

Speed Sensor



Read and understand equipment operators manual before operating or performing maintenance. Failure to do so could result in serious injury or death.

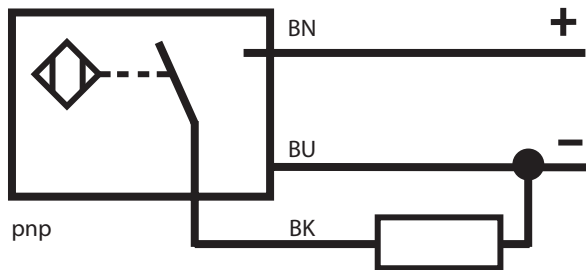
Safety Information

⚠ WARNING
<p>Failure to follow instructions below could result in death or serious injury:</p> <ul style="list-style-type: none"> • Lockout/Tagout/Blockout before performing maintenance or installation. • Follow installation instructions completely. Failure to do so may cause death or serious injury.

NOTICE
<p>Route Speed Sensor wires/conduit away from electrical power conduit to prevent electromagnetic interference, which results in lost signal and faulty readings.</p> <p>Wiring conduit from control box to Speed Sensor offers greater cable protection. Any damage to cable can interrupt Smart Monitor from receiving sensor signal.</p> <p>Use of flexible conduit prevents need of strain relief. Route wires or flexible conduit along Speed Sensor mounting bracket towards hinge point allowing free motion of hinge. Check wires are not restricting Speed Sensor movement.</p>

Wiring Diagram

Figure 1



Electrical Data:

Nominal Voltage [V] - 110...240 AC (50...60 Hz) / 27 DC (typ. 24 DC)

Voltage tolerance [%] - -20...+10

Power consumption [VA] - 19.6...27.7 DC SELV, ≤ 15 mA

Inputs:

pnp/npn; NAMUR (24 V)

auxiliary supply : typ. 24 V DC / 15 mA; short-circuit protected

threshold pnp: > 12 V on; < 5 V off

threshold npn; > 15 V off; < 8 V on

Input frequency (max): 5 kHz (corresponds to min. pulse length / space 0.1 ms)

Outputs

Relay

Contact Rating

- 6 A (250 V AC); B300,R300

Transistor

Transistor Outputs

-pnp; external supply

-switching voltage/current: 24 V DC / max. 15 mA; short-circuit protected

Analog

Analog Output

- 0/4...20 mA

Max. Load [

-500

-Limitation: 20.5 mA; accuracy: 1% (of final value)

Measuring / Setting Range

Setting Rang [pulses/min.]

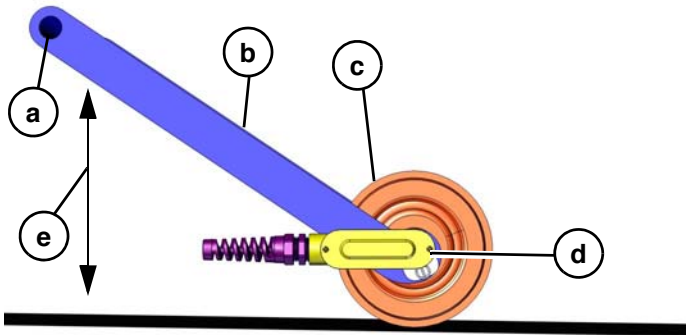
-1...60000 (0.1...1000 Hz)

Clean Side Roll Installation

NOTICE

- Clean side roll must be installed in a location with free movement or premature failure may occur.
- Clean side roll may not be used on a reversing belt.
- If mounted improperly severe roll and belt damage may occur.

Figure 2



- a. Hinge Point
- b. Mounting Arm
- c. Clean Side Roll
- d. Roll Speed Sensor

- Install clean side roll speed sensor on clean side of belt.
- Do not exceed 45° (e) (Figure 2) on mounting arm.
- Mount in most convenient place to wire.
- Position roll on top or near return roll. This will prevent belt sagging.
- Avoiding beater bar or any other such kind of excessive vibration

Follow Instructions below for proper clean side roll speed installation:

1. Insert shaft hinge point on clean side roll.
2. Install retaining collar on each end and tighten set screws.

Note: Do not fully tighten set screws.

3. Install mounting brackets to conveyor at mounting location.

Note: Holes may be need to be drilled on conveyor for brackets.

4. Tighten retaining collar set screws after setting within 1/8 inch of hinge point.
5. Slide shaft sets into slots on mounting brackets and install end clips over shaft.

Clean Side Speed Sensor Wiring

⚠ WARNING

Heed to following warnings. Failure to do so could result in death or serious injury.

- Disconnect and lockout power before performing any maintenance or work on unit.
- Wear proper PPE during work and maintenance.

NOTICE

- No setup required for sensor inside return roll.
- Do not operate without a load. Dead short may result and cause permanent damage.
- DO not use incandescent light bulbs as a load. Overload may occur due to extremely high cold current.
- Do not pull wires connected to speed sensor. Pulling may cause damage.
- Do not directly operate a motor with sensor.
- Do not directly operate a motor with sensor.
- Do not apply voltage directly across speed sensor wires permanent damage may occur.
- Do not apply power to sensor immediately after installation. Verify circuits meet sensor specifications.

Specifications:

1/2" 90° elbow conduit access port

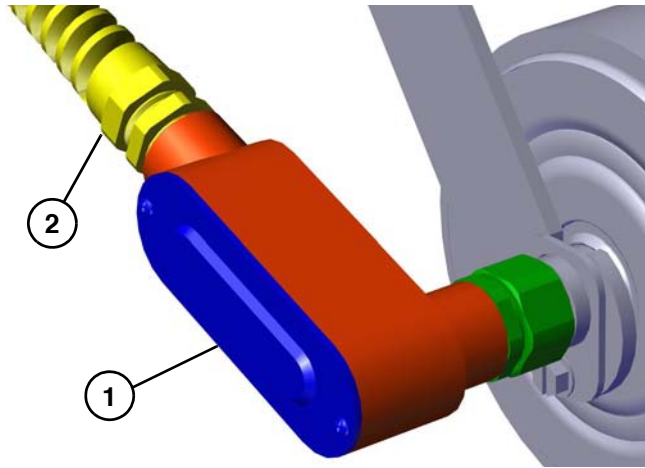
2 wire

22 AWG

PVC jacket

6 ft.PVC insulation

Figure 3



Follow instructions below for proper wiring:

1. Rout wiring from monitor to return roll speed sensor.

Note: use minimum of 22 AWG shielded cable.

2. Remove cover (1) (Figure 3) from 90° elbow conduit access port
3. Run monitor wire through elbow conduit opening (2) (Figure 3).
4. Connect monitor and speed sensor wires.

Note: Cut wires to fit within elbow conduit.

5. Install elbow conduit access port cover and tighten screws.

Return Roll installation

⚠ WARNING

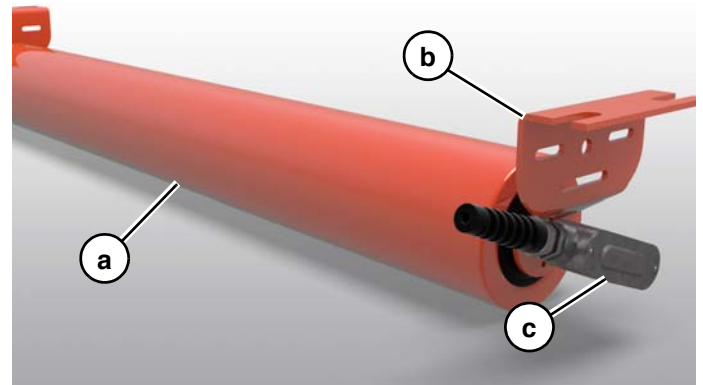
Heed to following warnings. Failure to do so could result in death or serious injury.

- It is recommended to run wires/conduit from speed sensor away from electrical power conduit. Electrical power may cause interference with speed sensor signal.

NOTICE

Go to Return Roll Installation within conveyor manual for proper return roll installation instructions.

Figure 4



- a. Return Roll
- b. Return Roll Bracket
- c. Speed Sensor

1. Place speed sensor on return belt side of conveyor.
2. Select which conveyor side conduit/wires for speed sensor will be ran.
3. Ensure drop brackets are installed.
4. Unscrew and carefully remove hex bushing on speed sensor.
5. Run wires from sensor through proper drop bracket and place return roll into brackets.

Note: Ensure wiring is not pinched or crushed after being installed through bracket.

6. Lock return rolls into place

Note: Bend tab against shaft to fully secure roller.

7. Place wiring through hex bushing and thread onto speed sensor and shaft.
8. Ensure return roll is centered on conveyor.
9. Tighten drop brackets bolt into conveyor frame.

Return Roll Speed Sensor Wiring

⚠ WARNING

Heed to following warnings. Failure to do so could result in death or serious injury.

- Disconnect and lockout power before performing any maintenance or work on unit.
- Wear proper PPE during work and maintenance.

NOTICE

- No setup required for sensor inside return roll.
- Do not apply voltage directly across speed sensor wires permanent damage may occur.
- DO not use incandescent light bulbs as a load. Overload may occur due to extremely high cold current.
- Do not operate without a load. Dead short may result and cause permanent damage.
- Do not directly operate a motor with sensor.
- Do not pull wires connected to speed sensor. Pulling may cause damage.
- Do not apply power to sensor immediately after installation. Verify circuits meet sensor specifications.

Specifications:

1/2" 90° elbow conduit access port

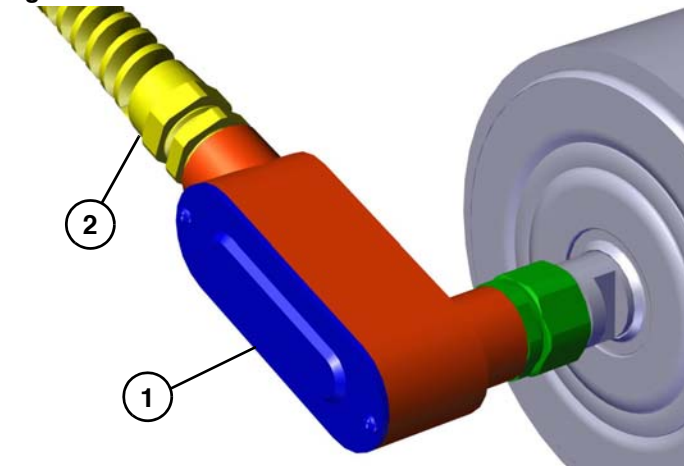
2 wire

22 AWG

PVC jacket

6 ft.PVC insulation

Figure 5



Follow instructions below for proper wiring:

1. Rout wiring from monitor to return roll speed sensor.

Note: use minimum of 22 AWG shielded cable.

2. Remove cover (1) (*Figure 5*) from 90° elbow conduit access port

3. Run monitor wire through elbow conduit opening (2) (*Figure 5*).

4. Connect monitor and speed sensor wires.

Note: Cut wires to fit within elbow conduit.

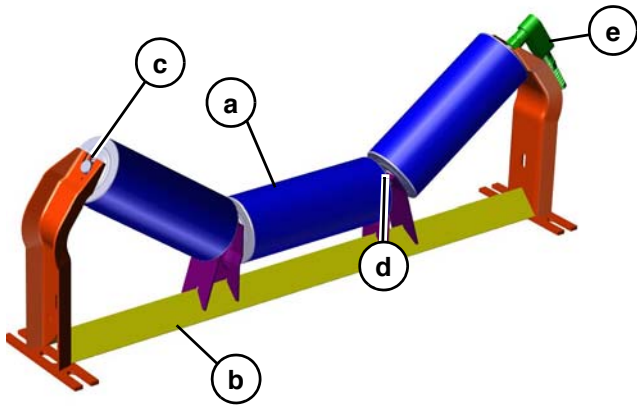
5. Install elbow conduit access port cover and tighten screws.

Idler Speed Sensor Installation

NOTICE

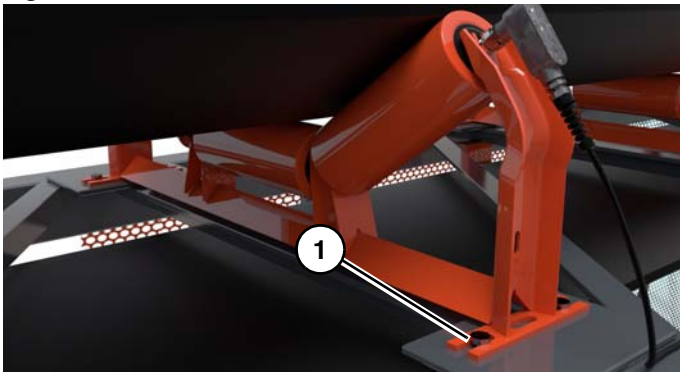
- Go to idler Installation within conveyor manual for proper return roll installation instructions.
- It is recommended to run wires/conduit from speed sensor away from electrical power conduit. Electrical power may cause interference with speed sensor signal.

Figure 6



- Roll
- Frame
- Bracket
- Retainer Clip
- Roll Speed Sensor

Figure 7



Follow Instructions below for proper idler roll speed installation:

1. Place idler on frame, align holes and secure with supplied hardware (1) (Figure 7).
2. With hardware still loose, slide both sides of idler towards head of conveyor.
3. Tighten bolts completely.

Return Roll Speed Sensor Wiring

⚠ WARNING

Heed to following warnings. Failure to do so could result in death or serious injury.

- Disconnect and lockout power before performing any maintenance or work on unit.
- Wear proper PPE during work and maintenance.
- Do not apply voltage directly across speed sensor wires permanent damage may occur.
- DO not use incandescent light bulbs as a load. Overload may occur due to extremely high cold current.
- Do not operate without a load. Dead short may result and cause permanent damage.
- Do not directly operate a motor with sensor.
- Do not pull wires connected to speed sensor. Pulling may cause damage.
- Do not apply power to sensor immediately after installation. Verify circuits meet sensor specifications.

NOTICE

- No setup required for sensor inside return roll.

Specifications:

1/2" 90° elbow conduit access port

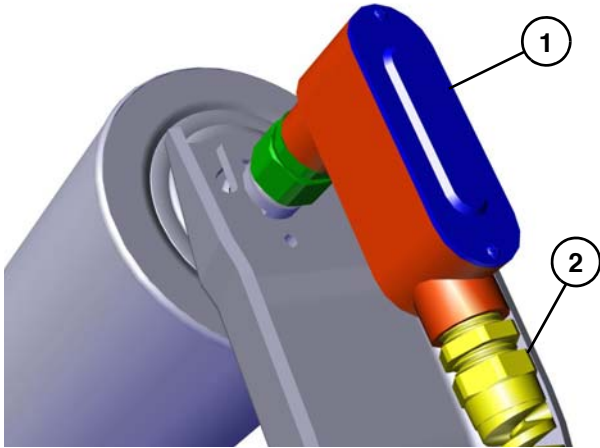
2 wire

22 AWG

PVC jacket

6 ft.PVC insulation

Figure 8



Follow instructions below for proper wiring:

1. Rout wiring from monitor to idler roll speed sensor.

Note: use minimum of 22 AWG shielded cable.

2. Remove cover (1) (Figure 8) from 90° elbow conduit access port
3. Run monitor wire through elbow conduit opening (2) (Figure 8).
4. Connect monitor and speed sensor wires.

Note: Cut wires to fit within elbow conduit.

5. Install elbow conduit access port cover and tighten screws.

Speed Sensor Monitor

NOTICE

Refer to speed sensor monitor manual for proper wiring and installation instructions.

Figure 9



Speed sensor monitor displays speed of roll sensor is attached to. Sensor monitor is equipped with a low speed detection alarm.

AC to DC Converter

⚠ WARNING

Heed to following warnings. Failure to do so could result in death or serious injury.

- Disconnect and lockout power before performing any maintenance or work on unit.
- Wear proper PPE during work and maintenance.
- Consult and follow local and national electrical codes.

Setup

1. Insure sensor operates on 15 VDC to 18 VDC supply.
2. Insure sensor consumes 100mA or less operating current.
3. Insure sensor contains sink or source output connected to Python's TRIAC switch control line.

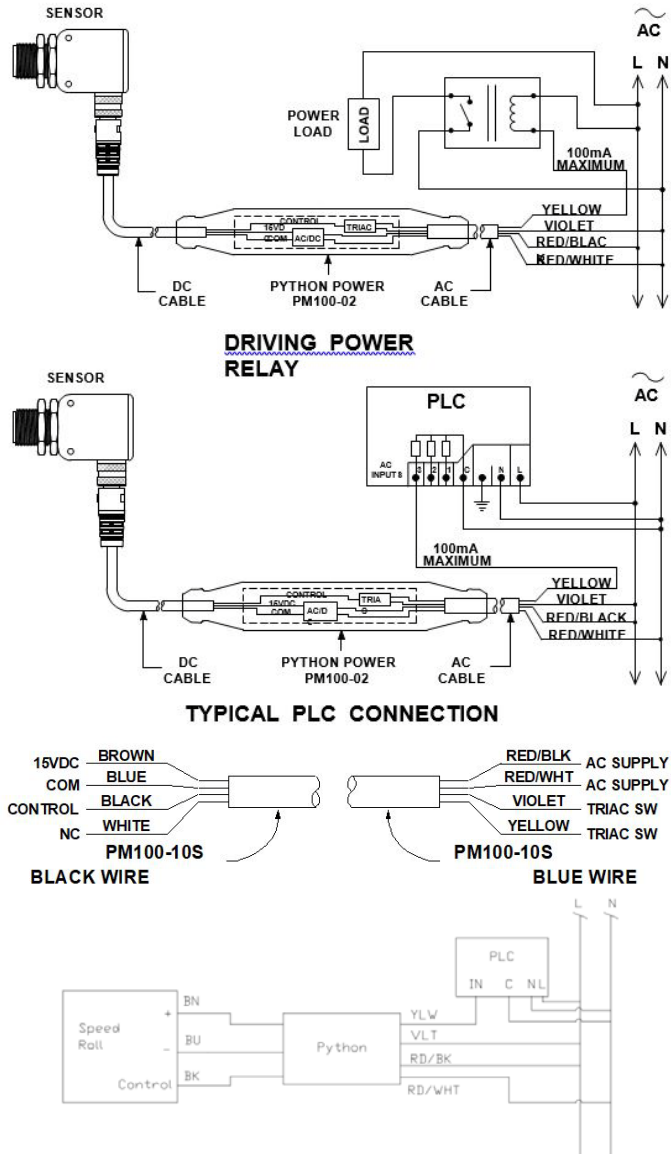
Note: mis-wiring can render Python permanently non-functional.

Connect Source Voltage and Load

NOTICE

Check specifications of Relay or PLC Input before connecting Relay or PLC Input load must be Minimum 1200 ohm at 120 VAC / 2400 ohm at 240 VAC to prevent irreversible damage to Python.

Figure 10



Checkout

WARNING

Heed to following warnings. Failure to do so could result in death, serious injury or damage to equipment

- Apply AC load that limits Python's TRIAC switch to rated current.

- Plug Python's connector into sensor.
- Check for proper function.

Note: When sensor's output switch closes, Python's TRIAC switch should close, energizing applied load or PLC input.

Python Specifications

AC Power Requirements

Supply voltage range: 100 VAC TO 240 VAC, 50/60Hz

Current and power consumption: 38 mA max., 4VA max.

Installation category: II (IEC 60364-4-443)

Input fusing: Non-replaceable, non-repairable

DC Output Ratings (to sensor)

Output voltage @ rated current: 15 VDC min.

Output voltage @ no load: 20 VDC max.

Output voltage regulation: 40 V/A

Output current, max. rated: 100 mA

Output current fault, max.: 200 mA

Pri/sec. isolation: 2200 VAC, 1 min.

Turn-on delay, 100 mA load, 90% final voltage: 10 ms typical

Turn-off delay, 0 mA load, 10% full voltage: 1 sec typical

TRIAC Switch Ratings (switch AC current only)

Features: Optically isolated, zero-crossing

Switch voltage, maximum: 230 VAC

Switch current, maximum: 50 mA@230 VAC, 100 mA@120 VAC

Peak repetitive surge current: 1 A (100µs, 120pps)

On-state voltage: 3 V max @ 100mA

Off-state leakage: 500 nA max.

Holding current: 250 µA typ.

Critical rate of rise of off-state voltage: 600 V/us min.

Isolation surge voltage: 7500 VAC min, 60 Hz. 1sec.

Turn-on time, full load, max voltage: 15 ms max. (zero-crossing)

Turn-off time, full load, max voltage: 15 ms max. (zero-crossing)

Over-current protection: Internal fuse (non-replaceable, non-repairable)

Minimum Load: 1200 ohm at 120 VAC, 600 ohm at 240 VAC

Mechanical & Cables

Material: PVC

Body dimension, length x diameter: 152 mm (6 in.) x 24 mm (0.95in.)

AC cable: 4-wire, 18AWG, 300V, PVC: 2 m (79 in.) x 7 mm (0.28 in.) dia.

DC cable: 4-wire, 22AWG, 300V, PVC : 1 m (39 in.) x 5.2 mm (0.21 in.) dia.

Environmental

Operating temperature: -25°C to 60°C (-13°F to 140°F)

Storage temperature: -40°C to 85°C (-40°F to 185°F)

Humidity: 100%, non-condensing

Enclosure ratings: Type 1 (UL50), IP67

Approvals / Certifications

North Amer. Safety: UL, UL-cUL: 61010C-1, "Industrial Control Equipment" File #E238344

European safety: CE: EN 61010C-1

North American emissions: FCC: Class A

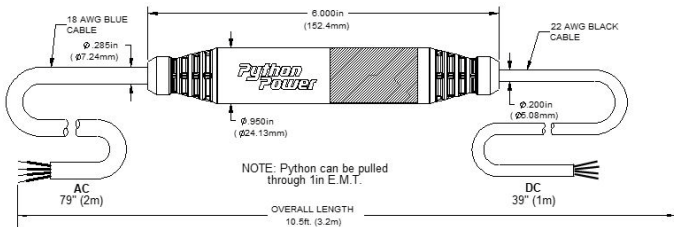
EU emissions: CE: EN55011:1998 Group 1, Class A

EU EMC: EN61326:1997 Measure, Lab., and Control

Materials safety: FDA: cables and over-mold are FDA compatible non-contact

Dimensions

Figure 11



Diagnostics

1. Everything is connected but sensor does not appear to operate:

Disconnect sensor and check for proper DC output voltage at Python connector.

2. Sensor is receiving power but does not actuate Python's TRIAC switch:

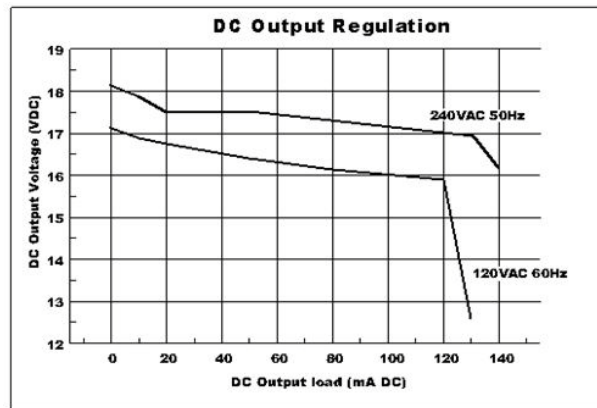
Python's TRIAC is a floating switch. External power source must be applied to load circuit which TRIAC acts as switch. Be extremely careful not to allow currents greater than rated current to flow through the TRIAC switch or permanent damage may occur. Internal fuse may blow if current is applied in excess of rating. Fuse is not replaceable.

3. Python presents proper output voltage when disconnected from sensor but will not correctly power sensor when connected:

Sensor may be drawing too much current causing Python's output voltage to fall below a useful level.

Excess output loading may also be caused by a load on sensor's PNP (sourcing) output line that, in addition to sensor's current requirement, exceeds capacity.

Figure 12



Replacement Parts

Clean Side Speed Sensor



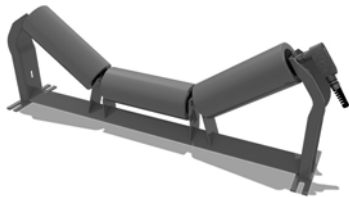
DESCRIPTION	PART NUMBERS
Clean Side Roll Speed Sensor	26-100001
Speed Roll	D5-36LAG.25SPEED

Clean Side Mounting Bracket



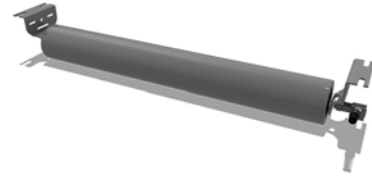
DESCRIPTION	PART NUMBERS
Clean Side Mounting Bracket	26-100002

Troughing Side Speed Sensor



DESCRIPTION	PART NUMBERS
Trough Roll	C5-36SPEED
Trough Roll w/ Lagging	C4-36LAG.5SPEED
Trough Idler w/ Speed Sensor Roll	C5-35E-36SPEED

Return Side Speed Sensor



DESCRIPTION	PART NUMBERS
Return Roll	C5-RET-36SPEED
Return Roll w/ Lagging	C4-RET-36LAG.5SPEED

Speed Sensor Module



DESCRIPTION	PART NUMBERS
DD2503 Speed Sensor Module	11-04136

Composite Module Enclosure



DESCRIPTION	PART NUMBERS
Module Enclosure - Composite	11-04229

Steel Module Enclosure



DESCRIPTION	PART NUMBERS
Module Enclosure - Steel	11-04230

Power Cord



DESCRIPTION	PART NUMBERS
Power Cord	11-04204

Note: Cut to specific length.

Speed Converter



DESCRIPTION	PART NUMBERS
Sensor Converter	11-04557