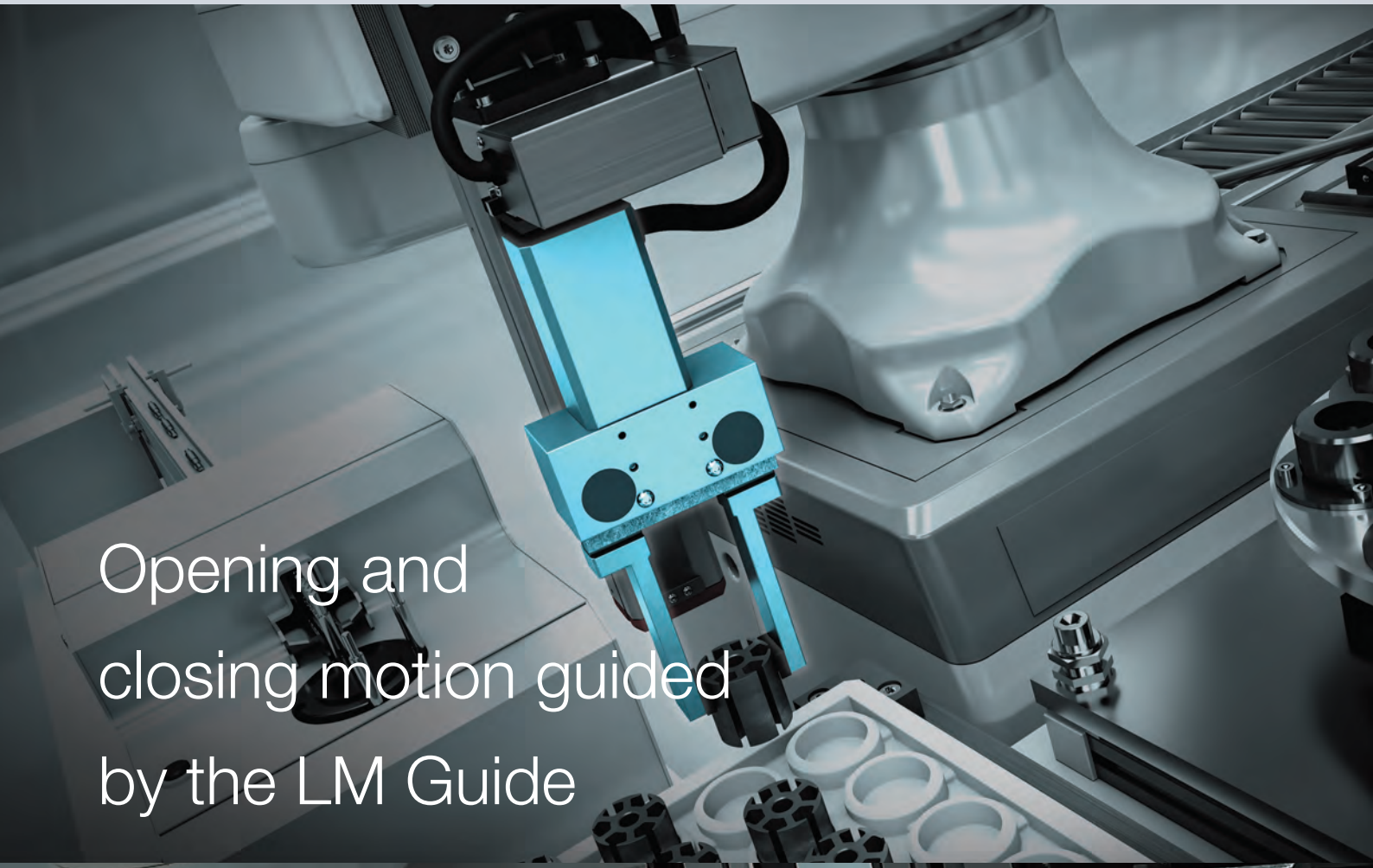
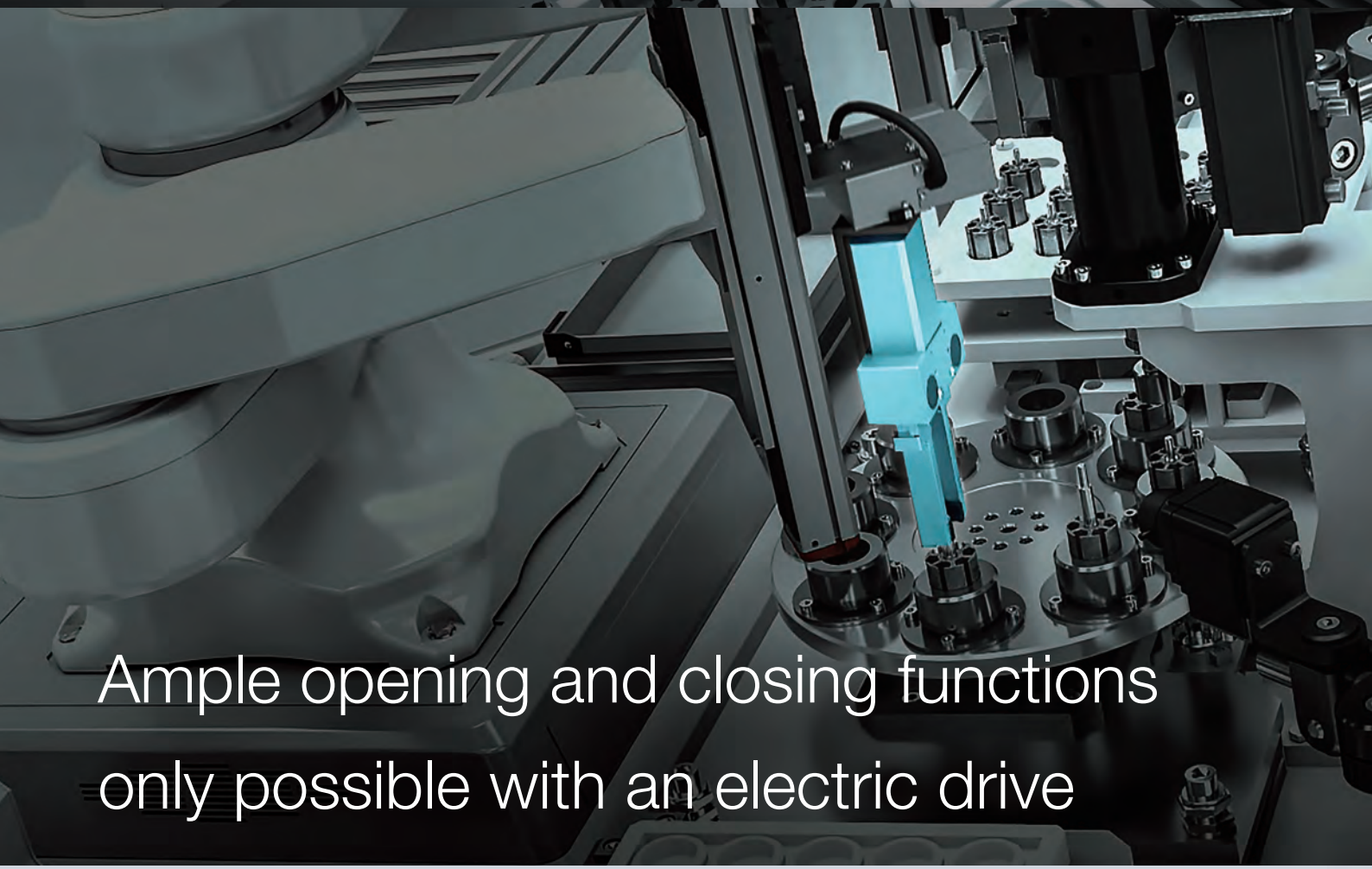
THK

Electric Gripper **EG**

A tough electric gripper
that supports workpiece retention

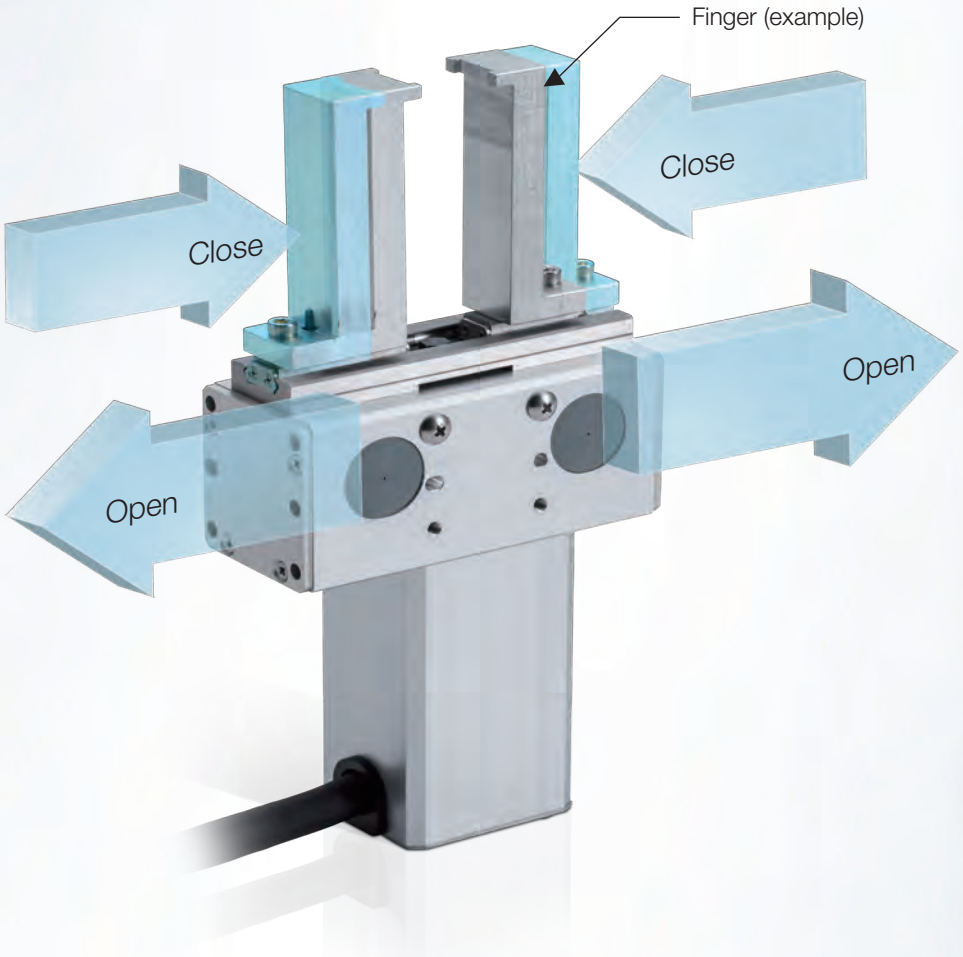


Opening and
closing motion guided
by the LM Guide



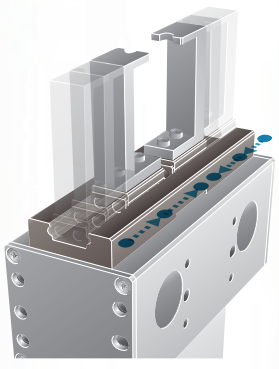
Ample opening and closing functions
only possible with an electric drive

Electric Gripper EG

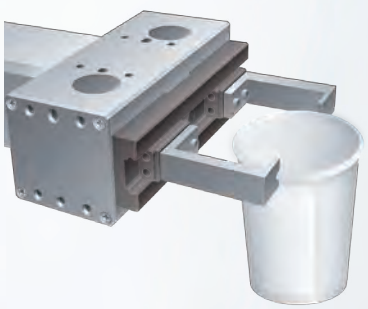


Multi-point positioning and variable gripping force (plus adjustable opening/closing speed)

The combination of an electric drive with position control makes it possible to easily set three or more positions without stoppers.
The gripping force can be set to grip items in various ways (and it can continue to grip items even if the power is shut off).



Multi-point positioning



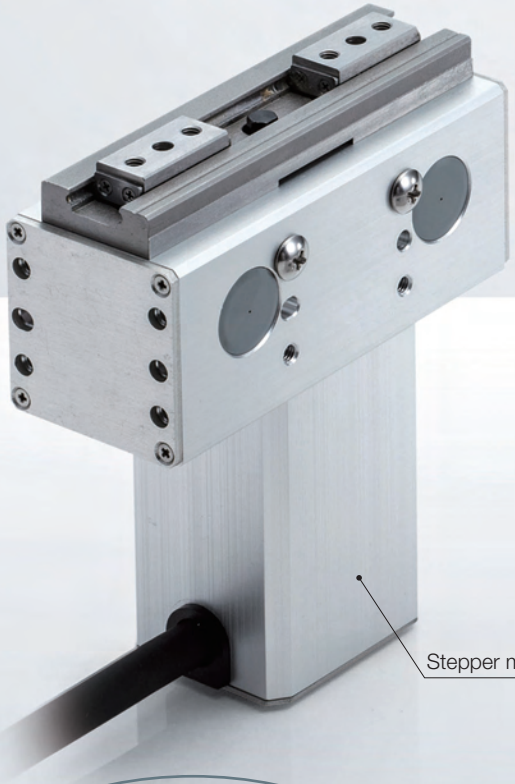
Gripping force setting

EG

Multi-point positioning
Control open/close speed
Gripping force setting
LM Guide used for the guiding mechanism
Positioning repeatability: ±0.01 mm

TSC specifications

Stepper Driver
Controller TSC



Stepper motor built in

High-performance EG structure

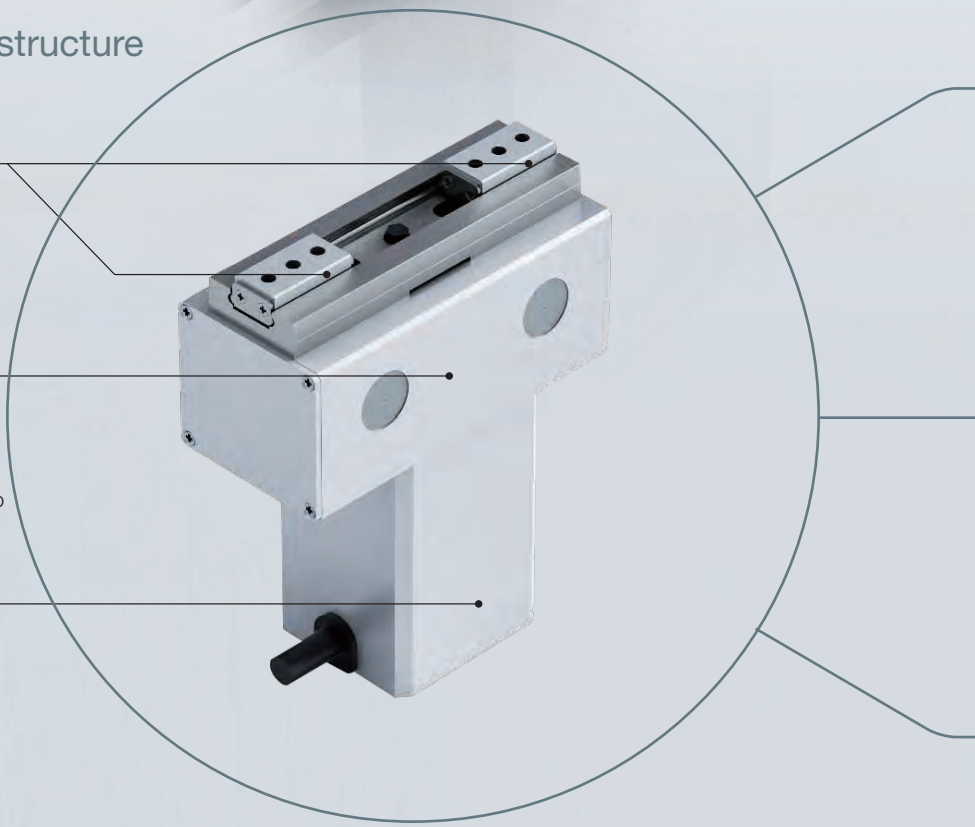
Smooth open/close mechanism

- Linear guide structure features the LM Guide

Built-in drive element

- Drive mechanism combines a motor and sliding screw
- Sophisticated mechanism in which the sliding screw drive transfers precisely to the LM Guide

Motor



Without motor

Stepper motor specifications

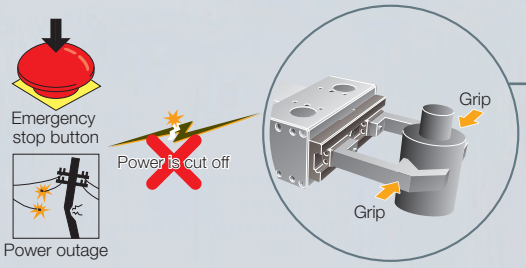
Servo motor specifications

Smooth motion that withstands repeated open/close operations

This product achieves high rigidity plus the smooth motion of the LM Guide.
Combining a small lead sliding screw and reduction gear, this product features stable gripping force and high-precision positioning through the driving force from a small motor.

Maintains gripping force even when power is lost

Gripping force is maintained because the open/close portion has a mechanism to hold its position.
* The open/close portion can be unlocked with a special tool.

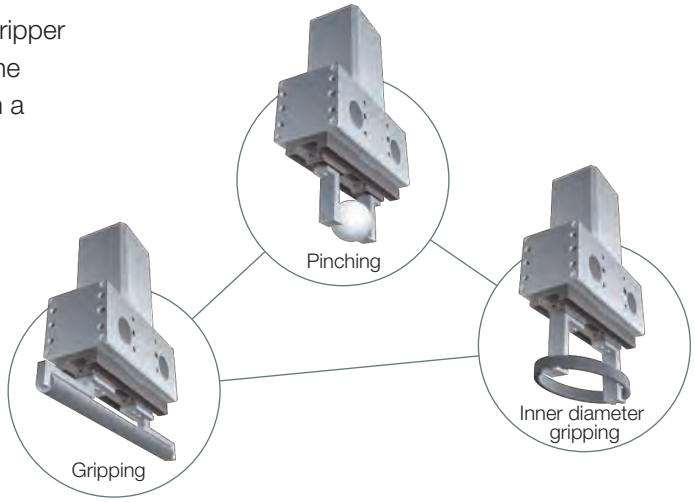


Different varieties are available for purchase

This product can come with a motor that pairs with the THK controller, a motor that you specify, or no motor installed.

Applications

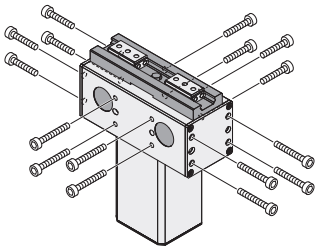
Depending on the fingers installed, the gripper can pinch workpieces, hold them from the inside, and grip them steadily even when a moment is applied.



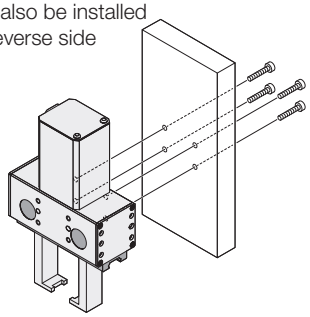
Mounting Methods

The main unit has mounting locations on four surfaces and features reference holes to make it easy to remove and reinstall the unit in the same place.

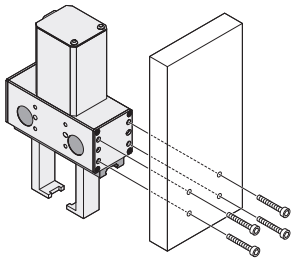
Mounting surface



Horizontal installation
Can also be installed on reverse side

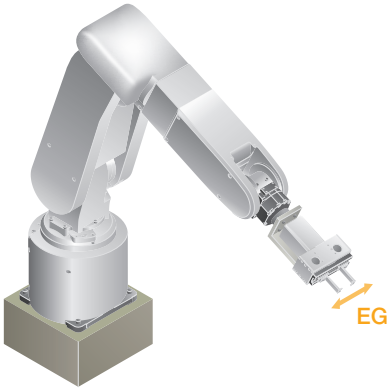


Side surface installation
Can also be installed on reverse side



Example Applications

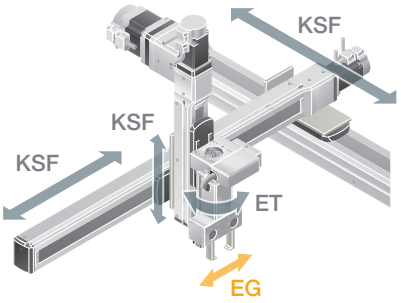
General industry
Vertical articulated robot



The EG is used in the hand of the vertical articulated robot. The guiding portion uses the LM Guide to provide smooth motion and high rigidity, which makes it possible to maintain a stable grip even in orientations where moments act on the unit.

Model used — Hand: EG

General industry
Orthogonal-axis robot



The EG is used in the end effector (hand) of the orthogonal-axis robot. Changing the shape of the fingers that are installed makes it possible to pinch and grip objects or hold them by the inner diameter.

Models used
Hand: EG
θ axis: ET
X, Y, and Z axis: KSF

General Specifications

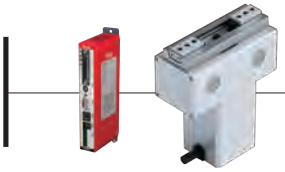
Three sizes are available: EG28V, 35V, and 42V. The stroke and motor size for each are given below.

TSC specifications

EG28V

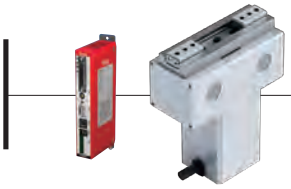
Stroke | Max. 7 mm (one side)
Motor size: 28×28

EG35V



Stroke | Max. 11 mm (one side)
Motor size: 35×35

EG42V



Stroke | Max. 15 mm (one side)
Motor size: 42×42

Without motor: Stepper motor specifications

EG28V

Stroke | Max. 7 mm (one side)
Motor size: 28×28

EG35V

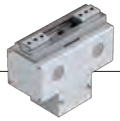
Stroke | Max. 11 mm (one side)
Motor size: 35×35

EG42V

Stroke | Max. 15 mm (one side)
Motor size: 42×42

Without motor: Servo motor specifications

EG28V



Stroke | Max. 7 mm (one side)
Motor size: 25×25

EG35V

Stroke | Max. 11 mm (one side)
Motor size: 25×25

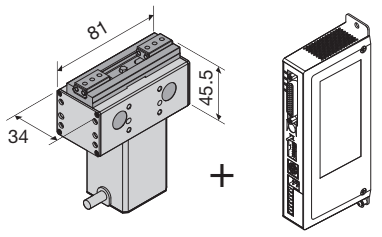
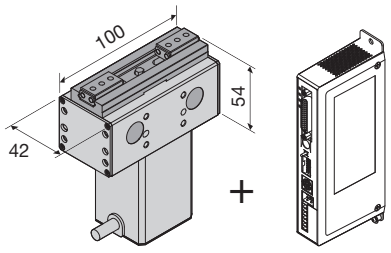
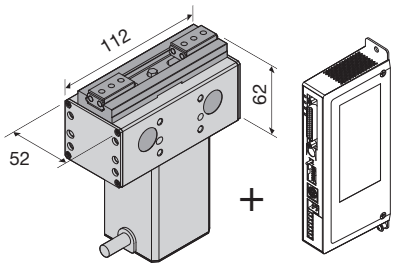
EG42V

Stroke | Max. 15 mm (one side)
Motor size: 40×40

EG (with Stepper Driver Controller TSC)

Combination with dedicated driver controller

Lineup

EG28V+TSC	EG35V+TSC	EG42V+TSC
		

Model Number Coding

Model ①	Feed screw lead ②	Stroke ③	Control device ④	Motor bracket ⑤	Motor size ⑥	Home position ⑦	Cable type/length ⑧
EG28V –	02 –	014 –	TS –		/ 28P –	D00 –	S3
EG28V	02: 02 mm	014: 14 mm	TS: Stepper Driver Controller TSC	No symbol: None	28P: Stepper motor 28×28	D00: Open side	No symbol: None
EG35V		022: 22 mm			35P: Stepper motor 35×35	R00: Closed side	S3: Standard 3 m
EG42V		030: 30 mm			42P: Stepper motor 42×42		S5: Standard 5 m
							SA: Standard 10 m

Controller must be procured separately.
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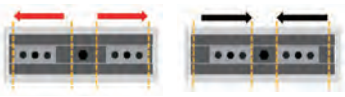
The available stroke options vary based on the model.
EG28V: 014
EG35V: 022
EG42V: 030

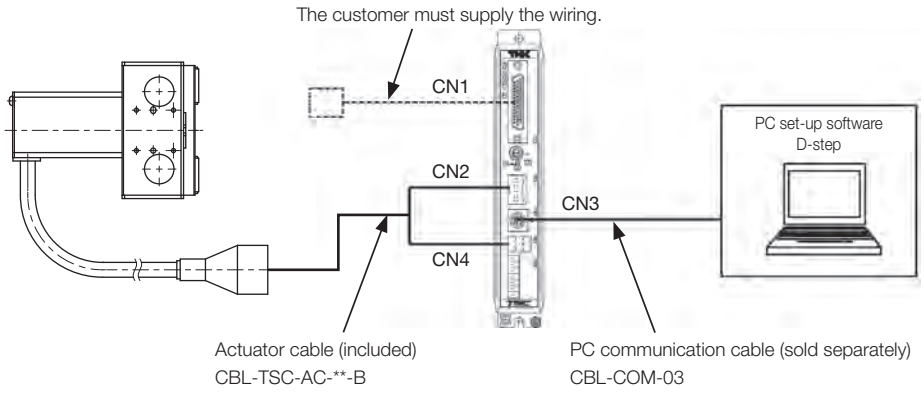
The available motor options vary based on the model.
EG28V: 28P
EG35V: 35P
EG42V: 42P

D00 and R00 use mechanical homing.



D00: Open side R00: Closed side

System Configuration



Cable List

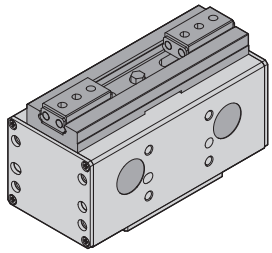
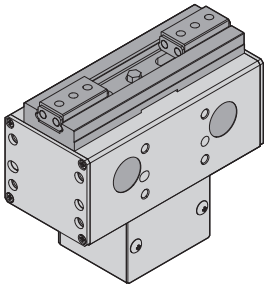
Cable	Quantity	Notes
Actuator cable for TSC	1	Comes with compatible actuator
I/O cable	1	Sold separately (I/O connector for TSC side only comes with TSC)
PC communication cable	1	Sold separately

Note: When using a 10 m actuator cable, please insert a noise filter in the TSC power source.
We recommend the RSAN-2003 noise filter from the TDK-Lambda Corporation.

EG (without Motor)

Main actuator unit only or equipped with motor specified by customer

Lineup

EG28V, EG35V, EG42V	
Stepper motor specifications	Servo motor specifications
	

Model Number Coding

Model		Feed screw lead		Stroke		With/without motor		Motor bracket
①		②		③		④		⑤
EG28V	–	02	–	014	–	0	–	A
EG28V		02: 02 mm		014: 14 mm		0: Without motor		A : Stepper motor
EG35V				022: 22 mm		1: With motor (THK will purchase and mount the motor you specify)		B : Servo motor
EG42V				030: 30 mm				

The available stroke options vary based on the model.
EG28V: 014
EG35V: 022
EG42V: 030

If “0” is selected:
No coupling will be attached. Please specify if a coupling is required when ordering.
A coupling is not required when a stepper motor will be used.

If “1” is selected:
The designated motor will be mounted. Please specify the motor cable direction separately.

EG28V

Gripper type | Stepper motor 28×28 | Servo motor 10 W | Servo motor 20 W | Servo motor 30 W | Motor Direct coupling | Stroke 14 mm

Model Number Coding

If "TS" is selected for ④ With or without motor/controller type, selections must be made for ⑥ to ⑧.

Model ①	Feed screw lead ②	Stroke ③	With or without motor/ controller type ④	Motor bracket ⑤	Motor size ⑥	Home position ⑦	Cable type/length ⑧
EG28V –	02 –	014 –	TS –	A /	28P –	D00 –	S3
EG28V	02: 02 mm	014: 14 mm	TS: Stepper Driver Controller TSC	No symbol: None	28P: Stepper motor 28×28	D00: Open side	No symbol: None
			0: Without motor	A: Stepper motor		R00: Closed side	S3: Standard 3 m
			1: With motor (purchased by THK)	B: Servo motor			S5: Standard 5 m
				If "TS" is selected for ④ With or without motor/controller type, please select "No symbol." If "0" or "1" is selected, please choose either "A" or "B."			SA: Standard 10 m

Selection Information

Basic Specifications

Motor size		28×28
Stroke[1] (mm)		14 (7)
Gripping force[2] (N)		20
Gripping force retention (%)		95
Acceleration/deceleration (G)		0.1
Movement speed[1] (mm/s)		80 (40)
Gripping speed[1] (mm/s)		6 (3)
Feed screw lead (mm)		2
Reduction ratio (LM Guide block/nut)		9.25/14
Positioning repeatability (mm)		±0.01
Backlash (mm)		0.2
Starting torque (N·m)		0.006
Travel life (grip cycles) (10,000 cycles)		1000
Permissible input torque (N·m)		0.07
Mass (kg)	Stepper motor specifications[3]	0.33
	Servo motor specifications[3]	0.38
	TSC specifications	0.54

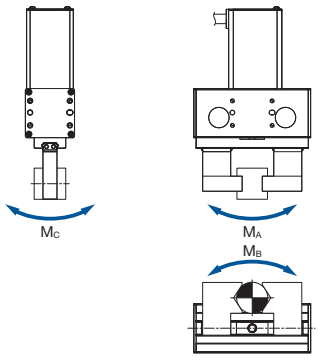
[1] Values in parentheses are for one side.
[2] Value when Controller TSC is selected.
[3] Motor mass not included.

LM Guide	Basic dynamic load rating C (N)		2050
	Basic static load rating C_0 (N)		2690
	Static permissible moment[4] (N·m)	M_A direction	7.33
		M_B direction	7.33
		M_C direction	12.5

[4] Static permissible moment is the maximum moment that can be permitted while the product is stationary.
The standard for M_A and M_C moments is the top surface of the LM Guide, while the standard for M_B moments is the center of the LM Guide.

Note 1) This is the value when the LM Guide has 1 block.

Static Permissible Moment



Motor Selection Information

■ For Stepper Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)
2	38	0.066	9.25/14	0.36	1.21×10^{-6}

■ For Servo Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)	Recommended coupling	
						Coupling model	Coupling inertia (kg·m²)
2	52.4	0.066	9.25/14	0.36	1.32×10^{-6}	SFC-010SA2-5B-*B	0.58×10^{-6}

Compatible Motors

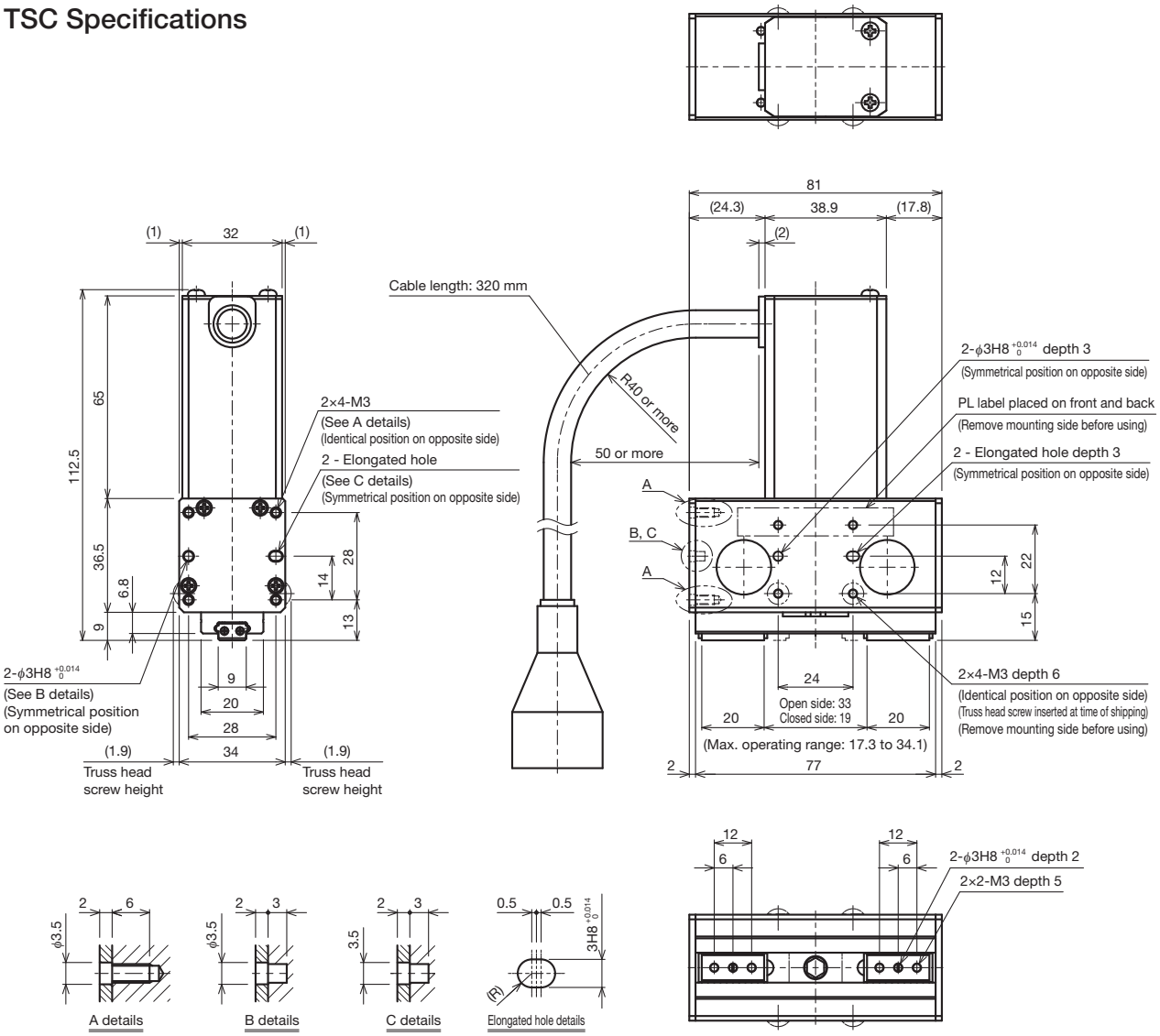
AC servo motor				Motor rated output (W)	Flange size	Motor bracket
YASKAWA Electric Corporation	Σ-Vmini		SGMMV-A1	10	25×25	B
			SGMMV-A2	20		
			SGMMV-A3	30		
Mitsubishi Electric Corporation	MELSERVO	J4	HG-AK0136	10	25×25	B
			HG-AK0236	20		
			HG-AK0336	30		

Stepper motor			Flange size	Motor bracket
ORIENTAL MOTOR CO., LTD.	5-phase	PKP523N12A	28×28	A
		PK523HPA(B)		
		PK523HPMA(B)		
		PK523HPA–R2GL		
		PKP525N12A		
		CRK52□		
	–	ARM2□		
SANYO DENKI CO., LTD.	–	PBM282	28×28	A
	–	PBDM282	28×28	

Note 2) Please select and use a motor that is suited to the usage conditions. The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer.
Note 3) If the maximum torque of the installed motor will exceed the permissible input torque, please consider a safety measure to limit the torque.
Note 4) For the motor output shaft, select a shaft end shape that suits the mounting on the machine side.
Note 5) Installation may not be possible depending on the motor options, so please verify in advance.

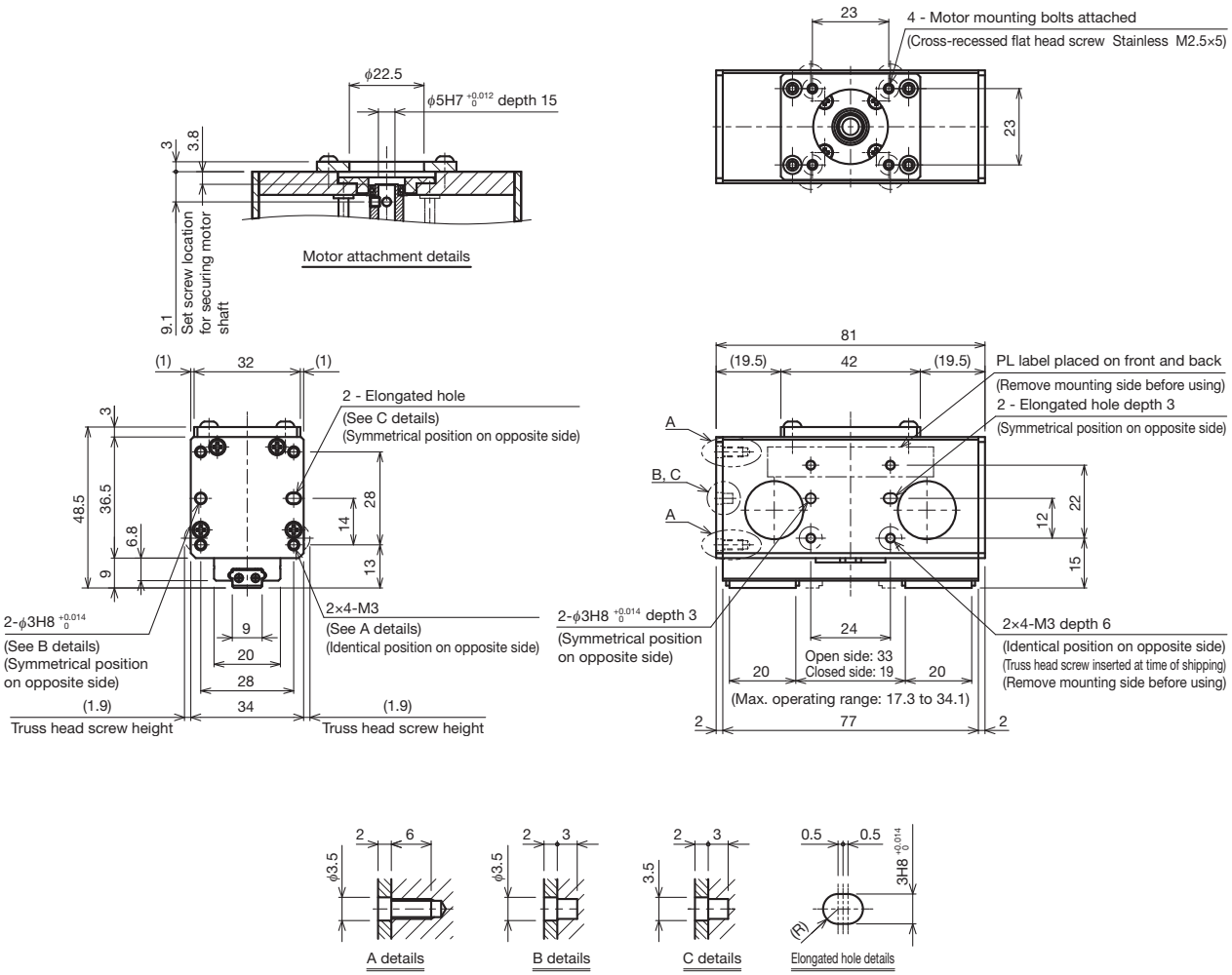
Dimensions

TSC Specifications



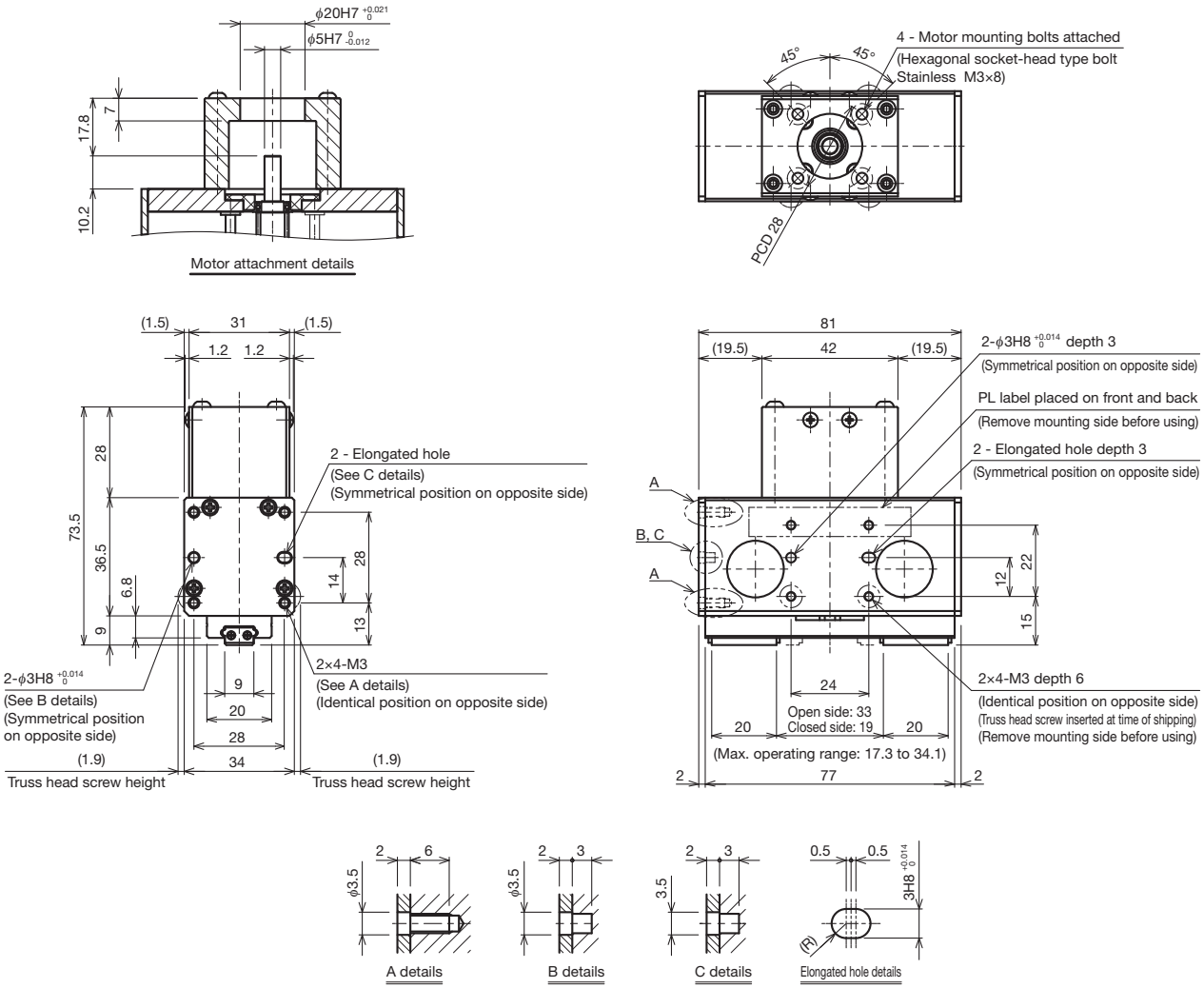
Dimensions

Without Motor (Stepper Motor Specifications)



Dimensions

Without Motor (Servo Motor Specifications)



EG35V

Gripper type | Stepper motor 35×35 | Servo motor 10 W | Servo motor 20 W | Servo motor 30 W | Motor Direct coupling | Stroke 25 mm

Model Number Coding

If "TS" is selected for ④ With or without motor/controller type, selections must be made for ⑥ to ⑧.

Model ①	Feed screw lead ②	Stroke ③	With or without motor/ controller type ④	Motor bracket ⑤	Motor size ⑥	Home position ⑦	Cable type/length ⑧
EG35V	02	022	TS	A	35P	D00	S3
EG35V	02: 02 mm	022: 22 mm	TS: Stepper Driver Controller TSC	No symbol: None	35P: Stepper motor 35×35	D00: Open side	No symbol: None
			0: Without motor	A: Stepper motor		R00: Closed side	S3: Standard 3 m
			1: With motor (purchased by THK)	B: Servo motor			S5: Standard 5 m
				If "TS" is selected for ④ With or without motor/controller type, please select "No symbol." If "0" or "1" is selected, please choose either "A" or "B."			SA: Standard 10 m

Selection Information

Basic Specifications

Motor size		35×35
Stroke[1] (mm)		22 (11)
Gripping force[2] (N)		57
Gripping force retention (%)		95
Acceleration/deceleration (G)		0.3
Movement speed[1] (mm/s)		100 (50)
Gripping speed[1] (mm/s)		6 (3)
Feed screw lead (mm)		2
Reduction ratio (LM Guide block/nut)		12.8/19
Positioning repeatability (mm)		±0.01
Backlash (mm)		0.3
Starting torque (N·m)		0.008
Travel life (grip cycles) (10,000 cycles)		1000
Permissible input torque (N·m)		0.157
Mass (kg)	Stepper motor specifications[3]	0.55
	Servo motor specifications[3]	0.59
	TSC Specifications	0.83

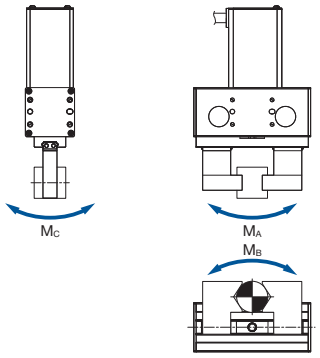
[1] Values in parentheses are for one side.
[2] Value when Controller TSC is selected.
[3] Motor mass not included.

LM Guide	Basic dynamic load rating C (N)		2960
	Basic static load rating C_0 (N)		3680
	Static permissible moment[4] (N·m)	M_A direction	11.2
		M_B direction	11.2
		M_C direction	21.1

[4] Static permissible moment is the maximum moment that can be permitted while the product is stationary.
The standard for M_A and M_C moments is the top surface of the LM Guide, while the standard for M_B moments is the center of the LM Guide.

Note 1) This is the value when the LM Guide has 1 block.

Static Permissible Moment



Motor Selection Information

■ For Stepper Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)
2	45.8	0.088	12.8/19	0.36	2.76×10^{-6}

■ For Servo Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)	Recommended coupling	
						Coupling model	Coupling inertia (kg·m²)
2	59	0.088	12.8/19	0.36	2.87×10^{-6}	SFC-010SA2-5B-*B	0.58×10^{-6}

Compatible Motors

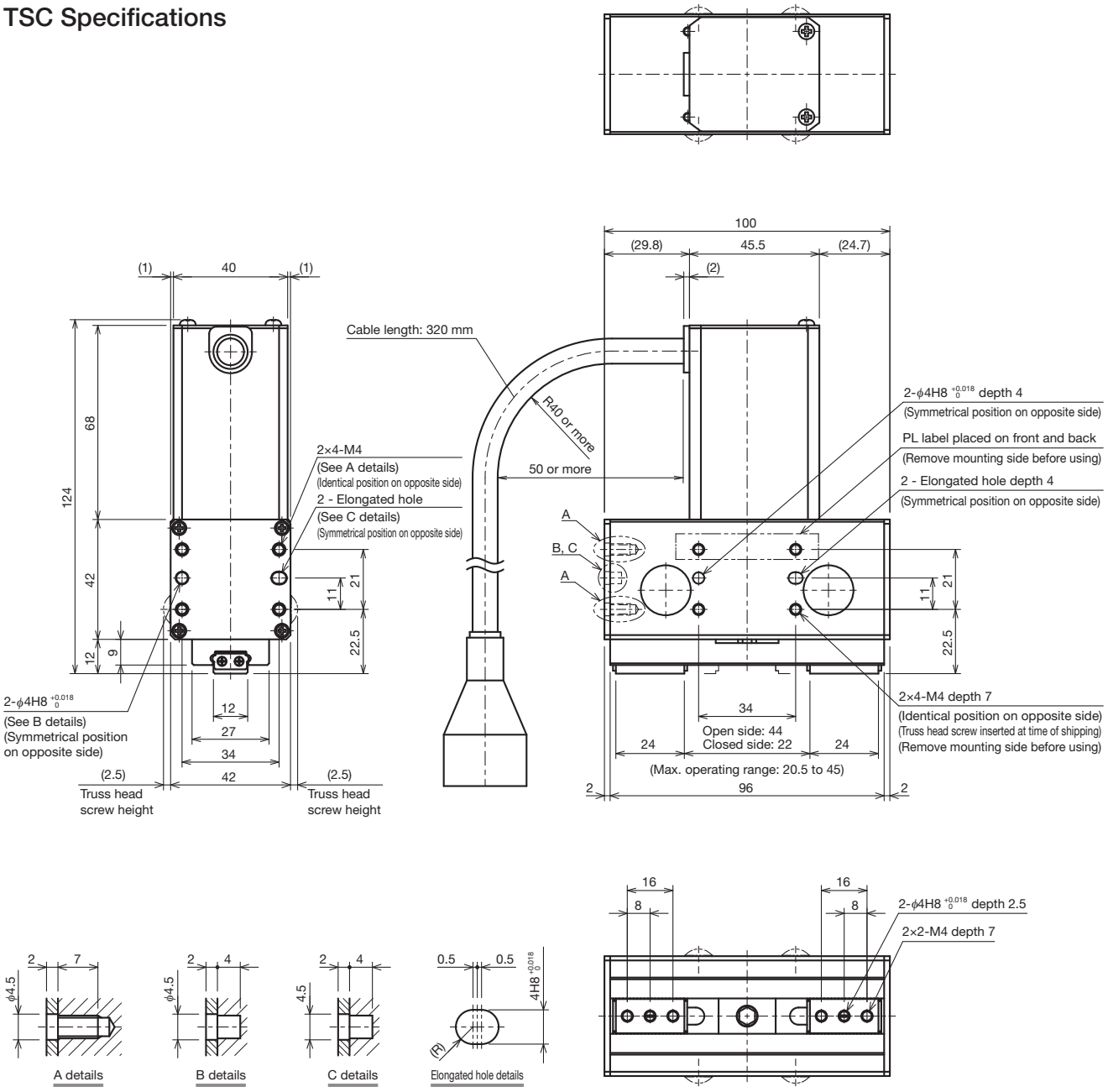
AC servo motor				Motor rated output (W)	Flange size	Motor bracket
YASKAWA Electric Corporation	Σ-Vmini		SGMMV-A1	10	25×25	B
			SGMMV-A2	20		
			SGMMV-A3	30		
Mitsubishi Electric Corporation	MELSERVO	J4	HG-AK0136	10	25×25	B
			HG-AK0236	20		
			HG-AK0336	30		

Stepper motor			Flange size	Motor bracket
ORIENTAL MOTOR CO., LTD.	2-phase	PKP233D15A(B)	35×35	A
		PKP235D15A(B)		

Note 2) Please select and use a motor that is suited to the usage conditions. The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer.
Note 3) If the maximum torque of the installed motor will exceed the permissible input torque, please consider a safety measure to limit the torque.
Note 4) For the motor output shaft, select a shaft end shape that suits the mounting on the machine side.
Note 5) Installation may not be possible depending on the motor options, so please verify in advance.

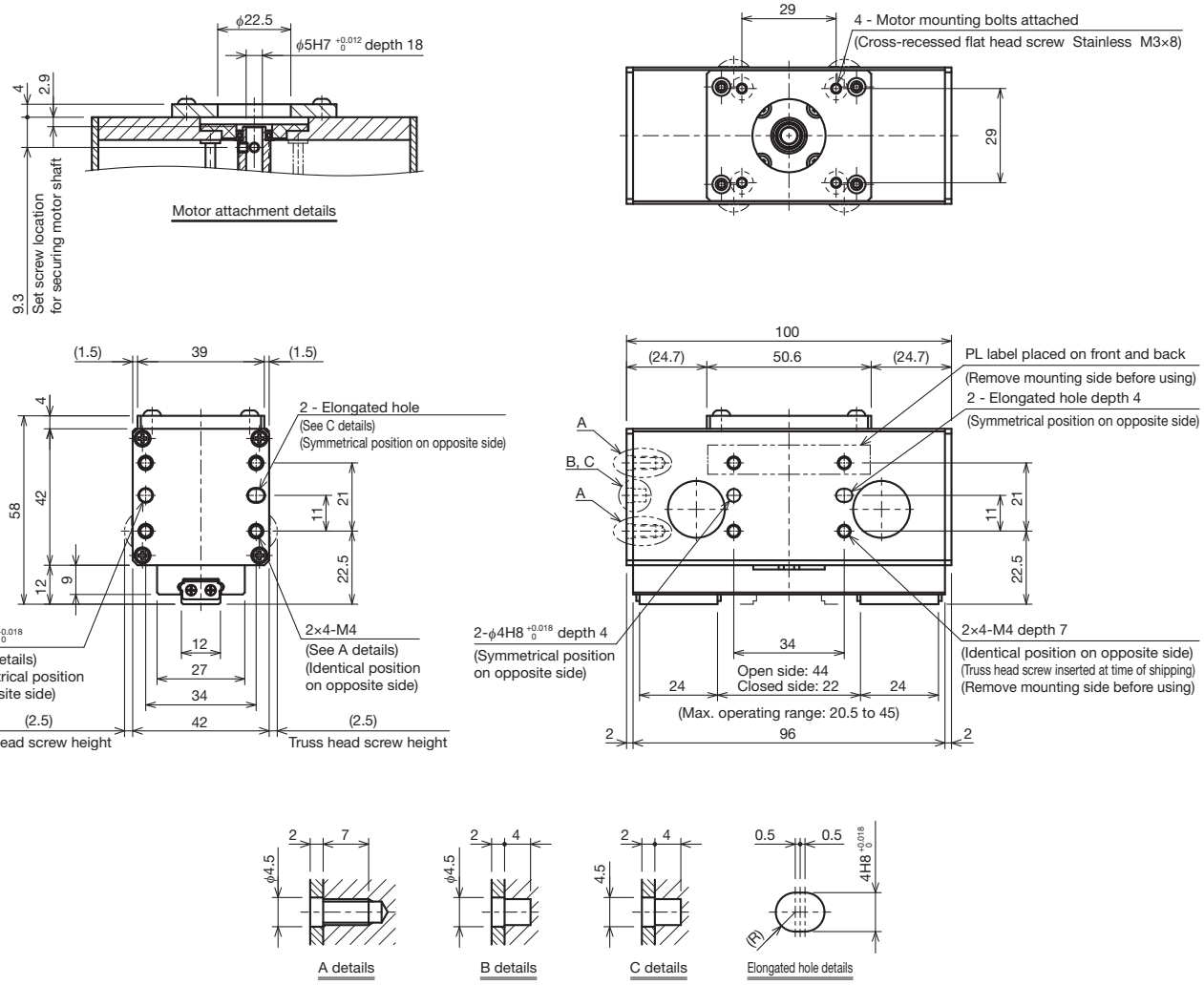
Dimensions

TSC Specifications



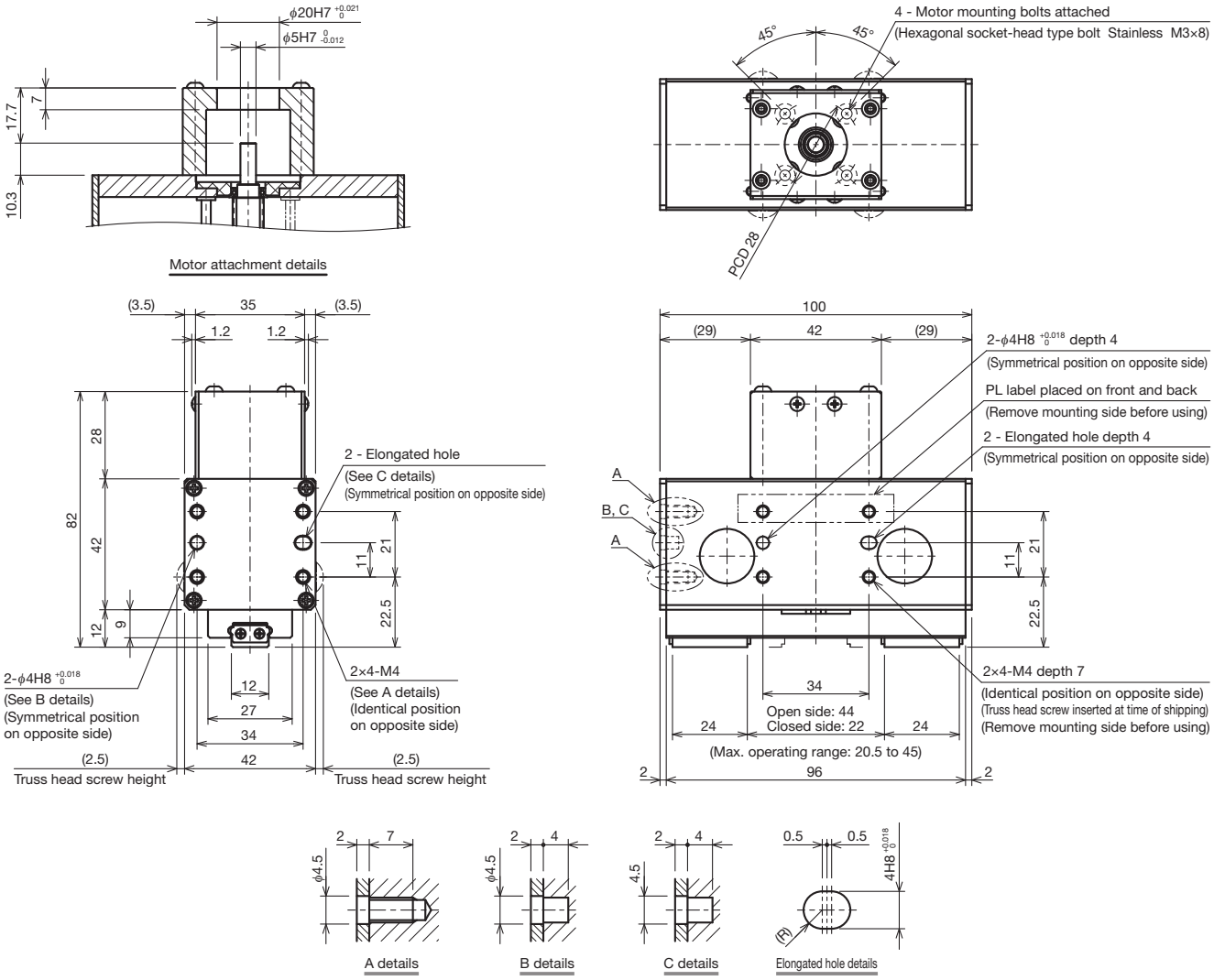
Dimensions

Without Motor (Stepper Motor Specifications)



Dimensions

Without Motor (Servo Motor Specifications)



EG42V

Gripper type | Stepper motor 42×42 | Servo motor 50 W | Servo motor 80 W | Servo motor 100 W | Servo motor 150 W | Motor Direct coupling | Stroke 30 mm

Model Number Coding

If "TS" is selected for ④ With or without motor/controller type, selections must be made for ⑥ to ⑧.

Model ①	Feed screw lead ②	Stroke ③	With or without motor/controller type ④	Motor bracket ⑤	Motor size ⑥	Home position ⑦	Cable type/length ⑧
EG42V	02	030	TS	A	42P	D00	S3
EG42V	02: 02 mm	030: 30 mm	TS: Stepper Driver Controller TSC	No symbol: None	42P: Stepper motor 42×42	D00: Open side	No symbol: None
			0: Without motor	A: Stepper motor		R00: Closed side	S3: Standard 3 m
			1: With motor (purchased by THK)	B: Servo motor			S5: Standard 5 m
				If "TS" is selected for ④ With or without motor/controller type, please select "No symbol." If "0" or "1" is selected, please choose either "A" or "B."			SA: Standard 10 m

Selection Information

Basic Specifications

Motor size		42×42
Stroke[1] (mm)		30 (15)
Gripping force[2] (N)		102
Gripping force retention (%)		95
Acceleration/deceleration (G)		0.3
Movement speed[1] (mm/s)		140 (70)
Gripping speed[1] (mm/s)		6 (3)
Feed screw lead (mm)		2
Reduction ratio (LM Guide block/nut)		14.2/20
Positioning repeatability (mm)		±0.01
Backlash (mm)		0.3
Starting torque (N·m)		0.01
Travel life (grip cycles) (10,000 cycles)		1000
Permissible input torque (N·m)		0.311
Mass (kg)	Stepper motor specifications[3]	0.79
	Servo motor specifications[3]	0.87
	TSC Specifications	1.22

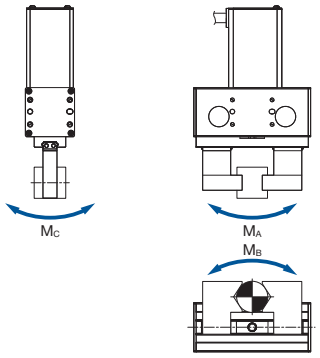
[1] Values in parentheses are for one side.
[2] Value when Controller TSC is selected.
[3] Motor mass not included.

LM Guide	Basic dynamic load rating C (N)		4440
	Basic static load rating C_0 (N)		5080
	Static permissible moment[4] (N·m)	M_A direction	17.4
		M_B direction	17.4
		M_C direction	36

[4] Static permissible moment is the maximum moment that can be permitted while the product is stationary.
The standard for M_A and M_C moments is the top surface of the LM Guide, while the standard for M_B moments is the center of the LM Guide.

Note 1) This is the value when the LM Guide has 1 block.

Static Permissible Moment



Motor Selection Information

■ For Stepper Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)
2	51.6	0.112	14.2/20	0.36	6.11×10^{-6}

■ For Servo Motors

Feed screw lead (mm)	Thread length (mm)	Moving part mass (kg)	Reduction ratio	Overall efficiency	Shaft conversion inertia (kg·m²)	Recommended coupling	
						Coupling model	Coupling inertia (kg·m²)
2	63.6	0.112	14.2/20	0.36	6.20×10^{-6}	SFC-020SA2-6B-*B	2.39×10^{-6}

Compatible Motors

AC servo motor				Motor rated output (W)	Flange size	Motor bracket
YASKAWA Electric Corporation	Σ-7		SGM7J-A5	50	40×40	B
			SGM7A-A5			
			SGM7J-01	100		
			SGM7A-01			
			SGM7J-C2	150		
	Σ-X		SGMXJ-A5	50	40×40	B
			SGMXA-A5			
			SGMXJ-01	100		
			SGMXA-01			
			SGMXJ-C2	150		
			SGMXA-C2			
Mitsubishi Electric Corporation	MELSERVO	J4	HG-MR053	50	40×40	B
			HG-KR053			
		J5	HK-KT053	50	40×40	B
			HK-KT13	100		
TAMAGAWA SEIKI CO., LTD.	TBL-iⅣ		TSM3102	50	40×40	B
			TSM3104	100		
Panasonic Corporation	MINAS	A6	MHMF5A	50	40×40	B
			MHMF01	100		

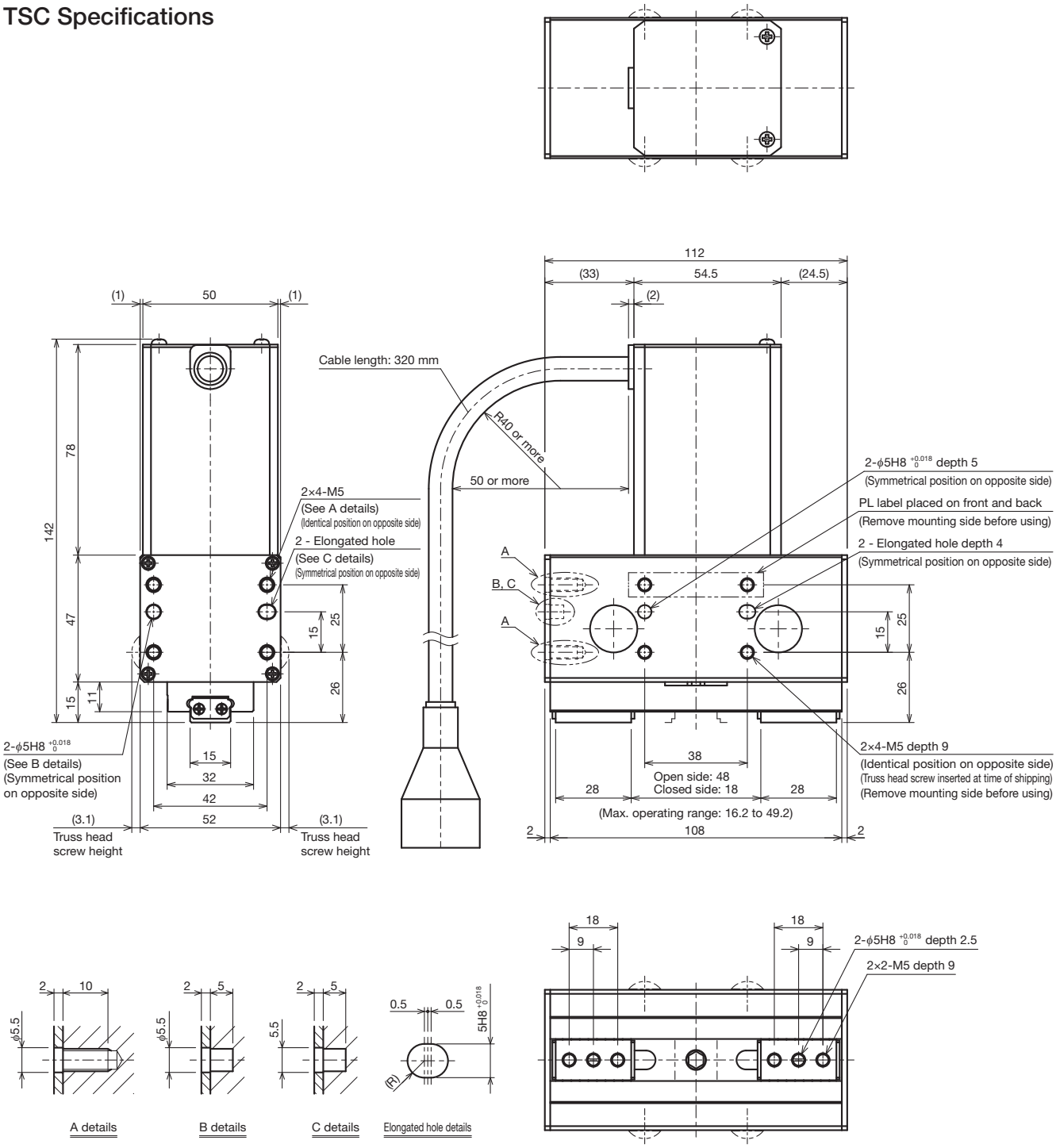
AC servo motor			Motor rated output (W)	Flange size	Motor bracket
SANYO DENKI CO., LTD.	SANMOTION R	R2□A04005	50	40×40	B
		R2EA04008	80		
OMRON Corporation	OMNUC G5	R88M-K05030	50	40×40	B
		R88M-K10030	100		

Stepper motor			Flange size	Motor bracket
ORIENTAL MOTOR CO., LTD.	5-phase	PKP543N18A(B)2	42×42	A
		PKP544N18A(B)2		
		CRK54□		
	2-phase	PK24□-01A		

Note 2) Please select and use a motor that is suited to the usage conditions. The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer.
Note 3) If the maximum torque of the installed motor will exceed the permissible input torque, please consider a safety measure to limit the torque.
Note 4) For the motor output shaft, select a shaft end shape that suits the mounting on the machine side.
Note 5) Installation may not be possible depending on the motor options, so please verify in advance.

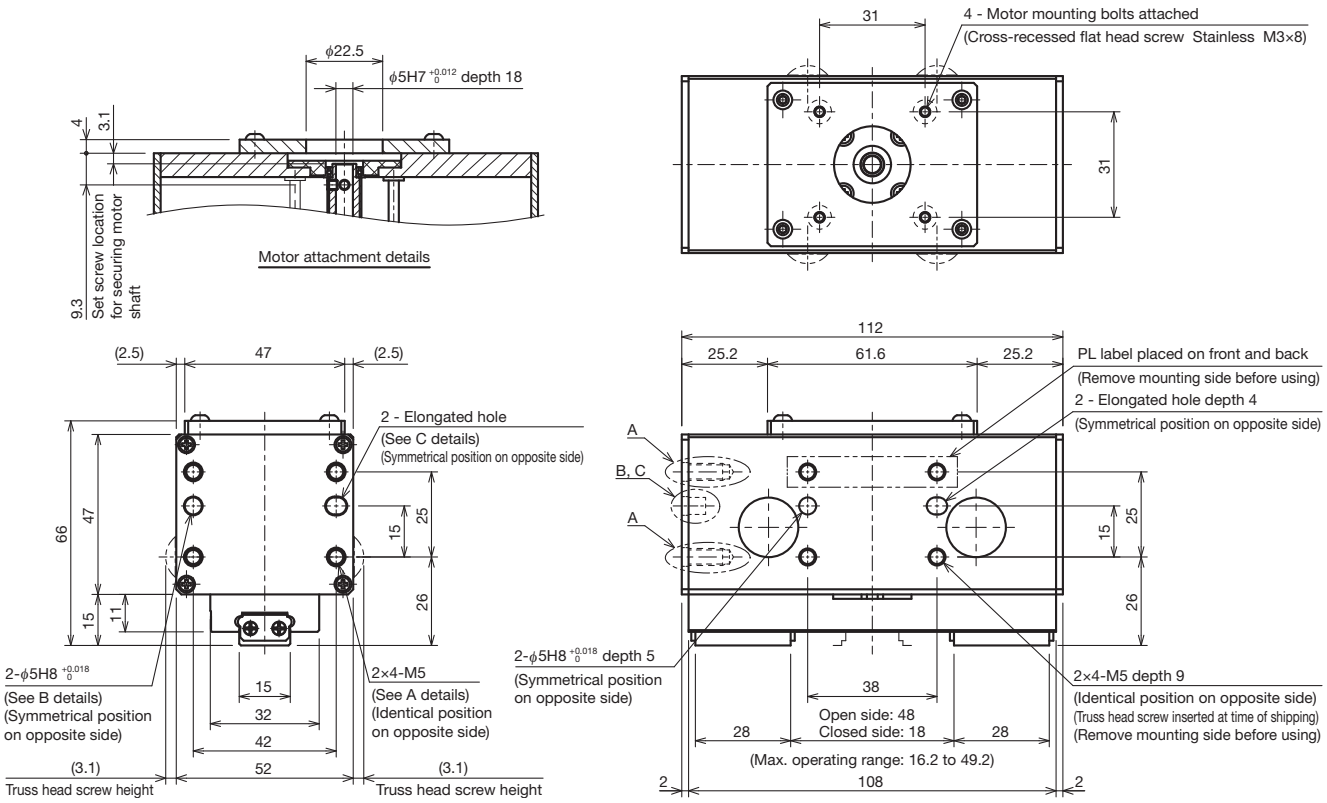
Dimensions

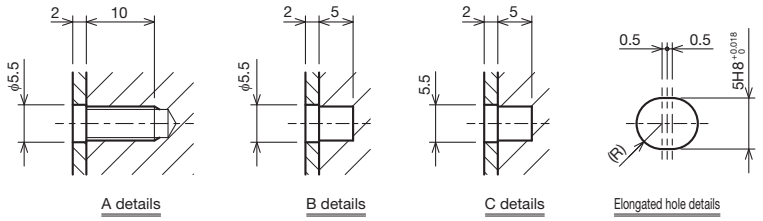
TSC Specifications



Dimensions

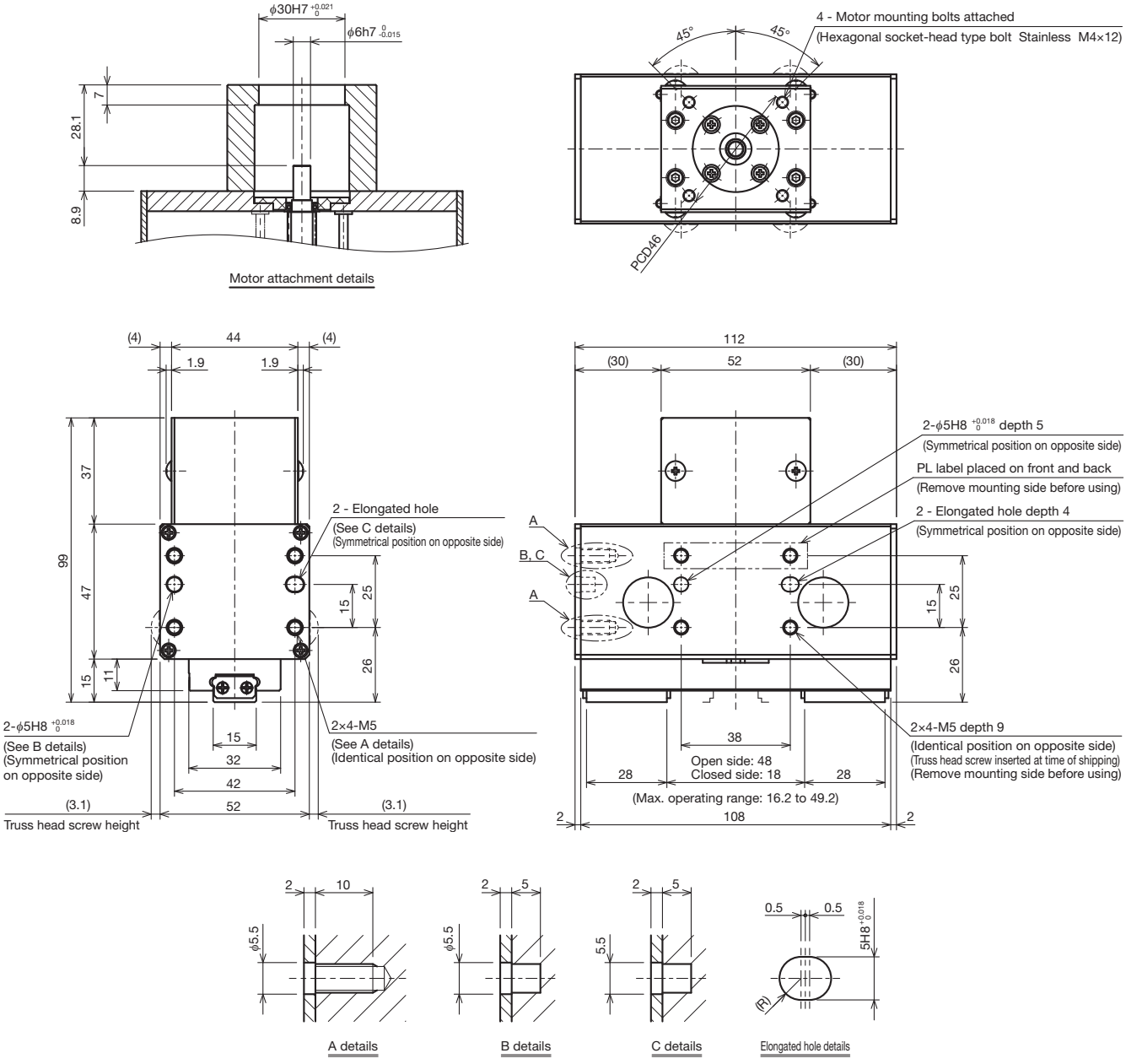
Without Motor (Stepper Motor Specifications)





Dimensions

Without Motor (Servo Motor Specifications)



TSC Stepper Driver Controller (Single-Axis Position Type)

Features

Use quickly with simple setup.

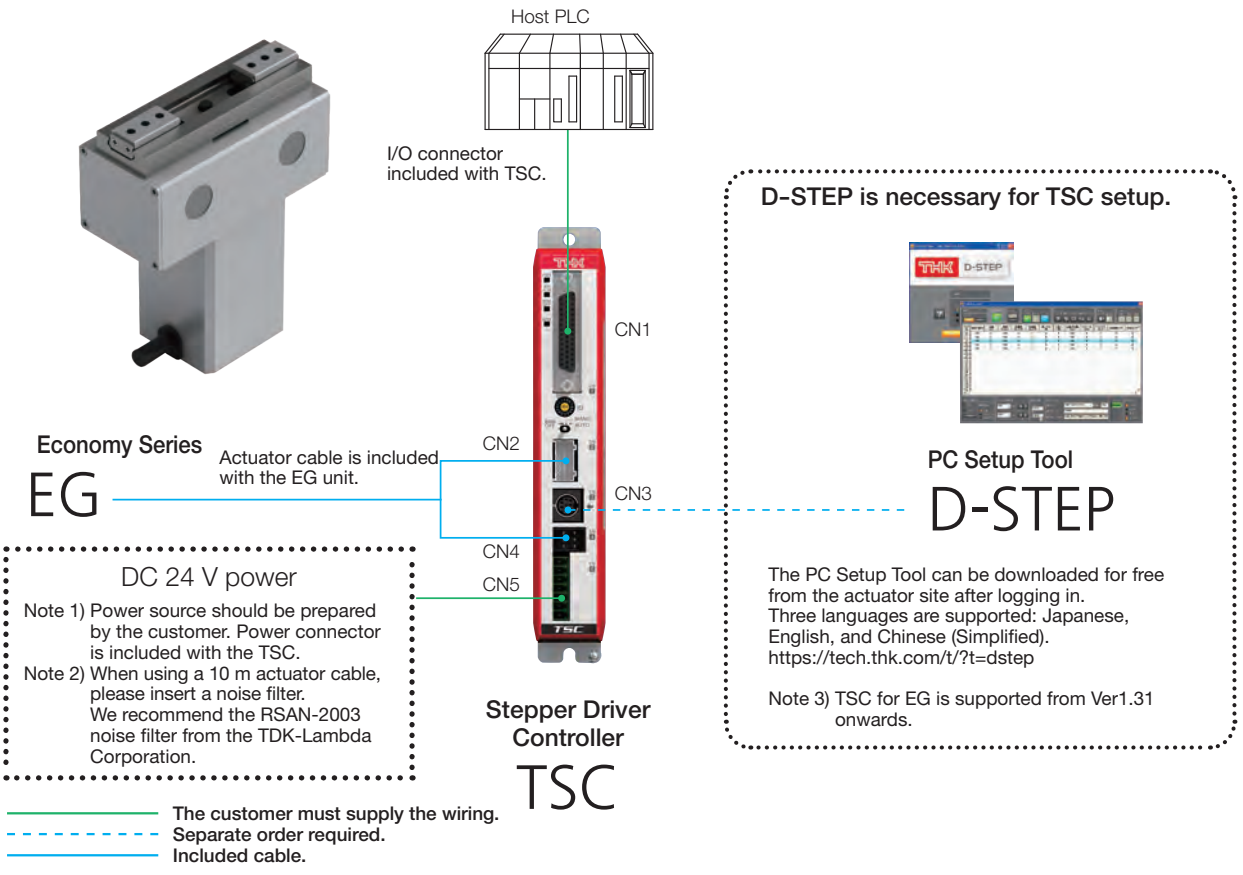
Simple operation

You can utilize a wealth of features simply by using the PC setup tool “D-STEP.”

Functions

· Choose function mode
(64-position mode, external input teaching type, 256-position mode, solenoid mode 1, solenoid mode 2)
· Step data count: Maximum 256 items (varies by function mode)
· Alarm log: Maximum 50 events (including power on log)
· Switch between automatic and manual
· Choose control method (positioning, gripping)

System Structure



Cable List

Cable	Quantity	Notes
Actuator cable for TSC	1	Comes with compatible actuator
I/O cable	1	Sold separately (I/O connector for TSC side only comes with TSC)
PC communication cable	1	Sold separately

Note 4) When using a 10 m actuator cable, please insert a noise filter in the TSC power source.
We recommend the RSAN-2003 noise filter from the TDK-Lambda Corporation.

Model Number Coding

Model ①	Electrical current value ②	Design symbol ③	Type ④	Actuator model ⑤	Feed screw lead ⑥	Stroke ⑦	Home position ⑧	Brake ⑨
TSC	015	B	MOD	EG28V	02	014	D	
TSC	015: 1.5 A	B	MOD: Mode switch type	EG28V EG35V EG42V	02: 02 mm	014: 14 mm 022: 22 mm 030: 30 mm	D: Open side R: Closed side	No symbol: Without brake

The available stroke options vary based on the model.
EG28V: 014
EG35V: 022
EG42V: 030

Specifications

Basic specifications	Input power supply		DC 24 V ±10% (Maximum 2.5 A)				
Control	Number of axes controlled		1 axis				
	Motor type		Stepper motor (28×28, 35×35, 42×42)				
	Motor control method		Feedback control (semi-closed loop)				
	Location detection method		Incremental				
	Acceleration/deceleration method		Trapezoidal				
Program	Function mode		64-position mode	External input teaching type	256-position mode	Solenoid mode 1	Solenoid mode 2
	Step data count		64	64	256	7	3
	Data input method		D-STEP (PC Setup Tool)				
Input/output	Dedicated input/output	Input items	16 items: start, home return, pause, reset, servo on, designate step number, etc.*				
		Output items	16 items: home return complete, in position, servo ready, alarm, emergency stop on, etc.*				
	External power for input/output		DC 24 V ±10% (to be prepared by the customer)				
Communication	Serial communication	Connection device	D-STEP (PC Setup Tool)				
		Communication method	RS–485				
		Port count	Mini-DIN x1				
Usage conditions	Operating temperature/Storage temperature		0°C to 40°C (no freezing) / -20°C to 85°C (no freezing)				
	Operating humidity/Storage humidity		90% RH or less (no condensation)				
	Ambient environment		Indoors (do not expose to direct sunlight), no exposure to corrosive gas, flammable gas, oil mist, or dust No exposure to water, oil, or chemicals				
General specifications	Protective functions		Overload, overvoltage, excessive position deviation, software over limit errors, etc.				
	Accessories		Power connector x1 I/O connector x1				
	Options (sold separately)		I/O cable (3 m, 5 m, 7 m, 10 m) PC communication cable (Mini-DIN ⇔ USB)				
	External dimensions		32 mm (W) × 192.2 mm (H) × 77.6 mm (D)				
	Mass		0.3 kg or less				

* Varies depending on function mode.

TSC Function Mode

There are five modes available for the TSC to suit different applications and purposes.

Function mode		Overview	Step data count	Gripping control
Multi-point positioning type	0: 64-position mode	64-point multi-point positioning operation Area output available, P area output available	64	Available
	1: External input teaching	64-point multi-point positioning operation I/O external input teaching mode Area output not available, P area output available	64	Not Available
	2: 256-position mode	256-point multi-point positioning operation Area output not available, P area output available	256	Available
Electromagnetic valve type	4: Solenoid mode 1	7-point multi-point positioning operation Direct movement command input Area output available, P area output available	7	Available
	5: Solenoid mode 2	3-point multi-point positioning operation Direct movement command input Location detection auto switch output, area output, P area output available	3	Not Available

Pin Assignment by TSC Function Mode

I/O	CN1 pin number	Signal name				
		Function mode 0	Function mode 1	Function mode 2	Function mode 4	Function mode 5
		64-position mode	External input teaching	256-position mode	Solenoid mode 1	Solenoid mode 2
Input	3	PI 0	PI 0	PI 0	ST 0	ST 0
	4	PI 1	PI 1	PI 1	ST 1	ST 1
	5	PI 2	PI 2	PI 2	ST 2	ST 2
	6	PI 3	PI 3	PI 3	ST 3	—
	7	PI 4	PI 4	PI 4	ST 4	—
	8	PI 5	PI 5	PI 5	ST 5	—
	9	—	MODE	PI 6	ST 6	—
	10	—	JOG/INCHING	PI 7	—	-
	11	—	JOG P	—	-	-
	12	(BKRL)	JOG N	(BKRL)	(BKRL)	(BKRL)
	13	STRT	STRT/PWRT	STRT	—	-
	14	MANU	MANU	MANU	MANU	MANU
	15	HOME	HOME	HOME	HOME	HOME
	16	PAUSE	PAUSE	PAUSE	PAUSE	PAUSE
	17	REST	REST	REST	REST	REST
	18	SV–ON	SV–ON	SV–ON	SV–ON	SV–ON
Output	19	PO 0	PO 0	PO 0	PE 0	LS 0
	20	PO 1	PO 1	PO 1	PE 1	LS 1
	21	PO 2	PO 2	PO 2	PE 2	LS 2
	22	PO 3	PO 3	PO 3	PE 3	—
	23	PO 4	PO 4	PO 4	PE 4	—
	24	PO 5	PO 5	PO 5	PE 5	—
	25	MOVE	MOVE	PO 6	PE 6	—
	26	AREA	MODES	PO 7	AREA	AREA
	27	P AREA	P AREA	P AREA	P AREA	P AREA
	28	MANU S	MANU S	MANU S	MANU S	MANU S
	29	HEND	HEND	HEND	HEND	HEND
	30	INPS	INPS	INPS	INPS	—
	31	LOAD/TRQS	WEND	LOAD/TRQS	LOAD/TRQS	—
	32	SVRDY	SVRDY	SVRDY	SVRDY	SVRDY
	33	EMGS	EMGS	EMGS	EMGS	EMGS
	34	ALM	ALM	ALM	ALM	ALM

Note) Items within parentheses are not supported.

Input Signal Function Details

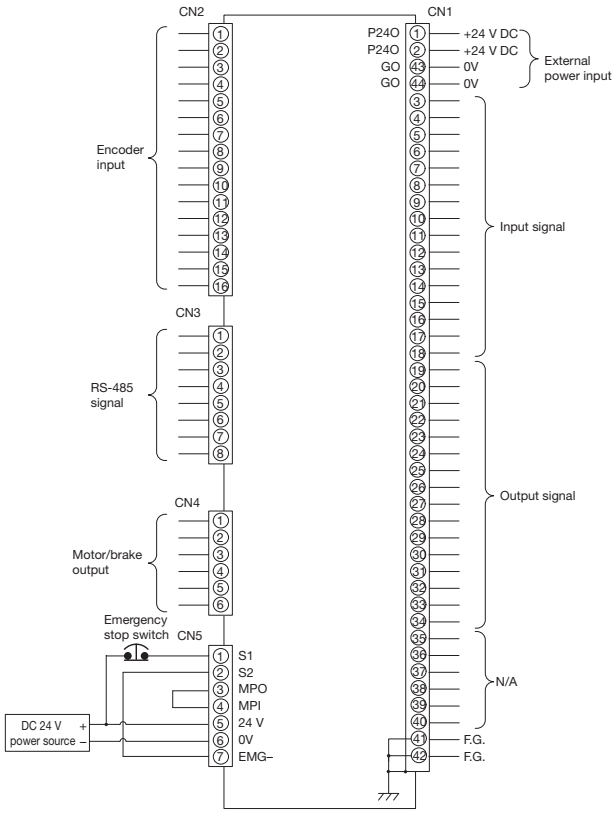
Input		
Signal name	Details	Notes
MANU	Run mode	Switch between AUTO/MANUAL from I/O. ON for MANUAL, OFF for AUTO.
STRT	Start	Program step start signal. ON to start program.
PI 0 to PI 7	Command position number	Input for position number designation. Program designation by signal level. Select program step and start program with “STRT” signal.
PAUSE	Pause	Temporarily suspend operation. OFF for PAUSE input state (N.C. contact specification).
HOME	Home return	Start home return operation. ON to start home return.
SV–ON	Servo ON	Turn servo on and off. ON to turn servo on, OFF to turn servo off.
REST	Alarm reset	Reset the alarm. Reset remaining travel amount when paused. ON to reset.
(BKRL)	Brake release	Force release the brake. ON to release brake.
MODE	External input teaching mode	Change to teaching mode by turning the signal on. ON for teaching mode.
PWRT	In external input teaching mode: Write current position	Designate the position and turn this signal on for 20 ms or more while in teaching mode to write position.
JOG/INCHING	In external input teaching mode: Switch manual movement	Switch manual movement mode while in teaching mode. Movement is INCHING when ON, movement is JOG when OFF.
JOG P	In external input teaching mode: Movement direction +	Movement direction and start signal when in teaching mode. ON to move to each soft limiter in + direction, OFF when moving for deceleration stop.
JOG N	In external input teaching mode: Movement direction -	Movement direction and start signal when in teaching mode. ON to move to each soft limiter in - direction, OFF when moving for deceleration stop.
ST 0 to ST 6	Cylinder type START	Program start signal for position numbers ST 0 through ST 6. You can select level or edge for signal with Parameter No. 13 “Movement command method.” Furthermore, when two signals are ON simultaneously, the lesser value will be prioritized.

Note) Items within parentheses are not supported.

Output Signal Function Details

Output		
Signal name	Details	Notes
MANU S	Run mode status	Run mode output (AUTO/MANUAL) ON for MANUAL, OFF for AUTO.
PO 0 to PO 7	Complete position number	Outputs position number after positioning is completed (binary output).
MOVE	Moving	Signal output when motor is running.
INPS	Positioning finished	This is output when the motor enters the positioning completion boundary.
SVRDY	Run prep complete	This signal is output when the servo is ON.
ALM	Alarm	Alarm output signal.
MODES	External input teaching mode status	Teaching mode / normal run mode output judgment signal. ON for teaching mode. OFF for normal run mode.
WEND	Write completed	Once writing through PWRT signal is complete, this signal turns on for 30 ms.
HEND	Home return completed	Output signal when home return operation is completed.
AREA	Area upper limit / lower limit	ON when actuator’s current position is within the set range of the parameter.
P AREA	Position area	ON when actuator’s current position is within the set range of the program step.
EMGS	Emergency stop state	Judgment output for emergency stop input. ON when in normal state, OFF when emergency stop circuit is broken.
LOAD	Load output judgment status	ON when specified torque exceeds threshold for a set amount of time within judgment range.
TRQS	Torque level status	ON when load threshold is reached while moving. OFF when below load threshold.
PE 0 to PE 6	Cylinder type arrival complete output	This signal is output after position number operation is completed.
LS 0 to LS 2	Cylinder type position detection output	This signal is output once all current positions (3 points) enter the positioning range.

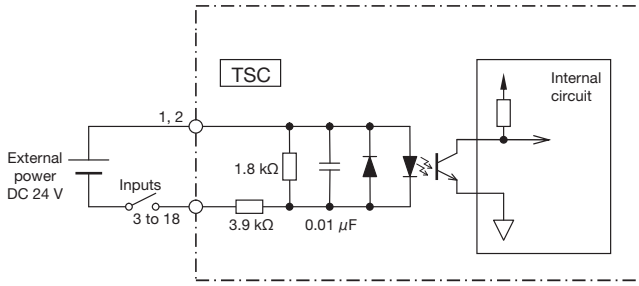
TSC Pin Assignment



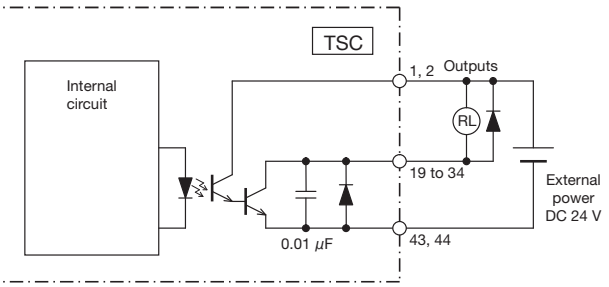
Note 1) DC 24 V power source for input/output circuit should be prepared by the customer.

TSC (CN1) input/output circuit

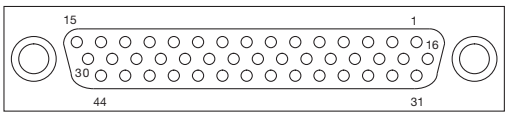
Input circuit



Output circuit

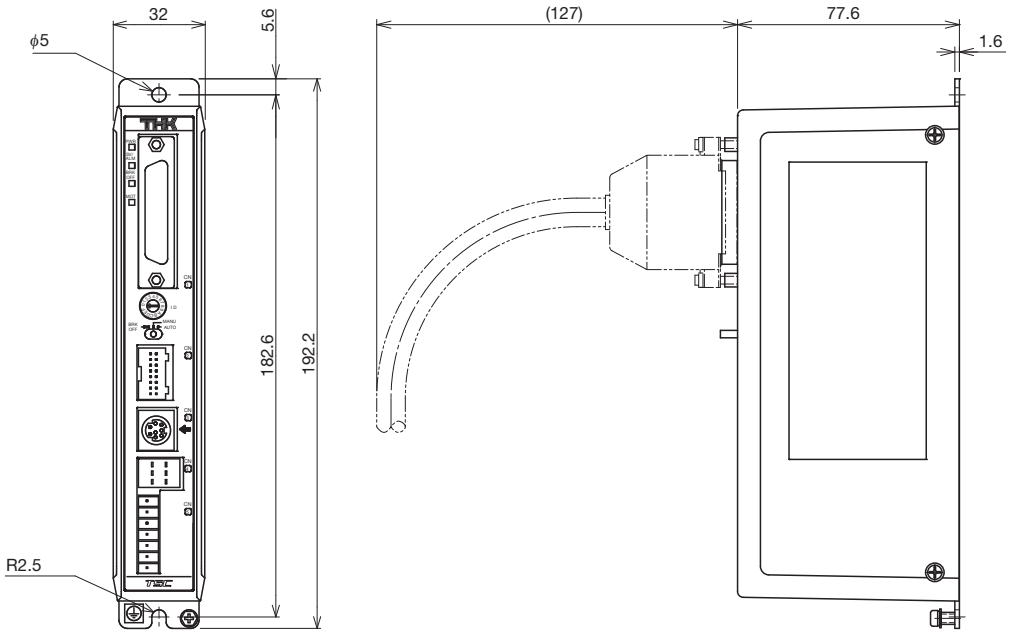


I/O Connector Pin Number



Note 2) This image shows the front of the TSC.

Dimensional Drawing



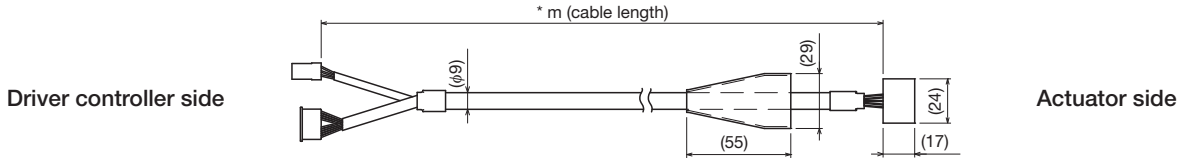
Note 3) Contact THK for details about dimensional drawings.

Cables

Actuator Cable

TSC Actuator Cable: CBL–TSC–AC–**–B (standard)

** is for cable length (03: 3 m, 05: 5 m, 10: 10 m)



Note 1) When using a 10 m actuator cable, please insert a noise filter in the TSC power source.
We recommend the RSAN-2003 noise filter from the TDK-Lambda Corporation.

Note 2) If using for a moving part, we recommend a bending radius of R95 or greater for the cable center. (For parts that are not movable, we recommend R50 or greater.)

Cable

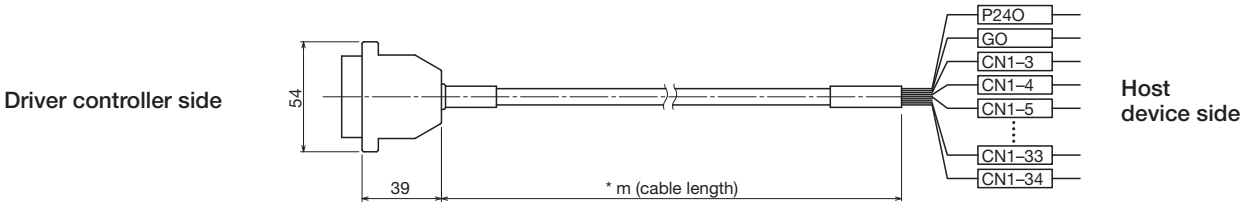
I/O cable: CBL–CON–IO–**

** is for cable length (03: 3 m, 05: 5 m, 10: 10 m)

(Sold separately)

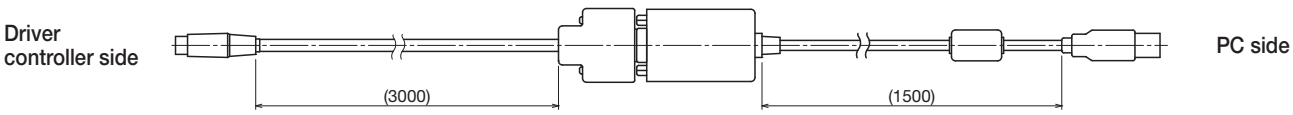
Can be used with driver controller TSC/TLC/THC.

Note 3) Multi-conductor cable on host device side will be shipped unprocessed.



PC communication cable: CBL–COM–03

(Sold separately)



D-STEP PC Setup Tool

Features

Simple interface that supports multi-functional TSC, TLC, and THC.

Simple Operation

Operate and set up the TSC at your PC.
Includes useful features for maintenance such as data backup and operation state logging.

Functions

- Confirmation, editing, backup, and offline editing of step data
- Confirmation, editing, backup, and offline editing of parameters
- Actuator operations (home return, jog movement, inching movement, program execution, servo on/off)
- Monitoring (I/O, current position, position command, current command)
- Logging (speed/electrical current waveform display)
- Alarm (log display, log clear, alarm reset)
- Display language (Japanese, English, Chinese (Simplified))

Supported OS: Windows XP, Windows Vista, Windows 7, Windows 10
D-STEP can be downloaded for free from the THK Electric Actuator Site.
(https://tech.thk.com/t/?t=dstep)

Note 4) TSC for EG is supported from Ver.1.31 onwards.

Available in three languages


User-friendly interface

⚠Precautions on Use

Handling

- Do not carelessly disassemble the actuator or control devices. This may result in debris entering the product and loss of functionality.
- Take care not to drop or strike the actuator or control devices. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
- Please contact THK when using the product in special environments such as locations exposed to constant vibrations, clean rooms, vacuums, and low/high temperatures.

Operating Environment

An improper usage environment may cause failure of the actuator and control devices. To avoid this, prepare an environment such as the following.

- Actuator: Ambient temperature between 0°C to 40°C, ambient humidity 80% RH or lower, no freezing, no condensation
- Controller: Ambient temperature between 0°C to 40°C, ambient humidity 90% RH or lower, no freezing, no condensation
- A location with no corrosive or flammable gas
- A location where electrically conductive particles such as steel dust, dust, oil mist, cutting oil, water content, salt content, or organic solvents will not be present in the air
- A location not exposed to direct sunlight or radiant heat
- A location where no strong electric fields or powerful magnetic fields are generated
- A location where vibrations or impacts are not transmitted to the main unit
- A location where inspections and cleanings can easily be performed

Safety Precautions

- Do not touch any moving parts while the product is in operation or in an operable state. In addition, do not enter the operating range of the actuator.
- When installing, adjusting, inspecting, or performing maintenance on the actuator and connected peripherals, be sure to disconnect all power. Implement safety measures to ensure that no one else can turn the power on.
- If performing a task involving multiple people, confirm how to perform the work, what signals will be used, and how to handle problems before beginning, and assign another person to monitor the work.
- Carefully read JIS B8433 “Manipulating Industrial Robots - Safety” and the Japanese Ministry of Health, Labour and Welfare’s “Ordinance on Industrial Safety and Health” before working with the product, and follow the guidance within.
- Using this product in excess of the torque limit may damage the components or cause an accident.
- Do not set the torque control parameter higher than the torque limit.
- A stopper is installed inside the product. It is intended to limit the stroke, and may become damaged in the event of a strong impact.
- In applications where this product will be moved or transferred, the conditions of use may cause inertia from the motor’s mass to result in damage to the motor attachment (Housing A) or other parts. Please contact THK before using in this manner.

Lubrication

- The EG must be lubricated in order for it to demonstrate its full performance. Insufficient lubrication may increase wear on the rolling elements and lead to premature damage.
- Do not mix lubricants with different properties.
- Contact THK if a special lubricant will be used.
- Contact THK if oil lubricant will be used.
- The greasing interval will vary depending on the usage conditions, so we recommend determining the interval based on the initial inspection.

Storage

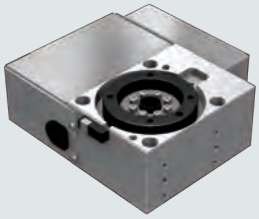
- When storing the actuator, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperatures, low temperatures, and high humidity.
- Avoid storing control devices in an environment with high/low temperatures or high humidity.

Other Recommended Products

Economy Series Electric Actuator

ES/EC

- ○ Uses a ball screw to move with higher precision than air cylinders.
- ○ Modularized structure reduces number of components and both design and assembly time.
- ○ Uses the Caged Ball LM Guide to achieve long-term maintenance-free operation (ES only).



Thin Electric Turntable

ET

- ○ High-performance rotary structure combines a THK cross-roller ring and hypoid gear.
- ○ Capable of multi-point positioning, continuous rotation in one direction, and rotational speed control.
- ○ Thin design helps reduce equipment footprint.

LM Guide Actuator

SKR/KR

- ○ Modularized structure reduces number of components and both design and assembly time.
- ○ Can be used in a horizontal, wall-mounted, vertical, or suspended orientation.
- ○ Optimal for high-precision positioning and orthogonal-axis designs.

Electric Gripper **EG**

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