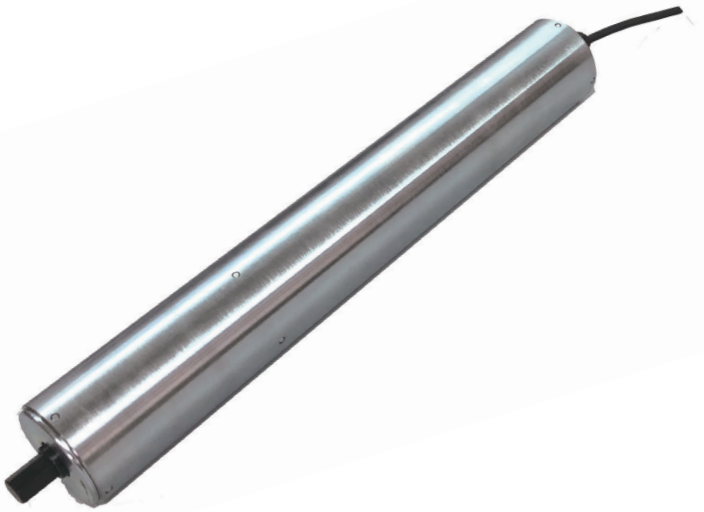
ITOH DENKI

POWER MOLLER 24
MDR -Motor Driven Roller-

Convey



Brushless DC MDR for heavy duty pallet handling

# PM605KT/PM605KT-B

**Motor Driven Roller**

# 〈 Technical documentation 〉

## Read this manual before use

Thank you for purchasing ITOH DENKI products.
(hereinafter referred to as “This Product”)

＊This Product does not include the dedicated driver card.

Read this manual carefully and familiarize yourself to the product as well as the information on safety and precautions before using and operating the product.
Keep this manual readily accessible for future reference.

User Manual for the dedicated driver card can be downloaded from our website:

ITOH DENKI Home > Technical support > Technical documentation

https://www.itoh-denki.com/technical-support/technical-documentation/

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Original notice - A1.13

## INDEX

# Product range

## POWER MOLLER® solutions

### CONTROLS

- Standard circuit board
  - CB016 | CB016B
  - CBM-105
  - CBK-109 | CBK-109B *Replacing CB030*
  - CB018
  - CBV-108
- ZPA circuit board
  - HB510 | HB510B
  - HBK-608
  - HBV-609
- Module circuit board
  - HBR-605
  - CBR-306
  - HBM-201
- Network controller
  - IB-E
  - IB-P

### MOTORIZED ROLLERS

- DC Brushless
  - External circuit board
    - Ø50
      - PM500 FE (KG 300) — CBM-105, HB510, IB-E
      - PM500 VE (KG 300) — CBV-108, HBV-609, IB-P
      - PM500 FE-B (KG 300) — CB016B, HB510B, ◎
    - Ø60,5
      - PM605 FE (KG 500) — CBM-105, HB510, IB-E
      - PM605 VE (KG 500) — CBV-108, HBV-609, IB-P
      - PM605 FE-B (KG 500) — CB016B, HB510B, ◎
      - PM605 KT (KG 1000) — CBK-109, HBK-608, IB-P, IB-E
      - PM605 KT-B (KG 1000) — CBK-109B, ◎
    - Ø32
      - PM320 HS (KG 10) — CB018
  - Integrated circuit board
    - Ø50
      - PM500 XE (KG 300) — B&W AS-i 5.0, Wenglor
      - PM500 XP (KG 300) — B&W AS-i 5.0, Wenglor
      - PM500 XK (KG 300) — PEPPERL-FUCHS, AS-Interface, B&W AS-i 5.0
      - PM500 XC (KG 300) — PEPPERL-FUCHS, AS-Interface, B&W AS-i 5.0
    - Ø60,5
      - PM605 XE (KG 500) — B&W AS-i 5.0, Wenglor
      - PM605 XP (KG 500) — B&W AS-i 5.0, Wenglor

### MODULES

- 90° transfer
  - F-RAT-S250 — HBR-605, CBM-105, CBR-306
  - F-RAT-S300 — HBR-605, CBM-105, CBR-306
  - F-RAT-NX75 — CBK-109, CB016B, HBM-201, IB-E, IB-P
- 45° transfer
  - POP-UP — CBM-105, CBR-306
  - POP-UP VE — IB-P03F-P-UL, IB-P01FP-UL, CBV-108FP-LF1, CBV-108FP, CBV-108FP-LF1
- 30° / 45° / 90° transfer
  - MABS — IB-E06F-M1

Corresponding circuit board | Compatible module / sensor | KG 500 Max load to be conveyed | ◎ Mechanical brake version

# 1. Introduction

## Features

- Allows heavy duty pallet handling with 60.5 diameter roller.
- Allows the creation of low profile conveyor.
- Available roller tube length minimum 340mm up to 1500mm maximum.
- Use of mechanical brake allows precise stop and holding the goods in position.

■ For decline conveyor applications: with the exception of Emergency stops, avoid repeated switch off of the control board during transport as it will shorten the life of the mechanical brake.

## Disclaimer

This product is designed as a general industrial device. Do not use for other applications. We do not take any responsibility for any damage that may result from the disregarding of these warnings.
Also, in the event that an accident results from the use of this product, we do not compensate for any damage, including abnormalities of equipment, connection devices, and/or software, any damage resulting from malfunctions, and/or any other secondary damage.

## Notes on industrial property rights

There are some examples of parts that need to be prepared by customers, as explained within this manual. However, this does not provide any guarantee against the existence of any rights, such as our industrial property rights, or those of other companies, in advance.

## Notes on technical support

We respond to technical inquiries based on the contents described within this manual, and on this product within the range of general items for this product unit with standard specifications, and for the options prepared by us.
There are some descriptions in this manual, about parts, equipment, and wiring arranged by customers, as well as the controls and operation under such circumstances. However, these are not included in the guaranteed operating range and/or support.
When in use, please check and perform the aforementioned based on your responsibility according to operation.

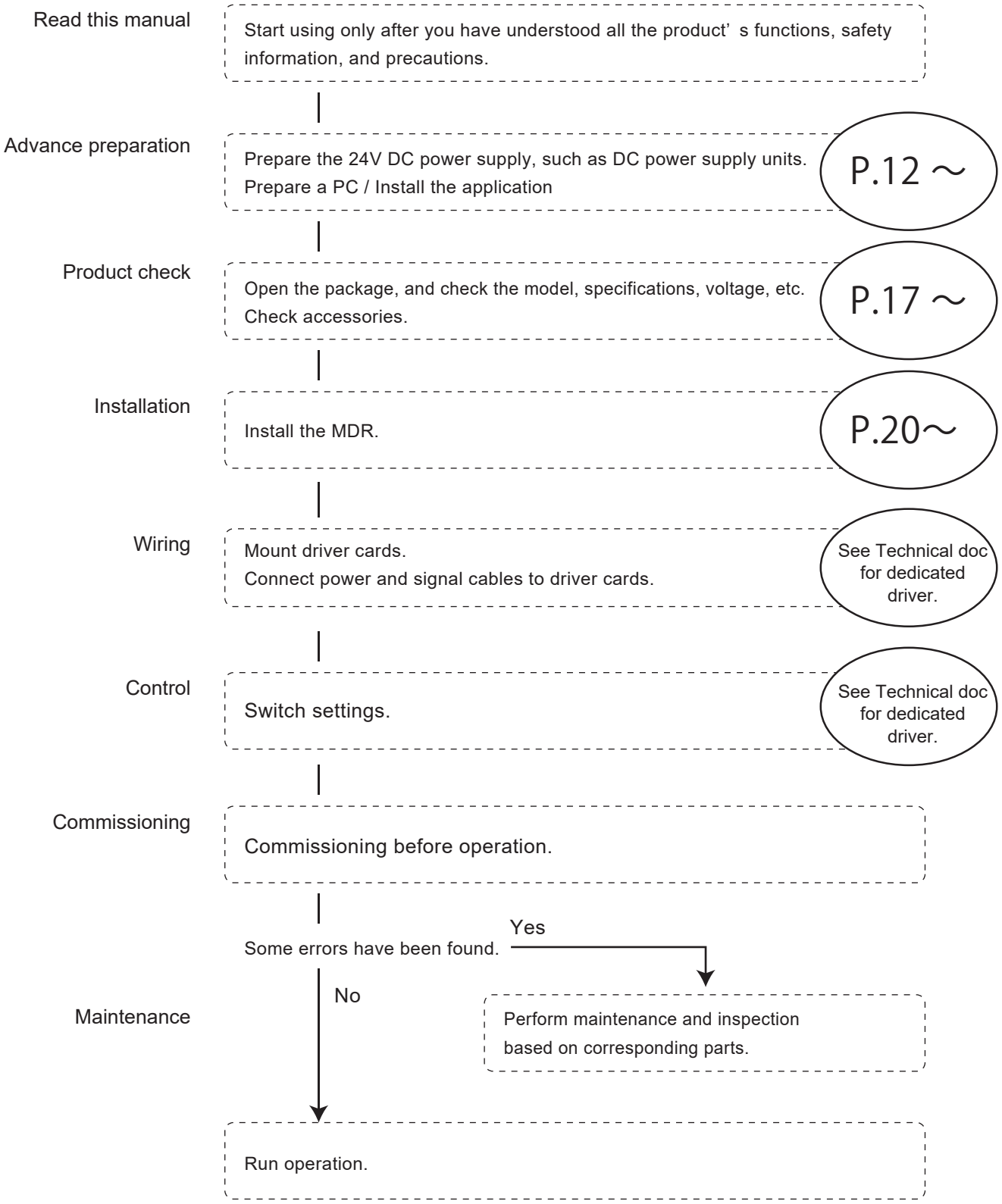
## About product reference

On the document, PM605KT/PM605KT-B series heavy duty pallet handling motorized roller is referred to as MDR.

Model number PM605KT/PM605KT-B is also referred to in parallel from time to time.

# 2. Procedures from installation to operation

## Procedures from installation to operation



# 3. Safety precautions

For parts names in sentences, refer to 5. Check product (P.17).

# 3. Safety precautions

## Danger level

To prevent hazards to users and/or others and to prevent any damage to the equipment, important precautions that must be followed are described below.

■ The degree of hazard and/or damage that may result if a user disregards the description and operates the product improperly is categorized with the following symbols and explained below.

| | |
|---|---|
| ⚠ WARNING | This indicates a high possibility that severe injury or even death may result. |
| ⚠ CAUTION | This indicates a high possibility that injury, or only equipment damage |

## Symbol explanation

■ We categorize the type of those precautions using the following symbols throughout the manual.

| | |
|---|---|
|  | This symbol indicates operations that are prohibited. |
|  | This symbol indicates forced operations that you should always perform. |

# 3. Safety precautions

## 3-1. General precautions

### ⚠ WARNING

Do not use the product near places subject to explosive, flammable gas, and/or corrosive atmosphere, and/or combustible materials.

Failure to follow this could result in explosion, fire, electric shock and/or injury.

When using the product in places where serious accidents and/or damage may possibly occur, install backup and/or fail-safe functions systematically.

Failure to follow this could result in the inability to control this product due to driver card malfunction, which could lead to serious accidents.

### ⚠ CAUTION

Do not forcibly bend and/or pull cables.
Also, do not put heavy materials on cables, or do not get them stuck between cables.

Failure to follow this could result in fire and/or electric shock due to cable damage.

Never modify the product and/or driver cards.

Failure to follow this could result in serious accidents.

Make sure to attach ground wires to the conveyor body and DC power supply unit.

Failure to follow this could result in electric shock if any malfunction or leakage occurs.

Do not touch the product when it is running or after it has just stopped operation.

Failure to follow this could result in burns.

Do not put water and/or oil on the product, and do not transfer wet and/or oily trays.

Failure to follow this could result in electric shock, and/or malfunction.

Do not apply strong impact and/or excessive force to the product, such as hitting it with objects, or dropping it. Also, do not use the equipment if strong impact has been applied, and/or if the appearance has become deformed.

Failure to follow this could result in malfunction due to applied impact.

Stop operation when abnormal sound is heard during operation.

Failure to follow this could result in unexpected accidents.

Do not use in a way exceeding the range of the product specifications.

Failure to follow this could result in malfunction, fire, and/or injury.

# 3. Safety precautions

## 3-1. General precautions

**⚠ CAUTION**

Turn off the power supply to the product before moving and/or installing the product, and performing maintenance and inspection (excluding those during operation).

Working while the power is on could result in accidents due to unexpected operation.

---

Observe the safety regulations required for installation locations, and/or products in use.

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Securely wire each cable to connection parts.

Improper wiring could result in electric shock and/or malfunction.

---

Do not turn on/off relays and/or contactors near power cables, signal cables, and/or driver cards.

Failure to follow this could result in malfunction due to noise generation.

---

LED or Pull-up/Pull-down circuits implemented in the output circuit of control devices could result in unexpected operation.

Carefully check the output circuit.

---

Do not unplug power and/or signal cables during operation. Also, do not run/stop this product by the power supply. (Use the signal.)

Failure to follow this could result in malfunction.

---

Do not forcibly rotate the MDR at times other than maintenance and inspection.

Failure to follow this could result in damage to driver cards, and/or their lifetime to be significantly shortened.

---

Do not shut off the power during operation unless there is an emergency.

Failure to follow this could result in malfunction.

---

Make sure to perform the start-up inspection, and check that devices are free from any abnormalities, and that safety equipment functions correctly before using the product.

---

When disposing of the product, make consigning contracts with licensed industrial waste disposers, and consign the disposal to them.

# 3. Safety precautions

## 3-2. Precautions on installation

**⚠ CAUTION**

When handling, wear protective equipment, such as gloves.

Since this product consists in large part of metal, careless handling could result in hands getting injured.

Make sure to use the recommended tightening torque to tighten bolts for installing the mounting bracket.

Failure to follow this could result in bolts and/or screws loosening, and/or malfunction.

If necessary warning/caution labels become hidden after installing fences, affix again on places where they can be seen.

Never fail to use the dedicated mounting bracket supplied to mount this product using the specified fastening torque.

Failure to follow this could result in workers getting injured or the damage to the Product.

Check the corresponding installing direction to the loading/discharging sides before installing.

Failure to follow this could result in objects/body parts getting caught and/or stuck.

Allow a 2 to 5 mm gap between MDR and conveyor frame to facilate the installation and removal.

Install the roller with the appropriate number of person according to the product weight.

## 3-3. Precautions on wiring

**⚠ WARNING**

Do not pull, tear or cut and then reconnect the power cables.

Failure to follow this could result in electric shock, fire or malfunction.

**⚠ CAUTION**

Perform wiring when the power is shut off.

Failure to follow this could result in electric shock and/or accidents due to unexpected operation.

Never perform wiring in wet environment or with wet fingers.

Failure to follow this could result in leakage, short-circuit or fire.

# 3. Safety precautions

## 3-4. Precautions on maintenance

### ⚠ WARNING

If any abnormalities are found, do not use this product until the causes have been eliminated completely .

Using this product with unattended abnormalities could result in not only damage to the devices, but also unexpected accidents.

---

Have specialists (or people who have sufficiently acquired skills) perform maintenance and inspection under instructions by management supervisors.

---

At the time of repair and replacement work, turn off the power to all connecting devices.

To prevent wraparound for the power circuits and/or signals, shut off the power, wait a sufficient amount of time, and discharge electricity inside the DC power supply equipment.

---

At the time of maintenance and inspection, post warning labels so as to prevent unauthorized persons from turning on the power.

Failure to follow this could result in malfunction and/or unexpected accidents.

### ⚠ CAUTION

When repairing/replacing, wear protective equipment, such as gloves.

Failure to follow this could result in hands getting injured by metal parts.

---

Do not disassemble sections and/or parts other than those specified.

Failure to follow this could result in malfunction and/or unexpected accidents.

---

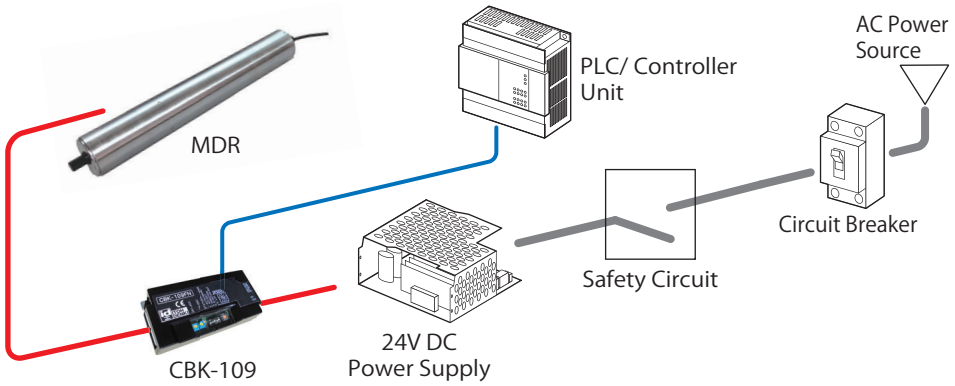
Make sure to prepare repair/replacement parts designated by ITOH DENKI.

Using parts other than those designated by ITOH DENKI could result in malfunction.

# 4. Preparation Before Installation

# 4. Preparation Before Installation

## Configuration example




■ The number(s) of input and output signals to and from the driver cards should match your operation design.

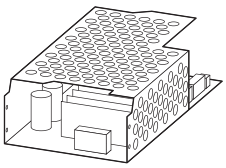
■ Safety circuit should include emergency stop button and magnetic contact switches.

## Components and devices to be provided by the customer. (Not included with this product)

① 24V DC power supply

Prior to installation, following components and devices need to be prepared by the customer.

Equipment to feed 24V DC power source.



• Switched-mode power supply (24V DC)

10A 240W per one PM605KT/PM605KT-B unit

• 24V DC battery

■ Switched-mode power supply for DC Power Supply (DC 24V ± 10%) is recommended to be used for Driver Card

■ Select the DC power supply with a sufficient capacity, over 24V DC, 10A, to avoid power fluctuations.

■ Use of transformer type power supply is prohibited.

■ Verify that the suppliedvoltage is stable at DC24V ± 10% at terminal for the Driver card.

■ Make sure to use a power supply having a capacity larger than the rated input of the dedicated driver card, multiplied by the number of MDR connected. If the capacity of the power supply is insufficient, it may cause supply voltage drop resulting malfunction or damage.
Note: In case multiple MDR start running simultaneously, power supply capacity should not be less than 10A x number of MDR.

■ Select a power supply with a protective mechanism that will not trigger below 30A-1msec peak current.

■ Select an isolated switched-mode power supply conforming to safety standard rated IEC60950-1 and/or UL60950-1. Do not use non isolated type power supply for safety reasons and for radiation noise restrictions.

# 4. Preparation Before Installation

② Driver card

A driver card is required to control MDR operation.

CBK-109、HBK-608、IB-E04、IB-P02

＊Mechanical brake option is compatible only with the CBK-109B driver card.

CBK-109
(Standard driver)

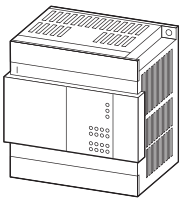
HBK-608
(Built-in logic driver)

IB-E04
(EtherNet/IP based Controller)

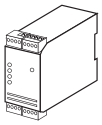
IB-P02
(Profinet based Controller)

③ Control equipment

Control equipment such as PLC for Driver cards.



④ Safety relay



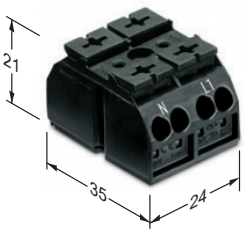
⑤ 24VDC power supply

| Reference | Input | Output | Power | Start-up boost |
|---|---|---|---|---|
| CT-10-241 | 380~480V 3 ph | 24V-10A | 240W | 120% |
| QT-20-241 | | 24V-20A | 480W | 150% |
| QT-40-241 | | 24V-40A | 960W | 150% |


- Very weak inrush current
- Accepts excess current of 120 to 150% at startup (according to model)

⑥ 24VDC distribution connector

| | Connector |
|---|---|
| Reference | PD-2P |




- 32A max
- 2 pole with marking «24V / OV»
- 4 connector by pole
- Cable 0.5 -4.00mm (AWG...)
- Fixing with M3 bolt or screw

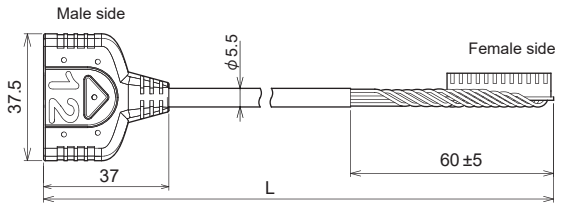
# 4. Preparation Before Installation

⑦ MDR extension cable (Optional)

An extension cable is required when the distance between the MDR and the driver card is longer than the MDR cable length.

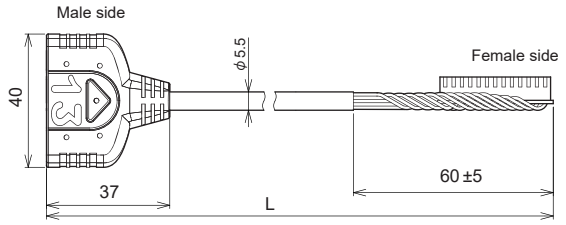
■ CBK-109 / HBK-608 / IB-E04 / IB-P02：12P Extension cable

| Part number | 12 Pin extension cable length |
|---|---|
| ACE-CBM-G1200 | L= 1200mm |
| ACE-CBM-G2000 | L= 2000mm |




■ CBK-109：13P Extension cable（for Mechanical brake option）

| Part number | 13 Pin extension cable length |
|---|---|
| ACE-CBK-H1000 | L= 1000mm |
| ACE-CBK-H2000 | L= 2000mm |

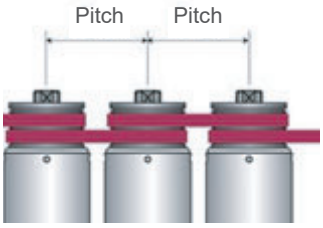



■ Total length of cable including cable on MDR must not be longer than 3000 mm.
■ Do not use multiple extension cables per MDR.

# 4. Preparation Before Installation

⑧ Ribbed belt (Optional)

| Pitch between the rollers (mm) For pulley Ø56mm | Number of teeth | |
|---|---|---|
| | 4 | 6 |
| 60-63 | Ref. 4PJ302-56 | Ref. 6PJ302-56 |
| 67-70 | - | Ref. 6PJ314-56 |
| 71-74 | - | Ref. 6PJ316-56 |
| 77-80 | Ref. 4PJ336-56 | - |
| 83-87 | Ref. 4PJ346-56 | - |
| 94-99 | Ref. 4PJ372-56 | Ref. 6PJ372-56 |
| 100-101 | Ref. 4PJ376-56 | Ref. 6PJ376-56 |
| 103-107 | Ref. 4PJ388-56 | - |
| 109-114 | Ref. 4PJ416-56 | Ref. 6PJ416-56 |
| 122-127 | Ref. 4PJ436-56 | Ref. 6PJ436-56 |
| 130-135 | Ref. 4PJ442-56 | - |
| 136-141 | Ref. 4PJ456-56 | Ref. 6PJ456-56 |
| 150-156 | Ref. 4PJ486-56 | Ref. 6PJ486-56 |
| 175-182 | Ref. 4PJ536-56 | Ref. 6PJ536-56 |
| 188-195 | Ref. 4PJ570-56 | Ref. 6PJ570-56 |


⑨ Emergency Stop Device

Refer to CBK-109 technical documentation for emergency stop.

⑨-1 Circuit breaker check points

Select the circuit breaker according to the capacity of your 24V DC power supply. Selecting the proper circuit breaker will provide additional protection to overflow current situation.
When selecting earth leakage breaker, select inverter compatible type. Some non-inverter type may incorrectly respond to the high frequency component of the switching power supply as earth leakage.

⑨-2 Device Operation Test

When the 24VDC power supply unit has been installed, check that the circuit breaker and emergency stop switch function properly. Perform operation according to the following steps.

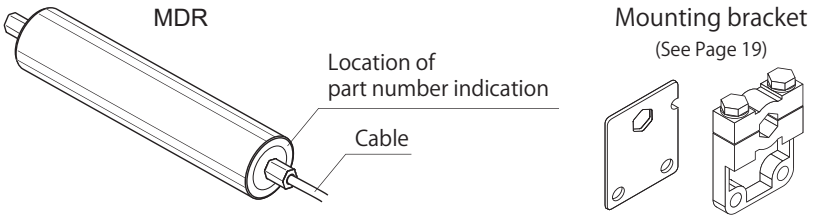
1) Input to the DC power supply is securely turned ON and OFF when turning ON and OFF the breaker.
2) Input to this Product (24V DC) is securely turned ON and OFF when turning the emergency stop switch OFF and ON.

# 5. Check product

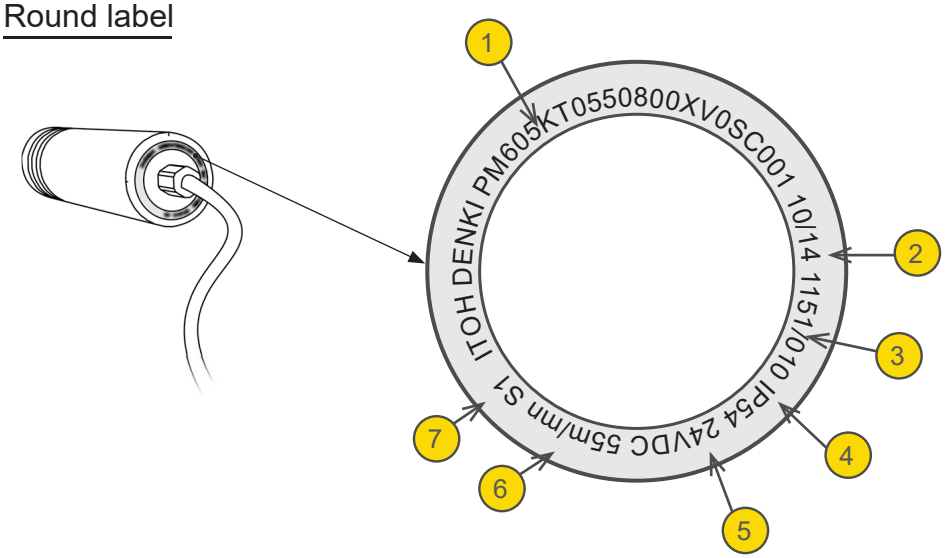
# 5. Check product

## Checking the model

Open the package, and verify the product part number matches what you ordered.

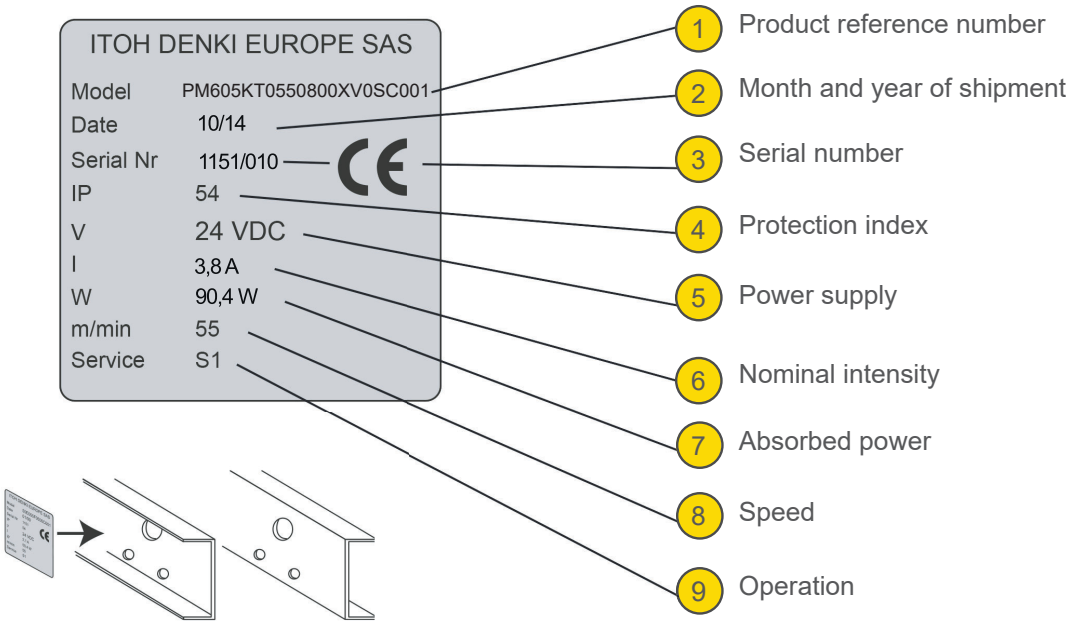



## Round label




1. Product reference number
2. Month and year of shipment
3. Serial number
4. Protection index
5. Power supply
6. Speed
7. Operation

## Square label



# 5. Check product

## Visual validation

① Verify the MDR product has no scratch, dent, residue, corrosions (rust etc.)
② Verify there is no missing parts such as screws etc.
NOTE : Should any irregularity be found, contact the vendor immediately.

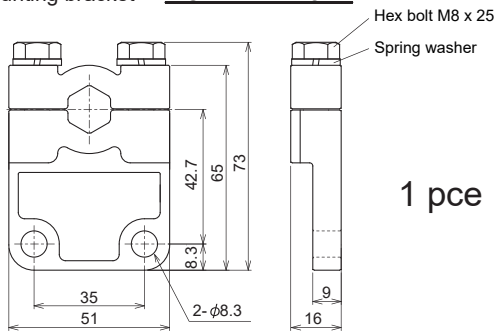
## Verify accessories

Mounting bracket

■ Use only the hex bolts contained in the package.

### Cable side shaft

Mounting bracket **Ref : MBK-0K1**



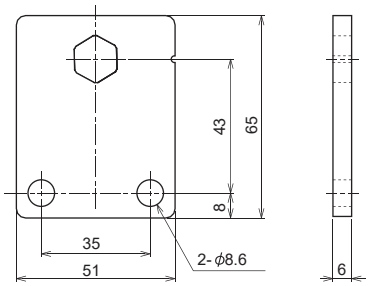

1 pce

Hex bolt M8 x 25
Strengthening category 10.9
2 pcs

Spring washer: M8 2 pcs

Toothed washer nut: M8 2 pcs

Mounting bracket **Ref : MBK-0K1-6W (for IP65)**




2 pcs

Hex bolt M8 x 25
Strengthening category 10.9
2 pcs

Spring washer: M8 2 pcs

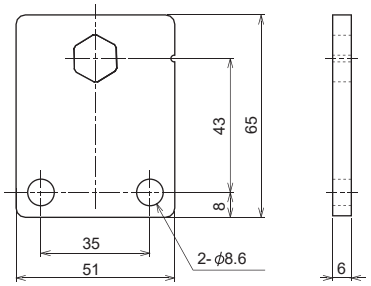
Toothed washer nut: M8 2 pcs

### Spring-loaded shaft (non cable side) (Optional)

Mounting bracket

**Ref : MBK-0K1-7**

**Ref : MBK-0K1-7W (for IP65)**




1 pce

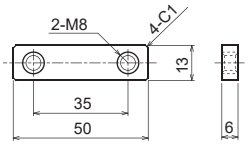
Hex socket head cap bolt：M8×25

2 pcs

Spring washer: M8

2 pcs

**D-35** (Dedicated nut)




1 pce

### M10 threaded shaft (non cable side) (Obligatory)

**Ref : SP-M10-20**

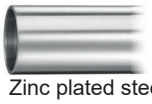
**Ref : SP-M10-20-SUS (for IP65)**

M10

# 6. Installation

# 6. Installation

## 6-1. Mechanical option

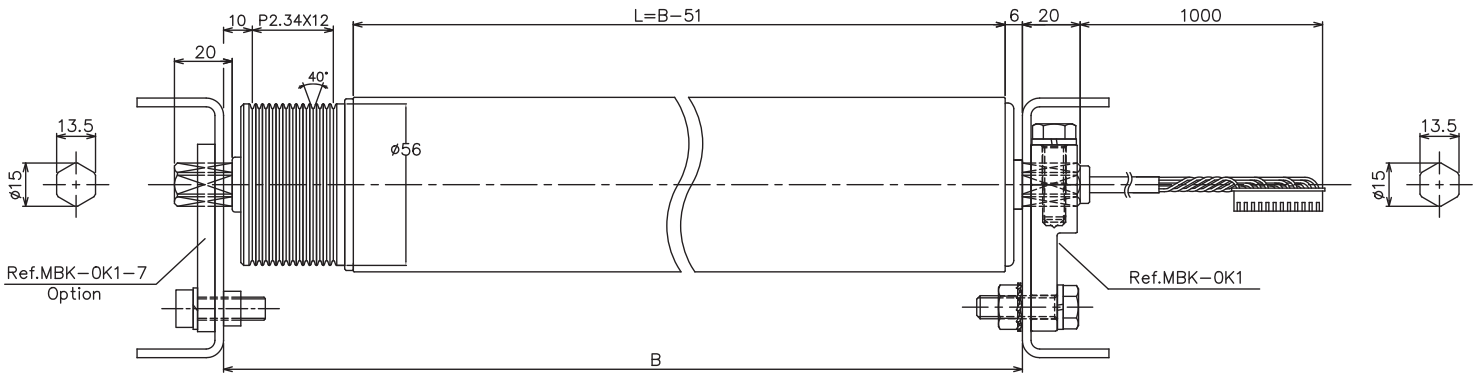
| | | |
|---|---|---|
| **Shaft and flange motor side :** |  Plain hexagonal | • Plain hexagonal 13,5mm<br>• Heat-treated and phosphated steel shaft<br>• Heat-treated flange |
| **Shaft and flange free side :** |  Hexagonal spring loaded<br>  Set screw | • Plain hexagonal 13,5mm with spring or Ø 15mm x 8mm, 13mm flat M10 threaded (not avalaible for brake version)<br>• Heat-treated and phosphated steel shaft<br>• Heat-treated flange |
| **Tube :** |  Zinc plated steel<br>  Stainless steel | • Tube in precision cold drawn steel, STKM12 quality, outer diam. 60,5mm<br>• Zinc plated steel or stainless steel (304L) |
| **Pulleys :** |  Ribbed with hexagonal spring loaded<br>  Ribbed with M10 threaded | Pulleys for :<br>• Ribbed belt 12 teeth, zinc plated steel<br>• Plain hexagonal 13,5mm with spring or M10 threaded (not avalaible for brake version) |
| **Lagging :** |  Polyurethane<br>  Natural rubber / nitrile | • Polymerized polyurethane coating, thickness 4,75 mm, 90 ShA, grey<br>• Natural hot vulcanized rubber coating, thickness 4,75 mm, 60~65 ShA |

# 6. Installation

## 6-2.
## Preparation to install MDR

MDR dimensions

### Roller with pulley for ribbed belt
### Hexagonal plain shaft motor side and hexagonal spring loaded shaft on free end




### Standard version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 411 ≤ B ≤ 1551 | 360 ≤ L ≤ 1500 |
| 55 | 391 ≤ B ≤ 1551 | 340 ≤ L ≤ 1500 |

| Tube L | | 350 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.1 | 5.3 | 5.7 | 6.1 | 6.5 | 6.9 | 7.3 | 7.7 | 8.1 | 8.5 | 8.9 | 9.3 | 9.7 |
| | 55 | 4.1 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.4 |
| Static load (Kg) | | 160 | | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | | |

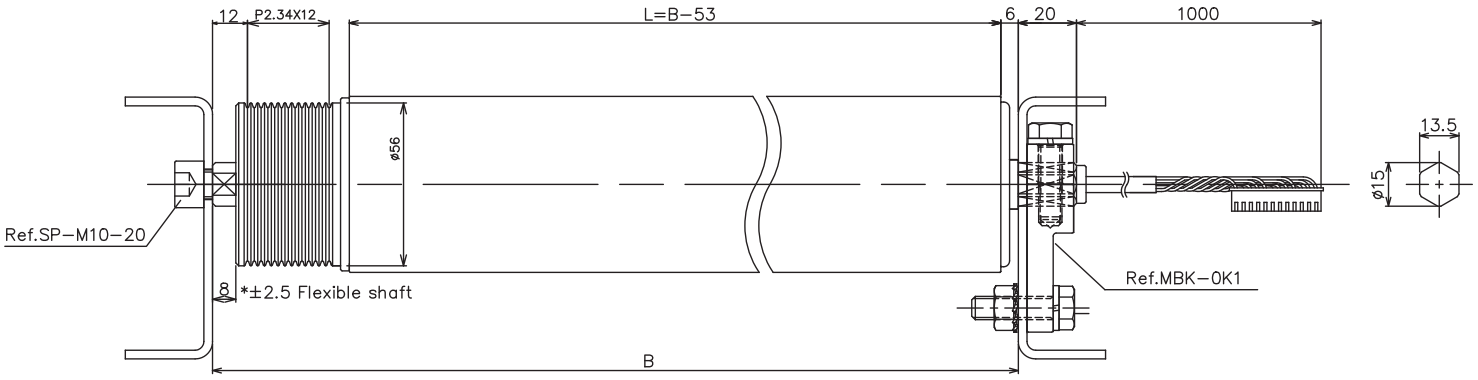
### Brake version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 461 ≤ B ≤ 1551 | 410 ≤ L ≤ 1500 |
| 55 | 441 ≤ B ≤ 1551 | 390 ≤ L ≤ 1500 |

| Tube L | | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.4 | 9.8 | 10.2 |
| | 55 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.3 | 8.7 | 9.1 | 9.5 | 9.9 |
| Static load (Kg) | | 160 | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | |

# 6. Installation

## Roller with pulley for ribbed belt
## Hexagonal plain shaft motor side and M10 threaded shaft with screw on free end




### Standard version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 413 ≤ B ≤ 1553 | 360 ≤ L ≤ 1500 |
| 55 | 393 ≤ B ≤ 1553 | 340 ≤ L ≤ 1500 |

| Tube L | | 350 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.0 | 5.2 | 5.6 | 6.0 | 6.4 | 6.8 | 7.2 | 7.6 | 8.0 | 8.4 | 8.8 | 9.2 | 9.6 |
| | 55 | 4.8 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.4 |
| Static load (Kg) | | 160 | | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | | |

### Brake version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 463 ≤ B ≤ 1553 | 410 ≤ L ≤ 1500 |
| 55 | 443 ≤ B ≤ 1553 | 390 ≤ L ≤ 1500 |

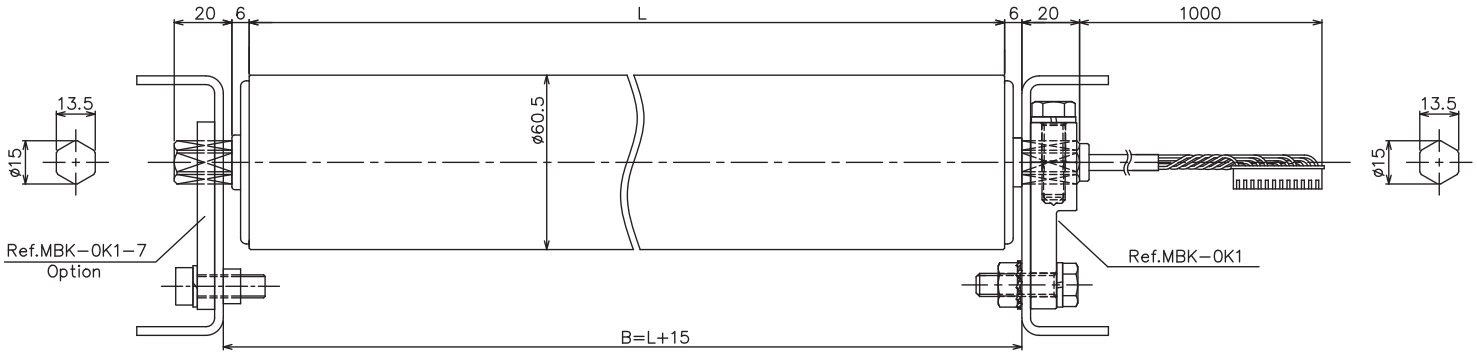
| Tube L | | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.3 | 8.7 | 9.1 | 9.5 | 9.9 |
| | 55 | 5.3 | 5.7 | 6.1 | 6.5 | 6.9 | 7.3 | 7.7 | 8.1 | 8.5 | 8.9 | 9.3 | 9.7 |
| Static load (Kg) | | 160 | | | | | | | | | | 80 | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | |

# 6. Installation



## Roller without drive

Hexagonal plain shaft motor side and hexagonal spring loaded shaft on free end




### Standard version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 375 ≤ B ≤ 1515 | 360 ≤ L ≤ 1500 |
| 55 | 355 ≤ B ≤ 1515 | 340 ≤ L ≤ 1500 |

| Tube L | | 350 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 4.8 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.4 |
| | 55 | 4.6 | 4.8 | 5.2 | 5.6 | 6.0 | 6.4 | 6.8 | 7.2 | 7.6 | 8.0 | 8.4 | 8.8 | 9.2 |
| Static load (Kg) | | 160 | | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | | |

### Brake version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 425 ≤ B ≤ 1515 | 410 ≤ L ≤ 1500 |
| 55 | 405 ≤ B ≤ 1515 | 390 ≤ L ≤ 1500 |

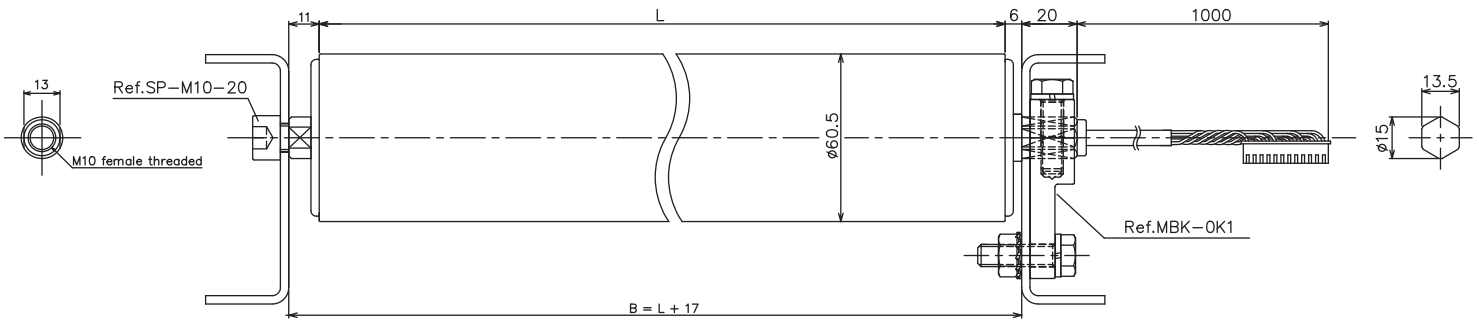
| Tube L | | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.3 | 8.7 | 9.1 | 9.5 | 9.9 |
| | 55 | 5.3 | 5.7 | 6.1 | 6.5 | 6.9 | 7.3 | 7.7 | 8.1 | 8.5 | 8.9 | 9.3 | 9.7 |
| Static load (Kg) | | 160 | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | |

# 6. Installation



## Roller without drive

## Hexagonal plain shaft motor side and M10 threaded shaft with screw on free end




### Standard version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 377 ≤ B ≤ 1517 | 360 ≤ L ≤ 1500 |
| 55 | 357 ≤ B ≤ 1517 | 340 ≤ L ≤ 1500 |

| Tube L | | 350 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 4.8 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.4 |
| | 55 | 4.6 | 4.8 | 5.2 | 5.6 | 6.0 | 6.4 | 6.8 | 7.2 | 7.6 | 8.0 | 8.4 | 8.8 | 9.4 |
| Static load (Kg) | | 160 | | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | | |

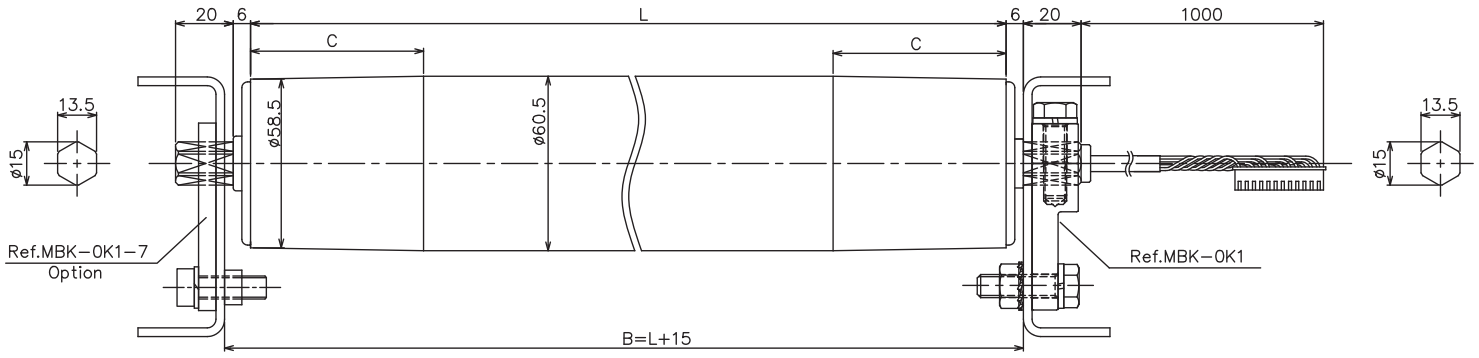
### Brake version

| Speed code | Dimension (B)<br>Mini ≤ B ≤ Maxi | Tube length (L)<br>mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 427 ≤ B ≤ 1517 | 410 ≤ L ≤ 1500 |
| 55 | 407 ≤ B ≤ 1517 | 390 ≤ L ≤ 1500 |

| Tube L | | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.7 | 6.1 | 6.5 | 6.9 | 7.3 | 7.7 | 8.1 | 8.5 | 8.9 | 9.3 | 9.7 | 10.1 |
| | 55 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.3 | 8.7 | 9.1 | 9.5 | 9.9 |
| Static load (Kg) | | 160 | | | | | | | | | 80 | | |
| Axial Force Max (N) | | 490 | | | | | | | | | | | |

# 6. Installation

## Crowned tube
## Hexagonal plain shaft motor side and hexagonal spring loaded shaft on free end




| L | L≦600 | L>600 |
|---|---|---|
| C | 60 | 120 |

### Standard version

| Speed code | Dimension (B) Mini ≤ B ≤ Maxi | Tube length (L) mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 375 ≤ B ≤ 815 | 360 ≤ L ≤ 800 |
| 55 | 355 ≤ B ≤ 815 | 340 ≤ L ≤ 800 |

| Tube L | | 350 | 400 | 500 | 600 | 700 | 800 |
|---|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 4.8 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 |
| | 55 | 4.6 | 4.8 | 5.2 | 5.6 | 6.0 | 6.4 |
| Static load (Kg) | | 160 | | | | | |
| Axial Force Max (N) | | 490 | | | | | |

### Brake version

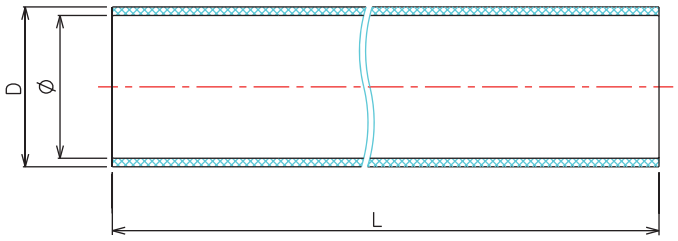
| Speed code | Dimension (B) Mini ≤ B ≤ Maxi | Tube length (L) mini ≤ L ≤ max |
|---|---|---|
| 15/28 | 425 ≤ B ≤ 815 | 410 ≤ L ≤ 800 |
| 55 | 405 ≤ B ≤ 815 | 390 ≤ L ≤ 800 |

| Tube L | | 400 | 500 | 600 | 700 | 800 |
|---|---|---|---|---|---|---|
| Weight (Kg) | 15/28 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 |
| | 55 | 5.3 | 5.7 | 6.1 | 6.5 | 6.9 |
| Static load (Kg) | | 160 | | | | |
| Axial Force Max (N) | | 490 | | | | |

# 6. Installation

## Coated in natural rubber, nitrile rubber and polyurethane

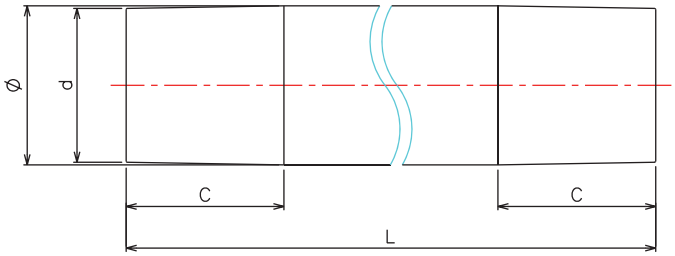
| Matiere | Characteritics | Hardness (ShA) | Thickness (mm) |
|---|---|---|---|
| Natural rubber | It improves the adherence of the products conveyed and reduces noise. Do not use in contact with hydrocarbon, oil or grease. | 60~65 | 4,75 |
| Nitrile rubber | Exceptional resistance in the presence of hydrocarbon, oil and grease. | | |
| Polyurethane | High resistance to abrasion, tearing and oil. | 90 | |




Cylindrical tube

| L (mm) | Ø (mm) | D (mm) |
|---|---|---|
| ≤1200 | 60.5 | 70 |

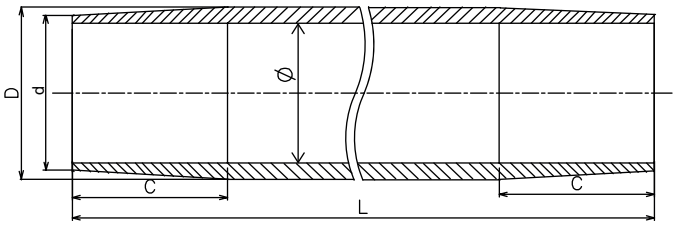
## Crowned machining




Tube in zinc-coated or stainless steel

| L (mm) | C (mm) | Ø (mm) | d (mm) |
|---|---|---|---|
| ≤600 | 60 | 60.5 | 58.5 |
| 601≤800 | 120 | | |

Other lengths, contact us.




Tube with natural rubber/polyurethane coating - thickness 4,75 mm

| L (mm) | C (mm) | Ø (mm) | d (mm) | d (mm) |
|---|---|---|---|---|
| ≤600 | 60 | 60.5 | 69 | 70 |
| 601≤800 | 120 | | | |

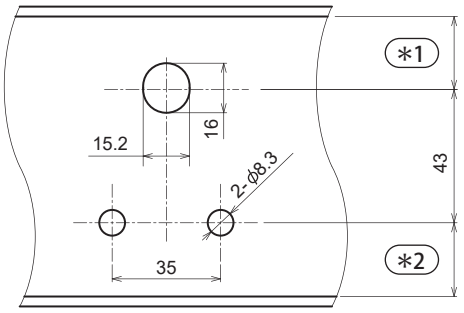
# 6. Installation

Frame mounting hole dimension

## Frame hole punching

**1** Punch frame holes required to install MDR.

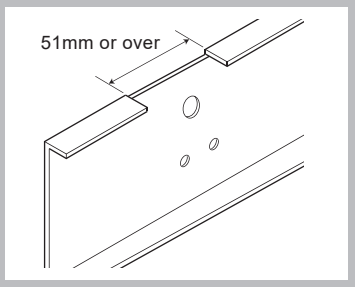
＊See fig. below for the position and dimensions of frame holes.




■ (∗1) 33mm minimum gap is required. Note)

■ (∗1) Leave enough room to tighten hex bolts with hex wrench.

Note) If this distance is 23 to 33mm, cut the bent part of top of frame for 51mm or over to make a space for M8x25 bolt attaching of the mounting bracket.




■ (∗2) 9mm minimum gap is required.

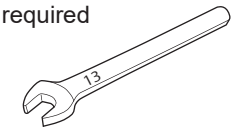
■ (∗1) & (∗2) Minimum gap should not include bending radius of the frame.

# 6. Installation

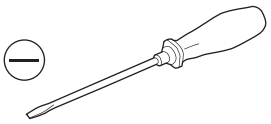
## 6-3. MDR installation with hexagonal shaft on free side

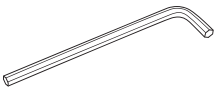
- MDR shaft must be tightened firmly with the mounting bracket supplied as standard accessory.
  Failure in tightening MDR shaft causes rattling, resulting in cable disconnection and malfunction.
- Install the roller with the appropriate number of person according to the product weight.
- Motor cable is designed for fixed installation. Prevent any repetitive flexing, even with an additional guiding device.

Tools required



13mm wrench (spanner)

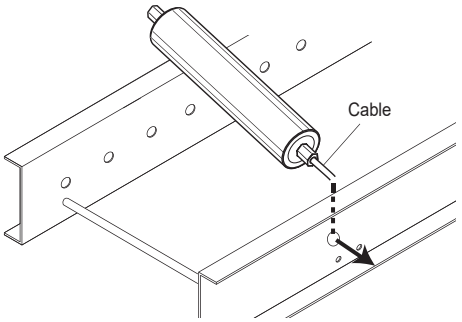

Flat head screw driver


6 mm hex wrench

### MDR installation with hexagonal shaft on free side

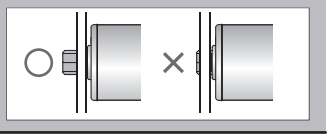
**1** Insert cable side shaft through the frame shaft hole.

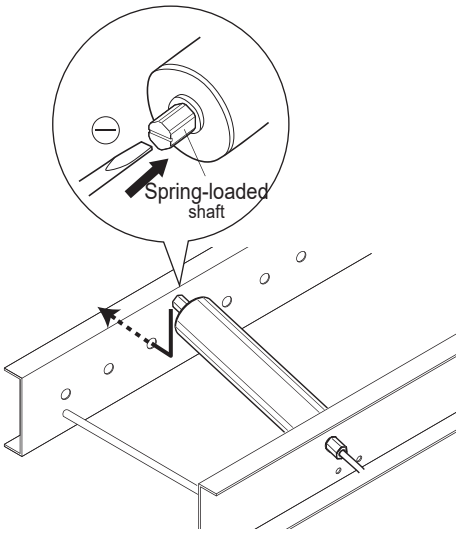
- Care must be paid not to pinch the cable.




**2** Press the spring loaded shaft (non cable side) with flat head screw driver and carefully insert it to the frame shaft hole.

- Do not press the shaft beyond the thrust collar.
- As shown in the below figure, make sure that the spring loaded shaft pops out from the frame hole.



# 6. Installation

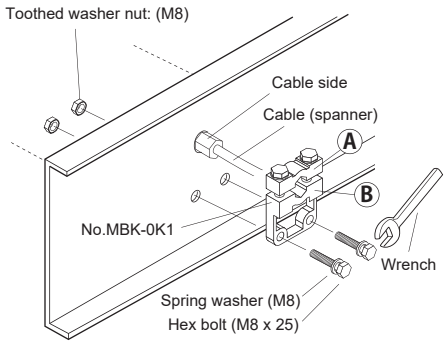
**3** Insert the Cable and Shaft from MDR through Mounting Bracket then tighten.

＊ If the distance between motor side attaching shaft and top of frame is 23 to 33mm, cut the bent part of top of frame for 51mm or over. (Refer to page 28)

■ Leave enough gap between Ⓐ and Ⓑ in figure to the right the attach the Mounting Bracket to ease the installation.

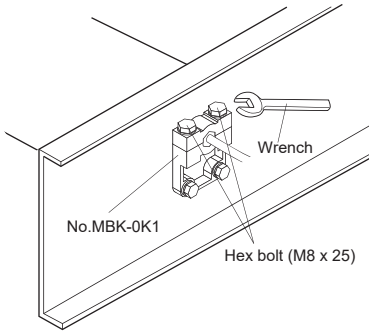
■ Recommended tightening Torque: 27 N･m

■ Do not force through the cable and housing connector, avoid damage during tightening of the Mounting Bracket.




**4** Tighten the MDR shaft firmly by fastening hex bolts (M8 x 25) for mounting bracket .

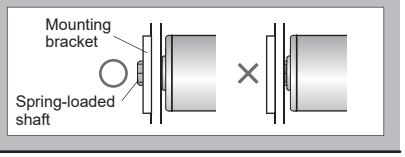
■ Recommended tightening Torque: 27 N･m



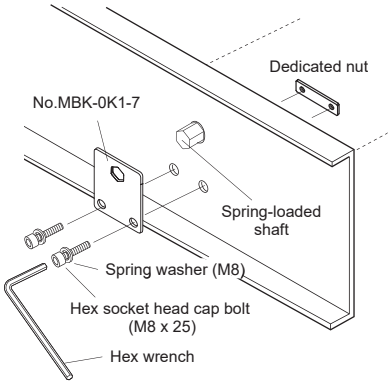

**5** Hold the MDR attaching shaft into the bracket, and fastening Hex socket head cap bolt (M8×25) and dedicated nuts.

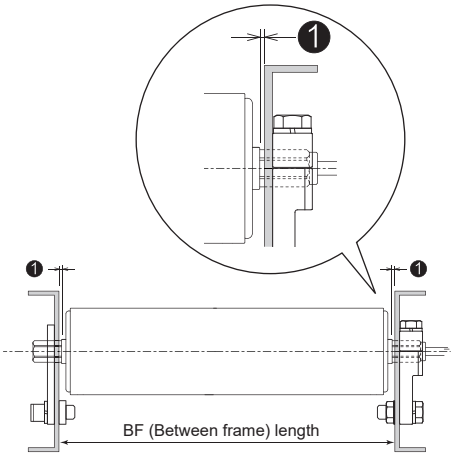
■ Recommended tightening Torque: 27 N･m

■ As shown in the below figure, make sure that the spring loaded shaft pops out from the frame hole.




■ ❶a gap 2 to 5mm is required between the frame inside dimension and MDR.

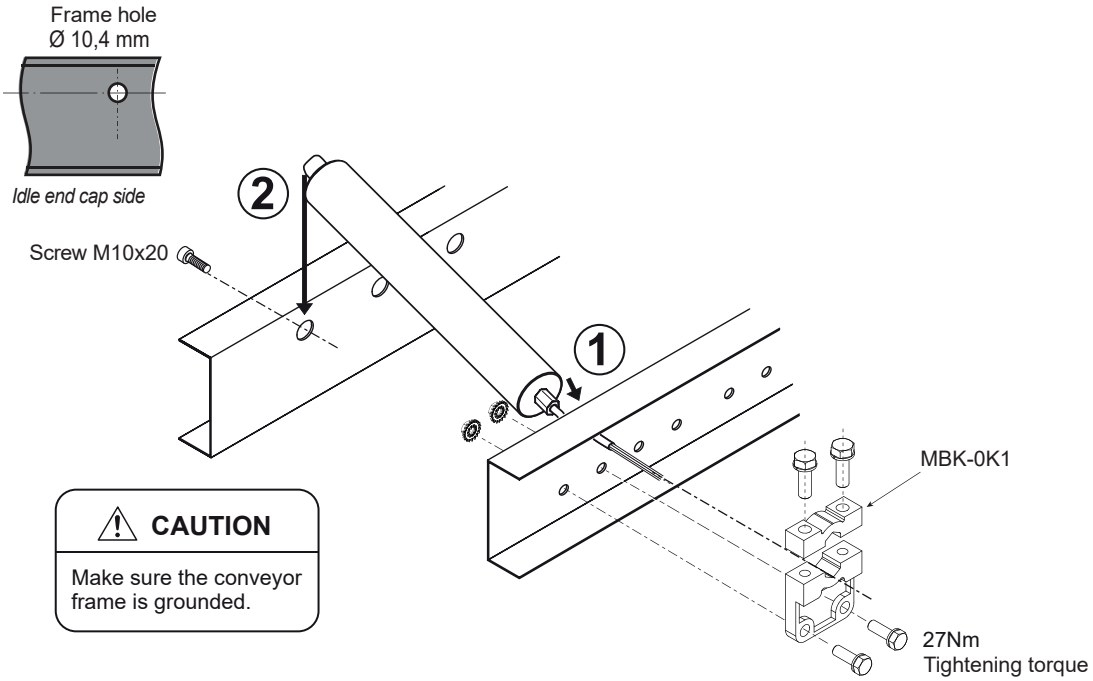


# 6. Installation

## 6-4. MDR installation with M10 shaft on free side

### MDR installation with M10 shaft on free side

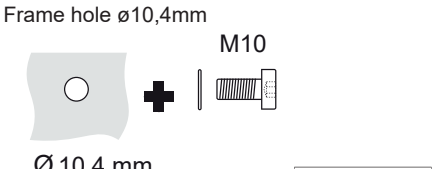



**⚠ CAUTION**

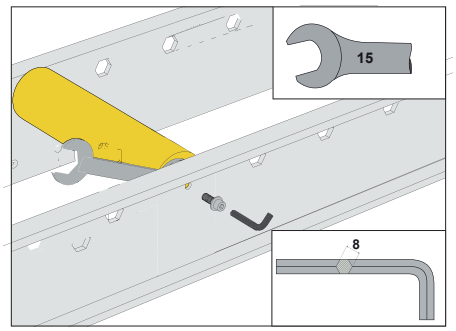
Make sure the conveyor frame is grounded.

**1** ⚠ Insert the cable-side shaft into the chassis hole.
Prevent risk of shearing or sticking the cable.

**2** Position the end cap shaft in front of the chassis hole and fix with M10 screws.




| | Screw |
|---|---|
| Reference | SP-M10-20 |




Cable diameter : 5.5mm
The minimum bend internal radius is 16.5mm.

# 7. Maintenance

# 7. Maintenance

MDR Check Points

## MDR Check Points

| No. | Check points | Recommended solutions | Details |
|---|---|---|---|
| 1 | Fixing screw of mounting bracket is loose. | Fasten the screw(s) with appropriate torque. | P.30 |
| 2 | MDR behaves abnormally (abnormal noise or motion) when it starts running. | Replace the MDR unit if necessary. | — |
| 3 | Any slip or wear in transmission belts? | Replace the belts with new ones. | P.16 |

■ Those three points need to be checked everyday without fail.

# Appendix

# Appendix

## Specifications

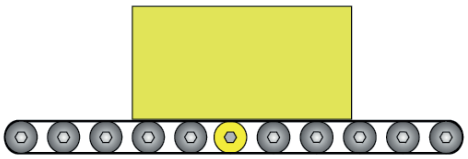
### MDR specifications

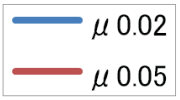
| | | | |
|---|---|---|---|
| MDR | Roller diameter | | ϕ60.5 |
| | Roller length available | | 340mm minimum up to 1500mm maximum |
| | Roller tube material | | STKM equivalent |
| | Roller tube wall thickness | | 3.2mm |
| | Shaft shape | | Hexagonal |
| | Shaft diameter | | ϕ15 |
| | Outgoing cable length | | 1000mm |
| | Brake torque (Only applicable for brake option) | 15m/min | 25.40N・m |
| | | 28m/min | 12.50N・m |
| | | 55m/min | 6.35N・m |
| Applicable driver card | Standard | | CBK-109, HBK-608, IB-E04, IB-P02 |
| | Brake | | CBK-109B□ |
| Speed | Nominal speed | | 15m/min, 28m/min, 55m/min |
| Power | Power specifications | | 24V DC±10% |
| Environment | Ambient temperature | | 0 to 40 degree C (no freeze) |
| | Ambient humidity | | ≦90% RH (no condensation) |
| | Installation | | Indoor |
| | Atmosphere | | No corrosive gas |
| | Vibration | | ≦ 0.5G |
| | Index of protection | | IP54<br>(Contact us for other classes) |
| | Pollution degree | | 2（IEC60640-1,UL840） |

# Appendix

## Transfer capacity

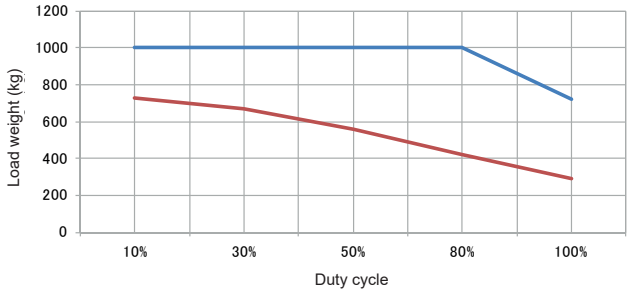
Roller conveyor



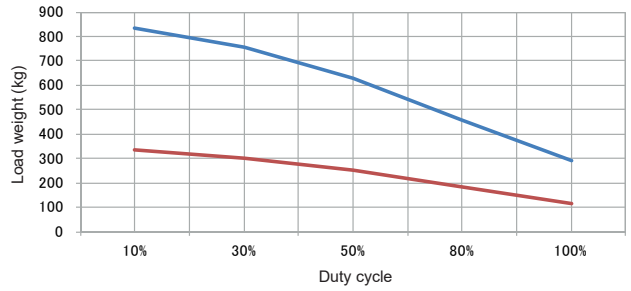



*μ : coefficient of rolling friction FYI : 10 slave rollers driven by ribbed belts with a pitch of 155mm.

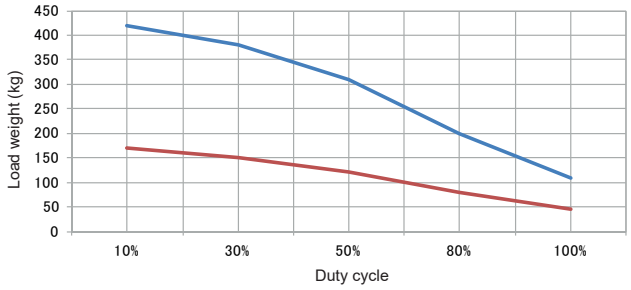
### PM605KT 15m/min




### PM605KT 28m/min



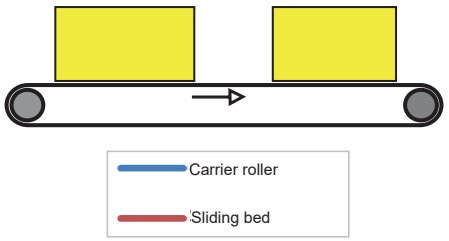

### PM605KT 55m/min

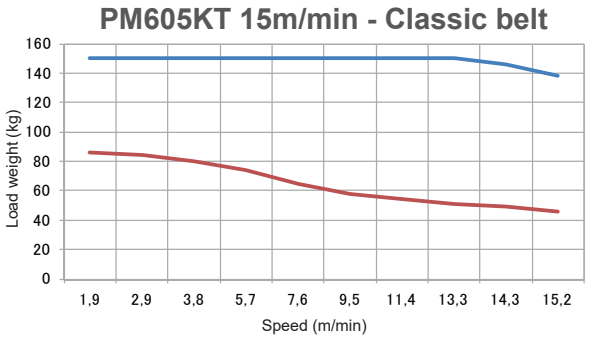



⚠ *These curves are given as a guide. Information are from KT motor without brake. Transfer capacity depends on the nature and quality of the transported load, the belt tension, the quality of the bearings, the nature of the sleeves, the ambient temperature...*

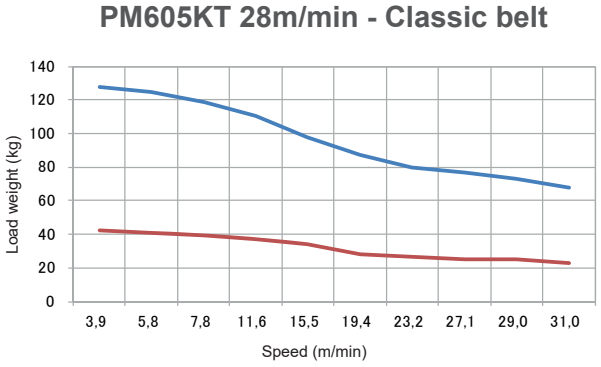
# Appendix

Belt conveyor

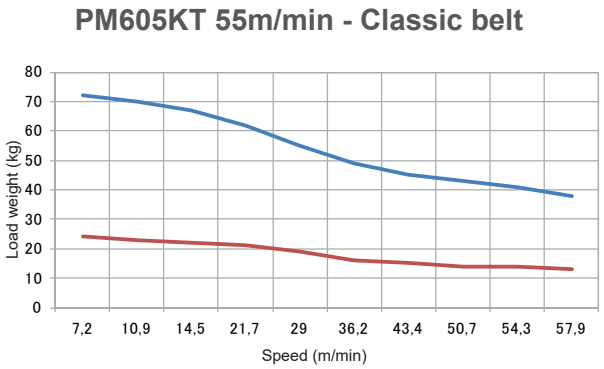



Belt conveyor dimension (lxL) : 1m x 4m




Belt conveyor dimension (lxL) : 1m x 3m




Belt conveyor dimension (lxL) : 1m x 3m

⚠ *Friction coefficient used to realise these curve was 0.25µ. Information are from KT motor without brake. These curves are given as a guide. Transfer capacity depends on the nature and quality of the transported load, the belt tension, the quality of the bearings, the nature of the sleeves, the ambient temperature...*

# Appendix



## Incorporation declaration

**Incorporation declaration**
**in accordance with the EC Machinery Directive 2006/42/EC, Annex II B**

**The manufacturer :**
ITOH DENKI CO., Ltd
1146-2 Asazuma-Cho, Kasai, Hyogo 679-0105 Japan

**Distributed in Europe by :**
ITOH DENKI Europe SAS
490 avenue des Jourdies - PAE les Jourdies - BP 323
74807 St Pierre en Faucigny Cedex - France

**hereby declares that the product series:**

**Motorized roller PM605KT/PM605KT-B**

**is an incomplete machine as defined in the EC Machinery Directive and therefore does not fully meet the requirements of this Directive. Service entry is prohibited until the whole machine/system in which it is incorporated is declared to be in compliance with the EC Machinery Directive.**

The health and safety requirements of Annex I have been applied. The special technical documents in accordance with Annex VII have been drawn up (and, if appropriate, submitted to the competent authorities).

Person authorized to compile the technical documentation :

ITOH DENKI CO., Ltd
Toshiyuki TACHIBANA
1146-2 Asazuma-Cho, Kasai, Hyogo 679-0105 Japan

ITOH DENKI EUROPE SAS
Masayuki SHIMODA
490 Avenue des Jourdies, 74800 St Pierre en Faucigny - France

**EC Directives applied :**

- Machinery Directive 2006/42/EC
- European EMC Directive 2014/30/EC
- European RoHS Directive 2011/65/EU

ITOH DENKI EUROPE SAS, undertakes to forward, following a duly motivated request from the national authorities, the relevant information concerning the quasi-machine.

Saint Pierre en Faucigny, 19 July 2021
T. AKASHI, General Director



# ITOH DENKI EUROPE S.A.S.

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