TRANSERVO Series

New product

TS-SH

Absolute robot positioner.

Robot positioner dedicated to TRANSERVO

Features | **Applicable to absolute** | **Easy operation only by specifying a point number**

NEW

New functions

Direct positioning command

Positioning operation can be performed by directly specifying position data or speed data for the remote commend prepared for the field network.

- Data registration or positioning can be made only with one step operation.
- Data can be managed directly from the PLC.
- Current position can always be monitored.

Built-in gateway function

The gateway function is built-into this robot positioner. When connecting multiple robot positioners, up to four units can be made applicable to the field network only by installing the network board in only one positioner and making the dedicated daisy-chain connections. This reduces the total cost.

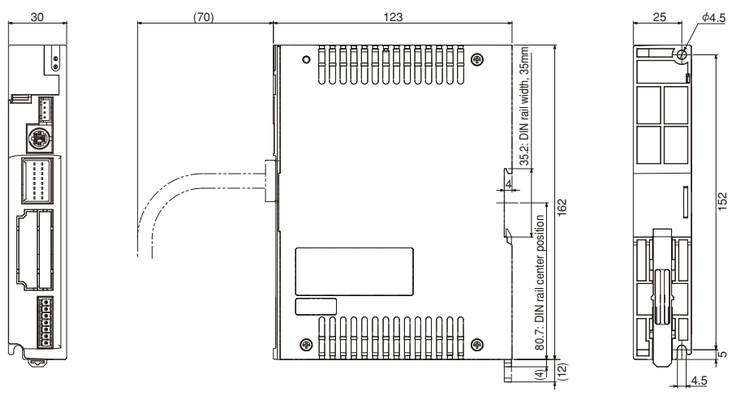
Basic specifications

Controllable robot	TRANSERVO series
Consumption current	Rating 3.5A (Max. 6.5A)
Dimensions	W30 x H162 x D123mm
Main unit weight	Approx. 0.3kg
Control power supply	DC24V ±10%
Main power supply	DC24V ±10%
Control method	Closed loop vector control method
Position detection method	Resolver with multi-turn absolute function (resolution: 20480 P/r) *1
Operation method	Positioning operation by specifying point number, direct positioning command
Operation type	Positioning operation, positioning linked operation, pushing operation, jog operation
Number of points	255 points
Point type setting	① Standard setting: Set a ratio (%) to the maximum level for the speed or acceleration. ② Custom setting: Set the speed or acceleration in the SI unit sy stem.
Point teaching method	Manual data input (coordinate value input), teaching, direct teaching
I/O interface	Select a desired interface from NPN, PNP, CC-Link, DeviceNet, and EtherNet/IP.

*1. This value may vary depending on the model.

Input	Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK), return-to-origin (ORG), manual mode (MANUAL), jig movement - (JOG-), jog movement + (JOG+), point number selection (PIN0 to PIN7)
Output	Servo state (SRV-S), alarm (/ALM), operation end (END), operation executing (BUSY), control output (OUT0 to 3), point number output 0 to 7 (POUT0 to POUT7)
Communication	RS-232C 1CH
Emergency stop circuit	Emergency stop input, emergency stop contact output (1 system: HT1 is used.)
Protection function	Position detection error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error, motor faulty wiring, excitation power failure error
Operating ambient temperature and humidity	0 to 40 , 35 to 85%RH (No dew condensation allowed.)
Storage ambient temperature and humidity	-10 to 65 , 10 to 85%RH (No dew condensation allowed.)
Atmosphere	Indoor place where the positioner is not exposed to the direct sunlight. There shall be no corrosive and flammable gas, oil mist, and dust.
Vibration resistance	In each of X, Y, and Z directions 10 to 57Hz, half amplitude 0.075mm, 57 to 150Hz, 9.8m/s^2
Absolute backup battery	Lithium battery
Absolute backup period	Approx. 1 year (non-energizing state)

External view



● Specifications and appearance are subject to change without prior notice.

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YAMAHA

New product information

Closed loop stepping motor single-axis robot

TRANSERVO

SG TYPE NEW
SG07

Absolute robot positioner

TS-SH

TRANSERVO Series

New product

SG07

SG TYPE

Closed loop stepping motor
single-axis robot

TRANSERVO series can be selected even for heavy object transfer.

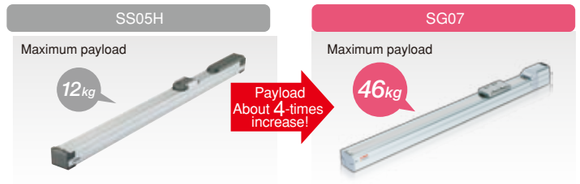
NEW

New performance of SG type

1 Maximum payload 46kg 20 kg can be supported even with the vertical specifications.

Use of a rigid table slide and 56□ motor makes it possible to greatly increase the payload. A maximum payload of 46kg is achieved. Up to 20kg can be transferred even with the vertical specifications.

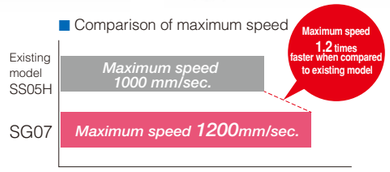
■ Comparison between TRANSERVO series SS05H and SG07



2 Maximum speed 1200mm/sec.

The speed is increased to a level 1.2 times faster than that of the existing model SS05H.

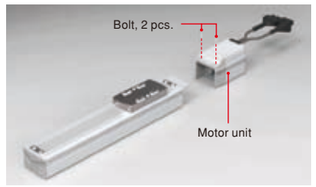
■ Comparison of maximum speed



3 Improved maintenance ability.

The motor unit can be removed or the motor can be replaced easily. Therefore, even if the motor replacement is needed, a period of time to restore the production line can be shortened.

■ Improvement of maintenance ability



The motor unit can be detached easily by removing only two bolts.This ensures easy motor replacement.

4 No homing is needed to shorten the startup time.

Absolute positioner TS-SH eliminates homing (origin) process.

Features of TRANSERVO series

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.

	Stepping motor	Servomotor
Merits	· Simple and low cost · No vibration during stopping	· Smooth movement · Constant torque at any time · Energy saving
Demerits	· High-pitched operation sound · Large torque decrease in high speed area · Large power consumption during stopping	· Micro vibration during stopping · High cost

TRANSERVO combines the merits of both motors!

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 CO2 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.

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.

Optical encoder	Resolver
●Sensitive to vibration, and harsh environment like oil mist.	●Magnetic ●Simple structure only with iron core and winding. Less potential failure factors ●Immune to impact or electric noise.
	High reliability 

SG07 Slider type

● High lead: Lead 20 ● CE compliance ● Origin on the non-motor side is selectable.

Ordering method

SG07 -		-		-		-		-		-	SH	-		-	
Model	Lead		Model		Brake		Origin position		Grease option		Stroke		Cable length Note 1		Controller		I/O		Battery
	20: 20mm 12: 12mm 06: 6mm		S: Straight model		N: With no brake B: With brake		N: Standard Z: Non-motor side		N: Standard grease C: Clean room grease		50 to 800 (50mm pitch)		1L: 1m 3L: 3m 5L: 5m 10L: 10m		SH: TS-SH		NP: NPN PN: PNP CC: CC-Link DN: DeviceNet EP: EtherNet/IP		B: With battery (Absolute) N: None (Incremental)

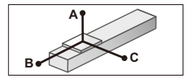
Note 1. The robot cable is flexible and resists bending.

Basic specifications

Motor		56□ Step motor		
Resolution (Pulse/rotation)		20480		
Repeatability Note 1 (mm)		+/-0.02		
Deceleration mechanism		Ball screw ϕ12 (Class C10)		
Ball screw lead (mm)		20	12	6
Maximum speed Note 2 Note 3 (mm/sec)		1200	800	350
Maximum payload (kg)	Horizontal	36	43	46
	Vertical	4	12	20
Max. pressing force (N)		60	100	225
Stroke (mm)		50 to 800 (50pitch)		
Overall length (mm)	Horizontal	Stroke+288		
	Vertical	Stroke+328		
Maximum outside dimension of body cross-section (mm)		W65×H64		
Cable length (m)		Standard: 1 / Option: 3, 5, 10		

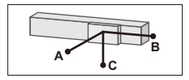
Note 1. Positioning repeatability in one direction.
Note 2. When the stroke is longer than 600mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speeds shown in the table below.
Note 3. It is necessary to change the maximum speed according to the payload. For details, see the "Speed vs. payload" graph shown below.
Note. Position detectors (resolvers) are common to incremental and absolute specifications.
If the controller has a backup function then it will be absolute specifications.

Allowable overhang Note



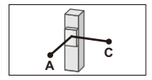
Horizontal installation (Unit: mm)

		A	B	C
Lead 20	10kg	3572	458	486
	25kg	2971	220	245
	36kg	3150	140	160
Lead 12	15kg	3703	363	406
	30kg	1962	172	196
	43kg	1430	114	131
Lead 6	15kg	3853	363	414
	30kg	2105	172	197
	46kg	1500	106	122



Wall installation (Unit: mm)

		A	B	C
Lead 20	10kg	450	402	3261
	25kg	117	155	2943
	36kg	98	85	2520
Lead 12	15kg	351	307	3403
	30kg	134	117	1663
	43kg	68	59	1070
Lead 6	15kg	353	307	3541
	30kg	134	117	1752
	46kg	58	50	1100

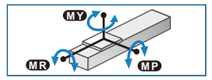


Vertical installation (Unit: mm)

		A	C
Lead 20	2kg	2303	2303
Lead 12	4kg	1147	1147
	4kg	1386	1386
Lead 6	12kg	442	442
	7kg	781	781
	20kg	252	252

Note. Distance from center of slider upper surface to carrier center-of-gravity at a guide service life of 10,000 km (Service life is calculated for 600mm stroke models).
Note. Calculated by the speed corresponding to the payload.

Static loading moment



(Unit: N·m)

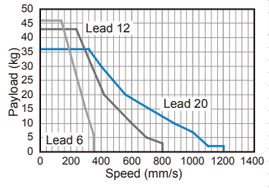
MY	MP	MR
101	114	101

Controller

Controller	Operation method
TS-SH	I/O point trace / Remote command

Speed vs. payload

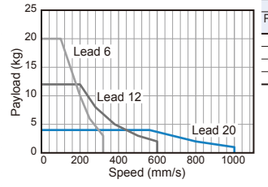
Horizontal



■ Quick reference

Lead 20		Lead 12		Lead 06	
Payload (kg)	Speed (mm/sec)	Payload (kg)	Speed (mm/sec)	Payload (kg)	Speed (mm/sec)
36	320	43	240	46	140
30	400	40	255	42	155
25	480	35	295	40	165
20	560	30	340	35	190
15	720	25	380	30	200
10	800	20	420	25	245
9	900	15	500	20	270
8	950	10	600	15	300
7	1000	9	615	10	325
6	1020	8	635	9	330
5	1035	7	655	8	335
4	1055	6	675	7	340
3	1075	5	700	6	350
2	1100	4	750		
1	1200	3	800		

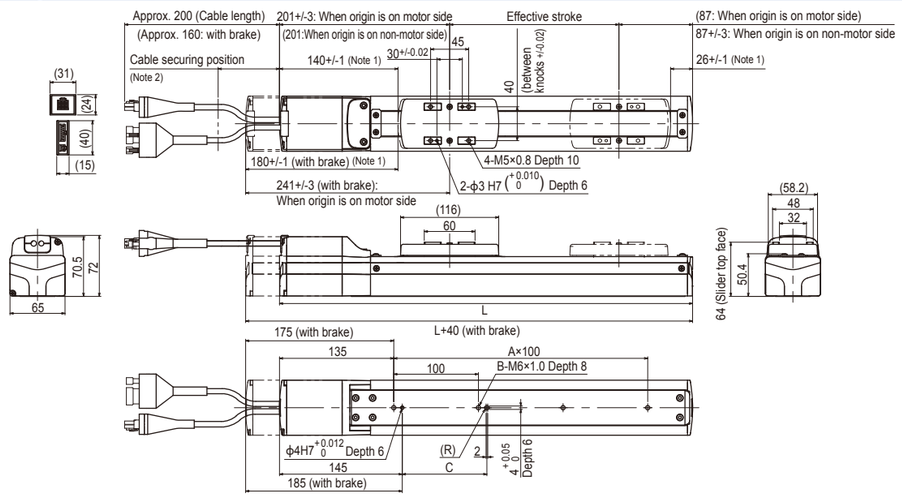
Vertical



■ Quick reference

Lead 20		Lead 12		Lead 06	
Payload (kg)	Speed (mm/sec)	Payload (kg)	Speed (mm/sec)	Payload (kg)	Speed (mm/sec)
4	560	12	200	20	100
3	680	10	240	15	150
2	800	9	260	12	180
1	1000	8	280	10	200
		7	310	9	210
		6	345	8	225
		5	380	7	235
		4	435	6	250
		3	500	5	270
		2	600	4	295
				3	320

SG07 Straight model S



Effective stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L		338	388	438	488	538	588	638	688	738	788	838	888	938	988	1038	1088
A		1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9
B		2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
C		100	100	100	100	100	100	400	400	400	400	400	400	700	700	700	700
Weight (kg) Note 4		2.9	3.2	3.4	3.6	3.9	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.7	5.9	6.1	6.3
Maximum speed for each stroke Note 5 (mm/sec)	Lead20 (Horizontal)	1200												1020	900	780	720
	Lead20 (Vertical)	1000												1000			
	Lead12 (Horizontal)	800												578	510	442	408
	Lead12 (Vertical)	600															
	Lead6 (Horizontal)	350												298	263	228	210
	Lead6 (Vertical)	320															
	Speed setting	–												85%	75%	65%	60%

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Secure the cable with a tie-band 100mm or less from unit's end face to prevent the cable from being subjected to excessive loads.
Note 3. The cable's minimum bend radius is R30.
Note 4. These are the weights without a brake. The weights are 0.7kg heavier when equipped with a brake.
Note 5. When the stroke is longer than 600mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speeds shown in the table at the below.