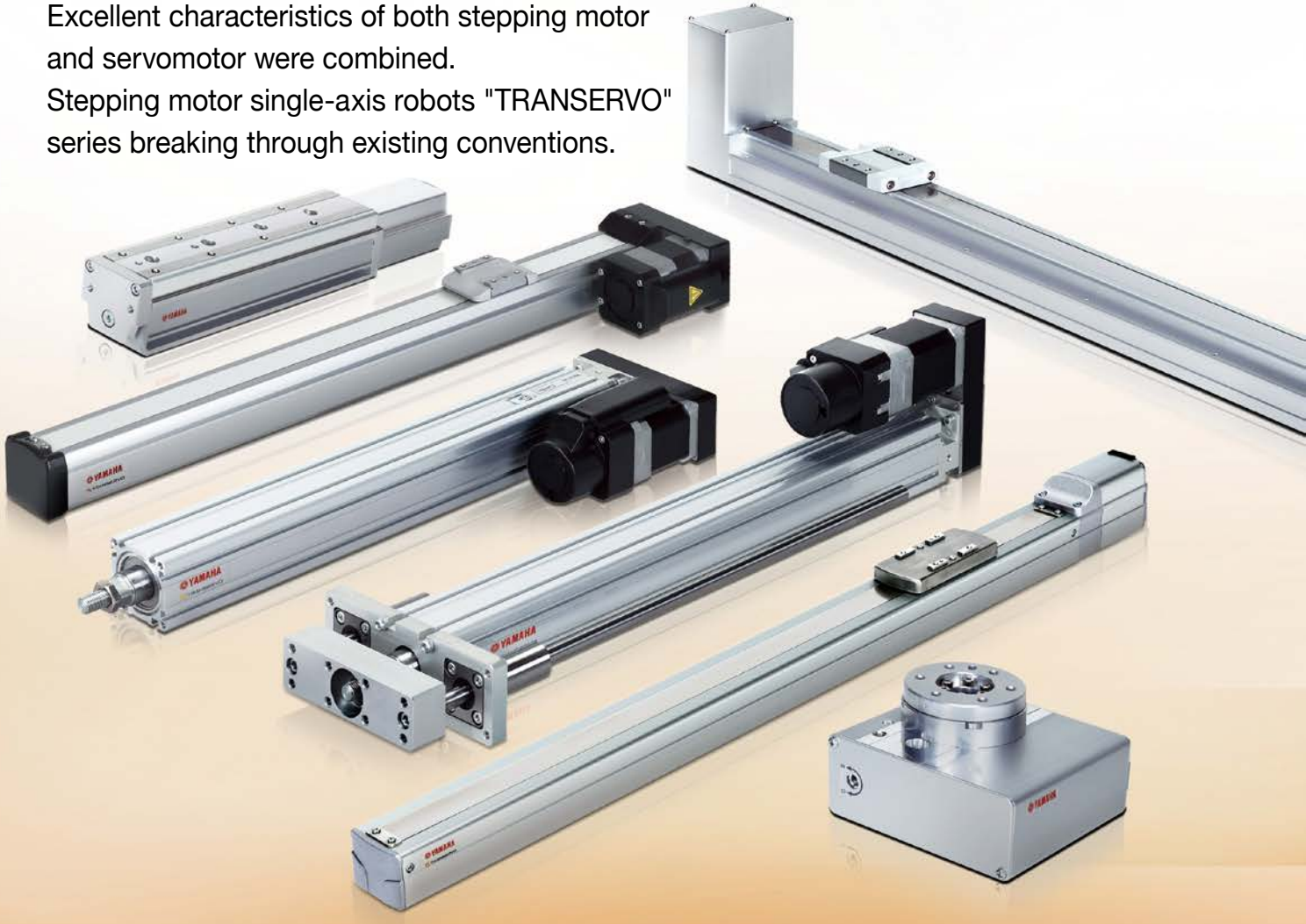
TRANSERVO
Series

Product Lineup

CLOSED LOOP STEPPING MOTOR SINGLE-AXIS ROBOTS

Excellent characteristics of both stepping motor and servomotor were combined.
Stepping motor single-axis robots "TRANSERVO" series breaking through existing conventions.



Robot positioner TS-S2/TS-SH P.626

This robot positioner is specialized for the I/O point trace input. The positioning or pushing operation can be performed using simple operation, only by specifying a point number from the host control unit and inputting the START signal.

Applicable models: SS | SG[Note] | SR | STH | RF | BD

Note. SG07 is only applicable to TS-SH.

TS-S2 TS-SH

Robot driver TS-SD P.636

This robot driver omits the operation with robot languages and is dedicated to the pulse train input. This driver can be made applicable to the open collector method or line driver method using the parameter setting and signal wiring. So, you can match the robot driver to the host unit to be used.

Applicable models: SS | SR | STH[Note] | RF[Note] | BD

Note. Except for STH vertical specifications and RF sensor specifications.

TS-SD

Newly developed vector control method provides functions and performance similar to servomotors.

SS type (Slider type)

Straight model P.256

SS05H-S

Space-saving model (Side mounted motor model) P.257

SS05H-R (L)

SG type (Slider type)

Straight model P.262

SG07

SR type (Rod type standard)

Straight model P.263

SR05-S SR04-S SR03-S

Space-saving model (Side mounted motor model) P.264

SR05-R (L) SR04-R (L) SR03-R (L)

SR type (Rod type with support guide)

Straight model P.266

SRD05-S SRD04-S SRD03-S

Space-saving model (Side mounted motor model) P.267

SRD05-U SRD04-U SRD03-U

Type	Model	Size (mm) Note 1	Lead (mm)	Maximum payload (kg) Note 2		Maximum speed (mm/sec.) Note 3	Stroke (mm)	Page
				Horizontal	Vertical			
SS type (Slider type) Straight model/ Space-saving model	SS04-S SS04-R (L)	W49 × H59	12	2	1	600	50 to 400	SS04-S: P.256
			6	4	2	300		SS04-R (L): P.257
			2	6	4	100		
	SS05-S SS05-R (L)	W55 × H56	20	4	-	1000	50 to 800	SS05-S: P.258
			12	6	1	600		SS05-R (L): P.259
			6	10	2	300		
	SS05H-S SS05H-R (L)	W55 × H56	20	6	-	1000	50 to 800	SS05H-S: P.260
			12	8	2	600 (Horizontal) 500 (Vertical)		SS05H-R (L): P.261
			6	12	4	300 (Horizontal) 250 (Vertical)		
SG type (Slider type)	SG07	W65 × H64	20	36	4	1200	50 to 800	SG07: P.262
			12	43	12	800		
			6	46	20	350		
SR type (Rod type standard) Straight model/ Space-saving model	SR03-S SR03-R (L) SR03-U	W48 × H56.5	12	10	4	500	50 to 200	SR03-S: P.263
			6	20	8	250		SR03-R (L): P.264
								SR03-U: P.265
	SR04-S SR04-R (L)	W48 × H58	12	25	5	500	50 to 300	SR04-S: P.268
			6	40	12	250		SR04-R (L): P.269
			2	45	25	80		
	SR05-S SR05-R (L)	W56.4 × H71	12	50	10		50 to 300	SR05-S: P.272
			6	55	20	150		SR05-R (L): P.273
			2	60	30	50		
SR type (Rod type with support guide) Straight model/ Space-saving model	SRD03-S SRD03-U	W105 × H56.5	12	10	3.5	500	50 to 200	SRD03-S: P.266
			6	20	7.5	250		SRD03-U: P.267
	SRD04-S SRD04-U	W135 × H58	12	25	4	500	50 to 300	SRD04-S: P.270
			6	40	11	250		SRD04-U: P.271
			2	45	24	80		
	SRD05-S SRD05-U	W157 × H71	12	50	8.5	300	50 to 300	SRD05-S: P.274
			6	55	18.5	150		SRD05-U: P.275
			2	60	28.5	50		

Note 1. The size shows approximate maximum cross sectional size.
Note 2. The payload may vary depending on the operation speed. For details, refer to the detailed page of relevant model.
Note 3. The maximum speed may vary depending on the transfer weight or stroke length. For details, refer to the detailed page of relevant model.

■ **Allowable ambient temperature for robot installation**
SS/SR type 0 to 40 °C

As the slide table type, rotary type, and belt type were added to the product lineup, the design flexibility was extended.

STH type (Slide table type)

Straight model P.276

STH04-S
STH06-S

Space-saving model P.277

STH04-R (L)
STH06-R (L)

Type	Model	Size (mm) Note 1	Lead (mm)	Maximum payload (kg) Note 2		Maximum speed (mm/sec.) Note 3	Stroke (mm)	Page
				Horizontal	Vertical			
STH type (Slide table type) Straight model/ Space-saving model	STH04-S	W45 × H46	5	6	2	200	50 to 100	STH04-S: P.276
	STH04-R (L) Note 4	W73 × H51	10	4	1	400		STH04-R (L): P.277
	STH06	W61 × H65	8	9	2	150	50 to 150	STH06: P.278
	STH06-R (L)	W106 × H70	16	6	4	400		STH06-R (L): P.279

RF type (Rotary type)

Standard model P.280

High rigidity model P.281

RF02
RF03
RF04

Type	Model	Height (mm)	Torque type	Rotation torque (N • m)	Maximum pushing torque (N • m)	Maximum speed (mm/sec.) Note 3	Rotation range (°)	Page
RF type (Rotary type) Standard/High rigidity	RF02-N RF02-S	42 (Standard) 49 (High rigidity)	N: Standard	0.22	0.11	420	310 (RF02-N) 360 (RF02-S)	RF02-N: P.280 RF02-S: P.283
			H: High torque	0.32	0.16	280		
	RF03-N RF03-S	53 (Standard) 62 (High rigidity)	N: Standard	0.8	0.4	420	320 (RF03-N) 360 (RF03-S)	RF03-N: P.284 RF03-S: P.287
			H: High torque	1.2	0.6	280		
	RF04-N RF04-S	68 (Standard) 78 (High rigidity)	N: Standard	6.6	3.3	420	320 (RF04-N) 360 (RF04-S)	RF04-N: P.288 RF04-S: P.291
			H: High torque	10	5	280		

BD type (Belt type)

Straight model P.292

BD04
BD05
BD07

Type	Model	Size (mm) Note 1	Lead (mm)	Maximum payload (kg) Note 2		Maximum speed (mm/sec.) Note 3	Stroke (mm)	Page
				Horizontal	Vertical			
BD type (Belt type)	BD04	W40 × H40	48	1	-	1100	300 to 1000	BD04: P.292
	BD05	W58 × H48	48	5	-	1400	300 to 2000	BD05: P.293
	BD07	W70 × H60	48	14	-	1500	300 to 2000	BD07: P.294

Note 1. The size shows approximate maximum cross sectional size.
Note 2. The payload may vary depending on the operation speed. For details, refer to the detailed page of relevant model.
Note 3. The maximum speed may vary depending on the transfer weight or stroke length. For details, refer to the detailed page of relevant model.
Note 4. STH04-R (L) with 50-stroke and brake is not supported.

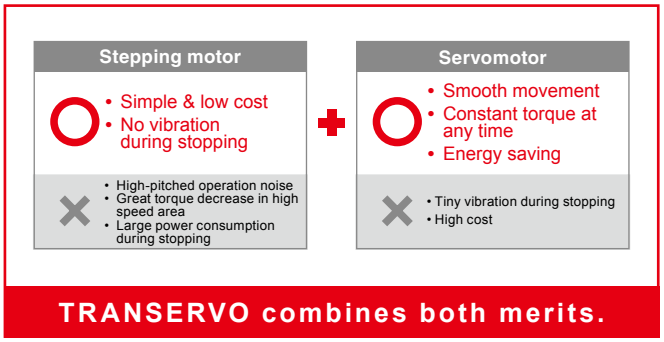
■ **Allowable ambient temperature for robot installation**
STH/RF/BD type 5 to 40 °C

Common features of TRANSRVO Series

POINT 1

New control method combining the advantages of both the servomotor and stepping motor

The stepping motor provides features that its price is less expensive and hunting (minute vibration) does not occur during stopping. However, this motor has disadvantages that the positional deviation due to step-out occurs (in the open loop mode), the torque decreases greatly in the high speed area, and the power consumption is large during stopping. As YAMAHA's TRANSERVO uses the closed loop control, this ensures complete "no step-out". Furthermore, use of a newly developed vector control method ensures less torque decrease in the high speed area, energy saving, and low noise. The function and performance equivalent to the servomotor are achieved at a low cost even using the stepping motor.



Energy saving

As the basic control is the same as the servomotor, waste power consumption is suppressed. This greatly contributes to the energy saving and CO_2 reduction.

No hunting during stopping

Stop mode without hunting can be set in the same manner as the general stepping motor. So, select this mode as required.

POINT 2

Closed loop control using excellent environment resistant resolver

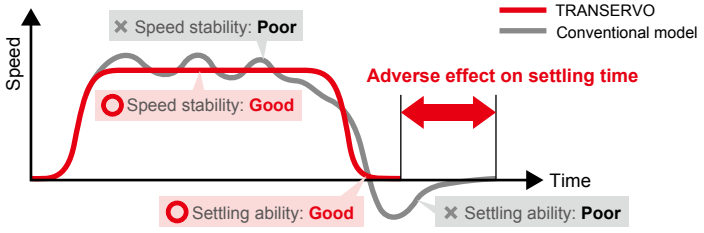
A resolver with excellent reliability is used to detect the motor position in the same manner as YAMAHA's upper model. The stable position detection can be made even in a poor environment where fine particle dusts or oil mists exist. Additionally, a high resolution of 20480 pulses per revolution is provided.

This resolver is a magnetic position detector. The resolver features a simple structure without using electronic components and optical elements, and less potential failure factors when compared to general optical encoders.
The resolver has **high environment resistance and low failure ratio**, and is used in a wide variety of fields aiming at reliability such as automobile or aircraft industry.

POINT 3

Excellent controllability

Use of a high resolution (4096, 20480 pulse/rev) makes it possible to maintain excellent controllability. Variations in speed are small and settling time during deceleration stop can be shortened.



POINT 4

Return-to-origin is not needed to shorten the start-up time.

New type robot positioner TS-SH applicable to the high power was newly developed.
This robot positioner is applicable to the absolute position system and does not need any return-to-origin.
The work can be started quickly to shorten the start-up time.
(SG type is only applicable to TS-SH.)

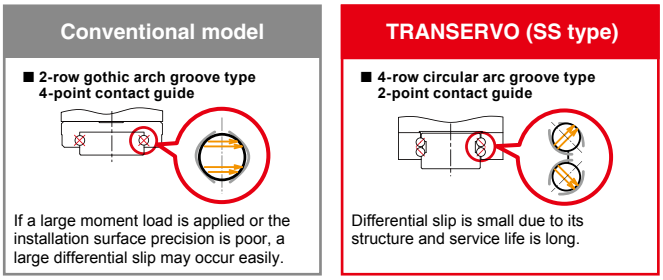

TS-SH

SS type (Slider type) Straight model/Space-saving model

POINT

4-row circular arc groove type 2-point contact guide applicable to even large moment load

A newly developed module guide is employed with a 4-row circular arc groove type 2-point contact guide built into a very compact body similar to the conventional model. This guide maintains a satisfactory rolling movement with less ball differential slip due to its structure even if a large moment load is applied or the installation surface precision is poor, and has characteristics that are difficult to malfunction, such as unusual wear.

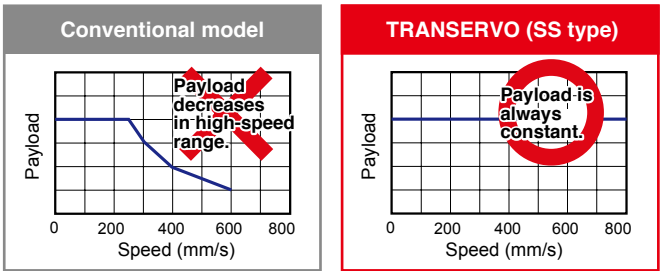


POINT

Tact is shortened by high-speed movement.

As advantages of the vector control method are utilized at maximum level, the TRANSERVO maintains a constant payload even in a high-speed range. This greatly contributes to shortening of the tact time. Additionally, by combining this feature with high-lead ball screws, the TRANSRERVO has achieved a maximum speed of 1 m/sec.[Note] which is faster than any single-axis servo motor.

Note. SS05-S/SS05H-S with 20 mm-lead specifications

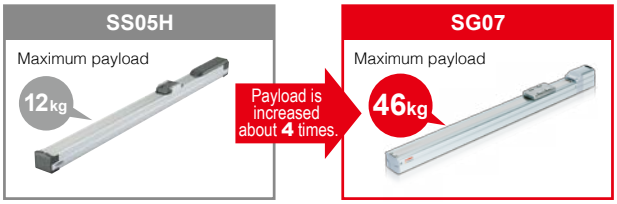


SG type (Slider type)

POINT

Maximum payload is 46 kg. A maximum payload of 20 kg is supported even with the vertical specifications.

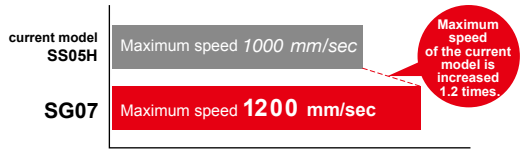
As rigid table slide and 56 □ motor are adopted, the payload is increased greatly. A maximum payload of 46 kg is achieved.
Up to 20 kg can be transferred even with the vertical specifications.



POINT

Maximum speed is 1200 mm/sec.

The maximum speed is made 1.2 times faster than that of the current model SS05H.
The tact-up of the equipment can be achieved.



SR type (Rod type) Standard model/Model with support guide

POINT

Long-term maintenance free is achieved.

A lubricator used in the ball screw and a contact scraper installed at the rod inlet and outlet provide maintenance-free operation.

Maintenance interval is greatly extended.

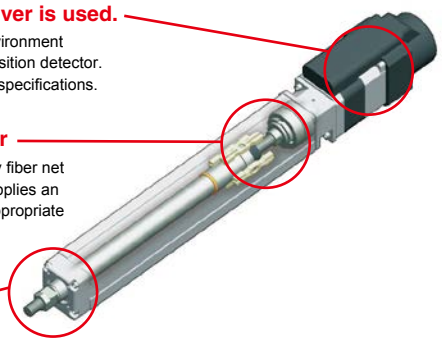
Normal grease lubrication on the ball screw loses a very small amount of oil as the ball screw moves.
The SR type has a lubricator that supplies grease lost over long periods to greatly extend the maintenance interval and ensure near maintenance-free operation[Note].

Note. The maintenance-free period is within the running life of the robot.

Highly reliable resolver is used.
A resolver with excellent environment resistance is used for the position detector. All models can select brake specifications.

Ball screw lubricator
A lubricator with high density fiber net impregnated with grease supplies an adequate amount of oil to appropriate locations.

Laminated type contact scraper
A dual-layer scraper removes fine foreign objects sticking to the rod to prevent them from entering the inside and troubles caused by foreign objects. Rod rattle is suppressed effectively.



Environment-friendly lubrication system

The lubrication system is environment-friendly as it uses a high density fiber net and supplies an adequate amount of oil to appropriate locations to eliminate waste lubrication.

Prevention of foreign object entry

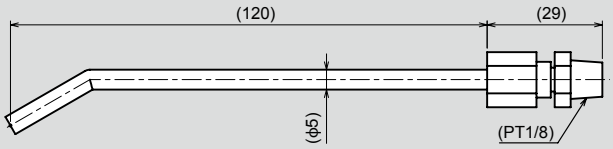
The dual-layer scraper is in contact with the front of the rod to ensure excellent fine contaminant particle removal performance. The scraper removes fine contaminant particles sticking to the rod through multi steps to prevent them from entering the inside and troubles caused by foreign objects. Additionally, oleo-synthetic foam rubber with a self-lubricating function ensures low-friction resistance.

■ Tip nozzle for grease application

When applying the grease to the ball screw of the SR type space-saving model SR03-UB or SRD03-UB, use a grease gun with the tip bent.

Model	KCU-M3861-00

Note. YAMAHA's recommended product. This tip nozzle can be attached to a generally available grease gun.

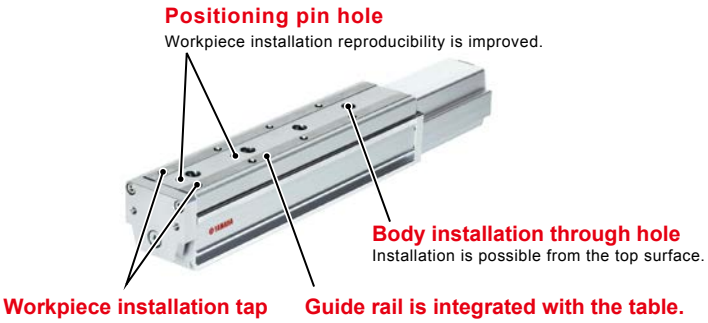


STH type (Slide table type) Straight model/Space-saving model

POINT

Use of a circulation type linear guide achieves the high rigidity and high accuracy.

- Guide rail is integrated with the table.
- Table deflection amount is small.
- Use of a circulation type linear guide achieves the high rigidity and high accuracy.
- STH06 provides an allowable overhang exceeding that of FLIP-X series T9.
- Space-saving model with the motor built-into the body is also added to the product lineup.
- Suitable for precision assembly.

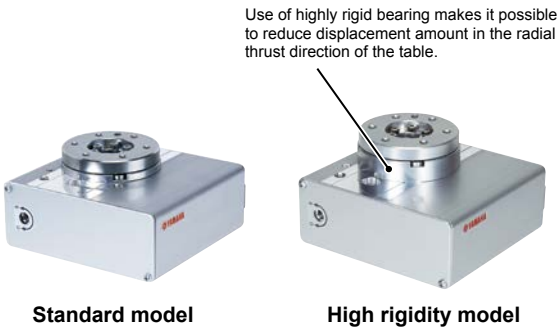


RF type (Rotary type) Standard model/High rigidity model

POINT

Rotation axis model, first in TRANSERVO series

- Rotation axis model, first in TRANSERVO series
- Thin and compact
- Can be secured from the top or bottom surface.
- Hollow hole, through which the tool wiring is passed, is prepared.
- Workpiece can be attached easily.
- Motor is built-into the body to achieve the space-saving.
- Standard model or high rigidity model can be selected.



BD type (Belt type) Straight model

POINT

Belt type applicable to long stroke

- Applicable to up to 2000 mm-stroke.
- High speed movement at a speed of up to 1500 mm/sec. can be made.
- Maximum payload 14 kg
- Main body can be installed without disassembling the robot.
- Shutter is provided as standard equipment. This prevents grease scattering or entry of foreign object.