*Specifications in this catalog are subject to change without prior notice.*

# Features and Solutions

In today's progressive manufacturing and distribution environments, designing conveyor systems can be a difficult challenge. Complex problems often need to be solved. Now there is an innovative and advanced engineering solution that meets the demands of a new age in production automation and flexibility. The Power Moller® is a self-contained motorized roller that opens new horizons in handling system design. Its low profile and ease of installation make it the perfect choice when production efficiency and space savings are required.

**Working Concept**
The turning force of the motor is transmitted through the shock absorber to the planetary gearing. The planetary gearing drives the inner gear which is affixed to the roller tube. The tube will rotate because the output shaft is held stationary by the conveyor frame.

**"One Touch" Spring Loaded Shaft - Easy Installation**
The Power Moller spring-loaded shaft enables the unit to be quickly installed or removed without disassembling the conveyor frame

**Space Saving**
Motor and gearbox integral with roller tube

**Safe, Simple and Clean**
Totally sealed construction with no exposed chains or sprockets

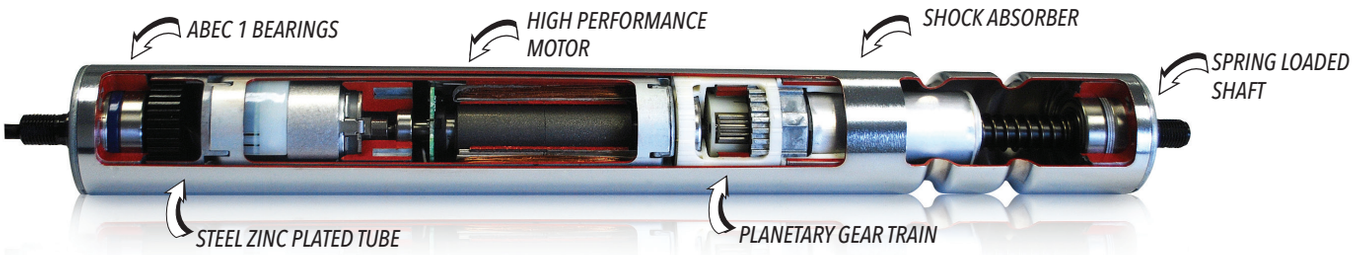
**Quiet and Smooth Operation**
No pneumatics. Enables low vibration transfer

**Maintenance Free**
Lifetime lubrication ensures long life and maintenance free operation

**Built-in Shock Absorber**
Protects the gearbox from a sudden stop, impact, or acceleration in the line

**Easy Wiring**
Supplied mounting brackets (DC rollers) or terminal block with safety cover (AC rollers) secures the motor shaft to the frame and provides easy and convenient wiring

**Reversible**
Easy control of forward, reverse and stop functions




**STANDARD PART NUMBER EXAMPLE**

PM486FE-60-747-D-024

- Model Type: Power Moller
- Diameter: 48.6mm
- Brushless Motor Output on cable side shaft
- Speed Code: Nominal 60m/min
- Tube Length: 747mm
- Voltage Type: DC
- Voltage: 24V

# Selecting a Power Moller

- **Material**
  ***What is in contact with the Motorized Roller?***
  Metal, plastic, wood, urethane, natural rubber, corrugated cardboard, other material

- **Product weight**
  ***What will be the maximum weight?***

- **Desired transportation speed**
  ***How fast do you want to move the article? Feet/minute (FPM)***

- **Diameter of the roller**
  ***What diameter are you looking for?***
  Common Itoh Denki Roller Diameters
  1.26" (32.0mm), 1.91" (48.6mm), 2.25" (57.0mm), 2.38" (60.5mm), 2.50" (63.5mm), 3.00" (76.3mm)

- **Available voltages**
  ***What voltage are you using?***
  24V DC
  3 Phase 230V AC @ 60Hz
  Single Phase 115V AC @ 60 Hz
  Other voltages

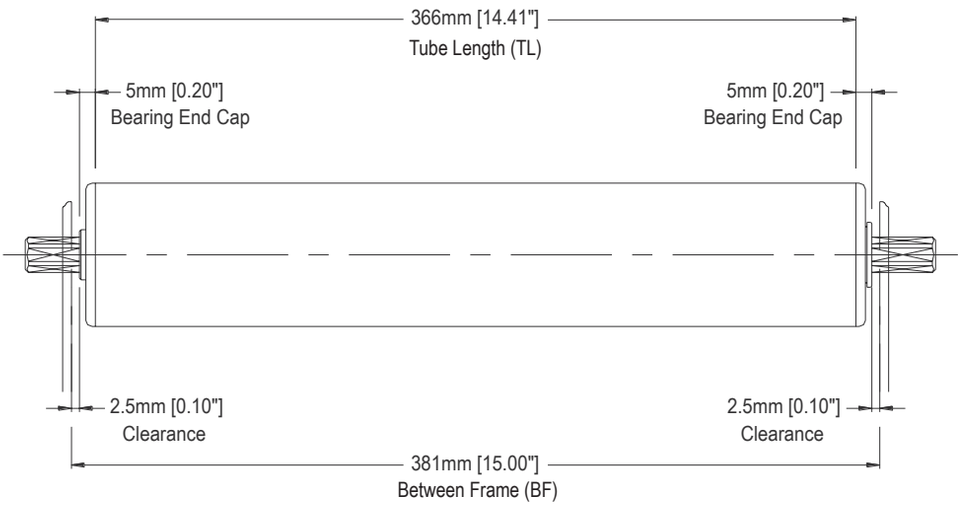
(Convert English units to Metric units, 1 inch=25.4 mm)

**HOW TO SPECIFY THE LENGTH OF A POWER MOLLER® (Between Frame dimension - BF)**
In determining the correct length of the Power Moller required, you should first obtain the Between Frame (BF) width of the conveyor you will be mounting the Power Moller in. If this dimension is in inches, you should convert the dimension to millimeters, as all Power Moller Tube Lengths (TL) are in metric units. From this dimension, subtract 15mm for bearing End Caps (EC) and clearances to achieve the correct tube length. Subtract 20mm when using PM635FS. Subtract 30mm when using PM763BS.

**Example:** BF measures 15 inches. Converting to millimeters 15" X 25.4mm / in. = 381mm. Deducting 15mm for bearing EC and clearances, 381mm - 15mm = 366mm. TL will be 366mm long. When in doubt, contact an Itoh Denki representative to help you in selecting the correct Power Moller for your application.

* Please refer to specific product page and diagram for proper EC deduction when determining roller length.

**TL (Tube Length) = BF (Between Frame) - EC (Endcap deduction)**




- **Options**
  ***Does the application call for any special options?***
  Lagging (Natural rubber, Nitrile Rubber, Neoprene, Urethane)
  Dustproof, Waterproof, Brake, Clutch, Other
  KF - Brackets not ordered with roller

**Formula 1**
TF = μ X W
TF = Required tangential force
W = Weight of article to be transferred
μ = Coefficient of rolling friction in accordance with the material composition of the bottom of the article to be transferred. (See Table 1)

To determine the number of Power Moller units required for transfer, compare required tangential force (F) and the tangential force of one Power Moller unit (f)

**Example**

| | |
|---|---|
| Material | Cardboard |
| Weight | 70 Pounds |
| Voltage | 24V DC |
| Speed | 170 FPM |
| Diameter | 1.91" (48.6mm) |
| Between Frame | 16 Inches |
| Options | None |

- **Tangential force required (Formula 1)**
  Given W = 70 lbs.
  Cardboard coefficient μ = 0.11
  TF = μ X W
  TF = 0.11 X 70 lbs.
  TF = 7.7 lbs. required to move this article
  PM486FE-60 TF = 24.7 lbs. > 7.7 lbs. (See Performance Data, page 7)

- **Match/Best fit diameter**
  Diameter given 1.91" (48.6mm)

- **Model – PM486**

- **Given DC motor type**
  Model number/motor type reflects AC or DC
  PM486**FE**

- **Select the speed**
  Speed code is an approximate meter-per-minute figure and varies by model
  Reference FPM values; See speed table for PM486FE, page 7
  Given 170 FPM, Speed code 60 offers 196.8 FPM
  **Model number with speed code – PM486FE-60**

- **Maximum load limit**
  See maximum static load limit table, page 53
  PM486 series
  300-400mm tube length
  Maximum load limit of 121 lbs. per roller
  70 lbs. load < 121 lbs. – Okay

- **Select the correct voltage**
  PM486FE is a DC motor type
  Selected voltage is 24V DC
  Model number with voltage – PM486FE-60-391-D-024

- **Options**
  Double grooved tube standard (50mm/32mm) for O-ring drive
  Model number with options – PM486FE-60-391-D-024-P2

Table I - Coefficient of Rolling Friction (μ) — Product Material

| Tube Material | Metal | Plastic | Wood | Urethane | Natural Rubber | Corrugated Cardboard |
|---|---|---|---|---|---|---|
| Steel | 0.01 - 0.03 | 0.02 - 0.04 | 0.02 - 0.05 | 0.02 - 0.05 | 0.03 - 0.05 | 0.07 - 0.11 |
| Urethane Lagging | 0.02 - 0.05 | 0.02 - 0.05 | 0.02 - 0.05 | 0.02 - 0.05 | 0.03 - 0.05 | 0.07 - 0.11 |
| Natural Rubber Lagging | 0.03 - 0.05 | 0.03 - 0.05 | 0.03 - 0.05 | 0.03 - 0.05 | 0.03 - 0.05 | 0.07 - 0.11 |

*The above values are based on industry standards of products with a smooth, uniform bottom surface in contact with the roller.*

# PM320HS

## DC Motor Driven Roller

**Diameter:** 1.26" (32.0mm)
**Voltage:** 24V DC

### Standard Features

- Low-profile, compact design
- Stable speed against varying loads
- No hall effect sensors
- Reversible
- Stainless steel exterior for wash down applications (IP 65)
- Ideal for small belt applications
- Brushless DC motor provides long life
- Crowned, seamless tube
- 7/16" Hex shaft standard
- ABEC 1 Bearings

This is a non-spring loaded shaft roller

### Operation

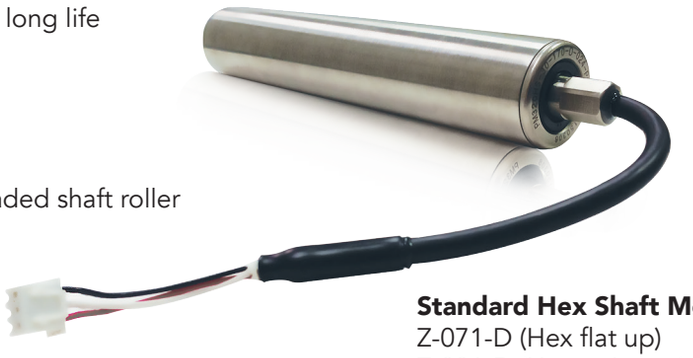
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

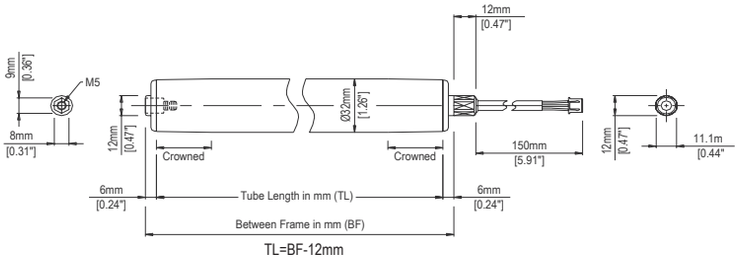
- Motor is protected from overheating

### Environment

- Ambient Temperature 32~104° F (0~40°C)
- No corrosive gases
- Vibration < 0.5G



### Available Options





### Standard Hex Shaft Mounting Brackets

Z-071-D (Hex flat up)
Z-081-D (Hex point up)

### Opposite Cable Side Bracket

AM-32HS-M5

***1 Standard and 1 Opposite Cable mounting bracket needed for this roller***

*See pages 49-50 for bracket diagrams*

### PM320HS Extension Cables

AACB18-1000 (1000mm)
AACB18-2000 (2000mm)

### Minimum/Maximum Tube Lengths

MIN 170mm (6.69")

MAX 570mm (22.44")

| CB-018N2 8 speed settings | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Speed Code | DIP Switch Setting | | | No-load speed (FPM) | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) | | |
| | SW1-4 CN2-5 | SW1-5 CN2-4 | SW1-6 CN2-3 | | | | Starting | No-Load | Rated |
| 30 | off | off | off | 19.0 | 18.5 | 11.7 | 2.00 | 0.10 | 0.60 |
| | off | off | on | 32.5 | 18.5 | 11.7 | 2.00 | 0.18 | 0.64 |
| | off | on | off | 42.7 | 18.5 | 11.7 | 2.00 | 0.23 | 0.66 |
| | off | on | on | 52.2 | 18.5 | 11.7 | 2.00 | 0.28 | 0.69 |
| | on | off | off | 61.7 | 18.5 | 11.7 | 2.00 | 0.34 | 0.72 |
| | on | off | on | 72.2 | 18.5 | 11.7 | 2.00 | 0.39 | 0.75 |
| | on | on | off | 81.0 | 18.5 | 11.7 | 2.00 | 0.44 | 0.77 |
| | on | on | on | 94.5 | 18.5 | 11.7 | 2.00 | 0.50 | 0.80 |

### TL Considerations for non-standard EC

- RP: BF - 25mm = TL

# PM486FE

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shaft standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- One shaft mounting, cable end
- Dynamic brake
- Transport product up to 200lbs

### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

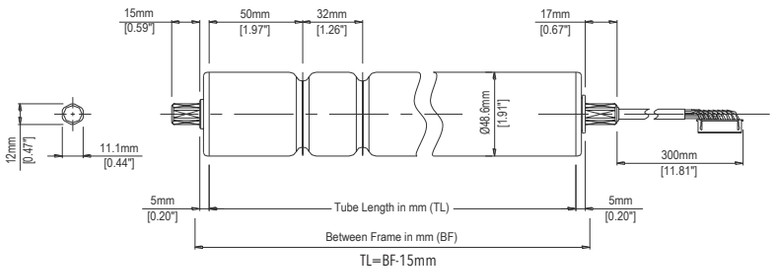
- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Spring loaded shaft roller

### Available Options

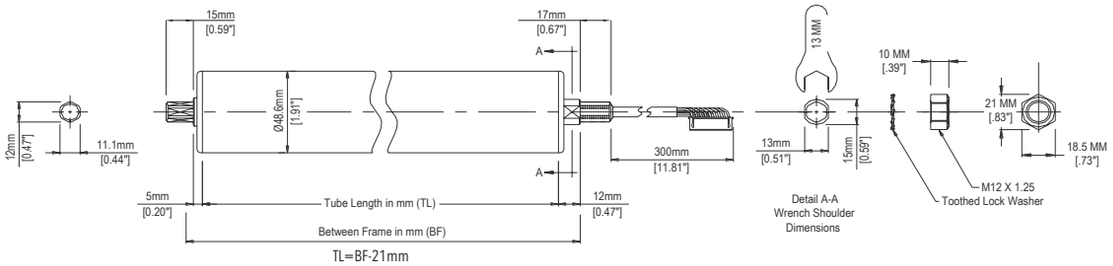



Standard Hex Shafts with Grooved Tube

**Standard Hex Shaft Mounting Brackets**
MBB-071 (Hex flat up)
MBB-081 (Hex point up)

**Low Profile Hex Shaft Mounting Brackets**
MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***1 mounting bracket needed for this roller***
*See page 49 for bracket diagrams*




JQ - (Threaded Hex Shaft with Wrench Shoulder) / Straight Tube

**JQ Shaft Standard Mounting Hardware**
Toothed lock washer and nut
Nuts to be tightened to 22.1lb • ft ± 10%

## CB-016S7 20 speed settings

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 24.0 | 6.9 | 95.0 | 90.8 | 3.6 | 0.3 | 1.6 |
| | 8 | 34.1 | 6.9 | 98.5 | 94.2 | 4.0 | 0.4 | 2.1 |
| | 10 | 44.7 | 6.9 | 95.0 | 90.8 | 4.0 | 0.5 | 2.4 |
| | 17 | 55.3 | 6.9 | 77.4 | 74.0 | 4.0 | 0.8 | 2.8 |
| 2 | 20 | 85.3 | 24.6 | 30.3 | 29.0 | 3.6 | 0.3 | 1.6 |
| | 30 | 121.4 | 24.6 | 31.5 | 30.1 | 4.0 | 0.4 | 2.1 |
| | 45 | 159.1 | 24.6 | 30.3 | 29.0 | 4.0 | 0.5 | 2.4 |
| | 60 | 196.8 | 24.6 | 24.7 | 23.7 | 4.0 | 0.8 | 2.8 |
| 1 | 70 | 303.2 | 87.6 | 9.7 | 9.3 | 3.6 | 0.3 | 1.6 |
| | 100 | 431.5 | 87.6 | 10.1 | 9.6 | 4.0 | 0.4 | 2.1 |
| | 140 | 565.6 | 87.6 | 9.7 | 9.3 | 4.0 | 0.5 | 2.4 |
| | 210 | 699.7 | 87.6 | 7.9 | 7.6 | 4.0 | 0.8 | 2.8 |

*See page 26 for CB-016S7 diagram*

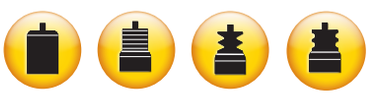

## HB-510N 10 speed settings

| Gear Stage | Speed Code | No-load (FPM) SW3 9 High | No-load (FPM) SW3 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 24.0 | 13.8 | 95.0 | 90.8 | 3.6 | 0.3 | 1.4 |
| | 8 | 34.1 | 13.8 | 98.5 | 94.2 | 4.0 | 0.4 | 1.8 |
| | 10 | 44.7 | 13.8 | 95.0 | 90.8 | 4.0 | 0.5 | 2.2 |
| | 17 | 55.3 | 13.8 | 77.4 | 74.0 | 4.0 | 0.8 | 2.6 |
| 2 | 20 | 85.3 | 49.2 | 30.3 | 29.0 | 3.6 | 0.3 | 1.4 |
| | 30 | 121.4 | 49.2 | 31.5 | 30.1 | 4.0 | 0.4 | 1.8 |
| | 45 | 159.1 | 49.2 | 30.3 | 29.0 | 4.0 | 0.5 | 2.2 |
| | 60 | 196.8 | 49.2 | 24.7 | 23.7 | 4.0 | 0.8 | 2.6 |
| 1 | 70 | 303.2 | 174.8 | 9.7 | 9.3 | 3.6 | 0.3 | 1.4 |
| | 100 | 431.5 | 174.8 | 10.1 | 9.6 | 4.0 | 0.4 | 1.8 |
| | 140 | 565.6 | 174.8 | 9.7 | 9.3 | 4.0 | 0.5 | 2.2 |
| | 210 | 699.7 | 174.8 | 7.9 | 7.6 | 4.0 | 0.8 | 2.6 |

*See page 31 for HB-510N diagram*


*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


### Minimum Tube Lengths



| GEAR STAGES | | |
|---|---|---|
| 1 | 2 | 3 |
| 244mm (9.61") | 267mm (10.51") | 290mm (11.42") |
| 293mm (11.54") | 316mm (12.44") | 339mm (13.35") |
| 302mm (11.89") | 325mm (12.80") | 348mm (13.70") |
| 357mm (14.06") | 381mm (15.00") | 404mm (15.91") |

### TL Considerations for non-standard EC

- JQ: BF - 21mm = TL
- VP: BF - 35mm = TL
- VG: BF - 41mm = TL
- RP: BF - 35mm = TL
- P2 double groove tube standard (50mm/32mm)
- All shaft configurations available with grooved tube or straight tube

# PM486FS

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Dual shaft mounting
- Dynamic brake
- Time tested performance
- Torque transmitted through ouput tube

Available as spring loaded or non spring loaded shaft

### Available Options


### Operation

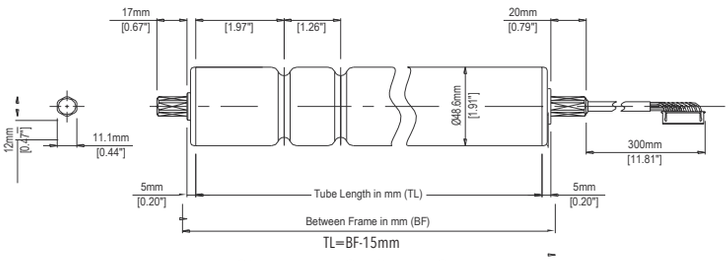
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

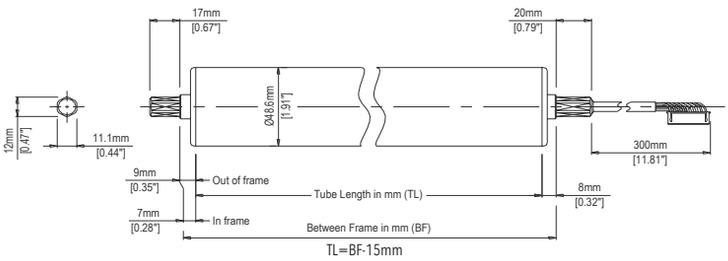
- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

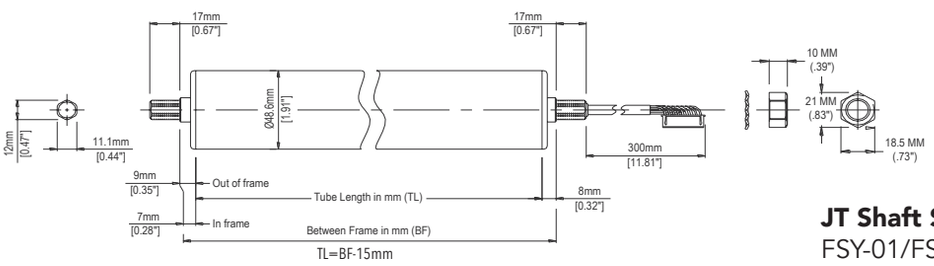
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G




**Standard Hex Shafts with Grooved Tube**




**JR - (Yoke Style) Hex Shafts / Straight Tube**




**JT - (Threaded) Hex Shafts / Straight Tube**

### Standard Hex Shaft Mounting Brackets

MBB-071 (Hex flat up)
MBB-081 (Hex point up)

### Low Profile Hex Shaft Mounting Brackets

MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***2 mounting brackets needed for this roller***

*See page 49 for bracket diagrams*

### JT Shaft Standard Mounting Hardware

FSY-01/FSY-02 Toothed lock washer and nut
Nuts to be tightened to 22.1 lb • ft ± 10%

**CB-016S7 20 speed settings**

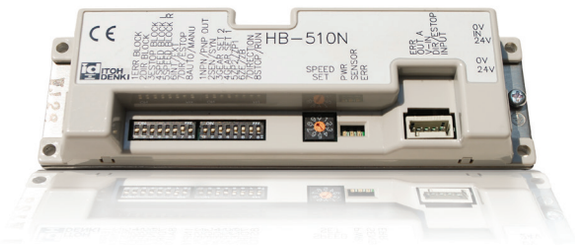
| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 24.5 | 7.2 | 92.8 | 88.8 | 3.6 | 0.3 | 1.6 |
| | 8 | 34.9 | 7.2 | 96.3 | 92.1 | 4.0 | 0.4 | 2.1 |
| | 10 | 45.8 | 7.2 | 92.8 | 88.8 | 4.0 | 0.5 | 2.4 |
| | 15 | 56.6 | 7.2 | 79.1 | 75.6 | 4.0 | 0.6 | 2.8 |
| 2 | 20 | 92.6 | 26.6 | 27.9 | 26.7 | 3.6 | 0.3 | 1.6 |
| | 30 | 131.8 | 26.6 | 29.0 | 27.7 | 4.0 | 0.4 | 2.1 |
| | 45 | 172.7 | 26.6 | 27.9 | 26.7 | 4.0 | 0.5 | 2.4 |
| | 55 | 213.7 | 26.6 | 23.8 | 22.8 | 4.0 | 0.6 | 2.8 |

*See page 26 for CB-016S7 diagram*


**HB-510N 10 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW3 9 High | No-load (FPM) SW3 0 Low | Tangential force(lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 24.5 | 14.1 | 92.8 | 88.8 | 3.6 | 0.3 | 1.4 |
| | 8 | 34.9 | 14.1 | 96.3 | 92.1 | 4.0 | 0.4 | 1.8 |
| | 10 | 45.8 | 14.1 | 92.8 | 88.8 | 4.0 | 0.5 | 2.2 |
| | 15 | 56.6 | 14.1 | 79.1 | 75.6 | 4.0 | 0.6 | 2.5 |
| 2 | 20 | 92.6 | 53.5 | 27.9 | 26.7 | 3.6 | 0.3 | 1.4 |
| | 30 | 131.8 | 53.5 | 29.0 | 27.7 | 4.0 | 0.4 | 1.8 |
| | 45 | 172.7 | 53.5 | 27.9 | 26.7 | 4.0 | 0.5 | 2.2 |
| | 55 | 213.7 | 53.5 | 23.8 | 22.8 | 4.0 | 0.6 | 2.5 |

*See page 31 for HB-510N diagram*




*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


**Minimum Tube Lengths**

| GEAR STAGES 2 | GEAR STAGES 3 |
|---|---|
| 254mm (10.00") | 277mm (10.91") |
| 305mm (12.01") | 328mm (12.91") |
| 305mm (12.01") | 328mm (12.91") |
| 369mm (14.53") | 392mm (15.43") |
| 315mm (12.40") | 338mm (13.31") |

- JT shafts add 10mm to minimum tube length

- P2 double groove tube standard (50mm/32mm)
- All shaft configurations available with grooved tube or straight tube

# PM486FP

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (threaded) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Dual shaft mounting
- Dynamic brake
- Strong motor torque
- Torque transmitted through ouput tube
- Transport product up to 400lbs

Spring loaded shaft roller

### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

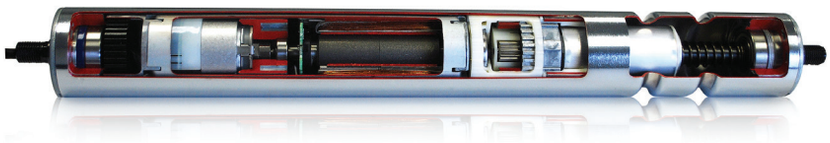
### Protection

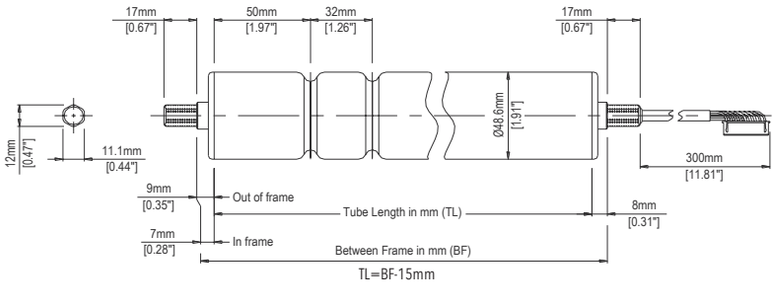
- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

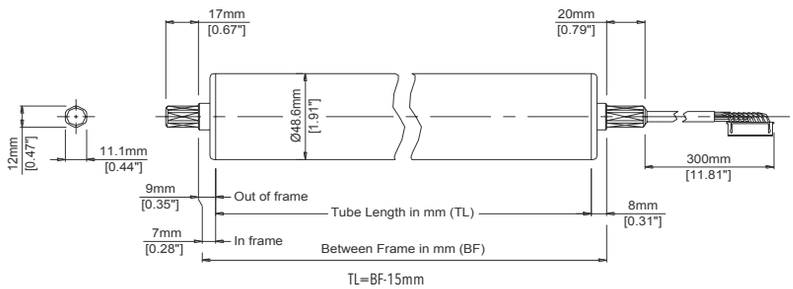
### Available Options






**Standard Threaded Hex Shafts with Grooved Tube**

**Standard Threaded Hex Shaft Mounting Brackets**
P-0C1 (Hex point up)
P-0B1 (Hex flat up)
**Nuts are to be tightened to 22.1 lb • ft ± 10%*




**JR - (Yoke Style) Hex Shafts/Straight Tube**

**Standard JR Yoke Style Hex Shaft Mounting Brackets**
MBB-071 (Hex flat up)
MBB-081 (Hex point up)

***2 mounting brackets needed for this roller***
*See page 49 for bracket diagrams*

**CB-016S7 20 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 26.1 | 7.2 | 149.4 | 142.9 | 4.0 | 0.4 | 2.0 |
| | 8 | 36.5 | 7.2 | 141.9 | 135.7 | 4.0 | 0.5 | 2.7 |
| | 10 | 48.2 | 7.2 | 119.5 | 114.3 | 4.0 | 0.7 | 3.2 |
| | 15 | 56.6 | 7.2 | 104.6 | 100.0 | 4.0 | 0.9 | 3.5 |
| 2 | 20 | 98.4 | 26.6 | 45.0 | 43.0 | 4.0 | 0.4 | 2.0 |
| | 30 | 137.8 | 26.6 | 42.7 | 40.9 | 4.0 | 0.5 | 2.7 |
| | 45 | 182.0 | 26.6 | 36.0 | 34.4 | 4.0 | 0.7 | 3.2 |
| | 55 | 213.7 | 26.6 | 31.5 | 30.1 | 4.0 | 0.9 | 3.5 |
| 1 | 100 | 448.3 | 121.4 | 11.2 | 10.7 | 4.0 | 0.4 | 2.0 |
| | 140 | 627.6 | 121.4 | 10.7 | 10.2 | 4.0 | 0.5 | 2.7 |
| | 190 | 829.3 | 121.4 | 9.0 | 8.6 | 4.0 | 0.7 | 3.2 |
| | 255 | 973.5 | 121.4 | 7.9 | 7.5 | 4.0 | 0.9 | 3.5 |

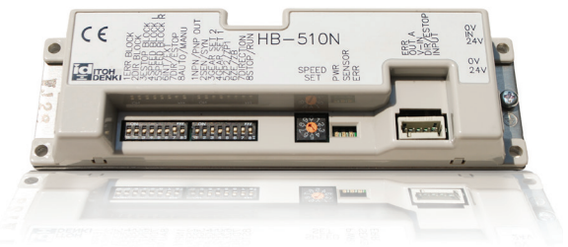
*See page 26 for CB-016S7 diagram*


*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


**HB-510N 10 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 26.1 | 14.1 | 149.4 | 142.9 | 4.0 | 0.4 | 1.9 |
| | 8 | 36.5 | 14.1 | 141.9 | 135.7 | 4.0 | 0.5 | 2.5 |
| | 10 | 48.2 | 14.1 | 119.5 | 114.3 | 4.0 | 0.7 | 3.0 |
| | 15 | 56.6 | 14.1 | 104.6 | 100.0 | 4.0 | 0.9 | 3.2 |
| 2 | 20 | 98.4 | 53.5 | 45.0 | 43.0 | 4.0 | 0.4 | 1.9 |
| | 30 | 137.8 | 53.5 | 42.7 | 40.9 | 4.0 | 0.5 | 2.5 |
| | 45 | 182.0 | 53.5 | 36.0 | 34.4 | 4.0 | 0.7 | 3.0 |
| | 55 | 213.7 | 53.5 | 31.5 | 30.1 | 4.0 | 0.9 | 3.2 |
| 1 | 100 | 448.3 | 243.0 | 11.2 | 10.7 | 4.0 | 0.4 | 1.9 |
| | 140 | 627.6 | 243.0 | 10.7 | 10.2 | 4.0 | 0.5 | 2.5 |
| | 190 | 829.3 | 243.0 | 9.0 | 8.6 | 4.0 | 0.7 | 3.0 |
| | 255 | 973.5 | 243.0 | 7.9 | 7.5 | 4.0 | 0.9 | 3.2 |

*See page 31 for HB-510N diagram*




## Minimum Tube Lengths

| GEAR STAGES | | |
|---|---|---|
| 1 | 2 | 3 |
| 322mm (12.68″) | 345mm (13.58″) | 368mm (14.49″) |
| 322mm (12.68″) | 345mm (13.58″) | 368mm (14.49″) |
| 322mm (12.68″) | 345mm (13.58″) | 368mm (14.49″) |
| 386mm (15.20″) | 409mm (16.10″) | 432mm (17.01″) |
| 330mm (12.99″) | 353mm (13.90″) | 376mm (14.80″) |

## TL Considerations for non-standard EC

- GV: BF - 41mm = TL
- PV: BF - 35mm = TL
- RP: BF - 35mm = TL
- P2 double groove tube standard (50mm/32mm)
- All shaft configurations available with grooved tube or straight tube

# PM486FH

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Dual shaft mounting
- Dynamic brake
- Improved motor torque
- Torque transmitted through ouput tube
- 12 pin connector

### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

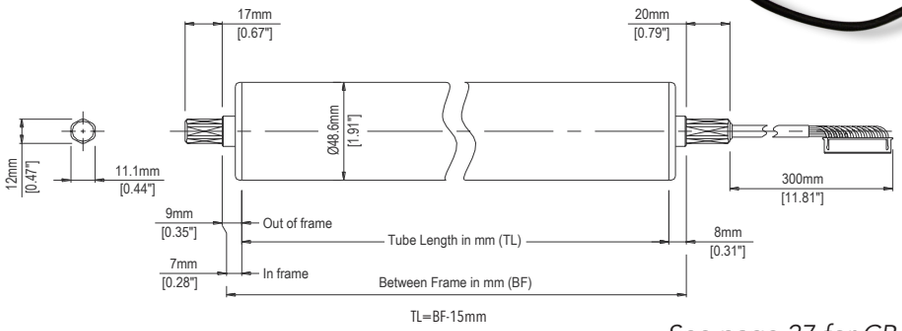
- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

### Available Options

Spring loaded shaft roller




**Standard Hex Shaft Mounting Brackets**
MBB-071 (Hex flat up)
MBB-081 (Hex point up)

***2 mounting brackets needed for this roller***
*See page 49 for bracket diagrams*

*See page 36 for IB-E04 diagram*
**Controls 2 Power Mollers*


*See page 27 for CB-030S diagram*


**CB-030S 20 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 2 | 20 | 88.9 | 26.6 | 53.4 | 51.3 | 7.0 | 0.3 | 2.6 |
| | 30 | 133.2 | 26.6 | 55.9 | 53.1 | 7.0 | 0.4 | 3.3 |
| | 45 | 187.0 | 26.6 | 49.3 | 46.9 | 7.0 | 0.7 | 3.6 |
| | 55 | 213.9 | 26.6 | 45.1 | 43.4 | 7.0 | 1.0 | 3.7 |
| 1 | 100 | 405.4 | 121.7 | 13.3 | 12.4 | 7.0 | 0.3 | 2.6 |
| | 140 | 606.8 | 121.7 | 14.0 | 13.3 | 7.0 | 0.4 | 3.3 |
| | 190 | 851.8 | 121.7 | 12.3 | 11.5 | 7.0 | 0.7 | 3.6 |
| | 255 | 973.5 | 121.7 | 11.3 | 10.6 | 7.0 | 1.0 | 3.7 |

### Minimum Tube Lengths

| GEAR STAGES | |
|---|---|
| 1 | 2 |
| 322mm (12.68") | 345mm (13.58") |
| 322mm (12.68") | 345mm (13.58") |
| 322mm (12.68") | 345mm (13.58") |

### TL Considerations for non-standard EC

- PV: BF - 35mm = TL
- GV: BF - 41mm = TL
- P2 double groove tube standard (50mm/32mm)

# PM486LD

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Runs at 1/2 the amperage of standard DC rollers
- High speed capability up to 260.2 FPM
- Shorter minimum tube lengths
- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- Hall sensorless motor construction
- One shaft mounting, cable end
- Dynamic brake

Spring loaded shaft roller

### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

### Standard Hex Shaft Mounting Brackets

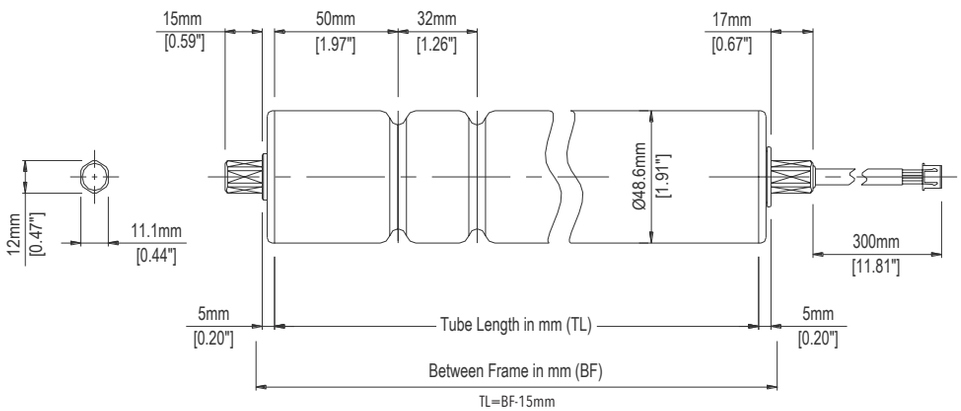
MBB-071 (Hex flat up)
MBB-081 (Hex point up)

### Low Profile Hex Shaft Mounting Brackets

MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***1 mounting bracket needed for this roller***

*See page 49 for bracket diagrams*




### Minimum Tube Lengths

| GEAR STAGE |
|---|
| 2 |
| 230mm (9.06") |
| 230mm (9.06") |
| 280mm (11.00") |

*See page 30 for CBM-107 diagram*


*See page 33 for HBL-606F diagram*


**CBM-107FP 10 speed settings**

| Gear Stage | Speed Code | No-load (FPM) External Voltage 9.5 V High | 0.5 V Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | No-Load | Rated |
|---|---|---|---|---|---|---|---|---|
| 2 | 80 | 260.2 | 65.6 | 11.7 | 13.3 | 2.0 | 0.5 | 1.2 |

### TL Considerations for non-standard EC

- VG: BF - 41mm = TL
- P2 double groove tube standard (50mm/32mm)
- Available with grooved tube or straight tube

# PM486XE/XP

## DC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Internal driver card simplifies wiring direct to roller
- Stable speed function
- One shaft mounting, cable end
- High Torque (XP model)

Spring loaded shaft roller

### Available Options

### Operation

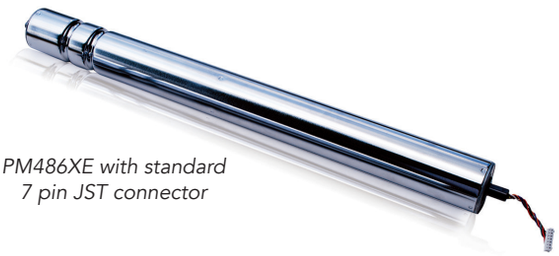
- Cycle: 1s ON; 1.5s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

- Motor is protected from overheating
- Undervoltage error
- Back EMF error

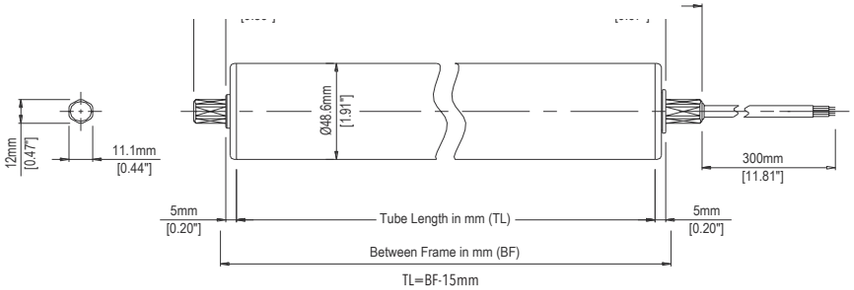
### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

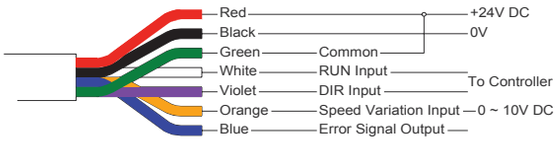


*PM486XE with standard 7 pin JST connector*

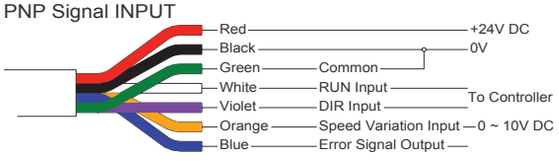
*PM486XP with optional cable-less Snap-In-Drive connector*



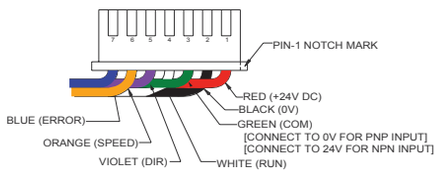

NPN Signal OUTPUT




PNP Signal INPUT




*Standard 7 pin JST connector (XHP-7)*
*For use with terminal block A-B70/A-B80*




### Standard Hex Shaft Mounting Brackets

MBB-071 (Hex flat up)
MBB-081 (Hex point up)

### Low Profile Hex Shaft Mounting Brackets

MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***1 mounting bracket needed for this roller***
*See page 49 for bracket diagrams*

***When ordering, error output signal type must be specified:***
NN - NPN error output
NP - PNP error output
*Ex: PM486XE/XP-60-366-D-024-NN*
1st letter = input
2nd letter = output
NP = NPN input; PNP output

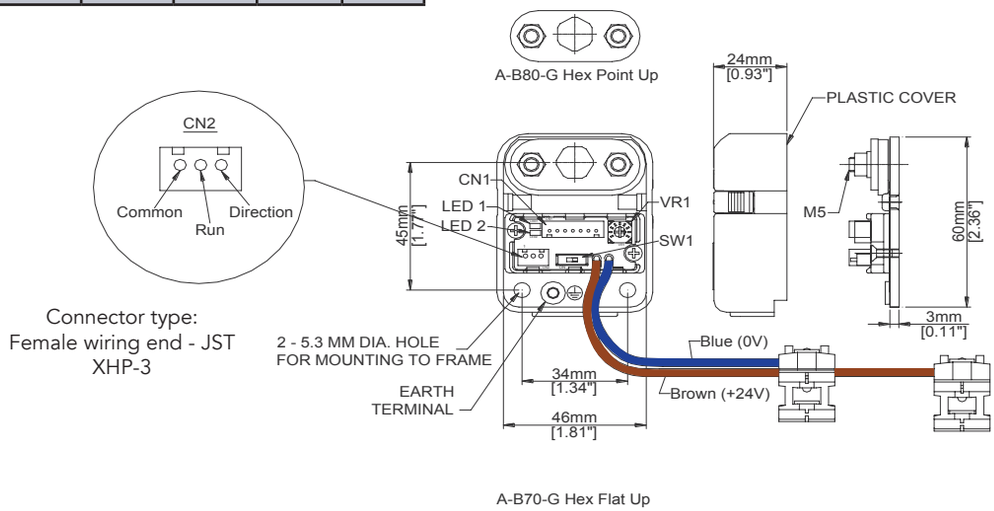
**Standard 10 speed settings for PM486XE**

| Gear Stage | Speed Code | No-load (FPM) External Voltage 9.5 V High | No-load (FPM) External Voltage 0.5 V Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 17 | 55.4 | 6.9 | 60.3 | 57.5 | 2.0 | 0.3 | 1.7 |
| 2 | 30 | 93.2 | 11.8 | 41.2 | 39.4 | | | |
| | 60 | 196.8 | 24.6 | 19.6 | 18.6 | | | |
| 1 | 100 | 331.6 | 41.3 | 13.3 | 12.7 | | | |

**Standard 10 speed settings for PM486XP**

| Gear Stage | Speed Code | No-load (FPM) External Voltage 9.5 V High | No-load (FPM) External Voltage 0.5 V Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 17 | 55.4 | 6.9 | 78.1 | 74.6 | 4.0 | 0.4 | 2.0 |
| 2 | 30 | 93.2 | 11.8 | 53.3 | 51.0 | 4.0 | 0.4 | 2.0 |
| | 60 | 196.8 | 24.6 | 25.2 | 24.2 | 4.0 | 0.4 | 2.0 |
| 1 | 100 | 331.6 | 41.3 | 17.3 | 16.5 | 4.0 | 0.4 | 2.0 |

To view card wiring diagrams and for more information, please visit www.itohdenki.com




Connector type:
Female wiring end - JST XHP-3

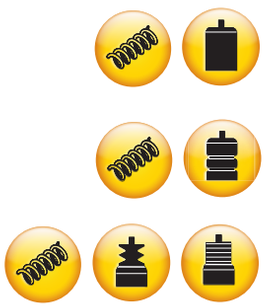
## A-B70-G and A-B80-G I/O Terminal Block

- I/O terminal on mounting bracket
- Built in 10kΩ resistor for speed variation
- Speed adjustable from 12.5% to 100%
- Reverse direction slide switch
- Green LED indication for 24V DC power
- Red LED indication for motor error
- 24V DC is supplied using cable splice connectors
- RUN and DIR inputs from any 24V DC switching source

**** C007 (70mm) power cable option is required for use with this terminal block***

**Minimum Tube Lengths**

| GEAR STAGES | | |
|---|---|---|
| 1 | 2 | 3 |
| 282mm (11.10") | 310mm (12.20") | 332mm (13.07") |
| 334mm (13.15") | 362mm (14.25") | 385mm (15.16") |
| 282mm (11.10") | 310mm (12.20") | 332mm (13.07") |



## TL Considerations for non-standard EC

- VP: BF - 35mm = TL
- VG: BF - 41mm = TL
- P2 double groove tube standard (50mm/32mm)
- All shaft configurations available with grooved tube or straight tube

# PM570FE

## DC Motor Driven Roller

**Diameter:** 2.24" (57.0mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- One shaft mounting, cable end
- Dynamic brake

Available as spring loaded
or non spring loaded shaft

### Available Options


### Operation

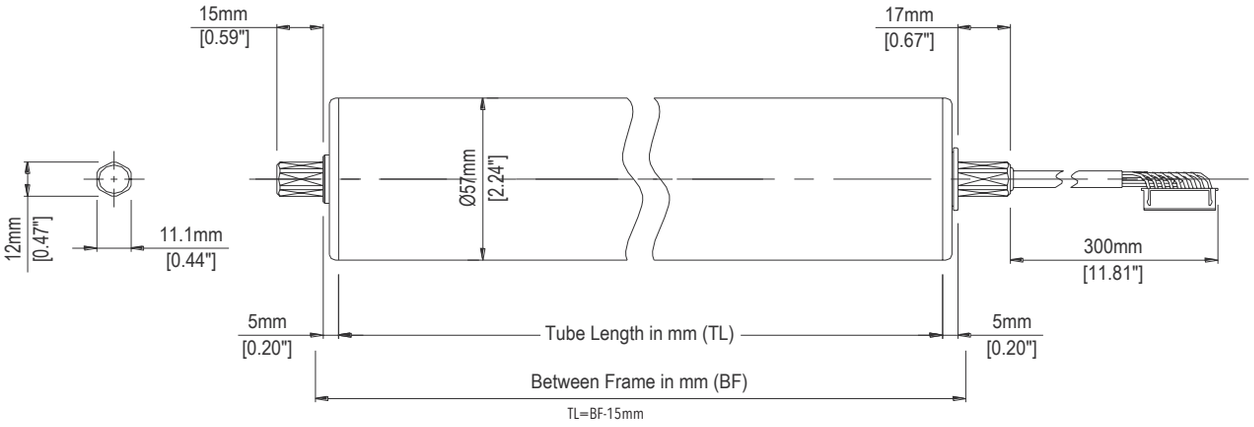
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G




**Standard Hex Shaft Mounting Brackets**
MBB-071 (Hex flat up)
MBB-081 (Hex point up)

**Low Profile Hex Shaft Mounting Brackets**
MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***1 mounting bracket needed for this roller***
*See page 49 for bracket diagrams*

## CB-016S7 20 speed settings

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 28.1 | 8.6 | 81.0 | 90.8 | 3.6 | 0.3 | 1.6 |
| | 8 | 40.0 | 8.6 | 84.0 | 94.2 | 4.0 | 0.4 | 2.1 |
| | 10 | 52.4 | 8.6 | 81.0 | 90.8 | 4.0 | 0.5 | 2.4 |
| | 17 | 64.9 | 8.6 | 66.0 | 74.0 | 4.0 | 0.8 | 2.8 |
| 2 | 20 | 100.0 | 30.6 | 25.8 | 29.0 | 3.6 | 0.3 | 1.6 |
| | 30 | 142.4 | 30.6 | 26.9 | 30.1 | 4.0 | 0.4 | 2.1 |
| | 45 | 186.6 | 30.6 | 25.8 | 29.0 | 4.0 | 0.5 | 2.4 |
| | 60 | 230.8 | 30.6 | 21.1 | 23.7 | 4.0 | 0.8 | 2.8 |
| 1 | 70 | 355.6 | 109.0 | 8.3 | 9.3 | 3.6 | 0.3 | 1.6 |
| | 100 | 506.1 | 109.0 | 8.6 | 9.6 | 4.0 | 0.4 | 2.1 |
| | 140 | 663.4 | 109.0 | 8.3 | 9.3 | 4.0 | 0.5 | 2.4 |
| | 210 | 820.6 | 109.0 | 6.7 | 7.6 | 4.0 | 0.8 | 2.8 |

*See page 26 for CB-016S7 diagram*


## HB-510N 10 speed settings

| Gear Stage | Speed Code | No-load (FPM) SW3 9 High | No-load (FPM) SW3 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 28.1 | 16.2 | 81.0 | 90.8 | 3.6 | 0.3 | 1.4 |
| | 8 | 40.0 | 16.2 | 84.0 | 94.2 | 4.0 | 0.4 | 1.8 |
| | 10 | 52.4 | 16.2 | 81.0 | 90.8 | 4.0 | 0.5 | 2.2 |
| | 17 | 64.9 | 16.2 | 66.0 | 74.0 | 4.0 | 0.8 | 2.6 |
| 2 | 20 | 100.0 | 57.7 | 25.8 | 29.0 | 3.6 | 0.3 | 1.4 |
| | 30 | 142.4 | 57.7 | 26.9 | 30.1 | 4.0 | 0.4 | 1.8 |
| | 45 | 186.6 | 57.7 | 25.8 | 29.0 | 4.0 | 0.5 | 2.2 |
| | 60 | 230.8 | 57.7 | 21.1 | 23.7 | 4.0 | 0.8 | 2.6 |
| 1 | 70 | 355.6 | 205.0 | 8.3 | 9.3 | 3.6 | 0.3 | 1.4 |
| | 100 | 506.1 | 205.0 | 8.6 | 9.6 | 4.0 | 0.4 | 1.8 |
| | 140 | 663.4 | 205.0 | 8.3 | 9.3 | 4.0 | 0.5 | 2.2 |
| | 210 | 820.6 | 205.0 | 6.7 | 7.6 | 4.0 | 0.8 | 2.6 |

*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


*See page 31 for HB-510N diagram*


### Minimum Tube Lengths

| | GEAR STAGES 1 | 2 | 3 |
|---|---|---|---|
| | 252mm (9.92") | 276mm (10.86") | 300mm (11.81") |
| | 235mm (9.25") | 259mm (10.20") | 282mm (11.10") |
| | 252mm (9.92") | 276mm (10.86") | 300mm (11.81") |
| | 305mm (12.00") | 329mm (12.95") | 350mm (13.78") |
| | 252mm (9.92") | 276mm (10.86") | 300mm (11.81") |
| | 370mm (14.57") | 394mm (15.51") | 415mm (16.34") |

### TL Considerations for non-standard EC

- VP: BF - 35mm = TL
- P2 double groove tube standard (65mm/30mm)
- Available with grooved tube or straight tube
- Waterproof option does not include spring loaded shaft; add WT to model number to recieve spring loaded shaft.
- Check with your Itoh Denki representative for WA speeds available

# PM570KT

## DC Motor Driven Roller

**Diameter:** 2.24" (57.0mm)
**Voltage:** 24V DC

**Standard Features**
- Brushless DC motor provides long life
- ABEC 1 Bearings
- 13.5mm (0.53") hex shaft
- High torque
- Supplied with 1000mm (39.4") power cable
- IP54 Enclosure
- Class E Insulation

Spring loaded shaft roller

**Operation**
- Cycle: 1s ON; 1 OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

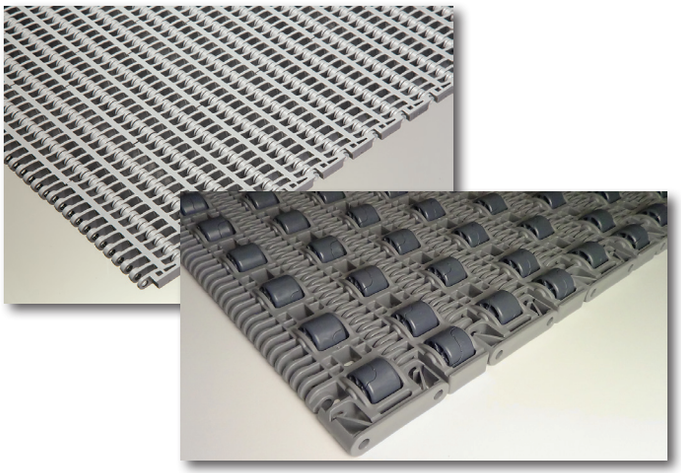
**Protection**
- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

NEW FOR BELTED CONVEYORS PRODUCT

*Our Power Moller 24 motorized driven roller has been modified with a splined aluminum tube profile which is fitted with Intralox's patented MDR sprocket that allows the roller to drive the belt.*

Intralox patented MDR sprocket



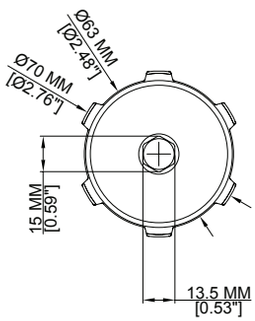
Modular Plastic Belting by Intralox

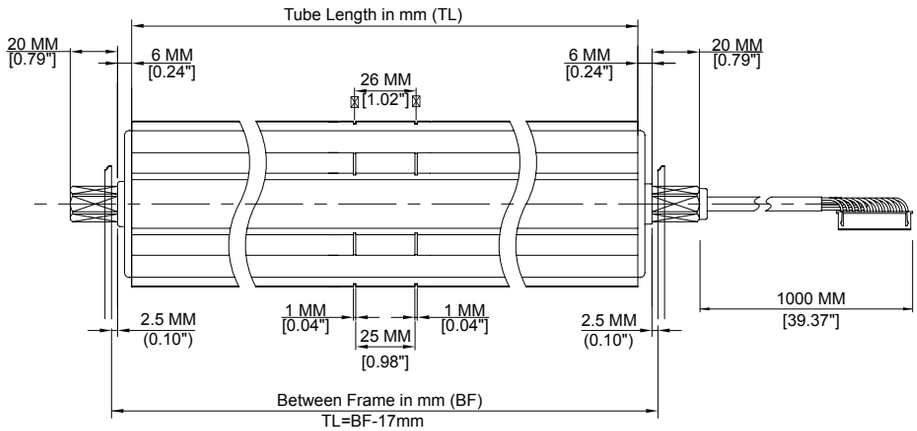
*See page 36 for IB-E04 diagram*
**Controls 2 Power Mollers*


*See page 34 for HBK-608 diagram*


**HBK-608FP Performance Data using PM570KT**

| Speed Code | No-load (FPM) High | No-load (FPM) Low | Tangential Force | Torque (lb/in) Starting | Current (A) Starting | Current (A) No-Load | Current (A) Rated |
|---|---|---|---|---|---|---|---|
| 15 | 53.1 | 13.1 | 202.4 | 236.8 | 6.9 | 0.6 | 3 |
| 28 | 114 | 14 | 93.8 | 111.7 | 7 | 0.7 | 3.8 |




**Minimum Tube Length**

MIN 360mm (14.17")

**Standard Hex Shaft Mounting Brackets - Point Up**
MBK-01K-6 (Cable end)
MBK-01K-7 (Spring loaded end)

***1 each of the above mounting brackets needed for this roller***
*See page 50 for bracket diagrams*

# PM605FE

## DC Motor Driven Roller

**Diameter:** 2.38" (60.5mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 7/16" Hex (plain) shafts standard
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- One shaft mounting, cable side
- Dynamic brake

Available as spring loaded
or non spring loaded shaft

### Available Options


### Operation

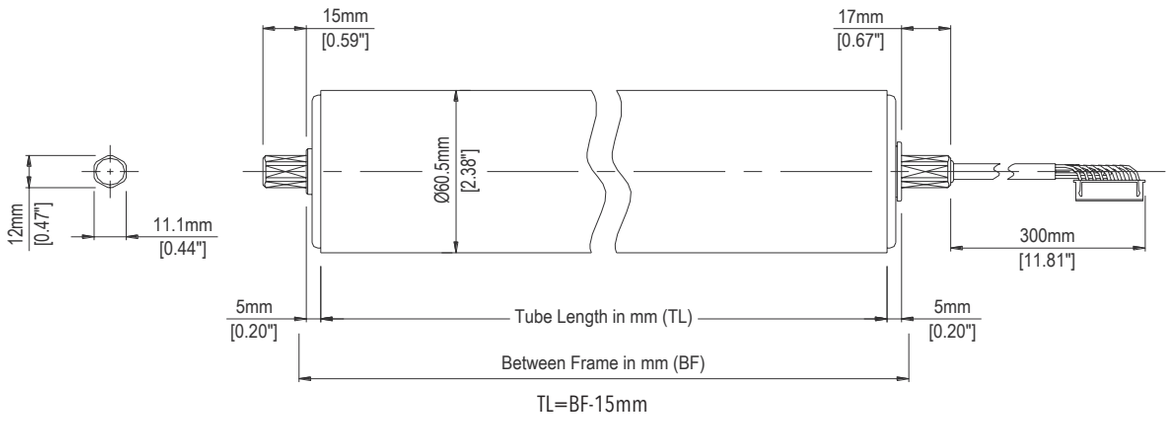
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G




### Standard Hex Shaft Mounting Brackets

MBB-071 (Hex flat up)
MBB-081 (Hex point up)

### Low Profile Hex Shaft Mounting Brackets

MBC-071 (Hex flat up)
MBC-081 (Hex point up)

***1 mounting bracket needed for this roller***

*See page 49 for bracket diagrams*

**CB-016S7 20 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 29.9 | 8.6 | 76.3 | 90.8 | 3.6 | 0.3 | 1.6 |
| | 8 | 42.4 | 8.6 | 79.1 | 94.2 | 4.0 | 0.4 | 2.1 |
| | 10 | 55.6 | 8.6 | 76.3 | 90.8 | 4.0 | 0.5 | 2.4 |
| | 17 | 68.8 | 8.6 | 62.2 | 74.0 | 4.0 | 0.8 | 2.8 |
| 2 | 20 | 106.2 | 30.6 | 24.3 | 29.0 | 3.6 | 0.3 | 1.6 |
| | 30 | 151.1 | 30.6 | 25.3 | 30.1 | 4.0 | 0.4 | 2.1 |
| | 45 | 198.1 | 30.6 | 24.3 | 29.0 | 4.0 | 0.5 | 2.4 |
| | 60 | 245.0 | 30.6 | 19.8 | 23.7 | 4.0 | 0.8 | 2.8 |
| 1 | 70 | 377.4 | 109.0 | 7.8 | 9.3 | 3.6 | 0.3 | 1.6 |
| | 100 | 537.2 | 109.0 | 8.1 | 9.6 | 4.0 | 0.4 | 2.1 |
| | 140 | 704.1 | 109.0 | 7.8 | 9.3 | 4.0 | 0.5 | 2.4 |
| | 210 | 871.0 | 109.0 | 6.3 | 7.6 | 4.0 | 0.8 | 2.8 |

*See page 26 for CB-016S7 diagram*


**HB-510N 10 speed settings**

| Gear Stage | Speed Code | No-load (FPM) SW3 9 High | No-load (FPM) SW3 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 29.9 | 17.2 | 76.3 | 90.8 | 3.6 | 0.3 | 1.4 |
| | 8 | 42.4 | 17.2 | 79.1 | 94.2 | 4.0 | 0.4 | 1.8 |
| | 10 | 55.6 | 17.2 | 76.3 | 90.8 | 4.0 | 0.5 | 2.2 |
| | 17 | 68.8 | 17.2 | 62.2 | 74.0 | 4.0 | 0.8 | 2.6 |
| 2 | 20 | 106.2 | 61.2 | 24.3 | 29.0 | 3.6 | 0.3 | 1.4 |
| | 30 | 151.1 | 61.2 | 25.3 | 30.1 | 4.0 | 0.4 | 1.8 |
| | 45 | 198.1 | 61.2 | 24.3 | 29.0 | 4.0 | 0.5 | 2.2 |
| | 60 | 245.0 | 61.2 | 19.8 | 23.7 | 4.0 | 0.8 | 2.6 |
| 1 | 70 | 377.4 | 217.6 | 7.8 | 9.3 | 3.6 | 0.3 | 1.4 |
| | 100 | 537.2 | 217.6 | 8.1 | 9.6 | 4.0 | 0.4 | 1.8 |
| | 140 | 704.1 | 217.6 | 7.8 | 9.3 | 4.0 | 0.5 | 2.2 |
| | 210 | 871.0 | 217.6 | 6.3 | 7.6 | 4.0 | 0.8 | 2.6 |

*See page 31 for HB-510N diagram*


*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


- P2 double groove tube standard (65mm/30mm)
- Available with grooved tube or straight tube
- Waterproof option does not include spring loaded shaft; add WT to model number to recieve spring loaded shaft.
- Check with your Itoh Denki representative for WA speeds available

**Minimum Tube Lengths**


| GEAR STAGES | | |
|---|---|---|
| 1 | 2 | 3 |
| 305mm (12.00") | 329mm (12.95") | 350mm (13.78") |
| 252mm (9.92") | 276mm (10.86") | 300mm (11.81") |
| 235mm (9.25") | 259mm (10.20") | 282mm (11.10") |
| 370mm (14.57") | 394mm (15.51") | 415mm (16.34") |
| 252mm (9.92") | 276mm (10.86") | 300mm (11.81") |

# PM635FS

## DC Motor Driven Roller

**Diameter:** 2.50" (63.5mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 11/16" Hex (threaded) shafts standard
- ABEC 1 Bearings
- DOM, carbon steel tube
- Heavy duty pallet handling
- Low profile requirement of pallet handling
- One shaft mounting, cable side
- Dynamic Brake
- Loads up to 2500 lbs

**Available Options -** Waterproof and Low Temp available on certain speed codes. Contact an Itoh Denki representative to review your specific application

### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

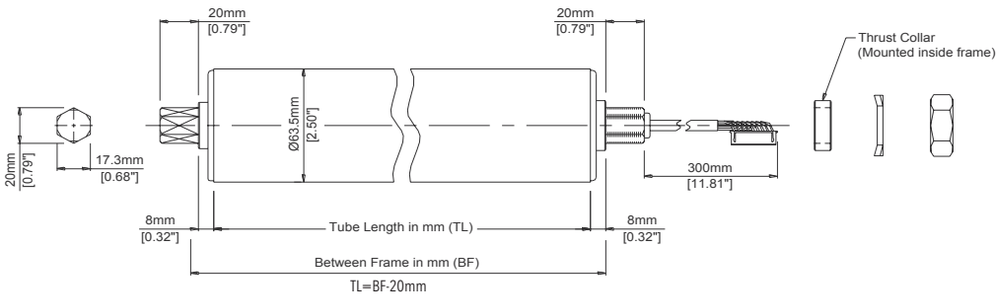
### Protection

- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

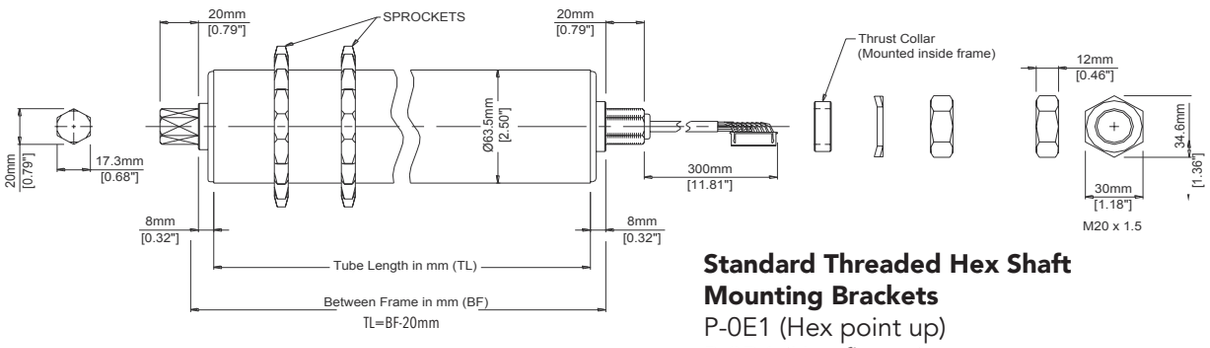
### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Available as spring loaded shaft
* Double sprocket end cap available in non spring loaded shaft only




Standard
(Threaded Hex Shaft)




**Standard Threaded Hex Shaft Mounting Brackets**
P-0E1 (Hex point up)
P-0D1 (Hex flat up)
**Thrust collar nuts are to be tightened to 110.6 lb • ft ± 10%*

***1 mounting bracket needed for this roller***
*See page 49 for bracket diagrams*

| CB-016S7 20 speed settings | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gear Stage | Speed Code | No-load (FPM) SW1-5 on SW5 9 High | No-load (FPM) SW1-5 off SW5 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
| 3 | 6 | 34.1 | 9.2 | 114.3 | 142.9 | 4.0 | 0.4 | 2.0 |
| | 10 | 47.7 | 9.2 | 108.6 | 135.7 | 4.0 | 0.5 | 2.7 |
| | 15 | 63.0 | 9.2 | 91.5 | 114.3 | 4.0 | 0.7 | 3.2 |
| | 20 | 74.0 | 9.2 | 80.0 | 100.0 | 4.0 | 0.9 | 3.5 |
| 2 | 25 | 128.6 | 34.8 | 34.4 | 43.0 | 4.0 | 0.4 | 2.0 |
| | 40 | 180.0 | 34.8 | 32.7 | 40.9 | 4.0 | 0.5 | 2.7 |
| | 60 | 237.9 | 34.8 | 27.5 | 34.4 | 4.0 | 0.7 | 3.2 |
| | 75 | 279.2 | 34.8 | 24.1 | 30.1 | 4.0 | 0.9 | 3.5 |

*See page 26 for CB-016S7 diagram*


| HB-510N 10 speed settings | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gear Stage | Speed Code | No-load (FPM) SW3 9 High | No-load (FPM) SW3 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | Current (A) At highest speed No-Load | Current (A) At highest speed Rated |
| 3 | 6 | 34.1 | 18.4 | 114.3 | 142.9 | 4.0 | 0.4 | 1.9 |
| | 10 | 47.7 | 18.4 | 108.6 | 135.7 | 4.0 | 0.5 | 2.5 |
| | 15 | 63.0 | 18.4 | 91.5 | 114.3 | 4.0 | 0.7 | 3.0 |
| | 20 | 74.0 | 18.4 | 80.0 | 100.0 | 4.0 | 0.9 | 3.2 |
| 2 | 25 | 128.6 | 69.9 | 34.4 | 43.0 | 4.0 | 0.4 | 1.9 |
| | 40 | 180.0 | 69.9 | 32.7 | 40.9 | 4.0 | 0.5 | 2.5 |
| | 60 | 237.9 | 69.9 | 27.5 | 34.4 | 4.0 | 0.7 | 3.0 |
| | 75 | 279.2 | 69.9 | 24.1 | 30.1 | 4.0 | 0.9 | 3.2 |

*See page 31 for HB-510N diagram*


*See page 35 for IB-E03 diagram*
**Controls 2 Power Mollers*


**OS= Other Specifications**
If needed, call out welded sprockets when ordering:
40A21, 50A17, or 60A15.

**Minimum Tube Lengths**

| GEAR STAGES | |
|---|---|
| 2 | 3 |
| 387mm (15.24") | 410mm (16.14") |
| 352mm (13.86") | 375mm (14.76") |
| 387mm (15.24") | 410mm (16.14") |
| 387mm (15.24") | 410mm (16.14") |

**TL Considerations for non-standard EC**

- SW: BF - 63mm = TL
- VG: BF - 66mm = TL
- OS: BF - 20mm = TL
- Contact an Itoh Denki representative to review your specific application

# PM635KE/KT

## DC Motor Driven Roller

***PM635KE (10 AMP); PM635KT (7 AMP)***

**Diameter:** 2.50" (63.5mm)
**Voltage:** 24V DC

### Standard Features

- Brushless DC motor provides long life
- 11/16" Hex (threaded) shafts standard
- ABEC 1 Bearings
- DOM, carbon steel tube
- Heavy duty pallet handling
- Low profile requirement of pallet handling
- 1000mm (39.37") power cable standard
- One shaft mounting, cable side

Available as spring loaded shaft
* Double sprocket end cap available in non spring loaded shaft only

### Available Options

### Operation

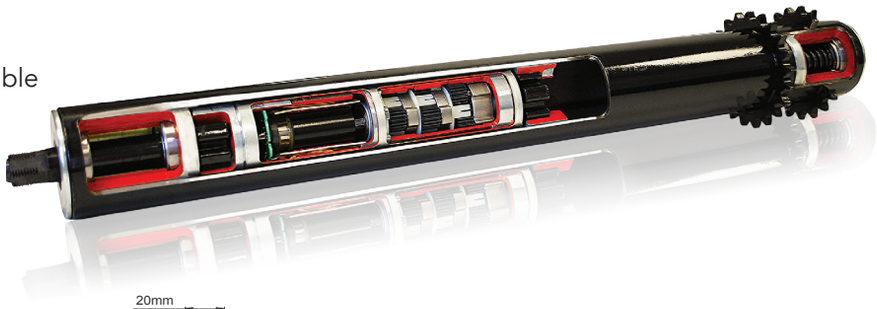
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

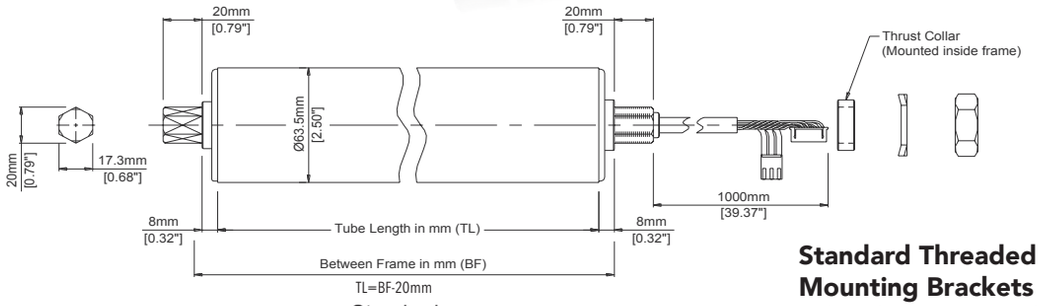
### Protection

- Thermal overload 221°F (105°C) in the motor when used with an Itoh Denki controller

### Environment

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

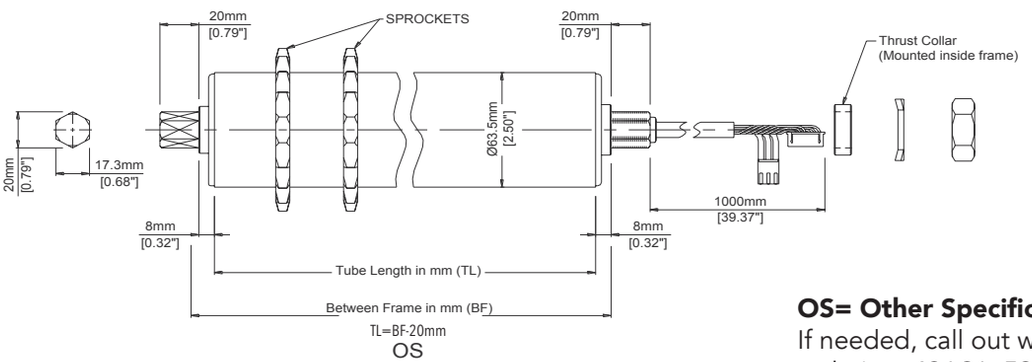





Standard
(Threaded Hex Shaft)

**Standard Threaded Hex Shaft Mounting Brackets**
P-0E1 (Hex point up)
P-0D1 (Hex flat up)
**Thrust collar nuts are to be tightened to 110.6 lb • ft ± 10%*

***1 mounting bracket needed for this roller***
*See page 49 for bracket diagrams*




OS
(Other Specifications - Sprockets)

**OS= Other Specifications**
If needed, call out welded sprockets when ordering: 40A21, 50A17, or 60A15.

PM635KE: cable has 2 connectors for use with the CBM-103FN driver card

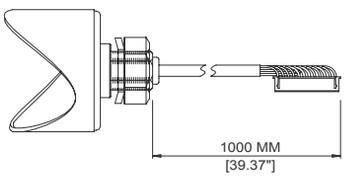
| CBM-103FN 10 speed settings | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | No-load (FPM) | | | | | | |
| Gear Stage | Speed Code | SW2 9 High | SW2 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | No-Load | Rated |
| 3 | 16 | 52.5 | 6.6 | 228.6 | 285.9 | 10.0 | 0.7 | 2.8 |
| 2 | 60 | 199.5 | 24.9 | 63.3 | 78.8 | 10.0 | 0.8 | 2.8 |
| 1 | 230 | 757.9 | 94.8 | 17.5 | 22.1 | 10.0 | 0.9 | 2.8 |

*See page 28 for CBM-103 diagram*


PM635KT: 12 pin motor connector for use with the CB-030S or IB-E04 driver card

| CB-030S 20 speed settings | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | No-load (FPM) | | | | | | |
| Gear Stage | Speed Code | SW2 9 High | SW2 0 Low | Tangential force (lb) Starting | Torque (lb·in) Starting | Current (A) At highest speed Starting | No-Load | Rated |
| 3 | 16 | 59.4 | 7.5 | 181.6 | 227.4 | 7.0 | 0.7 | 2.9 |
| 2 | 60 | 225.1 | 28.2 | 50.3 | 62.8 | 7.0 | 0.8 | 2.9 |
| 1 | 230 | 855.3 | 107.3 | 13.9 | 17.7 | 7.0 | 0.9 | 2.9 |

*See page 27 for CB-030S diagram*


PM635KT with 12 pin motor connector

*See page 36 for IB-E04 diagram*
**Controls 2 Power Mollers*


## Minimum Tube Lengths

| GEAR STAGES | | |
|---|---|---|
| 1 | 2 | 3 |
| 360mm (14.17") | 380mm (14.96") | 400mm (15.75") |
| 325mm (12.80") | 345mm (13.58") | 365mm (14.37") |
| 360mm (14.17") | 380mm (14.96") | 400mm (15.75") |
| 360mm (14.17") | 380mm (14.96") | 400mm (15.75") |

## TL Considerations for non-standard EC

- SW: BF - 63mm = TL
- VG: BF - 66mm = TL
- OS: BF - 20mm = TL
- Contact an Itoh Denki representative to review your specific application

# CB-016S7

Driver Card

***Applicable models: PM486FS, PM486FE, PM486FP, PM570FE, PM605FE, PM635FS***

**Operation**

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

**Protection**

- Thermal overload 185°F (85°C) on PCB
- 5A fuse to power supply
- Diode for protection from incorrect wiring

**Environment**

- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

**Available Options**

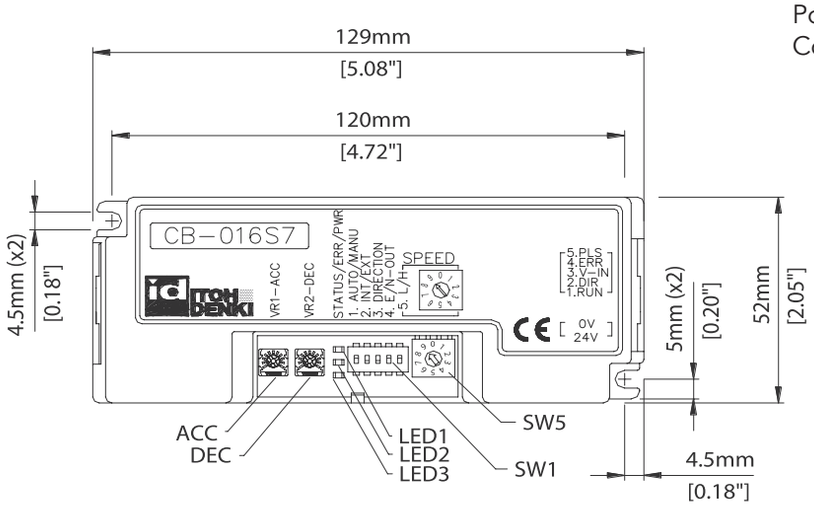


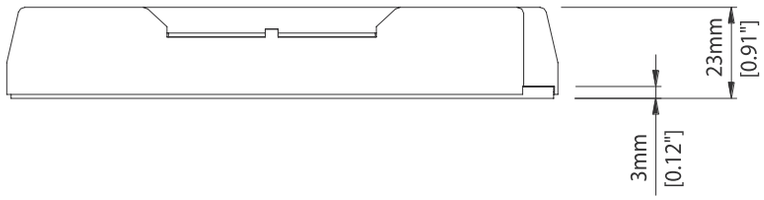
**Features**

- 3 LED's to identify type of error and number of occurrences
- Dynamic brake control
- Stable speed function to ensure articles of different weights travel at the same rate
- Variable speed control by 1 DIP switch combined with1 rotary switch or by external voltage input for up to 20 speeds
- Direction control by onboard DIP switch or external signal input
- Adjustable acceleration and deceleration time (0 to 2.5s)
- Switch for manual or automatic recovery of thermal overload device
- Forcibly stops the motor if motor lock or thermal overload error lasts for 4 seconds or more
- Snap on cover for easy NPN/PNP switching without removing the card off the frame
- Also available for rollers with built-in brakes, CB-016BS7
- Includes mounting hardware and wiring connectors

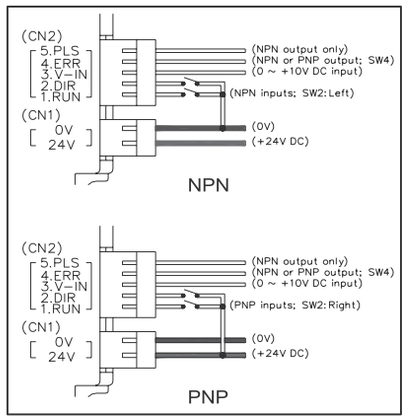
***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #734-102 (Included)
Control: WAGO #733-105 (Included)




Wiring



# CB-030S
## Driver Card

***Applicable models: PM486FH, PM635KT, PM570KT***

**Operation**
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

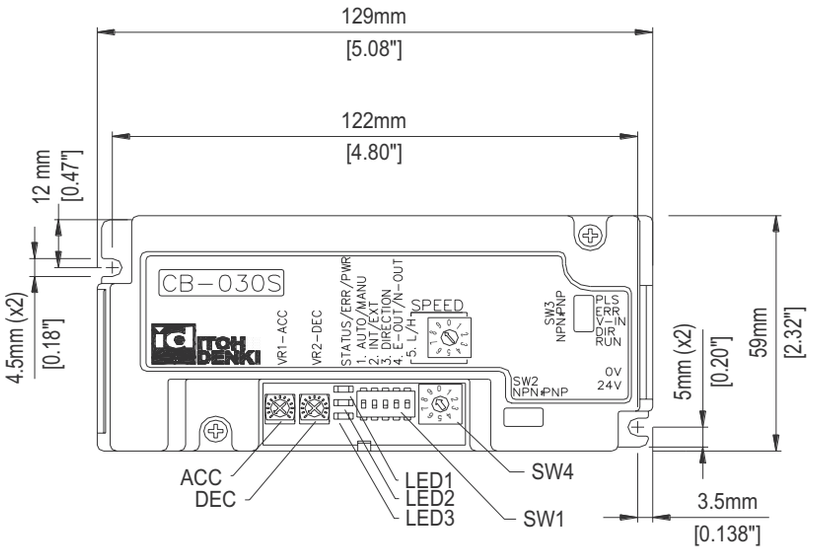
**Protection**
- Thermal overload 185°F (85°C) on PCB
- 10A fuse to power supply
- Diode for protection from incorrect wiring

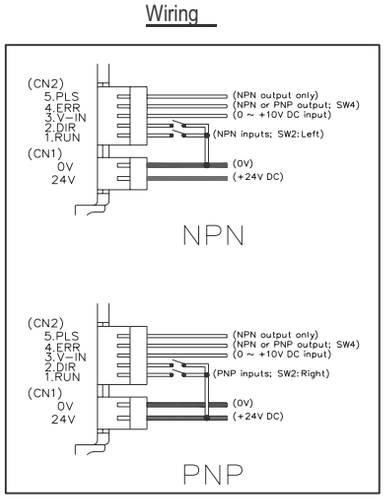
**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G


**Features**
- Designed for use with the high torque PM486FH (up to 7A) and PM635KT
- 3 LED's to identify type of error and number of occurrences
- Dynamic brake
- Stable speed function to ensure articles of different weights travel at the same rate
- Variable speed control by 1 DIP switch combined with 1 rotary switch or by external voltage input for up to 20 speeds
- Direction control by onboard DIP switch or external signal input
- Adjustable acceleration and deceleration time (0 to 2.5s)
- Switch for manual or automatic recovery of thermal overload device
- Forcibly stops the motor if motor lock or thermal overload error lasts for 4 seconds or more
- Includes mounting hardware and wiring connectors

***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #734-102 (Included)
Control: WAGO #733-105 (Included)



# CBM-103F

## Driver Card

***Applicable models: PM635KE***

PNP output - CBM-103FP; NPN output CBM-103FN
Must specify when ordering


**Operation**
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

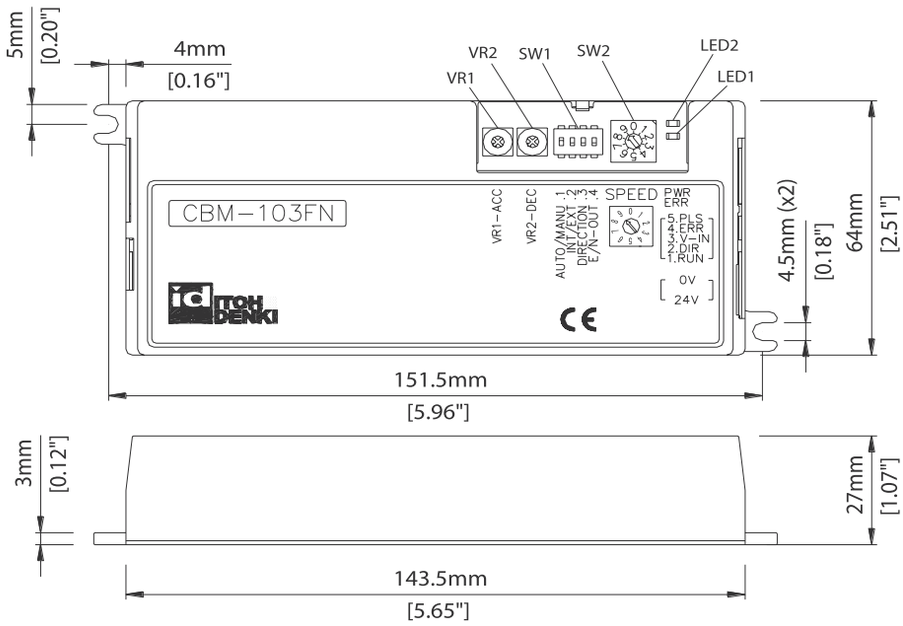
**Protection**
- Thermal overload 203°F (95°C) on PCB
- 18A fuse to power supply

**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

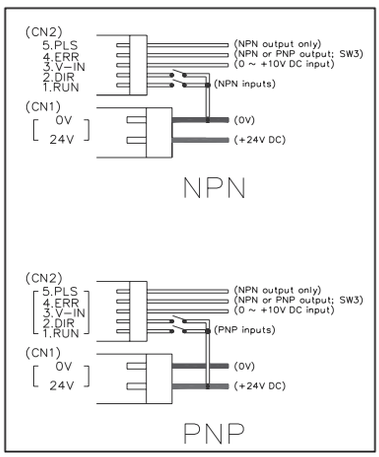
**Connectors for power and control are:**
Power: WAGO #231-102/026-000 (Included)
Control: WAGO #733-105 (Included)

**Features**
- Designed for use with the high torque PM635KE (up to 10A)
- 2 LED's to identify type of error and number of occurrences
- Dynamic brake control
- Stable speed function to ensure articles of different weights travel at the same rate
- Variable speed control with rotary switch for 10 fixed speed settings or by external voltage input for up to 16 speeds
- Direction control by onboard DIP switch or external signal input
- Adjustable acceleration and deceleration time (0 to 2.5s)
- Switch for manual or automatic recovery of thermal overload device
- Forcibly stops the motor if there is a motor lock, back EMF, or thermal overload occurs
- Output is selectable through a dip switch
- Includes mounting hardware and wiring connectors

***To view more information please visit www.itohdenki.com***




**Wiring**



# CBM-105F

## Driver Card

***Applicable models: PM486FS, PM486FE, PM486FP, PM570FE, PM605FE, PM635FS***

PNP output - CBM-105FP; NPN output CBM-105FN
Must specify when ordering


### Operation

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Protection

- Thermal overload 158°F (70°C) on PCB
- 5A fuse to power supply
- Diode for protection from incorrect wiring

### Environment

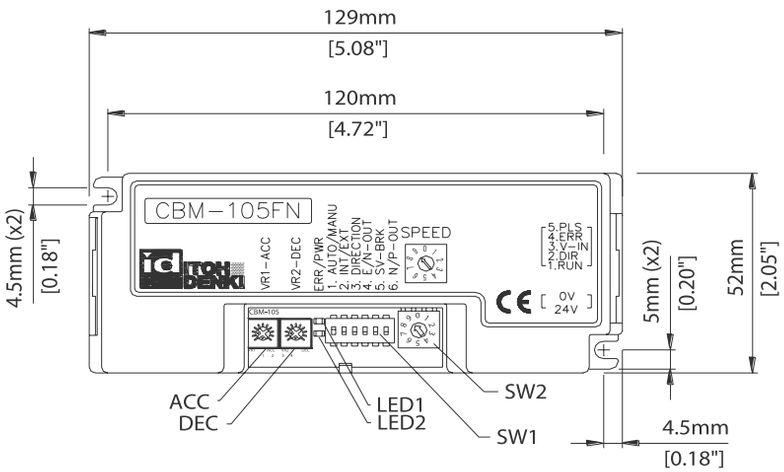
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

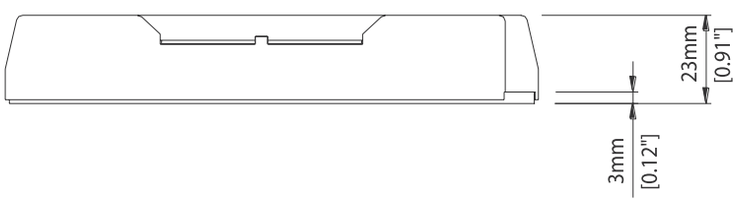
**Connectors for power and control are:**
Power: WAGO #734-102 (Included)
Control: WAGO #733-105 (Included)

### Features

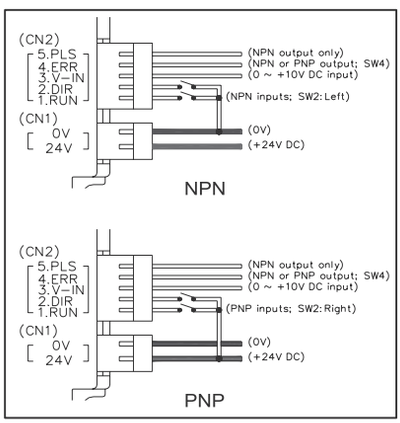
- 2 LED's to identify type of error
- Error output signal for self diagnosis
- Dynamic brake and servo brake control
- Variable speed by rotary switch or external voltage input
- Direction control by DIP switch or external signal input
- Adjustable acceleration and deceleration time (0-2.5s)
- Switch for automatic or manual recovery of back EMF error and thermal overload device
- Forcibly stops the motor if there is a motor lock, back EMF, or thermal overload occurs
- Output is selectable through a dip switch
- Includes mounting hardware and wiring connector

***To view more information please visit www.itohdenki.com***




**Wiring**



# CBM-107F

## Driver Card

***Applicable models: PM486LD, PM486LE***

PNP output - CBM-107FP; NPN output CBM-107FN
Must specify when ordering


**Operation**
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

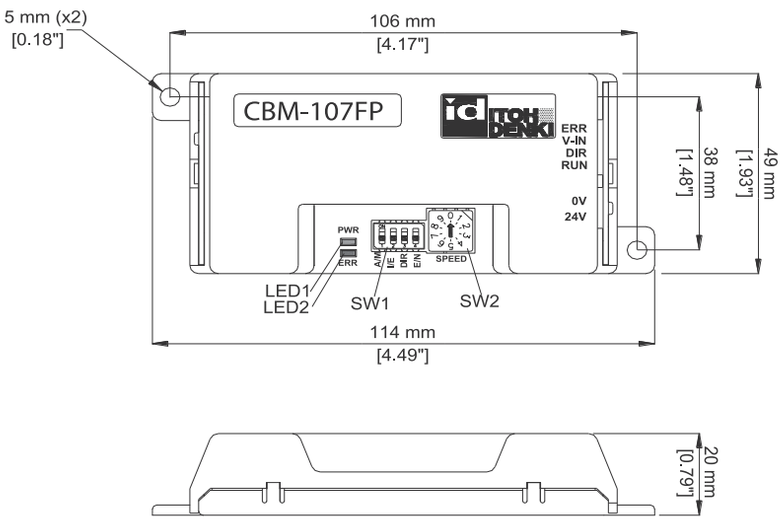
**Protection**
- Thermal overload 203°F (95°C) on PCB
- 5A fuse to power supply
- Diode for protection from incorrect wiring

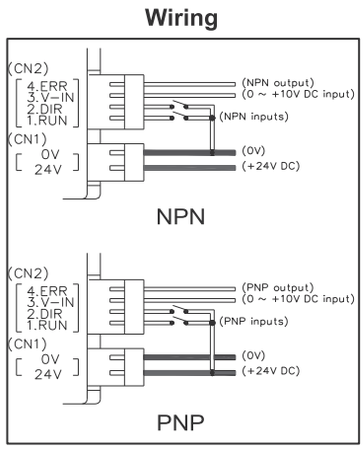
**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

**Features**
- Provides thermal protection for both Power Moller and driver card
- Two LED's to identify type of error
- Error output signal for self diagnosis
- Dynamic brake control
- Variable speed by rotary switch or external voltage input
- Direction control by DIP switch or external signal input
- Switch for automatic or manual recovery of back EMF error and thermal overload device
- Forcibly stops the motor if there is a motor lock, back EMF, or thermal overload occurs
- Please specify NPN input (CBM-107FN) or PNP input (CBM-107FP)
- Includes mounting hardware and wiring connector

***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #734-102 (Included)
Control: WAGO #733-104 (Included)



# HB-510

## ZPA Hybrid Driver Card

***Applicable models: PM486FS, PM486FE, PM486FP, PM570FE, PM605FE, PM635FS***

PNP output - HB-510P; NPN output - HB-510N
Must specify when ordering

**Available Options**



### Operation
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

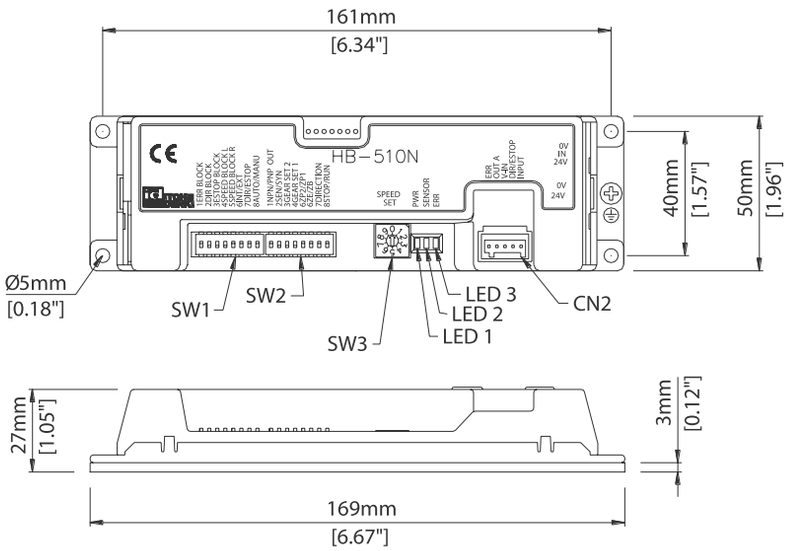
### Protection
- Thermal overload 185°F (85°C) on PCB
- 5A fuse to power supply
- Diode for protection from incorrect wiring

### Environment
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

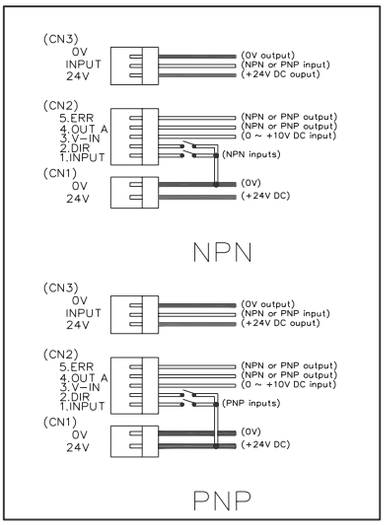
### Connectors for power and control are:
Power: WAGO #734-102 (Included)
Sensor: WAGO # 733-103 (Included)
Optional External Control: WAGO #733-105 (Not Included)

### Features
- 3 LED's to identify type of error and number of occurrences
- Dynamic brake control
- Stable speed function to ensure articles of different weights travel at the same rate
- Variable speed control by rotary switch or by external voltage input for up to 10 speeds
- Direction control by onboard DIP switch or external signal input
- Logic for general zero pressure accumulation (ZPA) control is built in
- Direct connection for photo eye to power it and receive its output signal
- Easy connection between adjacent HB-510's with communication cable to simplify wiring
- Flexible Zone Recognition (patented) to handle long articles which simultaneously block multiple sensors
- Also available for rollers with built-in brakes, HB-510B
- Includes mounting hardware and wiring connectors

***To view more information please visit www.itohdenki.com***




**Wiring**



# HBM-604B

## 2 Zone ZPA Hybrid Driver Card

***Applicable models: PM486FS, PM486FE, PM486FP, PM570FE, PM605FE, PM635FS***

PNP output - HBM-604BP; NPN output - HBM-604BN
Must specify when ordering


**Operation**
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

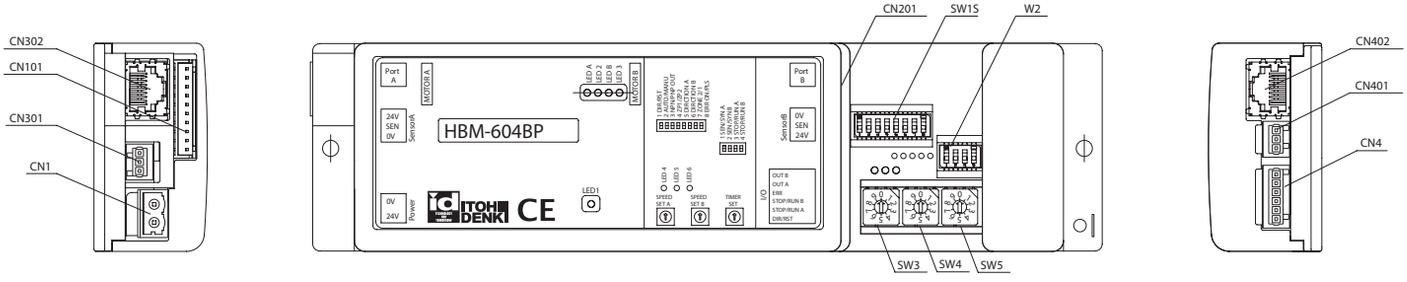
**Protection**
- Thermal overload 203°F (95°C) on PCB
- Two 7A fuses for each motor
- Input power protected against reversed polarity

**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

**Features**
- Controls up to 2 Power Mollers (brake and non-brake models)
- 2 available sensor connections that power and receive the output from sensor
- Dynamic brake control
- Stable speed function to ensure articles of different weights travel at the same rate
- Variable speed control by rotary switch
- Motor direction control by onboard DIP switch
- Logic for general Zero Pressure Accumulation (ZPA) control is built in
- Flexible Zone Recognition to handle long articles which simultaneously block multiple sensors
- Easy connection between adjacent HBM-604's with communication cable to simplify wiring

***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #231-302/ 026-000 (Included)
Sensor: WAGO # 733-103 (Included)
Optional External Control: WAGO #733-106 (Not Included)
** Non brake model rollers must use 10-pin motor connector*

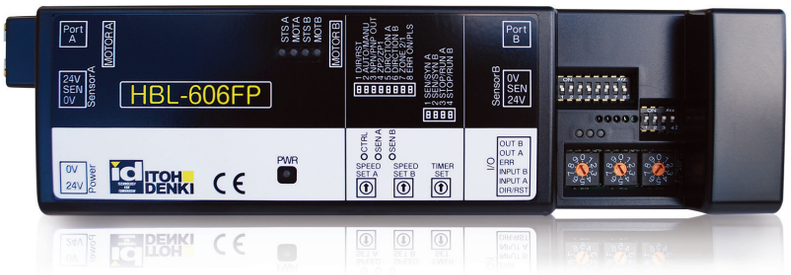


# HBL-606F

## 2 Zone ZPA Hybrid Driver Card

***Applicable models: PM486LD, PM486LE***

PNP output - HBL-606FP; NPN output - HBL-606FN
Must specify when ordering




**Operation**
- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

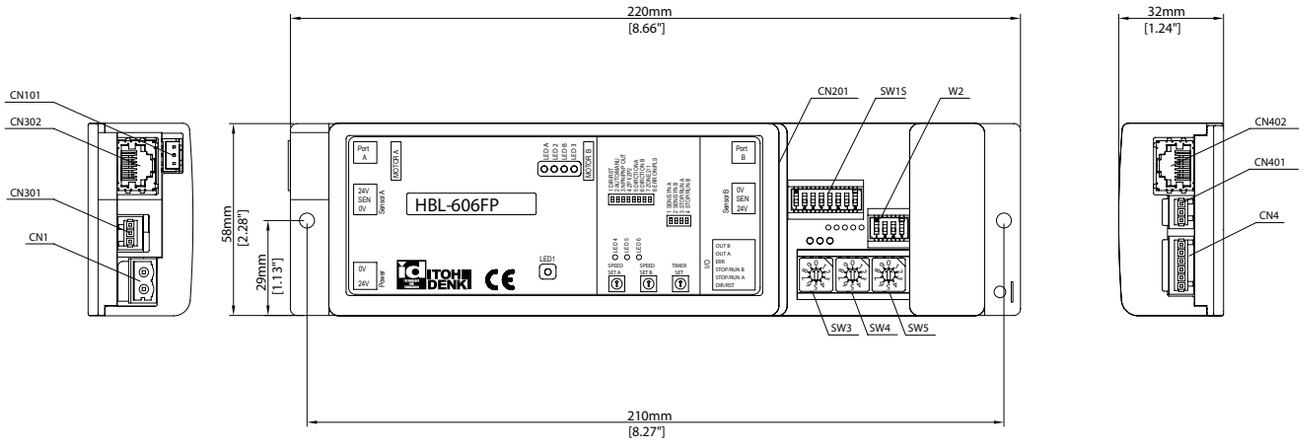
**Protection**
- Thermal overload 203°F (95°C) on PCB
- Thermal overload 221°F (105°C) in the motor
- 2 5A fuses for each motor
- Protection from incorrect wiring (reverse polarity)

**Environment**
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

**Features**
- Controls up to 2 Power Mollers
- 2 available sensor connections that power and receive the output from sensor
- Variable speed control by rotary switch
- Direction control by onboard DIP switch or external signal input
- Logic for general Zero Pressure Accumulation (ZPA) control is built-in
- Flexible Zone Recognition to handle long articles which simultaneously block multiple sensors
- Easy connection between adjacent HBL-606's with communication cable to simplify wiring

***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #734-102/ 026-000 (Included)
Sensor: WAGO # 733-103 (Included)
Optional External Control: WAGO #733-106 (Not Included)

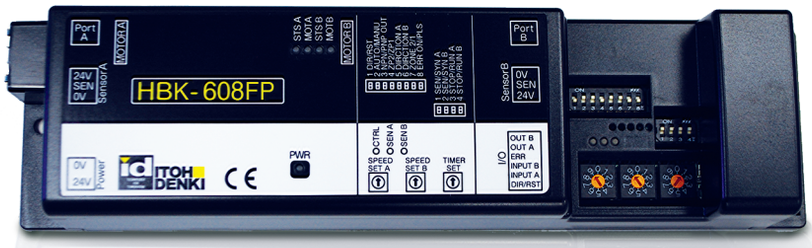


# HBK-608F

## 2 Zone ZPA Hybrid Driver Card

***Applicable models: PM486FH, PM635KT, PM570KT***

PNP output - HBK-608FP; NPN output - HBK-608FN
Must specify when ordering




**Operation**

- Cycle: 1s ON; 1s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

**Protection**

- Thermal overload 203°F (95°C) on PCB
- Thermal overload 221°F (105°C) in the motor
- 2 10A fuses for each motor
- Protection from incorrect wiring (reverse polarity)

**Environment**

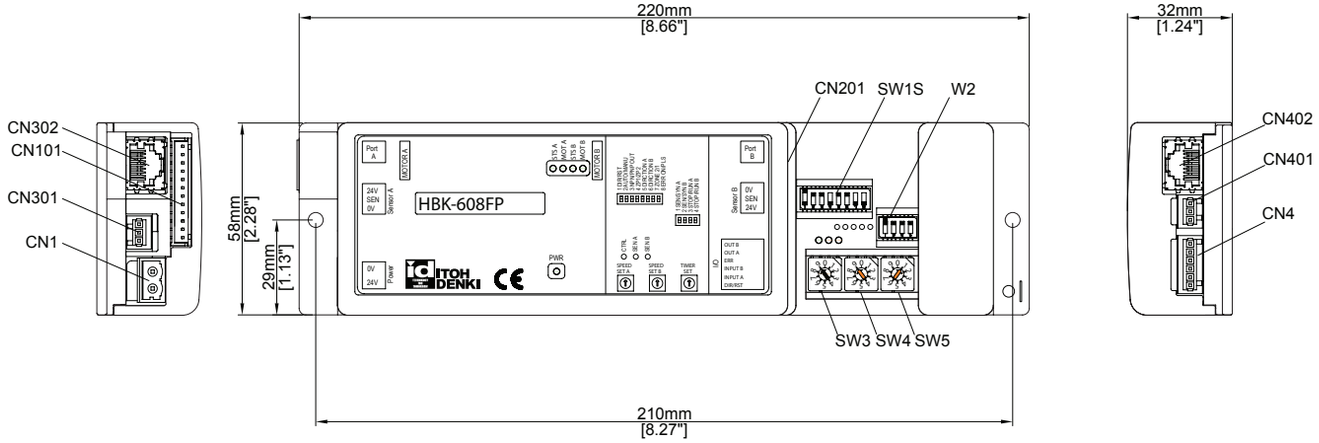
- Ambient temperature 32~104° F (0~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

**Features**

- Controls up to 2 Power Mollers
- 2 available sensor connections that power and receive the output from sensor
- Variable speed control by rotary switch
- Direction control by onboard DIP switch or external signal input
- Logic for general Zero Pressure Accumulation (ZPA) control is built-in
- Flexible Zone Recognition to handle long articles which simultaneously block multiple sensors
- Easy connection between adjacent HBK-608's with communication cable to simplify wiring

***To view more information please visit www.itohdenki.com***

**Connectors for power and control are:**
Power: WAGO #231-302/026-000 (Included)
Sensor: WAGO # 733-103 (Included)
Optional External Control: WAGO #733-106 (Not Included)



# IB-E03B

## 2 Zone Controller

***Applicable models: PM486FS, PM486FE, PM486FP, PM605FE, PM635FS, PM570FE***

PNP output - IB-E03BP; NPN output - IB-E03BN
Must specify when ordering


EtherNet/IP™

**Protection**

- Thermal overload 185°F (90°C) on PCB
- 7 A fuse for each motor
- Diode for protection from incorrect wiring

**Environment**

- Ambient temperature -4~104° F (-20~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 1.0G

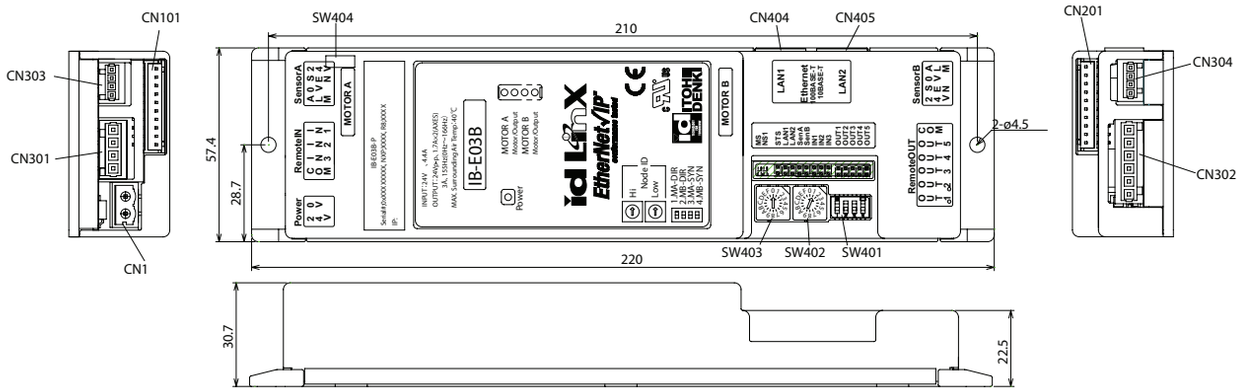
**Features**

- Controls up to 2 Power Mollers (brake and non brake models)*
- Direct connection for 2 photo-sensors that power and receive the output signal
- Custom programmable ladder logic for fine tuning your specific application
- I/O device equipping 3 discrete inputs and 5 discrete outputs
- Establish I/O connection to software and control platforms through E/IP
- Local and remote control are available
- 2 port Ethernet switch
- LED status / error indicators
- Motor pulse counting through local logic
- EtherNet/IP CONFORMANCE TESTED™
- UL and cUL recognized component
- AOP (Add-On Profile)
- Wire side connectors are available from various sources. They are not provided as standard.

| IB-E BASIC CONNECTOR KIT (REQUIRED) | | |
|---|---|---|
| DESCRIPTION | WAGO PART | QTY. REQUIRED |
| POWER | 231-302<br>026-000 | 1 |
| PHOTO EYE SENSOR | 733-104 | 2 |
| WAGO TOOL | 733-191 | 1 |
| WAGO TOOL | 231-231 | 1 |

| IB-E I/O CONNECTOR KIT (OPTIONAL) | | |
|---|---|---|
| DESCRIPTION | WAGO PART | QTY. REQUIRED |
| EXTERNAL INPUT | 734-204 | 1 |
| SIGNAL OUTPUT | 734-206 | 1 |
| WAGO TOOL | 734-201 | 1 |

***To view more information please visit www.itohdenki.com***



# IB-E04F

## 2 Zone Controller

***Applicable models: PM486FH, PM570KT, PM635KT***

PNP output - IB-E04FP; NPN output - IB-E04FN
Must specify when ordering


EtherNet/IP™

**Protection**

- Thermal overload 185°F (90°C) on PCB
- 10 A fuse for each motor
- Diode for protection from incorrect wiring

**Environment**

- Ambient temperature -4~104° F (-20~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 1.0G

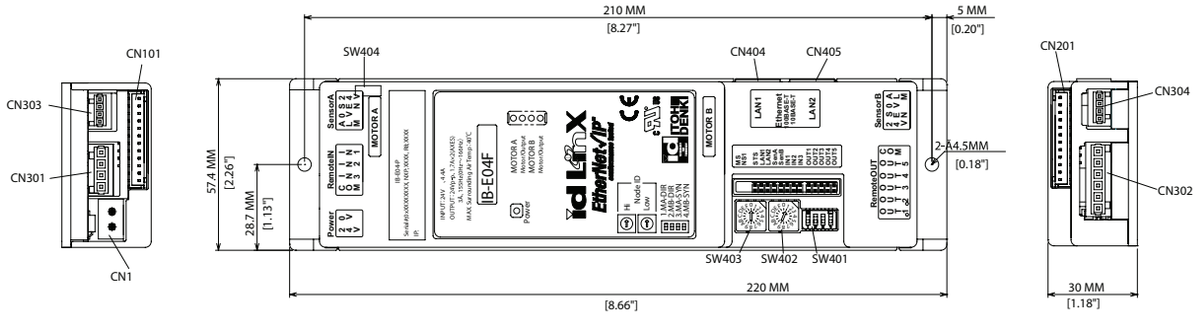
**Features**

- Controls up to 2 Power Mollers
- Direct connection for 2 photo-sensors that power and receive the output signal
- Custom programmable ladder logic for fine tuning your specific application
- I/O device equipping 3 discrete inputs and 5 discrete outputs
- Establish I/O connection to software and control platforms through E/IP
- Local and remote control are available
- 2 port Ethernet switch built upon switch technology
- LED status / error indicators
- Motor pulse counting through local logic
- EtherNet/IP CONFORMANCE TESTED™
- UL and cUL recognized component
- AOP (Add-On Profile)
- Wire side connectors are available from various sources. They are not provided as standard.

| IB-E BASIC CONNECTOR KIT (REQUIRED) | | |
|---|---|---|
| DESCRIPTION | WAGO PART | QTY. REQUIRED |
| POWER | 231-302<br>026-000 | 1 |
| PHOTO EYE SENSOR | 733-104 | 2 |
| WAGO TOOL | 733-191 | 1 |
| WAGO TOOL | 231-231 | 1 |

| IB-E I/O CONNECTOR KIT (OPTIONAL) | | |
|---|---|---|
| DESCRIPTION | WAGO PART | QTY. REQUIRED |
| EXTERNAL INPUT | 734-204 | 1 |
| SIGNAL OUTPUT | 734-206 | 1 |
| WAGO TOOL | 734-201 | 1 |

***To view more information please visit www.itohdenki.com***



# IB-E CONNECTOR KITS

***Applicable models: IB-E03B, IB-E04F***

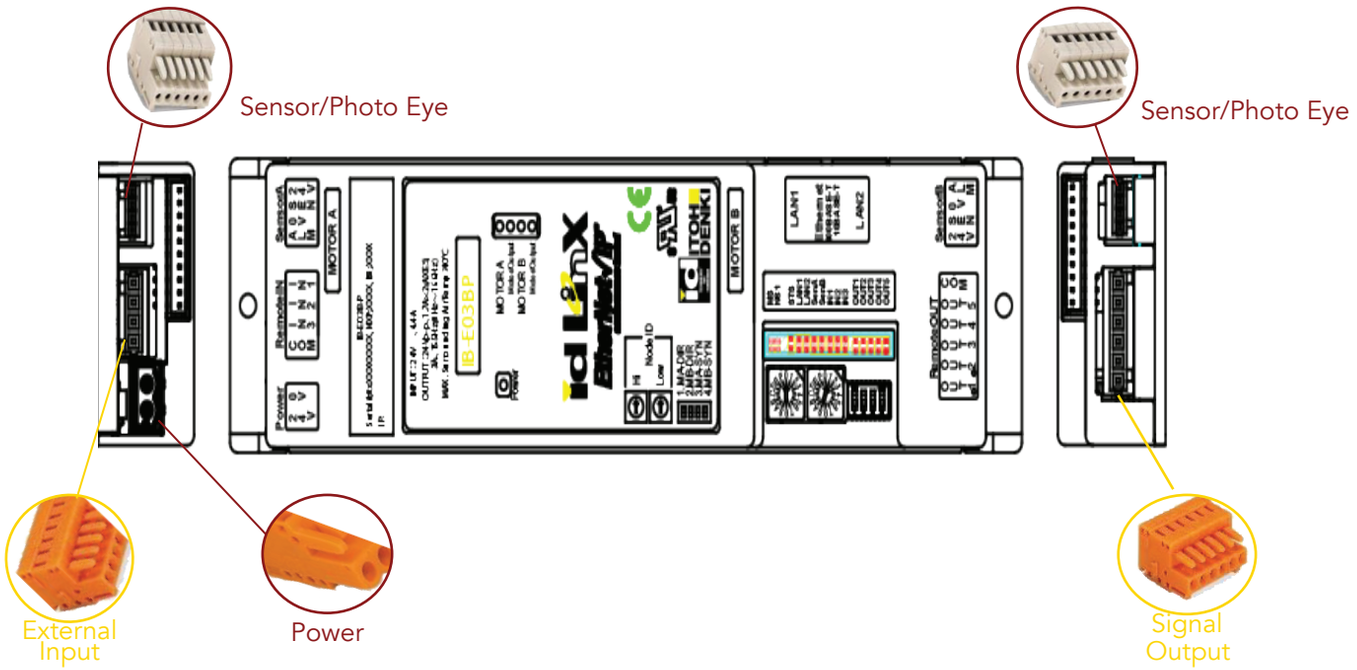
IB-E Basic connector kit (required); IB-E I/O connector kit (optional)

| | Description | WAGO Part# | Required # | IMAGE |
|---|---|---|---|---|
| IB-E Basic Pack | Power | 231-302<br>026-000 | 1 |  |
| | Photo Eye Sensor | 733-104 | 2 |  |
| | Wago Tool(733) | 733-191 | 1 |  |
| | Wago Tool (231) | 231-231 | 1 |  |


Basic connector kit parts circled in red on diagram.

| | Description | WAGO Part# | Required # | IMAGE |
|---|---|---|---|---|
| IB-E I/O Pack | External Input | 734-204 | 1 |  |
| | Signal Output | 734-206 | 1 |  |
| | Wago Tool (734) | 734-231 | 1 |  |

IB-E I/O connector kit parts circled in yellow on diagram.




***To view more information please visit www.itohdenki.com***

# PM486BS

## AC Motor Driven Roller

**Diameter:** 1.91" (48.6mm)
**Voltage:** 115V Single Phase
230V 3 Phase

### Standard Features

- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Designed for medium to heavy load conveyors

### Operation

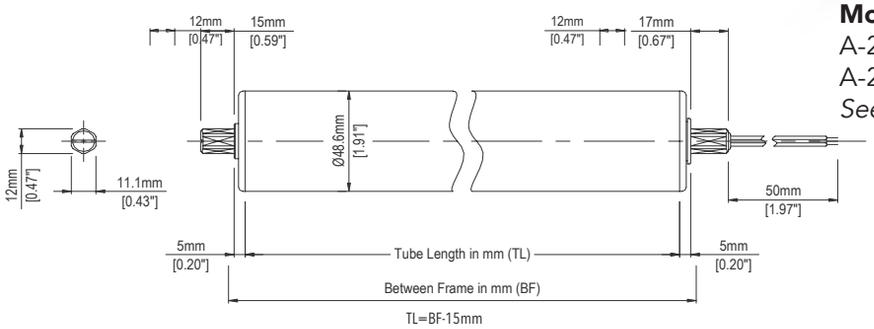
- Cycle: 3s ON; 2s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Available as spring loaded or non spring loaded shaft

### Available Options




**Mounting Hardware:**
A-270-GS (Hex flat up) Terminal Block
A-280-GS (Hex point up) Terminal Block
*See page 48 for diagrams*

**3Ø 230V 60HZ**

| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting (lb) | Torque Starting (lb-in) | No-Load | Current (A) Rated | Starting |
|---|---|---|---|---|---|---|
| 5 | 16.4 | 14.5 | 13.9 | 0.06 | 0.06 | 0.08 |
| 10 | 33.8 | 8.4 | 8.1 | 0.06 | 0.06 | 0.08 |
| 15 | 53.5 | 5.3 | 5.0 | 0.06 | 0.06 | 0.08 |
| 20 | 67.9 | 5.6 | 5.4 | 0.04 | 0.05 | 0.11 |
| 30 | 107.0 | 3.6 | 3.5 | 0.04 | 0.05 | 0.11 |
| 40 | 130.2 | 2.9 | 2.8 | 0.04 | 0.05 | 0.11 |
| 50 | 169.0 | 2.3 | 2.2 | 0.04 | 0.05 | 0.11 |

**1Ø 115V 60HZ**

| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting (lb) | Torque Starting (lb-in) | No-Load | Current (A) Rated | Starting |
|---|---|---|---|---|---|---|
| 5 | 16.4 | 6.6 | 6.4 | 0.13 | 0.14 | 0.17 |
| 10 | 33.8 | 4.0 | 3.8 | 0.13 | 0.14 | 0.17 |
| 15 | 53.5 | 2.5 | 2.4 | 0.13 | 0.14 | 0.17 |
| 20 | 67.9 | 3.2 | 3.1 | 0.11 | 0.17 | 0.3 |
| 30 | 107.0 | 2.0 | 1.9 | 0.11 | 0.17 | 0.3 |
| 40 | 130.2 | 1.7 | 1.6 | 0.11 | 0.17 | 0.3 |
| 50 | 170.2 | 1.3 | 1.2 | 0.11 | 0.17 | 0.3 |

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 315mm (12.40") | N/A |
| | 250mm (9.84") | N/A |
| | 300mm (11.81") | 250mm (9.84") |
| | 250mm (9.84") | 200mm (7.87") |
| | 260mm (10.24") | N/A |

- P2 double groove tube standard (50mm/32mm)

# PM570AS

## AC Motor Driven Roller

**Diameter:** 2.25" (57mm)
**Voltage:** 115V Single Phase
230V 3 Phase

### Standard Features

- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Designed for medium to heavy load conveyors
- 12mm (0.47") Diameter D-Shafts

### Available Options

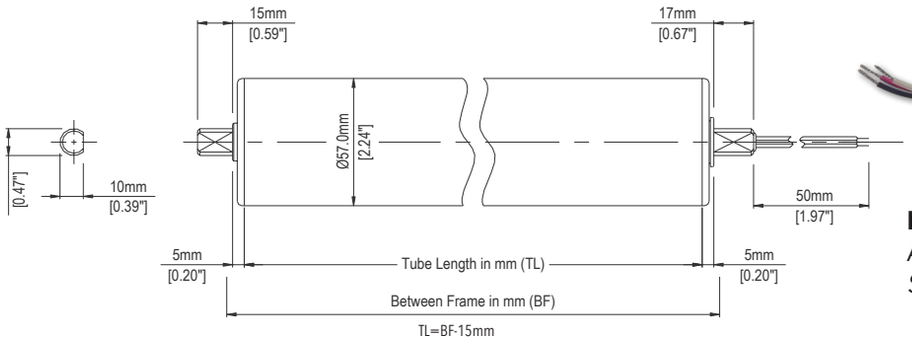
### Operation

- Cycle: 3s ON; 2s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Available as spring loaded or non spring loaded shaft




* Roller shown with optional Urethane lagging

**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

| 3Ø 230V 60HZ | | | |
|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting(lb) | Torque Starting (lb-in) |
| 4 | 14.8 | 27.9 | 31.2 |
| 5 | 20.3 | 20.3 | 22.8 |
| 8 | 29.9 | 14.0 | 15.7 |
| 9 | 37.4 | 11.1 | 12.5 |
| 10 | 41.0 | 10.2 | 11.4 |
| 13 | 51.5 | 8.0 | 9.0 |
| 15 | 62.7 | 7.6 | 8.6 |
| 20 | 89.6 | 5.4 | 6.0 |
| 30 | 130.6 | 3.7 | 4.2 |
| 45 | 170.9 | 2.8 | 3.2 |
| 50 | 188.0 | 2.5 | 2.8 |
| 60 | 247.4 | 2.0 | 2.2 |

| Current (A) | | | |
|---|---|---|---|
| 3Ø 230V 60HZ | No-Load | Rated | Starting |
| | 0.06 | 0.06 | 0.13 |

| 1Ø 115V 60HZ | | | |
|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting(lb) | Torque Starting (lb-in) |
| 4 | 14.8 | 11.4 | 12.8 |
| 5 | 20.3 | 8.4 | 9.4 |
| 8 | 29.9 | 5.8 | 6.5 |
| 9 | 37.4 | 4.6 | 5.1 |
| 10 | 41.0 | 4.2 | 4.7 |
| 13 | 51.5 | 3.8 | 4.2 |
| 15 | 62.7 | 3.3 | 3.7 |
| 20 | 89.6 | 2.4 | 2.7 |
| 30 | 130.6 | 1.7 | 1.9 |
| 45 | 170.9 | 1.3 | 1.4 |
| 50 | 188.0 | 1.1 | 1.2 |
| 60 | 247.4 | 0.9 | 1.0 |

| Current (A) | | | |
|---|---|---|---|
| 1Ø 115V 60HZ | No-Load | Rated | Starting |
| | 0.17 | 0.19 | 0.28 |

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 320mm (12.60") | N/A N/A |
| | 250mm (9.84") | N/A N/A |
| | 300mm (11.81") | 250mm (9.84") |
| | 260mm (10.24") | 200mm (7.87") |
| | 290mm (11.24") | 260mm (10.24") |
| | 330mm (13.00") | 280mm (11.02") |

- P2 double groove tube standard (65mm/30mm)
- Waterproof option does not include spring loaded shaft, add WT to model number for tube lengths 290mm and over to receive spring loaded shaft.
- Check with your Itoh Denki representative for WA speeds available.

# PM570BP

## AC Motor Driven Roller

**Diameter:** 2.25" (57mm)
**Voltage:** 230V 3 Phase

### Standard Features

- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Designed for heavy load conveyors
- 12mm (0.47") Diameter D-Shafts

### Operation

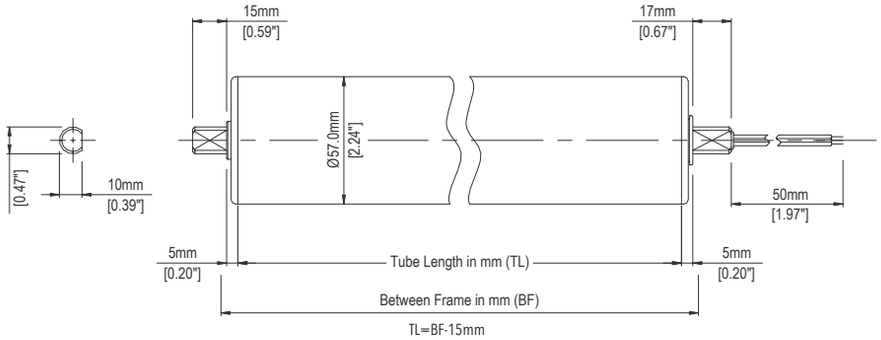
- Cycle: 3s ON; 5s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Available as spring loaded
or non spring loaded shaft

### Available Options


**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

**3Ø 230V 60HZ**

| Speed Code | No-Load Speed (ft/min) | Tangential Force Rated (lb) | Tangential Force Starting (lb) | Torque Rated (in•lb) | Torque Starting (in•lb) | Current (A) No-Load (A) | Current (A) Rated (A) | Current (A) Starting (A) |
|---|---|---|---|---|---|---|---|---|
| 4 | 13.8 | 34.7 | 85.9 | 48.7 | 96.5 | 0.09 | 0.10 | 0.31 |
| 5 | 19.7 | 24.5 | 60.8 | 34.4 | 68.2 | 0.09 | 0.10 | 0.31 |
| 8 | 27.6 | 17.4 | 43.0 | 24.3 | 48.2 | 0.09 | 0.10 | 0.31 |
| 9 | 34.1 | 14.0 | 34.7 | 19.6 | 38.9 | 0.09 | 0.10 | 0.31 |
| 10 | 39.0 | 12.2 | 30.4 | 17.2 | 34.1 | 0.09 | 0.10 | 0.31 |
| 13 | 48.6 | 9.9 | 24.5 | 13.9 | 27.5 | 0.09 | 0.10 | 0.31 |
| 15 | 74.5 | 6.5 | 15.9 | 9.0 | 17.9 | 0.09 | 0.10 | 0.31 |
| 20 | 100.4 | 5.1 | 12.6 | 7.2 | 14.2 | 0.09 | 0.10 | 0.31 |
| 30 | 142.1 | 3.6 | 8.9 | 5.0 | 10.0 | 0.09 | 0.10 | 0.31 |
| 50 | 176.2 | 2.9 | 7.2 | 4.1 | 8.1 | 0.09 | 0.10 | 0.31 |
| 60 | 218.5 | 2.4 | 5.8 | 3.3 | 6.5 | 0.09 | 0.10 | 0.31 |

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 310mm (12.20") | N/A |
| | 250mm (9.84") | N/A |
| STOP | 300mm (11.81") | 250mm (9.84") |
| | 260mm (10.29") | 240mm (9.45") |
| | 260mm (10.24") | 240mm (9.45") |

- P2 double groove tube standard (65mm/30mm)
- Waterproof option does not include spring loaded shaft, add WT to model number for tube lengths 290mm and over to receive spring loaded shaft
- Check with your Itoh Denki representative for WA speeds available.

# PM570AU

## AC Motor Driven Roller

**Diameter:** 2.25" (57mm)
**Voltage:** 230V 3 Phase

### Standard Features

- Thermally stable motor that can be operated 24/7 without fear of overheating
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Special high impedance motor allows loads to be accumulated limitlessly without overheating
- 12mm (0.47") Diameter D-Shafts

Available as spring loaded or non spring loaded shaft

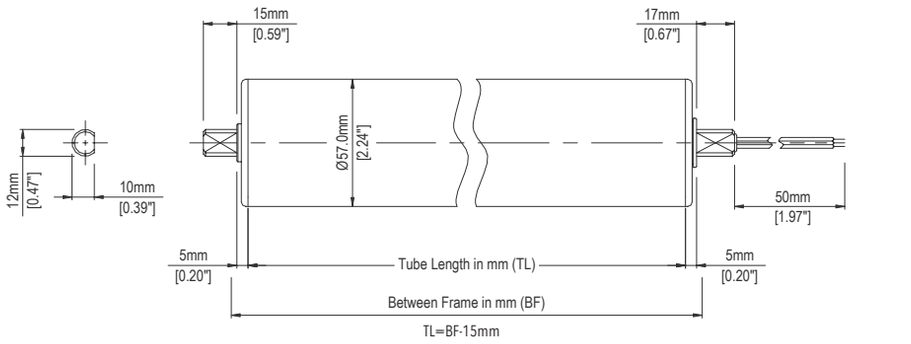
### Operation

- Limitless
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

### Available Options




**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

| 3Ø 230V 60HZ | | | | | | |
|---|---|---|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting (lb) | Torque Starting (lb-in) | Current (A) No-Load | Current (A) Rated | Current (A) Starting |
| 4 | 13.5 | 9.9 | 11.2 | 0.05 | 0.05 | 0.06 |
| 5 | 18.4 | 7.3 | 8.1 | 0.05 | 0.05 | 0.06 |
| 8 | 26.9 | 5.0 | 5.6 | 0.05 | 0.05 | 0.06 |
| 9 | 33.8 | 3.9 | 4.4 | 0.05 | 0.05 | 0.06 |
| 10 | 36.7 | 3.6 | 4.1 | 0.05 | 0.05 | 0.06 |
| 13 | 46.6 | 3.3 | 3.7 | 0.05 | 0.05 | 0.06 |
| 15 | 56.4 | 2.9 | 3.3 | 0.05 | 0.05 | 0.06 |
| 20 | 80.7 | 2.0 | 2.3 | 0.05 | 0.05 | 0.06 |
| 30 | 117.4 | 1.4 | 1.6 | 0.05 | 0.05 | 0.06 |

- Check with your Itoh Denki representative for WA speeds available

**Minimum Tube Lengths**

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 250mm (9.84") | N/A |
| | 330mm (13.00") | 280mm (11.02") |
| | 260mm (10.24") | 200mm (7.87") |
| | 260mm (10.24") | N/A |

# PM605AS

## AC Motor Driven Roller

**Diameter:** 2.38" (60.5mm)
**Voltage:** 115V Single Phase
230V 3 Phase

### Standard Features

- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Designed for medium to heavy load conveyors
- 12mm (0.47") Diameter D-Shafts

Available as spring loaded or non spring loaded shaft

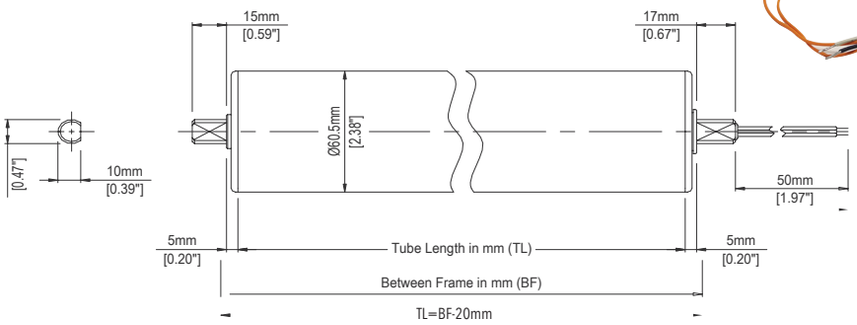
### Available Options

### Operation

- Cycle: 3s ON; 2s OFF
- Continuous or intermittent duty
- Do not exceed 150% of No-Load Speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G




**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

| 3Ø 230V 60HZ | | | |
|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting(lb) | Torque Starting (lb-in) |
| 4 | 15.7 | 26.2 | 31.2 |
| 5 | 21.7 | 19.2 | 22.8 |
| 8 | 31.5 | 13.2 | 15.7 |
| 9 | 39.7 | 10.5 | 12.5 |
| 10 | 43.3 | 9.6 | 11.4 |
| 13 | 54.8 | 7.6 | 9.0 |
| 15 | 66.6 | 7.2 | 8.6 |
| 20 | 95.1 | 5.1 | 6.0 |
| 30 | 138.5 | 3.5 | 4.2 |
| 45 | 181.4 | 2.7 | 3.2 |
| 50 | 199.5 | 2.4 | 2.8 |
| 60 | 262.5 | 1.9 | 2.2 |

| Current (A) | | | |
|---|---|---|---|
| 3Ø 230V 60HZ | No-Load | Rated | Starting |
| | 0.06 | 0.06 | 0.13 |

| 1Ø 115V 60HZ | | | |
|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting(lb) | Torque Starting (lb-in) |
| 4 | 15.7 | 10.8 | 12.8 |
| 5 | 21.7 | 7.9 | 9.4 |
| 8 | 31.5 | 5.4 | 6.5 |
| 9 | 39.7 | 4.3 | 5.1 |
| 10 | 43.3 | 3.9 | 4.7 |
| 13 | 54.8 | 3.6 | 4.2 |
| 15 | 66.6 | 3.1 | 3.7 |
| 20 | 95.1 | 2.2 | 2.7 |
| 30 | 138.5 | 1.6 | 1.9 |
| 45 | 181.4 | 1.2 | 1.4 |
| 50 | 199.5 | 1.0 | 1.2 |
| 60 | 262.5 | 0.8 | 1.0 |

| Current (A) | | | |
|---|---|---|---|
| 1Ø 115V 60HZ | No-Load | Rated | Starting |
| | 0.17 | 0.19 | 0.28 |

- P2 double groove tube standard (65mm/30mm)
- Waterproof option does not include spring loaded shaft, add WT to model number for tube lengths 290mm and over to receive spring loaded shaft. Check with your Itoh Denki representative for WA speeds available.

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 250mm (9.84") | N/A N/A |
| | 250mm (9.84") | N/A N/A |
| | 260mm (10.24") | 200mm (7.87") |
| | 290mm (11.24") | 260mm (10.24") |
| | 330mm (13.00") | 280mm (11.02") |
| | 320mm (12.60") | N/A N/A |
| | 300mm (11.81") | 250mm (9.84") |

# PM605BP

## AC Motor Driven Roller

**Diameter:** 2.38" (60.5mm)
**Voltage:** 230V 3 Phase

### Standard Features
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Designed for heavy load conveyors
- 12mm (0.47") Diameter D-Shafts

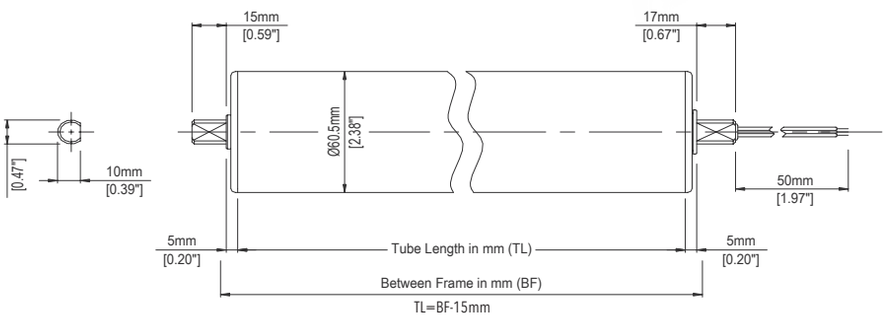
### Available Options

### Operation
- Cycle: 3s ON; 5s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment
- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

Available as spring loaded or non spring loaded shaft

* Roller shown with optional Urethane lagging




**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

| 3Ø 230V 60HZ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Rated (lb) | Tangential Force Starting (lb) | Torque Rated (in•lb) | Torque Starting (in•lb) | Current (A) No-Load (A) | Current (A) Rated (A) | Current (A) Starting (A) |
| 4 | 14.8 | 32.7 | 81.0 | 38.9 | 96.5 | 0.09 | 0.10 | 0.31 |
| 5 | 20.7 | 23.1 | 57.3 | 27.5 | 68.2 | 0.09 | 0.10 | 0.31 |
| 8 | 29.2 | 16.3 | 40.5 | 19.5 | 48.2 | 0.09 | 0.10 | 0.31 |
| 9 | 36.4 | 13.2 | 32.7 | 15.7 | 38.9 | 0.09 | 0.10 | 0.31 |
| 10 | 41.7 | 11.5 | 28.6 | 13.7 | 34.1 | 0.09 | 0.10 | 0.31 |
| 13 | 51.5 | 9.3 | 23.1 | 11.1 | 27.5 | 0.09 | 0.10 | 0.31 |
| 15 | 79.1 | 6.1 | 15.0 | 7.3 | 17.9 | 0.09 | 0.10 | 0.31 |
| 20 | 106.6 | 6.0 | 11.9 | 7.2 | 14.2 | 0.09 | 0.10 | 0.31 |
| 30 | 150.9 | 3.4 | 8.4 | 4.1 | 10.0 | 0.09 | 0.10 | 0.31 |
| 50 | 187.0 | 2.7 | 6.8 | 3.3 | 8.1 | 0.09 | 0.10 | 0.31 |
| 60 | 232.0 | 2.2 | 5.5 | 2.7 | 6.5 | 0.09 | 0.10 | 0.31 |

- P2 double groove tube standard (65mm/30mm)
- Check with your Itoh Denki representative for WA speeds available.

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 250mm (9.84") | N/A |
| | 260mm (9.84") | 240mm (9.45") |
| | 260mm (10.24") | 240mm (9.45") |
| | 300mm (11.81") | 250mm (9.84") |
| | 310mm (12.20") | N/A |

# PM605AU

## AC Motor Driven Roller

**Diameter:** 2.38" (60.5mm)
**Voltage:** 230V 3 Phase

### Standard Features

- Thermally stable motor that can be operated 24/7 without fear of overheating
- ABEC 1 Bearings
- DOM, zinc plated, carbon steel tube
- Special high impedance motor allows loads to be accumulated limitlessly without overheating
- 12mm (0.47") Diameter D-Shafts

Available as spring loaded or non spring loaded shaft

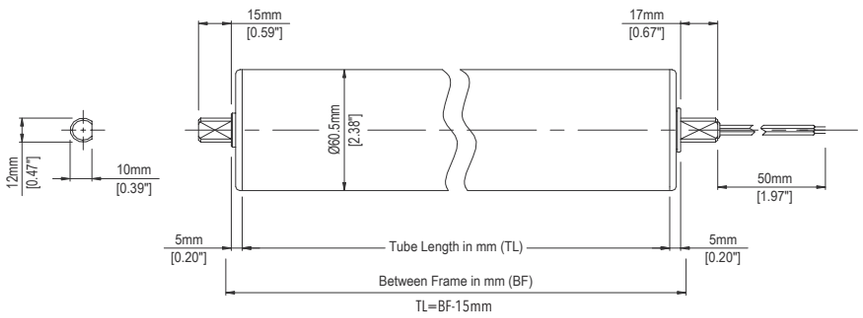
### Operation

- Limitless
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

### Available Options




**Mounting Hardware:**
A-200 Terminal Block
*See page 48 for diagram*

| 3Ø 230V 60HZ | | | | | | |
|---|---|---|---|---|---|---|
| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting (lb) | Torque Starting (lb-in) | No-Load | Current (A) Rated | Starting |
| 4 | 14.1 | 9.4 | 11.2 | 0.05 | 0.05 | 0.06 |
| 5 | 19.4 | 6.8 | 8.1 | 0.05 | 0.05 | 0.06 |
| 8 | 28.5 | 4.7 | 5.6 | 0.05 | 0.05 | 0.06 |
| 9 | 35.8 | 3.7 | 4.4 | 0.05 | 0.05 | 0.06 |
| 10 | 39.0 | 3.4 | 4.1 | 0.05 | 0.05 | 0.06 |
| 13 | 49.2 | 3.1 | 3.7 | 0.05 | 0.05 | 0.06 |
| 15 | 59.7 | 2.7 | 3.3 | 0.05 | 0.05 | 0.06 |
| 20 | 85.6 | 1.9 | 2.3 | 0.05 | 0.05 | 0.06 |
| 30 | 126.7 | 1.3 | 1.6 | 0.05 | 0.05 | 0.06 |

- P2 double groove tube standard (65mm/30mm)
- Waterproof option does not include spring loaded shaft, add WT to model number for tube lengths 290mm and over to receive spring loaded shaft. Check with your Itoh Denki representative for WA speeds available.

### Minimum Tube Lengths

| | | |
|---|---|---|
| | 250mm (9.84") | 200mm (7.87") |
| | 250mm (9.84") | N/A N/A |
| | 260mm (10.24") | 200mm (7.87") |
| | N/A N/A | 260mm (10.24") |
| | 330mm (13.00") | 280mm (11.02") |
| | 310mm (12.20") | N/A N/A |

# PM763BS

## AC Motor Driven Roller

**Diameter:** 3.0" (76.3mm)
**Voltage:** 230V 3 Phase

### Standard Features

- Operation without oil bath
- ABEC 1 Bearings
- Class E insulation
- Drip proof design (IP 55)
- DOM, zinc plated, carbon steel tube
- Designed to drive compact belt conveyors for light to medium load handling
- 20mm (0.79") dual flat shafts
- Crowned tube standard

Available as non spring loaded shaft only

### Available Options

### Operation

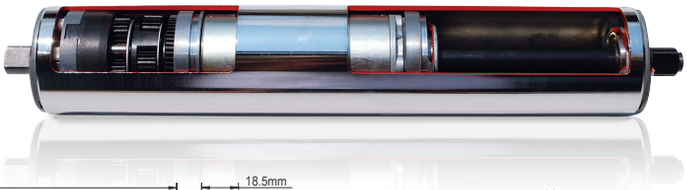
- 10s ON; 10s OFF
- Continuous or intermittent duty
- Do not exceed 150% of no-load speed

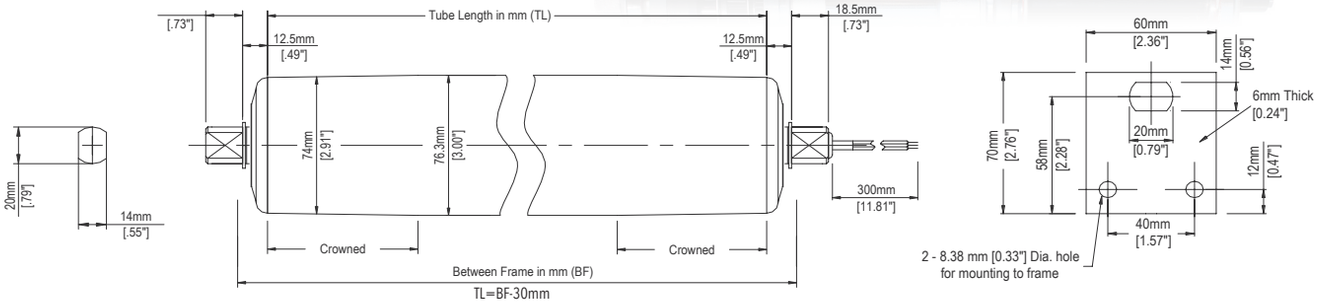
### Environment

- Ambient temperature 14~104° F (-10~40°C)
- < 90% relative humidity (no condensation)
- No corrosive gases
- Vibration < 0.5G

### Environment

- Built in thermal overload protection






≥ 800 Tube length - Straight tube only

**Mounting Hardware:**
M-021-B
*See page 50 for diagram*

**3Ø 230V 60HZ**

| Speed Code | No-Load Speed (ft/min) | Tangential Force Starting (lb) | Torque Starting (lb-in) | Current (A) No-Load | Current (A) Rated | Current (A) Starting |
|---|---|---|---|---|---|---|
| 5 | 19.7 | 243.4 | 365.5 | 0.19 | 0.29 | 1.07 |
| 8 | 26.6 | 182.1 | 273.5 | 0.19 | 0.29 | 1.07 |
| 10 | 40.0 | 120.8 | 181.4 | 0.19 | 0.29 | 1.07 |
| 20 | 81.0 | 66.0 | 99.1 | 0.19 | 0.29 | 1.07 |
| 30 | 109.6 | 48.9 | 73.5 | 0.19 | 0.29 | 1.07 |
| 40 | 167.6 | 31.8 | 47.8 | 0.19 | 0.29 | 1.07 |

**MAXIMUM TRANSPORTED LOAD ON BELTED CONVEYOR**

| Speed Code | Max Load Kg | Max Load Lb |
|---|---|---|
| 5 | 40 | 88 |
| 8 | 30 | 66 |
| 10 | 20 | 44 |
| 20 | 15 | 33 |
| 30 | 8 | 18 |
| 40 | 4 | 8.8 |

**Referenced load values were obtained under the following test parameters:**
Conveyor length: 4m (13ft.)
Belt thickness: 1mm (0.040")
Conveyor angle: Horizontal (without carrier rollers)
Belt width: 500mm (20")
Power source: 230V AC 3 Phase

### Minimum Tube Lengths

| | |
|---|---|
| | 250mm (9.84") |
| | 250mm (9.84") |
| | 300mm (11.81") |

# F-RAT-S300

## Flat Right Angle Transfer

**Specifications**

- 24V DC
- Drop in installation into existing MDR frames
- 3 motors - spine (belts), lifting/dropping mechanism and transfer rollers
- Controlled with Itoh Denki's IB-E03 or CB-016S7 zone cards
- Minimum package size: 300mm (11.81") x 300mm (11.81")
- Module height: 170mm (6.69")
- Transfer capacity: 2500/hr (based on 13.8" x 15.4", 66lb. package)

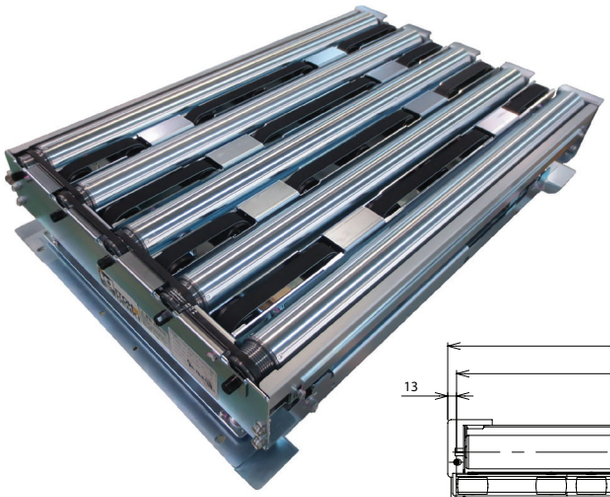
| F-RAT-S Size | Recommended Product Size |
|---|---|
| 15" wide X 30" long, Size A | W 300mm (11.8") x L 350mm (13.8") to W 300mm (11.8") x L 650mm (25.6") |
| 20" wide X 30" long, Size B | W 300mm (11.8") x L 350mm (13.8") to W 400mm (15.7") x L 650mm (25.6") |
| 24" wide X 30" long, Size C | W 300mm (11.8") x L 350mm (13.8") to W 500mm (19.7") x L 650mm (25.6") |
| 28" wide X 30" long, Size D | W 300mm (11.8") x L 350mm (13.8") to W 600mm (23.6") x L 650mm (25.6") |

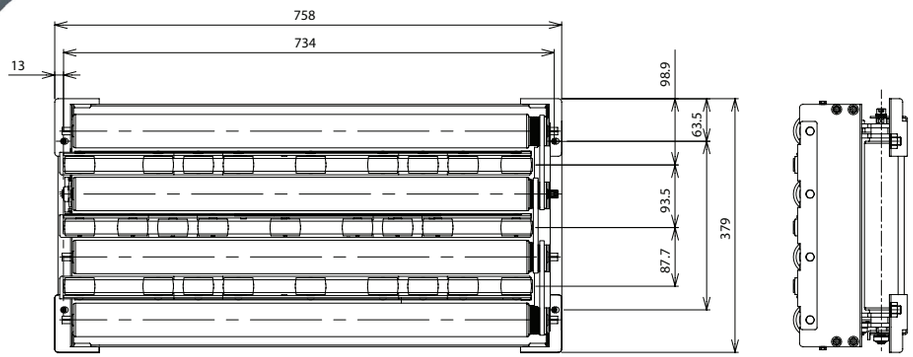
Maximum Load Weight

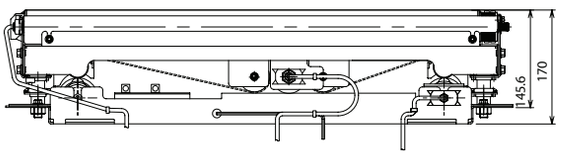
| Speed Code | Size A | Size B, C, D |
|---|---|---|
| 17 (56 FPM) | 37.5kg (82.5lbs) | 50kg (110lbs) |
| 60 (197 FPM) | 37.5kg (82.5lbs) | 50kg (110lbs) |
| 90 (295 FPM) | 10kg (22lbs) | 10kg (22lbs) |

**Basic Specifications**

- Roller diameter: 50mm
- Size BF width (W) transfer direction: 15", 20", 24", 28"
- Length (L) spine direction: 30"
- Height: 170mm (6.69")
- Transfer/spine speed: 56, 197, 295 FPM
- Stroke: 10mm (0.39")
- Power voltage: 24V DC
- Ambient temperature: 0 ~ 40°C (No freezing)
- Humidity: Below 90% RH (No condensation)
- Atmosphere: No corrosive gas
- Vibration: Below 0.5G
- Installation: Indoor





# F-RAT-U225

## Flat Right Angle Transfer

**Specifications**

- 24V DC
- Drop in installation into existing MDR frames
- 3-4 motors - depending on transfer size
- Controlled with Itoh Denki's IB-E03 or CB-016S7 zone cards
- Minimum package size: 224mm (8.8") x 224mm (8.8")
- Module height: 125mm (4.9")
- Transfer capacity: 2500/hr (based on 13.8" x 15.4", 66lb. package)

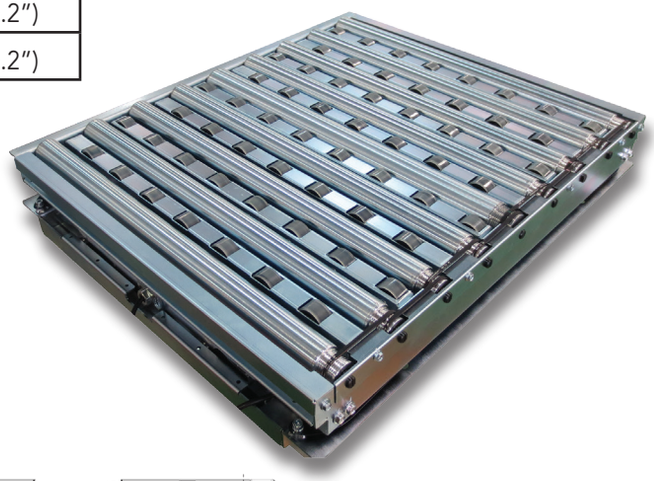
| F-RAT-U225 Model Number | F-RAT-U225 Size |
|---|---|
| 6040 | W 395mm (15.5") x L 595mm (23.4") |
| 6050 | W 495mm (19.5") x L 595mm (23.4") |
| 6060 | W 595mm (23.4") x L 595mm (23.4") |
| 6070 | W 695mm (27.3") x L 595mm (23.4") |
| 6080 | W 795mm (31.3") x L 595mm (23.4") |
| 9040 | W 395mm (15.5") x L 895mm (35.2") |
| 9050 | W 495mm (19.5") x L 895mm (35.2") |
| 9060 | W 595mm (23.4") x L 895mm (35.2") |
| 9070 | W 695mm (27.3") x L 895mm (35.2") |
| 9080 | W 795mm (31.3") x L 895mm (35.2") |

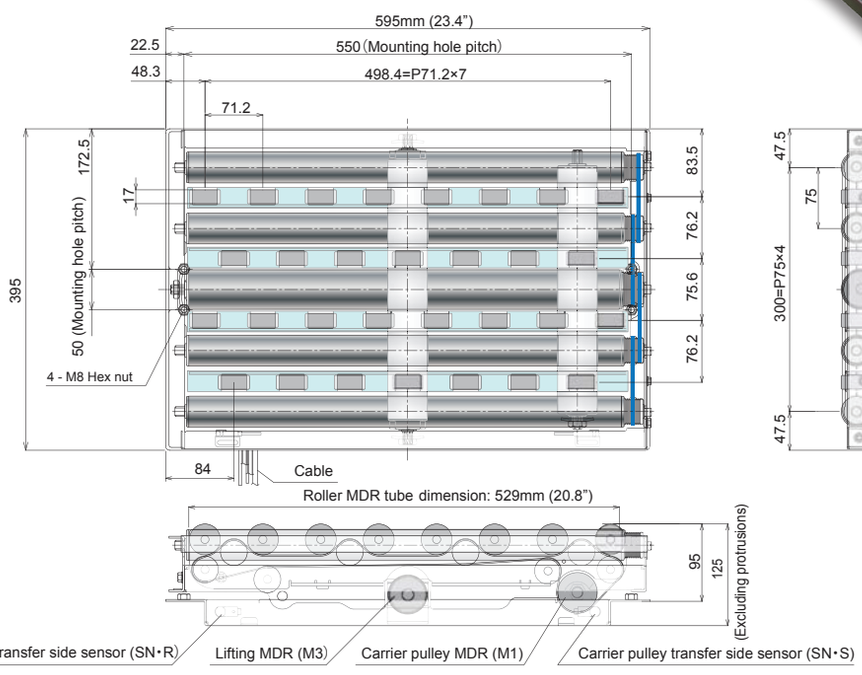
**Basic Specifications**

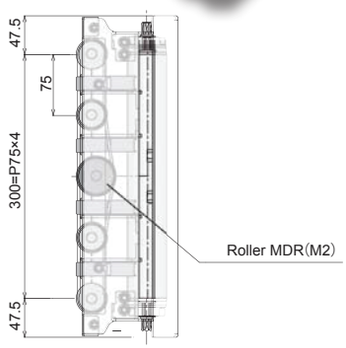
- Roller diameter: 48.6mm
- Length (L) spine direction: 23.4" or 35.2"
- Height: 170mm (6.69")
- Transfer/spine speed: 56, 197 FPM
- Stroke: 7mm (0.2")
- Power voltage: 24V DC
- Ambient temperature: 0 ~ 40°C (No freezing)
- Humidity: Below 90% RH (No condensation)
- Atmosphere: No corrosive gas
- Vibration: Below 0.5G
- Installation: Indoor

Maximum Load Weight

| Speed Code | All Sizes |
|---|---|
| 17 (56 FPM) | 50kg (110lbs) |
| 60 (197 FPM) | 50kg (110lbs) |





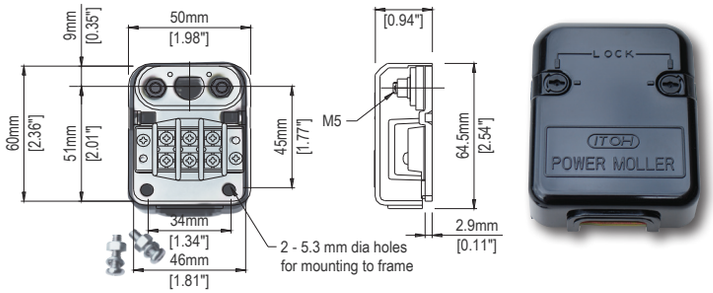




Cable Lengths
M1 : Carrier pulley MDR 1000mm (39.3")
M2 : Roller MDR 1100mm (43.3")
M3 : Lifting MDR 1300mm (51.1")
Roller transfer side sensor (SN・R) 1000mm (39.3")
Carrier pulley transfer side sensor (SN・S) 600mm (23.6")

# Terminal Blocks

**A-200**

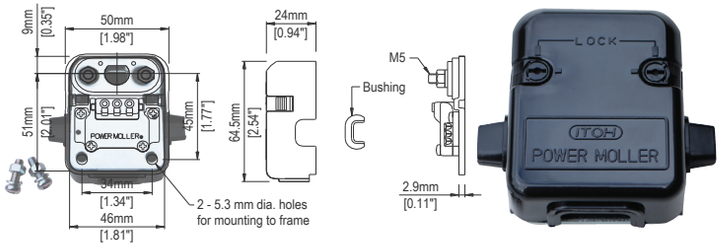
Applicable models: PM570AS, PM570AU, PM570BP, PM605AS, PM605AU, PM605BP




- Each output shaft should be fixed by the applicable fitting. In case output shaft turns freely, it causes wires to break.
- The shaft hole and studs of the back plate are offset, which allows the mounting plates to slide down on the stud to fasten the output shaft securely.
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware
- If a grounding screw is required, please order A-200-G

**A-800**

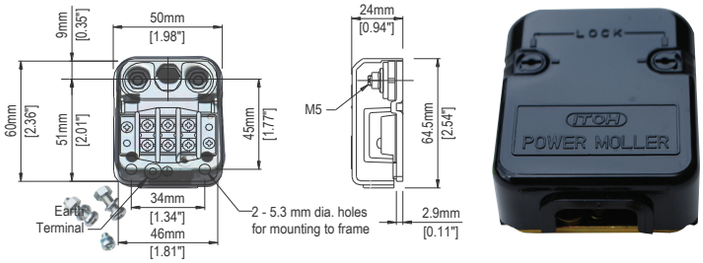
Applicable models: PM570AS, PM570AU, PM570BP, PM605AS, PM605AU, PM605BP




- Same functionality of A-200 without the need to cut or strip any wires
- No terminal connection is required, which drastically slashes wiring time
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

**A-270-GS/A-280-GS**

Applicable model: PM486BS

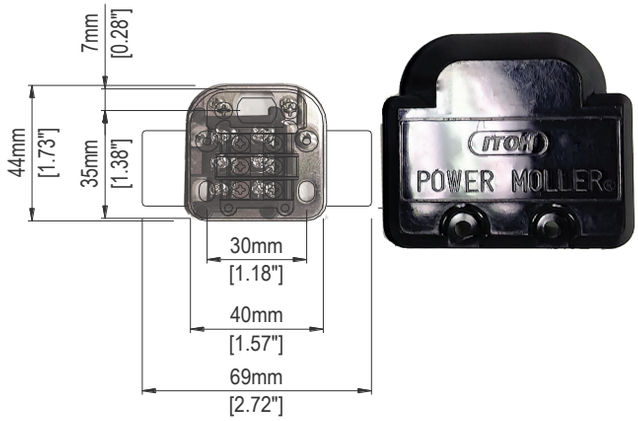



- Each output shaft should be fixed by the applicable fitting. If the output shaft rotates freely it will result in damage to the wires
- Nuts be torqued to 4.4 lb • ft (6Nm)
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

*A-270-GS (Hex flat up) shown above; A-280-GS (Hex point up) also available*

**E-920**

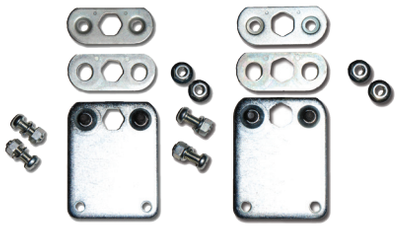
Applicable models: PM380AS, PM427AS

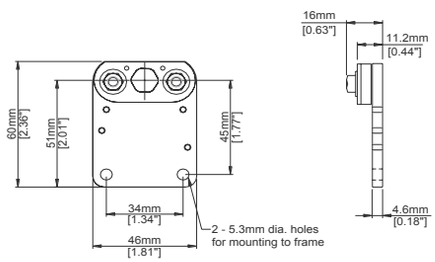



- Each output shaft should be fixed by the applicable fitting. If the output shaft rotates freely it will result in damage to the wires
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

# Mounting Brackets

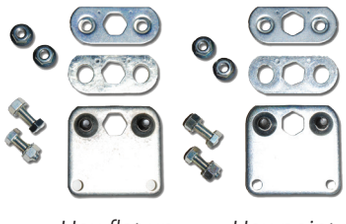
**MBB-071/MBB-081**
Applicable models: PM486, PM570FE

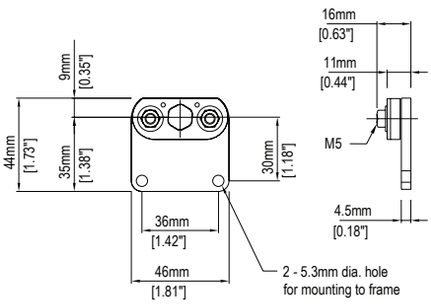



- The shaft hole of the middle plate is rotated a few degrees which grips the shaft securely once the top plate and nuts are tightened to the correct torque.
- Nuts must be torqued to 2.2 lb • ft (3 Nm)
- Supplied with nut (M12 x 1.25)
- Requires 2 for each PM486FP and PM486FS
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

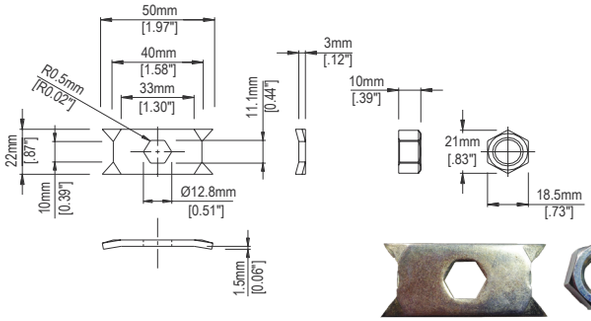
**MBC-071/MBC-081**
Applicable models: PM486, PM570FE




- Optional low profile bracket
- The shaft hole of the middle plate is rotated a few degrees which grips the shaft securely once the top plate and nuts are tightened to the correct torque.
- Nuts must be torqued to 2.2 lb • ft (3 Nm)
- Supplied with nut (M12 x 1.25)
- Requires 2 for each PM486FP and PM486FS
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

**P-0B1/P-0C1**
Applicable models: PM486FP

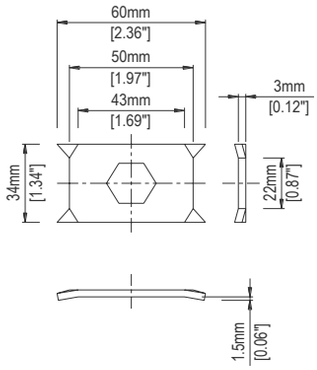


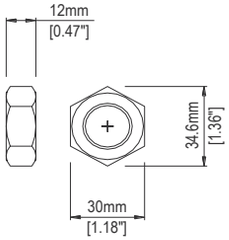

Hex flat up

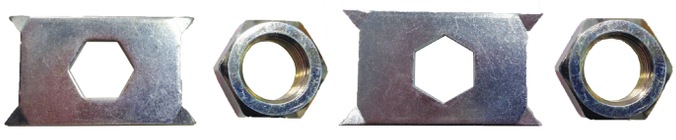
Hex point up

- Low profile and designed for maximum holding of threaded hex shafts
- Supplied with nut (M12 x 1.25)
- Requires 2 for each PM486FP
- Nuts must be torqued to 22.1 lb • ft (30Nm)

**P-0D1/P-0E1**
Applicable models: PM635FS, PM635KE



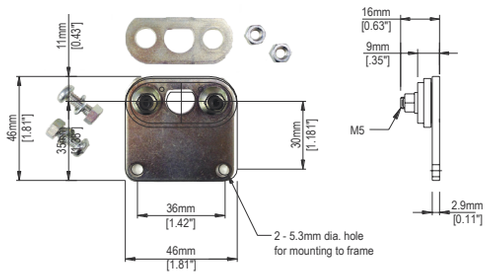
Hex flat up

Hex point up

- Low profile and designed for maximum holding of threaded hex shafts
- Supplied with nut (M20 x 1.25)
- Requires 1 for each PM635
- Nuts must be torqued to 110.6 lb • ft (149.5Nm)

# Mounting Brackets

**C-001**
Applicable models: PM570AS, PM570AU, PM570BP, PM605AS, PM605AU, PM605BP



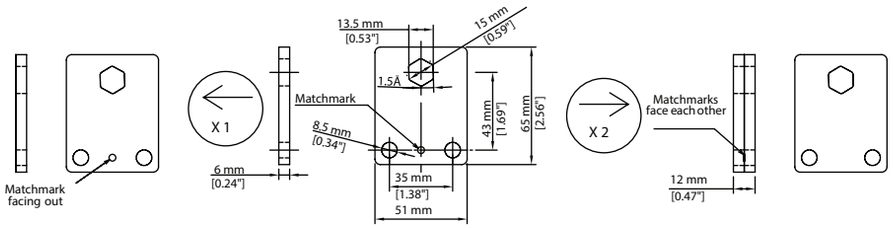

- This bracket is used where there is not enough room for the A-200 terminal block
- Terminal block and safety cover are not available for this
- C-001-D stainless steel bracket is also available for drip proof and waterproof models
- The shaft hole and studs of the back plate are offset, which allows the mounting plates to slide down on the stud to fasten the output shaft securely.
- Nuts must be torqued to 2.2 lb • ft (3Nm)
- Supplied with M5 x 15 pan head Phillips mounting bolts and hardware

**FSY-01/FSY-02**
JQ, JT Shaft Standard Mounting Hardware
Toothed lock washer and nut

**M-021-B**
Applicable models: PM763BS

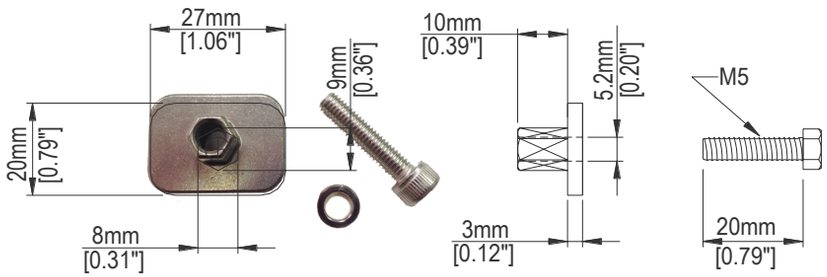
- Each output shaft should be fixed by the applicable fitting. In case output shaft turns freely, it causes wires to break
- Mounting hardware not included

**MBK-0K1-6** (Cable end)
**MBK-0K1-7** (Spring loaded end)
Applicable model: PM570KT




**AM-32HS-M5**
Applicable models: PM320HS

- Opposite stainless cable side bracket. Used in combination with MBB-071 or MBB-081



# Molded Extension Cables

Available only for DC Power Mollers that require extra cable length

**Cables available in the following standard lengths:**
600mm (23.62”), 1200mm (47.24”), and 2700mm (106.30”)

Allows for easy hook up between Power Moller roller cable and driver card

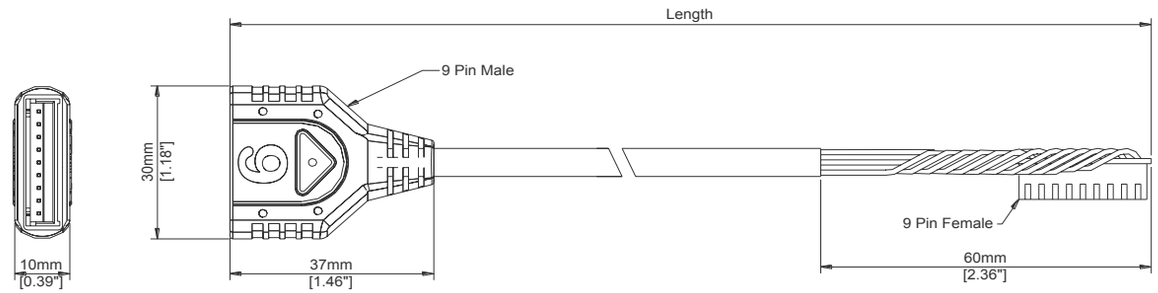
**Available in the following configurations:**
- 9 pin male to 9 pin female
- 9 pin male to 10 pin female
- 10 pin male to 10 pin female
- 12 pin male to 12 pin female

- Maximum distance from roller to card - 3000mm (118.11”)
- Ambient temperature -22~140°F (-30~60°C)

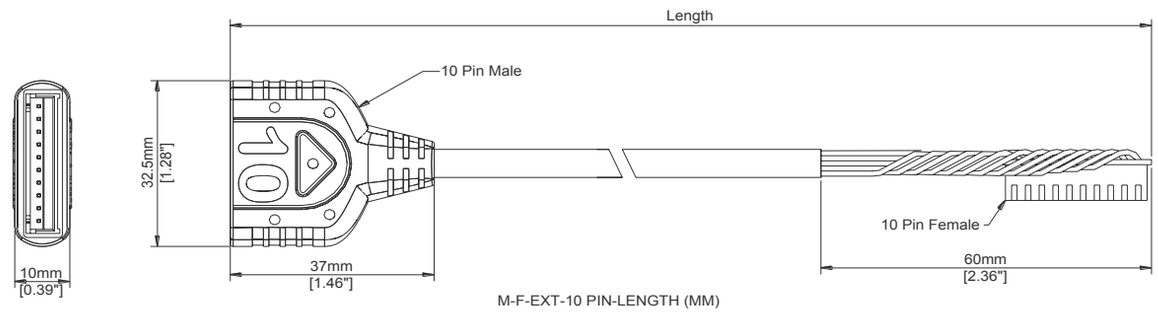
**Example Model Numbers**

| M-F | EXT | 9 PIN | 600 |
|---|---|---|---|
| Male<br>Female | Extension<br>Cable | Number<br>of Pins | Cable<br>Length |

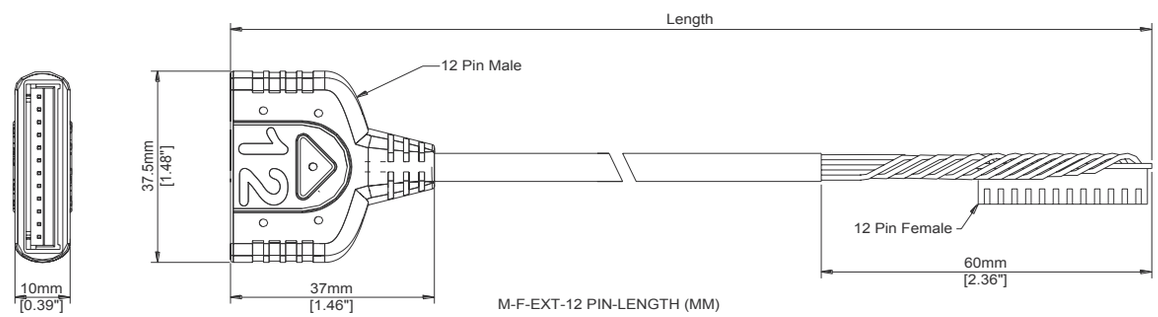
| M-F | EXT | 9 PIN/10 PIN | 1200 |
|---|---|---|---|
| Male<br>Female | Extension<br>Cable | Number<br>of Pins | Cable<br>Length |



M-F-EXT-9 PIN-LENGTH (MM)



M-F-EXT-10 PIN-LENGTH (MM)



M-F-EXT-12 PIN-LENGTH (MM)

# Technical Information

**LEVEL OF CONVEYING SURFACE**

- If the bottom surface of the load is not flat or the conveyor rollers are not level, the Power Moller may rotate freely and the load may not be transferred or may tend to drift. It is especially important when transferring relatively heavy loads that the static load limit of the Power Moller is not exceeded.

- Transferring light loads (less than 5kg) may be impeded by the resistance of idler rollers. Check to be sure that the idlers spin freely.

- Due to packing (binding) bands, bulging of the bottom of the load, etc., the load may lean to one side during transfer. The use of rubber lagging on each end of the Power Moller would facilitate a straight transfer of the load.

When the diameters of the roller tube and the shafts of the Power Moller are the same as that of idler rollers, the existing shaft holes in the conveyor frame can be used without any modification. If these dimensions are not the same, the level of the Power Moller must be adjusted by hanging the height of the shaft holes in the frame so that the load will be evenly applied to all the rollers.

**INERTIA AND INTERMITTENT OPERATION**

- As a result of motor inertia, the Power Moller will not instantly stop rotating after the power is disconnected.
- Inertia values differ in accordance with motor type, speed, operation time as well as weight of the load.

**CHANGE IN TRANSPORTING SPEED**

The peripheral velocity (transportation speed) of the Power Moller is dependent upon the weight and material composition of the load as well as the ambient temperature. Please contact your Itoh Denki representative for additional technical information.

Care should be taken to avoid exposing the Power Moller to excessive shock as a result of drastic load speed changes within a line or between adjoining lines. Depending on the weight and speed of the load, typically no harm is done by load speed changes within 50% of nominal Power Moller speed. Slave driving idlers and load weights can have an effect on the speed of the Power Moller.

**LOCKING**

Because a special outer rotor is used for the Power Moller's motor, the coil will not burn out when the Power Moller is locked under conductance for a short period of time. Repeated locking will raise the temperature of the motor coil and result in gradual deterioration of the insulation and eventually cause the motor to burn out. It's unnecessary to turn off the power when the Power Moller is locked under conductance for a few seconds. However, if locking longer than 10 seconds is required, it is necessary to turn off the power or use the accumulation type.

Driver cards for brushless DC motors have built in motor lock protection; disabling motor drive shortly after a stall occurs. However, repeated locking will subject the motor windings to high current and eventually damage the winding insulation.

**CONTACT TIME / CYCLE TIME / DUTY CYCLE**

Due to temperature rise of the coil winding, the minimum contact time during intermittent operation is approximately as specified below:

| Type | | Minimum Contact Time |
|---|---|---|
| | PM486 | 1 second ON / 1 second OFF |
| Standard | PM570AS | 3 seconds ON / 2 seconds OFF |
| | PM605AS | |
| Accumulation | PM570AU | Limitless |
| | PM605AU | |

Duty Cycle= Time on / (Time on + Time off)

**Example**
Duty Cycle = 20 seconds on / (20 seconds on + 20 seconds off). Duty Cycle = 0.5 OR 50%

**INVERTER USE**
When using a frequency inverter / variable frequency drive for AC rollers, Itoh Denki recommends utilizing a surge protector into the line to decrease the possibility of high voltage spikes. **Note -** change in frequency may affect performance.

Safe operating frequencies

| Type | Frequency |
|---|---|
| PM486BS | 30-90 Hz |
| PM570AS | |
| PM605AS | |
| PM570BP | 30-70 Hz |
| PM605BP | |
| PM763BS | |

**STATIC LOAD**

| TYPE | Outside Diameter of Tube | | Wall Thickness of Tube | | | Tube Lengths - mm (in) | | | | | | | | | | Thrust Load |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | in | mm | in | GA | 200 (7.8) | 250 (9.8) | 300 (11.8) | 400 (15.7) | 500 (19.7) | 600 (23.6) | 700 (27.6) | 800 (31.5) | 900 (35.4) | 1000 (39.4) | |
| | | | | | | Maximum Static Load Per Power Moller™ - kg (lbs) | | | | | | | | | | |
| PM380AS | 38 | 1.50 | 1.2 | 0.05 | 18 | 50 (110) | 45 (99) | 45 (99) | 40 (88) | 35 (77) | 30 (66) | -- | -- | -- | -- | 30 (66) |
| PM427AS | 42.7 | 1.68 | 1.5 | 0.06 | 16 | 75 (165) | 65 (143) | 65 (143) | 55 (121) | 45 (99) | 35 (77) | 30 (66) | 25 (55) | -- | -- | |
| PM486 | 48.6 | 1.91 | 1.4 | 0.05 | 17 | 65 (143) | 65 (143) | 65 (143) | 55 (121) | 45 (99) | 35 (77) | 30 (66) | 25 (55) | 20 (44) | 20 (44) | |
| PMT50AS | Small Ø 50 | 1.97 | 1.6 | 0.06 | 16 | -- | -- | 100 (220) | 100 (220) | 80 (176) | 80 (176) | 60 (132) | 60 (132) | -- | -- | 50 (110) |
| PM570 | 57 | 2.25 | 1.6 | 0.06 | 16 | 120 (266) | 100 (220) | 100 (220) | 100 (220) | 80 (176) | 80 (176) | 60 (132) | 60 (132) | 50 (110) | 50 (110) | |
| PM605 | 60.5 | 2.38 | 3.2 | 0.13 | 11 | 190 (419) | 160 (353) | 160 (353) | 160 (353) | 130 (287) | 130 (287) | 100 (220) | 100 (220) | 80 (176) | 80 (176) | |
| PM635 | 63.5 | 2.50 | 3 | 0.12 | 11 | Any length - 306.8 kg (675lbs) | | | | | | | | | | |
| PM763BS | 76.3 | 3.00 | 3.6 | 0.14 | 10 | -- | 250 (551) | 250 (551) | 225 (496) | 200 (440) | 200 (440) | -- | -- | -- | -- | 70 (154) |
| IP-G | 115 | 4.53 | 4 | 0.16 | 8 | -- | 400 (880) | 400 (880) | 350 (770) | 350 (770) | 300 (660) | -- | -- | -- | -- | |

**IMPACT LOADING**
In applications where the article being transferred is dropped onto the Power Moller, reduce static load limits in the above table by 50% to compensate for the increased forces generated from impact. As the load limit will vary considerably in accordance with the intensity of impact, allow a substantial margin of safety.

For belted zone applications, please refer to belted zone guide or consult Itoh Denki representative

# Options

**LAGGING – NR, UR, NB, CR**
Prevents light loads from slipping and protects the surface of loads during transfer. Lagging is molded on to tube to assure permanent adhesion. Options include:

| Type | Material | Use | Color | Hardness |
|---|---|---|---|---|
| NR | Natural Rubber | General | black | 60-65 durometer |
| UR | Urethane | Abrasion Resistant | grey | 90 durometer |
| NB | Nitrile Rubber | Oil Resistant | black | 60-65 durometer |
| CR | Neoprene | Heat Resistant | black | 60-65 durometer |

*Different thicknesses available. Most common 3mm thick. Contact an Itoh Denki representative for more details.*

**FREE CLUTCH - EC**
- When power is on, the Power Moller functions normally.
- When power is off, the Power Moller functions as an idler roller.
- Available for PM570AS/PM605AS series models.
- The minimum tube length that free clutch option can be attached to is 11". In case the Power Moller has a spring-loaded end cap, the said minimum length is 13".
- Free Clutch option can be added to the Power Moller with brake. In this case, the minimum tube lengths are 13" without a spring-loaded end cap and 15" with a spring-loaded end cap.

**CLEAN ROOM**
Designed for the handling line that requires a high degree of cleanliness, such as electronics and pharmaceuticals industries etc.

| POWER MOLLER™ CLEAN ROOM CLASSIFICATIONS | | | |
|---|---|---|---|
| Model | Class 10,000 | Class 1000 | Class 100 |
| FS | Yes, no option needed | Yes, DR with SS tube, SS shaft | Yes, with WA |
| FE | Yes, no option needed | Yes, DR with SS tube,SS shaft | Yes, with WA |
| FP | Yes, no option needed | Yes, DR with SS tube, SS shaft | N/A |

**WATERPROOF - WA**
Designed for the food and beverage industry, outdoor lines or lines subject to water spray (washdown). Output and attaching shafts, end caps and tubes are made of stainless steel to resist corrosion. Waterproof specification IP-65, IEC 529.
- Direct water spray to shafts in washdown application may reduce life of the roller.
- Waterproof option may affect speed and torque.

**LOW TEMP ROLLER – LT**
Operates in temperatures down to -30°C (-22°F). Includes low temperature grease, air removal inside tube, rust-proof internal circuitry, reinforced gearbox and low temperature mechanical operation.

**DRIP PROOF - DR**
Designed for conveyor lines in high moisture areas. Rubber seals and o-rings protect internals. Meets or exceeds IP-55 specifications.

**MOUNTING BRACKET NOT INCLUDED - KF**

## BUILT-IN BRAKE – BR

- In automated conveyor lines, it is sometimes necessary to minimize coasting of the article being transferred. In these cases, the optional built-in electromagnetic brake should be used.
- When not powered, the built-in electro-magnet uses spring force to lock the motor and prevent the tube rotation. The motor is released when the brake is powered (energized). Ordinarily, the power to the brake and motor is controlled simultaneously.

Braking characteristics vary by Power Moller model and weight transferred. Please contact your Itoh Denki representative for additional information.

| | Effective static brake | | | | |
|---|---|---|---|---|---|
| Standard Brake DC Model* | Diameter (mm) | Torque (N·m) | (lb·ft) | Tangential Force (N) | (lb) |
| PM486FE-5, 8, 10, 15, 17 | 48.6 | 9.2 | 6.8 | 379.9 | 85.5 |
| PM486FE-20, 30, 45, 55, 60 | 48.6 | 2.2 | 1.6 | 90.6 | 20.4 |
| PM486FE-70, 100, 140, 180, 210 | 48.6 | 0.6 | 0.4 | 22.8 | 5.1 |
| PM486FS-5, 8, 10, 15 | 48.6 | 9.0 | 6.7 | 370.7 | 83.4 |
| PM486FS-20, 30, 45, 55 | 48.6 | 2.0 | 1.5 | 83.5 | 18.8 |
| PM486FP-5, 8, 10, 15 | 48.6 | 9.0 | 6.7 | 370.7 | 83.4 |
| PM486FP-20, 30, 45, 55 | 48.6 | 2.0 | 1.5 | 83.5 | 18.8 |
| PM486FP-70, 100, 140, 180 | 48.6 | 0.4 | 0.3 | 16.4 | 3.7 |
| PM570FE-5, 8, 10, 15 | 57 | 9.2 | 6.8 | 323.9 | 72.9 |
| PM570FE-20, 30, 45, 55 | 57 | 2.2 | 1.6 | 77.2 | 17.4 |
| PM570FE-70, 100, 140, 180 | 57 | 0.6 | 0.4 | 19.4 | 4.4 |

## HIGH TORQUE BRAKE – BR-OS

*Available for FS, FE, and FP rollers*

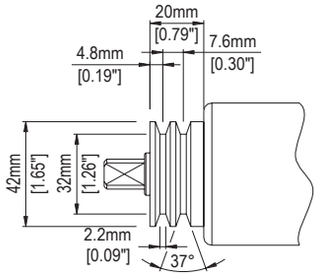
Up to 39% more torque than standard brake, designated by blue band on cable

Can be controlled with CB-016 and HB-510 series driver cards (Not to be used with CB-005 or HB-508)

| | Effective static brake | | | | |
|---|---|---|---|---|---|
| High Torque Brake DC Model* | Diameter (mm) | Torque (N·m) | (lb·ft) | Tangential Force (N) | (lb) |
| PM486FE-5, 8, 10, 15, 17 | 48.6 | 12.8 | 9.5 | 526.1 | 118.4 |
| PM486FE-20, 30, 45, 55, 60 | 48.6 | 3.0 | 2.2 | 125.4 | 28.2 |
| PM486FE-70, 100, 140, 180, 210 | 48.6 | 0.8 | 0.6 | 31.5 | 7.1 |
| PM486FS-5, 8, 10, 15 | 48.6 | 12.5 | 9.3 | 513.3 | 115.5 |
| PM486FS-20, 30, 40, 55 | 48.6 | 2.8 | 2.1 | 115.6 | 26.0 |
| PM486FP-5, 8, 10, 15 | 48.6 | 12.5 | 9.3 | 513.3 | 115.5 |
| PM486FP-20, 30, 45, 55 | 48.6 | 2.8 | 2.1 | 115.6 | 26.0 |
| PM486FP-70, 100, 140, 180 | 48.6 | 0.6 | 0.4 | 22.7 | 5.1 |
| PM570FE-5, 8, 10, 15 | 57 | 12.8 | 9.5 | 448.5 | 100.9 |
| PM570FE-20, 30, 45, 55 | 57 | 3.0 | 2.2 | 106.9 | 24.1 |
| PM570FE-70, 100, 140, 180 | 57 | 0.8 | 0.6 | 26.9 | 6.1 |

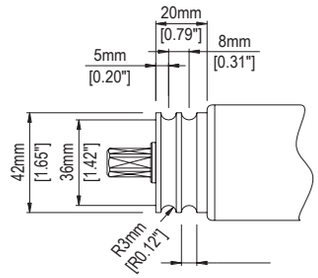
# Belt Pulley and Grooves

### VP V-BELT PULLEY
Applicable models: PM570AU, PM570BP, PM605AS, PM605AU, PM605BP



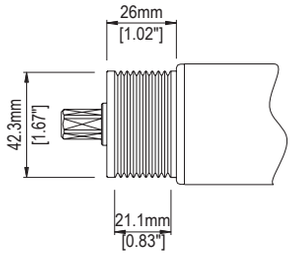

- Special end cap designed to accommodate small V-Belts
- Provides maximum clearance between Power Moller and idler roller power transmission belts
- Spring loaded shaft is standard for all tube lengths
- Between Frame - 35mm = Tube Length*

### RP ROUND BELT PULLEY
Applicable models: PM427AS, ALL PM486, ALL PM570, ALL PM605



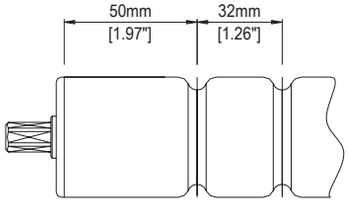

- Special end cap designed to accommodate Poly V-Belts
- Provides maximum clearance between Power Moller and idler roller power transmission belts
- Spring loaded shaft is standard for all tube lengths
- Between Frame - 35mm = Tube Length*

### VG POLY V-BELT PULLEY
Applicable models: PM486FE, PM486XE, PM486XP, PM635FS, PM635KE




- Special end cap designed to accommodate round belts
- High efficiency power transmission
- Provides maximum clearance between Power Moller and idler roller power transmission belts
- Spring loaded shaft is standard for all tube lengths
- Between Frame - 41mm = Tube Length for PM486 series*
- Between Frame - 66mm = Tube Length for PM635 series

### P2 DOUBLE GROOVED TUBE
Applicable models: ALL PM486, PM570, PM605




- Simple and effective power transfer design
- Groove locations are measured from the end of the tube to the center of the first groove, the second groove measured from the center of the first groove to the center of the second
- Standard locations for a PM486 are 50/32mm**
- Standard locations for a PM570, PM605 are 65/30mm**

*If using JQ shaft option, subtract an additional 6mm
**Other groove locations are available

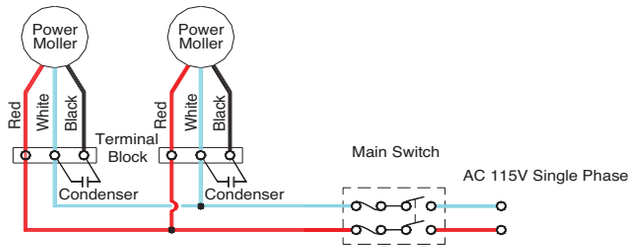
# Installation Precautions

**Important, please read before installation**

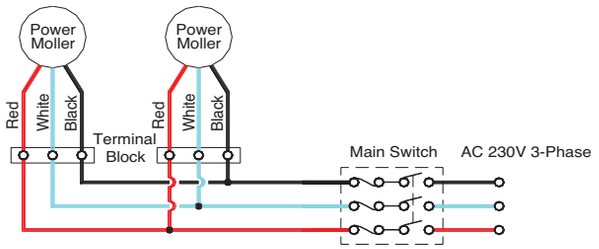
| Precaution | Action | Reason |
|---|---|---|
| Power supply | If the power supply is not sized appropriately for the number of cards/rollers it provides power to, then a low voltage condition may occur. | ■ If the voltage drops below 15V DC and remains low for 1s, then the low voltage error will appear<br>■ If the voltage drops below 15V DC five times in 0.5s, then the low voltage error will appear<br>■ If the voltage drops below 15V DC less than five times in 0.5s or does not remain low for 1s, the roller may stutter – quickly turning off then on |
| Multiple power supplies | 0V line of all power supplies on the same conveyor line (powering the card/rollers, & controls) need to be physically linked together. | This completes the signal path from one section of the conveyor (powered by a power supply) to the adjacent section of conveyor (powered by another power supply) and allows for proper communication through the cable and external interfaces. |
| Voltage drop across the power bus | Use suitable gauge wire in relation to distance and current draw to prevent voltage drop. Operating DC voltage is 24V ±10% | When running long distances from a DC power supply, the voltage drop during motor operation across the power bus may be significant (may drop below 15V!). If there is a large enough drop in voltage, the roller(s) may behave in a strange manner. In order to prevent this, a larger gauge wire must be used. |
| Grounding | Ensure the control card is securely grounded to the conveyor frame. The conveyor frame should also be at the same potential reference as earth ground. Standard grounding practices should be followed. | Static discharge may interfere and damage internal components. |
| Electrical | 24V DC ±10%<br>4A maximum current limiter (motor lock is 4A)<br>Diode protection for mis-wiring<br>Sensor power short circuit protection<br>5A fuse for power supply protection | Improper power will damage the card. The motor/card should not be subject to locked conditions repeatedly. Internal fuse is not replaceable. If the fuse has blown, more serious damage has occurred within the card/motor. |
| Environment | Ambient temperature is 32~104°F<br>Ambient humidity is < 90%RH<br>Atmosphere has no corrosive gas<br>Vibration is < 0.5G - Indoor use only | Extreme environmental variables may cause poor or no performance and damage the card. |
| Over-Speeding | Over-speeding of the roller's no-load speed by more than 50% may cause damage. | Back EMF will be generated. |
| Speed Variation | Speed tolerance +/- 3%-10% depending on model. | |

# AC Wiring

## Basic wiring for Power Moller®

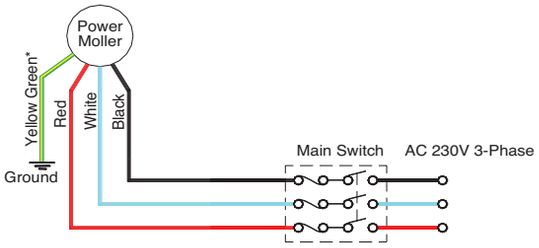



**Single Phase - 115V AC**
For reverse rotation switch the position of the black and white wires.



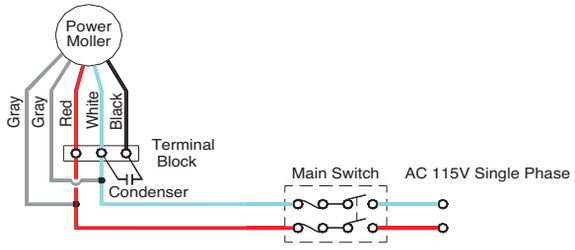

**3 Phase - 230V AC**
For reverse rotation switch the position of any 2 of the 3 wires.

## PM763BS and IP-G wiring

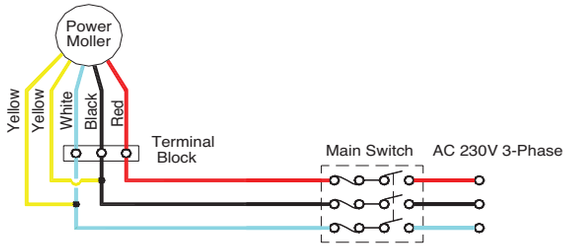



**3 Phase - 230V AC**
* Yellow green ground wire is an option (GW) however it is not necessary for operation.

## (BR) Brake wiring same as motor voltage



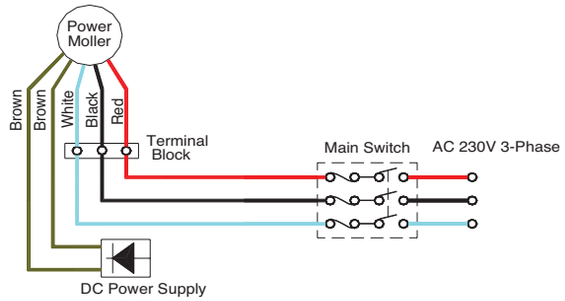

**Single Phase - 115V AC brake and motor**



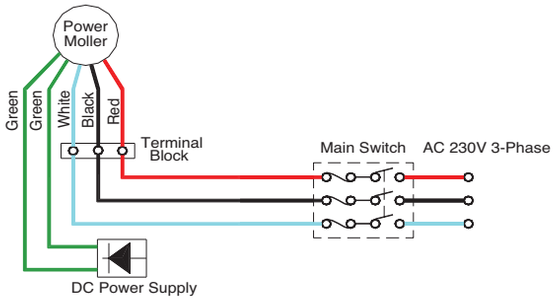

**3 Phase - 230V AC brake and motor**

# AC Wiring

## (BR) (OS) - Brake voltage DC, motor voltage AC

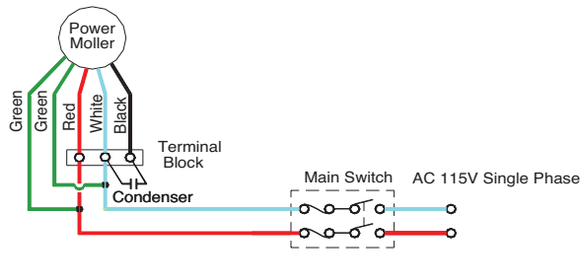



**100V DC brake; motor voltage AC**

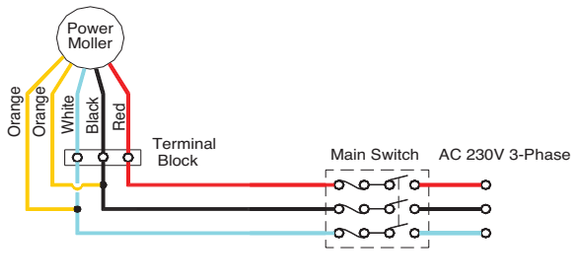



**24V DC brake; motor voltage AC**

## (EC) - Free clutch voltage same as motor

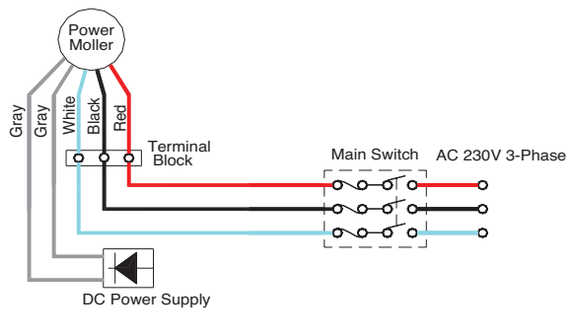



**115V AC single phase free clutch and motor**

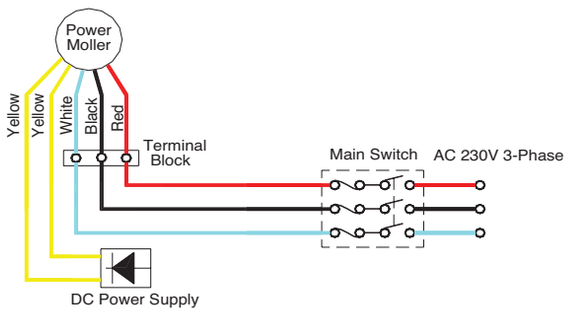



**230V AC 3 phase free clutch and motor**

## (EC) (OS) - Free clutch voltage DC, motor voltage AC




**100V DC free clutch, motor voltage AC**




**24V DC free clutch, motor voltage AC**

# Quality Policy

Based on Technology and Integrity,
IDU will focus on continual improvements by
establishing quality objectives which are communicated
to IDU staff, thereby providing quality products that meet the
customers' requirements, improving their prosperity.

# Warranty

Itoh Denki warrants its Power Mollers to be free from defects in material and workmanship under normal and proper use for a period of one year starting from the date stamped on the Power Moller.

Itoh Denki's only obligation shall be to repair or replace defective equipment which does not conform to the warranty. Itoh Denki shall not be liable for any injury, loss, or damage, direct or consequential, arising out of or the inability to use, the equipment. Before using, Buyer and/or the ultimate User shall determine the suitability of the product for its intended use and User assumes all risks and liability in connection therewith.

The foregoing may not be changed except by an agreement signed by an authorized Itoh Denki representative.

The articles that are replaced pursuant to the terms of this warranty shall be retained by Itoh Denki and the User is responsible for any freight cost relating to repair or replacement.

The foregoing warranty is exclusive and in lieu of all other warranties of quality, whether written, oral or implied (including any other warranty of merchantability or fitness for purpose).

The following are exclusions from warranty:
If usage, adaptation, or installation are not in accordance with our installation and operating instructions.
If the product has been opened, dismantled, or returned with clear evidence of abuse or other damage.
If our written specifications are not properly applied by the buyer when selecting the equipment.
If our equipment has been used to perform functions other than the functions it was designed to handle.
If electrical accessories and other components have been used in disregard of the basic wiring diagram for which they were designed.

All costs related to installation and reinstallation of the Itoh equipment covered by this are not the responsibility of Itoh Denki. Itoh Denki will not be responsible for any consequential damages during the installation procedures.
If the Buyer resells any Itoh Denki products to another Buyer or End-user, it shall include all of the terms and provisions of this warranty in such a resale. Itoh Denki's responsibility to any such Third Party shall be no greater than Itoh Denki's responsibility under the warranty to the original Buyer.