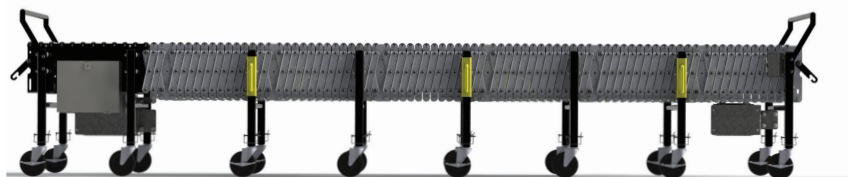
Features:

- 1-3/8" diameter rollers, 1-1/2" collapsed c/c, 3" expanded c/c
- 110 VAC input power
- Heavy-duty, sealed, quick-connect power cabling
- Rollers driven by high-tension, urethane O-ring belts
- Precision bearings
- Supports at 30" top of roller
- Locking, swivel casters with brake
- Pin-adjustable height plus or minus 4" on 1/2" increments
- Powder coated frame and supports
- Aluminum side flex bars
- Start/Stop button at each end
- Forward/Reverse switch on base end
- Entrance zone interface box includes dry contact relays for control of entrance zone driver card
- Exit zone interface box has speed control potentiometer along with dry contact relays for control of exit zone driver card



Accumulation Features:

- Motor driver cards contain internal accumulation logic
- Multiple release modes
- Run-On-Demand power savings
- Photo eye sensor array across full width in each zone
- Quick-connect RJ-12 communication cables
- Reverse mode is transportation only with package stop photoeye



Standard Product Specifications

		FX24-14ABF40T-3A5V1	FX24-14ABF60T-3A5V1
Conveyor Bed Width (BF)			
	Inches	24 or 30	30
	Millimeters	610 or 762	762
Load Capacity Per Linear Foot (305 mm)			
	Pounds	50	50
	Kilograms	22.5	22.5
Rollers			
	Inches	1.4	1.4
	Millimeters	34.9	34.9
	Axle	5/16"	5/16"
	Tube	18 GA	18 GA
	Bearings	Precision	Precision
Product Travel Speed			
	Feet per minute	60-150	60-150
	Meters per minute	45.72	45.72
Casters			
	Inches	5" x 1-1/4"	5" x 1-1/4"
	Millimeters	127 x 31.75	127 x 31.75
Adjustable Conveyor Height			
	Inches	26-34	26-34
	Millimeters	660-864	660-864
Expanded to Compressed Ratios			
	3" (76 mm) roller centers	1.8:1	1.8:1
Belts			
	Material	Cyclothane-B	Cyclothane-B
	Durometer	85A +/-3A	85A +/-3A
	Diameter	.1875"	.1875"
	Drive Color	Red	Red
	Drive Length	12-3/4"	12-3/4"
	Idler Color	Blue Transparent	Blue Transparent
	Idler Length	11-15/16"	11-15/16"
	Base Idler Color	Blue Transparent	Blue Transparent
	Base Idler Length	6-1/4"	6-1/4"

Powered Flex Conveyor

Standard Product Specifications (cont.)

Voltage		120VAC	120VAC
Amps		9.9 amps	15.1 amps
Drive Motor			
	Motor (continuous torque)	15 in-lbf/66.7N	15 in-lbf/66.7N
	Full Load Demand	4 amps	4 amps
	Voltage	24VDC	24VDC
Noise Level			
	Rating at conveyor bed level (approx.)	70dB	70dB
	Rating at ear level (approx.)	60dB	60dB
Conveyor Shipping Weights (per linear foot of expanded conveyor)(lbs./kgs)			
3" Roller Centers			
	Conveyor Width		
	30"	50/22.7	50/22.7

Safety Information

- Move conveyor only by grasping the handles located on the sides or at each end of the conveyor.
- When expanding or compressing your conveyor, keep hands, clothing and other items clear of the sidebars.
- Do not exceed the conveyor load capacity, as it may result in possible operator injury or conveyor damage.
- Avoid wearing excessively loose clothing when working with moving equipment.
- Keep long hair pulled up to prevent it from becoming caught in moving parts.
- Broken or worn parts must be replaced immediately.
- Powered Flex Conveyors must only be serviced by properly trained and qualified technicians.
- Conveyor's power cord must be connected to a grounded receptacle that is protected by an overcurrent device rated at no more than 30 amps, unless otherwise specified.
- Never service a conveyor with the power applied. Always disconnect power before servicing equipment and use the company's machine specific lockout/tagout procedures.
- Never operate conveyor with an electrical enclosure open, or any guards removed.

Installation

****Follow all proper safety precautions and plant installation procedures***

- 1) Unpack the NAC Powered Flex Conveyor and inspect for possible damage that may have occurred during shipping. Pay particular attention to the wiring to ensure that no wires are pulled loose or damaged in any way. If you find any damage, contact the factory before applying power to the conveyor.
- 2) Make sure all stop push-buttons are depressed (there will be one start/stop switch at each end of the conveyor.) Make sure fwd/rev switch is set to fwd.
- 3) Roll the unit into position. If applicable, use the connect hooks to attach the Powered Flex Conveyor to a rigid or other flexible conveyor. Connect the yellow interface cable as needed.
- 4) Conveyor must be installed to meet all local, city, state and national codes.
- 5) Plug the power cord into a 115 VAC/30 AMP **grounded** receptacle.
- 6) To start the conveyor, locate the base end with power supply enclosure and turn the disconnect switch on. Locate one of the on/off switches for the conveyor and press the green on button when ready to start the conveyor.

Note: Rollers will begin to move as soon as the on button is pressed. If step 2 was not followed, the rollers will turn on as soon as the disconnect is turned to on.
- 7) If needed, the speed of the conveyor can be adjusted via the potentiometer on the DC Variable Speed Drive located at the base end of the conveyor.
- 8) Begin placing packages on the conveyor.

Interface Kit Specifications

NorthAmCon's standard Powered Flex Conveyor comes with a basic interface kit. The basic kit includes everything needed for interfacing with other NorthAmCon Powered Flex Conveyors. It may also be compatible with some other manufacturers with similar controls schemes at the interface point. If another manufacturer's interface is not compatible with the basic kit, an optional kit can be purchased. The list of compatible manufacturers and those that require the optional kit are shown below. Contact the factory with questions.

- a. *No interface kits should be needed for the following conveyor manufacturers:
 - i. Best/FMH
 - ii. Dematic
 - iii. Wynright
- b. *One optional interface kit will likely be needed per flex connection point with Intelligrated or Roach equipment.
 - i. If there is a possibility of connecting all of the Powered Flex Conveyor at one site to an Intelligrated or Roach conveyor, then one interface kit per Powered Flex Conveyor would likely be required.
 - ii. If connecting at both the infeed and discharge ends of the NorthAmCon Powered Flex Conveyor, then (2) interface kits would likely be required per unit.

*Based on Feb 2017 data

The operating voltage of the NorthAmCon's Powered Flex Conveyor is 24VDC, however the included basic interface uses dry contacts/relays to work with multiple voltages (110VAC or 24VDC). The relays are utilized to communicate Ready-To-Receive (RTR) and Ready-To-Send (RTS) signals between conveyors. See the interface schematics for more specific information.

NorthAmCon's Powered Flex Conveyors are equipped with a yellow Turck Mini connector at each end of the conveyor. The below pictures show the orientation and location of the connectors on the conveyor. To connect two Powered Flex Conveyors together (from a controls standpoint) simply connect the male and female ends of the cables together. The conveyors should now function as one unit.

Powered Flex Conveyor
Discharge Connector – 6 Pin Male



Powered Flex Conveyor
Infeed Connector – 6 Pin Female



Interface Kit Specifications (cont.)

Powered Flex Conveyor
Infeed End/Connector



Powered Flex Conveyor
Discharge End/Connector



Connecting Two Powered Flex Conveyors



Power Requirements

Each NorthAmCon Flex Conveyor requires:

- **Grounded** 115VAC/30 AMP plant **L5-30R receptacle** located close enough to the conveyor to not cause any strain on the power cable.
- Must meet all **Local and National Electrical Codes.**

Voltage and amperage requirement for the powered flex conveyor are as follows:

- 40' Flex = 9.9 amps 115VAC
- 60' Flex = 15.1 amps 115VAC

The conveyors are equipped with:

- (1) 10/3 SJOOW 6-foot power cable with (1) unmarked twist lock L5-30P plug at the conveyor base/discharge end.
- (2) 10/3 SJOOW power extension pass through cables, (1) cable marked ■ red and cable marked ■ yellow, each with (1) **L5-30R receptacle** flush with the conveyor Infeed end and (1) **L5-30P plug** extended 6-feet from the conveyor base/discharge end.
- (1) 10/3 SJOOW reverse power extension pass through cable marked ■ blue with (1) **L5-30R receptacle** flush with the conveyor base/discharge end and (1) **L5-30P plug** extended 6-feet from the conveyor infeed end.

Receptacle
L5-30R



Plug
L5-30P



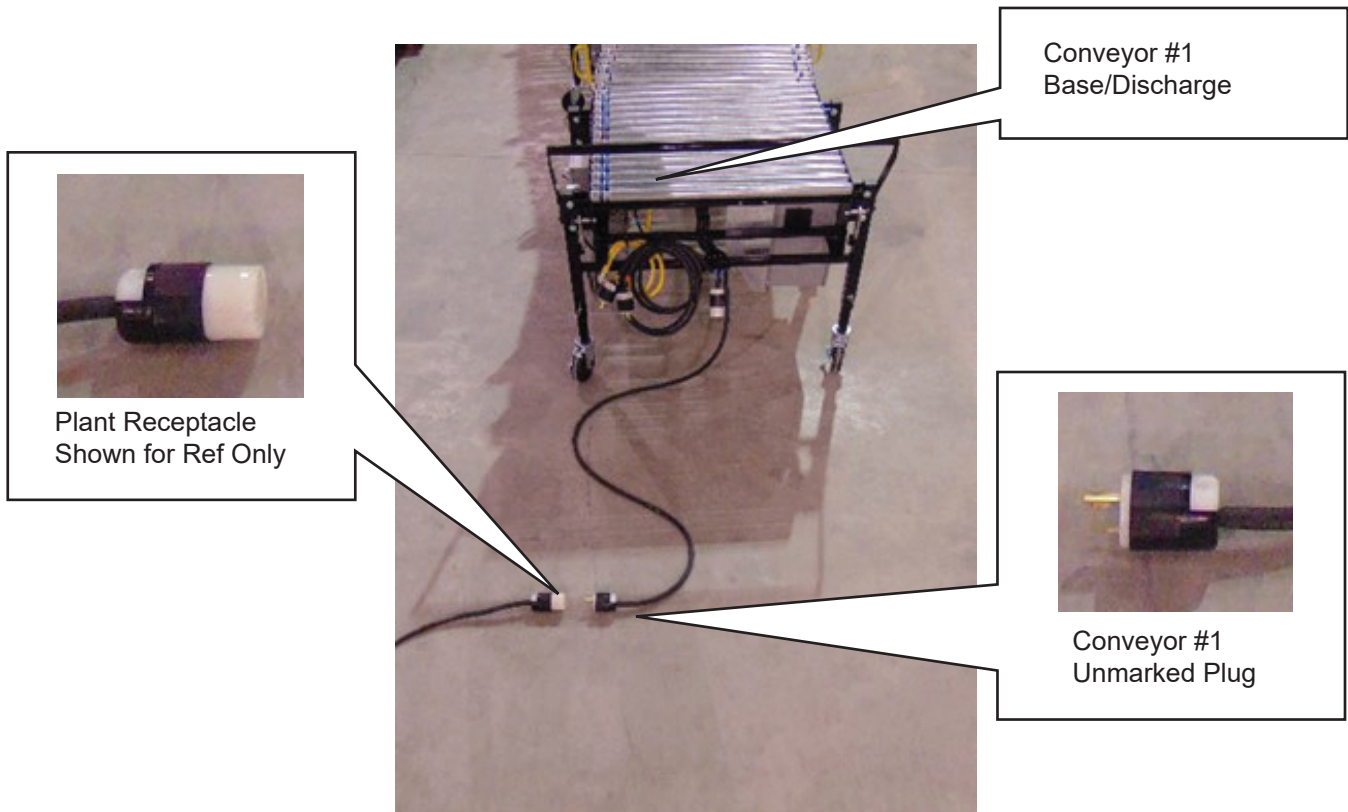
Power Requirements (cont.)

The NorthAmCon Flex Conveyor can receive power from:

- The unmarked power cable at the base/discharge end of the conveyor. (see step A)
- The power extension pass through cable marked ■ red, on the first flex conveyor, allows a second flex conveyor to receive power from the base/discharge end of the first flex conveyor. (see step B)
- The power extension pass through cables marked ■ yellow, on the first and second flex conveyor, allows a third conveyor to receive power from the base/discharge end of the first flex conveyor. (see step C)
- The reverse power extension pass through cable marked ■ blue, allows the flex conveyor to receive power from the infeed end of the conveyor. (see step D)

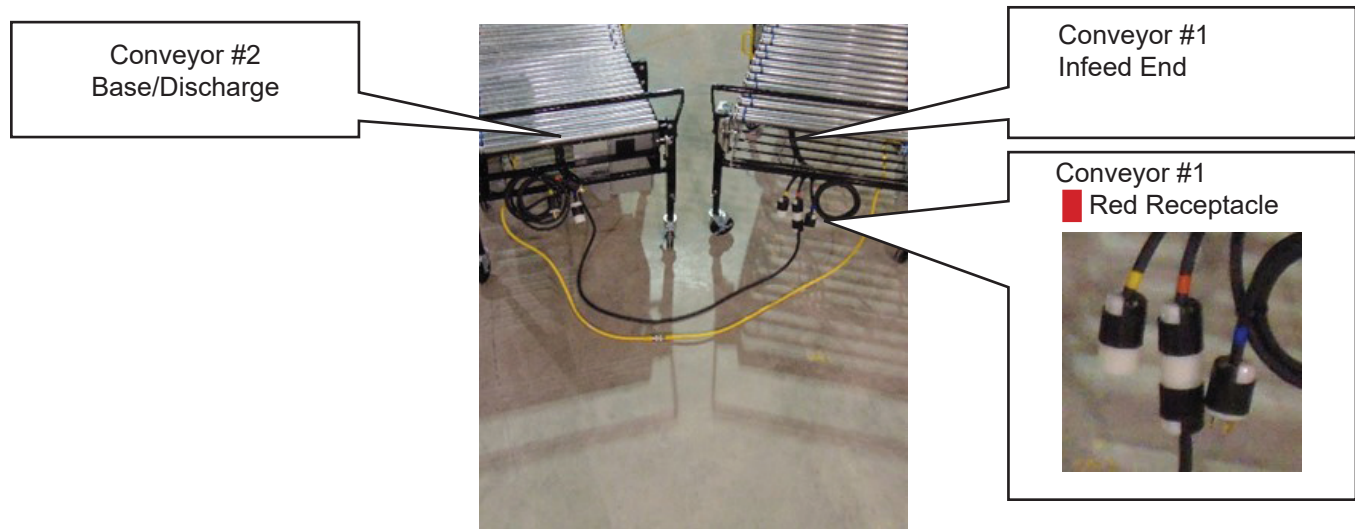
A. When powering a NorthAmCon Flex Conveyor from the base/discharge end:

- Simply plug the 6-foot power cable with the unmarked plug into a 115 VAC/30 AMP **grounded** plant receptacle.

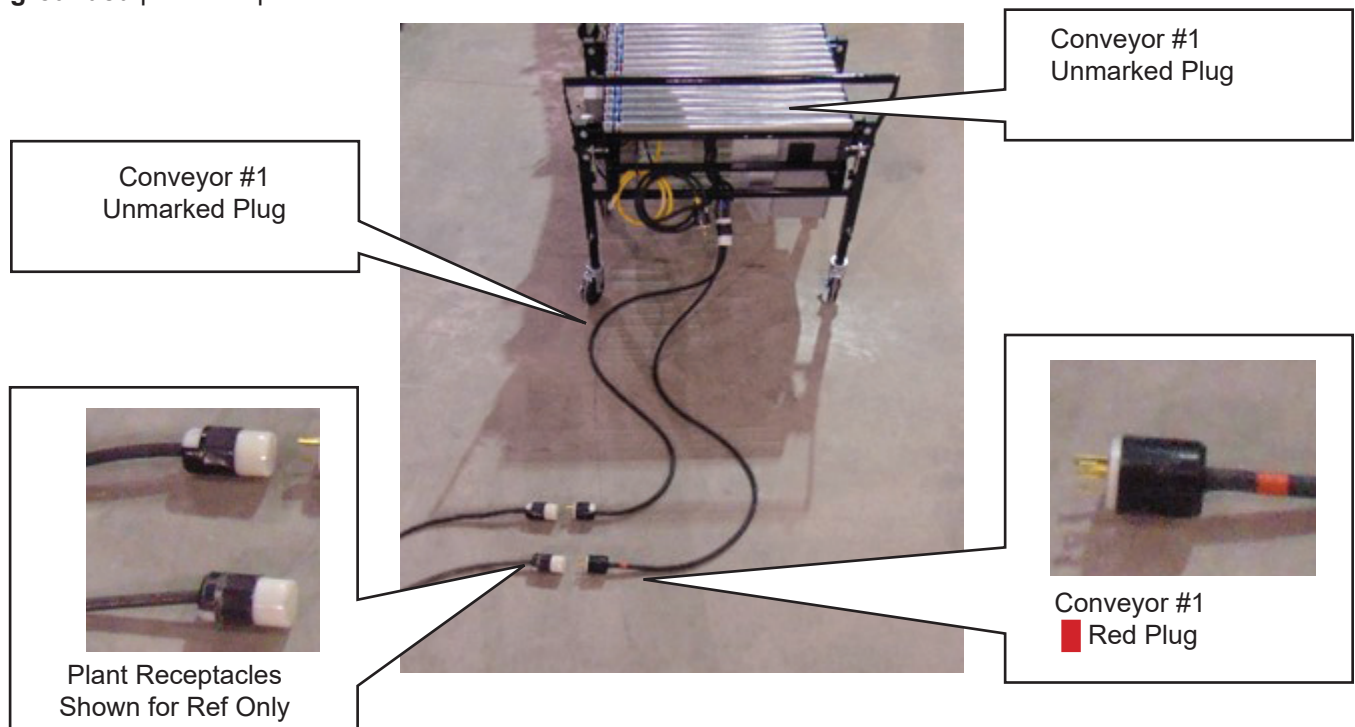


Power Requirements (cont.)

- B. When powering a second NorthAmCon Flex Conveyor from the base/discharge end of another Flex Conveyor, via the power extension pass through cable:
- Follow step (A) for powering conveyor #1.
 - At the base/discharge end of conveyor #2, plug the unmarked plug into the red marked extension cable receptacle at the infeed end of conveyor #1.

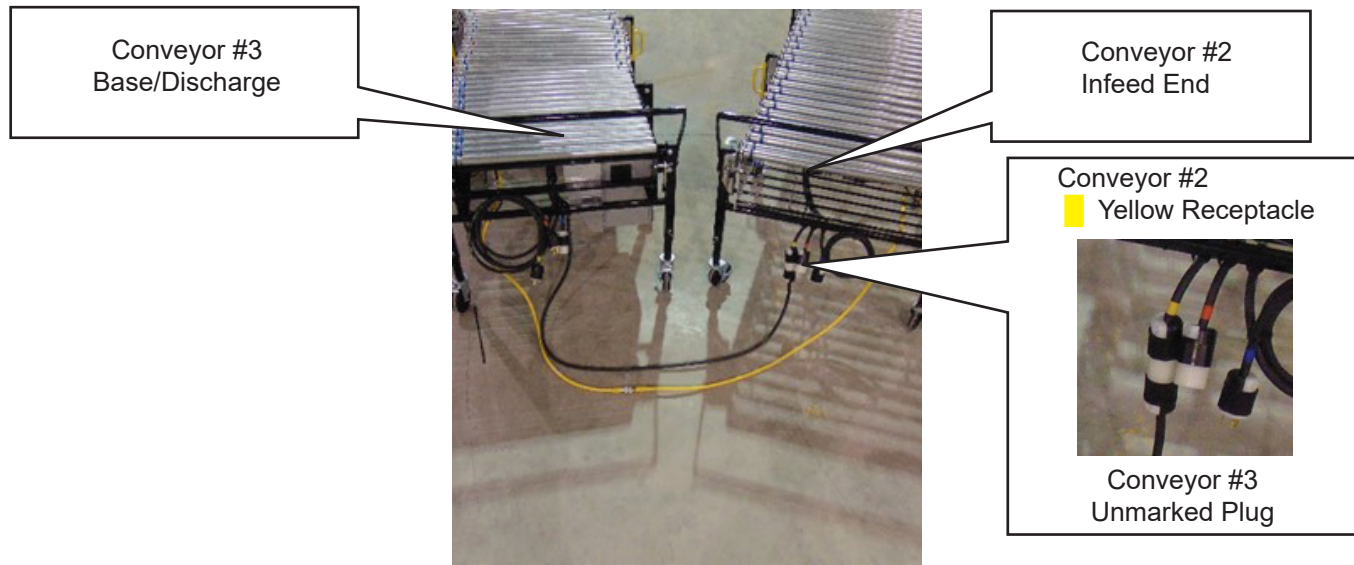


At the base/discharge end of conveyor #1, plug the ■ red marked extension cable plug into a 115 VAC/30 AMP **grounded** plant receptacle.

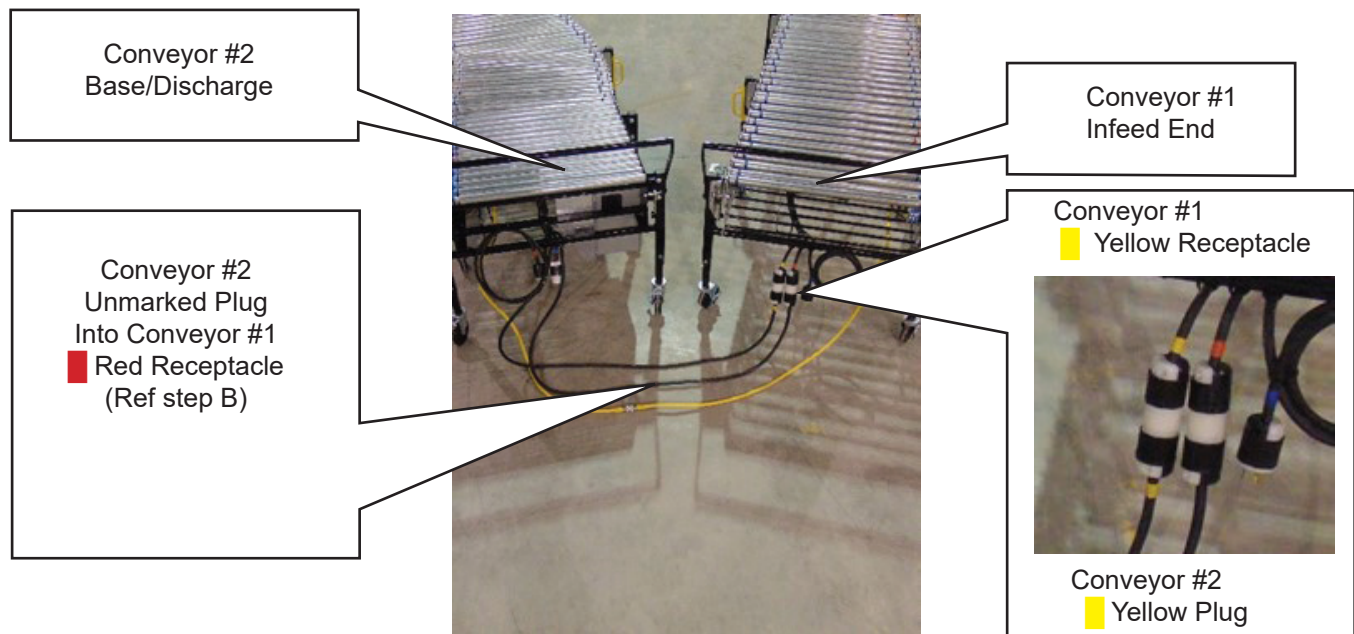


Power Requirements (cont.)

- C. When powering a third NorthAmCon Flex Conveyor from the base/discharge end of another Flex Conveyor, via the power extension pass through cables:
- Follow step (B) for powering conveyors #1 and #2.
 - At the base/discharge end of conveyor #3, plug the unmarked plug into the ■ yellow marked extension cable receptacle at the infeed end of conveyor #2.

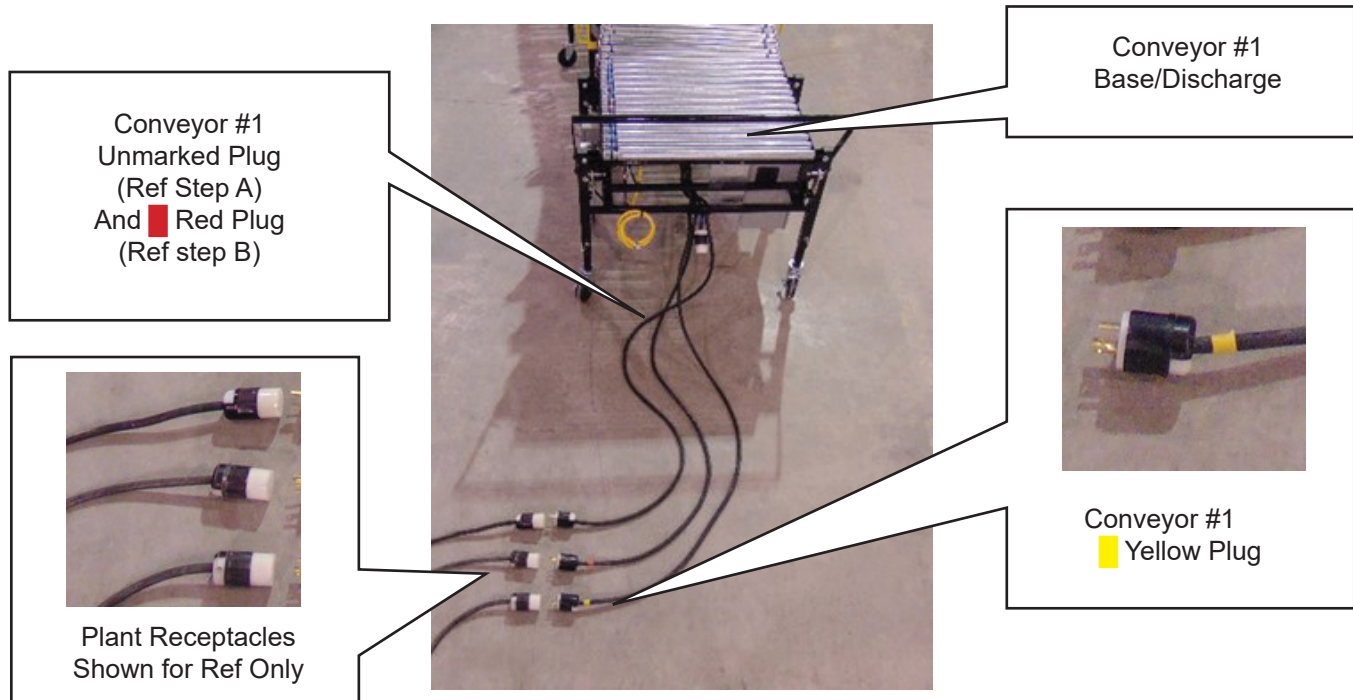


- At the base/discharge end of conveyor #2, plug the ■ yellow marked extension cable plug into the ■ yellow marked extension cable receptacle at the infeed end of conveyor #1.



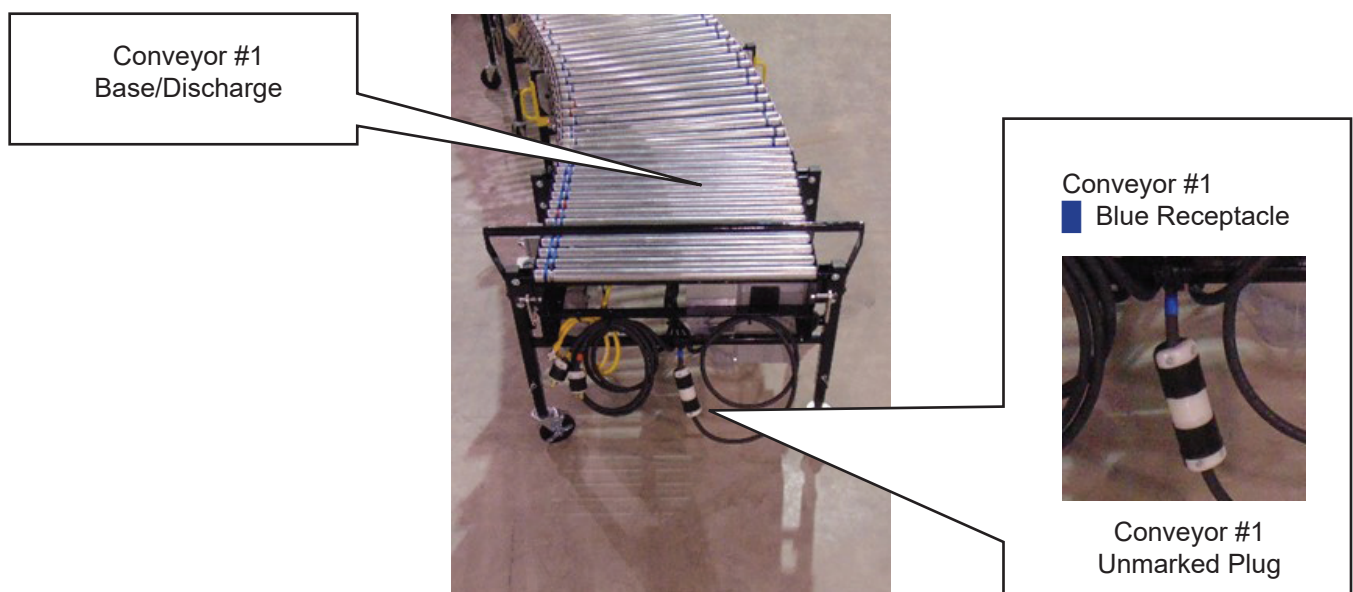
Power Requirements (cont.)

- At the base/discharge end of conveyor #1, plug the  yellow marked extension cable plug into a 115 VAC/30 AMP grounded plant receptacle



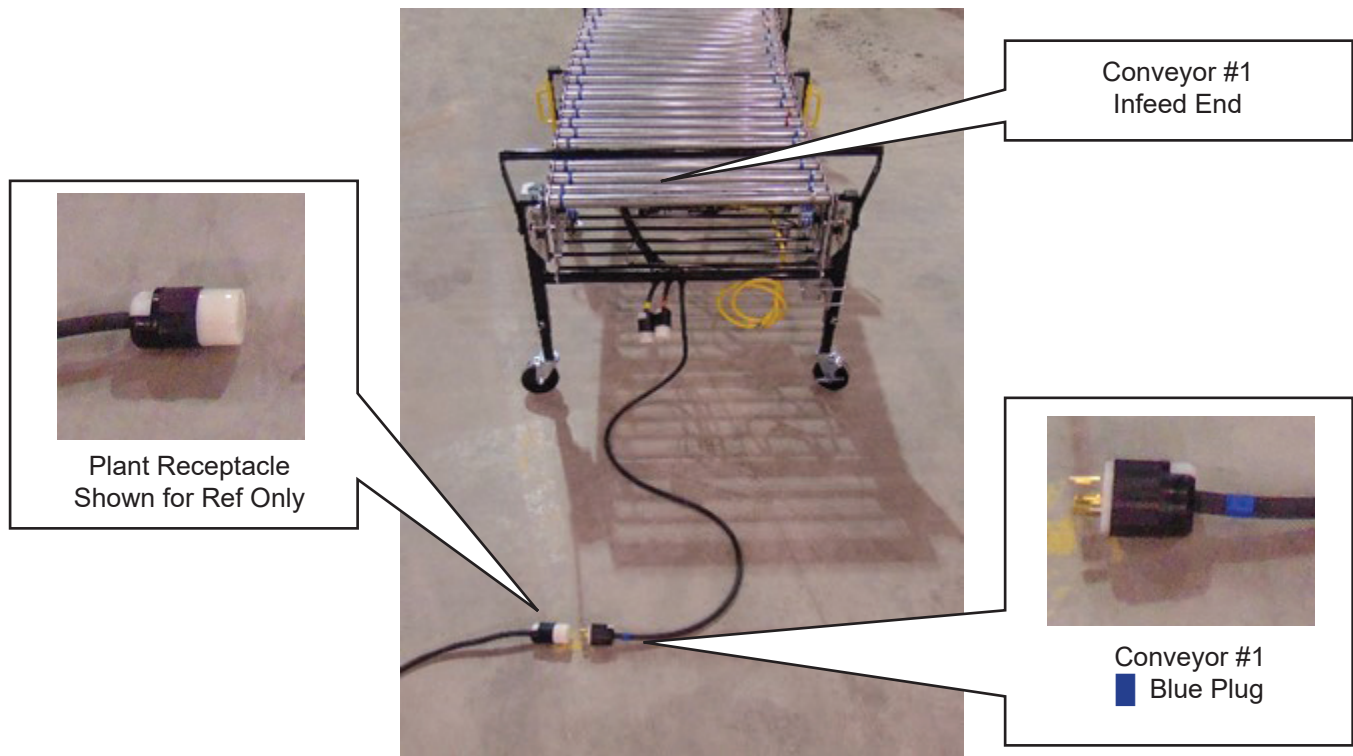
- D. When powering a NorthAmCon Flex Conveyor from the infeed end, via the reverse power extension pass through cable:

- At the base/discharge end of the conveyor, plug the unmarked plug into the  blue marked extension cable receptacle.



Power Requirements (cont.)

- At the infeed end of the conveyor, plug the  blue marked extension cable plug into a 115 VAC/30 AMP **grounded** plant receptacle.



Maintenance Procedures

Follow general maintenance safety procedures and review safety material prior to performing maintenance on any equipment. Follow your company machine specific lockout/tagout procedures prior to performing any maintenance.

NorthAmCon recommends regular inspections of the powered flexible conveyor to ensure proper operation of mechanical, electrical, and safety systems.

DAILY MAINTENANCE

- Keep the conveyor clean and free of debris, dirt and grease accumulation.
- Inspect wires and cables for damage. If damage to wires or cables is found, disconnect the power cord immediately and do not operate unit until proper repair is completed.
- Inspect belts for wear. Replace excessively worn belts.
- Inspect for loose fasteners or missing parts. Tighten or replace as needed.
- Verify all Start/Stop push-buttons operate properly.

WEEKLY MAINTENANCE

Unit Safety Check

- Confirm placement of all warning labels.
- Check for unrestrained/pinched wiring, loose wiring connectors, nip points and other hazards.
- Check Mech-Drive Controller drive card for any warning lights.
- Check for loose bolts and tighten as needed.

MONTHLY MAINTENANCE

Belt Tension

- Check for consistent belt tension between rollers and replace belts as needed.
- Verify drive sheave set screws are tight.

QUARTERLY MAINTENANCE

Drives

- Ensure that motor is operating within its proper heat and noise range

Troubleshooting

PROBLEM	CAUSE	SOLUTION
None of the Zones Will Run	Power supply if off	Turn on power supply
	Power supply is not receiving AC power	Check AC power
	AC power fuse is blown or breaker is tripped	Replace fuse, check breaker
	Power supply breaker is tripped	Check power supply breaker
	No power to flat motor ZPA module	Check output power of power supply
	Power supply voltage too high or too low	Check output voltage of power supply
Entry Zone Will Not Turn On	Missing wake-up zone photo-eye	Add wake-up photo-eye
	Entry zone photo-eye not aligned properly	Check wake-up photo-eye alignment
	Missing/incorrect handshaking wiring	Check handshaking wiring
	Incorrect DIP switch setting	Check DIP switches
	No power to ZPA module	Check power connections
	Motor cable not connected to ZPA module	Check motor connections
Transport Zone Will Not Turn On	Communication wiring missing or not plugged in	Check upstream and downstream communication wiring
	Photo-eye is blocked or misaligned	Check photo-eye and reflector
	Incorrect DIP switch setting	Check DIP switches
	No power to ZPA module	Check power connections
	Motor cable not connected to ZPA module	Check motor connections
Transport Zone Will Not Turn Off	Upstream zone is attempting to send product	Check photo-eye alignment in upstream zone
	Upstream zone is attempting to send product	Check for jammed product in upstream zone
Entry Zone or Transport Zone will Not Discharge Product	Communication wiring missing or not plugged in	Check communication wiring
	Downstream zone is full	Remove product from downstream zone
	Downstream zone photo-eye not aligned properly	Check downstream photo-eye
Exit Zone Will Not Discharge Product	Incorrect handshaking wiring	Check handshaking wiring
	Downstream device not sending a release signal	Check downstream device output signals
	DIP switch not configured properly	Check DIP switches

Troubleshooting

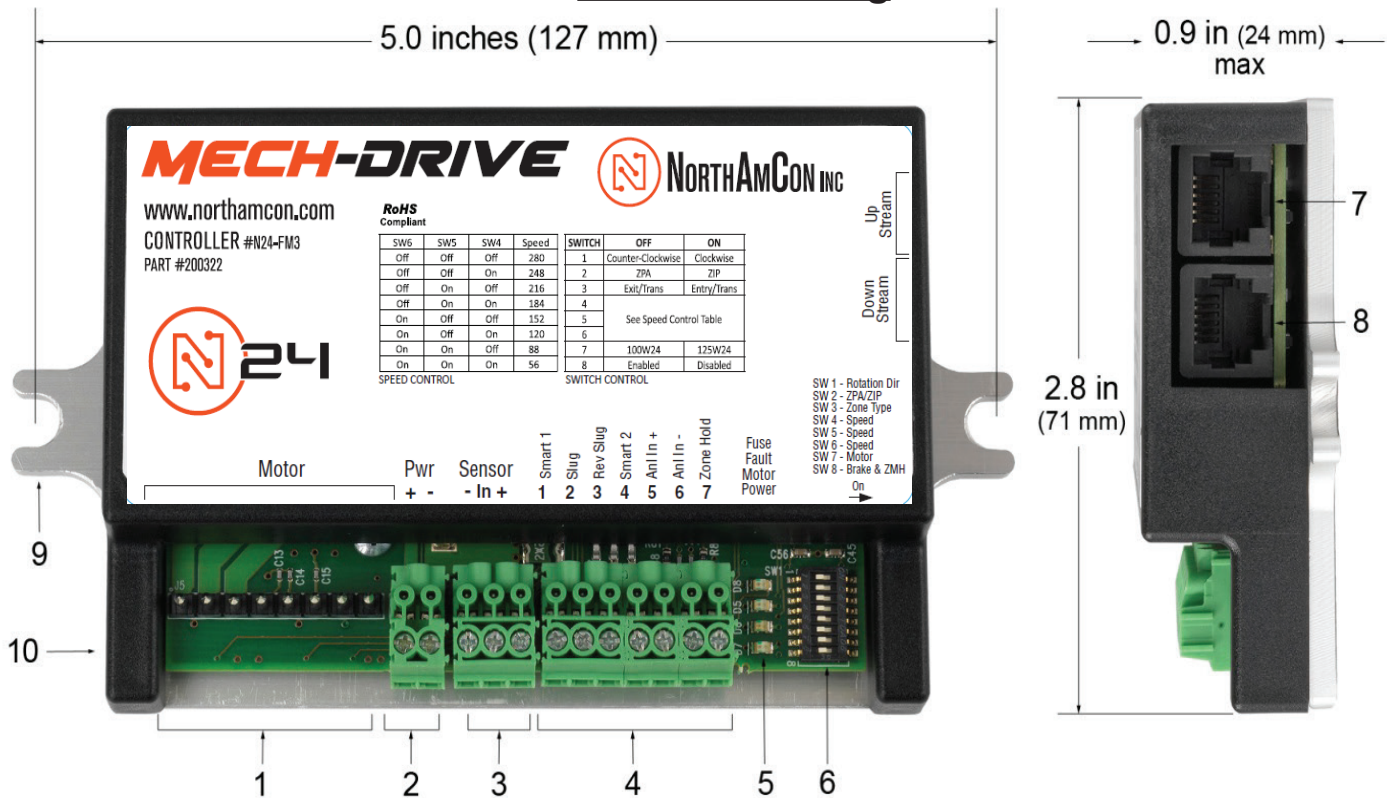


Figure 1: MECH-DRIVE N24-FM3 Controller Components

- 1) Motor Connection Header
- 2) +24V DC Power Input Header (plug included)
- 3) PNP Sensor Connection Header (plug included)
- 4) Smart/User Input-Output Connection Header (plug included)
- 5) Feedback LED Indicators
- 6) Configuration Switches
- 7) Upstream Peer-to-Peer PNP RJ-12 Connection
- 8) Downstream Peer-to-Peer PNP RJ-12 Connection
- 9) Mounting Plate/Heat Sink
- 10) Cover

NOTE: This guide refers to the components by their item number as listed above.

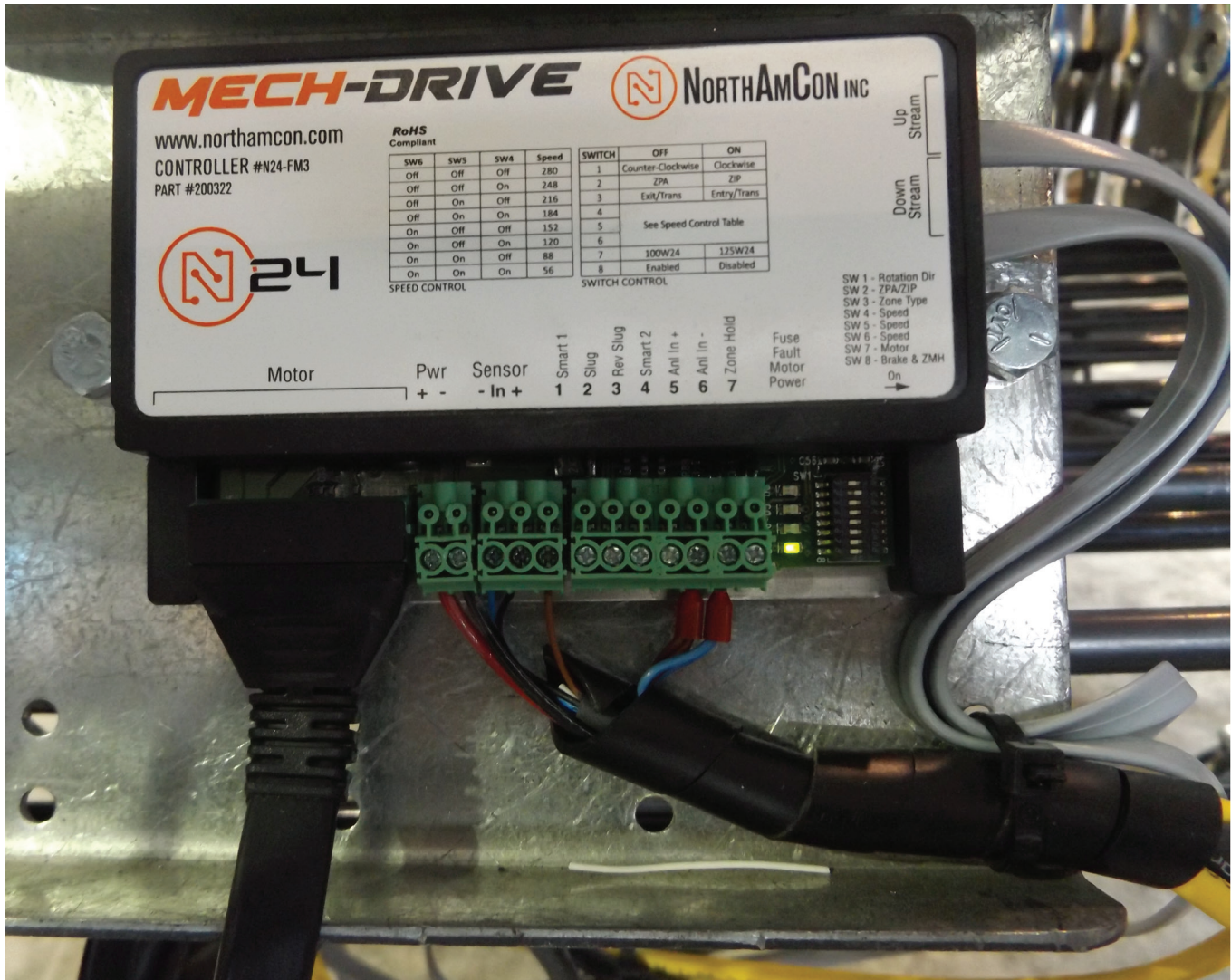
Troubleshooting (cont.)

The Mech-Drive N24-FM3 provides four (4) LED indicators shown as item 5 in Figure 1: Mech-Drive N24-FM3 Controller Components. 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.

PROBLEM	CAUSE	SOLUTION
No LED's On	No power to the system	Check power supply
FUSE LED (RED) is On	Fuse is blown	Check wiring
		Replace fuse
FAULT LED 5.1 (RED) - Constantly On	Stalled motor or blocked photoeye	Check for mechanical obstructions
FAULT LED 5.1 (RED) - 1 Flash in 4 Seconds	ZPA module problem	Replace ZPA module
FAULT LED 5.1 (RED) - 2 Flashes in 4 Seconds	Input voltage too high	Check power supply
FAULT LED 5.1 (RED) - 3 Flashes in 4 Seconds	Input voltage too low	Check power supply
FAULT LED 5.1 (RED) - 4 Flashes in 4 Seconds	Problem with motor cable connection	Check motor cable for damage and secure connection to ZPA module
FAULT LED 5.1 (RED) - 5 Flashes in 4 Seconds	Control over temperature	Allow card to cool. Check for ambient temperature and heat sources. Check for proper motor function and wiring. Cycle power to reset.
FAULT LED 5.1 (RED) - 6 Flashes in 4 Seconds	Extreme over current	Check for proper motor function and damaged wiring. Allow unit to cool. Cycle power to reset.
MOTOR LED 5.2 (AMBER) - Constantly On	ZPA module is current limiting the flat motor	If condition persists, check for obstructions
MOTOR LED 5.2 (AMBER) - Flickering	Flat motor is drawing significant current during startup, ZPA module is current limiting	No action required
		Motor may not reach full speed
MOTOR LED 5.2 (AMBER) - 4 Flashes in 4 Seconds	ZPA module has overheated and current limiting the flat motor to about 1/2 normal operation	Check for mechanical obstruction
		Allow ZPA module to cool, before restarting
POWER LED 5.3 (GREEN) - Constantly On	Power is properly applied and fuse is not blown	Normal operation

Troubleshooting (cont.)

Mech-Drive Controller wiring and lights during normal operation.



Troubleshooting (cont.)

Power Supply with power applied during normal operation.



If not lit up green, power is not applied to the conveyor:

1. Check to be sure disconnect is in the ON position
2. Check Start/Stop buttons
3. Check power source
4. Check for loose wires inside enclosure

Warranty Statement

The Seller warrants that the Equipment will be free of defects in workmanship and material (if properly installed, operated and maintained) for a period of one year or 2080 hours of use, whichever is sooner, from date of shipment to Customer, subject to the limitations hereunder set forth. If within the one year warranty period, the Seller receives from the Customer written notice of any alleged defects in the Equipment and if the Equipment is not found to be in conformity with this warranty (the Customer having provided the Seller a reasonable opportunity to perform any appropriate tests thereon) Seller will, at its option, either repair the Equipment or supply a replacement therefore.

The Seller under either option shall have the right to require Customer to deliver the Equipment to Seller's designated service center and the Customer shall pay all charges for in-bound and out-bound transportation and for services of any kind, diagnostic or otherwise, excepting only the direct and actual costs of repairing or replacing the Equipment. If after reasonable effort the Seller cannot correct said deficiencies, the Seller will make an equitable price adjustment based on actual performance, provided that such adjustment shall under no circumstances exceed the purchase price. The Seller further warrants that the parts, and components supplied by the Seller and forming a part of the Equipment will be free from defects in material and workmanship for a period of one year or 2080 hours of use, whichever is sooner, from date of shipment to the Customer. The Seller's liability shall be solely limited to the supplying of replacement parts and materials.

For a copy our full warranty included in our Terms and Conditions of Sale, contact NorthAmCon, Inc.

See page 25 for detailed Return Merchandise Authorization Procedures.

Warranty and Return Authorization Procedures

If the part in question is included in the replacement parts package, the following procedure will apply:

- Identify the part number from the manual
- If part is indicated as wear part
 - Replace the damaged or defective part from parts inventory
 - Order additional parts as required
- If the part is indicated as a warranty part
 - Replace the damaged or defective part from parts inventory
 - Contact NAC for a Return Merchandise Authorization (RMA) number
 - Have conveyor serial number available when contacting NAC.
 - Send the part to the following address
NorthAmCon
3544 US 23 North
Alpena, MI 49707
Attn: Flex Product Manager
- Include the conveyor serial number and RMA number on the packaging and the packing slip
- NAC will inspect the part and make a warranty determination
- If the part is under warranty, NAC will...
 - ship a replacement to Customer to replenish parts stock
 - Issue a credit for the freight

If the part in question is not included in the replacement parts package, the following procedure will apply:

- Identify the part number from the manual
- Contact NAC for an initial review to establish if part is covered under warranty and to provide a quote if needed.
 - Have conveyor serial number available when contacting NAC
- Issue a purchase order for a replacement part
- NAC will issue a Return Merchandise Authorization (RMA) number for the part to be returned.
- Send the part to the following address
NorthAmCon
3544 US 23 North
Alpena, MI 49707
Attn: Flex Product Manager
- Include the conveyor serial number and RMA number on the packaging and the packing slip
- NAC will inspect the part and make a warranty determination
- If the part is under warranty, NAC will Issue a credit to Customer for the purchased part and associated freight charges