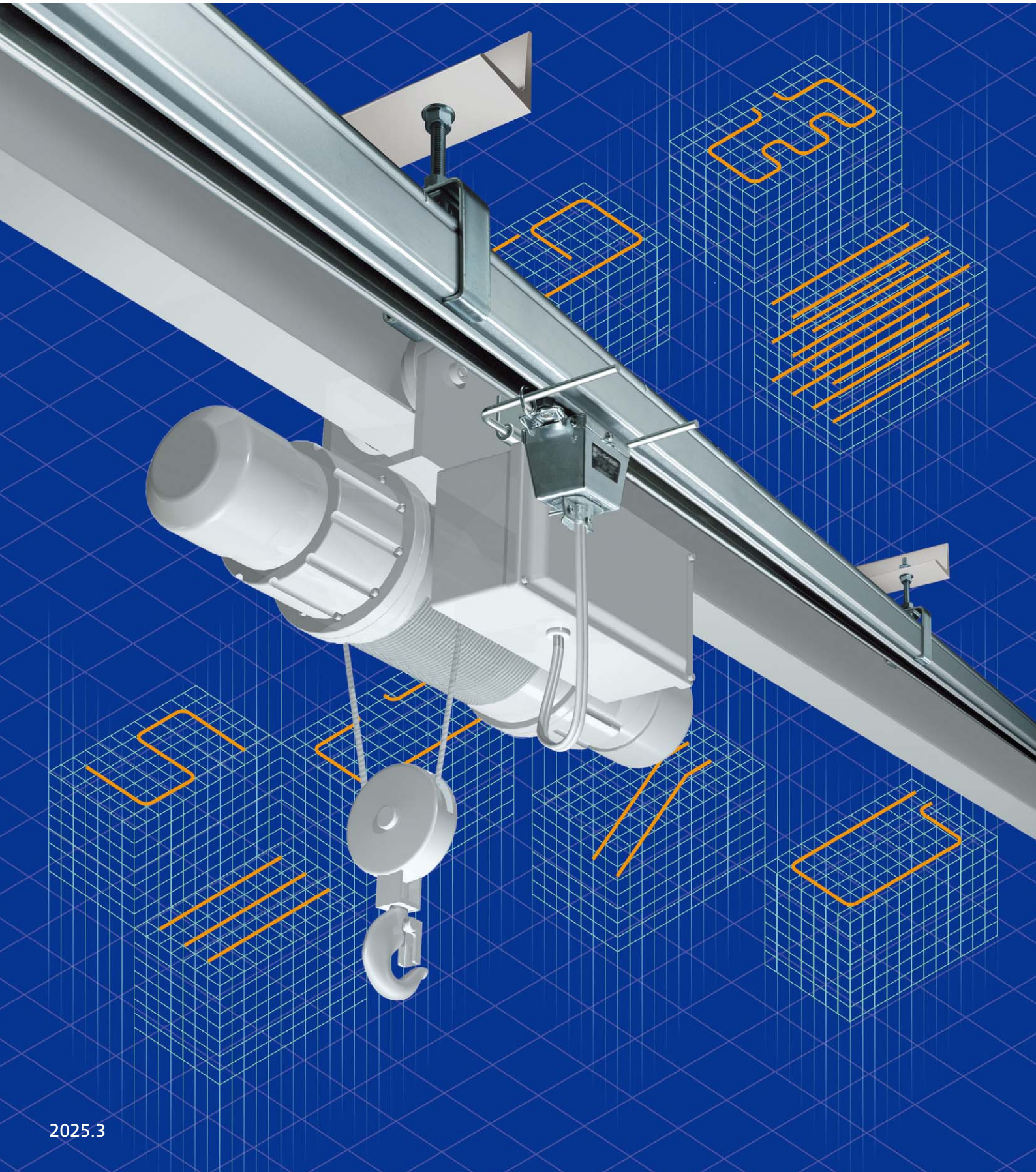
Panasonic

Trolley Ducts



2025.3

Before Use

1. Periodic maintenance of this product is necessary. Use only equipment on which periodic maintenance can be performed.

   If an abnormality (burrs※1, entrance/adhesion of foreign materials, etc.) occurs, there is a danger of fire due to short-circuiting or grounding.
   For information regarding maintenance, please refer to pp. 49 to 50.

2. Since there is a risk of disconnection or short-circuiting in the Trolley Duct depending on the installation conditions and usage environment, it should not be used for applications requiring extremely high reliability (equipment greatly affected by circuit breakers for leakage current, etc., medical equipment, applications directly affecting human life).

3. When designing a system using the Trolley Duct, include appropriate safety measures in case of an accident during use.

4. There are limitations on the environments in which the Trolley Duct can be used. Please refer to the following points about usage location when considering use of the Trolley Duct.

   1)For environments where flammable gases or dust (explosive/flammable) are generated, since sparks may occur during use of this product, the Trolley Duct cannot be used based on the Electrical Equipment Technology Standards (laws) and Internal Wiring Regulations.

   2)The Trolley Duct cannot be used in environments with ambient temperatures below -10 ℃ or above 40 ℃ , or where there is a risk of condensation forming due to sudden changes in temperature.
   There is a risk of electric shock, fire, or equipment falling in such cases.

   3)Clean rooms, food factories, etc.
   Since friction dust is generated by this product, it is not suitable for use in such environments.

   4)Environments where corrosive gases are generated, etc.
   Since equipment falling or faulty contact may occur with the Trolley Duct due to corrosion, it cannot be used in such environments.

5. It is obligatory that construction using the Trolley Duct be performed in accordance with the Electrical Equipment Technology Standards (laws) and Internal Wiring Regulations.
   If appropriate circuit protection is not provided, there is a risk of fire if short-circuiting or over-current flow occurs.

6. Since the performance of the Trolley Duct is greatly affected by installation accuracy (horizontality/verticality of main body), sufficient care should be taken regarding design and installation.

7. For the Trolley Duct, equipment design should be performed so that when electricity is supplied to a trolley in stopped status, the supplied electricity should be set to less than 1/2 of the trolley's rated current as a general target.
   Exceeding this value may result in faulty connection or fire due to the temperature increase of the contacts between the conductor and the collector.

8. Since stainless-steel conductor Trolley Ducts are special-application products, please contact your sales store, construction specialist, or Matsushita Electric Works, Ltd. for further information.

■Equation for calculating voltage drop (three-phase/three-wire case)

$E=\sqrt{3}\cdot I\cdot Z\cdot L$

I=Total rated current of loads (A)　Z=Impedance (Ω/m)

L=Line length (m)

Rated current (A)	Resistance R (mΩ/m)	Resistance X (mΩ/m)	Impedance Z (mΩ/m)
30A	2.02	0.14	2.03
60A	0.57	0.14	0.59
100A	0.44	0.16	0.47

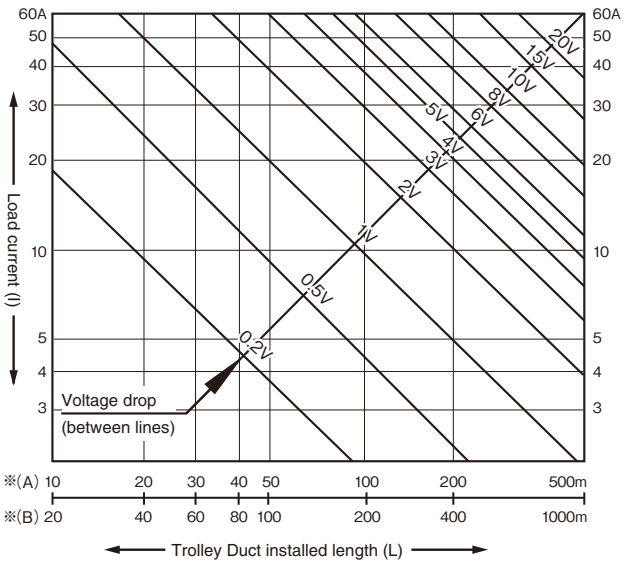
■Voltage drop quick reference chart

This catalog includes a Trolley Duct voltage drop chart for a quick reference.

・Reading the chart

For example, assume that a 60A Trolley Duct has been installed for 100m, power is fed into the end of the unit, and the total rated current of the load is 20A. Mark the 100m point on the horizontal axis, and the 20A point on the vertical axis. The point where the two lines intersect indicates the voltage drop to be about 2V.

60A Trolley Ducts



※(A) indicates lengths when electricity is supplied from one end.
(B) indicates lengths when electricity is supplied from both ends or at the center.

Maintenance schedule

The product-life is different in use conditions and the service space, however, It is possible to use it for about t 10 years by regularly maintaining and the regular service in correct construction.

Please check by the maintenance table based on this maintenance schedule.
Refer to the maintenance table for a concrete check item.

Maintenance done by the electrical work trader.

	At introduction → The 5th year → The 10th year	
Trolley Duct	・Check the presence of remarkable dirt of the surface of the conductor. (Once every 3 to 6 months) → Clean it with the cotton waste etc. ・Check the Tro-Reel unit doesn't become it in a zigzag line. (Once every 3 to 6 months) → Correct the position of the hanger.	Product exchange recommendation.
Feed-in Box Center Feed-in Box	・Check whether there is loosening the screws of conductor splices ?(Once every 3 to 6 months) → Retighten.	
Hanger	・Check whether there is loosening of the mounting nut.(Once every 3 to 6 months) → Retighten.	
Trolley	・Check whether there is loosening of the terminal screw.(Once every 3 to 6 months) → Retighten. ・Check whether wear has reached the replacement line. (Once every 1 to 3 months) → Exchange the collector, when worn out to the replacement line. ・Check if Running wheels rotate smoothly.(Once every 1 to 3 months) → Exchange products.	

⚠Safety Precautions

■Precautions on installation

Installation of the Trolley Duct must be performed only by a licensed electrician. To prevent injury or accidents, always pay attention to the following points.

⚠Warning

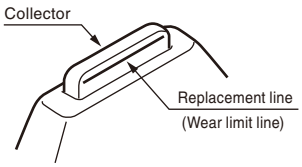
Prohibited	●Do not modify the Trolley Duct in any way. ～Any modification may cause electric shock, fire, or damage due to equipment falling.～	Compulsory	●The Trolley Duct should be installed in accordance with the Electrical Equipment Technology Standards (laws) and Internal Wiring Regulations. The proper overcurrent breaker should be used on the primary side of the power supply. For the Trolley Duct power supply, select a power supply with the proper size for the rated current and equipped with overcurrent breakers to protect the junction circuits. For details, refer to the Internal Wiring Regulations. ～Failure to do so may cause electric shock, fire, or damage due to equipment falling.～ ●Installation must be carried out according to the "Installation Manual" included with the product. ～Improper installation may result in electric shock, fire, or damage due to equipment falling.～

⚠Caution

Prohibited	●Do not use the Trolley Duct in areas where the duct interior may be exposed to dust, steam, gases, oil fumes, etc. ～Electric shock or fire may occur.～ ●Do not use the Trolley Duct in environments with ambient temperatures below -10˚C or above 40˚C, or where condensation may form due to extreme temperature fluctuations. ～Electric shock, fire, or damage due to equipment falling may occur.～	Compulsory	●Traveling speed must be 120m/min. or less (40m/min. or less in pickup duct or point duct sections). However, further restrictions may be necessary depending on the load and voltage types. For details, please contact Matsushita Electric Works, Ltd. ～Sparking may occur, causing fire, poor contact, derailing of a trolley, etc.～ ●In areas where the Trolley Duct is subject to excessive vibration such as crane girders or turntables or in areas where pickup ducts or point ducts are used, be sure to use sideway traverse hangers. ～Otherwise, damage due to equipment falling, poor contact, derailing of a trolley, etc. may occur.～ ●Be sure to perform a pre-use test run of the Trolley Duct. ～Otherwise, electric shock, fire, or damage due to falling equipment may occur.～ ●Use the Trolley Duct only within the specified rating and load capacity ranges. ～Exceeding the specified ranges may cause burning or fire.～
Compulsory	●For outdoor installations, make sure to use an outdoor-type Trolley Duct. ～Otherwise, electric shock or fire may occur.～ ●Always position the opening of the Trolley Duct facing downward. ～If installed with the opening facing upward or sideways, sparking may occur, causing fire, poor contact, derailing of a trolley, etc.～		

■Precautions on use

⚠Warning

Prohibited	●Do not modify the Trolley Duct in any way. ～Any modifications may cause electric shock, fire, or damage due to equipment falling.～ ●Do not use in an atmosphere containing flammable gas or dust (explosive/flammable). ～Explosion may result.～	Compulsory	●Always switch off power before performing maintenance. ～Failure to do so may cause electric shock.～ ●Collectors should be replaced before wear reaches the replacement line. ～Otherwise, sparking may occur, causing fire, poor contact, or derailing of the trolley, etc.～ 
Compulsory	●If any abnormalities occur, turn off power immediately and contact a licensed electrician for inspection and repair. ～Otherwise, electric shock, fire, or damage due to equipment falling may occur. At this time, be sure to provide the electrician with the "Installation Manual".～ ●Trolley Duct parts replacement and maintenance should be performed only by a licensed electrician.		

⚠Caution

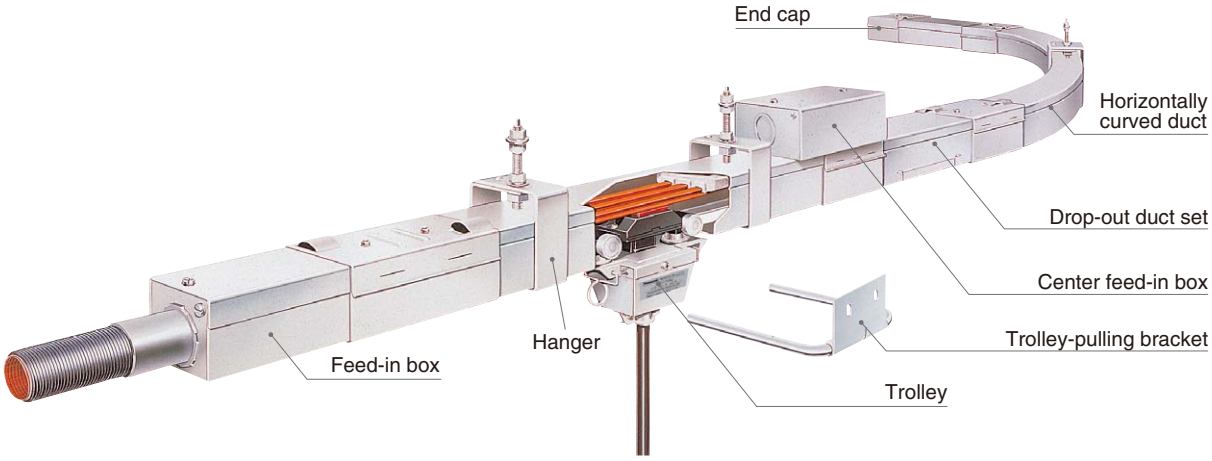
Prohibited	●Do not use the Trolley Duct in areas where the duct interior may be exposed to dust, steam, gases, oil fumes, etc. ～Electric shock or fire may occur.～ ●Do not use the Trolley Duct in environments with ambient temperatures below -10˚C or above 40˚C, or where condensation may form due to extreme temperature fluctuations. ～Electric shock, fire, or damage due to equipment falling may occur.～ ●The collectors use a dry lubrication system. Do not apply any other lubricants to the collectors or to the Trolley Duct's conductor surface. ～Doing so may cause poor contact.～	Compulsory	●Traveling speed must be 120m/min. or less (40m/min. or less in pickup duct or point duct sections). However, further restrictions may be necessary depending on the load and voltage types. For details, please contact Matsushita Electric Works, Ltd. ～Sparking may occur, causing fire, poor contact, derailing of a trolley, etc.～ ●Be sure to perform periodic maintenance. Please refer to pp. 49 to 50. ～Otherwise, electric shock, fire, or damage due to equipment falling may occur.～ ●If the Trolley Duct is not used for a long period of time, the conductor surfaces may become oxidized, resulting in poor contact. Before using, clean the conductors and perform maintenance. ～Otherwise, electric shock or fire may occur.～

A wide range of Panasonic wiring systems help improve manufacturing line flexibility.

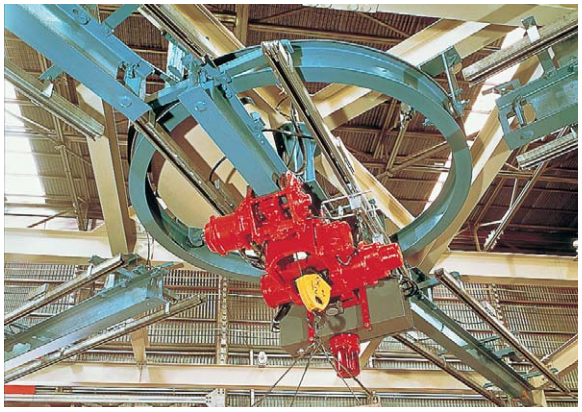
As product varieties increase, more and more parts are used, and small-lot production becomes more popular, the need for greater flexibility in production processes is on rise. Flexible wiring systems can be a perfect answer to satisfy this need. The Factory Flexible Wiring Systems (FFS) from Panasonic is an ideal factory wiring system that is versatile enough to fit any scale of factory and any degree of flexibility. By combining three different systems – a power system for moving loads, power systems for stationary loads, and data transmission systems, your production lines can be equipped to be as flexible as possible.

<Features>

compact	A compact duct type that can be installed in less space than an insulated trolley.
Stable running possible	The trolley for power collection is attached to the duct,allowing for stable operation without the worry of derailment.
A highly reliable system can be built	With a wide range of components,we can build reliable systems even for complex lines involving curved construction, point switching, and circuit segmentation.



<Installation Examples>



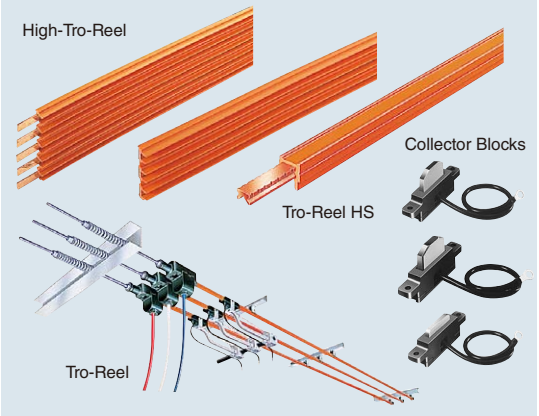
<Application of the Transfer Circuit System and Guide to Conditions of Use>

	Character of use	Tro-Reel HS <Non-Tension Type>	High-Tro-Reel <Non-Tension Type>	Tro-Reel	High-Tro-Reel <Tension Type>	Trolley Wire <Non-Tension Type>	Trolley Duct	Collector block
Construction Method	Apply tension to a general electrical circuit			●	●			
	Tension cannot be applied to ordinary electrical circuits	●	●			●	●	
	Multiple wiring required in a small installation space	●	●		●		●	●
	Install the opening horizontally	●	●	●	●	●		
Line Form	long line	●	●	●	●	●	●	●
	There are many curved parts	●	●	●		●	●	
	There are points and transfers	●	●	●		●	●	
	On-site adjustment required	●	●	●	●	●		●
Circuit Structure	Control circuit required (insulated section/conductor cut)	●	●	●		●	●	
	Sending power and control signals simultaneously	●	●				●	
	Running speed is 300m/min or less	●※1		●※1	●	●※1		
	Running speed is 200m/min or less		●※1					
	Travel speed is 120m/min or less						●※2	
Construction Location	For outdoor use			●		● (Excluding 90A)	● (For outdoor type use)	
	Bad environment (dust, humidity)			●		● (Excluding 90A)		
	Area with a lot of oil			●		●		

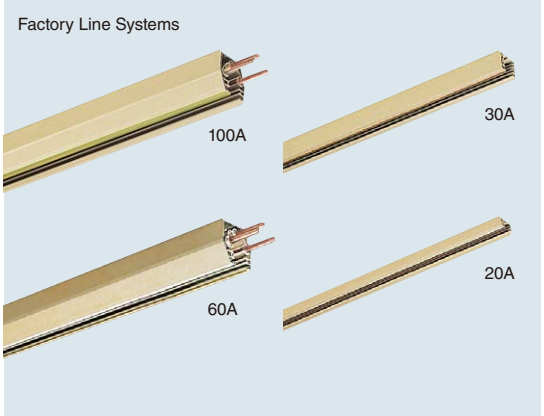
※1 Guide cap mounting section: 60m/min or less
※2 Pickup duct/point duct mounting section, 40m/min or less when using roller type trolley

<Related Products>

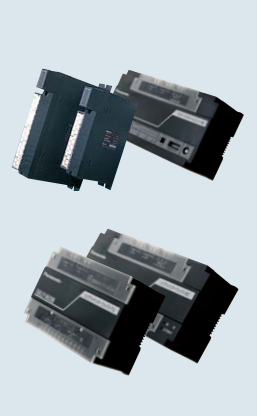
Insulated Trolleys



Duct Systems

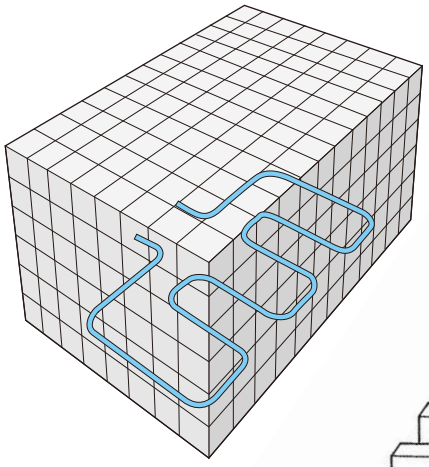


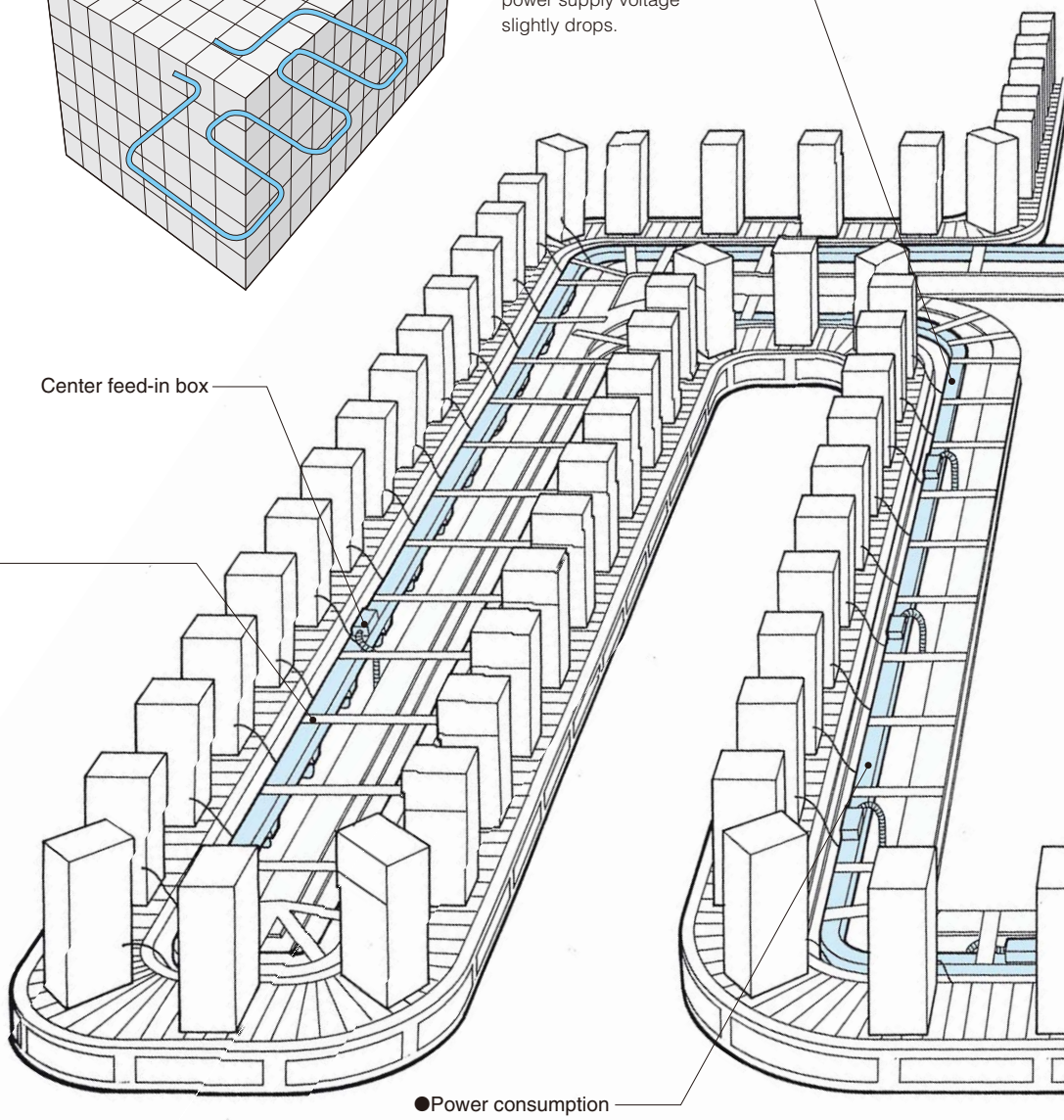
Trolley-Mation Systems



Aging and product inspection circuits

The Trolley Duct is used for aging and product inspection circuits that come after assembly processes at electrical appliances manufacturing facilities, contributing to line automation and labor-savings. Here is an example of Trolley Duct use for the aging circuit on a home-use refrigerator manufacturing line.
Outline of circuit separation depending on the type of inspection is also discussed for a reference.



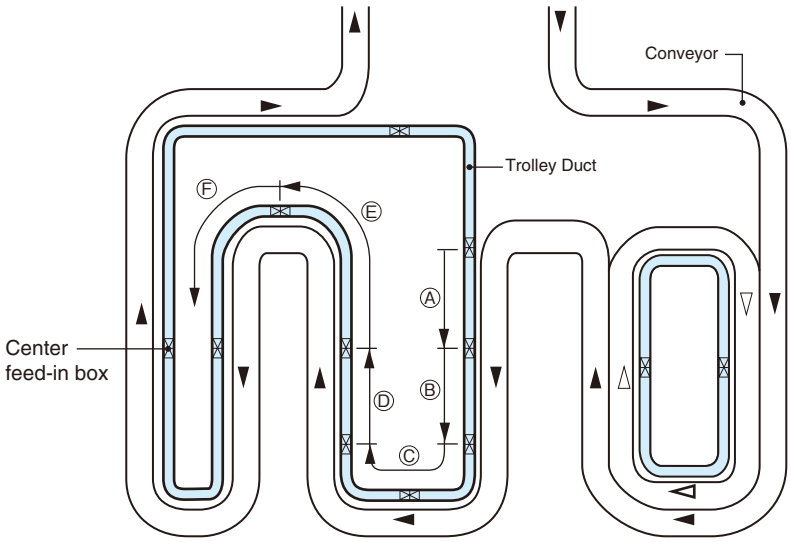


■Ducts and trolleys used in this example

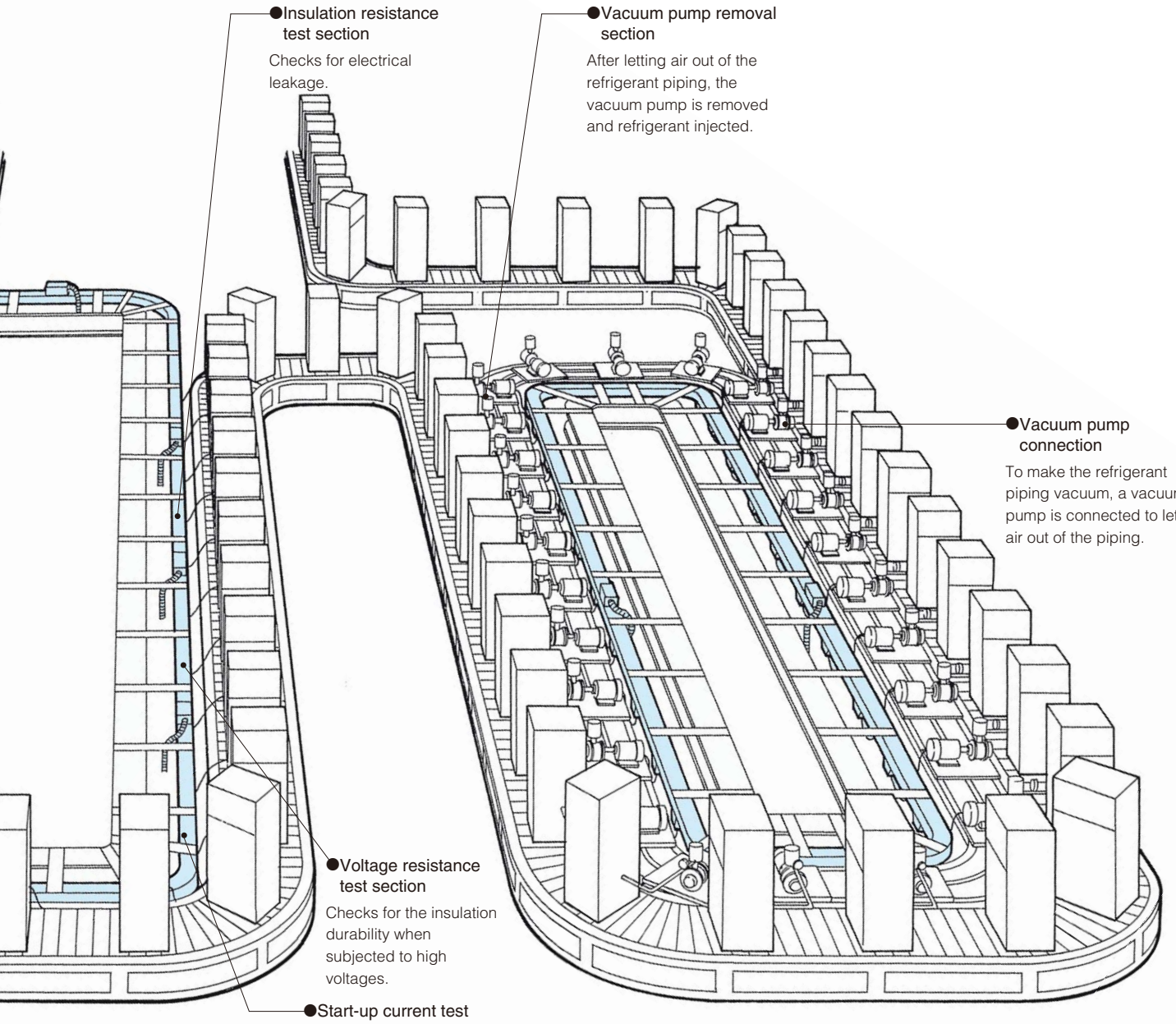
	Pages
Straight line duct	16.21
Horizontally curved duct	17.21
Drop-out duct set	16.21
Circuit-separating duct	30.34
Micro-rod attached trolley	31.35

■Separating a drive power circuit for arc prevention

Inspection circuits frequently generate arcs due to potential differences between different test sections or direct transfer of loads to the next section. To prevent this, an arc-extinguishing circuit using a circuit-separating duct that partially consists of non-conductive sections must be constructed. For different methods of cutting conductors and their applications, consult Matsushita Electric Works.

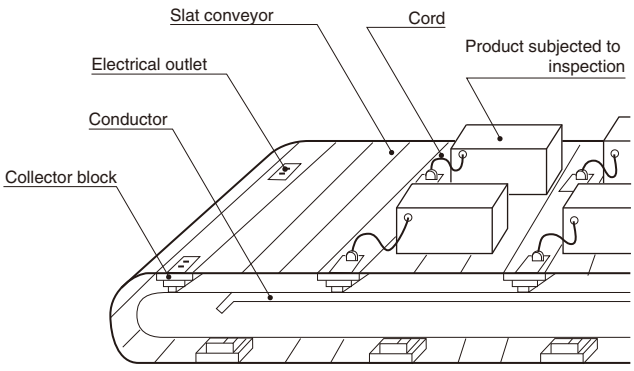


Section	Test
A	Insulation resistance test
B	Voltage resistance test
C	Start-up current test
D	Power consumption test
E	Low-voltage test
F	Continuous power feed test



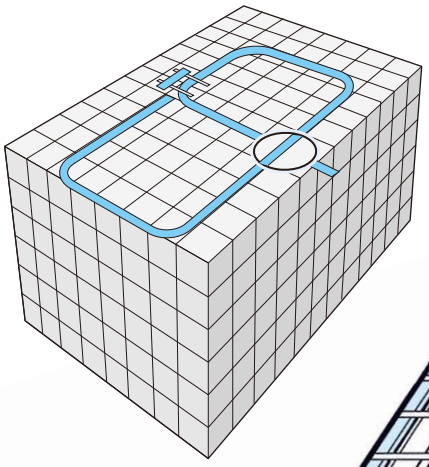
■Collector blocks - trolley-applied products

On lines where electrical appliances undergo various tests on slat conveyors (as shown below), collector blocks (a partially modified version of trolleys) are used to supply power for inspection circuits.



Lines equipped with switching devices

In addition to delivering power to moving equipment, the Trolley Duct greatly contributes to automating and saving labor for various manufacturing lines. Here is an example of effectively using the Trolley Duct on automated automobile assembly lines including turn tables and traversers.



■Ducts and trolleys used in this example

	Pages
Straight line duct	16.21
Horizontally curved duct	17.21
Drop-out duct	16.21
Point duct	29.33
Circuit-separating duct	30.34
Point-use trolley	31.35
Micro-rod attached trolley	31.35

●Passenger car body loading section

Loads passenger car bodies conveyed via a conveyor line onto hoists in order to convey them to their chassis conveyance line.

●Light van body loading section

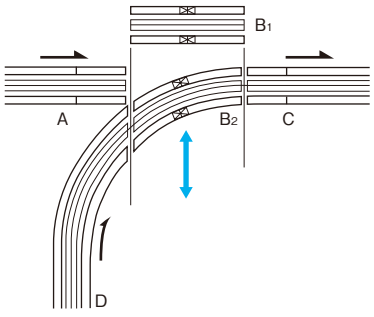
Loads light van bodies conveyed via a conveyor line onto hoists in order to convey them to their chassis conveyance line.

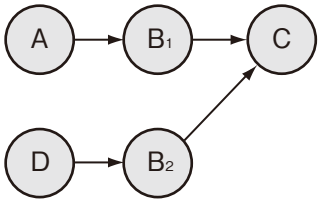
●Line switching device (turntable) control section

Controls the turntable used to change the flow of empty hoists. Hoists needing repair are put out of the line and spare hoists put on the lines instead.

■Line-switching device [1] - Traversers

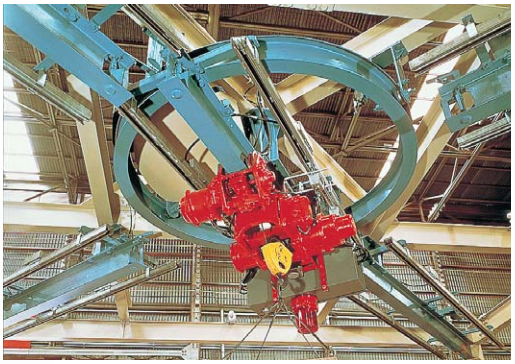
When changing the vehicle body from a passenger car to a light van, the Trolley Duct at a switching point is moved toward the left of the line travel direction, and the center and outer lines join as shown. Traversers are used for these parallel transfers between lines.





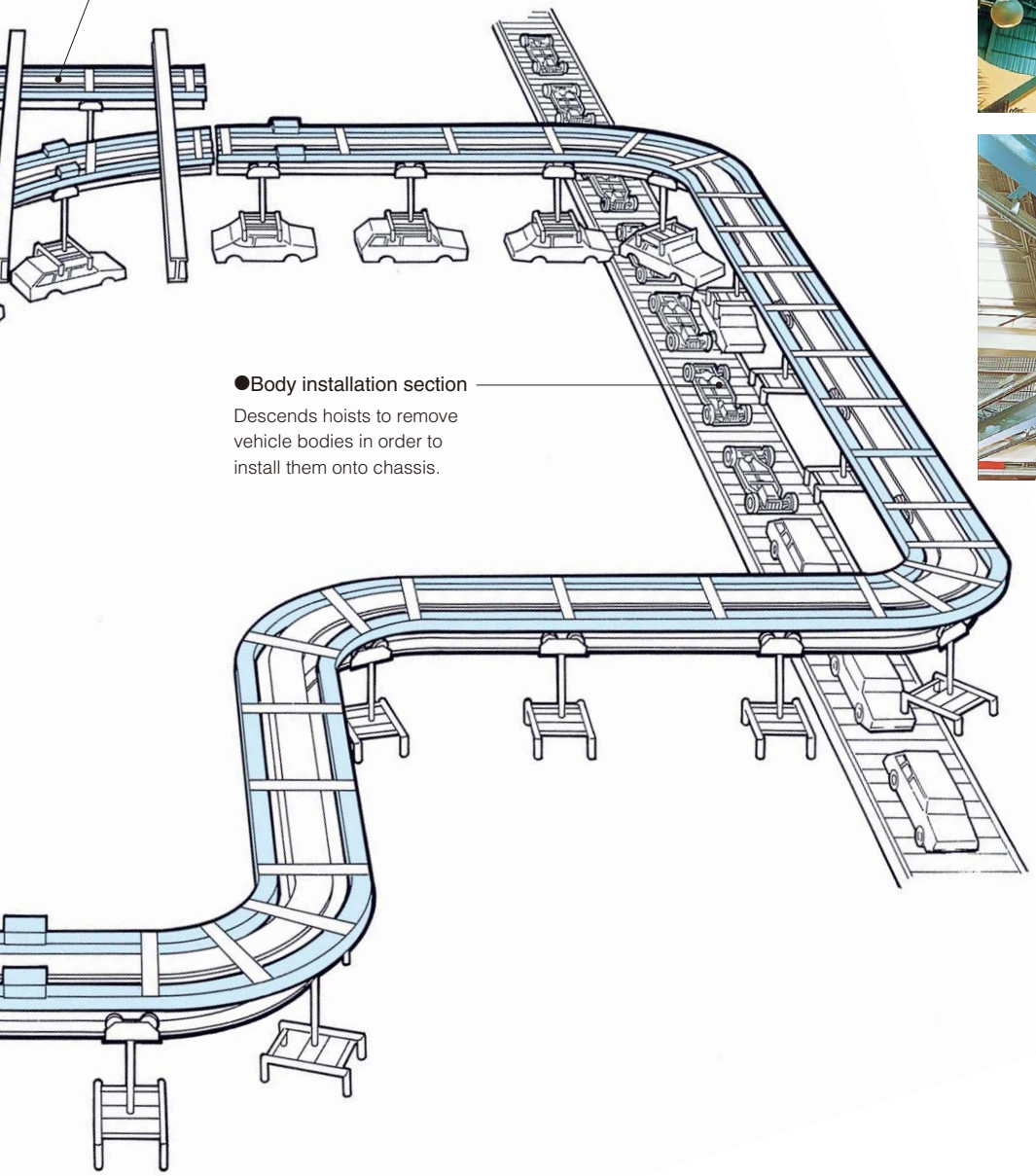
●Line switching device (traverser) control section

Controls the traverser for parallel line transfer when changing vehicle bodies to be installed on chassis from passenger cars to light vans.



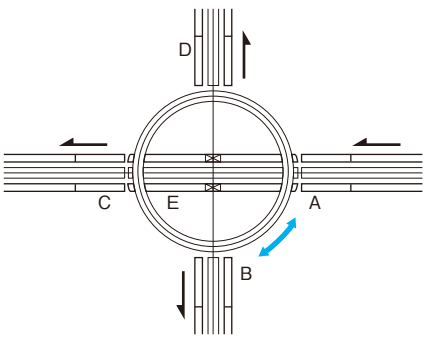
●Body installation section

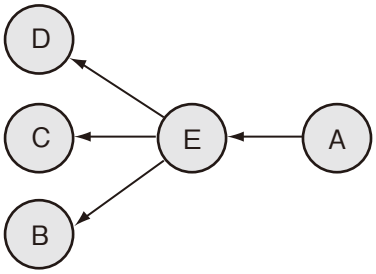
Descends hoists to remove vehicle bodies in order to install them onto chassis.



■Line-switching device [2] - Turntables

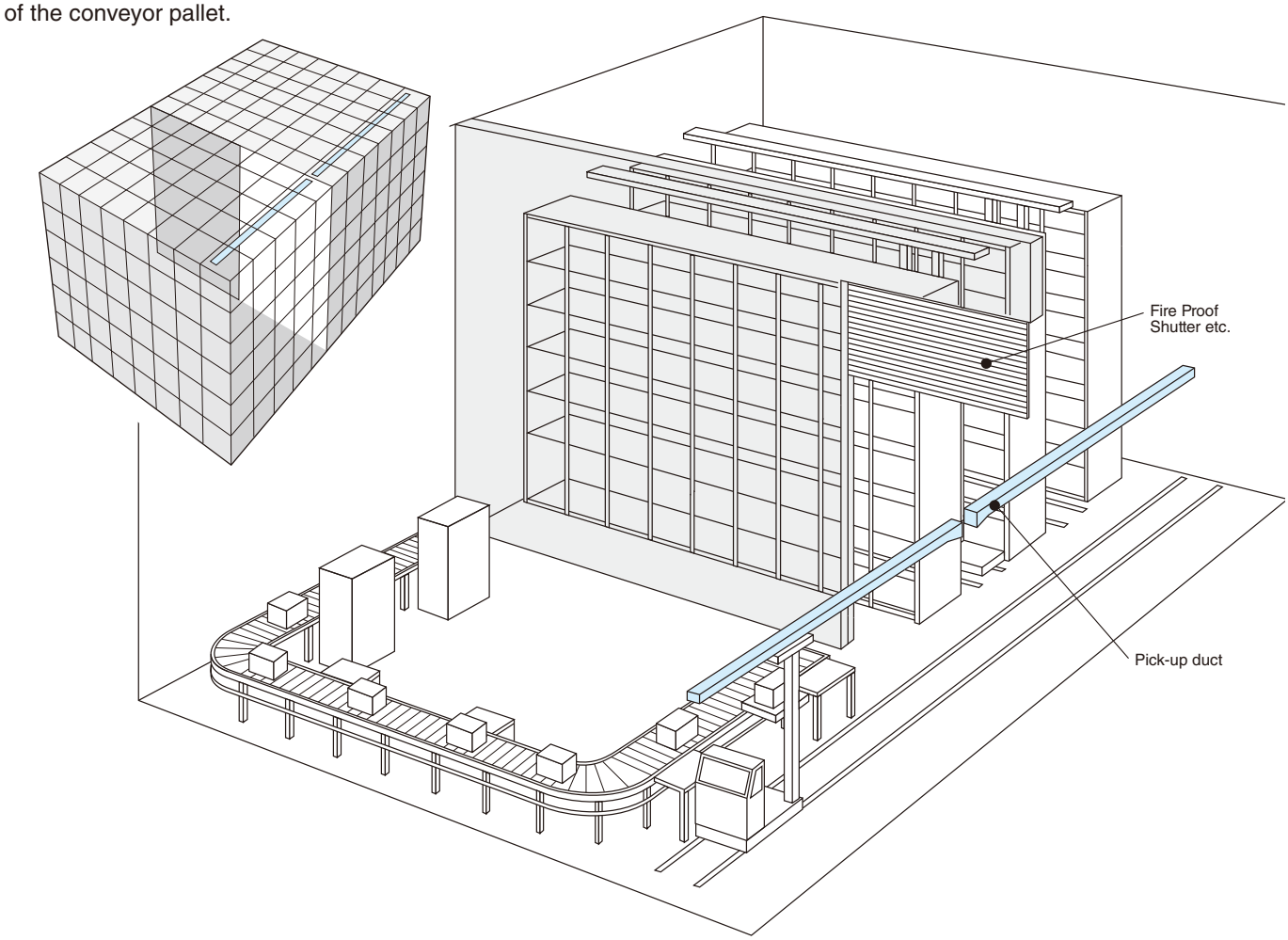
After installing vehicle bodies onto chassis, the lines are switched using a turntable depending on whether empty hoists are transferred to the passenger car line or light van line. If there are hoists causing problems, they are sent out to spare lines (bottom section of the drawing below) for repair, and a replacement hoist is placed on the line.

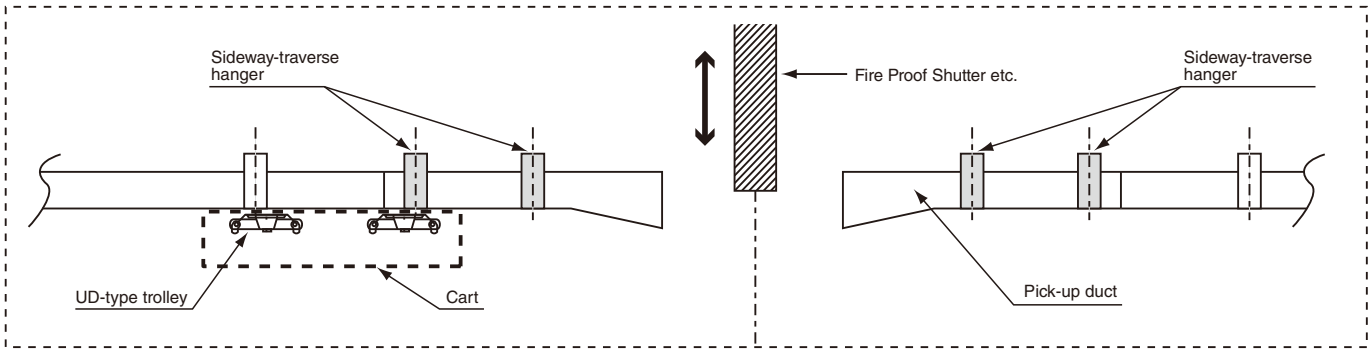




When the Fire Proof Shutter etc. are included on the Conveyor Line

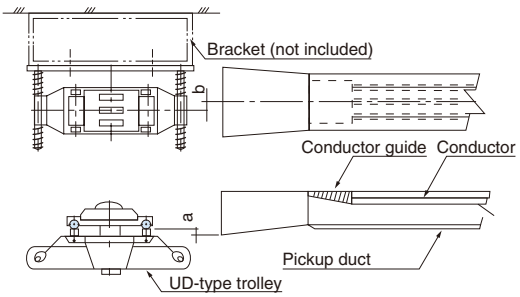
The space can be installed in the Conveyor Line by using the pick-up duct and UD-type Trolley when the Fire Proof Shutter etc. are set up on the line of the conveyor pallet.





● Pick-up duct and UD-type trolley

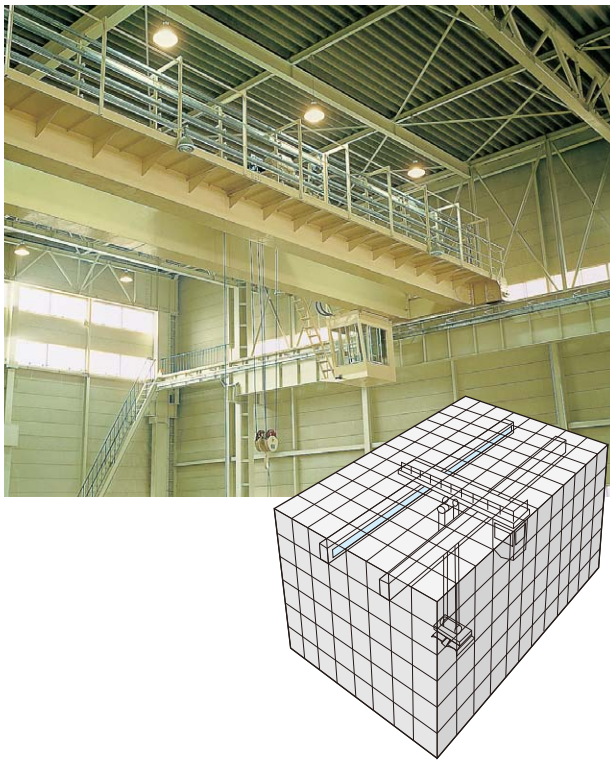
A pick-up duct is used in areas such as the pallet entry section of an automated warehouse in order to facilitate smooth entry of the trolley from a section with no duct to the duct on the lines which partially consist of the Trolley Duct.
Along with the pickup ducts, use of UD-type trolleys (also tailored to this application) is recommended.
For details regarding the pick-up ducts and UD-type trolleys, refer to the
"Trolley Duct Product Guide" section
(page 27-33).



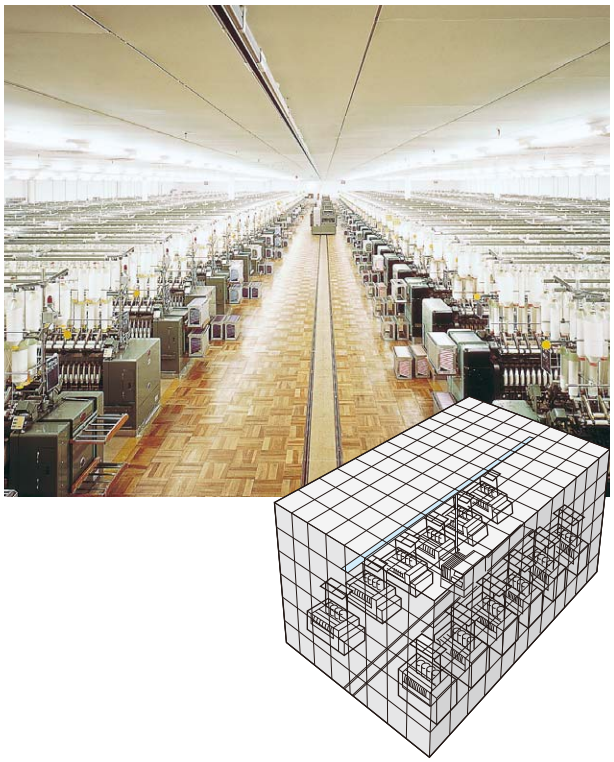
Use a sideway traverse hanger at the section where a pickup duct is installed in order to minimize influences of vibration and swinging. For details regarding sideway traverse hangers, see page 43 and the “Trolley Duct Product Guide” section (page 16, 20, 24 and 26).

Other applications

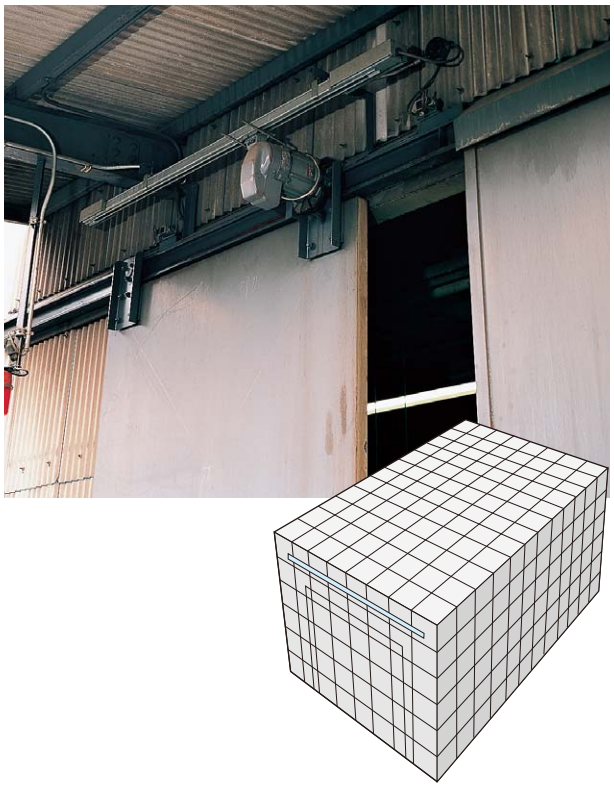
■Cranes with multiple control lines



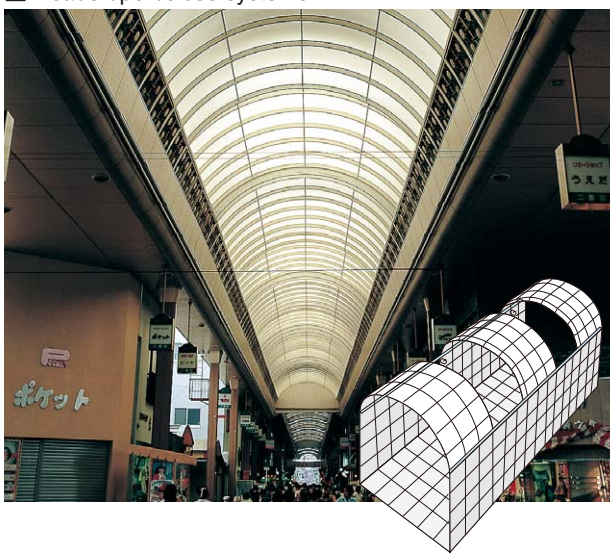
■Electric pallets



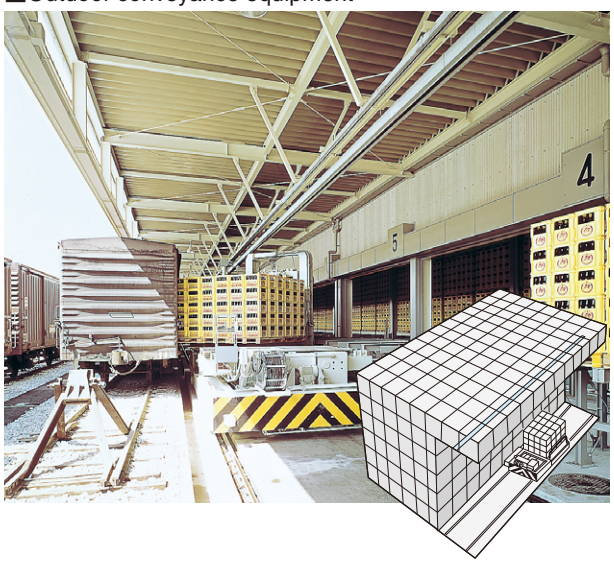
■Automatic doors



■Arcade open/close systems



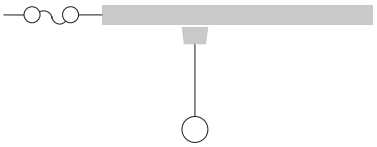
■Outdoor conveyance equipment



Q How can I determine the Trolley Duct rated current from the load capacity?

A The calculation of applicable rated current (applicable rating) is discussed below with examples classified into three loads: 1) a single load, 2) two or more loads, and 3) two or more loads, at least one of which is a motor.

1.A single load



(1) A motor (calculated at a working voltage of 200V).

If the rated current of the load is less than 50A:

Applicable rating is ≥ 1.25 times the rated current of the load.

If the rated current of the load is more than 50A:

Applicable rating is ≥ 1.1 times the rated current of the load.

(2) Other loads (except a welder):

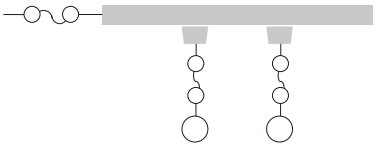
Applicable rating is ≥ 1.0 times the rated current of the load.

Example calculation

- One 5.5kW motor is used (load current of 26A).
- Total current requirements = 26A x 1.25 = 32.5A

Trolley Duct	Trolley
60A	40A

2.Two or more loads



(1) Motors

If the rated current of the load is less than 50A: Applicable rating is ≥ 1.25 times the total rated current of the motors.

If the rated current of the load is more than 50A: Applicable rating is ≥ 1.1 times the total rated current of the motors.

(2) Other loads (except a welder):

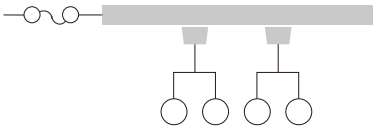
Applicable rating is ≥ 1.0 times the total rated current of the whole load.

Example calculation

- Fifteen 0.75 kW motors are used (load current of 4.7A).
- Total current requirements = 4.7A x 15 x 1.1 = 77.55A

Trolley Duct	Trolley
100A	40A

3.Two or more loads, at least one of which is a motor.



(1) If the total rated current of the motor(s) is less than that of the other loads: Applicable rating is ≥ 1 times the total rated current of the whole load.

(2) When the total rated current of the motor(s) is more than that of other loads:

- If the total rated current of the motor(s) is less than 50A: Applicable rating is ≥ (1.25 times the total rated current of the motor(s)) + (1 times the total rated current of other loads).
- If the total rated current of the motor(s) is more than 50A: Applicable rating is ≥ (1.1 times the total rated current of the motor(s)) + (1 times the total rated current of other loads).

Example calculation

(1) When the total rated current of the motor(s) is less than that of other loads:

- Three 0.75kW motors (load current of 4.7A) and three 1.7kW heaters (load current of 4.9A) are used.
- Total current requirements = (4.7A x 3) + (4.9A x 3) = 28.8A

Trolley Duct	Trolley
30A	20A

(2) When the total rated current of the motor(s) is more than that of other loads:

- Two 3.7kW motors (load current of 17A) and two 2kW/3ϕ heaters (load current of 5.77A) are used.
- Total current requirements = (17A x 2 x1.25) + (5.77A x 2) = 54.04A

Trolley Duct	Trolley
60A	40A

■ Notes regarding calculation

(1) Determine the motor load current through calculations based on the nameplate, catalogue, indoor wiring regulations, and other pertinent regulations. For a general estimate, assume 4A per 1 kW at 200V.

(2) If the demand factor, power factor and other relevant values are known, use them to correct the calculation for the load current. Also, try to select the most cost-effective setup, taking such points as additional power installation into consideration.

(3) For an overhead traveling crane, you may use the following equation for calculation.

$$\text{Total load current} = \text{Main hoisting motor current} + \frac{\text{Auxiliary hoisting motor current} + \text{Traveling motor current} + \text{Traversing motor current}}{2}$$

■ Applicable Trolley Ducts according to electric hoist crane rating (reference values)

		0.5 ton	1 ton	2 ton	3 ton	5 ton	10 ton
Electrical hoist rating (200V)	Hoisting motor	6A	9A	15A	21A	30A	45A
	Traveling motor	1.5A	1.5A	3.0A	4.5A	6.5A	9.0A
Trolley rating		20A	20A	20A	20A+20A	40A	40A+40A
Trolley Duct rating		30A	30A	30A	30A	60A	60A
Overhead traveling hoist crane (200V)	Hoisting motor	6A	9A	15A	21A	30A	45A
	Traveling motor	1.5A	1.5A	3.0A	4.5A	6.0A	9.0A
	Traversing motor	6.4A	6.4A	6.4A	16.0A	16.0A	22.0A
Trolley rating	Traversing	20A	20A	40A	40A	80A	80A
	Traveling	20A	20A	40A	80A	80A	80A
Trolley Duct rating	Traversing	30A	30A	30A	60A	100A	100A
	Traveling	30A	30A	60A	100A	100A	100A

Note: The Trolley Duct rating on the above table has been determined for a single load. If there are other non-motor loads such as lighting and heating used with the overhead traveling hoist crane, the other load current should also be taken into consideration.

Q Do voltage drops in the Trolley Duct affect equipment in any way?

A When the installation length is very long, voltage drops affect the motor and other loads positioned far from the power supply. If the voltage drop is too extreme (according to calculation of drop at the farthest point from the power supply when the total load current is applied), the rated current on the wiring should be raised by one step, or the power supply points should be changed or increased in number. The voltage drop in between the distribution board and the power supply points should also be taken into account.

■ Voltage drop calculation equation (three-phase, three-wire)

E= $\sqrt{3}$ · I · Z · L, where "I" is total rated load current (A), "Z" is impedance (Ω/m), and "L" is line length (m).

Rated current	Resistance R (mΩ/m)	Resistance X (mΩ/m)	Impedance Z (mΩ/m)
30A	2.02	0.14	2.03
60A	0.57	0.14	0.59
100A	0.44	0.16	0.47

See page 48 regarding impedance.

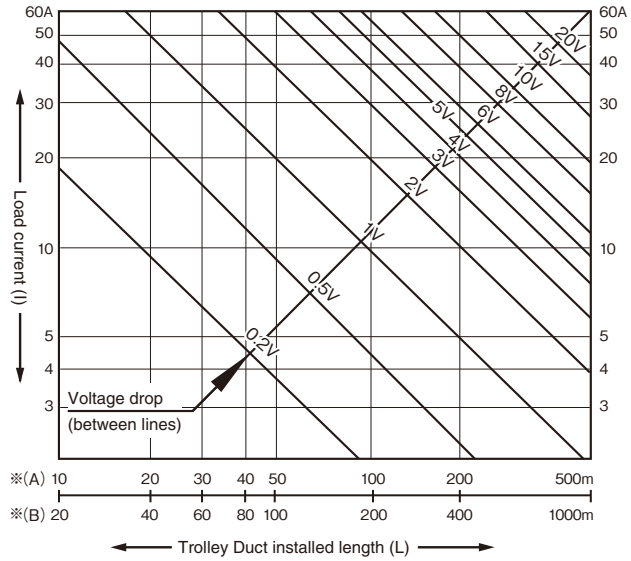
■ Voltage drop quick reference chart

This catalog includes a Trolley Duct voltage drop chart for a quick reference.

・Reading the chart

For example, assume that a 60A Trolley Duct has been installed for 100m, power is fed into the end of the unit, and the total rated current of the load is 20A. Mark the 100m point on the horizontal axis, and the 20A point on the vertical axis. The point where the two lines intersect indicates the voltage drop to be about 2V.

60A Trolley Ducts



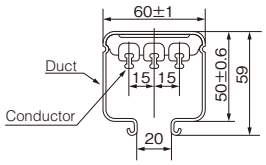
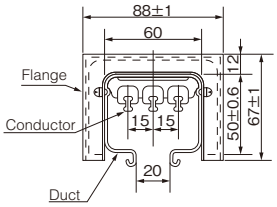
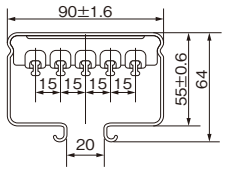
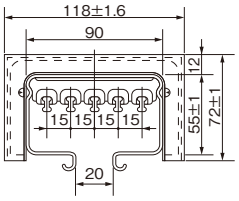
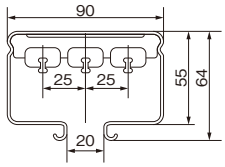
※(A) indicates lengths when electricity is supplied from one end.
(B) indicates lengths when electricity is supplied from both ends or at the center.

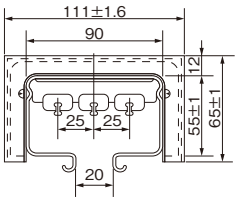
Selection Guidelines

Unit : mm

■ Trolley Duct types and ratings

Trolley Duct is available in various types ranging from 30A to 400A. 600A to 3,000A Trolley Ducts are custom-made.

<table>
<tr><th rowspan="2">Rated current</th><th rowspan="2">Rated voltage</th><th rowspan="2">No.of poles</th><th colspan="2">Cross-sectional view</th><th rowspan="2">Compatible trolleys</th><th rowspan="2">Remarks</th></tr>
<tr><th>Standard type</th><th>Outdoor type</th></tr>
<tr><td rowspan="5">30A
60A</td><td rowspan="5">300V</td><td>2P</td><td rowspan="2"> 
</td><td rowspan="2"> 
</td><td>20A
40A</td><td rowspan="5">●Steel ducts are high-precision roll-formed products.
●The surface is galvanized with chromate treatment. (The outdoor type has an additional clear lacquer layer.)
●2P and 4P types have no center conductor.
●Horizontally and vertically curved ducts are also available.</td></tr>
<tr><td>3P</td><td>20A
40A</td></tr>
<tr><td></td><td>2P type is custom-made.</td><td></td></tr>
<tr><td>4P</td><td rowspan="2"> 
</td><td rowspan="2"> 
</td><td>20A
40A</td></tr>
<tr><td>5P</td><td>20A
40A</td></tr>
<tr><td></td><td>4P type is custom-made.</td><td></td></tr>
<tr><td>100A</td><td>600V</td><td>3P</td><td> 

2P type is custom-made.</td><td> 

2P type is custom-made.</td><td>40A
80A</td><td>●Steel ducts are high-precision roll-formed products.
●The surface is galvanized with chromate treatment. (The outdoor type has an additional clear lacquer layer.)
●2P type has no center conductor.
●Horizontally and vertically curved ducts are also available.</td></tr>
</table>

Note:
"Custom-made product" on the above table denotes that products are custom-designed and manufactured according to customer specifications.
For lateral motion, be sure to use horizontal-traverse hangers (double hangers).

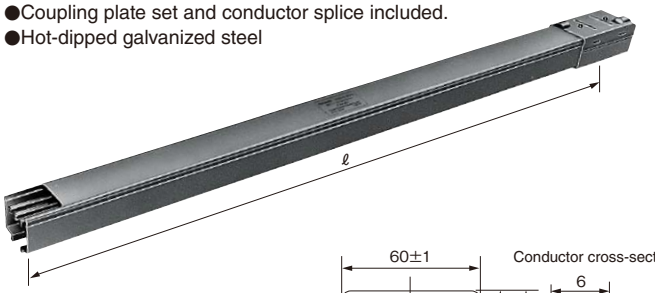
Standard-type Trolley Ducts <30A・60A 300V AC>

Unit : mm

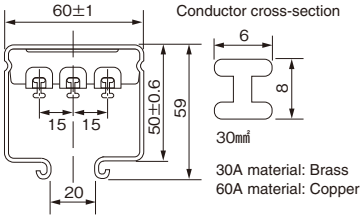
Note: Refer to the "Trolley Duct Installation" section (page 36 - 43) for product combinations and usage.

Straight-line ducts

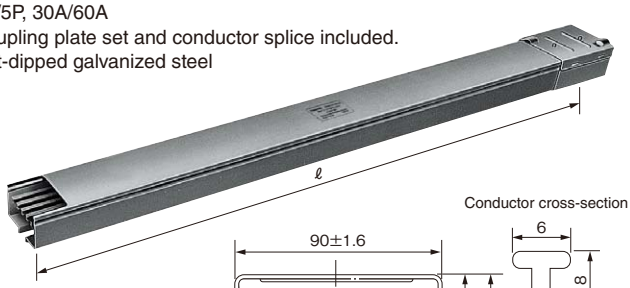
●2P/3P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



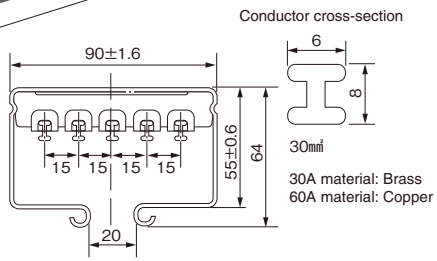
(Photo shows a 3P, 30A type.)
2P type has no center conductor & conductor splice.



●4P/5P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



(Photo shows a 5P, 30A type.)
4P type has no center conductor & conductor splice.



30A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6123	602	2P30A	3,000	8.1
DH6122	〃	〃	2,000	5.4
DH6121	〃	〃	1,000	2.7
DH6133	〃	3P30A	3,000	9.0
DH6132	〃	〃	2,000	6.0
DH6131	〃	〃	1,000	3.0
DH6143	1004	4P30A	3,000	14.1
DH6142	〃	〃	2,000	9.4
DH6141	〃	〃	1,000	4.7
DH6153	〃	5P30A	3,000	15.0
DH6152	〃	〃	2,000	10.0
DH6151	〃	〃	1,000	5.0

Note: In addition to standard 1m, 2m, and 3m lengths, other lengths can also be made to order (200㎜ minimum to 3m maximum).

60A

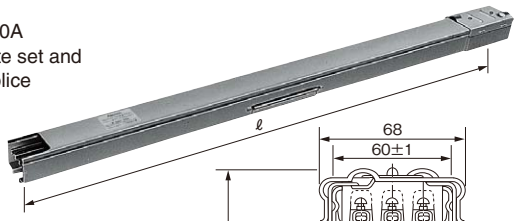
Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6223K2	602	2P60A	3,000	8.1
DH6222K2	〃	〃	2,000	5.4
DH6221K2	〃	〃	1,000	2.7
DH6233K2	〃	3P60A	3,000	9.0
DH6232K2	〃	〃	2,000	6.0
DH6231K2	〃	〃	1,000	3.0
DH6243K2	1004	4P60A	3,000	14.1
DH6242K2	〃	〃	2,000	9.4
DH6241K2	〃	〃	1,000	4.7
DH6253K2	〃	5P60A	3,000	15.0
DH6252K2	〃	〃	2,000	10.0
DH6251K2	〃	〃	1,000	5.0

Note: In addition to standard 1m, 2m, and 3m lengths, other lengths can also be made to order (200㎜ minimum to 3m maximum).

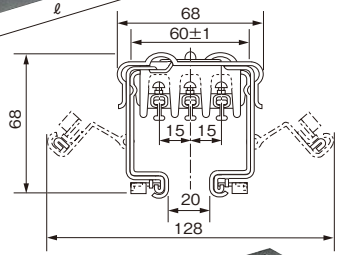
Drop-out ducts

An opening is provided for trolley insertion and removal. A drop-out duct must be used for each line. For extended lines, a drop-out duct is used for every 20m.

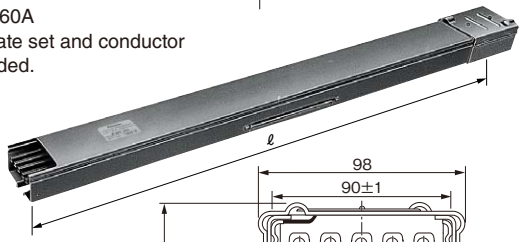
●2P/3P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



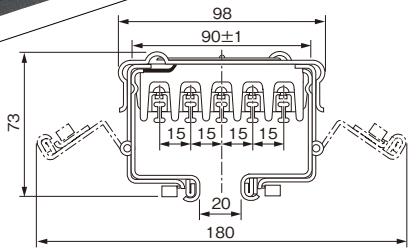
(Photo shows a 3P, 30A type.)
2P type has no center conductor & conductor splice.



●4P/5P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



(Photo shows a 5P, 30A type.)
4P type has no center conductor & conductor splice.



30A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6161K	602	2P30A	1,000	2.7
DH6171K	〃	3P30A	1,000	3.0
DH6181	1004	4P30A	1,000	4.7
DH6191	〃	5P30A	1,000	5.0

Note: In addition to the standard 1m length, other lengths can also be made to order (500㎜ minimum to 3m maximum).

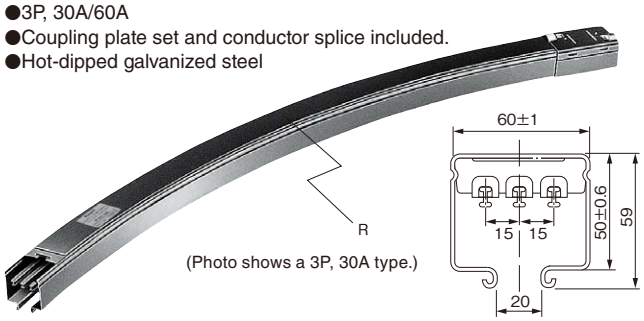
60A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6261K2	602	2P60A	1,000	2.7
DH6271K2	〃	3P60A	1,000	3.0
DH6281K2	1004	4P60A	1,000	4.7
DH6291K2	〃	5P60A	1,000	5.0

Note: In addition to the standard 1m length, other lengths can also be made to order (500㎜ minimum to 3m maximum).

Horizontally curved ducts

●3P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

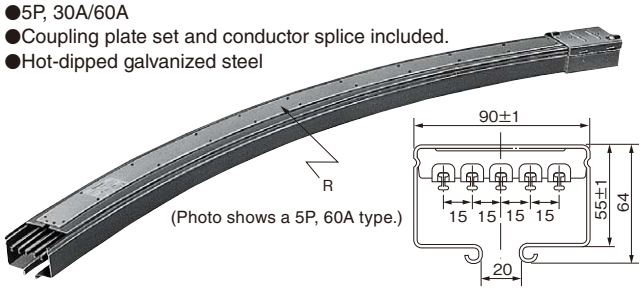


(Photo shows a 3P, 30A type.)

Note: In addition to the listed radii and angles, other radii and angles are also available to order.
However, the minimum radius (R) and duct length (ℓ) are as shown according to the rated current of the trolley.

Trolley rated current	Minimum radius (R)	Available duct length ℓ
20A	800mm	500mm (min.) to 1,800mm (max.)
40A	1,000mm	

●5P, 30A/60A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



(Photo shows a 5P, 60A type.)

Note: In addition to the listed radii and angles, other radii and angles are also available to order.
However, the minimum radius (R) and duct length (ℓ) are as shown according to the rated current of the trolley.

Trolley rated current	Minimum radius (R)	Available duct length ℓ
20A･40A	1,000mm	500mm (min.) to 1,800mm (max.)

30A

Cat. No.	Type	Rating	R・θ	Weight (kg)
DH6134	602	3P30A	1,200R45°	2.9
DH6135	〃	〃	1,500R45°	3.6
DH6136	〃	〃	1,700R45°	4.0
DH6137	〃	〃	2,000R45°	4.7
DH6138	〃	〃	2,300R45°	5.4
DH6139	〃	〃	2,800R30°	4.4
DH6156	1004	5P30A	1,700R45°	6.7
DH6158	〃	〃	2,300R45°	9.1

Note: 2P/4P type is custom-made.

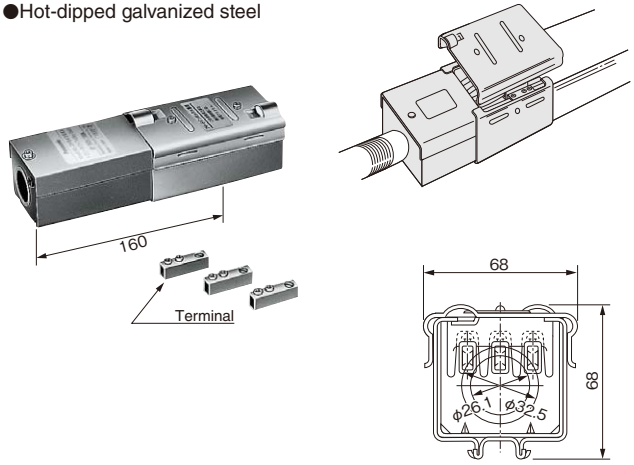
60A

Cat. No.	Type	Rating	R・θ	Weight (kg)
DH6234K2	602	3P60A	1,200R45°	2.9
DH6235K2	〃	〃	1,500R45°	3.6
DH6236K2	〃	〃	1,700R45°	4.0
DH6237K2	〃	〃	2,000R45°	4.7
DH6238K2	〃	〃	2,300R45°	5.4
DH6239K2	〃	〃	2,800R30°	4.3
DH6256K2	1004	5P60A	1,700R45°	6.1
DH6258K2	〃	〃	2,300R45°	9.1

Note: 2P/4P type is custom-made.

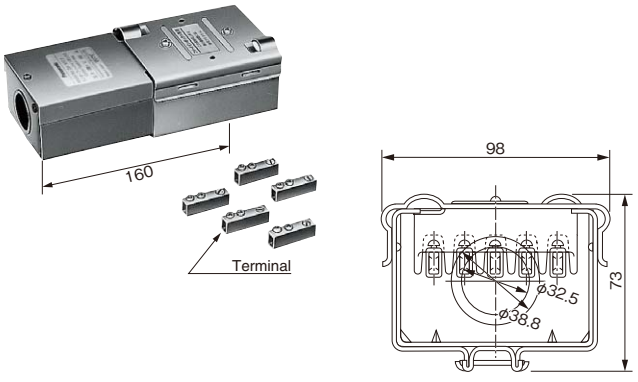
Feed-in boxes

●For 2P/3P, 30A/60A ducts
●Coupling plate set and terminals included.
●Knockout diameter: φ26.1,φ32.5
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6172	602	2P･3P 30A･60A	1.2

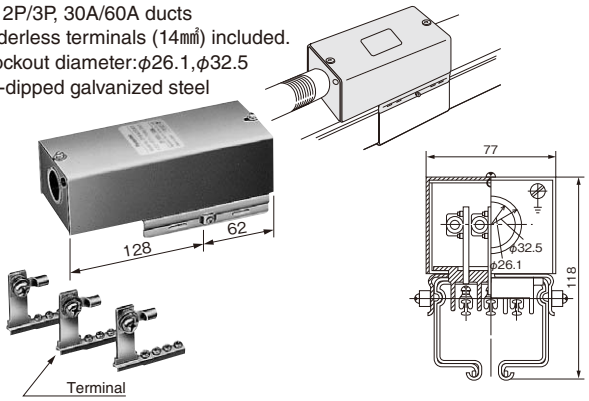
●For 4P/5P, 30A/60A ducts
●Coupling plate set and terminals included.
●Knockout diameter:φ32.5,φ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6192	1004	4P･5P 30A･60A	1.3

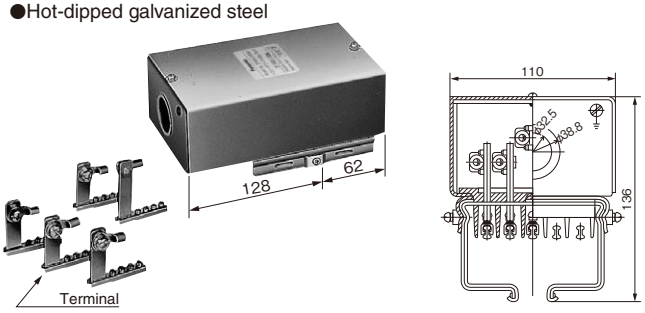
Center feed-in boxes

●For 2P/3P, 30A/60A ducts
●Solderless terminals (14㎟) included.
●Knockout diameter:φ26.1,φ32.5
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6173	602	2P･3P 30A･60A	0.9

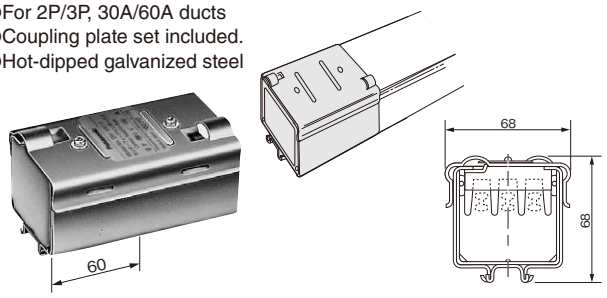
●For 4P/5P, 30A/60A ducts
●Crimp-on terminals (14㎟) included.
●Knockout diameter:φ32.5,φ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6193	1004	4P･5P 30A･60A	1.3

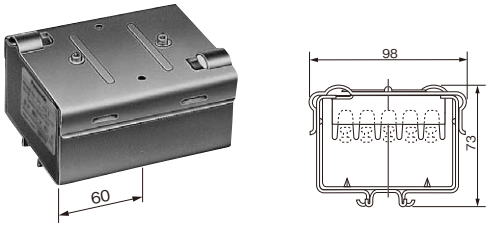
End caps

●For 2P/3P, 30A/60A ducts
●Coupling plate set included.
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6112	602	2P･3P 30A･60A	0.4

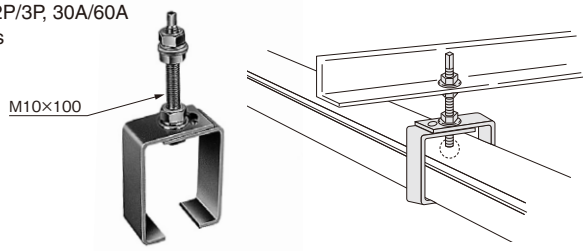
●For 4P/5P, 30A/60A ducts
●Coupling plate set included.
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6114	1004	4P･5P 30A･60A	0.8

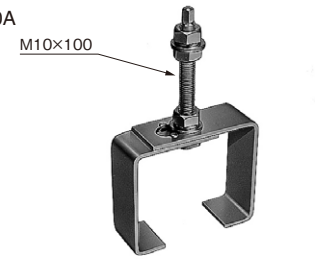
Hangers

●For 2P/3P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6111	602	0.3

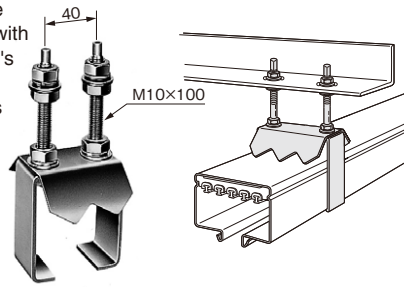
●For 4P/5P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6411	1004	0.4

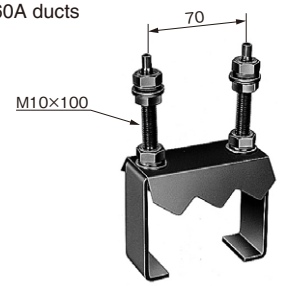
Horizontal-traverse hangers

Used in locations where the duct moves or turns along with the device, such as a crane's lateral travel.
●For 2P/3P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6113	602	0.6

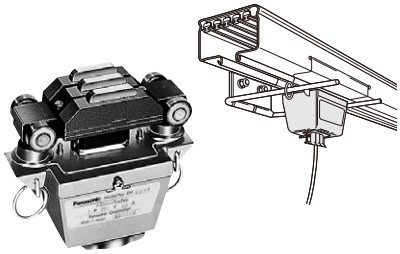
●For 4P/5P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6413	1004	0.8

Standard trolleys

●2P/3P, 20A trolley 〈for 30A/60A ducts〉



3.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6165	602	2P20A trolley	0.7
DH6175	602	3P20A trolley	0.7

Note: Photo shows 3P type.
2P type has no center collector.
●Refer to page for the replacement trolley collector.

●4P/5P, 20A trolley 〈for 30A/60A ducts〉
●5P, 40A trolley 〈for 30A/60A ducts〉

20A trolley

3.5㎟ pressure terminals included.

40A trolley

5.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6185	1004	4P20A trolley	0.9
DH6195	1004	5P20A trolley	0.9
DH6296	1004	5P40A trolley	0.9

Note 1: Photo shows 5P type. 4P type has no center collector.
Note 2: 4P, 40A trolley is custom-made.
●Refer to page for the replacement trolley collector.

●2P/3P, 40A trolley 〈for 30A/60A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6266	602	2P40A trolley	0.8
DH6276	602	3P40A trolley	0.8

Note: Photo shows 3P type. 2P type has no center collector.
●Refer to page for the replacement trolley collector.

Side outlet cable trolleys

With this trolley type, cables are connected to the side of the trolleys.
●2P/3P, 20A trolley 〈for 30A/60A ducts〉

3.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6362	602	2P20A trolley	0.7
DH6363	602	3P20A trolley	0.7

Note: Photo shows 3P type.
●Refer to page for the replacement trolley collector.

●4P/5P, 20A trolley 〈for 30A/60A ducts〉

3.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6364	1004	4P20A trolley	0.9
DH6365	1004	5P20A trolley	0.9

Note: Photo shows 5P type.
●Refer to page for the replacement trolley collector.

●3P, 40A trolley 〈for 30A/60A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6367	602	3P40A trolley	0.8

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

Roller type trolleys

Used when smooth movement is required, such as cutting machines and bolt spreaders in sewing factories.
●2P/3P, 5A trolley 〈for 30A/60A ducts〉

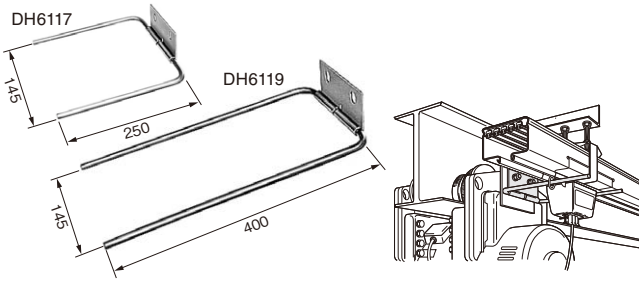
Cat. No.	Type	Product name	Weight (kg)
DH6075	602	2P5A roller type trolley	0.7
DH6076	602	3P5A roller type trolley	0.7

Note 1: Photo shows 3P trolley. Roller type trolleys are not usable with curved ducts.
Note 2: Use at a traveling speed of 40 m/min or below.

Accessories and Maintenance Parts for Standard and Outdoor Type Trolley Ducts

Trolley-pulling brackets

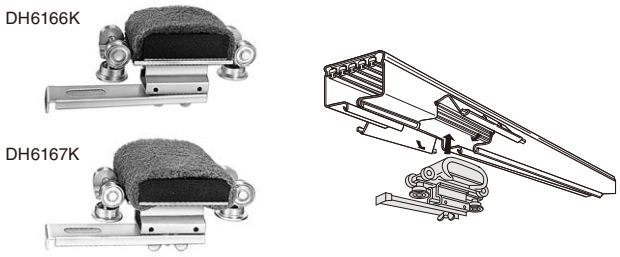
Used with a pull-type trolley.



Cat. No.	Product name	Compatible trolleys
DH6117	Trolley-pulling bracket A-1	2P-5P20A·2P·3P40A trolley (for single line)
DH6119	Trolley-pulling bracket A-2	2P-5P20A·2P·3P40A trolley (for double line)

Conductor cleaners

Used for cleaning the conductor surface. It should regularly be run over the conductor surface.



Cat. No.	Product name	Compatible trolleys
DH6166K	Conductor cleaner 602	For 2P·3P30A·60A ducts
DH6167K	Conductor cleaner 1004	For 4P·5P30A·60A ducts

Note: When using the cleaner, be sure to switch off power to prevent possible short circuits.

Trolley collectors

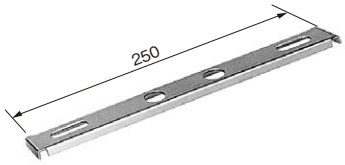
Trolley collectors make direct contact with conductors for collecting power. Worn-out collectors should be replaced.
The replacement interval is about 3,000 km.

Cat. No.	Product name
DH6000	2P 5A roller type collector
DH6001	3P 5A roller type collector
DH6100	2P20A collector
DH6101	3P20A collector
DH6102	4P20A collector
DH6103	5P20A collector
DH6104	2P40A collector
DH6105	3P40A collector
DH6208	4P40A collector
DH6209	5P40A collector

Note1: One set contains the number of collectors needed for one trolley (two for 2P type, three for 3P type, etc).

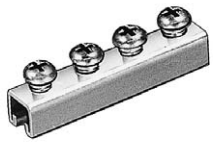
Coupling fixture A

For coupling two trolleys.



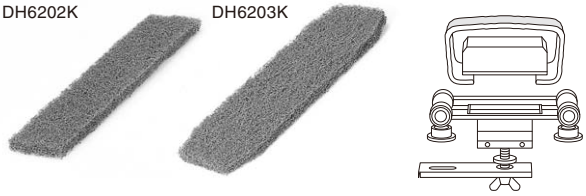
Cat. No.	Compatible trolleys
DH6108	2P-5P20A/40A trolley

Conductor splice



Cat. No.	Compatible ducts
DH6116	30A·60A ducts

Conductor cleaner pads



Cat. No.	Product description	Compatible ducts
DH6202K	For conductor cleaner 602 (incl. 10 pads)	2P·3P30A·60A ducts
DH6203K	For conductor cleaner 1004 (incl. 10 pads)	4P·5P30A·60A ducts

Accessory sets for connections(Custom-made products)

A set consists of coupling plates and conductor splice.
●2P/3P/4P/5P, 60A
●Hot-dipped galvanized steel

Compatible ducts
2P30A·60A ducts
3P30A·60A ducts
4P30A·60A ducts
5P30A·60A ducts

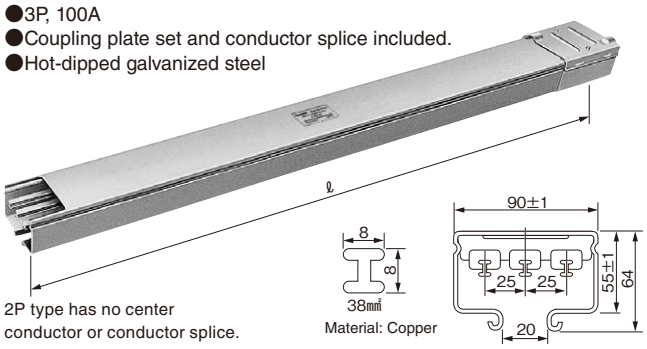
Note: Custom-made products.

Standard-type Trolley Ducts <100A · 600V AC>

Unit : mm

Straight-line ducts

●3P, 100A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



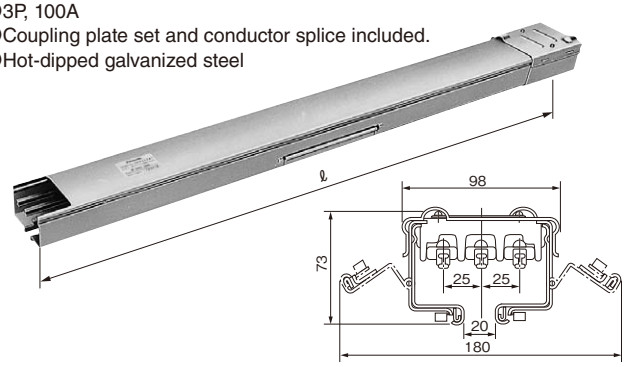
2P type has no center conductor or conductor splice.

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6433K2	1004	3P100A	3,000	14.7
DH6432K2	1004	3P100A	2,000	9.8
DH6431K2	1004	3P100A	1,000	4.9

Note: In addition to standard 1m, 2m, and 3m lengths, other lengths can also be made to order (200㎜ minimum to 3m maximum). 2P type is custom-made.

Drop-out duct

●3P, 100A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

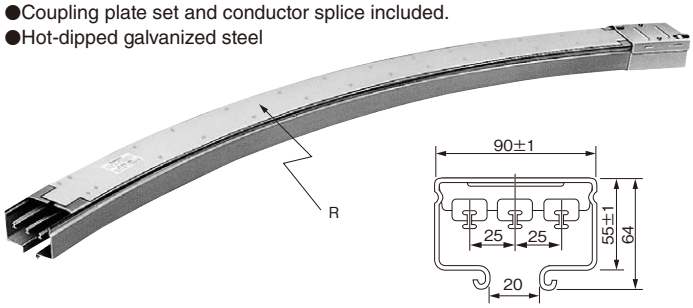


Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6471K2	1004	3P100A	1,000	4.9

Note: In addition to the standard 1m length, other lengths can also be made to order (500㎜ minimum to 3m maximum). 2P type is custom-made.
Custom made for details of using this product with trolleys (3P 80A).

Horizontally curved ducts

●3P, 100A
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

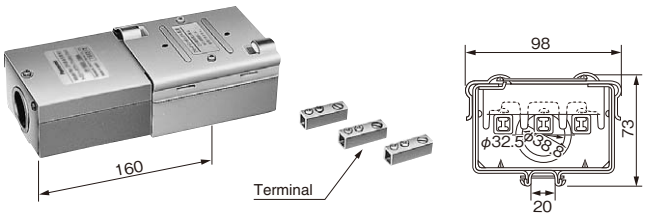


Cat. No.	Type	Rating	R	Weight (kg)
DH6436K2	1004	3P100A	1,700R45˚	6.6
DH6438K2	1004	3P100A	2,300R45˚	8.9

Note: In addition to the listed radii and angles, other radii and angles are also available to order.
However, the minimum radiuses are 1,000㎜ and 2,500㎜ for 40A and 80A trolleys, respectively, and duct lengths are 500㎜ minimum and 1,800㎜ maximum.

Feed-in box

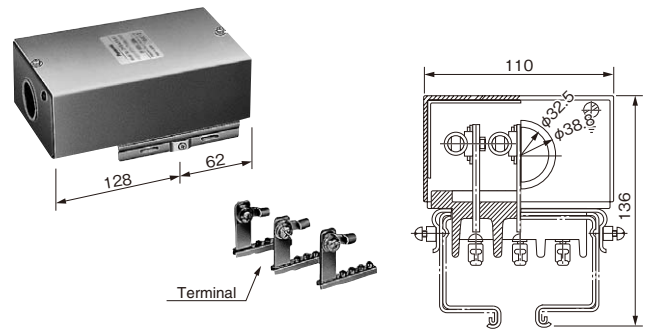
●For 3P, 100A ducts
●Coupling plate set and terminals included.
●Knockout diameter: ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6472	1004	3P100A	1.3

Center feed-in box

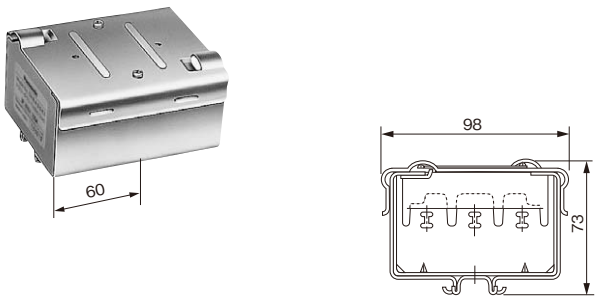
●For 3P, 100A ducts
●Crimp-on terminals (38㎟) included.
●Knockout diameter: ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6473	1004	3P100A	1.2

End cap

●For 3P, 100A ducts
●Coupling plate set included.
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6412	1004	3P100A	0.8

Hanger

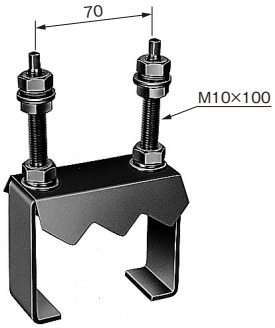
●For 3P, 100A ducts

Cat. No.	Type	Weight (kg)
DH6411	1004	0.4

Horizontal-traverse hanger

Used for lateral travel of cranes, point ducts, pickup ducts, and other locations where vibrations or misalignments may occur.

●For 3P, 100A ducts



Cat. No.	Type	Weight (kg)
DH6413	1004	0.8

Standard trolleys

●3P, 40A trolley 〈for 100A ducts〉
●3P, 80A trolley 〈for 100A ducts〉

40A trolley

8㎟ pressure terminals included.

80A trolley

Without pressure terminals

Cat. No.	Type	Product name	Weight (kg)
DH6476	1004	3P40A trolley	0.9
DH6477	1004	3P80A trolley	1.6

Note: 2P type is custom-made.

Side outlet cable trolley

With this trolley type, cables are connected to the side of the trolleys.

●3P, 40A trolley 〈for 100A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6369	1004	3P40A trolley	0.9

Note: 2P type is custom-made.

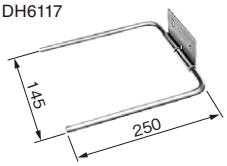
●Refer to page for the replacement trolley collector.

Accessories and Maintenance Parts for Standard and Outdoor Type Trolley Ducts

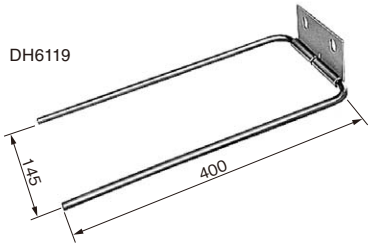
Trolley-pulling brackets

Used with a pull-type trolley.

DH6117



DH6119



Cat. No.	Product name	Compatible trolleys	A	B
DH6117	Trolley-pulling bracket A-1	3P40A trolley (for single line)	250	145
DH6119	Trolley-pulling bracket A-2	3P40A trolley (for double line)	400	145
DH6417	Trolley-pulling bracket B-1	3P80A trolley (for single line)	250	200

Conductor cleaner

Used for cleaning the conductor surface. It should regularly be run over the conductor surface.

Cat. No.	Product name	Compatible ducts
DH6167K	Conductor cleaner 1004	3P100A ducts

Note: When using the cleaner, be sure to switch off power to prevent possible short circuits.

Trolley collectors(Replacement parts)

Trolley collectors make direct contact with conductors for collecting power. Worn-out collectors should be replaced.
The replacement interval is about 3,000 km.

40A collector

Cat. No.	Product name
DH6104	2P40A collector
DH6105	3P40A collector
DH6107	3P80A collector

Note: One set contains the number of collectors needed for one trolley (two for 2P type and three for 3P type).

Accessory sets for connections(Custom-made products)

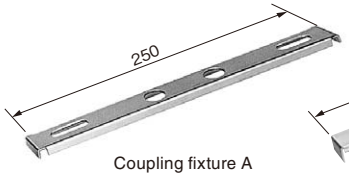
A set consists of a coupling plate and conductor splice.
●3P, 100A
●Hot-dipped galvanized steel

Rating
3P100A

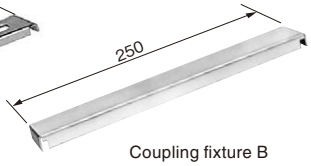
Note: Custom-made products.

Coupling fixtures

For coupling two trolleys.



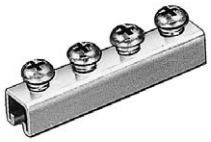
Coupling fixture A



Coupling fixture B

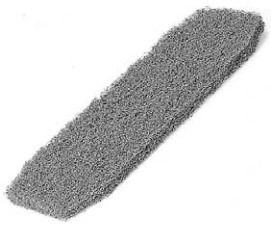
Cat. No.	Product name	Compatible trolleys
DH6108	Coupling fixture A	3P40A trolley
DH6109	Coupling fixture B	3P80A trolley

Conductor splice



Cat. No.	Compatible ducts
DH6116	100A

Conductor cleaner pads(Replacement parts)



Cat. No.	Product description	Compatible ducts
DH6203K	For conductor cleaner 1004 (incl. 10 pads)	3P100A ducts

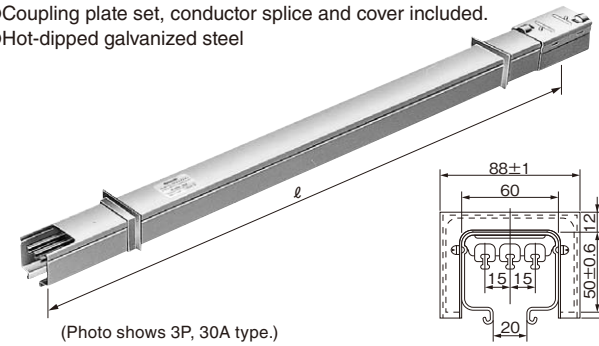
Outdoor-type Trolley Ducts <30A・60A 300V AC>

Unit : mm

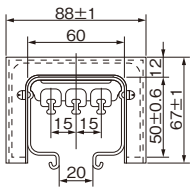
Note: Avoid installation in coastal areas.
Refer to page 16 for common parts and replacement parts for standard-type and outdoor-type trolley ducts.

Straight-line ducts

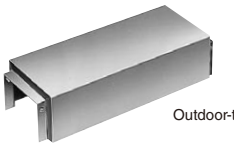
●3P, 30A/60A
●Coupling plate set, conductor splice and cover included.
●Hot-dipped galvanized steel



(Photo shows 3P, 30A type.)

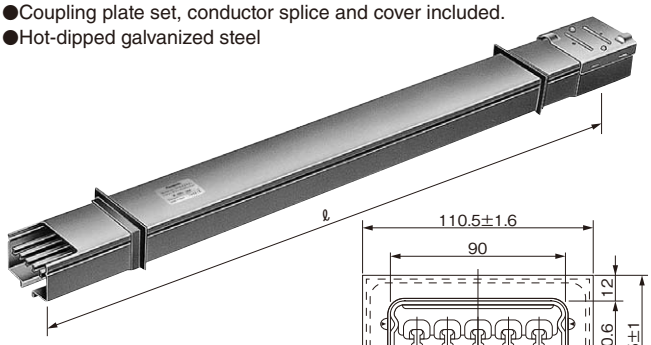


Outdoor-type cover

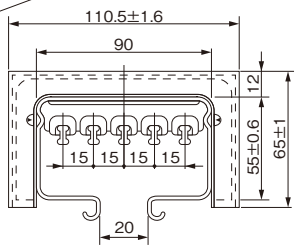


Outdoor-type cover

●5P, 30A/60A
●Coupling plate set, conductor splice and cover included.
●Hot-dipped galvanized steel



(Photo shows 5P, 30A type.)



30A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6533	602	3P30A	3,000	9.3
DH6553	1004	5P30A	3,000	15.3

Note: In addition to the standard 3m length, other lengths can also be made to order (500㎜ minimum to 3m maximum). 2P/4P type is custom-made.

60A

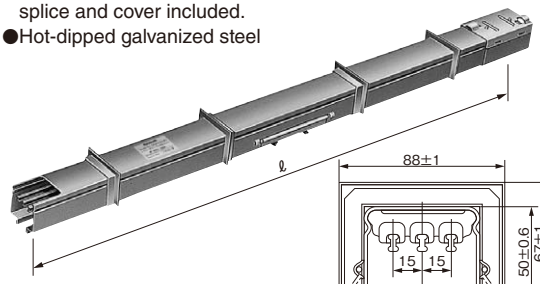
Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6633K2	602	3P60A	3,000	9.3
DH6653K2	1004	5P60A	3,000	15.3

Note: In addition to the standard 3m length, other lengths can also be made to order (500㎜ minimum to 3m maximum). 2P/4P type is custom-made.

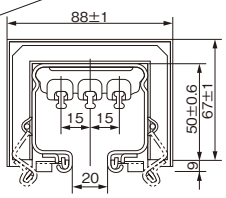
Drop-out ducts

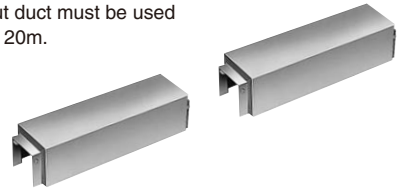
An opening is provided for trolley insertion and removal. A drop-out duct must be used for each line. For extended lines, a drop-out duct is used for every 20m.

●3P, 30A/60A
●Coupling plate set, conductor splice and cover included.
●Hot-dipped galvanized steel

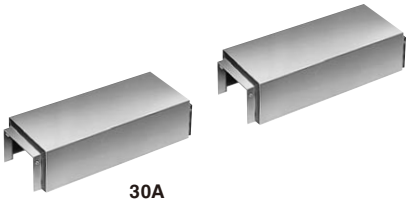


(Photo shows 3P, 30A type.)



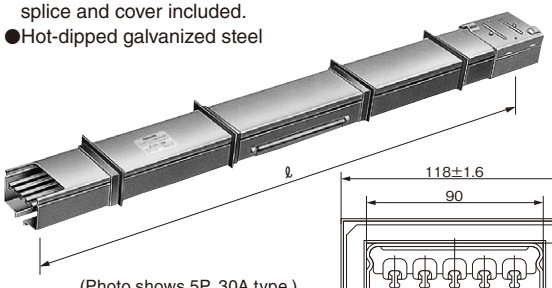


Outdoor-type cover (2 pcs)

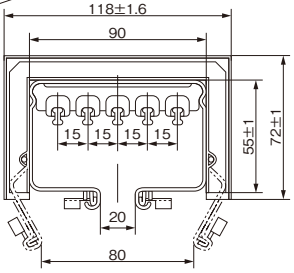


Outdoor-type cover (2 pcs)

●5P, 30A/60A
●Coupling plate set, conductor splice and cover included.
●Hot-dipped galvanized steel



(Photo shows 5P, 30A type.)



30A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6571K	602	3P30A	1,000	3.3
DH6591	1004	5P30A	1,000	5.3

Note: In addition to the standard 1m length, other lengths can also be made to order (800㎜ minimum).
2P/4P type is custom-made.

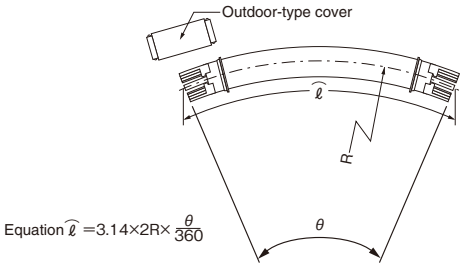
60A

Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6671K2	602	3P60A	1,000	3.3
DH6691K2	1004	5P60A	1,000	5.3

Note: In addition to the standard 1m length, other lengths can also be made to order (800㎜ minimum).
2P/4P type is custom-made.
Custom made for details of using this product with trolleys (3P 80A).

Horizontally curved ducts(Custom-made products)

●3P/5P, 30A
●Coupling plate set, conductor splice and cover included.
●Hot-dipped galvanized steel

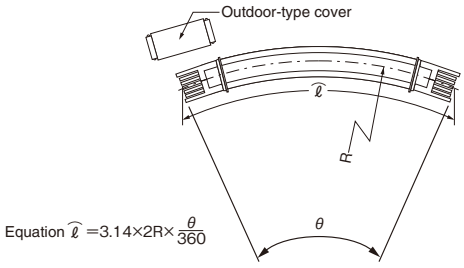


30A

Type	Rating	Minimum R	Available duct length ℓ
602	3P30A	20A trolley : 800㎜	500㎜(min.) to 1800㎜(max.)
		40A trolley : 1,000㎜	
1004	5P30A	20A trolley : 1,000㎜	

Note: Custom-made products.

●3P/5P, 60A
●Coupling plate set, conductor splice and Outdoor-type cover included.
●Hot-dipped galvanized steel



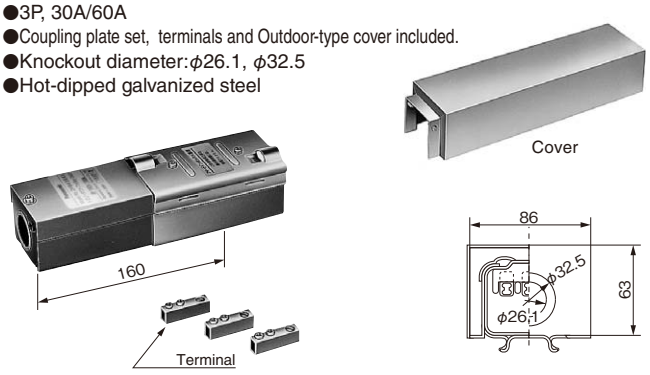
60A

Type	Rating	Minimum R	Available duct length ℓ
602	3P60A	20A trolley : 800㎜	500㎜(min.) to 1800㎜(max.)
		40A trolley : 1,000㎜	
1004	5P60A	20A trolley : 1,000㎜	

Note: Custom-made products.

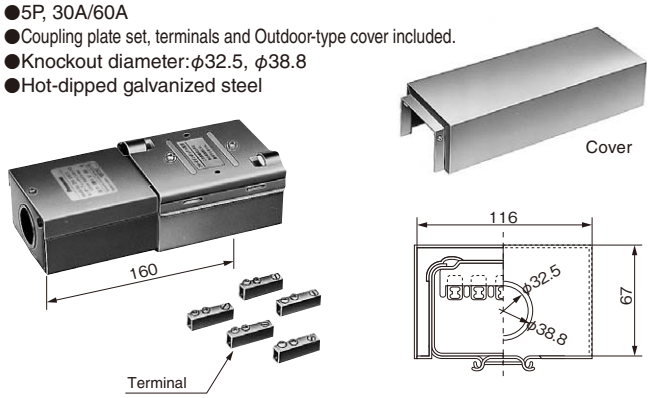
Feed-in boxes

●3P, 30A/60A
●Coupling plate set, terminals and Outdoor-type cover included.
●Knockout diameter:ϕ26.1, ϕ32.5
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6572	602	3P30A·60A	1.5

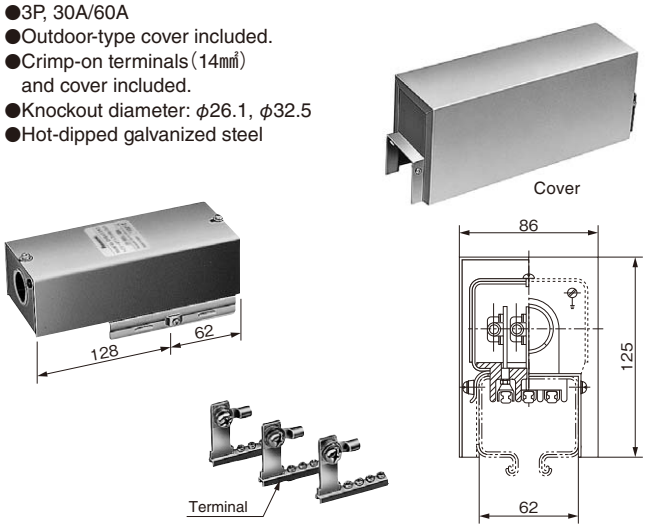
●5P, 30A/60A
●Coupling plate set, terminals and Outdoor-type cover included.
●Knockout diameter:ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6592	1004	5P30A·60A	1.6

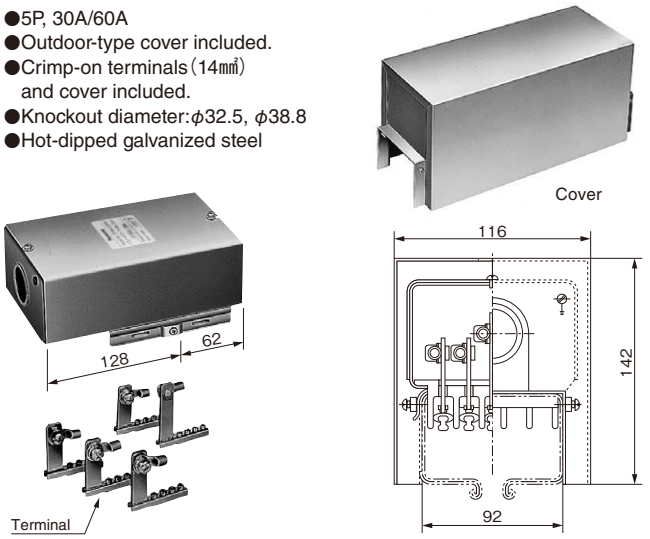
Center feed-in boxes

●3P, 30A/60A
●Outdoor-type cover included.
●Crimp-on terminals(14㎟)
and cover included.
●Knockout diameter: ϕ26.1, ϕ32.5
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6573	602	3P30A·60A	1.3

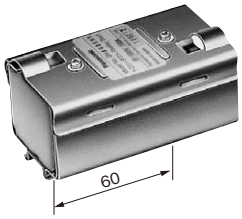
●5P, 30A/60A
●Outdoor-type cover included.
●Crimp-on terminals(14㎟)
and cover included.
●Knockout diameter:ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel

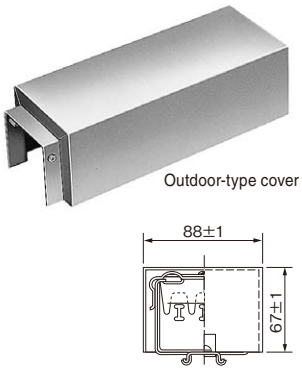


Cat. No.	Type	Rating	Weight (kg)
DH6593	1004	5P30A·60A	1.6

End caps

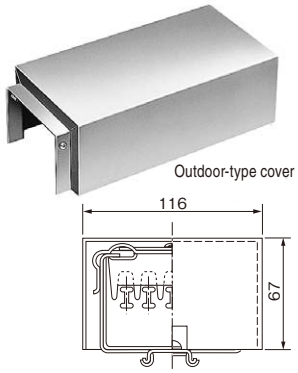
●3P, 30A/60A
●Outdoor-type cover included.
●Hot-dipped galvanized steel





Cat. No.	Type	Rating	Weight (kg)
DH6512	602	3P30A·60A	0.6

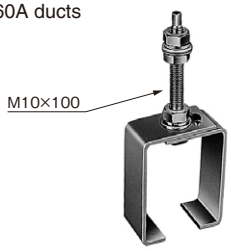
●5P, 30A/60A
●Outdoor-type cover included.
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6514	1004	5P30A·60A	1.1

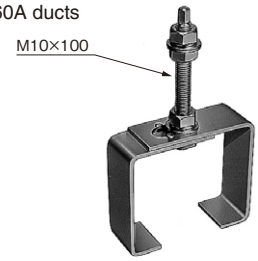
Hangers

●For 2P/3P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6111	602	0.3

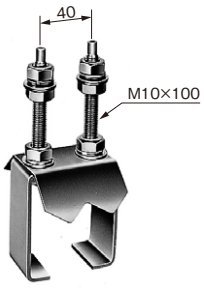
●For 4P/5P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6411	1004	0.4

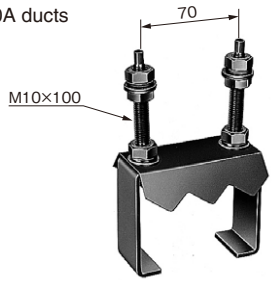
Horizontal-traverse hangers

Used in locations where the duct moves or turns along with the device, such as a crane's lateral travel.
●For 2P/3P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6113	602	0.6

●For 4P/5P, 30A/60A ducts



Cat. No.	Type	Weight (kg)
DH6413	1004	0.8

Outdoor-type trolleys

3.5㎟ crimp-on terminals included.

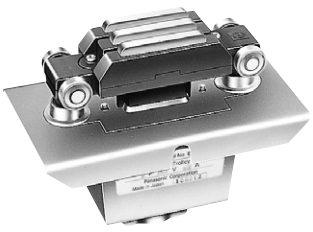
Cat. No.	Type	Product name	Compatible ducts
DH6275	602	3P20A trolley	3P30A·60A ducts

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

3.5㎟ crimp-on terminals included.

Cat. No.	Type	Product name	Compatible ducts
DH6295	1004	5P20A trolley	5P30A·60A ducts

Note: 4P type is custom-made.
●Refer to page for the replacement trolley collector.



8㎟ crimp-on terminals included.

Cat. No.	Type	Product name	Compatible ducts
DH6576	602	3P40A trolley	3P60A ducts

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

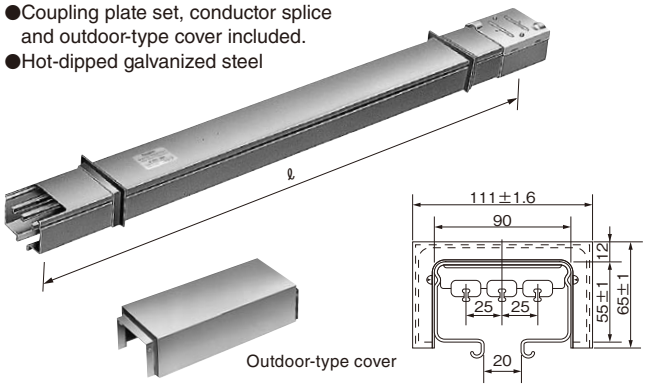
Outdoor-type Trolley Ducts <100A 600V AC>

Unit : mm

Note: Avoid installation in coastal areas.

Straight-line duct

●3P, 100A
●Coupling plate set, conductor splice and outdoor-type cover included.
●Hot-dipped galvanized steel

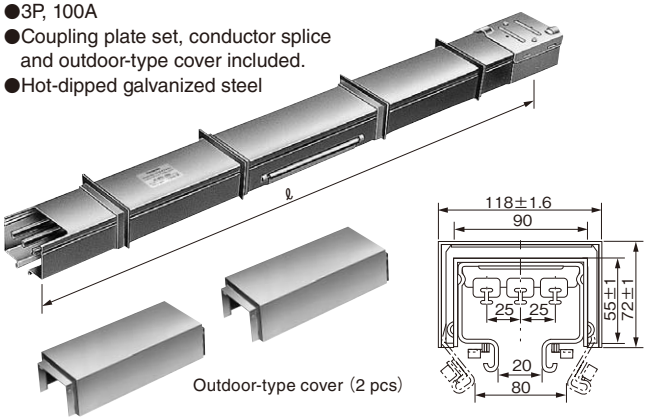


Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6933K2	1004	3P100A	3,000	15.0

Note: In addition to the standard 3m length, other lengths can also be made to order (500㎜ minimum to 3m maximum).
2P type is custom-made.

Drop-out duct

●3P, 100A
●Coupling plate set, conductor splice and outdoor-type cover included.
●Hot-dipped galvanized steel

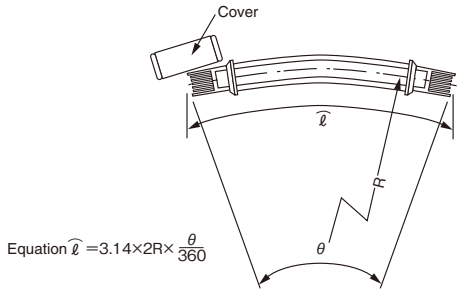


Cat. No.	Type	Rating	Standard length(ℓ)	Weight (kg)
DH6943K2	1004	3P100A	1,000	5.2

Note: In addition to the standard 1m length, other lengths can also be made to order (800㎜ minimum). 2P type is custom-made.

Horizontally curved duct(Custom-made products)

●3P, 100A
●Coupling plate set, conductor splice and outdoor-type cover included.
●Hot-dipped galvanized steel

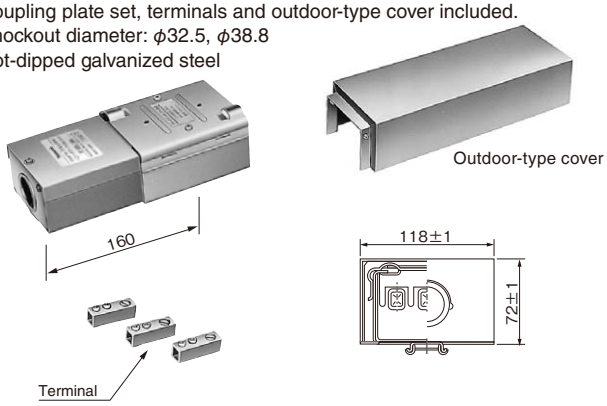


Type	Rating	Minimum R	Available duct length ℓ
1004	3P100A	40A trolley: 1,000㎜	500㎜(min.) to 1800㎜(max.)
		80A trolley: 2,500㎜	

Note: Custom-made products.

Feed-in box

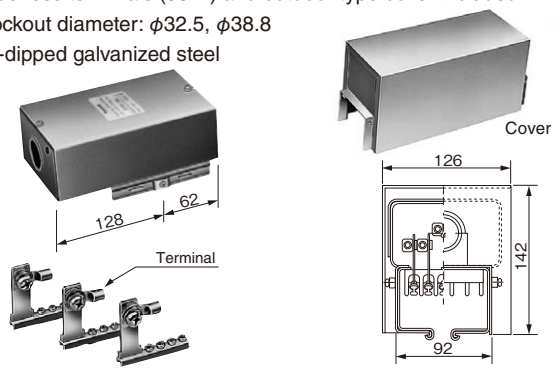
●3P, 100A
●Coupling plate set, terminals and outdoor-type cover included.
●Knockout diameter: ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6953	1004	3P100A	1.6

Center feed-in box

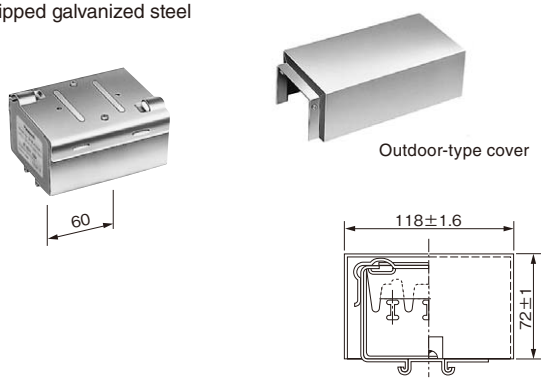
●3P, 100A
●Cover included.
●Solderless terminals (38㎟) and outdoor-type cover included.
●Knockout diameter: ϕ32.5, ϕ38.8
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6963	1004	3P100A	1.5

End cap

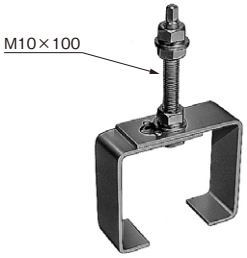
●3P, 100A
●Outdoor-type cover included.
●Hot-dipped galvanized steel



Cat. No.	Type	Rating	Weight (kg)
DH6515	1004	3P100A	1.1

Hanger

●For 3P, 100A ducts

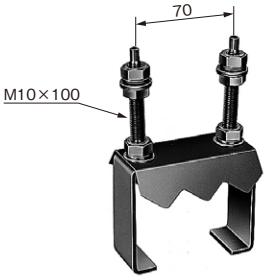


Cat. No.	Type	Weight (kg)
DH6411	1004	0.4

Horizontal-traverse hanger

Used in locations where the duct moves or turns along with the device, such as a crane's lateral travel.

●For 3P, 100A ducts



Cat. No.	Type	Weight (kg)
DH6413	1004	0.8

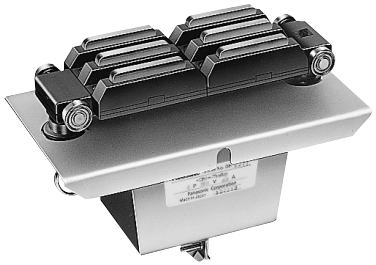
Outdoor-type trolley

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Compatible ducts
DH6676	1004	3P40A trolley	3P100A ducts

Note: 2P type is custom-made.

●Refer to page for the replacement trolley collector.



Without pressure terminals.

Cat. No.	Type	Product name	Compatible ducts
DH6696	1004	3P80A trolley	3P100A ducts

Note: 2P type is custom-made.

●Refer to page for the replacement trolley collector.

Trolley Ducts for Special Applications <30A·60A 300V AC>

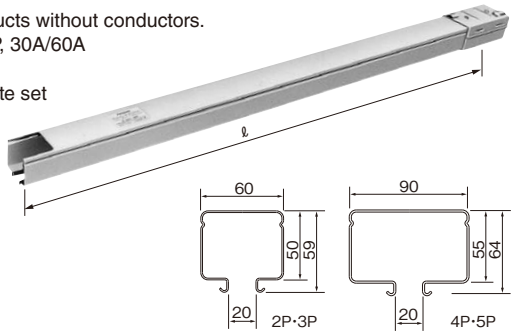
Unit : mm

(custom-made products)

Contact us for more details,.

Wireless ducts(Custom-made products)

Straight-line ducts without conductors.
- ●2P/3P/4P/5P, 30A/60A 3P, 100A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel

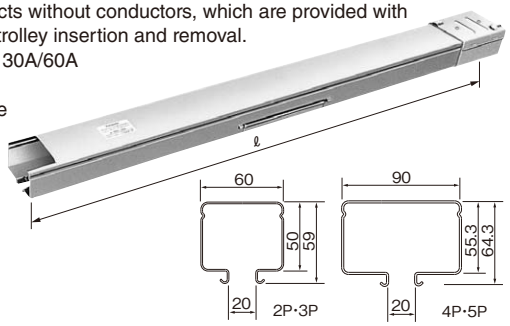


Type	Compatible ducts	Standard length(ℓ)
602	2P·3P 30A·60A	200～3,000
1004	4P·5P 30A·60A·3P100A	200～3,000

Note: Custom-made products.

Wireless drop-out ducts(Custom-made products)

Straight-line ducts without conductors, which are provided with an opening for trolley insertion and removal.
- ●2P/3P/4P/5P, 30A/60A 3P, 100A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel

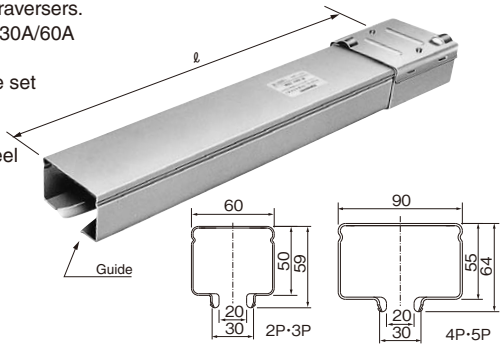


Type	Compatible ducts	Standard length(ℓ)
602	2P·3P 30A·60A	1,000
1004	4P·5P 30A·60A·3P100A	1,000

Note: Custom-made products.

Wireless Point ducts(Custom-made products)

Straight-line ducts without conductors, used at switching points such as turntables and traversers.
- ●2P/3P/4P/5P, 30A/60A 3P, 100A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel

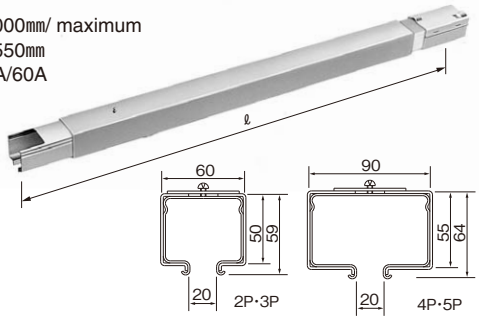


Type	Compatible ducts	Standard length(ℓ)
602	2P·3P 30A·60A	500
1004	4P·5P 30A·60A·3P100A	500

Note: Custom-made products.

Wireless take-up ducts(Custom-made products)

Straight-line ducts without conductors, used when the Trolley Duct length needs adjustment to match the stretching of the chain conveyor in an endless line.
Standard length: 1000㎜/ maximum adjustable length: 550㎜
- ●2P/3P/4P/5P, 30A/60A 3P, 100A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel

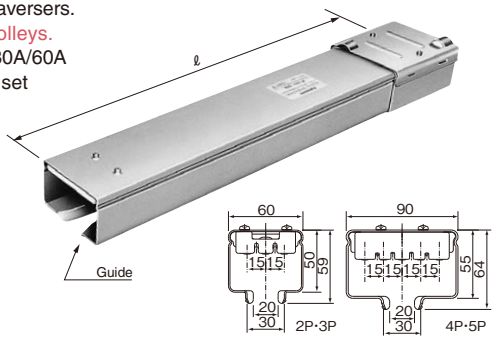


Type	Compatible ducts	Standard length(ℓ)
602	2P·3P 30A·60A	1,000～1,550
1004	4P·5P 30A·60A·3P100A	1,000～1,550

Note: Custom-made products.

Point ducts (with conductors)(Custom-made products)

Straight-line ducts with conductors for use at switching points such as turntables and traversers.
Use point-use trolleys.
- ●2P/3P/4P/5P, 30A/60A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel

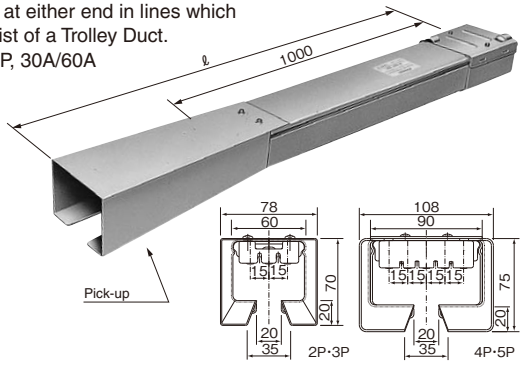


Type	Rating	Standard length(ℓ)
602	2P30A	500
602	3P30A	500
1004	4P30A	500
1004	5P30A	500
602	2P60A	500
602	3P60A	500
1004	4P60A	500
1004	5P60A	500

Note: Custom-made products.

Pick-up ducts (with conductors)(Custom-made products)

Ducts for use at either end in lines which partially consist of a Trolley Duct.
- ●2P/3P/4P/5P, 30A/60A
- ●Coupling plate set included.
- ●Hot-dipped galvanized steel



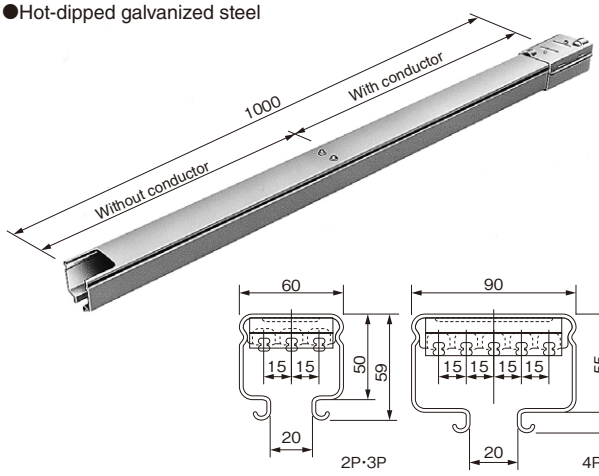
Type	Rating	Standard length(ℓ)
602	2P30A	1,200
602	3P30A	1,200
1004	4P30A	1,200
1004	5P30A	1,200
602	2P60A	1,200
602	3P60A	1,200
1004	4P60A	1,200
1004	5P60A	1,200

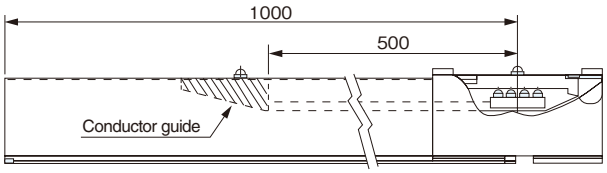
Note: Custom-made products.

Ducts with conductor guide(Custom-made products)

These ducts are provided with a guide to help the trolley move smoothly between duct sections with and without conductors on endless aging or product inspection lines, where Trolley Ducts without conductors are partially used.

●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel





30A

Type	Rating	Weight (kg)
602	2P30A	2.5
	3P30A	2.8
1004	4P30A	4.4
	5P30A	4.7

60A

Type	Rating	Weight (kg)
602	2P60A	2.5
	3P60A	2.8
1004	4P60A	4.4
	5P60A	4.7

Note: Custom-made products.

Circuit-separating ducts(Custom-made products)

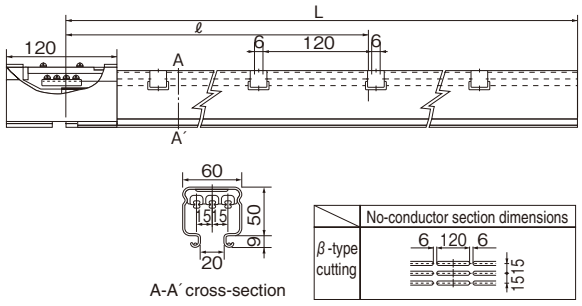
Ducts for use in separating circuits. Two types are available: a power-circuit use type with a function to extinguish arcs created by load current, and a signal-circuit type without arc-extinguishing function.

●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

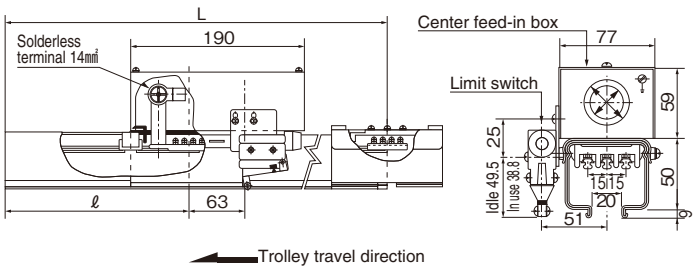
■3P, 30A/60A ducts

●For signal circuits (β-type cutting)

2P type has no center conductor.



●For power circuits (β-type cutting)

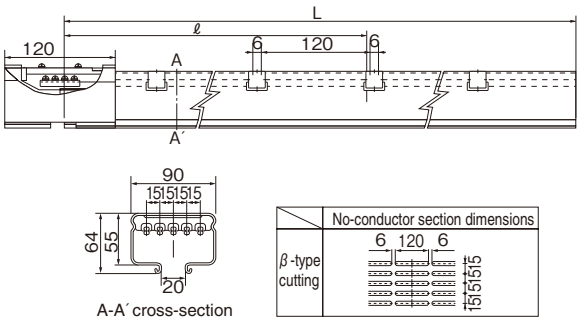


Note 1: Dimensions (L) and (ℓ) are determined after consulting customers.
See page 35 for β-type cutting.
Note 2: Custom-made products.

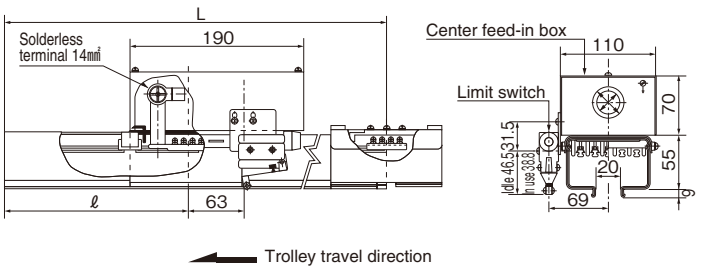
■5P, 30A/60A ducts

●For signal circuits (β-type cutting)

4P type has no center conductor.



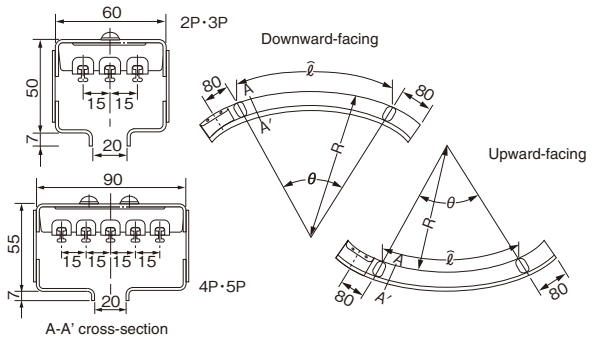
●For power circuits (β-type cutting)



Note 1: Dimensions (L) and (ℓ) are determined after consulting customers.
See page 35 for β-type cutting.
Note 2: Custom-made products.

Vertically curved ducts(Custom-made products)

Vertically curved ducts are available in two types: downward-facing and upward-facing.
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel



Note: 2P and 4P types have no center conductor & conductor splice.

30A

Type	Rating	Minimum radius R		Duct length ℓ	
		With conductors	Without conductors	Minimum	Maximum
602	2P30A	2,000mm～	1,500mm～	500mm	1,800mm
	3P30A				
1004	4P30A				
	5P30A				

Equation $\ell = 3.14 \times 2R \times \frac{\theta}{360}$

30A

Type	Rating	Minimum radius R		Duct length ℓ	
		With conductors	Without conductors	Minimum	Maximum
602	2P60A	2,000mm～	1,500mm～	500mm	1,800mm
	3P60A				
1004	4P60A				
	5P60A				

Note: Custom-made products.

Equation $\ell = 3.14 \times 2R \times \frac{\theta}{360}$

Micro-rod attached trolleys(Custom-made products)

Used with an automatic control circuit for conveyor lines, these trolleys include a mechanism for operating the microswitches which are built into the ducts. Use together with a circuit-separating duct.

●2P·3P, 20A trolley
(for 30A/60A ducts)

3.5mm² pressure terminals included.

Type	Product name	Weight (kg)
602	2P20A trolley	0.7
602	3P20A trolley	0.7

Note: Custom-made products.
●Refer to page for the replacement trolley collector.

●4P·5P, 20A trolley
(for 30A/60A ducts)

3.5mm² pressure terminals included.

Type	Product name	Weight (kg)
1004	4P20A trolley	0.9
1004	5P20A trolley	0.9

Note: Custom-made products.
●Refer to page for the replacement trolley collector.

●2P·3P, 40A trolley
(for 60A ducts)

8mm² pressure terminals included.

Type	Product name	Weight (kg)
602	2P20A trolley	0.8
602	3P40A trolley	0.8

Note: Custom-made products.
●Refer to page for the replacement trolley collector.

Point-use trolleys

Used where line switching is performed on circuits having turntables or traversers. Use with a point duct for line switching (see page 29).

●3P, 40A trolley
〈for 30A/60A ducts〉

8mm² pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6397	602	3P40A trolley	0.8

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

●4P/5P, 20A trolley
〈for 30A/60A ducts〉

3.5mm² pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6394	1004	4P20A trolley	1.0
DH6395	1004	5P20A trolley	1.0

Note: Photo shows 5P, 20A type. 4P type has no center collector.
●Refer to page for the replacement trolley collector.

UD-type trolleys

Used on circuits which partially employ a Trolley Duct. A mechanism that allows the trolley to move smoothly from a non-duct section to a duct section is included. Use with a pick-up duct (see page 27).

●3P, 20A trolley
(for 30A/60A ducts)

3.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6383K	602	3P20A trolley	1.8

Note: 2P type is custom-made.
Photo shows 3P, 20A trolley. 2P type has no center collector.
●Refer to page for the replacement trolley collector.

●3P, 40A trolley
〈for 60A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6387K	602	3P40A trolley	1.9

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

●4P/5P, 20A trolley
〈for 30A/60A ducts〉

3.5㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6384K	1004	4P20A trolley	2.0
DH6385K	1004	5P20A trolley	2.0

Note: Photo shows 5P, 20A trolley. 4P type has no center collector.
●Refer to page for the replacement trolley collector.

Dustproof trolleys(Custom-made products)

For use with the custom-made dustproof Trolley Ducts.
●3P/5P, 20A trolley (for 30A/60A ducts)
●3P, 40A trolley (for 60A ducts)

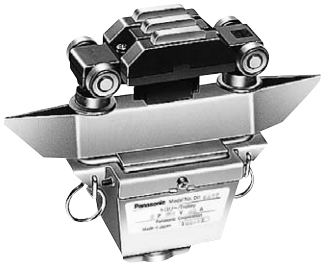


Photo shows 3P type.

Type	Product name	Weight (kg)
602	3P20A trolley	1.0
602	3P40A trolley	1.1
1004	5P20A trolley	1.1

Note: Custom-made products.

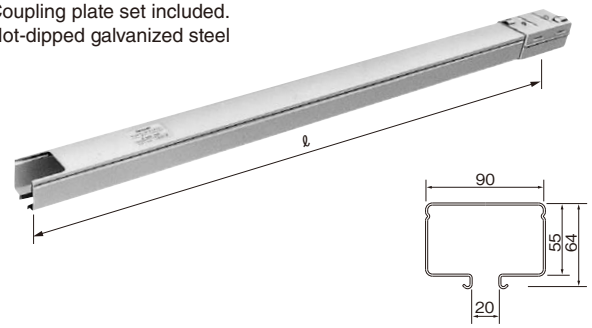
Trolley Ducts for Special Applications <100A 600V AC> Unit : mm

(custom-made products)

Contact us for more details,.

Wireless ducts(Custom-made products)

Straight-line ducts without conductors.
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel

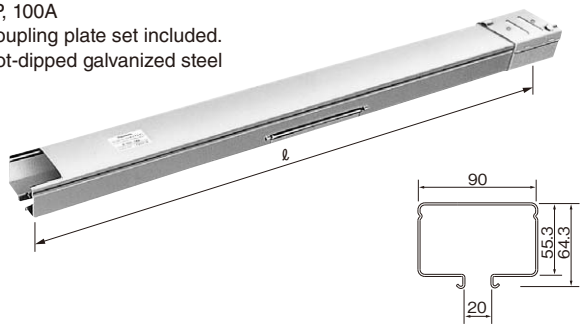


Type	Compatible ducts	Standard length(ℓ)
1004	3P100A	200～3,000

Note: Custom-made products.

Wireless drop-out duct(Custom-made products)

A straight-line duct without conductor, which is provided with an opening for trolley insertion and removal.
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel

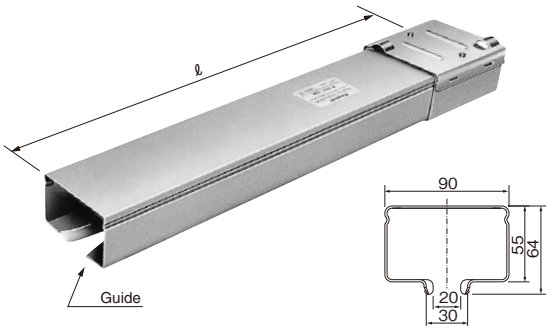


Type	Compatible ducts	Standard length(ℓ)
1004	3P100A	1,000

Note: Custom-made products.

Wireless point ducts(Custom-made products)

A straight-line duct without conductor, used at switching points such as turntables and traversers.
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel

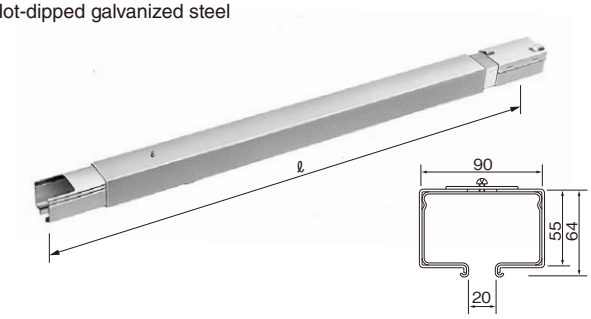


Type	Compatible ducts	Standard length(ℓ)
1004	3P100A	500

Note: Custom-made products.

Wireless take-up duct(Custom-made products)

A straight-line duct without conductor, used when the Trolley Duct length needs adjustment to match the stretching of the chain conveyor in an endless line.
Standard length: 1000㎜; maximum adjustable length: 550㎜
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel

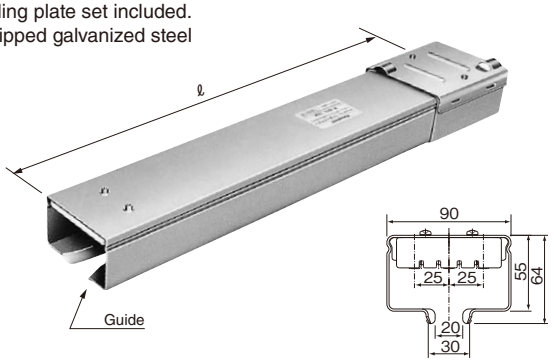


Type	Compatible ducts	Standard length(ℓ)
1004	3P100A	1,000～1,500

Note: Custom-made products.

Point duct (with conductor)(Custom-made products)

A straight-line duct with conductor for use at switching points such as turntables and traversers.
Note: Use point-use trolleys.
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel

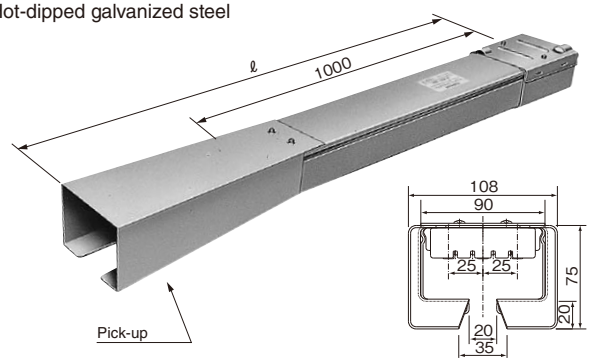


Type	Rating	Standard length(ℓ)
1004	3P100A	500

Note: Custom-made products.

Pick-up duct(with conductor)(Custom-made products)

A duct for use at either end in lines which partially consist of a Trolley Duct.
●3P, 100A
●Coupling plate set included.
●Hot-dipped galvanized steel



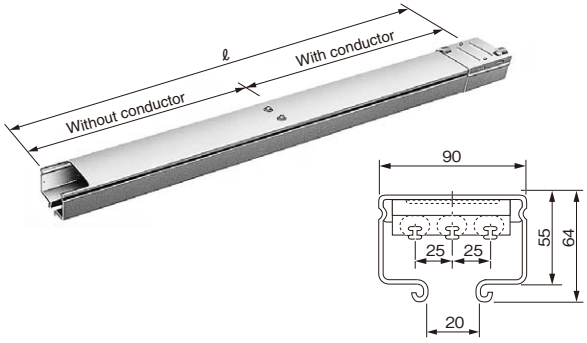
Type	Rating	Standard length(ℓ)
1004	3P100A	1,200

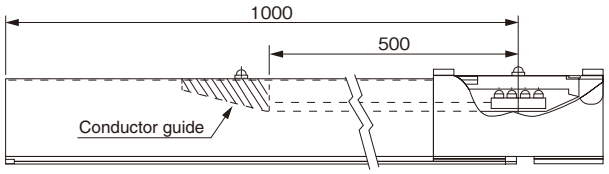
Note: Custom-made products.

Duct with conductor guide(Custom-made products)

This duct is provided with a guide to help the trolley move smoothly between duct sections with and without conductors on endless aging or product inspection lines, where Trolley Ducts without conductors are partially used.

●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel





Type	Rating	Standard length(ℓ)	Weight (kg)
1004	2P100A	1,000	4.2
	3P100A	1,000	4.5

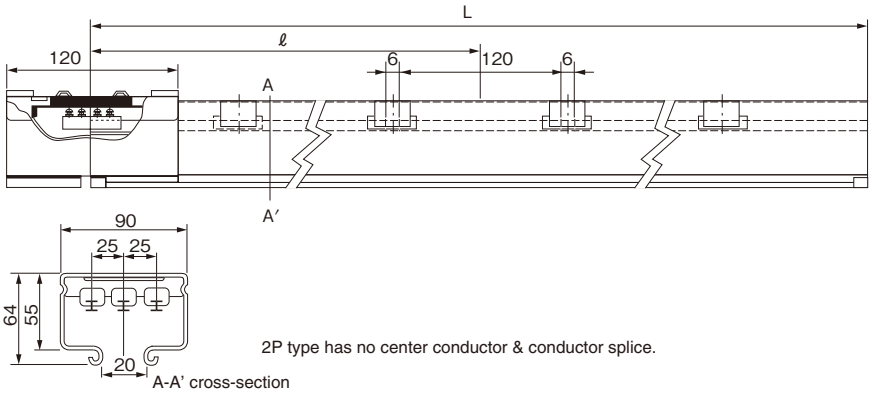
Note: Custom-made products. Ducts with conductor guide custom lengths are also available.

Circuit-separating ducts(Custom-made products)

Ducts for use in separating circuits. Two types are available: a power-circuit use type with a function to extinguish arcs created by load current, and a signal-circuit type without arc-extinguishing function.

●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

For signal circuits (β-type cutting)

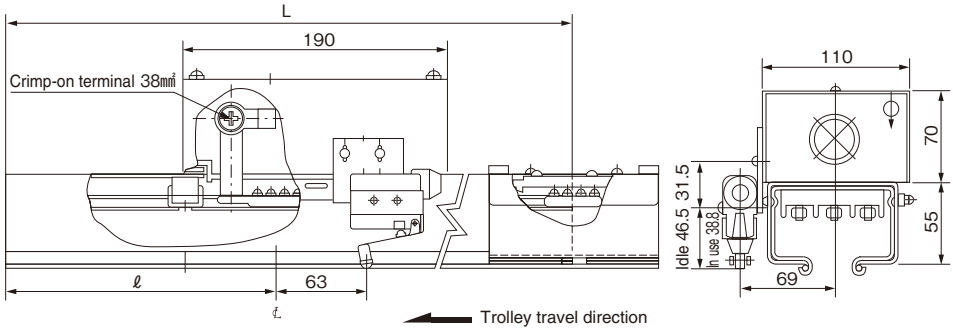


2P type has no center conductor & conductor splice.

A-A' cross-section

	No-conductor section dimensions
β-type cutting	6 120 6, 25

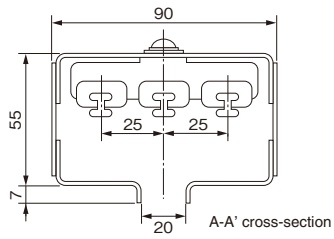
For power circuits (β-type cutting)



Note 1: Dimensions (L) and (ℓ) are determined after consulting customers.
2:See page 35 for β-type cutting.
3:Custom-made products.

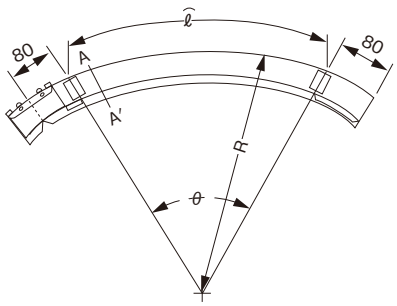
Vertically curved duct(Custom-made products)

The vertically curved duct is available in two types: downward-facing and upward-facing.
●Coupling plate set and conductor splice included.
●Hot-dipped galvanized steel

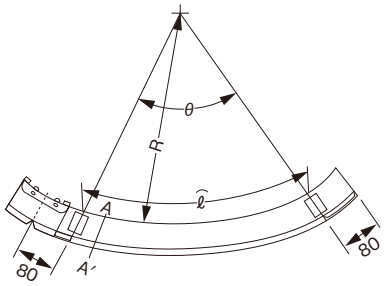


Note: 2P type has no center conductor.

Downward-facing



Upward-facing



Equation $\overset{\frown}{\ell}=3.14\times2R\times\frac{\theta}{360}$

Type	Rating	Minimum radius R		Duct length $\overset{\frown}{\ell}$	
		With conductors	Without conductors	Minimum	Maximum
1004	2P100A 3P100A	2,000㎜～	1,500㎜～	500㎜	1,800㎜

Note: Use a 40A trolley. 80A trolley cannot be used. Equation $\overset{\frown}{\ell}=3.14\times2R\times\frac{\theta}{360}$

Micro-rod attached trolley(Custom-made products)

Used with an automatic control circuit for conveyor lines, this trolley includes a mechanism for operating the microswitches which are built into the ducts. Use together with a circuit-separating duct.

●2P･3P, 40A trolley
〈for 100A ducts〉

8㎟ pressure terminals included.

Type	Product name	Weight (kg)
1004	2P40A trolley	0.9
1004	3P40A trolley	0.9

Note: Custom-made products.
●Refer to page for the replacement trolley collector.

UD-type trolley

Used on circuits which partially employ a Trolley Duct. A mechanism that allows the trolley to move smoothly from a non-duct section to a duct section is included. Use with a pick-up duct (see page 33).

●3P, 40A trolley
〈for 100A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6389K	1004	3P40A trolley	2.0

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

Point-use trolleys

Used where line switching is performed on circuits having turntables or traversers. Use with a point duct for line switching (see page 33).

●3P, 40A trolley 〈for 100A ducts〉

8㎟ pressure terminals included.

Cat. No.	Type	Product name	Weight (kg)
DH6399	1004	3P40A trolley	0.9

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

●3P, 80A trolley 〈for 100A ducts〉

Without pressure terminals.

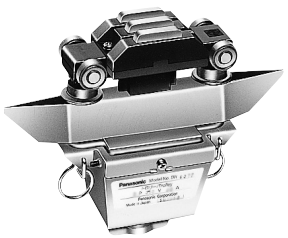
Cat. No.	Type	Product name	Weight (kg)
DH6393	1004	3P80A trolley	1.6

Note: 2P type is custom-made.
●Refer to page for the replacement trolley collector.

Dustproof trolley(Custom-made products)

For use with the custom-made dustproof Trolley Ducts.

●3P, 40A trolley 〈for 100A ducts〉



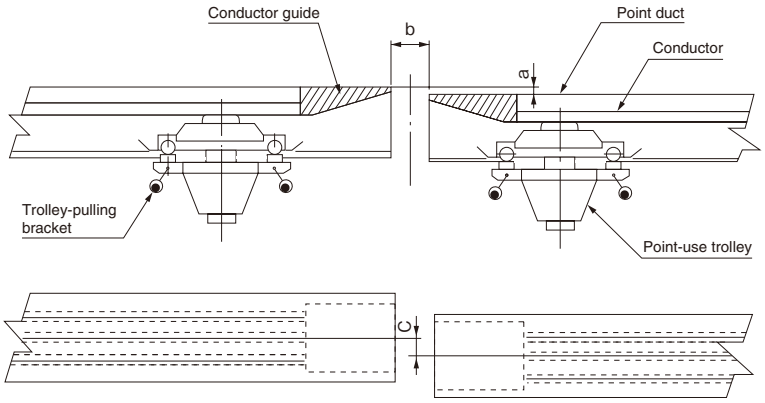
Type	Product name	Weight (kg)
1004	3P40A trolley	1.1

Note: Custom-made products.

Detailed information regarding switching points (traversers and turntables)

1.Connect two point-use trolleys using a coupling fixture. (For trolley connecting procedures, see page 43.)
2.Use a sideway-traverse hanger for the point duct (see page 45).
3.Allowable installation errors (during operation) are listed below:

Allowable installation error	
a (level)	3 max.
b (gap)	10~30
c (off-center)	3 max. b:(10~15)
	5 max. b:(16~30)

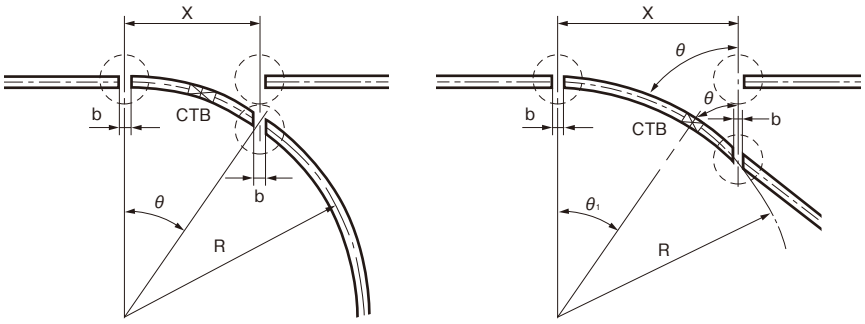


●Standard point dimensions

Rating			Minimum radius	θ	θ1
Voltage (V)	Point-use trolley		R	Max.	Max.
300V	2P 3P	40A	1200	68°	22°
	4P 5P	20A		59°	31°
600V	3P	40A			
	3P	80A	2500		

R	Max. X	
	60A	100A
1200	1112	1028
1500	1390	1285
1700	1576	1457
2000	1854	1714
2300	2132	1971
2800	2595	2399

●Standards for cutting points



CTB: Center feed-in box

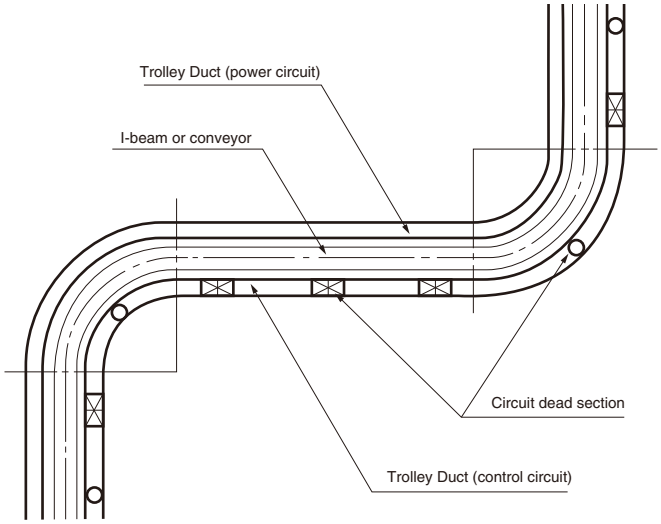
Note: Dimensions for X should be determined by checking the spacing between the hoist/I-beam and the duct.

Providing an automatic control circuit

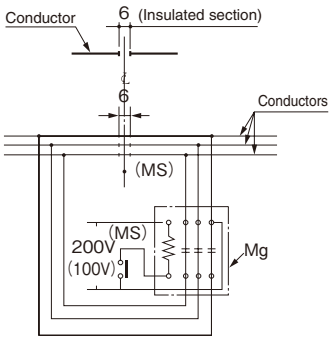
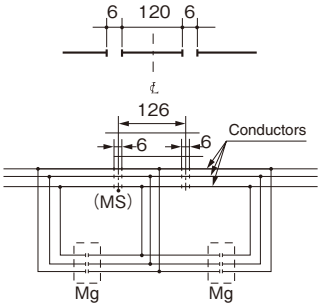
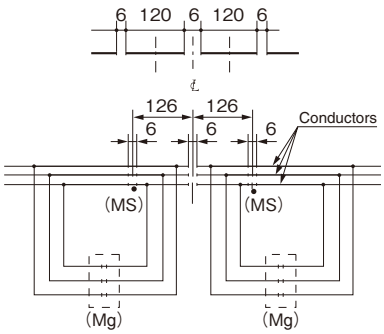
Automated conveyor lines require a control circuit to prevent conveyed items colliding or for automatic elevation of a hoist, in addition to the Trolley Duct for feeding power to the lines. A circuit-separating duct (including a section with no conductors) is used for the control circuit. Consult Matsushita Electric Works for conductor cutting methods and their applications.

●Types of conductor cutting

Name	Conductor cutting point	Symbol
α-type cutting	Conductor 6 (Insulated section)	
β-type cutting	6 120 6	



Conductor cutting methods

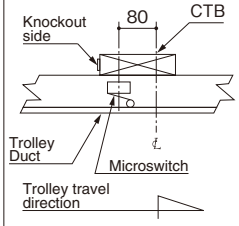
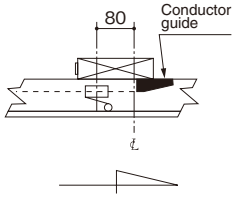
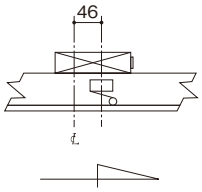
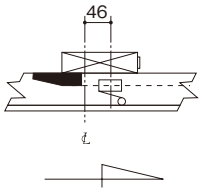
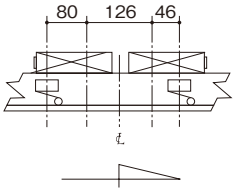
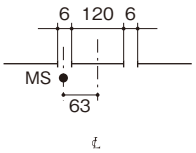
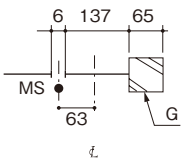
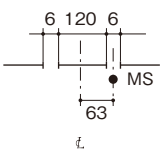
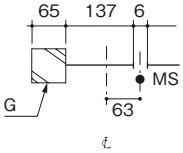
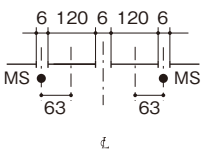
	α-type cutting〔without neutral sections〕	β-type cutting〔with one neutral section〕	γ-type cutting〔with two neutral sections〕
Cutting point			
Symbol			

MS: microswitch

Mg: Magnetic switch

Note 1: Magnetic switch connection is provided separately.
2: A microswitch is included with a duct.
3: An 80A trolley cannot be used.

Circuit-separating ducts

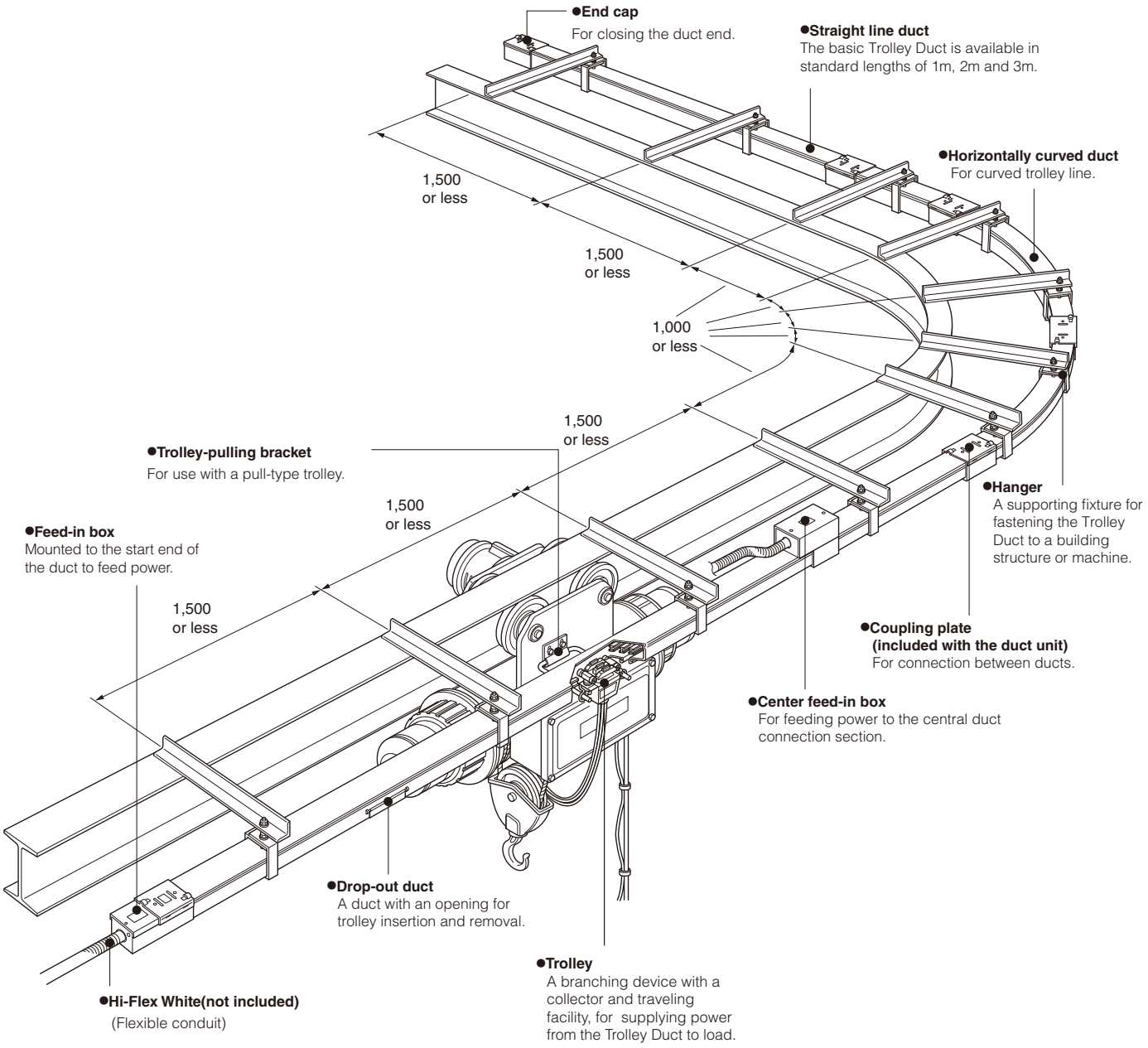
CTB mounting direction	Front		Back		Front/back
External view					
Conductor cutting point					
Symbol					

CTB: Center feed-in box, MS: Microswitch, G: Conductor guide

Note1: The same cutting method should be applied to all the conductors to be cut (2P - 5P).
2: Use a micro-rod attached trolley with a duct with a microswitch (see page 29 and 33).

Trolley Duct installation procedures

Unit : mm



Notes

- Use hanger more than two piece about one of the duct by all means. but in the case of the duct equal to or less than 1m,use hanger more than two piece by all means. (The dimensions of the figure are reference.)
- Make sure to use at least two hanger for curved duct.

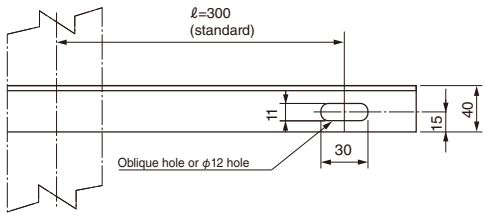
Unit : mm

1 Making a bracket available

Brackets for mounting the trolley supporting hanger are not provided by Panasonic Electric Works Co., Ltd. Commercially available angles should be used.

Duct rating			Bracket
2P 3P	AC 300V	30A 60A	L-40×40×5
4P 5P	AC 300V	30A 60A	
2P 3P	AC 600V	100A	

●Standard bracket dimensions 30A/60A/100A

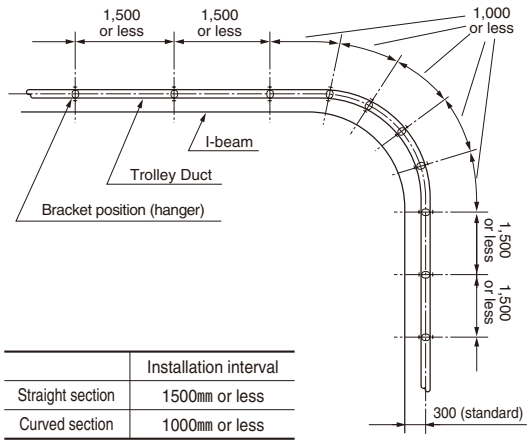


⚠ Caution

●If brackets other than those shown above are to be used, the brackets must be of a material with strength equal to or surpassing the specified brackets, otherwise the Trolley Duct may fall. Determine "ℓ" dimensions by taking the relationship with the device in use into consideration.

2 Installing brackets

1.Determine the bracket installation positions making sure that the hanger positions will not coincide with the Trolley Duct connections or drop-out duct openings for trolley insertion.
2.Install the brackets on I-beams or other building structures.

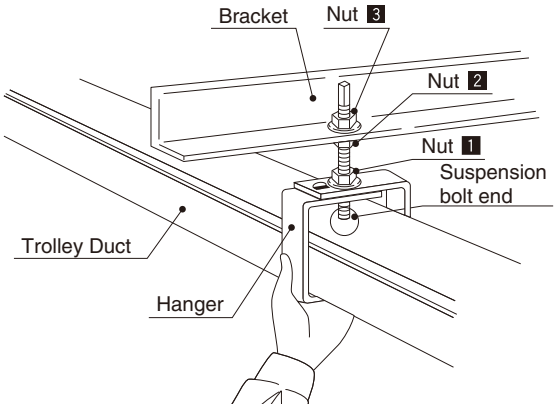


	Installation interval
Straight section	1500mm or less
Curved section	1000mm or less

⚠ Caution

- Standard installation intervals for brackets are shown above.
- Make sure to use at least one hanger for each duct, otherwise the duct may fall.
- Make sure to use at least two hanger for curved duct.

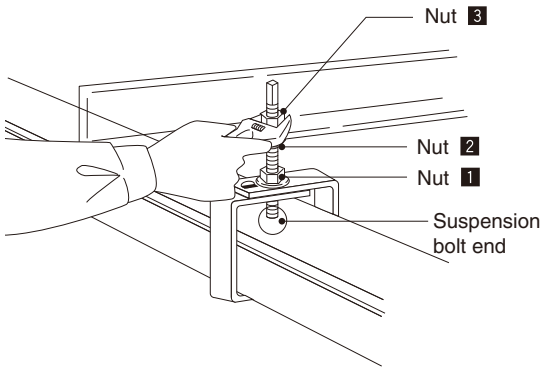
3 Installing the hangers



1.Mount the hanger onto the bracket and temporarily secure the Trolley Duct as shown. Turn the bolt until its end slightly contacts the duct upper surface and tighten the nut 1 to secure the duct.

Notes

- Before fastening the nut 1, check to see there is no gap between the hanger side face and duct side face.
  Otherwise, the duct may be fallen down.
- When the unt 1 to secure the duct, please warn that the bolt turns together.
- When the suspension bolts closed too much, there is a threat that the opening of the trolley duct becomes small.



2.Adjust duct height with the nut 3 and connect the sections of the duct. Securely attach the hanger to the bracket by tightening the nut 2. Make sure to tighten the nut 2 securely; otherwise the duct may fall.

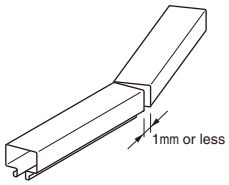
Notes

- For Trolley Duct connection, see section " 4 Connecting the Trolley Duct sections."
- Check to see that the centers of the hangers and ducts are aligned correctly with each other; otherwise poor contact may occur or the trolley may separate from conductors.
- Fix the hanger precisely on the bracket.

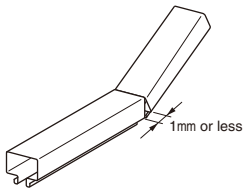
4 Connecting the Trollley Duct sections

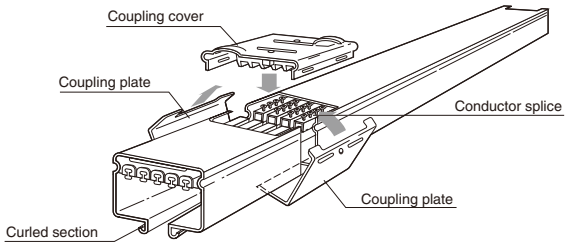
Standard of construction accuracy

1. Horizontal construction accuracy

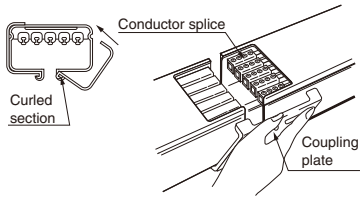


2. Vertical direction construction accuracy

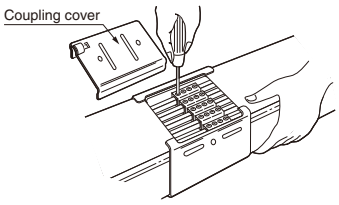




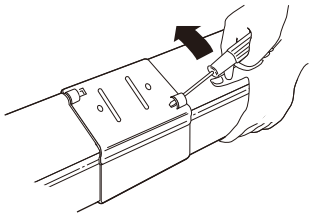
(**Drawing shows a 5P Trolley Duct.**)



1.Insert the conductor splice to the conductor and connect the duct sections, and install the right and left coupling plates over the curled section as shown.
Make sure to fit the left and right plates over the curled section correctly; otherwise the duct may fall.

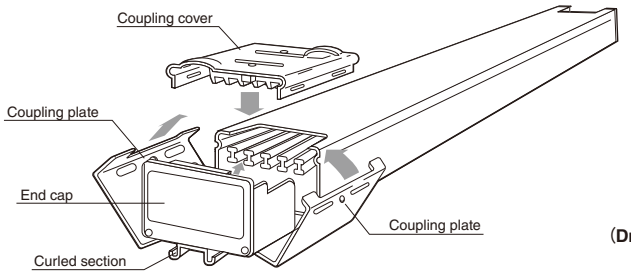


2.Move the conductor splice to the center of the connection section and tighten the screws securely. Then install the coupling cover.
Screws must be tightened securely in order to avoid any danger from fire.
Do not mount forcibly include a center shift. otherwise the conductor is twisted, and burr occurred on conductor or doing so may result in fire.
(Tightening torque: 1.0 to 1.5N.m)

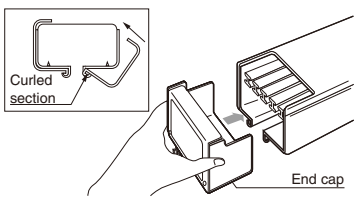


〈Removing the coupling cover〉
The coupling cover can be removed easily by inserting a screwdriver into the hook of the coupling cover and lifting it up.

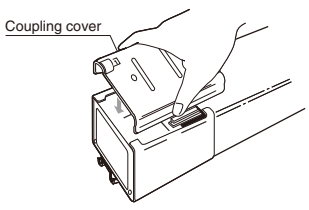
5 Installing the end cap



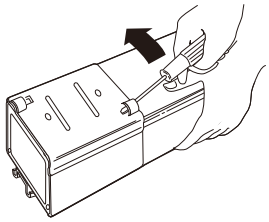
(**Drawing shows a 5P Trolley Duct.**)



1.Fit the end cap onto the end of the duct and fit the left and right coupling plates over the curled section.
Make sure to fit the left and right plates over the curled section correctly; otherwise the duct may fall.



2.Mount the coupling cover.



〈Removing the coupling cover〉
The coupling cover can be removed easily by inserting a screwdriver into the hook of the coupling cover and lifting it up.

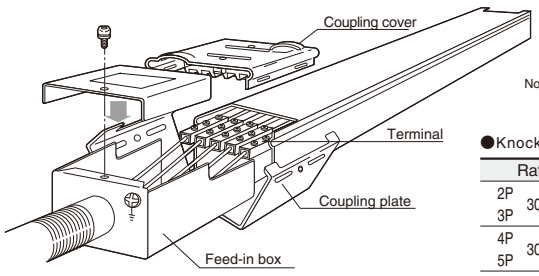
Unit : mm

6 Installing the feed-in box

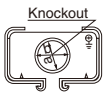
Trolley Duct type			Size of fitted flexible conduit	Cross section area of fitted wire
Rated voltage	Rated current	No. of poles		
AC 300V	30A	2・3	30	22mm²
	60A	4・5	38	22mm²
AC 600V	100A	2・3	38	38mm²

⚠ Caution

- Please decide the use electric wire in consideration of the load capacity etc.There is fear of a fire.
- Agreement flexible conduit changes by the electric wire used, and select it according to the electric wire, please.



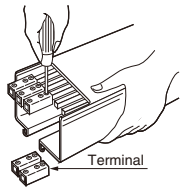
(**Drawing shows a 5P Trolley Duct.**)



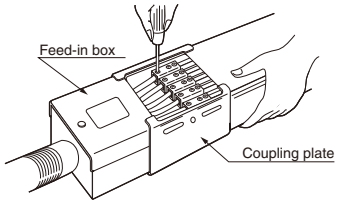
Note:Remove the knockout or make a hole in the end of the feed-in box before installing it to the Trolley Duct.

●Knockout dimensions

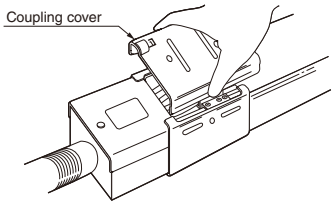
Rating			a	b
2P 3P	300V	30A 60A	ϕ26.1	ϕ32.5
4P 5P	300V	30A 60A	ϕ32.5	ϕ38.8
2P 3P	600V	100A	ϕ32.5	ϕ38.8



1.Insert the terminal to the conductor and tighten the screws securely. Fit the feed-in box onto the duct and install the left and right coupling plates over the curled section. Install the coupling plates securely over the curled section; otherwise the Trolley Duct may fall.
(Tightening torque: 1.0 to 1.5N.m)

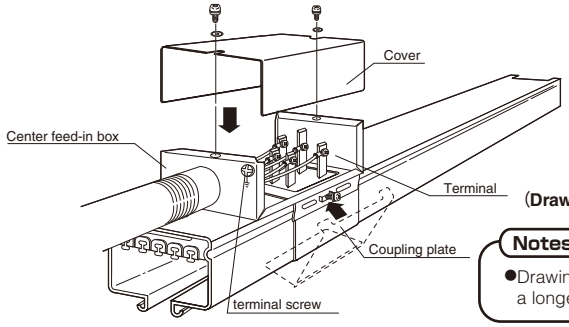


2.Connect wires to the feed-in box terminal board. Hi-Flex (class 2 metal flexible conduit) is most appropriate for piping. Make sure to connect the wires to the terminal board correctly by securely tightening the terminal screws; otherwise fire may result.
(Tightening torque: 1.0 to 1.5N.m)



3.Install the coupling cover. To remove the coupling cover, insert a screwdriver into the hook of the coupling cover and lift it up.

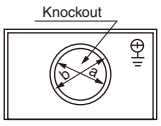
7 Installing the center feed-in box



(**Drawing shows a 5P Trolley Duct.**)

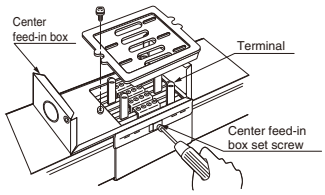
Notes

- Drawing shows a 5P Trolley Duct with a longer center terminal.

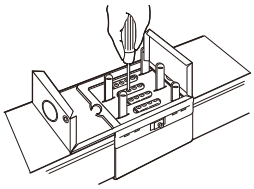


●Knockout dimensions

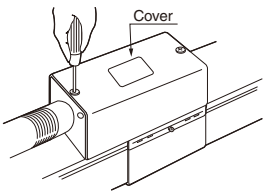
Rating			a	b
2P 3P	AC 300V	30A 60A	ϕ26.1	ϕ32.5
4P 5P	AC 300V	30A 60A	ϕ32.5	ϕ38.8
2P 3P	AC 600V	100A	ϕ32.5	ϕ38.8



1.Insert the terminals into the conductor as shown. Install the coupling plates, fit the cover and tighten the feed-in box set screws. Correctly install the coupling plates over the curled section; otherwise the Trolley Duct may fall.



2.Secure the terminals to the conductor. Hi-Flex (class 2 metal flexible conduit) is most appropriate for piping.
(Tightening torque: 1.0 to 1.5N.m)

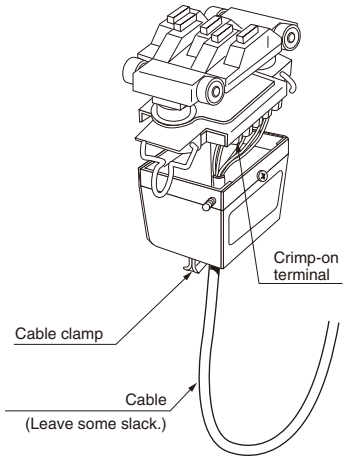


3.After wire connections, place the cover.

Notes

Tighten the terminal screws securely; otherwise fire may result.

8 Wiring



■Connecting wires to the trolley

Use cabtire cables for the cables, and fasten them securely using crimp-on terminals. A 20A trolley comes with 3.5mm^2 crimp-on terminals; a 40A trolley comes with 5.5mm^2 crimp-on terminals. (However, for an 80A trolley, the cables should be connected directly to the terminals.)

When installing the cables, be sure to use the cable clamp to hold them securely.

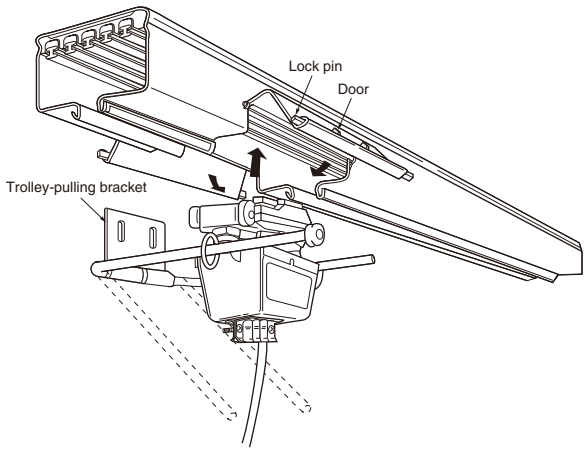
Notes

- Tighten terminal screws securely. (Tightening torque: 1.0 to 1.5N·m)
- Do not hang anything other than the power cables from the trolley.
- Leave sufficient slack in the cables so that the trolley does not tilt during travelling.

●Use cabtire cables for cables.

Trolley type			Compatible cables
Rated voltage	Rated current	No. of poles	No. of cores × nominal cross-sectional area × No. of cables
AC 300V	20A	2	2 cores × 0.75 to 5.5mm^2 × 1
		3	3 cores × 0.75 to 5.5mm^2 × 1
			4 cores × 0.75 to 5.5mm^2 × 1
		4	2 cores × 0.75 to 5.5mm^2 × 2
		5	3 cores × 0.75 to 5.5mm^2 × 2
			4 cores × 0.75 to 3.5mm^2 × 1
			5 cores × 0.75 to 3.5mm^2 × 1
	40A	2	2 cores × 0.75 to 8.0mm^2 × 1
		3	3 cores × 0.75 to 8.0mm^2 × 1
			4 cores × 0.75 to 5.5mm^2 × 1
		4	2 cores × 0.75 to 8.0mm^2 × 2
		5	3 cores × 0.75 to 8.0mm^2 × 2
			4 cores × 0.75 to 5.5mm^2 × 1
			5 cores × 0.75 to 5.5mm^2 × 1
AC 600V	40A	2	2 cores × 0.75 to 8.0mm^2 × 1
		3	3 cores × 0.75 to 8.0mm^2 × 1
			4 cores × 0.75 to 5.5mm^2 × 1
	80A	2・3	Single core × 8 to 30mm^2 × 3

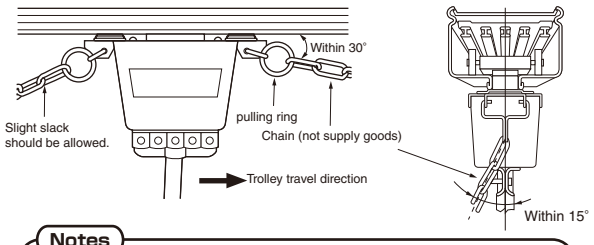
9 Installing and pulling the trolley



1. Insert the trolley into the opening of the drop-out duct. The opening of the drop-out duct can be opened by grasping the lock pin and unlocking it. After insert the trolley, securely close the opening. Incorrect locking may result in the trolley dropping down.
2. After insert the trolley, hand-move it about 30㎝ to check to see that it moves smoothly and the collector and the duct conductor correctly contact each other.

When using a chain (not supply goods)

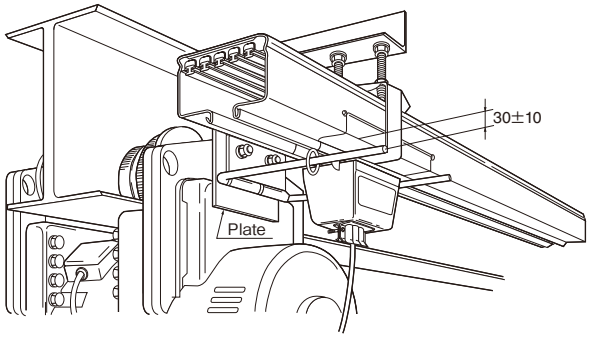
Mount the chain to the pulling ring as following under drawing.

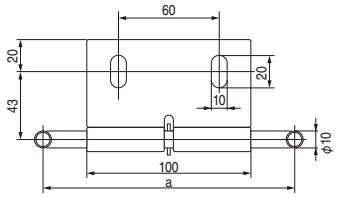


Notes

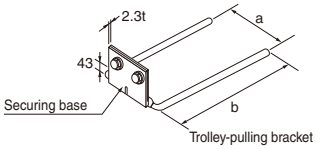
- Use that the chain angle is settled within the limits of the drawings.Not following the regulations may result in the imperfect contact and the trolley derailment.

10 Using the trolley-pulling bracket





Securing base



1.Tighten the trolley-pulling bracket to the plate attached to the crane or hoist using bolts. The plate should be purchased separately.
2.A 30㎜ space should be allowed between the duct bottom surface and the trolley-pulling bracket rod. Installation position can be adjusted by changing the securing base direction and using the oblique hole. Use M8 bolts.
3.Install the trolley-pulling bracket so that trolley-pulling bracket rod becomes it in parallel with an axle of the crane.

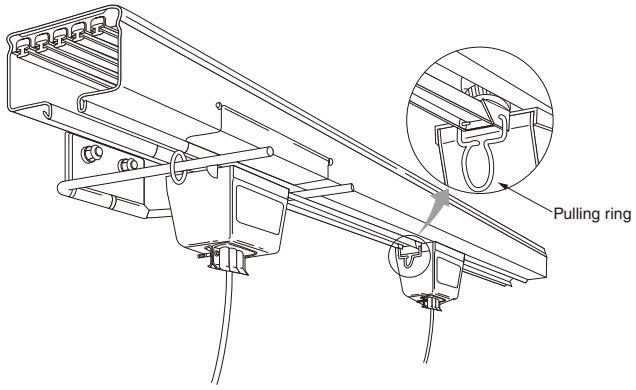
Notes

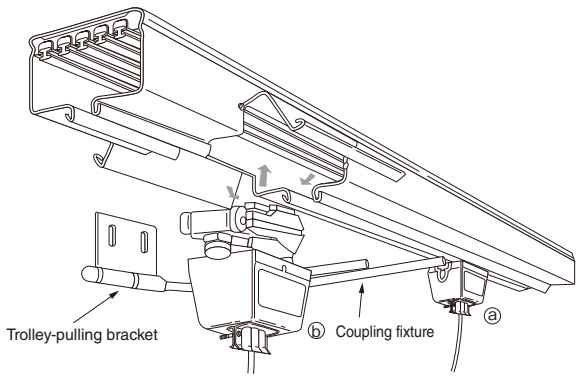
●Not travelling smoothly, the trolley tilt during the trolley, the trolley conductor is worn and the burrs occur.

Unit:㎜

Product name		Trolley-pulling bracket (A-1)	Trolley-pulling bracket (A-2)	Trolley-pulling bracket (B-1)
Dimensions	a	145	145	200
	b	250	400	250
Compatible trolleys		2P20A 3P20A 4P20A 5P20A 2P40A 3P40A 4P40A 5P40A		2P80A 3P80A

11 Connecting trolleys





●When connecting two trolleys, install the trolley-pulling bracket onto one of the two trolleys.

Product name	Dimensions and shape	Trolley rating	
Coupling fixture A	25, 250, 10	2P20A·40A 4P20A·40A	3P20A·40A 5P20A·40A
Coupling fixture B	30, 250, 13	2P80A	3P80A

Unit:㎜

1.Connecting two or more trolleys will facilitate smoother power collection in the following conditions. Use coupling fixtures when connecting trolleys.
①When a single trolley cannot provide enough capacity.
②When trolley's separation from conductors is a major problem.
(When one trolley becomes separated from conducters, the other can compensate for it, and vice versa.)
③For point use. (There will be no dead sections at switching points of ducts.)
2.When mounting the coupling fixtures:
1)Insert the trolley ⓐ into the duct.
2)Hook the coupling fixtures onto the rings of trolley ⓐ and trolley ⓑ and insert the trolley ⓑ into the duct.
3.When using the trolley-pulling bracket (A-2), do not use coupling fixtures.

12 Installing the pickup duct

●A pickup duct is used at the section where the trolley is inserted from space to within the trolley duct (such as on lines equipped with fire protection shutters, etc.) to enable the trolley to be smoothly inserted into the duct. In addition, for the trolley also, for this type of application use the UD-type trolley.

Notes

- ●For trolleys,use two UD-trolleys.
- ●Use two sideway traverse hanger on the duct of the pickup duct section.
- ●Installation and usage ranges should be kept within the range shown in Table 1. and C lever should be kept within the range shown Table 2.
- ●The installation positions for the sideway traverse hangers should be within 300mm from the pickup duct section.
- ●The distance from the pickup duct to the facing location should be a distance of at least 300mm.
- ●Installation interval of the UD-trolley should be a distance of at least 900mm. and should be a distance of at least 1500mm from the pickup duct section.

Table 1

Mounting position	a (level)	30A	For 2P/3P	100±3mm
		60A	For 2P/3P	
		30A	For 4P/5P	105±3mm
		60A	For 4P/5P	
		100A	For 2P/3P	
	b (de-centering)			0±2mm

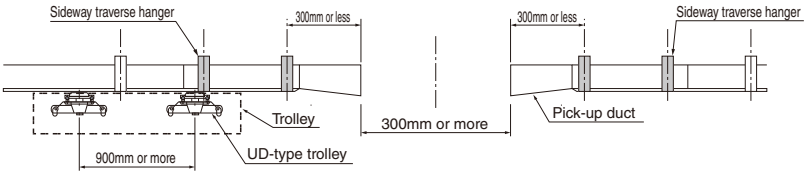
* Size a indicates the distance from the top surface of pickup duct to UD type trolley mounting hole.

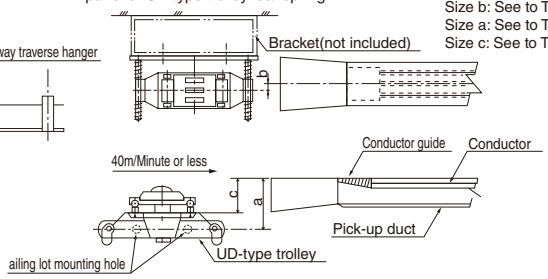
Table 2

c (level)	30A	For 2P/3P	78±3mm
	60A	For 2P/3P	
	30A	For 4P/5P	83±3mm
	60A	For 4P/5P	
	100A	For 2P/3P	

* Size c indicates the distance from the top surface of pickup duct to top panel of UD type trolley leaf spring.

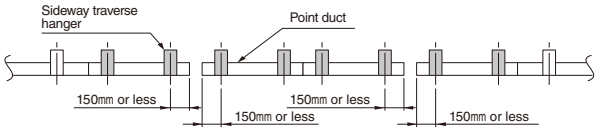
Size b: See to Table 1.
Size a: See to Table 1.
Size c: See to Table 2.





13 Installing the point duct

1. For trolleys, use two point trolleys and pull them separately using a pulling arm.
2. Use two sideway traverse hangers on the duct of the point duct section.
3. Installation standards should be kept within the ranges shown in Table 1.
4. The installation positions for the sideway traverse hangers should be within 150mm from the point duct section. However, for curved ducts, etc. where it is not possible to install the sideway traverse hangers within 150mm from the point duct section, the sideway traverse hangers should be installed as close as possible to the point duct section.



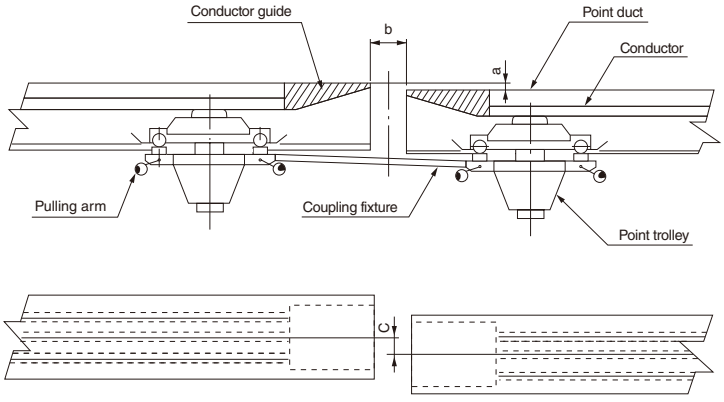


Table 1

Installation standards	
a (Level)	3mm以下
b (Gap)	10～30mm
c (Center shift)	3mm以下 b：(10～15mm)
	5mm以下 b：(16～30mm)

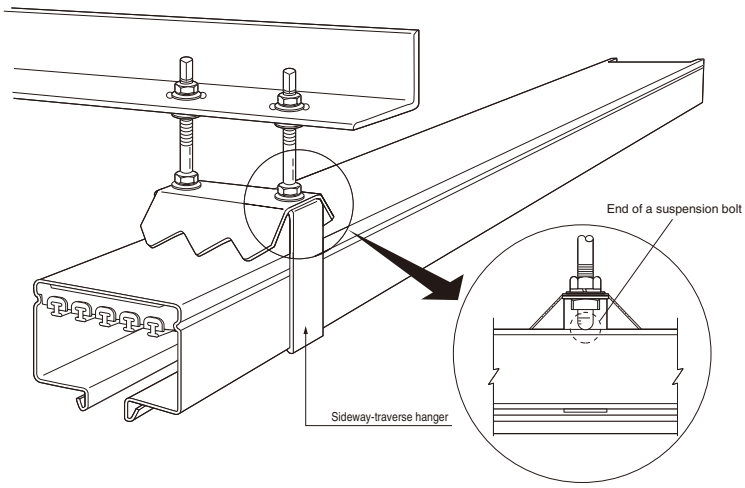
Sideway-traverse hangers

For applications where the I-beam or other structure onto which the Trolley Duct is installed is not stationary, but moves or rotates (e.g. crane girders, turntables, etc.), a sideway-traverse hanger capable of absorbing Trolley Duct vibration should be used, in order to avoid the duct dropping.

■Installing the sideway-traverse hanger

⚠ Caution

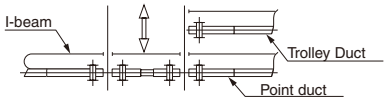
- Press the ends of the sideway-traverse hanger suspension bolts against the duct upper surface.



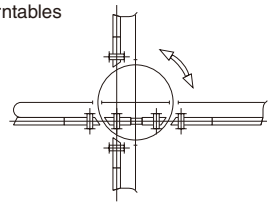
■Locations where the sideway-traverse hanger should be used

①When using a point-use duct

●Traversers

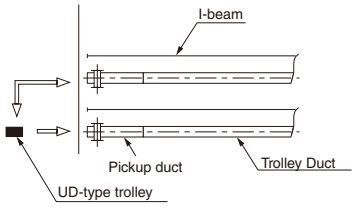


●Turntables



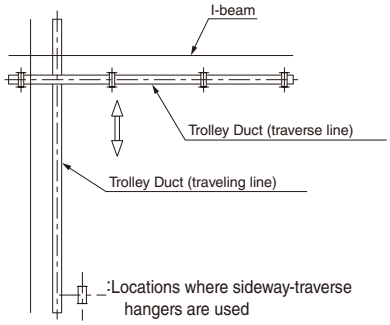
:Locations where sideway-traverse hangers are used

②When using a pickup duct



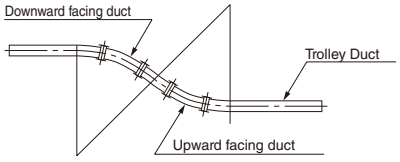
:Locations where sideway-traverse hangers are used

③Trolley Duct for traverse movement



:Locations where sideway-traverse hangers are used

④Vertically curved duct

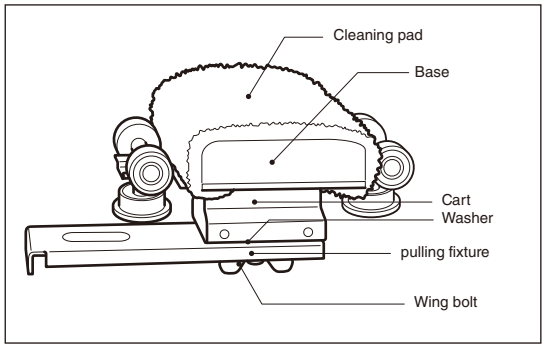


:Locations where sideway-traverse hangers are used

Using the conductor cleaner

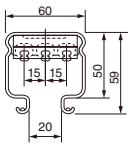
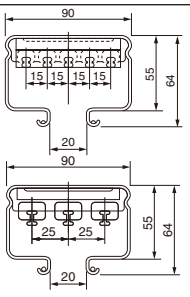
The conductor cleaner is a cleaning cart that removes some foreign substances, such as, dust or burr adhering on the conductor sliding surface of the trolley duct so that the duct is always clean if you run it periodically.

■Name of each part



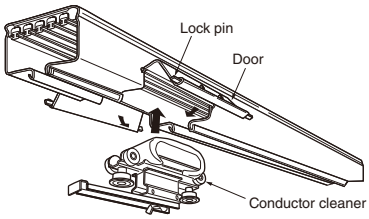
■Types of conductor cleaner

There are two types depending on the trolley duct housing types, as follows:

Cat. No.	Product name	Suitable duct type and its rating
DH6166	Conductor cleaner 	 2P30A 3P30A 2P60A 3P60A
DH6202	Cleaning pad 10pcs/set	
DH6167	Conductor cleaner 	 4P30A 5P30A 4P60A 5P60A 2P100A 3P100A
DH6203	Cleaning pad 10pcs/set	

■How to use

1.Open the opening of the drop-out duct and insert the conductor cleaner into the duct.

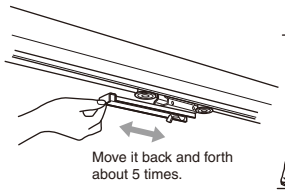


2.Run the conductor cleaner back and forth about 5 times to perform cleaning of the conductor.

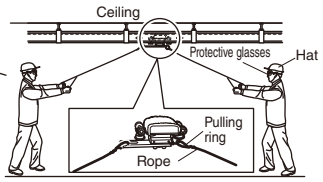
①In areas where you can reach, hold the pulling fixture and perform cleaning.

②In areas where you cannot reach, attach a pulling ring to the pulling fixture or cart, and use a rope, etc. to perform cleaning.

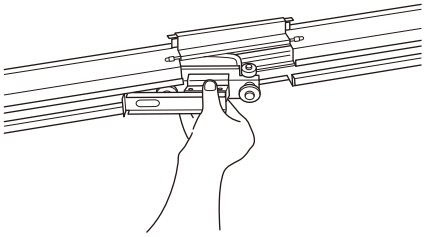
①When hands can reach:



②When hands cannot reach:



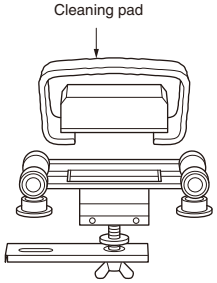
3.After cleaning, remove the conductor cleaner from the duct and use an air blower, etc. to clean inside the duct.



■Replacing the cleaning pad

Wrap the base with the cleaning pad and put it on top of the car and fasten the wing bolt.

This cleaning pad is available at cost.



Notes

- Replace the cleaning pad with a new one when it is deformed into concave shape.

⚠Caution

- **Be sure to switch off the power to the duct when using the conductor cleaner. Failure to do so may cause electric shock or short-circuiting.**
- **Always remove the conductor cleaner from the duct after cleaning.**
- **When cleaning, be sure to wear protective equipment.**
- **Cleaning should be performed approximately once every 3 months. However, this should be increased or decreased depending on your usage conditions.**
- **The cleaning pad should be replaced every 50m as a general criteria.**
  Failure to do so may result in dirtying of the conductor due to abrasion by the cleaning pad.
- **After removing the conductor cleaner from the duct, be sure to close the door of the drop-out duct securely.**

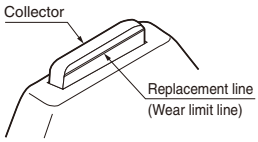
Replacement of collectors

Unit : mm

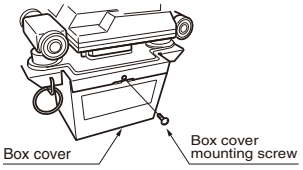
1 Removing collectors

■Collector replacement timing

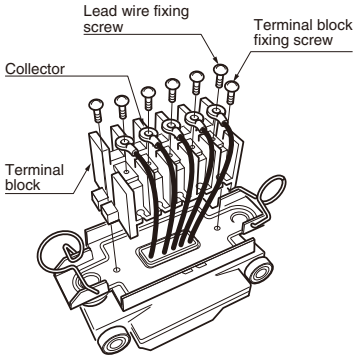
Collectors have an engraved replacement line. Replace collectors when they have been worn down to the replacement line. In addition, if there is a possibility that the collector will be worn down to the replacement line before the next maintenance cycle, the collector should be replaced early.



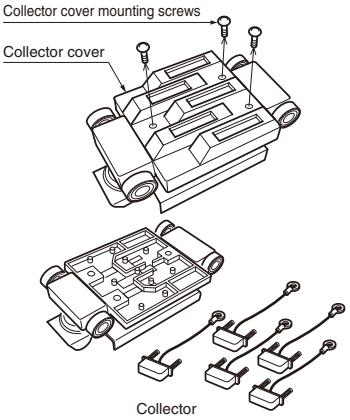
1.Unscrew the box cover mounting screw and remove the box cover.



2.Unscrew the lead wire fixing screws and terminal block fixing screws inside the box and remove the terminal block.



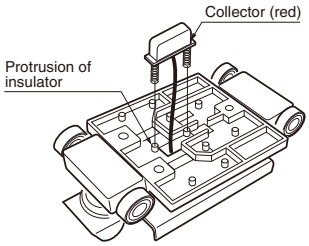
3.Unscrew the collector cover mounting screws, remove the collector cover, and remove the collectors.



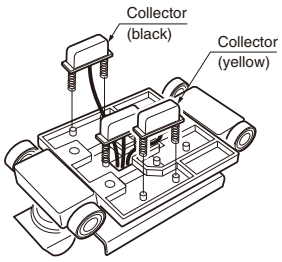
2 Installing collectors

1.Install the collectors in the insulator in the positions corresponding to the painted colors. (Example: 5 collectors)

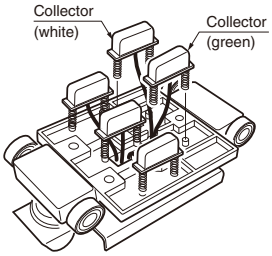
①Install the center collector (red) of the 3-collector row first in the insulator side.



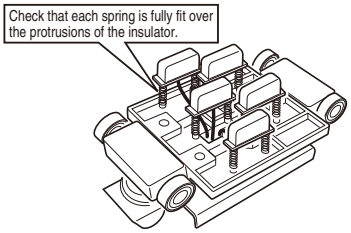
②Install the collectors (yellow, black) on both sides of the 3-collector row.



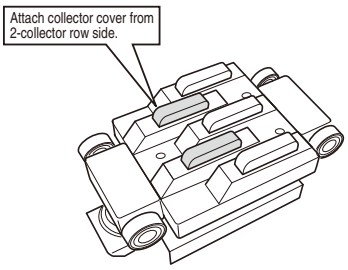
③Install the collectors (white, green) in the 2-collector row side.



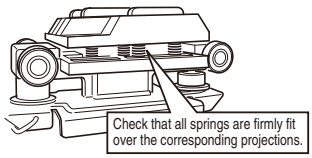
④Check that the springs of the collectors are fully fit over the protrusions of the insulator.



⑤Attach the collector cover from the 2-collector row side.

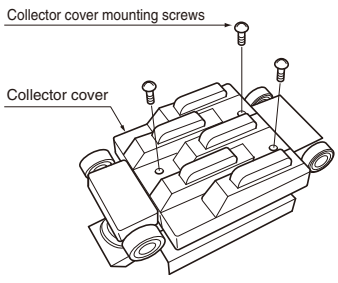


⑥Look through the gap between the insulator and the collector cover and check again that all springs are fully fit over the projections.
※If a spring has come out of the projection, use tweezers to put the spring back in its proper position.



⚠Caution When passing the collector lead wires through the insulator, be sure that the wires do not cross over each other. In addition, pass the lead wires through in the order of the terminal block colors.
～Failure to do so may place strain on the collectors, resulting in disconnection, arcing, uneven wear, etc.～

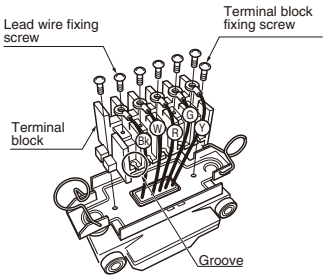
2.Attach the collector cover. (Tightening torque: 1.0 to 1.5N·m)



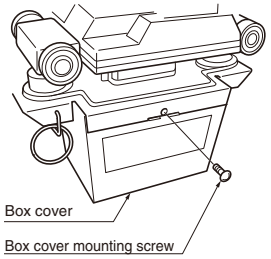
Notes

- Be careful not to pinch the silicon tubes.
- Make sure that the collector shoes move up and down direction smoothly.

3.Match the colors of the silicon tubes from the collectors to the corresponding colors of the terminal block and fasten the lead wires in place by tightening the lead wire fixing screws. After that, push the lead wires into the grooves, and fasten the terminal block with the terminal block fixing screws. (Tightening torque: 1.0 to 1.5N·m)



4.Replace the box cover and tighten the box cover mounting screw. (Tightening torque: 1.0 to 1.5N·m)



Trolley Duct general properties

1.Materials

Component		Material
Duct	Rated current : 30~100A	Hot-dipped galvanized steel plate
Conductor	Rated current : 30A	Brass rod
	Rated current : 60A 100A	Tough pitch copper rod
Conductor support		Polyester resin (premix)
Collector		Copper-based sintered alloy

2.Properties

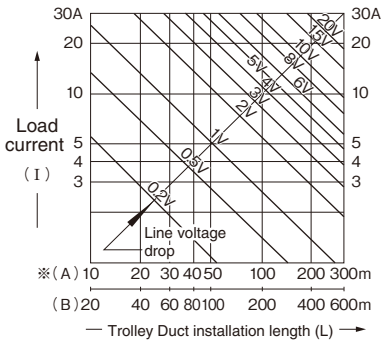
●Impedance

Rated current	Resistance R (mΩ/m)	Reactance X (mΩ/m)	Impedance Z (mΩ/m)
30A	2.02	0.14	2.03
60A	0.57	0.14	0.59
100A	0.44	0.16	0.47

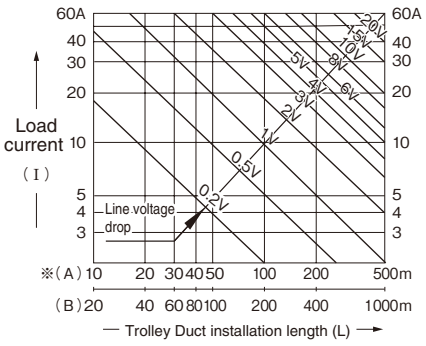
■Line voltage drop (3-phase, 3-wire)

●Line voltage drop equation Line voltage drop $E=\sqrt{3}\cdot I\cdot Z\cdot L$

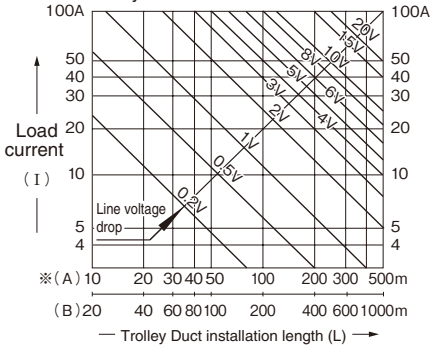
30A Trolley Duct



60A Trolley Duct



100A Trolley Duct

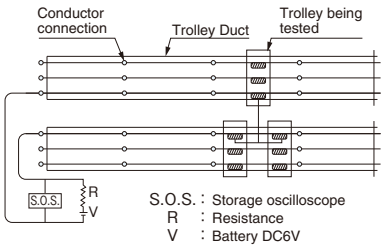


※ (A) represents the length when power is fed into only one end. (B) represents the length when power is fed into both ends or at the center.

3.Derailing characteristics

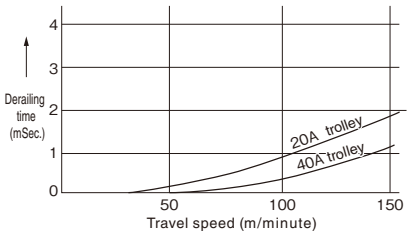
●Test method

Using the circuit shown at right, have the trolley travel both ways at a speed of 40-120m/minute and measure the time for which it derails or separates from the wires.



●Test results

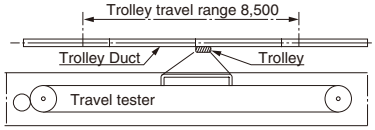
For 20A and 40A trolleys



4.Abrasion properties

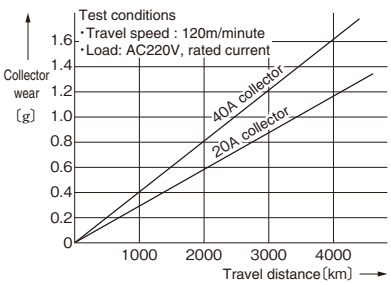
●Test method

Install the Trolley Duct and trolley on the travel tester as shown below. Operate the trolley for travel both ways by applying a rated current, and check the change in wear in relation to the travel distance.



●Test results

For 20A and 40A collectors



5.Pulling tension

Rating	Pulling tension(kg)
3P 300V 20A	1.5 or below
5P 300V 20A	2.5 or below
3P 300V 40A	2.0 or below
5P 300V 40A	2.5 or below
3P 600V 40A	2.0 or below
3P 600V 80A	3.0 or below

Trolley Duct Maintenance (Test run and periodic inspection)

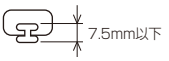
Notes

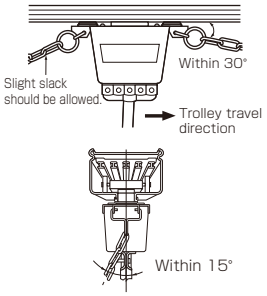
＜To Maintenance manager＞

- **Inspections item at the time of the pre-use test run(Checking at periodic inspection).**
- **For using safely, please inspect the system one month after starting regular operation.**
- **The inspection cycle is mentioned below. However, determine your own inspection cycle based on the actual operating rate and environmental condition.**
- **Items in bold: Inspection items requiring particular attention.**

Result	○ : Normal	Measures	○ : Exchange required
	× : Abnormality		● : Finished with exchange
			△ : Adjustment required
			▲ : Finished with adjustment

A title		Check day	Y D M	The check person in charge	

Product	Parts	Inspection area	Inspection details	Possible causes of problems	Remedy/countermeasure	※	Result	Measures	Inspection frequency
Trolley Ducts Drop-out ducts	Conductor	Surface	Check for deposits of foreign substances.	Oil and/or dust particles present in duct interior.	Clean using conductor cleaner. Depending on the conditions, it can be smoothed with a file. Clean inside of duct with air blower, etc.				Once every 3 to 6 months
			Check for scratches.	Oil and/or dust particles present in duct interior.					
			Check for burrs on the conductor.	Contact between conductor and collector is uneven.	Clean using conductor cleaner. Adjust how trolley is pulled.				
				Surface of trolley collector is uneven.	Clean using conductor cleaner. Grind the surface of the trolley collector.				
			Check for traces of arcing.	Burr occurred on conductor and short-circuited.	Clean using conductor cleaner. Depending on the conditions, it can be smoothed with a file. Clean inside of duct with air blower, etc.				
				Contact between conductor and collector was lost.	Check the wear condition of the collectors and replace if necessary. Check whether foreign materials have gotten inside the duct, and clean out if necessary.				
				A conductive foreign material got inside and short-circuited.	Check whether foreign materials have gotten inside the duct, and clean using air blower, etc.				
			(Disconnected conductor sections)	There is a large difference in voltages between the two conductors.	Use a file to file down conductors. Modify circuit.				
			(Trolley transfer sections)	There is a large voltage difference between the conductor and the collector at the time of the trolley transfer.	Use a file to file down conductors. Modify circuit.				
			Has wear condition reached the exchange standard? **Does wear of a duct reach a standard of exchange before the next check?**	Estimated replacement The 20 million number of times of trolley passage or wear of conductor 0.5 mm depth  Measure the duct terminal area after removing a conductor joint.	Replace trolley				
		Joints	**Check if conductor splice screws are loose.**	Duct is moving a lot.	Tighten screws more. (Proper tightening torque: 1.0 to 1.5N・m) Take anti-vibration countermeasures.	○			
			Check that the two conductor joint screws on each side of the splice are tight.	Faulty installation	Fix by fastening with 2 screws on each side.	○			
	Insulator	Surface/side surface	Check that there are no cracks.	Duct fell or was subject to impact.	Replace duct body.				
	Duct (casing)	Duct inside surfaces	Check for dust particle accumulation.	Friction dust; Entrance of dust from outside	Clean with cotton rags or air blower.				
			Check for burrs on the duct opening.	Trolley is running tilted due to the influence of the cable. Trolley is running tilted due to the effect of center of gravity.	Remove burrs and clean inside of duct. Adjust how trolley is pulled.				
			Do not wear on the case?	It wears out by friction with a trolley.	Replace the duct.				
		Joints	Check for misalignment of the duct openings.	Connecting plate is not securely fit into the curled section of the duct.	Fit connecting plate securely into the curled section of the duct.	○			
			Check that joint sections are straight and not angled.	Duct was not installed perfectly straight.	Change the positions of the hangers and brackets, and improve the linearity of the duct.	○			
		Drop-outs	Check that doors are securely closed.	Lock pin is not fit securely into the curled section of the duct.	Fit lock pin securely into the curled section of the duct.	○			
Feed-in boxes Center feed-in boxes	Terminal	Screws; Conductor splices	**Check for looseness.**	Duct is moving a lot.	Tighten screws more. (Proper tightening torque: 1.0 to 1.5N・m) Take anti-vibration countermeasures.	○			
			Check for discoloration.	Temperature increase due to loose screws or disconnection of wiring.	Tighten screws more. Replace wires.				
			Check that the two conductor splice screws on each side of the splice are tight.	Faulty installation	Fix by fastening with 2 screws on each side.	○			
			Check if screws on power supply section are loose.	——	Tighten screws more.	○			

Product	Parts	Inspection area	Inspection details	Possible causes of problems	Remedy/countermeasure	※	Result	Measures	Inspection frequency
Trolleys	Collectors	Friction surfaces; Side surfaces	Check for deposits of foreign substances.	Oil and/or dust particles present in duct interior.	Clean with cotton rags, etc.				Once every 1 to 3 months
			Check for roughness.	There is a difference in height between the conductor connection sections. Traces of arcing generated on the conductor are grinding it down.	Fix the conductor connection section. Grind off the traces of arcing on the conductor surface.				
			Check for traces of arcing on surface. (Inside of duct)	Contact between conductor and collector was lost.	Grind the conductor surface. Replace if necessary. Check whether foreign materials have gotten inside the duct, and clean out if necessary.				
			Check for traces of arcing on surface. (Inside of duct)	A conductive foreign material got inside and short-circuited.	Check whether foreign materials have gotten inside the duct, and clean using air blower, etc.				
			Check for traces of arcing on surface. (Inside of duct)	There is a large voltage difference between the two conductors at the disconnected section.	Use a file to file down conductors. Modify circuit.				
			Check for traces of arcing on surface. (Inside of duct)	At the trolley transfer section, there is a large voltage difference between the conductor and the collector at the time of the trolley transfer.	Use a file to file down conductors. Modify circuit.				
			Check whether wear has reached the wear limit line or whether it will reach the wear limit line before the next maintenance.	——	Replace collectors.				
			Check that conductor surface is even.	Contact between the conductor and collector is tilted. Duct itself is twisted due to faulty installation.	Grind the surface of the collector. If necessary, adjust the way the trolley is pulled. Adjust the linearity of the duct body.				
			Check for occurrence of burrs.	——	Remove burrs.				
			Check that collector moves up and down smoothly.	Friction dust has accumulated and movement has become poor.	Disassemble collector section and clean.				
	Running wheels; Guide wheels	——	Check if wheels rotate smoothly. Check for abnormal rattling.	Bearing damage, etc.	Replace trolley.				
	Terminal boxes	Terminal	**Check screws for looseness. Check for discoloration.**	Looseness of screw or disconnection.	Tighten screws more. Fix disconnection.				
		Cable clamps	Check if cable is clamped correctly.	Clamp size is not suitable for outside diameter of cable.	Correc	○			
			Check that pulling is not done with cable.	——	Adjust how trolley is pulled.	○			
			Check for cable insulation damage.	Cable is often bent. Force is applied to cable.	Adjust cable wiring conditions.				
	Pulling method	——	When using a chain (not supply goods) for pulling the trolley, take care that the chain angle is settled within the limits of the drawings. 	——	Adjust pulling angle. Be reexamined how trolley is pulled.	○			
	Travel characteristics	——	Check that trolleys can move within the duct smoothly.	Opening is narrowed because of hanger. Duct is not properly connected.	Adjust hanger. Adjust connection.	○			
(Common inspection items for all Trolley Duct components)	Insulation resistance	Between poles Between pole and ground	When operating voltage is 300V or less: Voltage to ground 150V or less : 0.1MΩ or more Voltage to ground higher than 150V : 0.2MΩ or more	——	・Clean the surface of the trolley duct insulator. ・Clean trolley surface or inside of terminal box.				
	Ground resistance	Duct and equipment	When operating voltage is more than 300V:0.4MΩ or more Operating voltage: 300V or less: D-type grounding : 100Ω or less More than 300V: C type grounding : 10Ω or less						
Hanger and bracket	——	Mounting parts, screws, nuts, etc.	・Check screws and nuts for looseness. ・Check for deformation. ・Check that hanger is properly fastened to duct.	——	Retighten screws. Correct.				Once every 3 to 6 months

Trolley Duct Related Products

For details, refer to respective catalogs.

Collector Blocks

Superior reliability and wear resistance enhance conveyor efficiency and safety.

Panasonic has solved the many problems associated with conventional conveyor lines. These include collectors separating from the wires, collector shoe wear, and compromised safety. The development of new pallets and collectors, as well as a charged section has contributed greatly to improving efficiency and safety.

- Minimized collector separation from the wires or derailing.
- Enhanced collector durability for easy maintenance and servicing.
- The charged section employs a Tro-Reel or High-Tro-Reel insulated trolley to prevent electric shock and short-circuiting.

●Collector blocks

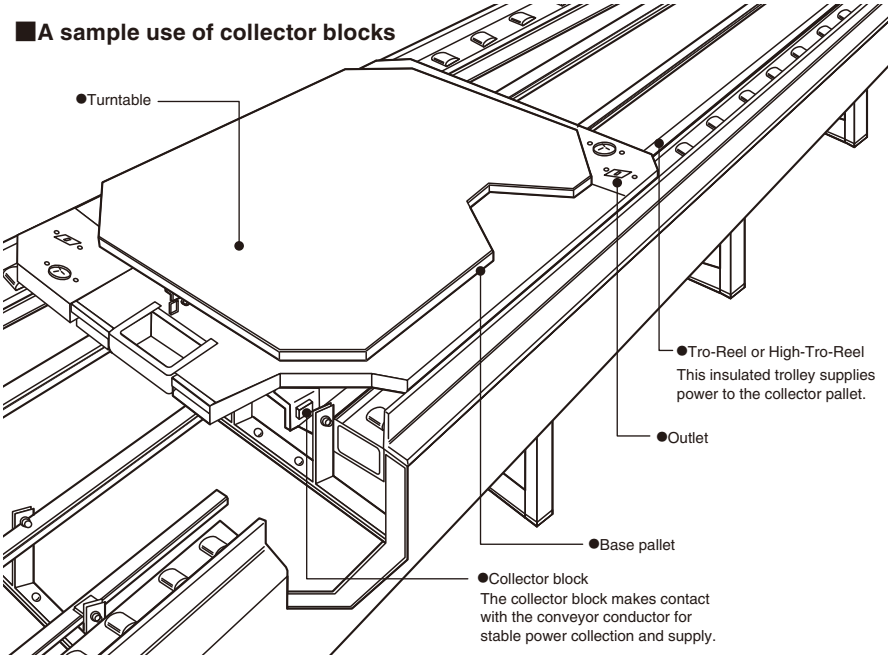
Type A (collecting power from a Tro-Reel)

Type B (collecting power from a copper bar)

Type D (collecting power from a copper bar)

Type C (collecting power from a copper bar) 2P, 3P, 4P and 5P

■A sample use of collector blocks

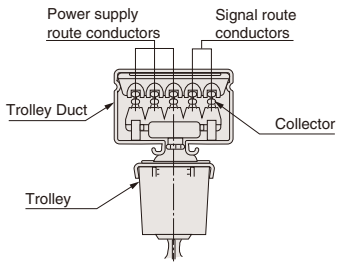


Trolley Mation

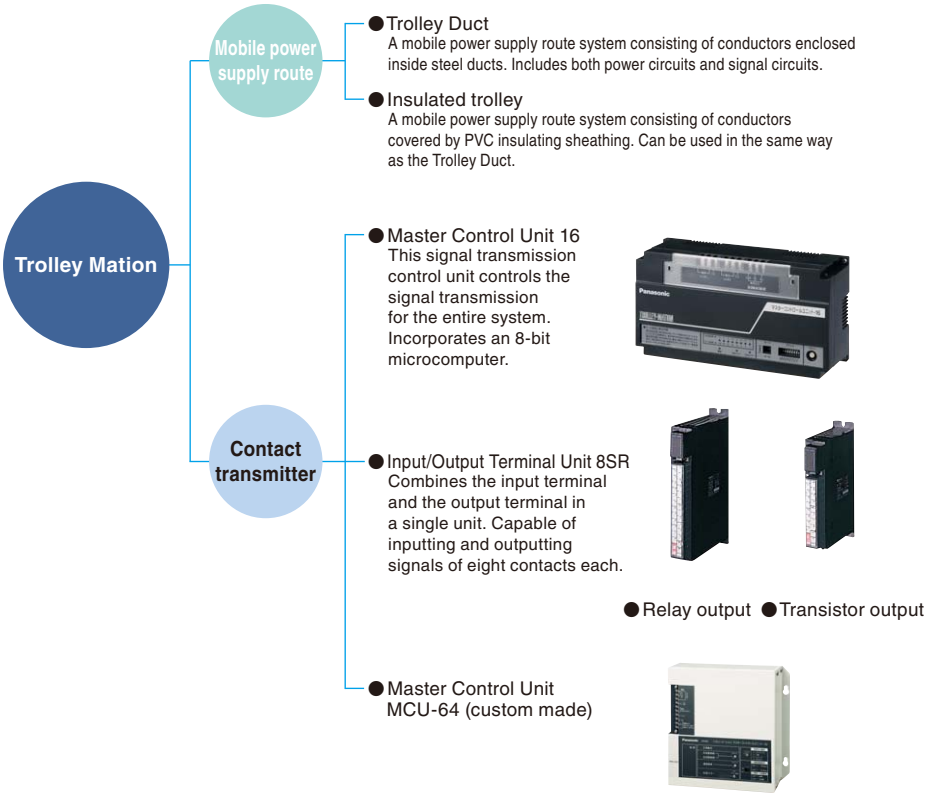
Transmitting power and signals for up to 256 contacts via a single duct to moving equipment.

The Trolley Mation contact transmitter has been developed by combining Panasonic experience in mobile power supply routes and multiplex transmission technology. Both a power supply and control signals for up to 256 contacts can be transmitted simultaneously via a single duct. The Trolley Mation serves as an effective aid in designing a total system to supply power and transmit control signals to moving devices.

- Power supply and control signal transmission via a single duct for a wiring system that significantly saves labor.



- Easy construction of an endless line control system.
- A high noise margin provides increased transmission reliability (signal voltage: ±65V).



Unit : mm

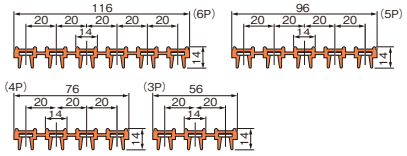
High-Tro-Reel (for indoor use only)
Multi-Lead Insulated Trolleys

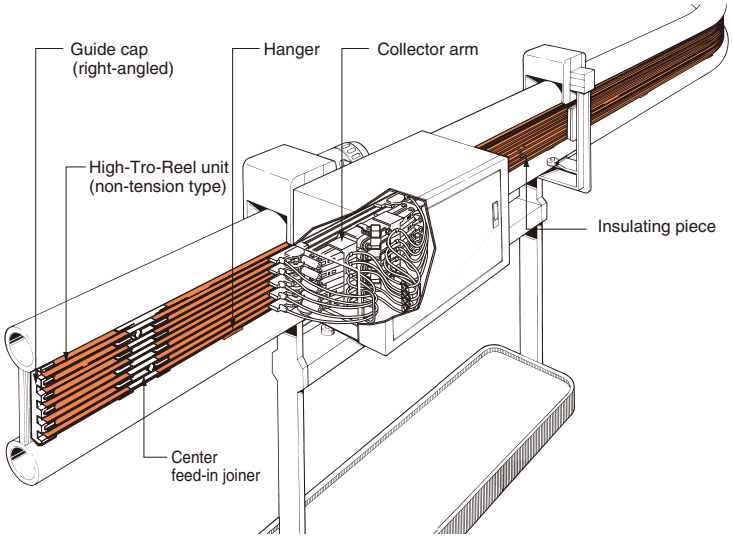
High-Tro-Reel multi-lead insulated trolleys are available in two versions - a non-tension type for supplying power to automated conveyor lines and a tension type for supplying power to hoists and cranes.

High-Tro-Reel (Non-Tension Type)
UL Listed

- Easy installation - simply snap the standard 3m High-Tro-Reel unit onto the hanger on the side of the rail.
- Installation on curved lines is possible (vertical curves only).
- When combined with a Trolley Mation, power supply and control signals can be transmitted simultaneously (5P and 6P types).

●Rating: 3P, 4P, 5P and 6P; 600V; 60A

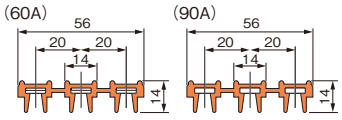


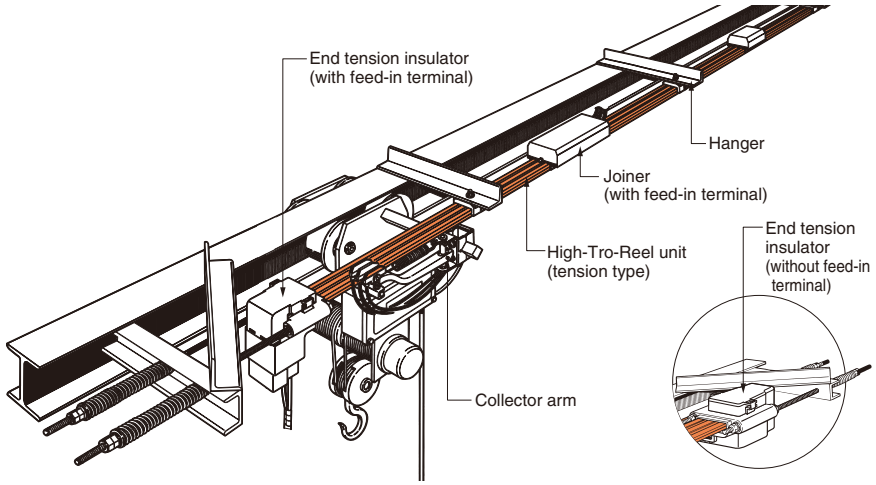


High-Tro-Reel (Tension Type)

- A multi-lead system makes conveyance, end-tightening and installation on a hanger extra easy and quick.
- Reduces installation space requirements.

●Rating : 3P, 4P, 5P; 600V; 60A
3P, 4P, 5P; 600V; 90A
3P, 4P; 600V; 150A
3P, 4P; 600V; 200A
Standard length :10m・30m・50m





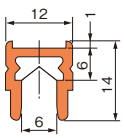
Tro-Reel HS (Non-Tension Type)
Indoor Use Insulated Trolleys・UL Listed

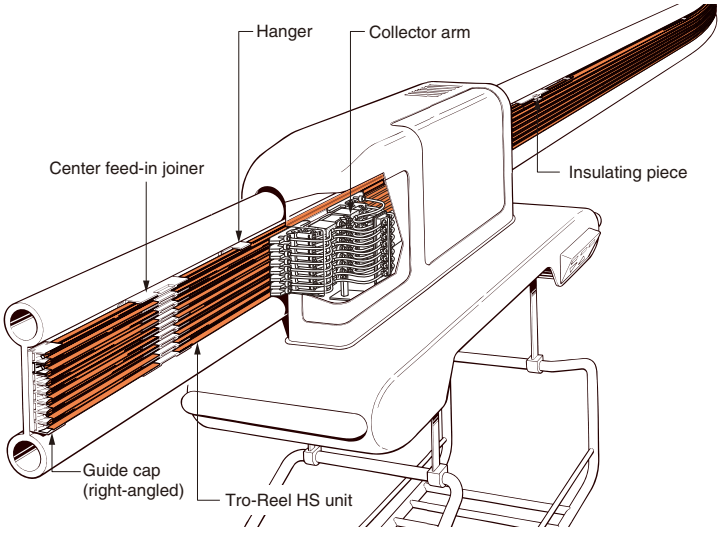
Even an 8P installation measures just 124mm in height. Ideal for multi-wire high-speed transport lines.

- 3m long Tro-Reel HS units are installed consecutively along the side of the rail. Installation on standard rails is quick and easy.
- The V-shaped conductors provide a large contact surface, ensuring consistently reliable power supply even at high speeds.
- Easy installation on curved lines as tight as 800mm in radius.

●600V;90A;3P-8P

●Sheath color: orange (Munsell 2.5YR6/13) or light blue (Munsell 5.5PB5.2/16)





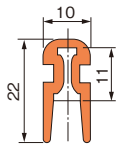
Tro-Reel
Insulated Trolleys for Indoor and Outdoor Use

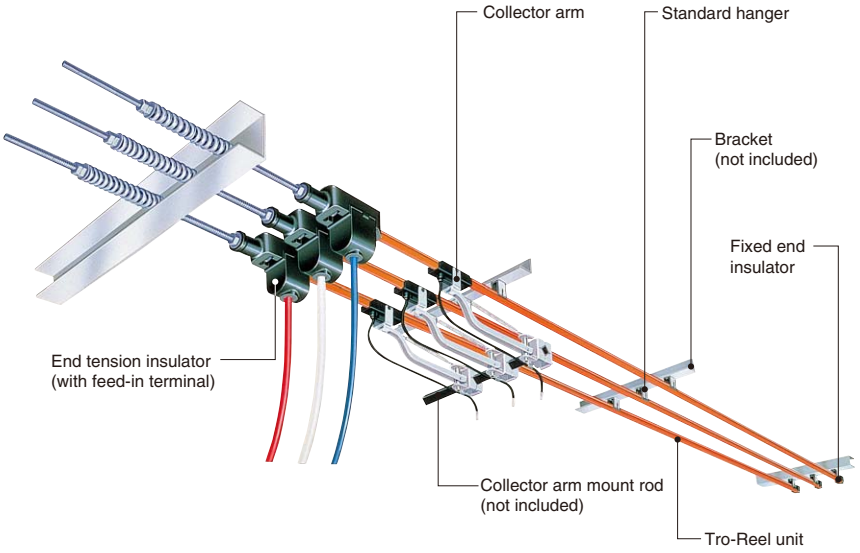
Simple installation of special lines in addition to power source routes for hoists and cranes.

Unit : mm

Recently, conveyance lines have become more and more complex and diversified. With a Tro-Reel unit, special power source routes can be installed easily including circuit separation, endless lines, and track switching circuits.

- Four types (60A, 150A, 200A and 300A) are available to choose from depending on the load.
- Easy installation and on-site work.
- Installation is possible in relatively poor environmental conditions (excluding 30A type).
- 100 meter jointless installation and reliable power collection during travel.





Factory Line Systems

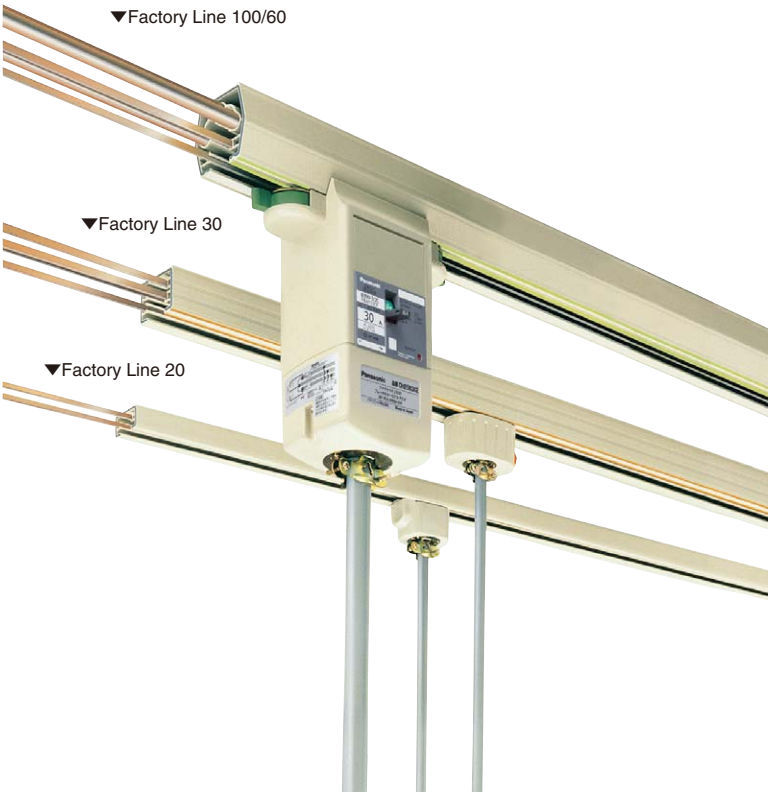
A total factory power supply duct system providing both main and branch circuits. Centralized monitoring and remote control are also possible.

The Factory Line system comprises a duct for the main line (100A and 60A) and branch lines (30A and 20A). A plug-in duct configuration allows power supply anywhere along the duct. Accommodates line layout changes and expansion flexibly and economically.

- A system can be configured to exactly match the scale of your factory.
- Provides drive load circuits, as well as power supply for lighting and electrical outlets from anywhere along a duct for neat wiring.

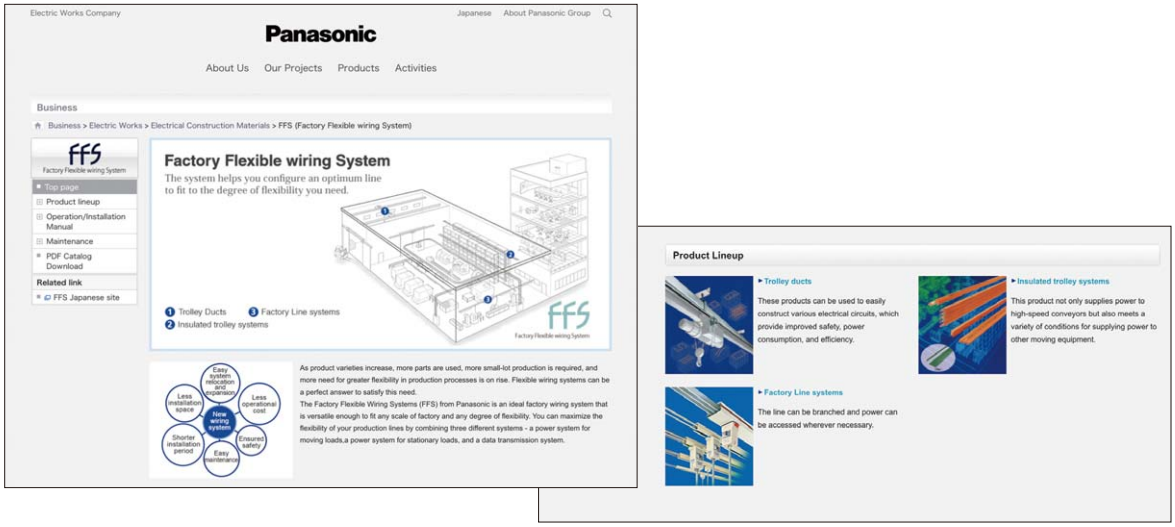
Factory Line System

- **Factory Line 100 and 60** — Used as the main line for providing power supply for drive power and lighting, and for direct branching to large capacity loads. 3P, 100A(60A), 440V +2P, 20A, 250V
- **Factory Line 30** — Providing branching circuits such as small drive loads, lighting, and electrical outlets. 4P, 30A, 440V
- **Factory Line 20** — Providing power supply for task lamps and electrical outlets. 2P, 20A, 220V



For information on the Panasonic Factory Flexible wiring System, visit

https://panasonic.net/electricworks/ecm/ffs/



※Note that screen images may be added or updated from time to time.

You can also download specification drawings and Operation/Installation Manuals.

Please contact .....

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