



Two-dimensional transport P&P system

Motor Driven Shuttle Mover ESM Series



ELECTRIC SHUTTLE MOVER ESM SERIES

Job Site Revolution New Solution for Transport



CKD Corporation

CC-1259A[5]

Motor Driven Shuttle Mover

ESM SERIES

Motorless type

Belt drive

Two-dimensional transport P&P system

Giving a new concept to the motorless actuator.

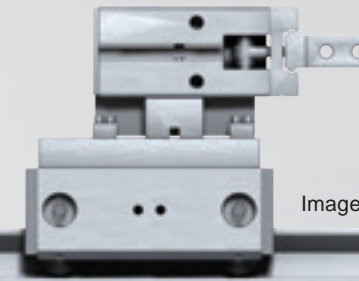


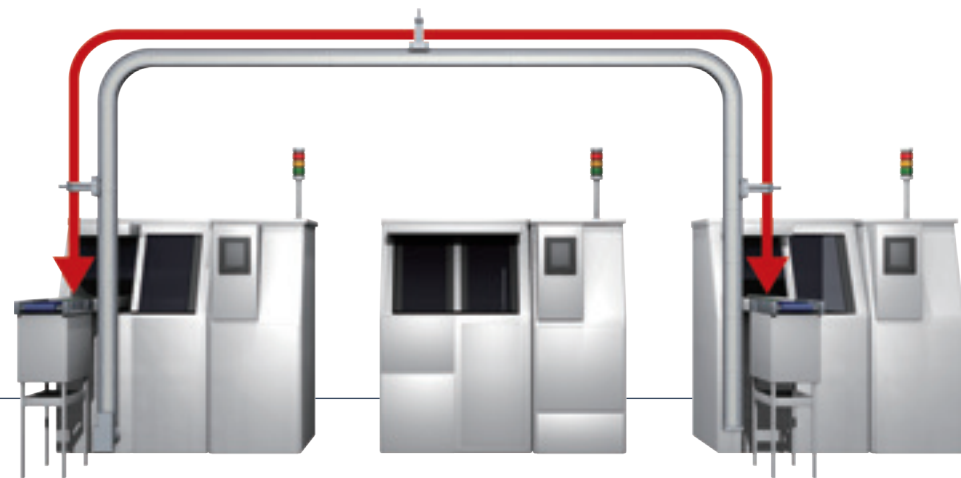
Image for illustration purposes. (Hand is sold separately.)

Modular connection of each rail

Free and flexible combination.

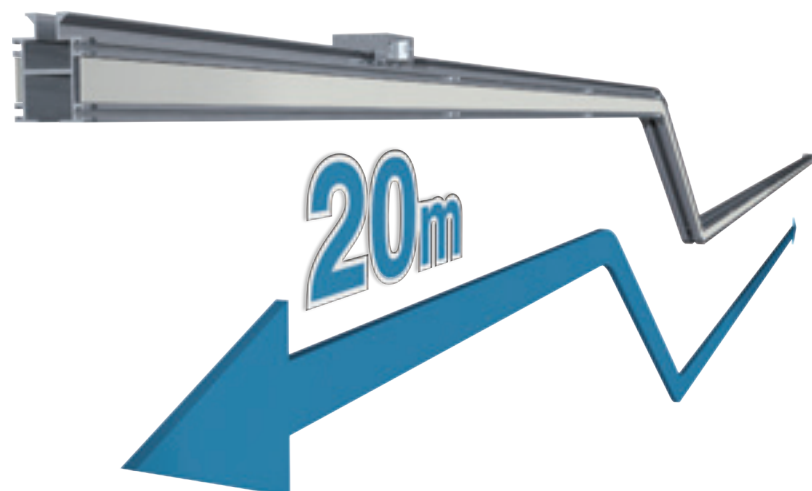
2D transport in a compact space with one motor

2D operation is realized without using multi-axis or gantry robots. The space can be utilized as desired. Ideal space-saving size.



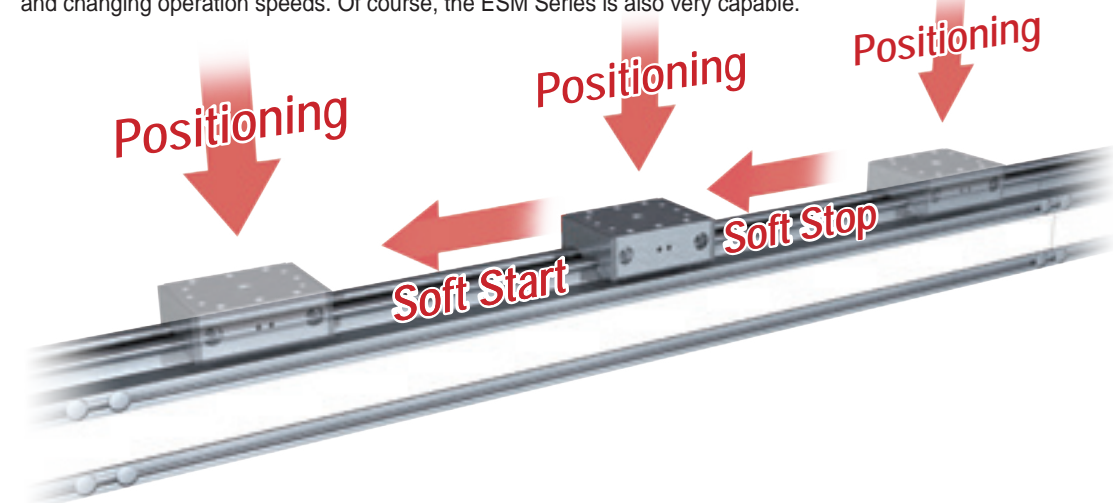
Long stroke a Max. of 20 m

Unusually long stroke lengths that shatter the conventional notion about electric actuators. Before considering linear motors, let ESM solve your problems.



Multiple point positioning and soft start & stop

Electric actuators are particularly adept at multi-point positioning, acceleration/deceleration settings, and changing operation speeds. Of course, the ESM Series is also very capable.



Motors by various manufacturers are supported

Mount motors you're familiar with. Includes brackets for motors from various companies, similar to the motorless series.

List of motor manufacturers and field networks

	General purpose	SSCNET	CC-Link	MECHATRO LINK-II	MECHATRO LINK-III	Device Net
MITSUBISHI	●	●	●			
Yaskawa Electric Corporation	●			●	●	●
Keyence Corporation	●			●		

This product does not have a motor mounted. The user must prepare, mount, and adjust the motor and driver. Refer to the table "Mounted motor specification and recommended motor model No. (rated output 750W)" on page 2 for details.

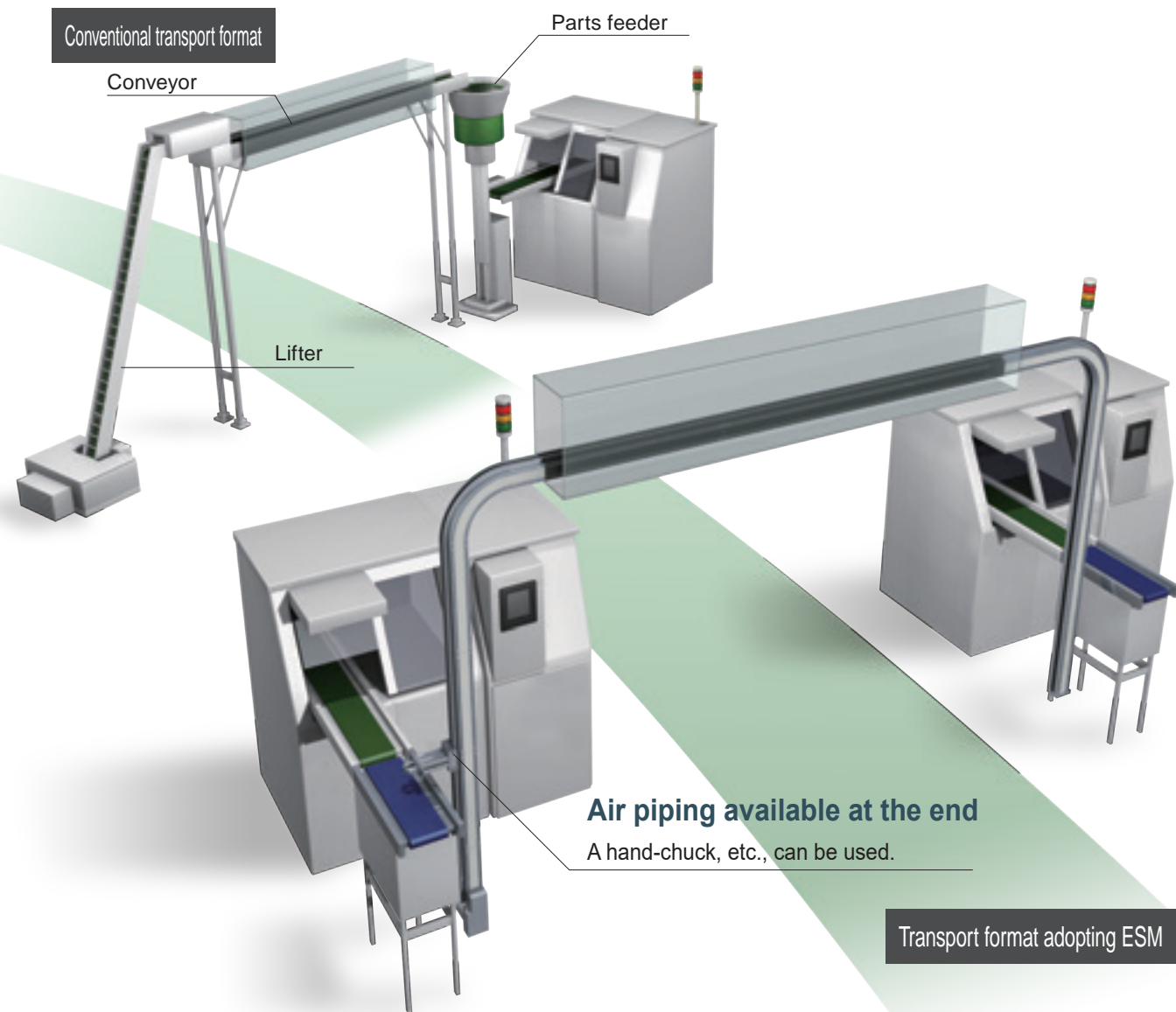
Solution examples

Effective use of space

Transport between devices to the next process

Two dimensional transport

To transfer a workpiece from device to device while securing the conventional passage.



Transport format adopting ESM

Effect example

- High speed transport is possible (straight part: max. 2,000mm/s, curved part: max. 1,500mm/s)
- Multi-point stop at any arbitrary position is possible (repeatability: $\pm 0.5\text{mm}$)
- Soft start and stop control are possible
- Set the path by combining straight lines and curved units ● Easy layout change after installation

For 3D transport

Air shuttle mover
SM-25

An air-driven three-dimensional P&P system which enables free three-dimensional layout. The bending technology enables curved movement without crushing the cylinder tube. 3D transport is realized.



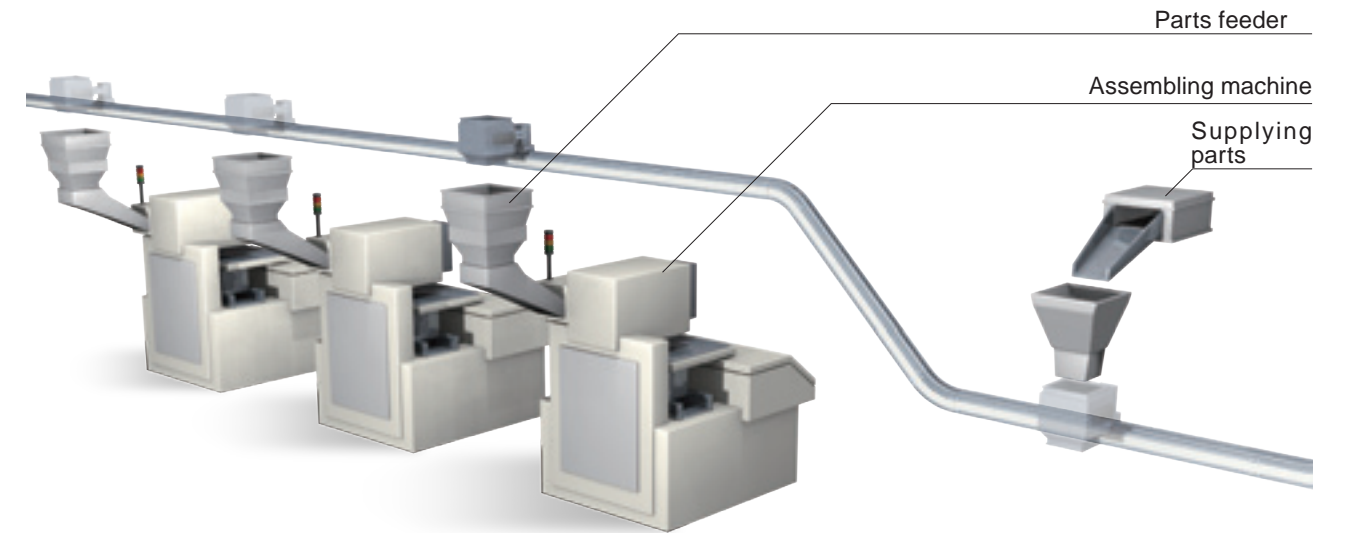
Transport problems can be solved with "ESM"! !

Increasing production efficiency

Parts are supplied to the same devices arranged in parallel.

Long stroke and multi-point positioning

The supply of assembly parts to the same equipment in large numbers can be integrated by one actuator.



Effect example

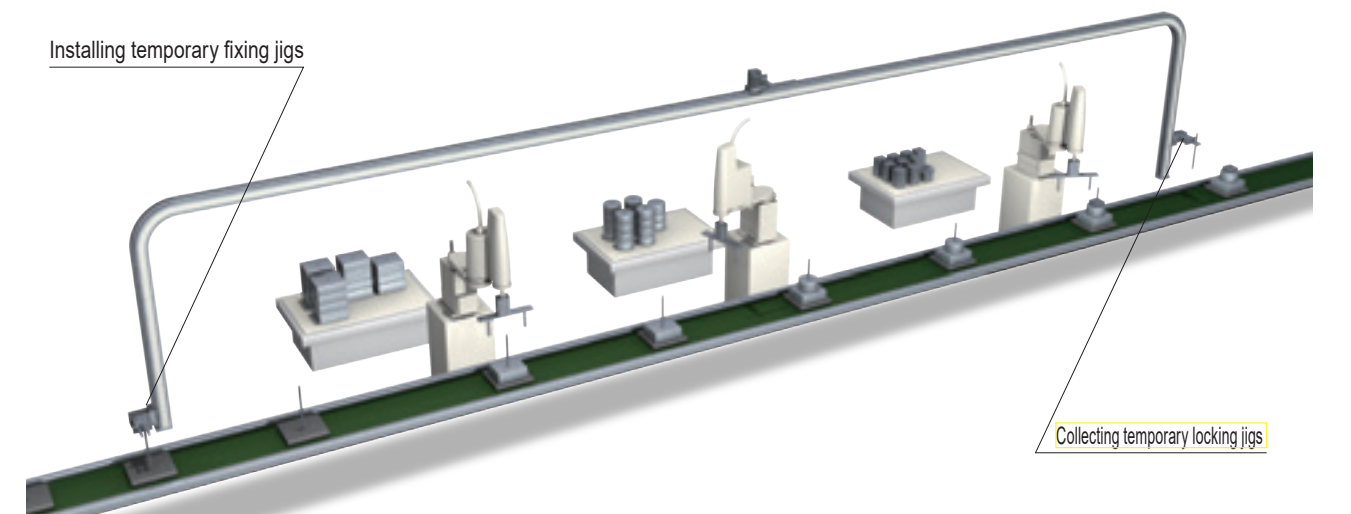
- Productivity improved as production lines were no longer wasted.
- Reduced staff workload.
- Assembly machines can be installed linearly to effectively use plant space.

No major capital investments or modifications

Collecting temporary fastening pins on a free-flow line

Long stroke and high speed

Pins for which workpieces are temporarily fastened at the start of assembly are finally collected. Returns to start location.



Effect example

- The transport workload of the staff has disappeared.
- The equipment layout was improved with little change.



Electric shuttle mover

ESM Series

● Electric 2D transport P&P system



Specifications

Item	ESM	
Motor power supply voltage	Three-phase 200 V	
Max. workload	kg	4
Max. speed	mm/s	Straight section: 2000 or less Curve part: 1500 or less
Max. transporting distance	*1 m	20
Vertical difference	*2 m	3
Repeatability	mm	±0.5
Lubrication	Not available	
Motor used	*3	AC servo motor 750W Refer to page 2 for recommended motors
Detection sensor	*4	Proximity switch OMRON Corporation E2E-X2D1-N
Working environment	General Plant Room (Room Temperature 5 to 40°C)	

*1 Consult with CKD for stroke lengths exceeding 20 m.

*2 The vertical difference is the value obtained by subtracting the min. height from the max. height in the transport path.

*3 Consult with CKD if the motor is not the recommended one.

*4 If overrun detection is required for the origin and both sides, three are required.
(Order the required quantity. Refer to page 2 for model No. and page 11 for specifications.)

* Use at the acceleration and deceleration of 0.4G or less. $1G \approx 9.8m/s^2$.

* This product does not have a motor mounted. The user must prepare, mount, and adjust the motor and driver.

* This product is sold as a unit. Mount and adjust the switch yourself.

* The PP unit (air supply unit) cannot be used with the curve unit directly connected to the motor drive unit.

* This product cannot be used horizontally or upside down.

Weight

Unit name	Unit model No.	Weight (kg)
Carrier unit	ESM-CA	0.7
Motor drive unit	ESM-HDU-M	4
Straight unit	ESM-ST-100 *1	0.5
Tension unit	ESM-TTU	2
Curve unit	ESM-VC-90-1	3.7
	ESM-VC-90-2	3.9
	ESM-VC-45-1	1.9
	ESM-VC-45-2	2

*1 The weight increases by 0.5kg as the stroke length becomes 100mm longer.

How to order

(1) Motor drive unit

ESM - HDU - M

A

A Mounted motor specification	
M	Select the mounted motor specification from the table below.
Y	* Contact CKD regarding other motor manufacturers and models.

Mounted motor specification and recommended motor model No. (rated output 750W)

Manufacturer	Code	Motor
Mitsubishi Electric Corporation	M	HG-KR73
YASKAWA Electric Corporation	Y	SGM7J-08
Keyence Corporation	Y	SV2-□075

(2) Tension unit

ESM - TTU

(3) Carrier unit

ESM - CA

(4) Straight unit

ESM - ST - 100

A

A Straight unit length	
100 to 2000	100mm~2000mm

* Production is possible in 1 mm increments from 100mm to 2000mm.

(5) Curve unit

ESM - VC - 90-1

A

A Angle	
90-1	Inside 90 degrees
90-2	Outside 90 degrees
45-1	Inside 45 degrees
45-2	Outside 45 degrees

* A set can have a total of 180 degrees.

Examples: 90 degree: Up to 2 units of 45 degrees: A total of 4 units (180 degrees)

(6) Belt

ESM - B - 01370

A

A Belt length	
01370 to 40570	1370mm to 40570mm

* Refer to pages 9 and 10 of the selection guide for belt length selection.

* Round off the first digit.

Other units

ESM - PP1

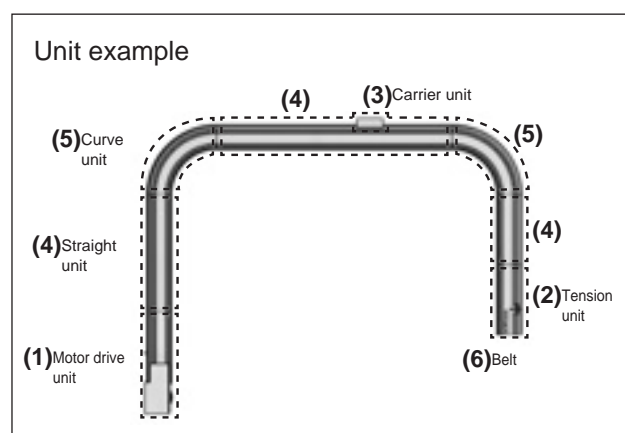
A

A Model No.	Description
PP1*1	PP unit (air supply unit)
SE	Detection sensor(Refer to page 10 for details)
T-NT*2	T-shaped flat nut

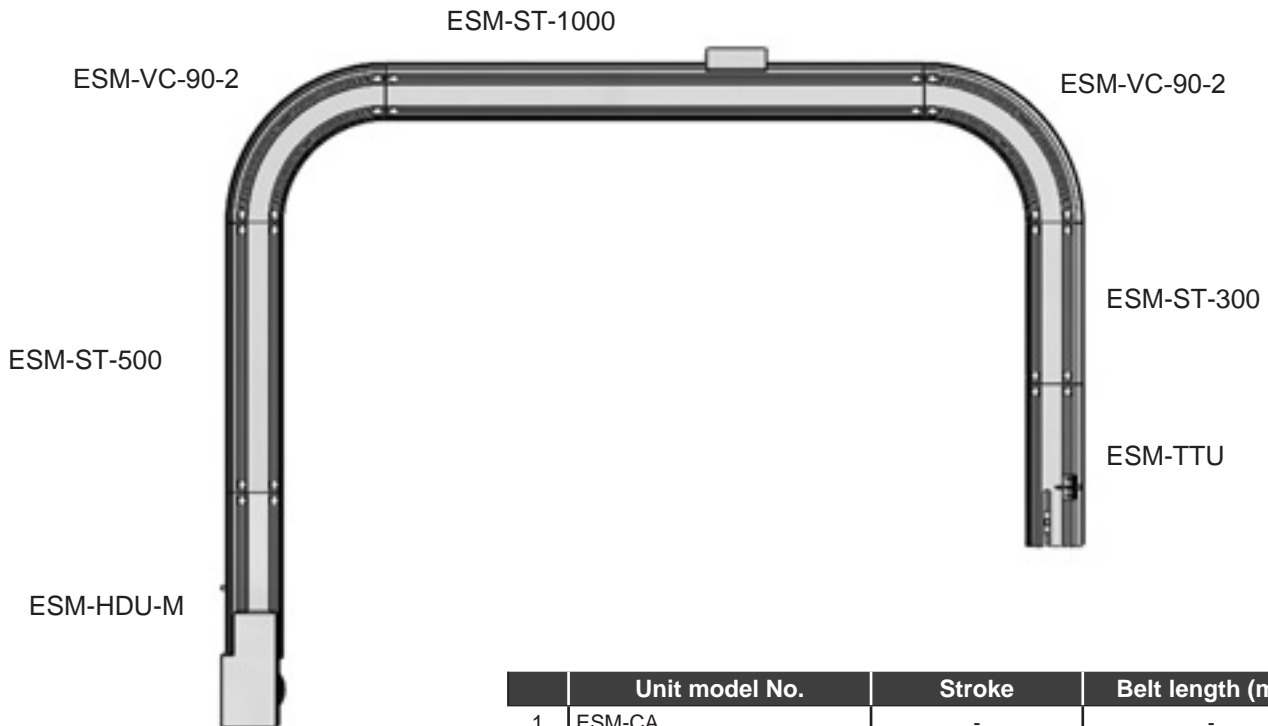
*1 Air intake unit mounted on the carrier for air supply at the end. The PP unit (air supply unit) cannot be used with the curve unit directly connected to the motor drive unit.

*2 Bracket for installation of body.

* Units other than "other units" are necessary for configuring one set.



Unit combination example



	Unit model No.	Stroke	Belt length (mm)
1	ESM-CA	-	-
2	ESM-HDU-M	150	HDU+TTU=1170
3	ESM-ST-500	500	1000
4	ESM-VC-90-2	550	910
5	ESM-ST-1000	1000	2000
6	ESM-VC-90-2	550	910
7	ESM-ST-300	300	600
8	ESM-TTU	150	-

- Transport distance: 3200mm
- Belt length: 6590mm

Belt length selection method and example

Calculate the belt length with the above unit combination as an example. (Refer to page 9 for details)

1. Belt length of motor drive unit and tension unit: 1170mm (fixed value)
2. calculate twice the stroke length of the straight section.
 $(\text{stroke length of [ESM-ST-500]} + \text{stroke length of [ESM-ST-1000]} + \text{stroke length of [ESM-ST-300]}) \times 2$
 $= (500+1000+300) \times 2$
 $= 3600\text{mm}$
3. 90 degree curve unit belt length: 910mm
 Since there are 2 units, $910 \times 2 = 1820\text{mm}$

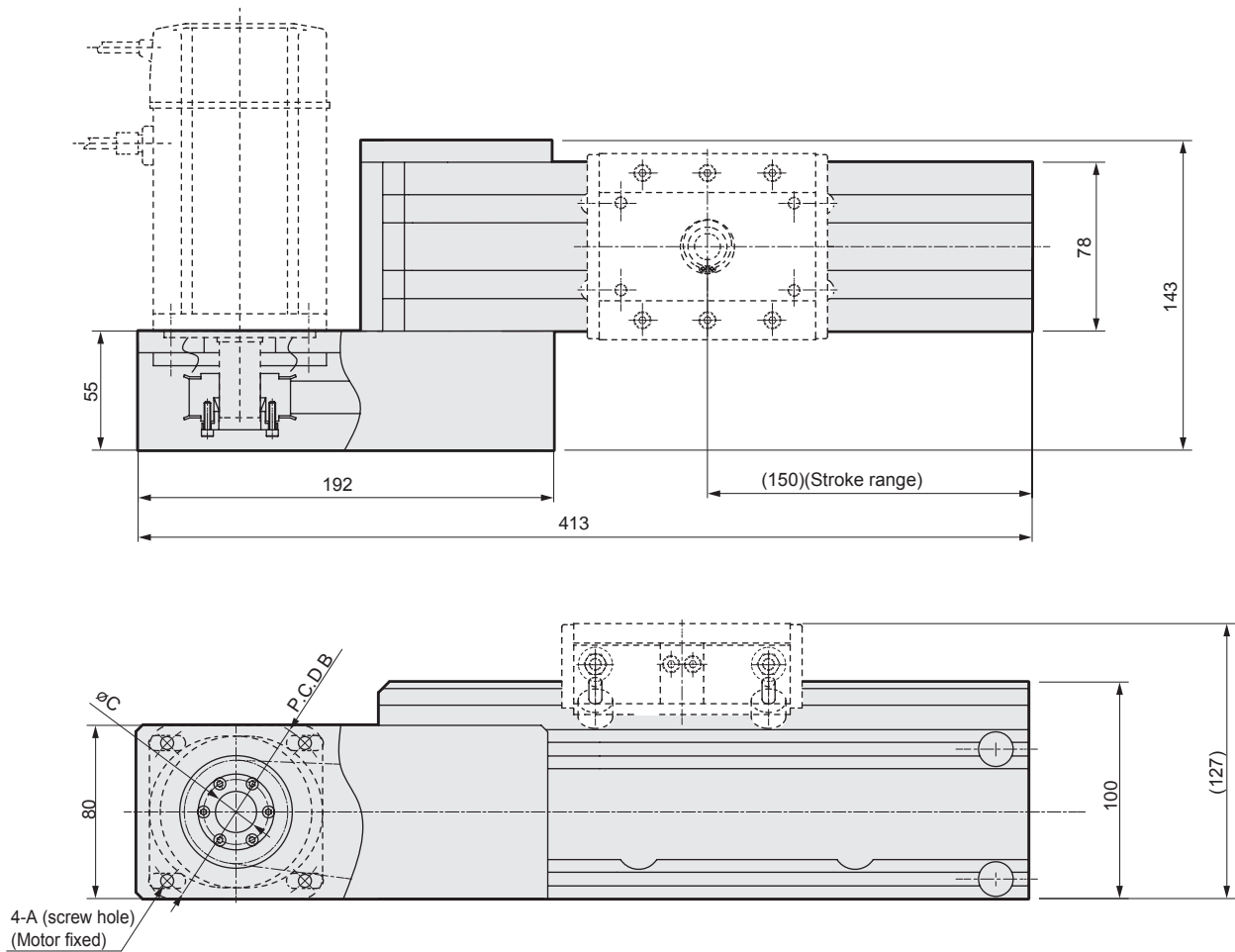
4. Add the belt length given by Item 1, Item 2 and Item 3 above" (round off the first digit)

"Belt length of motor drive unit and tension unit" + "Twice the stroke length of straight section" + "Belt length of curve unit × number"
 $= 1170\text{mm} + 3600\text{mm} + 1820\text{mm}$
 $= 6590\text{mm}$

Therefore, the belt length is: 6590mm
 Belt model No.: ESM-B-06590

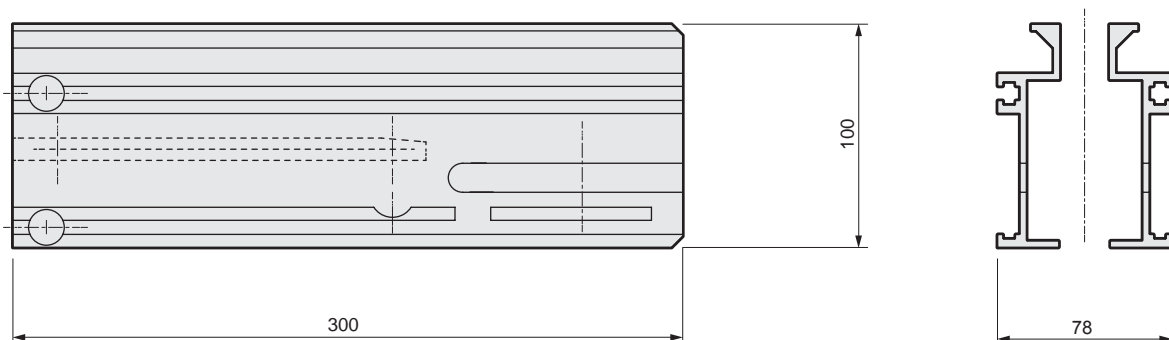
Dimensions

● Motor drive unit (ESM-HDU-*)



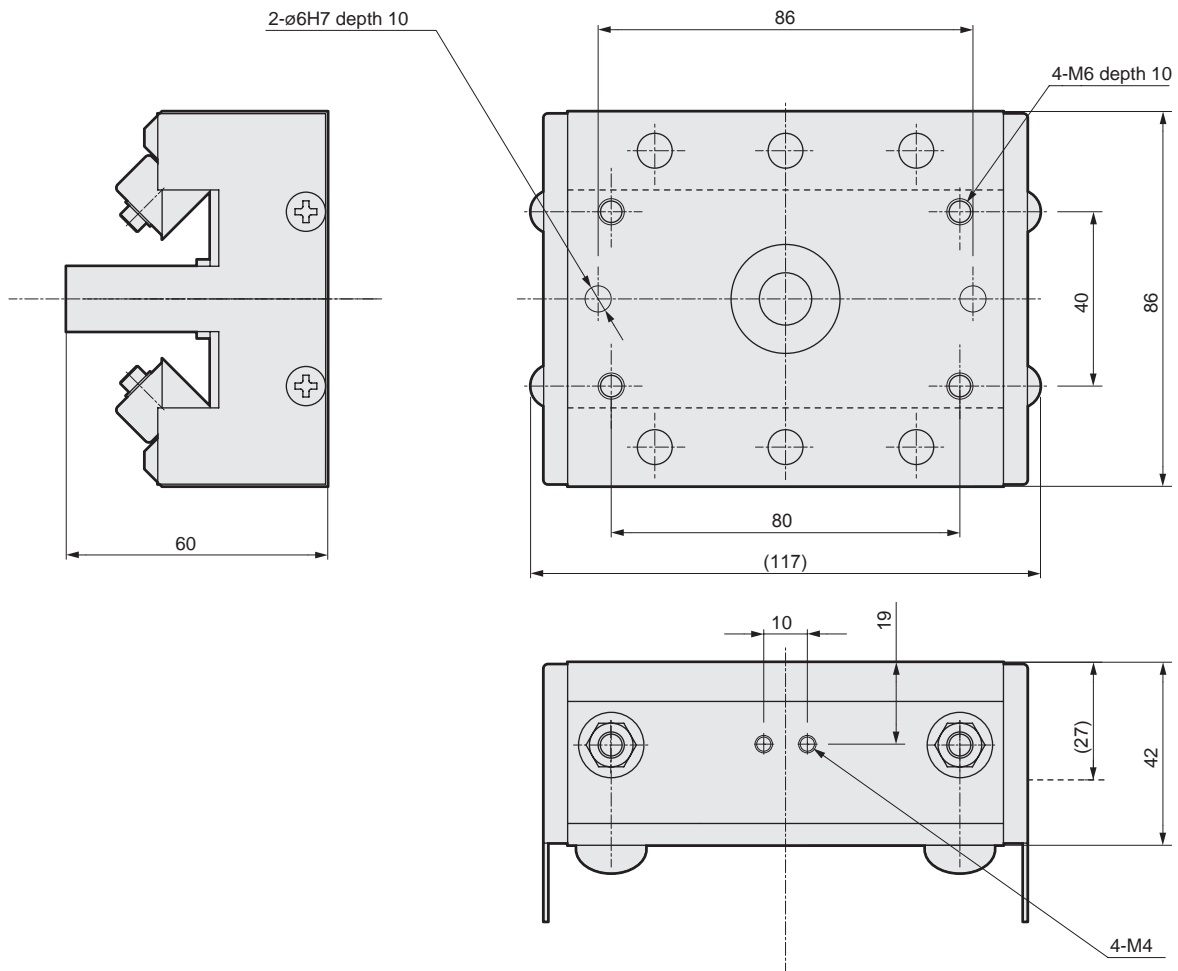
Mounted motor specification	A	B	C
M	M6	ø90	ø19
Y	M6	ø90	ø19

● Tension unit (ESM-TTU)

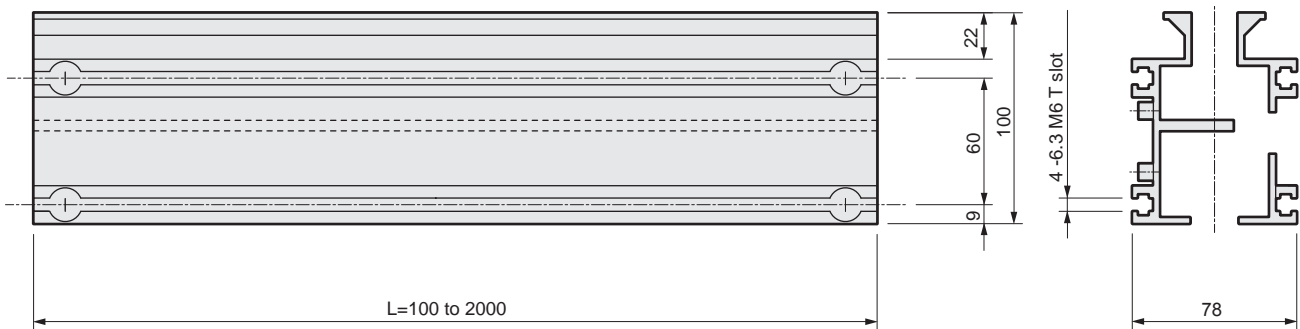


Dimensions

● Carrier unit (ESM-CA)



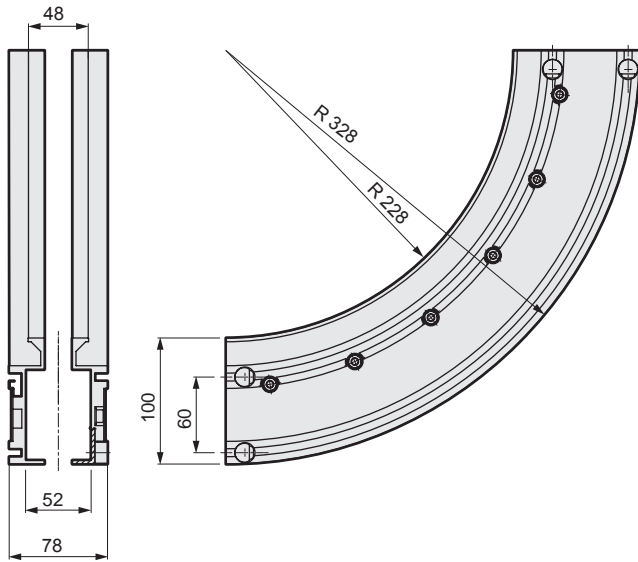
● Straight unit (ESM-ST-□)



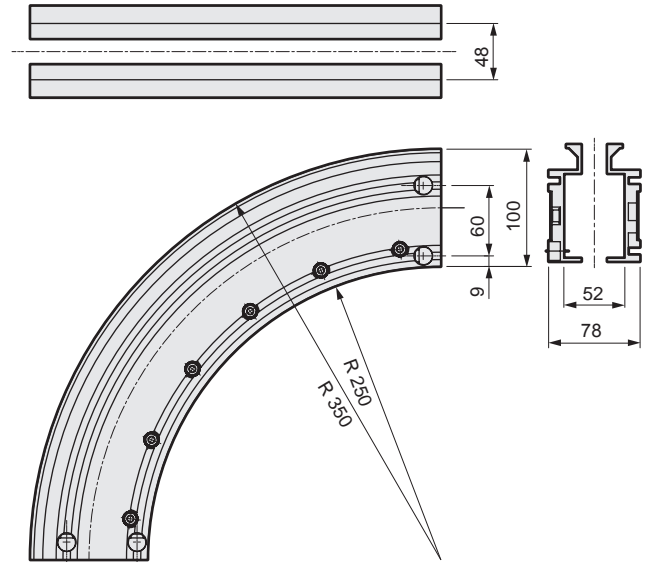
* When mounting seven square nuts are included for tightening at every 2 meters.

Dimensions

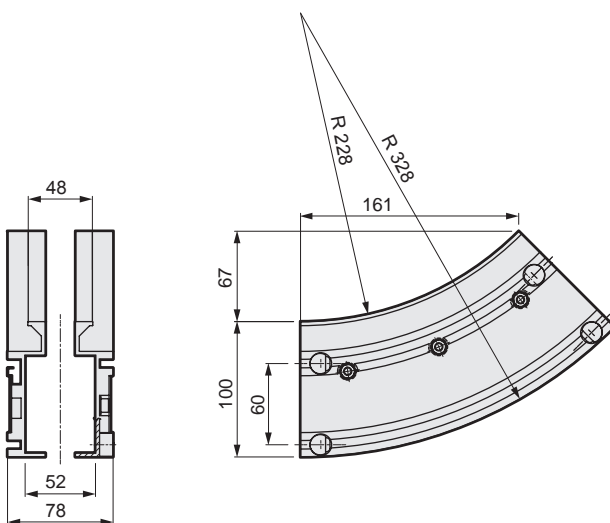
● Curve unit: Inside (ESM-VC-90-1)



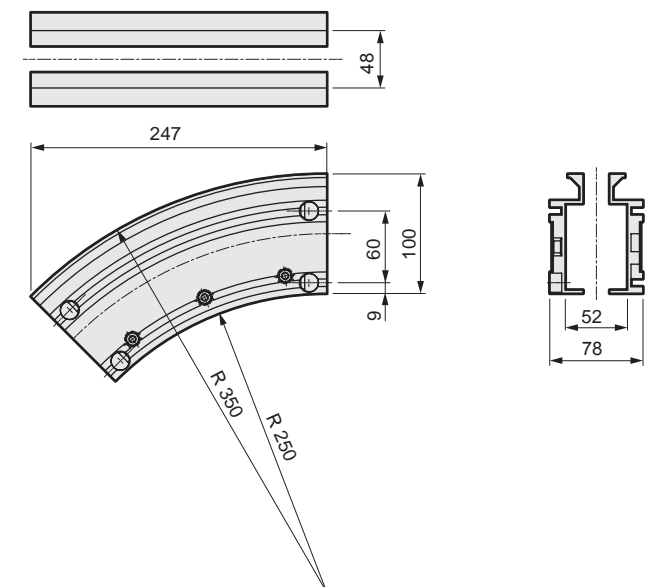
● Curve unit: Outside (ESM-VC-90-2)



● Curve unit: Inside (ESM-VC-45-1)



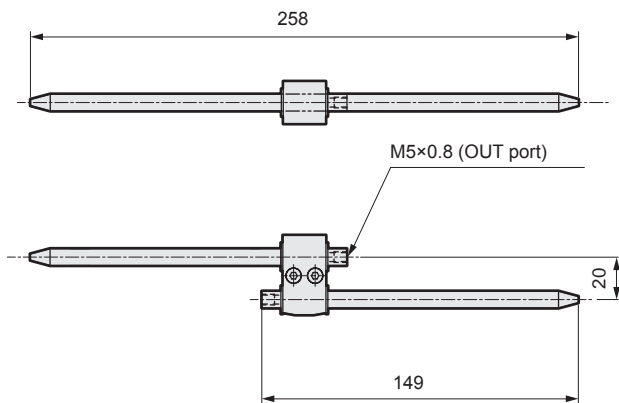
● Curve unit: Outside (ESM-VC-45-2)



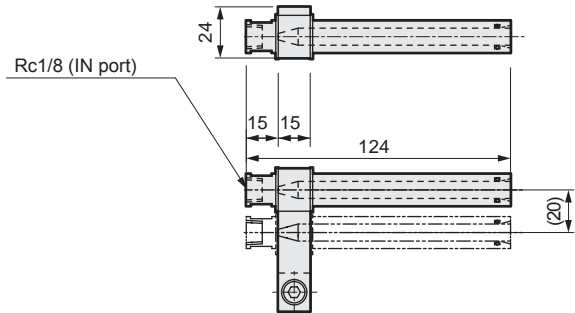
Dimensions

● PP unit (ESM-PP1, air supply unit)

◦ Carrier unit side nozzle

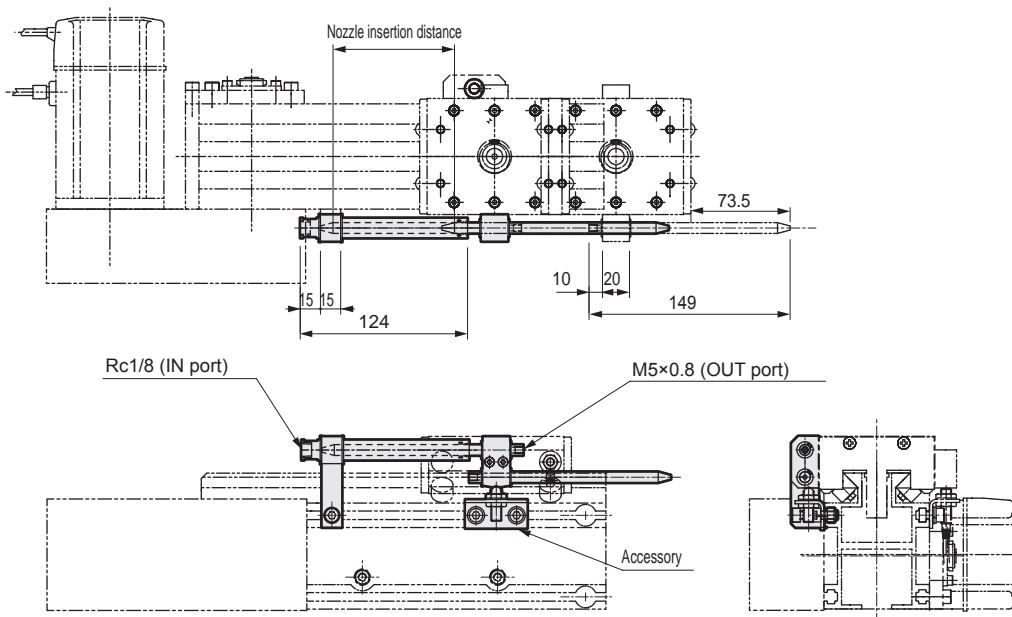


◦ Motor drive unit, tension unit side nozzle



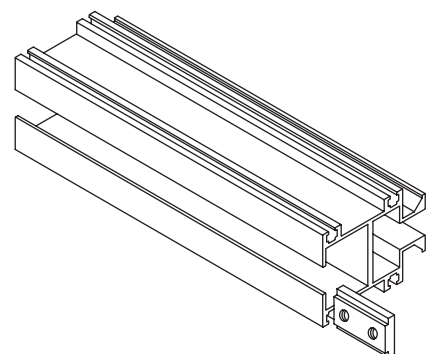
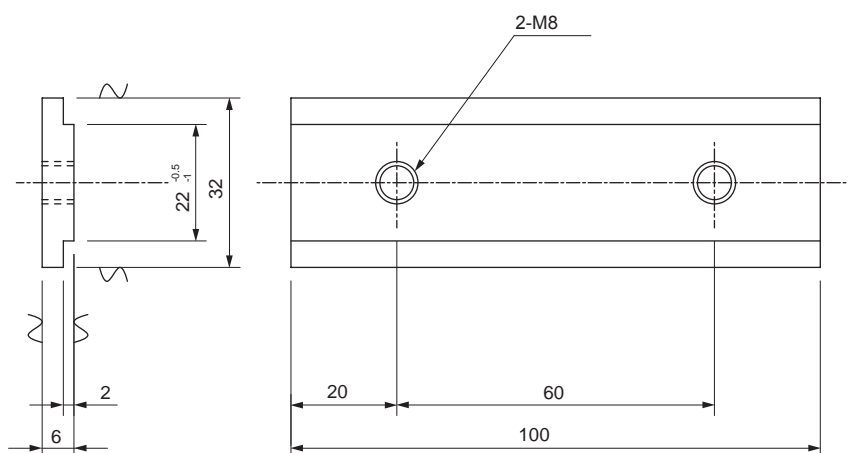
* PP unit (air supply unit) cannot be used with the curve unit directly connected to the motor drive unit.

● Configuration diagram when PP unit is installed (reference)

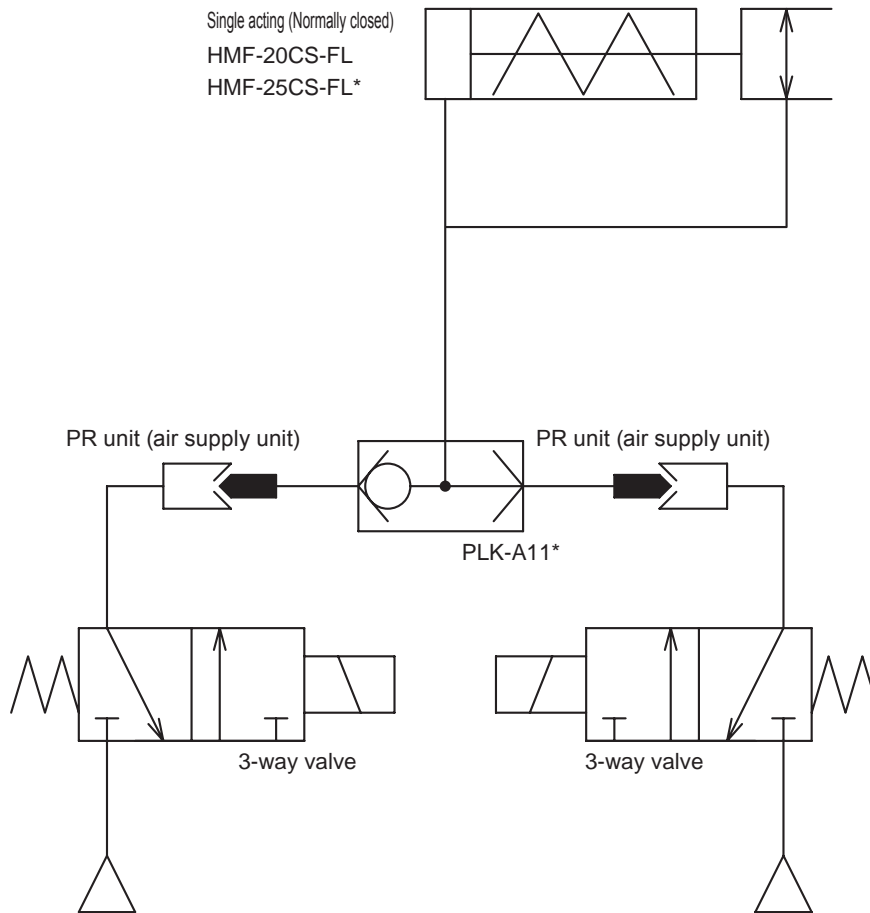


● T-shaped flat nut

[Reference: mounting example]



Circuit example when using air hand



* Contact CKD for details and specifications.

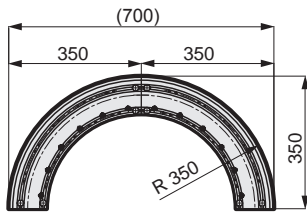
Unit selection

STEP-1 Confirming stroke and belt lengths of each unit

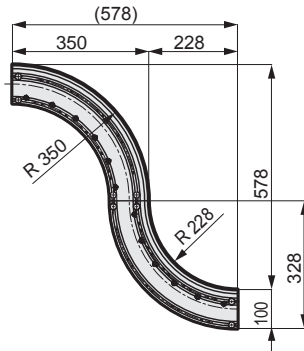
Unit name	Model No.	Stroke length (mm)	Belt length (mm)
Motor drive unit	ESM-HDU	150	1170 (including the tension unit) (fixed length)
StraightnKnit	Example ESM-ST-100	100	(200 Stroke 400 × Twice)
	ESM-ST-200	200	
	ESM-ST-1200	1200	
	ESM-ST-2000	2000	
Tension unit	ESM-TTU	150	(Refer to the motor drive unit.)
Inner 90 degree curve unit	ESM-VC-90-1	360	910 (fixed length)
Outside 90 degree curve unit	ESM-VC-90-2	550	910 (fixed length)
Inner 45 degree curve unit	ESM-VC-45-1	180	455 (fixed length)
Outside 45 degree curve unit	ESM-VC-45-2	275	455 (fixed length)

STEP-2 Min. dimensions of combination with a curve unit *A set can have a total of 180 degrees.

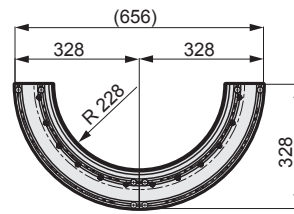
● 90° Outside - 90° Outside



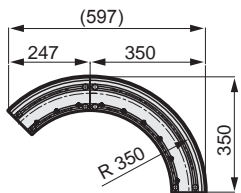
● 90° Outside - 90° Inside



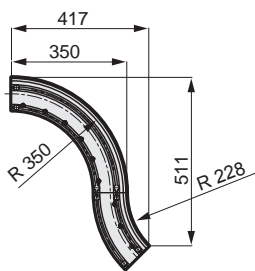
● 90° inner - 90° inner



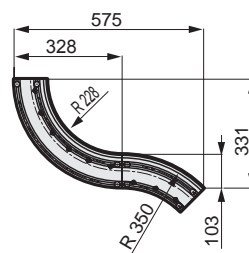
● 45° Outside - 90° Outside



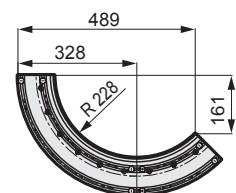
● 90° Outside - 45° Inside



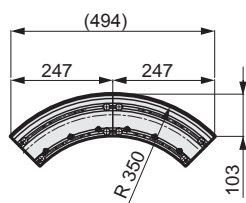
● 90° Inside - 45° Outside



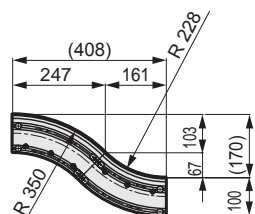
● 90° inner - 45° inner



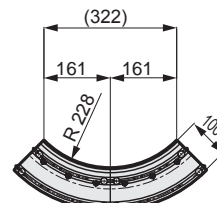
● 45° Outside - 45° Outside



● 45° Outside - 45° Inside



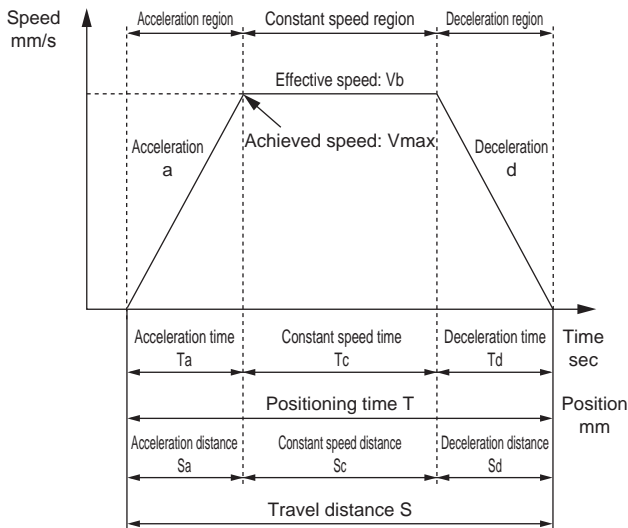
● 45° inner - 45° inner



Unit selection

STEP-3 Confirming tact time

Calculate the tact time with the selected product according to the following example and confirm that the required tact is attainable. Select the rotation speed and rotation acceleration/deceleration from the specification table (pages 1 and 2) for each model and the motor selected by the customer.



	Description	Code	Unit	Remarks
Set value	Set speed	V	mm/s	
	Set acceleration	a	mm/s ²	
	Set deceleration	d	mm/s ²	
	Travel distance	S	mm	
Calculated value	Achieved speed	Vmax	mm/s	$= (2 \times a \times d \times S / (a + d))^{1/2}$
	Effective speed	Vb	mm/s	Smaller of V and Vmax
	Acceleration time	Ta	s	$= Vb / a$ [0.5 sec or more]
	Deceleration time	Td	s	$= Vb / d$ [0.5 sec or more]
	Constant speed time	Tc	s	$= Sc / Vb$
	Acceleration distance	Sa	mm	$= (a \times Ta^2) / 2$
	Deceleration distance	Sd	mm	$= (d \times Td^2) / 2$
	Constant speed distance	Sc	mm	$= S - (Sa + Sd)$
Positioning time	T	s	$= Ta + Tc + Td$	

- Do not use at speeds that exceed the specifications.
- Acceleration/deceleration setting by acceleration/deceleration time varies with set speed and stroke length.
- Depending on acceleration/deceleration and stroke length, the trapezoid speed waveform may not be formed (the set speed may not be achieved). Compare with Vmax and set speed.
- Use at the acceleration and deceleration of 0.4 G or less.
- $1G \approx 9.8m/s^2$.

Model selection

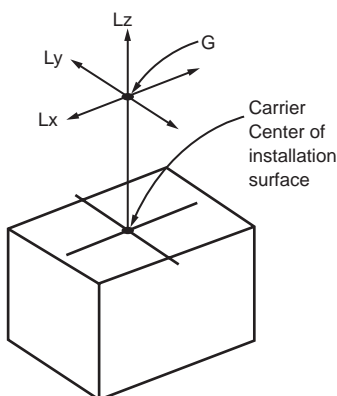
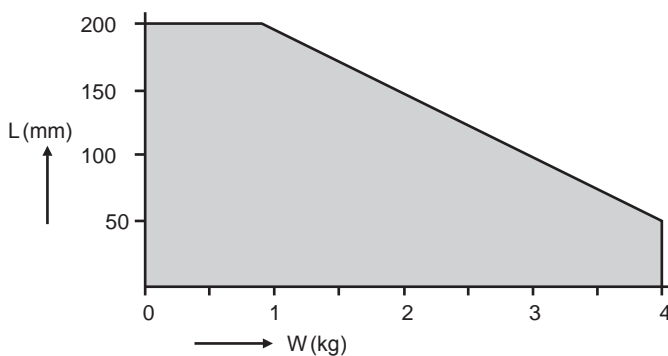
STEP-4 Confirming max. allowable load

The max. allowable load will vary depending on the amount of overhang of the center of gravity of the load.

*The allowable load weight varies depending on the amount of overhang.

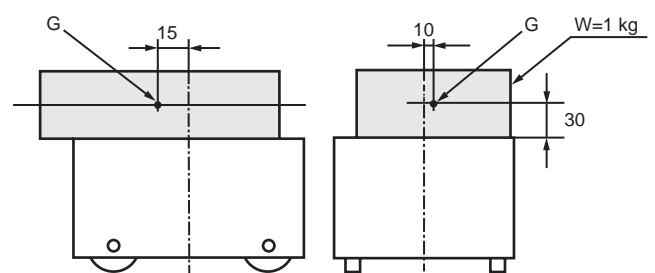
Use this product within the range of the graph below.

*Refer to the selection example for calculation of overhang amount L.



W: Load weight
 G: Center of gravity of load
 Lx: Displacement of G in X direction
 Ly: Displacement of G in Y direction
 Lz: Displacement of G in Z direction
 L: Amount of overhang
 $L = Lx + Ly + Lz$

● Example of selection



W=1 kg
 Lx=15 mm
 Ly=10 mm
 Lz=30 mm
 $L = 15 + 10 + 30 = 55 \text{ mm}$

For the displacement of the position of center of gravity of the load, W=1kg is acceptable because L=55mm is within the range of the graph.

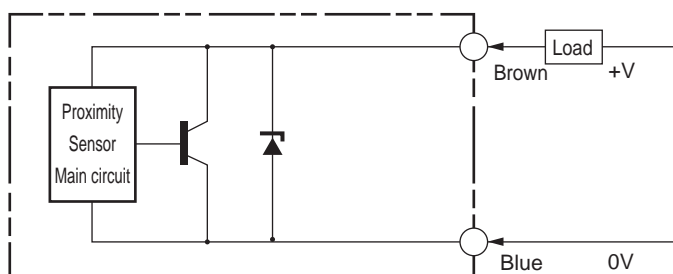
Detection sensor

Type	Manufacturer	Model
Proximity sensor	OMRON Corporation	E2E-X2D1-N

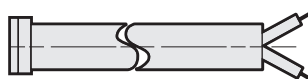
Performance

Item	Specifications
Cylinder detection head size	M8
Type	Shield
Detection	Induction
Detection distance	2 mm±10%
Setting distance	0 to 1.6mm
Hysteresis	15% or less of the detection distance
Detectable object	magnetic metal(The detection distance of non-magnetic metals decreases.)
Standard detection object	Iron 8×8×1mm
Response frequency	At DC: 1.5kHz(mean value)
Power supply voltage	DC12 to 24V Ripple(P-P)10% or less
Working voltage range	10 to 30 VDC
Leakage current	0.8 mA or less
Control output (output)	DC 2-wire
Control output (open/close capacity)	3 to 100mA
Display lamp	Operation indicator lamp(Red), Setting indicator lamp(Green)
Ambient temperature range	When using: -25 to 70°C In storage: -40 to 85°C ((Note that neither freezing nor condensation occurs.)
Ambient humidity range	When using: 35 to 95%RH In storage: 35 to 95%RH (Note that there is no condensation)
Influence of temperature	Detection distance change within temperature range of -25 to +70°C within ±15% (Detection distance at 23°C as reference)
Cable length	2m

Output circuit



Wiring diagram



Terminal layout

Color	Layout
Brown	+V
Blue	0V

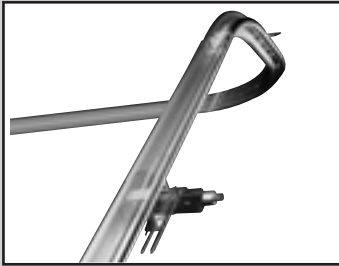
Consumable parts and repair parts

Set name	Set No.	Set Contents
Roller set	ESM-RO	Roller/shaft/bearing assembly (one unit)
Joint set	ESM-JO	Drive block/fitting plate/screws
Carrier side belt	ESM-B-****Belt	Belts machined to customer dimensions, refer to page 2 for model No
Motor side belt	ESM-B-K	For motor pulley 1 pc.
Square nut	ESM-S-NT	Square nuts 10 pcs/bag (set)

* Specify the set No. when placing an order.

* Keep each set of rubber and urethane in a place with low temperature and humidity, avoiding direct sunlight, oil, water, ozone, etc.

"Air drive that enables three-dimensional transport is also available! "



Shuttle mover standard/high load

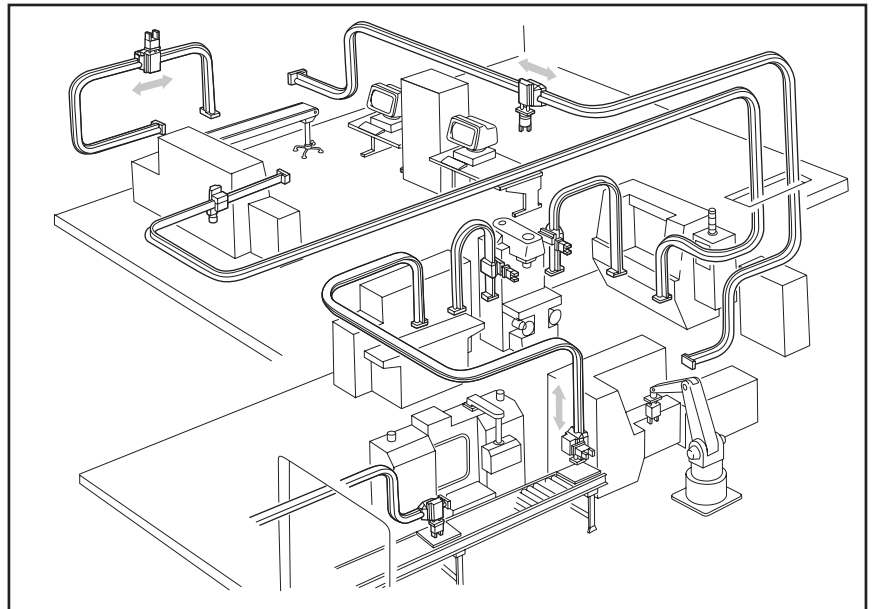
SM-25 Series

An air-driven three-dimensional P&P system which enables free layout



Overview

The air-driven three-dimensional transport P&P system shuttle mover [SM-25] employs a rodless cylinder that combines air with magnetic force. Three-dimensional transport which was not possible in the past has been realized. Use of a sleeve and O-ring in the connecting portion of the cylinder tube eliminates leakage of air and also enables easy assembly. This configuration enables free layout.



Specifications

Model No.		Standard	High load
Item			
Working fluid		Compressed air	
Max. working pressure	MPa	0.6	
Min. working pressure	MPa	0.3	
Ambient temperature	°C	5 to 40	
Bore size	mm	ø25	
Port size		Rc3/8	
Magnet holding force	N	120	240
Max. load capacity	kg	2 (total load weight to be mounted)	4 (total load weight to be mounted)
Max. transporting distance	m	20	
Stroke end adjustment length	mm	±10	
Cushion	Piston	Rubber cushion	
	Carrier	Shock absorber	
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)	

*Refer to the shuttle mover SM Series page in "Pneumatic Cylinders I (Catalog No.CB-029SA)" for details.



Safety Precautions

Always read this section before use.

When designing equipment using electric actuators, the manufacturer is obligated to ensure that the safety of the mechanism and the electrically controlled system are secured.

It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage.


Observe warnings and precautions to ensure device safety.


Check that device safety is ensured and a safe device is manufactured.


WARNING

- 1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.
 - 2** Use the product within specifications range.
This product must be used within its stated specifications. It must not be modified or machined additionally. This product is intended for use as a device or part for general-purpose industrial machinery. It is not intended for use outdoors (except for outdoor type) or for use under the following conditions or environment.
(Note that this product can be used under the following conditions only when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)
 - 1** Use for special applications which require the safety, including nuclear energy, railways, aircrafts, marine vessels, vehicles, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency operations (cutoff circuits, opening etc.) circuits, press machines, brake circuits, or safety devices or applications.
 - 2** Use for applications where life or assets could be adversely affected and special safety measures are required.
 - 3** Observe organization standards and regulations, etc. related to the safety of device design.
 - 4** Never remove devices before confirming safety.
 - 1** Inspect and service on the machine and devices after confirming safety of the entire system related to this product.
 - 2** Note that there may be hot or charged sections even after operation is stopped.
 - 3** When inspecting or maintaining device, be sure to shut down the power supply of the equipment and the relevant power supply, using caution to avoid electric shock.
 - 5** Observe instruction manual and precautions attached the product surely to prevent accidents.
 - 1** The product could operate unexpectedly during teaching operation or trial operation. Be especially careful not to touch the actuator. If operating the product from a position where the shaft body cannot be seen, be sure to first confirm that the safety is secured even if the actuator moves.
 - 6** Observe precautions to prevent electric shock.
 - 1** Do not touch the heat sink, cement friction, or motor inside the controller.
These will heat up, and could cause burns. Wait an appropriate amount of time prior to performing inspections or other tasks. A high voltage is applied until the electrical load stored in the internal capacitors is discharged after the power is turned OFF. Do not touch for around three minutes after the power OFF.
 - 2** Make sure to turn the switch on the controller power supply source OFF, before maintenances and inspections.
There is a danger of high voltage electric shocks.
 - 3** Do not attach or remove connector, while the power is on. Otherwise, this may cause malfunction, failure, or electric shock.
 - 7** Install an overcurrent protector.
The wiring to the driver should be in accordance with JIS B 9960-1:2019 (IEC 60204-1:2016) Safety of Machinery - Electrical Equipment of Machines - Part 1: General Requirements. Install an overcurrent protector (a circuit breaker or circuit protector for wiring) on the main power, control power, and I/O power.

(Reference: JIS B 9960-1 7.2.1 General description)
If there is a possibility the circuit current may exceed the rated value of the component or the allowable current of the conductor, an overcurrent protection must be provided. The details of the ratings or set values to be selected shall be provided in 7.2.10.
 - 8** Observe precautions below to prevent accidents.
- The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

 **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

 **WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

 **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. Every item provides important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.

However, following failures are excluded from this warranty:

- 1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
- 2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
- 3) Failure not caused by the product.
- 4) Failure caused by use not intended for the product.
- 5) Failure caused by modifications/alterations or repairs not carried out by CKD.
- 6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- 7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility confirmation

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

4 Range of service

The delivered product price does not include engineer dispatch service fees. Separate fees will be charged in the following cases.

- (1) Instruction of installation and adjustment, and presence on test operation
- (2) Maintenance and inspection, adjustment, and repair
- (3) Technical instructions and technical education (operation, program, wiring method, safety education, etc.)

Precautions for export

Products and related technologies in this catalog

Those of the products and related technologies in this catalog which are subject to US Export Administration Regulations

(EAR) are marked on the product page as "Product subject to the EAR (EAR99) or (EAR99 and 3A991)". For export or provision of products or related technologies subject to EAR regulations, we request that the US Export Administration Regulations (EAR) be observed appropriately.



Safety Precautions

Be sure to read this section before use.

Product-specific cautions: Electric shuttle mover ESM Series

Design/selection

DANGER

- Do not use in places where dangerous goods such as ignitable substances, inflammable substances or explosives are present. There is a possibility of ignition, combustion or explosion.
- Ensure that the product is free of water droplets and oil droplets. Failure to do so may cause fire or malfunction.
- When mounting the product, be sure to hold and fix (including work) it securely.
If the product falls, is knocked over, or experiences malfunction, it may lead to injury.

WARNING

- Always keep the travel speed of the carrier unit within the specified speed.
- It is not possible to fix the carrier unit and use the rail portion as a mobile unit.
- Do not damage the rail with a workpiece, etc., that has been dropped by mistake during mounting or removal of the workpiece. This may cause malfunction.
- If a foreign object is allowed to fit between the carrier unit and the rail, operation faults will occur.
- Provide a safety cover to prevent the operating area and position locking.
- Use this product in an environment where people work normally in a general factory. (Working temperature: 5 to 40°C, working humidity: 35 to 80%RH, no condensation)
- This product cannot be used in water, oil, or powder, or in places where the product is exposed to cutting fluid or cutting chips, as it may cause malfunction.
- This product cannot be used in an environment where corrosion may occur.
- Use the product in the range of conditions specified for the product.
- Design a safety circuit or equipment so that damage to equipment, injury to persons, etc., does not occur when the machine stops in the event of a system failure such as emergency stop or power outage.
- Install indoors with low humidity.
There is a risk of electric leakage or fire accidents in places exposed to rainwater or where there is high humidity (humidity of 85% or more, condensation). Oil drops and oil mist are also strictly prohibited.
 - Use in such an environment could lead to damage or operation failure.

- Install in a location free from direct sunlight, dust, and corrosive gas/explosive gas/inflammable gas/combustibles, and away from heat sources. Furthermore, chemical resistance has not been reviewed for this product.
Failure to comply may lead to damage, explosion, or combustion.
- Use and store in locations free from strong electromagnetic waves, ultraviolet rays, or radiation.
Otherwise, malfunction or damage may result.
- Consider the breakdown possibility of the power source.
 - Take measures to prevent bodily injury or machine damage even in the event of a power breakdown.
- Consider the operation status when restarting after emergency or abnormal stops.
 - Design the system so that restarting does not cause any personal injuries or damages on the machine.
If you should reset the electric driven actuator to the starting position, provide the system with a safety device.
Take into consideration the possibility of motor failure.
Design the system so that a power supply failure does not cause any personal injuries or damages on the machine.
- Avoid using this product where vibration and impact are present.
- Do not apply a load to the product that is greater than or equal to the allowable load listed in the materials for selection.
- This product cannot be used horizontally or upside down.

CAUTION

- A belt runs inside the rail. Be careful not to put chips on the assembly.
- Do not use in a range where the carrier unit could collide with the stroke end and break.
- Indicate the maintenance conditions in the device's instruction manual.
 - The product's functionality may drop too low to maintain an appropriate safety level depending on usage conditions, working environment and maintenance status. With correct maintenance, the product functions can be used to the fullest.
- Regarding installing, setting up, adjusting and maintaining the product, read through the instruction manual and operate correctly.
- The product is provided in conformity with the related standards. Do not attempt to modify the product.
- Refer to the instruction manual of the motor mounted to the product and control for your safety before wiring and designing.
- The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Mounting, installation and adjustment

⚠ DANGER

- Do not enter the operating range of the product while the product is operable. The product may suddenly move and result in injuries.

⚠ WARNING

- Use an interval of 3 m as a guide for the mounting pitch for the supports. (Customers are asked to prepare supports.)
- Fix the rails so that they are not twisted, bent, or pulled by installing supports or beams.
- Do not move the product by striking it with a hammer or hanging it directly with wire ropes, etc.
- Be sure to install a safety cover in cases when the product will be crossing pathways or working areas of people, or in areas where human hands can reach inside.
- Consider the space described below near the stroke end.
 - 1) Securing of space necessary for mounting and removing workpieces.
 - 2) Securing motor space.
 - 3) Securing of space where the belt can be replaced by the tension section.
- After completing installation and before installing the motor, manually slide the carrier to make sure that there is no interference within the operating region.
- Prevent foreign matter, such as cutting chips from drills used during installation work, from entering the product frame or belt.
- Precision parts are built in, so laying the product on its side or applying vibration or impact during transportation are strictly prohibited. This may cause damage to the parts.
- For preliminary installation, place horizontally.
- Do not step onto the packaging or place objects on it.
- Avoid condensation, freezing, etc., and maintain ambient temperatures of -10 to 50°C and ambient humidity of 35 to 80% when transporting and carrying. Failure to do so may cause damage to the product.
- Mount the product on incombustible materials. Direct attachment or mounting to or near flammable materials may cause fire. There is a risk of burns.
- Do not step onto the product or place objects on it. This may result in falling, knocking the product over, injury due to falling, product damage and/or malfunctions due therein, etc.

- Take measures to prevent bodily injury or machine damage even in the event of a power breakdown. There is a risk of unexpected accidents.
- In the case of any abnormalities, stop use immediately and contact the CKD sales office nearest you.

⚠ CAUTION

- Do not install in places where large vibration or impact is transmitted. This may cause malfunction.
- Do not operate the movable parts of the product with external force or sudden deceleration. This may lead to malfunction or damage due to regenerative current.
- When returning to origin, excluding pressing operation, do not hit the mechanical stopper, etc. The components could be damaged or malfunction.
- Durability varies with transported load and environment. The transport load, etc., should be at a setting well within the margin. Be sure not to apply impact to movable parts when using the product.
- Do not apply excessive moment to the carrier unit. Refer to the max. allowable load capacity (page 9) for details. This may cause damage or malfunction of the product.
- Do not move the carrier part prior to attaching a motor to this product. The belt inside the product could become bent, curled or damaged, resulting in early premature damage.
- Ensure that the flatness of the installation surface is 0.05mm/200mm or less and do not apply torsion or bending force to the product.
- Ensure that the flatness of the workpiece side attached to the carrier unit is 0.02mm or less, and do not apply torsion or bending force to the product. This may cause damage or malfunction of the product.
- Tighten the body mounting screws with the appropriate torque shown in the table below.

Thread size	Tightening torque (N·m)
M3	0.7
M4	1.5
M5	3
M6	5.2
M8	12.5
M10	24.5

Use/maintenance

DANGER

- Do not operate the unit with wet hands.
It may lead to electric shock.
- Immediately stop operation if a belt tooth or surface is worn or torn, a tooth is split vertically, the rear belt surface is cracked or soft (or partially cut) or the belt is otherwise abnormal. The working environment or working conditions may be inappropriate.

CAUTION

- Always turn the power OFF before conducting inspection and maintenance.
- Regular cleaning is necessary when using the product in a place where the rail, etc., is likely to become dirty.
- Regularly inspect the product at least two or three times a year to check that it operates correctly.

- Manage the belt tension appropriately. Be especially cautious of tension loosening (relaxing) during initial usage. Inappropriate tension could increase vibration and noise, reducing service life and causing teeth to jump.
- When performing maintenance, inspection and repair, stop the power supply to this product. Caution people in the vicinity that a third party should not turn ON the power inadvertently or operate the product.
- When disposing of the product, comply with laws pertaining to waste treatment and cleaning. Consign it to a specialized waste disposal company for processing.

Related products

Electric Actuator Motorless General Catalog

Wide-ranging lineup of motorless electric actuators

■ Slider

For high speed transport	EBS-L Series
For high load transport	ETS/ECS Series
For long stroke transport	ETV/ECV Series
For fast tact transport	EKS-L Series

■ Rod

For press fitting and hoisting	EBR-L Series
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Catalog No. CB-055A



Electric actuator EBS-M/EBR-M Series

■ Slider EBS-M Series

High speed transport

■ Rod with built-in guide EBR-M Series

For press fitting and hoisting

■ Controller ECR Series

"One controller" that connects to any actuator

■ Controller ECG Series

"New Controller" with easy inventory management, easy design, and easy configuration

Catalog No. CC-1422A



Electric actuator FLSH/FLCR/FGRC Series

■ 2-Finger Gripper FLSH Series

For soft handling of multi-model workpieces

■ Table FLCR Series

For short-stroke workpiece transport and positioning

■ Rotary FGRC Series

For indexing operation and workpiece inversion

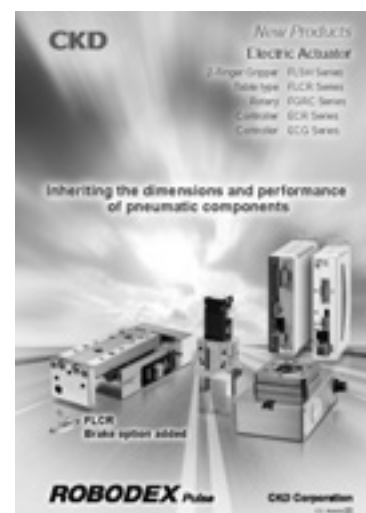
■ Controller ECR Series

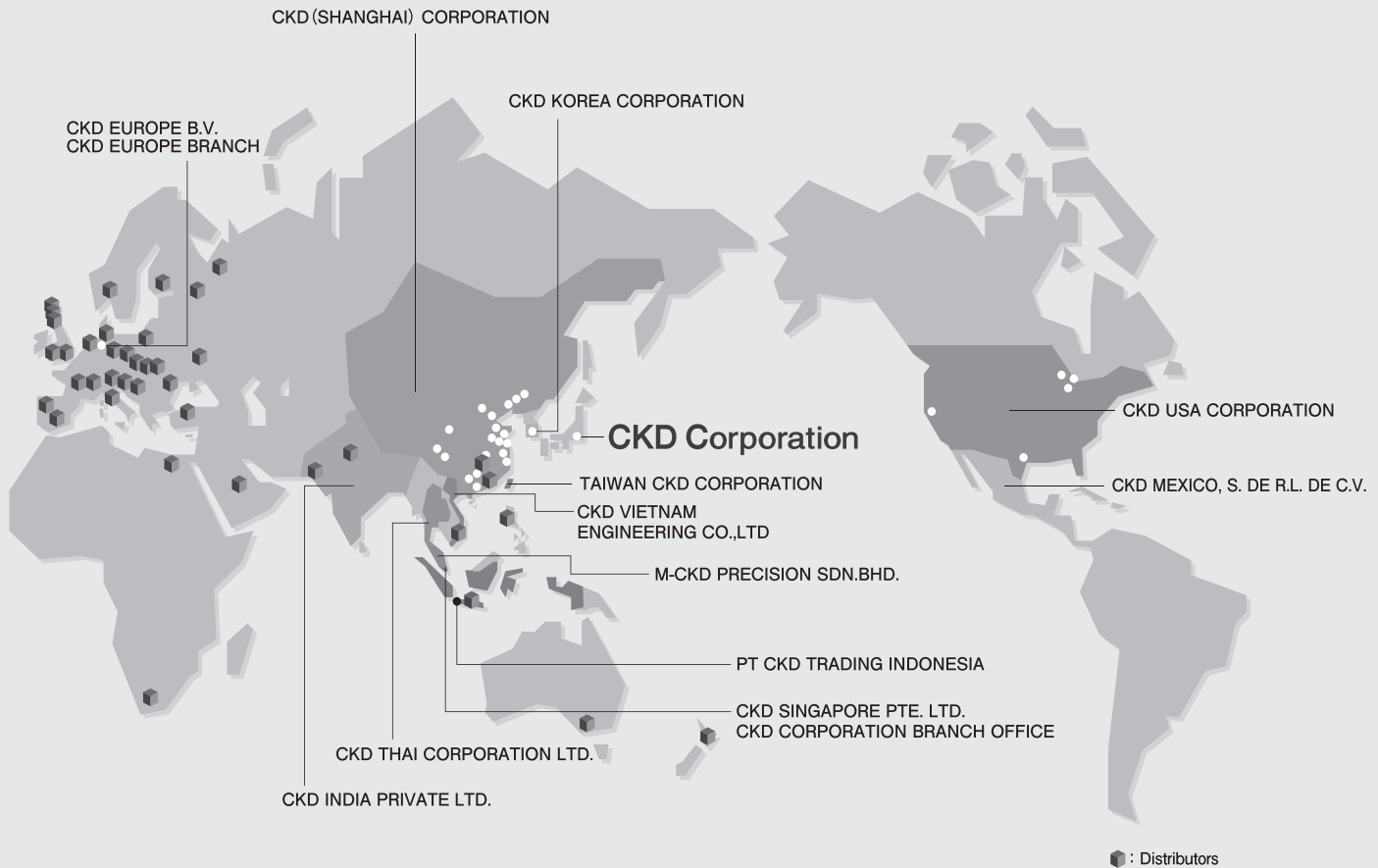
"One controller" that connects to any actuator

■ Controller ECG Series

"New Controller" with easy inventory management, easy design, and easy configuration

Catalog No. CC-1444A





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