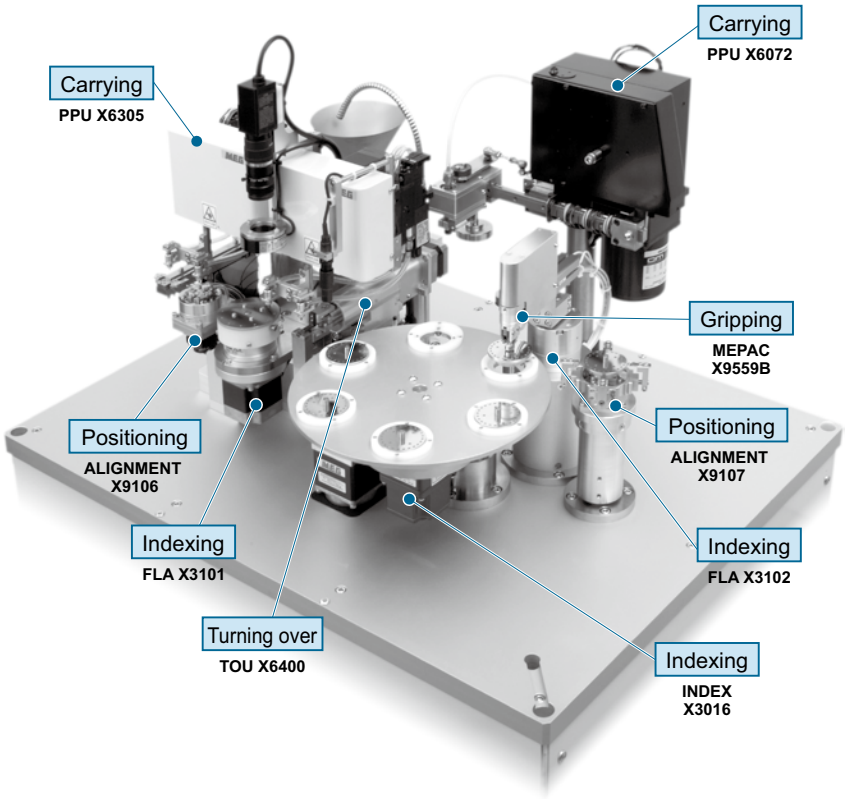


The center of auto assembly technologies is assembly work with loading. Four element technologies and functions “identifying properly, gripping properly, carrying properly, and assembling properly” have been developed with our own ideas and technologies. You may use as module products of auto assembly systems, for FA planning and building-up.

ORDER FORMS & INFORMATION

Notes on how to order

■ When you want to place an order, you may locate “Product number configuration” section on the relevant product's page. Please put model No., type, and others into “□□□....” to make a string of codes and use it to place an order.

■ For unclear points about products, system setup using products, and services, please feel free to contact our service representative.

■ If you want to directly view how the products are installed and the system is configured, please come to our regular showroom indicated below.

■ The product which you purchase comes with its instruction manual. Before use, read the instruction manual for safe and proper operation.

■ The pictures and illustrations presented on this catalog may slightly differ from the actual specifications.

■ The product specifications presented on this catalog may be subject to change without notice, due to product improvement. Before using, always obtain the latest catalog or product guidebook.

■ The latest information such as new products and product revision or abolition, visit the company's website (http://www.meg.co.jp/).

■ The contents of this catalog were generated in October 2012.

<table>
<tr><th>Manufacturer</th><th colspan="2">Regular showroom</th></tr>
<tr><td rowspan="3">MACHINE ENGINEERING CORPORATION
Device Sales Group
Tel: +81-265-76-0001
Fax: +81-265-76-9601</td><td>Main office
Showroom</td><td>2380-480, Minamiminowa-mura,
Kamiina-gun, Nagano
Tel: +81-265-76-0001</td></tr>
<tr><td colspan="2">MEG Internet Information</td></tr>
<tr><td colspan="2">Website: http://www.meg.co.jp/
e-mail: d-sales@meg.co.jp</td></tr>
</table>

Providing CAD data of MEG product

[Through the Internet/CD-ROM]

This service provides CAD data through the Internet
to help you improve design efficiency.

■ Data specifications

Data format: DXF (2D)

■ Applications, data provision method

- CAD data is provided through the company's website (URL: http://www.meg.co.jp/).
- If your environment does not allow you to use the Internet, check that your computer is equipped with a CD-ROM drive and fill in the application form on the right page to request. A CD-ROM will be provided.

■ Precautions

- Our CAD data is subject to change without notice, due to improvement.
- In a case where any problem occurs when and after the CAD data CD-ROM is used, our company shall not be liable for the problem.
- As for the CAD data CD-ROM, the software specifications and contents are subject to change without notice, due to improvement.

MEG CAD data request form (for CD-ROM version)

Application date / / (day/month/year)

■ Your company

Company name:

Department: Title:

Name:

Address:

Postal code:

Tel: Fax:

e-mail:

* Make a photocopy of this page and fax us at the fax number below.

MACHINE ENGINEERING CORPORATION

Fax: +81-265-76-9601 (Tel: +81-265-76-0001)

e-mail: d-sales@meg.co.jp

Communication sheet (Inquiry card)

Make a photocopy of this page and fax us at the fax number shown on the right.

Fax: +81-265-76-9601

■ **Please send us your suggestions and opinions about products.**

■ **Please send us your inquires about products currently avaiable.**

* We will use provided information, for future product commercialization, improvement, and addition.

Company name

Department

Name & title

Address

Tel Fax e-mail

To:

PPU: ORDER FORM

■ To order our PPUs, please fill out the PPU Technical Support Sheet and send it to us via fax.

* Please use H-6 for Multi types.

PPU (Cam-driven) Technical Support Sheet

Date of order (MM/DD/YYYY): / /

■ **Model No.**

■ **No. of units required** unit(s)

■ **Requested delivery date** (MM/DD/YYYY) / /

■ **Requested specifications** Please fill out the sections from (1) to (12).

(1) Cycle time sec

(2) Load mass kg

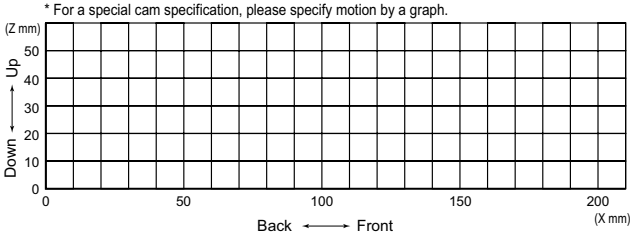
(3) Cam specification ☐ LD ☐ ULD ☐

(4) Arm movement Back-and-forth motion mm Vertical motion mm

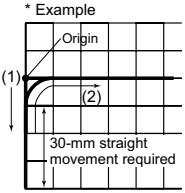
(5) Power supply used VAC (for motor)

☐ None (external input) ☐ Three-phase ☐ Single-phase ☐ 50 Hz ☐ 60 Hz

* For a special cam specification, please specify motion by a graph.



* Example



(6) Operating time hrs/day

(7) Machine cycle time sec

(8) Mecha-controller

Required quantity of sensor pc(s)

Required quantity of mechanical valve pc(s)

Usage of mechanical valve
☐ Single action chuck, suction
☐ Reciprocating chuck, others
☐ Blow

(9) Safety cover
☐ Not required
☐ Required
- ☐ Mecha-controller cover
- ☐ X607 series Arm cover

(10) Oil pan for arm
☐ Required ☐ Not required

(11) Swiveling attachment
☐ Required ☐ Not required

(12) Requests

* Please enter special order requests and usage information.

■ Person in charge of order

Company name

Dept.

Name & title

Address

TEL FAX

e-mail

To:

PPU: ORDER FORM

■ To order our PPUs, please fill out the PPU Technical Support Sheet and send it to us via fax.

PPU (Cam-driven Multi type) Technical Support Sheet

Date of order (MM/DD/YYYY): / /

■ **Model No.**

■ **No. of units required** unit(s)

■ **Requested delivery date** (MM/DD/YYYY) / /

■ **Requested specifications** Please fill out the sections from (1) to (15).

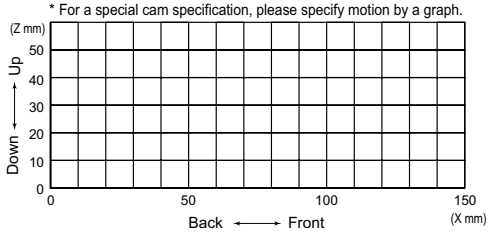
(1) Cycle time sec

(2) Load mass kg

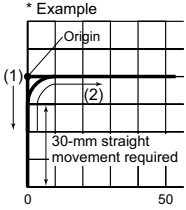
(3) Cam specification ☐ LD ☐ ULD ☐

(4) Arm movement Back-and-forth motion mm Vertical motion mm

* For a special cam specification, please specify motion by a graph.



* Example



(5) Cam type (if there is any request)

Back-and-forth motion cam ☐ Plate ☐ Grooved ☐ Ribbed

Vertical motion cam ☐ Plate ☐ Grooved ☐ Ribbed

(6) Operating time hrs/day

(7) Machine cycle time sec

(8) Mecha-controller

Required quantity of sensor pc(s)

Required quantity of mechanical valve pc(s)

Usage of mechanical valve ☐ Single action chuck, suction ☐ Reciprocating chuck, others ☐ Blow

(9) Safety cover (for Mecha-controller) ☐ Required ☐ Not required

(10) Top plate ☐ Required ☐ Not required

(11) X-arm hollow shaft ☐ Required ☐ Not required

(12) X-axis stroke adjustment mechanism ☐ Required ☐ Not required

(13) Motor bracket ☐ Required ☐ Not required

(14) Swiveling attachment ☐ Required ☐ Not required

(15) Requests

* Please enter special order requests and usage information.

■ Person in charge of order

Company name

Dept.

Name & title

Address

TEL FAX

e-mail

To.

PPU: ORDER FORM

■ To order our PPUs, please fill out the PPU Technical Support Sheet and send it to us via fax.

PPU (Pulse control motor type) Technical Support Sheet

Date of order (MM/DD/YYYY): / /

■ **Model No.** ☐ X6303A ☐ X6305A ☐ X6307A ☐ X6309A ☐ X6311A

units ■ **Requested delivery date** (MM/DD/YYYY) / /

☐ **Stepping type** ☐ **αSTEP** ☐ **External input type**

■ Requested specifications

Fill in for items (1) to (11).

(1) Cycle time sec.

(2) Feed mass (Chuck, workpiece, etc.) kg

(3) Dwell duration (Pick position) sec

(4) Run hours hrs/day

(5) Mechanical cycle time sec.

(6) Built-in sensor
* LS: CCW limit Sensor and center origin old type of sensor
☐ AS (Standard)
☐ LS (Special, CCW limit)

(7) Mecha-controller (Stepping/αSTEP)
Motor-rear photo sensor & dog
Required quantity of sensor pc(s)
Safety cover ☐ Needed ☐ Not needed

(8) Parallel air chuck holder (for ECO-Multi X9608)
☐ Needed ☐ Not needed

(9) Motion controller (Stepping/αSTEP)
☐ Needed (Dedicated controller: MPC020)
☐ Not needed (To be prepared by the customer)

(10) External input Input section hole diameter
☐ φ8 ☐ φ10

(11) Requests
* Please enter special order requests and usage information.

■ Person in charge of order

Company name

Department

Name & title

Address

Tel Fax e-mail

To.

INDEX & FLA: ORDER FORM

■To place an order for the index unit or flexible actuator, fill in the index unit/flexible actuator technical support sheet and fax it to our representative.

Technical Support Sheet

INDEX & **FLA**

Index unit　　Flexible actuator

Date of order (MM/DD/YYYY): ____/____/____

■ **Model No.**

■ **No. of units required**

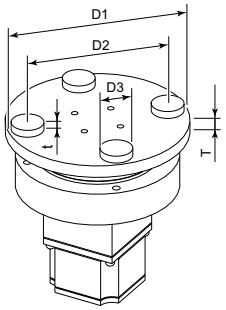
■ **Requested specifications**

(1) Cycle time ____ sec

(2) Power supply used AC ____ V ☐ Three-phase ☐ Single-phase

(3) Attachment orientation ☐ Vertical direction ☐ Horizontal direction

1 Basic type (Index)



■ **Table** Material quality　D1 mm　T mm

■ **Tool** Material quality　Quantity pieces　D3 mm

D2 mm　t mm

■ **Workpiece** Number of loaded items pieces　Mass g/piece

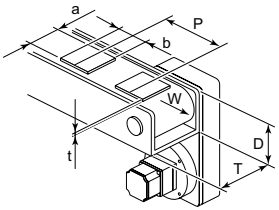
■ **Table slide resistance** ☐ Presence of slide: Let us know details. ☐ No slide

■ **When deaccelerated or accelerated with a gear (etc.)**

Speed ratio /　Output-side gear external-diameter mm　Internal diameter mm

Material quality　Driven-side gear external-diameter mm　Internal diameter mm

2 Basic type (Conveyor pitch feed)



■ **Pulley** Material quality　D mm　T mm

■ **Belt** Whole length mm　Material quality

■ **Tool** Material quality　Quantity pieces　a mm

b mm　t mm　Work mass g/piece

■ **Shift distance** P mm

■ **Slide resistance** W kg (Force applied when the conveyor starts to operate)

■ **When transmitted with a gear (etc.)**

Speed ratio /　Output-side gear external-diameter mm　Internal diameter mm

Material quality　Driven-side gear external-diameter mm　Internal diameter mm

Gear width mm

3 Other usages

Please let us know detailed specifications separately.

■ **If you have any request which we should know especially, please let us know it separately.**

■ **Person in charge of order**

Company name:

Department: ____ Position: ____

Name:

Address: ____ Postal code: ____

Tel: ____ Fax: ____

e-mail:

To.

ALU: ORDER FORM

■ To place an order for the alignment unit, fill in the form below and fax it to our representative.

Date of order (MM/DD/YYYY):
/ /

ALIGNMENT Technical Support Sheet

■ Model selection Check the checkbox for the desired model.

Alignment unit

Positioning by setting clearance with workpieces

- Small rigid ☐30 - 3 X9103 ☐
- Rigid ☐50 - 6 X9106 ☐
- Dust-proof rigid ☐50 - 6 X9107 ☐

The spring buffer workpieces for the close direction.

- Small buffer ☐30 - 3 X9113 ☐
- Buffer ☐50 - 6 X9116 ☐
- Small rigid ☐50 - 6 X9117 ☐

Motor-equipped ☐ **Connect (external drive)** ☐

■ No. of units required _____ units

■ Requested delivery date / / (day/month/year)

■ Requested specifications Fill in for items (1) to (7).

(1) Mechanical cycle time	ms	**(5) Work material**	
(2) Positioning time (open to close)	ms	**(6) Workpiece status**	Having fed and adsorbed/ after placement on a cradle
(3) Needed stroke	mm	**(7) Post-processing**	Inspection/assembly/taping/others
(4) Workpiece size	mm		

■ Time lag specifications are also available.

☐ X9106 time lag (3.45 mm stroke)
☐ X9107 time lag (3.45 mm stroke)

■ Remarks

- The stepping motor driver is not not supplied with the product. It is to be prepared by the customer.
- The stroke notation on this sheet is presented for strokes having both sides of jaws added.

■ Person in charge of order

Company name _____

Department _____

Name & title _____

Address _____

Tel _____ Fax _____ e-mail _____

To.

TOU: ORDER FORM

■ To place an order for the TOU, fill in the TOU technical support sheet and fax it to our representative.

TOU Turn over unit Technical Support Sheet

Date of order (MM/DD/YYYY):
_____/_____/_____

■ **Model No.** ☐ **X6410** ☐ **X6412** ☐ **X6414** ☐ **X6416**

☐ Motor and sensor not equipped ☐ With sensor ☐ Motor equipped ☐ With motor and sensor

_____ units ■ **Requested delivery date** ____/____/____ (day/month/year)

■ **Requested specifications** Fill in for items (1) to (3).

(1) Mechanical cycle time _____ sec.

(2) Reverse time _____ sec

(3) Workpiece size _____ mm

■ **Document for the workpiece catch of the head section**

☐ Please send. * It is also possible to download from the website.

■ **Requests** * Please enter special order requests, usage information etc.

■ **Person in charge of order**

Company name _____

Department _____

Name & title _____

Address _____

Tel _____ Fax _____ e-mail _____

International System of Units (SI unit)

■ Conversion of the International System of Units (SI) and conventional units

On this catalog, values are presented in the SI unit (conventional unit) format.
For detail specifications, perform conversion in accordance with the table and graph below:

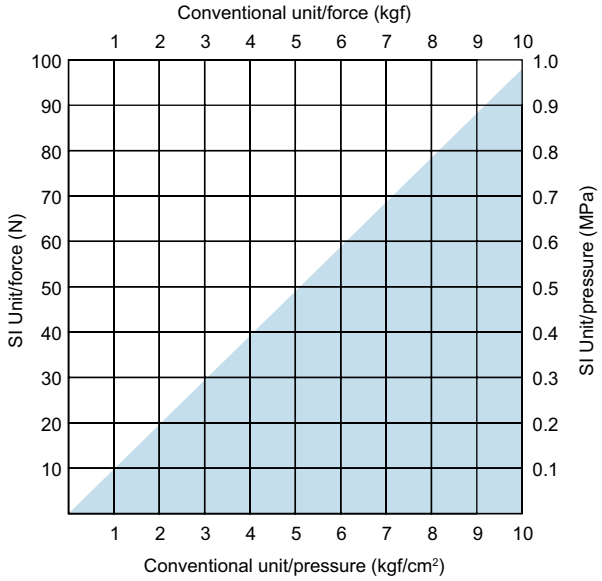
Main SI units

Name	Symbol	Conventional unit to SI unit	SI unit to Conventional unit
Pressure	MPa	1kgf/cm^2 ≒ 0.098 MPa	1 MPa ≒ 10.2 kgf/cm^2
Force/load	N	1 kgf ≒ 9.8 N	1 N ≒ 0.102 kgf
Force moment	N•m	1 kgf•m ≒ 9.8 N•m	1 N•m ≒ 0.102 kgf•m
Inertial moment	kg•m^2	1 kgf•cm•S^2 ≒0.098 kg•m^2	1 kg•m^2 ≒ 10.2 kgf•cm•S^2

■ Conversion graph of the International System of Units (SI) and conventional units

(How to read the graph)

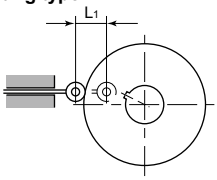
For the conversion of the force (load) unit, read with the scales at the top and left. For the conversion of the pressure unit, read from the intersection on the scales of the bottom and right.



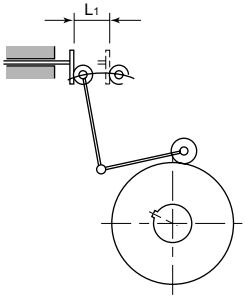
■ Basic structure of cam devices

The basic structure of cam mechanisms is represented by the following five types. Cams cannot present theoretical dynamic characteristics unless formation is made so that the acceleration displacement over the "L1" section becomes a cam curve.

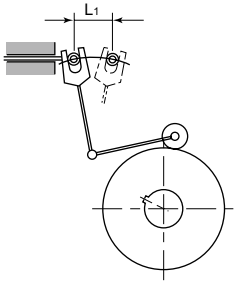
- **Direct acting type**



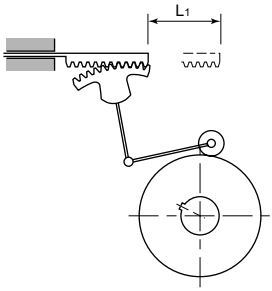
- **Sine type**
  The basic structure of MEG's gate motion PPUs is based on this sine type.



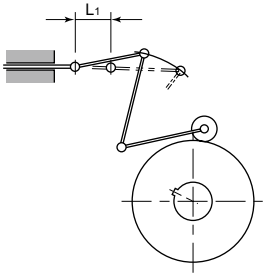
- **Tangent type**



- **Radian type**



- **Link type**



■ Cam curves

- **Harmonic motion curve**
  This is generally referred to as a constant velocity curve, and is also called harmonic or Archimedes.
  It is used when feed speed is to be made uniform over the entire section. This curve has such a disadvantage that the acceleration at the time of motion start and motion end becomes infinite, always resulting in shock occurrence. Therefore, it is used only when feed is to be uniformed at very slow speed like a cutter.

- **Modified sine curve (Mod Sin)**
  This is the curve employed for cam mechanisms most and is considered to suit for intermediate speed and intermediate load (suit for general use). It is a well-balanced easy-to-use curve.

- **Modified trapezoid (Mod Tra)**
  This is a cam curve for high speed and light load, resulted from conversion from acceleration displacement to trapezoid. It is a displacement curve having the maximum acceleration suppressed, developed by Ferguson Machine Co. in the U.S.

- **Modified constant velocity curve**
  This is a curve which presents uniform-speed displacement within a certain section regarding shift distance, and it is used when the shift distance is especially large or uniform-speed condition is imposed.
  Among the displacement curves, it allows the smallest pressure angle and is easy to use due to inclusion of a modified sine curve in its characteristics.

- **Trapecloid curve**
  This is a displacement curve having the cam index period at the deacceleration side increased to moderate stop energy.
  At the acceleration side 45% is indexed with a modified trapezoid, and at the deacceleration side 55% is indexed with a modified sine curve.

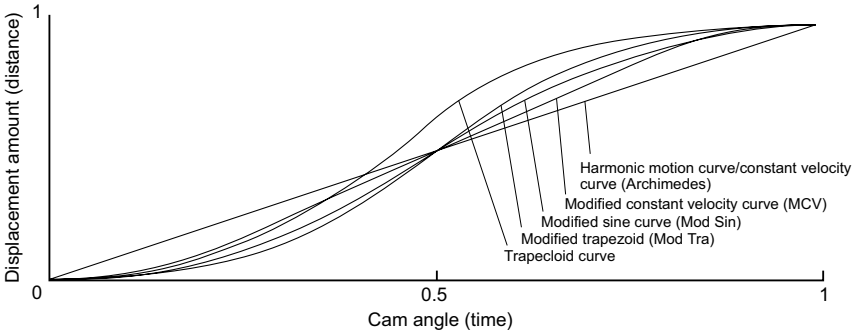


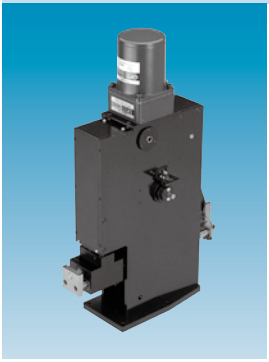
Fig. 1

Please visit our website.

http://www.meg.co.jp/

PPU (cam-driven)

X6085 *Stroke: 200 x 50 (mm)*



- The GD² of the working section is small and high speed and high accuracy are maintained.
- Design through thorough waste elimination has enabled inexpensive prices.
- The employment of a cam allows high reliability and high repetition accuracy.
- It can serve for free-flow conveyor lines having large conveyor width.

Specifications

Model No.	X6085
Stroke (maximum)	Horizontal 200 mm, vertical 50 mm
Position repeat accuracy	±0.035 mm
Standard motor	Induction, single-phase 100 V/200 V 40 W
Supplied sensor	Origin photomicrosensor
Main body mass	24.0 kg
Standard paint color	Black (equivalent to Munsell N1)
Operating ambient temperature	5 to 50°C
Operating ambient humidity	85% or less (No condensation)
Lubricant	COSMO GREASE, DYNAMAX EP No. 1

Product number configuration

X6085 - LD - 200 - 60 - 2.2 (Note 1)

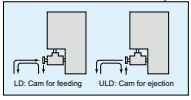
PPU model No.

Code	Working voltage
100	Single-phase 100 V
200	Single-phase 200 V
0.2	Three-phase 200 V

Code	Frequency
50	50 Hz
60	60 Hz

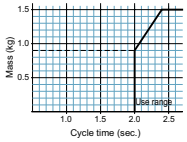
Cycle time	50 Hz	60 Hz
2.2	×	×
2.6	×	×
3.2	×	
3.7		×
4.4	×	×

(second)



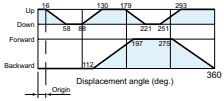
■ Cycle time and transportable mass (chuck mass included)

Be careful that use with excess mass can cause a problem.

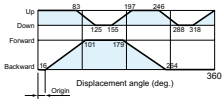


■ Timing of motion

(1) Cam for feeding (LD)



(2) Cam for ejection (ULD)



X6091F *Flexible type*

PAT.PEND

Newly available cam-driven type general-use robot PPU

- Workpiece supply position change and multi-point supply for multi-model production (for example) are possible.
- For the feed mechanism, the time-proven cam mechanism is employed and accurate supply is performed at high speed and with high repeat accuracy.
- The mechanism allows the x and z strokes to be freely set. Completely-free highly-flexible motions are enabled.
- This is available for usages which cannot be dealt with fixed strokes of conventional cam PPUs. Compact, flexible, and easy-to-use machines are enabled.

■ Variations

Model No.	Stroke (mm)
	100 x 25 (max)
X6091F	×

Product number configuration

X6091F

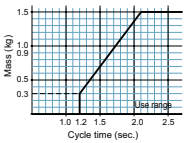
PPU model No.

■ Specifications

Stroke	X: 0 to 100 mm Z: 0 to 25 mm
Feed amount	X: 0.1 mm (full step) Z: 0.1 mm (full step)
Position repeat accuracy	±0.025 mm
Drive system	Stepping motor-driven
Transportable mass	From 1.5 kg (Depending on the cycle time)
Cycle time	From 1.2 sec
Standard motor	X: PK566NB Z: PK566NB
Supplied sensor	Origin photomicrosensor
Main body mass	10 kg
Standard paint color	Black (equivalent to Munsell No.1)
Working temperature	5 to 50°C
Operating ambient humidity	85% or less (No condensation)
Lubricant	COSMO GREASE, DYNAMAX EP No. 1

■ Cycle time and transportable mass (chuck mass included)

Be careful that use with excess mass can cause a problem.



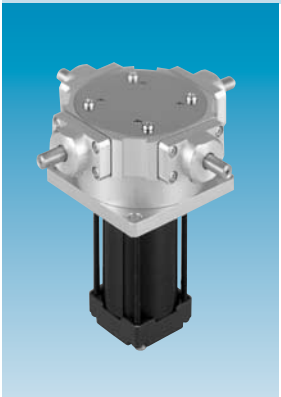
*1 The cycle time designates the time needed from motion start to motion stop after one cycle without interruption in terms of gate motions with horizontal 100 mm strokes and vertical 25 mm strokes.

*2 The transportable mass differs depending on the cycle time.

*3 Driver to be used
- Type AC power input type
- Step angle 0.072° (1/10)
- Operation current setting value 1.4 A

ALIGNMENT (Alignment unit)

Dust-proof rigid type X9107M



- This unit has high dust-proof capability through placement of the working shaft at the side of the body and the original
- dust-proof structure.

A rigid-type mechanism has been employed. The fingers operate based on
- cam curves, and shock-less and long-life products are resulted.

Due to free composition of jaws, a wide range of workpieces from tiny components to module components can be dealt with.

Product number configuration

X9107M

Model No.

(Dust-proof type: rigid specifications)

* This product is available on request.
* Agreement on the specifications is needed.

Dust-proof buffer type X9117M

- This unit has high dust-proof capability through placement of the working shaft at the side of the body and the original dust-proof structure.
- A butter-type mechanism has been employed. The fingers operate based on cam curves, and shock-less and long-life products are resulted.
- Due to free composition of jaws, a wide range of workpieces from tiny components to module components can be dealt with.

Product number configuration

X9117M

Model No.

(Dust-proof type: buffer specifications)

* This product is available on request.
* Agreement on the specifications is needed.

Special

Besides the products in the catalog, consultation about, for example, special units and cell machines which meet your specifications is welcomed.
The confidentiality will be guaranteed. You can totally trust us.

Delivery record (partial extraction)
Amusement related small machines
Semiconductor production/inspection machine on-board unit
Consumer product assembly desktop type machine
Micro unit for research institutions
Handling equipment for processing machines

Our website

http://www.meg.co.jp/

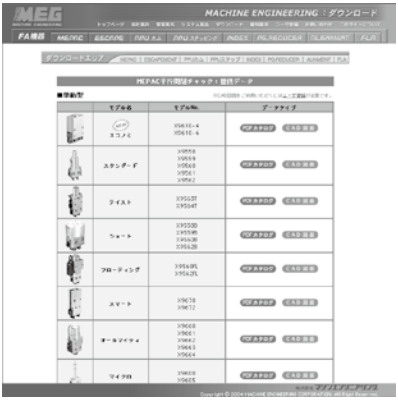
Introduction of helpful pages

■ Top page

The latest product information and information on the latest catalog are presented.

■ New product information

Besides the features and specifications of the new products, videos such as demonstrations with products are viewable.
It is also possible to download catalog data PDF files and request catalogs of new products.



■ CAD data

It is possible to download our products' CAD data (DXF) which may serve for your design.
* Please access through the download page.

■ Various catalogs, etc.

The latest catalog of our products is introduced.
It is also possible to request.

ALIGNMENT (Alignment unit)

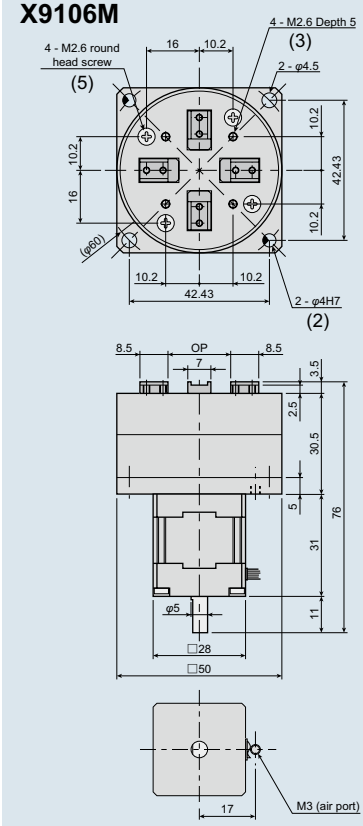
Rigid motor equipped X9106M

Buffer motor equipped X9116M

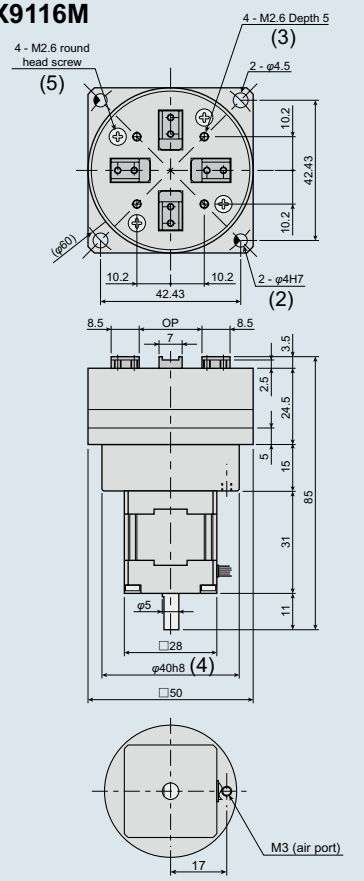
The production of the stepping motor used for this product is scheduled to be discontinued and further production has become difficult.

■ Dimensional drawing (mm)

X9106M

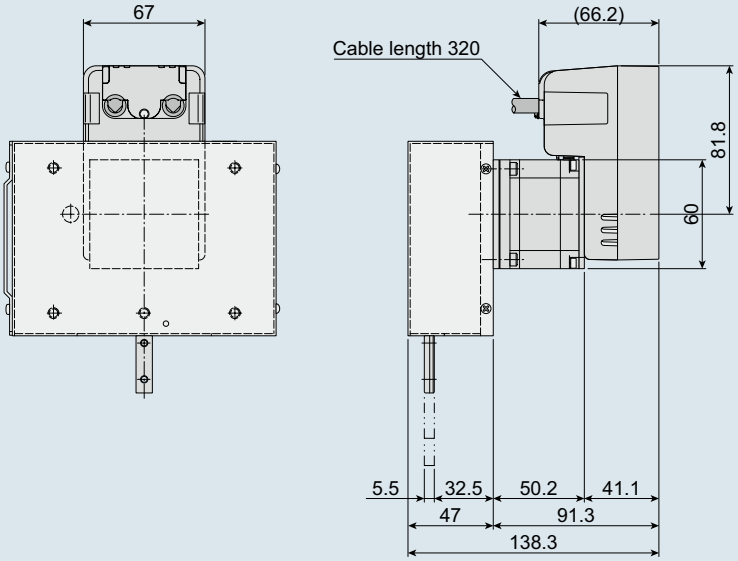


X9116M



PPU (Pulse control motor type pick & place unit) (mm)

Servo type
X6303-D, X6305-D, X6307A-D, X6309A-D

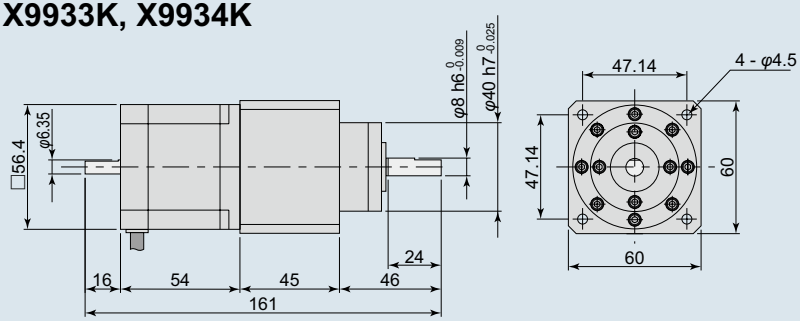


Discontinued products

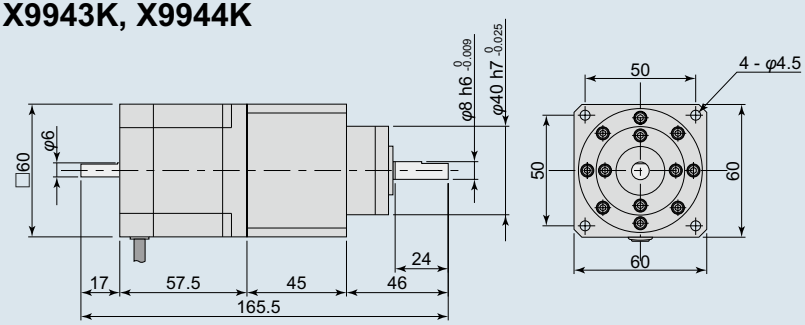
The products below have been removed from the Guide Book.
Thank you very much for using the products for many years.

PG.REDUCER Backlash-less speed reducer (mm)

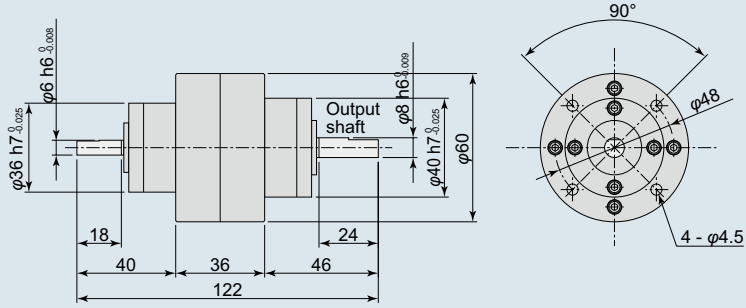
X9933K, X9934K



X9943K, X9944K



X9923K, X9924K



* The D processing section of the output shaft fits the height resulted from “shaft diameter x 0.9” and the length from the shaft end resulted from “shaft diameter x 1.5 standard”.

Model No. Index