

TS-S2/TS-SH/TS-X/TS-P

● CE compliance

TS series are positioner type controllers that only performs point trace. No program is needed. Operation is simple. After setting point data, specify the point number and enter a START signal from host controller such as a PLC. Positioning or pushing operation then begins.

Main functions ▶ P.94



Handy terminal
▶ HT1/HT1-D
P.698



Support software for PC
▶ TS-Manager
P.688



TS-S2

TS-SH

TS-X

TS-P

■ Basic specifications

■ TS-S2/TS-SH

Item		TS-S2	TS-SH
Basic specifications	Number of controllable axes	Single-axis	
	Controllable robots	TRANSERVO series	
	Current consumption	2.5A (Rating) 4.5A (Max.)	3.5A (Rating) 6.5A (Max.)
	Dimensions	W30 × H162 × D82mm	W30 × H162 × D123mm
	Weight	Approx. 0.2kg	Approx. 0.3kg
	Input power supply	DC24V +/-10%	
	Control power supply	DC24V +/-10%	
Axis control	Control method	Closed loop vector control method	
	Operating method	I/O point tracing (Positioning operation by specifying point number) / Remote command	
	Operation types	Positioning, merge-positioning, push, and jog operations	
	Position detection method	Resolver	Resolver with multi-turn absolute function
	Resolution	20480 pulses/rev. or 4096 pulses/rev. depending on the robot	
Points	Origin search method	Incremental	Absolute / Incremental
	Points	255 points	
	Point type setting	(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.	
	Point teaching method	Manual data input (coordinates input), Teaching, Direct teaching	
	I/O interface	Selectable from the following: NPN, PNP, CC-Link, DeviceNet™, EtherNet/IP™, PROFINET	
External input/output	Input	Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)	
	Output	Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)	
	External communications	RS-232C 1CH	
	Safety circuit	Emergency stop input, emergency stop contact output (1 system: When the HT1 is used.)	
	Options	Handy terminal HT1, HT1-D (with enable switch) Support software for PC TS-Manager	
General specifications	Operating temperature / Operating humidity	0°C to 40°C, 35% to 85%RH (non-condensing)	
	Storage temperature/ Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)	
	Atmosphere	Indoor location not exposed to direct sunlight. No corrosive, flammable gases, oil mist, or dust particles	
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²	
	Protective functions	Position detection error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error, motor cable faulty wiring, Excitation power failure error ^{Note 1}	

Note 1. The excitation power failure error is a protection function that is available only in TS-SH.

Controllable robot	TS-S2/TS-SH ▶ TRANSERVO P.253	TS-X ▶ FLIP-X P.295	TS-P ▶ PHASER P.341
CE marking		Field networks	CC-Link DeviceNet EtherNet/IP PROFINET

Model Overview

Name	TS-S2	TS-SH	TS-X/TS-P
Controllable robot	Dedicated compact single-axis TRANSERVO		TS-X: Single-axis robot FLIP-X TS-P: Linear motor single-axis PHASER
Input power	DC24V +/-10%		- AC100V specifications - Control power supply - Single phase 100 to 115V AC +/-10% - Main power supply - Single phase 100 to 115V AC +/-10%
Operating method	I/O point tracing / Remote command / Operation using RS-232C communication		
Maximum number of controllable axes	Single-axis		
Origin search method	Incremental	Absolute / Incremental	TS-X: Absolute / Incremental TS-P: Absolute / Semi-absolute

Ordering method

TS-S2/TS-SH (TRANSERVO)

Robot positioner	Type	I/O	Battery Note 1
S2: TS-S2	No entry: Standard	NP: NPN	B: With battery (Absolute model)
SH: TS-SH	S: Sensor	PN: PNP	N: None (Incremental model)
		CC: CC-Link	
		DN: DeviceNet™	
		EP: EtherNet/IP™	
		PT: PROFINET	
		GW: With no I/O board	

Note 1. Battery can only be selected for TS-SH. (Not provided for TS-S2).

TS-X/TS-P (FLIP-X/PHASER)

Controller	Driver: Power supply voltage/Power capacity	Regenerative unit	LCD monitor	Input/Output Selection	Battery Note 2
TSX: TS-X	105: 100V / 100W more less	No entry: None	No entry: None	NP: NPN	B: With battery (Absolute model)
TSP: TS-P	110: 100V / 200W	R: With RGT	L: With LCD	PN: PNP	N: None (Incremental model)
	205: 200V / 100W more less	R: With RGU-2		CC: CC-Link	
	210: 200V / 200W			DN: DeviceNet™	
	220: 200V / 400 to 600W			EP: EtherNet/IP™	
				PT: PROFINET	
				GW: With no I/O board	

Note 2. Battery can only be selected for TS-X. (Not provided for TS-P).

TS-X/TS-P

Item		TS-X / TS-P			
		100V AC input		200V AC input	
Basic specifications	Driver model	TS-X105 / TS-P105	TS-X110 / TS-P110	TS-X205 / TS-P205	TS-X210 / TS-P210
	Number of controllable axes	Single-axis			
	Controllable robots	TS-X: Single-axis robot FLIP-X series TS-P: Linear motor single-axis robot PHASER series			
	Power capacity	400VA	600VA	400VA	600VA
	Dimensions	W58 × H162 × D131mm			W70 × H162 × D131mm
Axis control	Weight	Approx. 0.9kg			
	Input power supply	Single phase 100 to 115V AC +/-10% 50/60Hz			
	Control power supply	Single phase 100 to 115V AC +/-10% 50/60Hz			
Points	Main power supply	Single phase 100 to 115V AC +/-10% 50/60Hz			
	Control method	Closed loop vector control method			
	Operating method	I/O point tracing (Positioning operation by specifying point number) / Remote command			
	Operation types	Positioning, merge-positioning, push, and jog operations			
	Position detection method	TS-X: Resolver with multi-rotation absolute function TS-P: Magnetic type linear scale			
External input/output	Resolution	TS-X: 16384 pulses/rev. TS-P: 1μm			
	Origin search method	TS-X: Absolute / Incremental TS-P: Incremental / Semi-absolute			
	Number of points	255 points			
Options	Point type setting	(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.			
	Point teaching method	Manual data input (coordinates input), Teaching, Direct teaching			
	I/O interface	Selectable from the following: NPN, PNP, CC-Link, DeviceNet™, EtherNet/IP™, PROFINET			
	Input	Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)			
	Output	Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)			
General specifications	External communications	RS-232C 1CH			
	Power supply for brake	DC24V +/-10% 300mA (prepared by the customer)			
	Safety circuit	Emergency stop input, main power input ready output, emergency stop contact output (1 system: When the HT1 is used.)			
	Handy terminal	HT1, HT1-D (with enable switch)			
	Support software for PC	TS-Manager			
General specifications	Operating temperature / Operating humidity	0°C to 40°C, 35% to 85%RH (non-condensing)			
	Storage temperature / Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)			
	Atmosphere	Indoor location not exposed to direct sunlight. No corrosive, flammable gases, oil mist, or dust particles			
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²			
	Protective functions	Position detection error, power module error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error			
Option	Protective structure	IP20			

TS-X / TS-P specification selection table

Some specifications are automatically determined by the robot model.

TS-X

		T4LH/ C4LH	T5LH/ C5LH	T6L/ C6L	T9	T9H	F8/ C8	F8L/ C8L	F8LH/ C8LH	F10/ C10	F10H	F14/ C14	F14H/ C14H	GF14XL	F17/ C17	F17L/ C17L	GF17XL	F20/ C20	F20N	N15/ N15D	N18/ N18D	B10	B14	B14H	R5	R10	R20
Power supply voltage / Current sensor	TS-X	105	●	●	●		●	●	●	●		●		●								●	●	●	●	●	●
		110				●					●		●	●													●
		205	●	●	●	●	●	●	●	●		●										●	●	●	●	●	
		210				●					●		●	●													●
		220													●	●	●	●	●	●	●						
Regenerative unit	No entry (None)				(1)	(2)				(1)	(2)	(1)	(2)	●	(3)		(6)	(3)	(4)								
	R (RGT)				(1)	(2)				(1)	(2)	(1)	(2)		(3)	●	(6)	(3)	(4)	●	●				(5)		

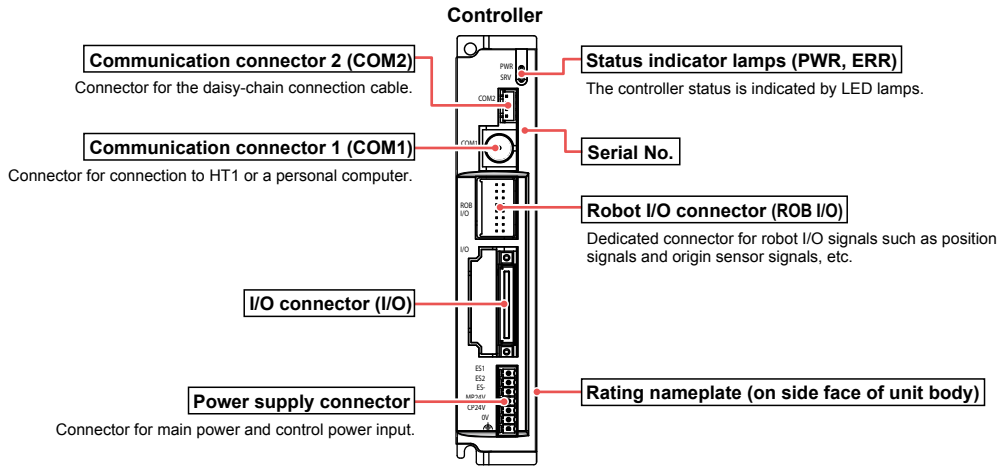
- (1) Regenerative unit is needed if using in a perpendicular position and movement stroke is 700mm or more.
- (2) Regenerative unit is needed if using in a perpendicular position.
- (3) [The following arrangements require a regeneration unit.]
- Using in the upright position.
 - To move at a speed exceeding 1,000 mm/sec horizontally.
 - High lead (40) used horizontally.
- (4) Regenerative unit is needed if using at maximum speeds exceeding 1000mm per second.
- (5) Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second.
- (6) Regenerative unit is needed if using at maximum speeds exceeding 750mm per second.

TS-P

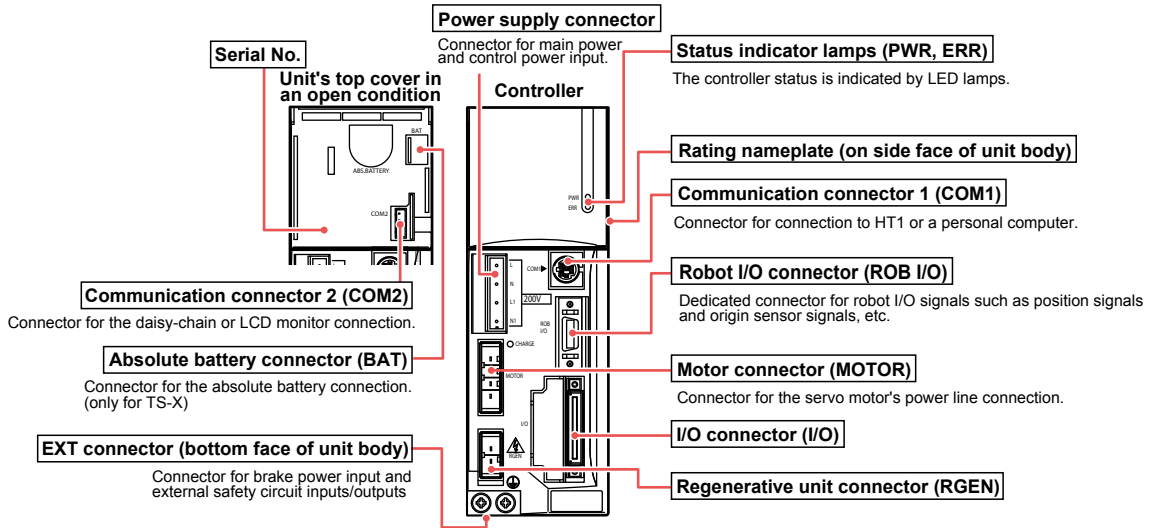
		MF7/7D	MF15/15D	MF20/20D	MF30/30D	MF75/75D
Power supply voltage / Current sensor	TS-P	105				
		110	●		●	
		205				
		210	●	●		
		220			●	●
Regenerative unit	No entry (None)	●	●			
	R (RGT)			●	●	
	R (RGU-2)					●

Part names

TS-S2/TS-SH

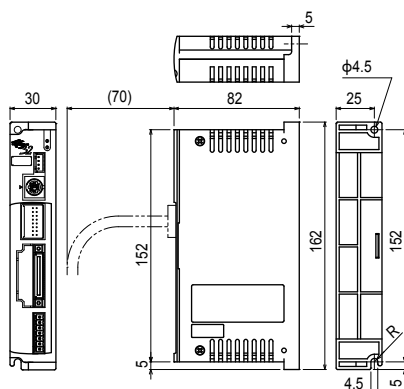


TS-X/TS-P

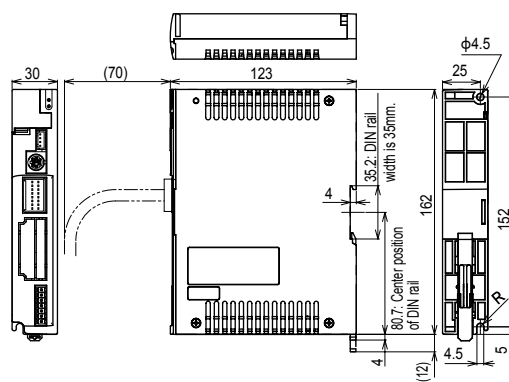


■ Dimensions

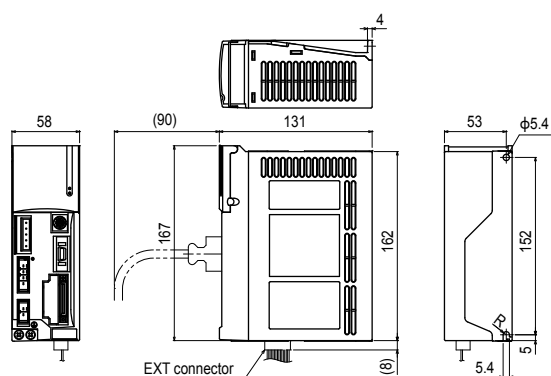
■ TS-S2



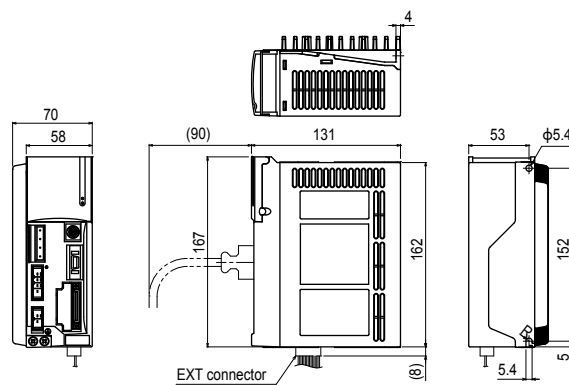
■ TS-SH



■ TS-X/TS-P (105/110/205/210)



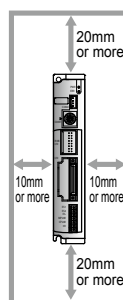
■ TS-X/TS-P (220)



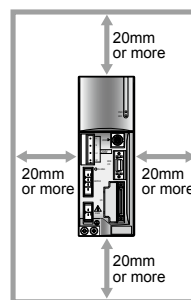
■ Installation conditions

- Install the TS-S2/TS-SH/TS-X/TS-P inside the control panel.
- Install the TS-S2/TS-SH/TS-X/TS-P on a vertical wall.
- Install the TS-S2/TS-SH/TS-X/TS-P in a well ventilated location, with space on all sides of the TS-S2/TS-SH/TS-X/TS-P (See fig. at right.).
- Ambient temperature : 0 to 40°C
- Ambient humidity : 35 to 85% RH (no condensation)

■ TS-S2/TS-SH



■ TS-X/TS-P



■ Cautions on TS-S2 / TS-SH

For the RF type sensor specifications, the controllers "TS-S2" and "TS-SH" become "TS-S2S" and "TS-SHS", respectively.

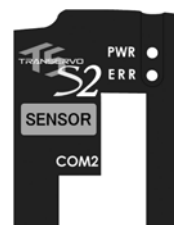
TS-S2 / TS-SH (Standard specifications)

"BK" label is affixed to the front of the controller.



TS-S2S / TS-SHS (Sensor specifications)

"SENSOR" label is affixed to the front of the controller.
 (Be aware that "TS-S2S" is affixed to the front of the controller.)



- Basic specifications

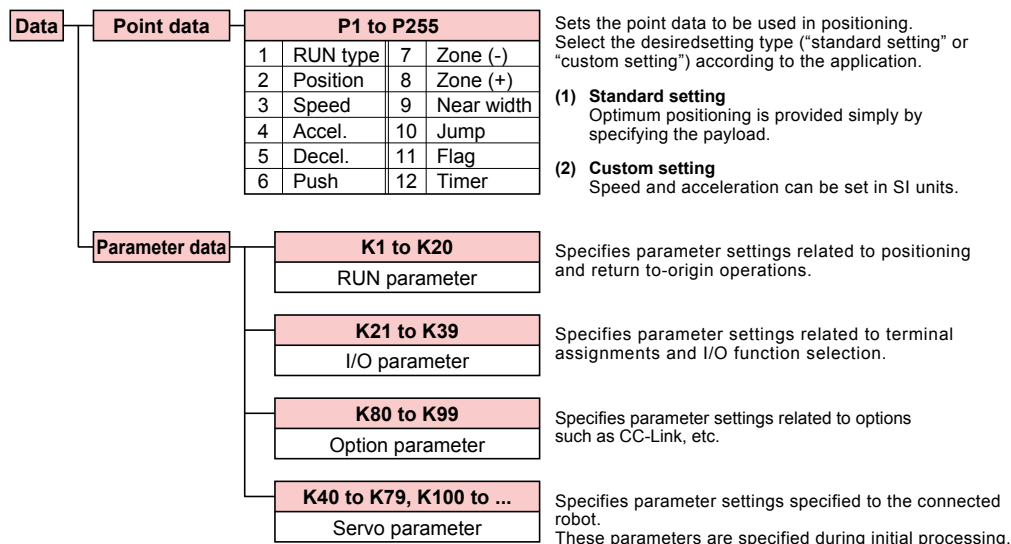
Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller.
Also, always use the dedicated cable when connecting the controller.

Point data and parameter data settings must be specified in order to operate a robot from a TS series controller.

- Data structure

The point data used in positioning operations includes items such as the "RUN type", "Position", and "Speed", etc. Up to 255 points (P1 to P255) can be registered. There are two point data setting types: "Standard setting" type that automatically defines optimal positioning simply by specifying the payload and "Custom setting" type that allows setting the speed (mm/s) and acceleration (m/s²) in SI units. Select the desired setting type according to the application.

Parameter data is divided into the following categories: "RUN parameters", "I/O parameters", "option parameters", and "servo parameters".



Point data item list

- Basic specifications

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

“Standard setting” and “custom setting”

There are 2 setting types for point data ("standard setting" or "custom setting"). Select the desired setting type according to the application.

The maximum number of setting points for both setting types is 255 points (P1 to P255).

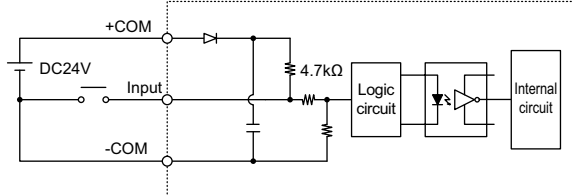
Setting Type	Description
Standard setting	Optimum positioning is provided simply by specifying the payload. This setting type is well-suited to assembly and transport applications.
Custom setting	Allows changing the speed and acceleration in SI units so the desired positioning operation can be set. This setting type is suited for machining and inspection systems.

I/O signals (NPN / PNP)

No.	Signal Name	Description	No.	Signal Name	Description
A1	+COM	I/O power input, positive common (24VDC +/-10%)	B1	POUT0	Point No. outputs
A2			B2	POUT1	
A3	NC	No connection	B3	POUT2	
A4	NC		B4	POUT3	
A5	PIN0	Point No. select	B5	POUT4	
A6	PIN1		B6	POUT5	
A7	PIN2		B7	POUT6	
A8	PIN3		B8	POUT7	
A9	PIN4		B9	OUT0	
A10	PIN5		B10	OUT1	
A11	PIN6		B11	OUT2	
A12	PIN7		B12	OUT3	
A13	JOG+	JOG movement (+ direction)	B13	BUSY	Operation-in-progress
A14	JOG-	JOG movement (- direction)	B14	END	Operation-end
A15	MANUAL	MANUAL mode	B15	/ALM	Alarm
A16	ORG	Return-to-origin	B16	SRV-S	Servo status
A17	/LOCK	Interlock	B17	NC	No connection
A18	START	Start	B18	NC	
A19	RESET	Reset	B19	-COM	I/O power input, negative common (0V)
A20	SERVO	Servo ON	B20		

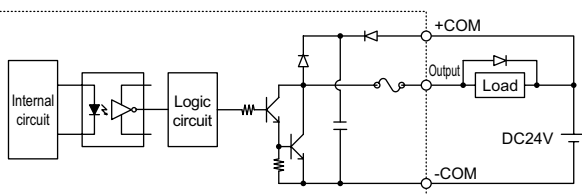
NPN type I/O circuit details

Input circuit



Type : DC input (plus common type)
 Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.1mA
 OFF voltage : 19.6Vmin (1.0mA)
 ON voltage : 4.9Vmax (4.0mA)

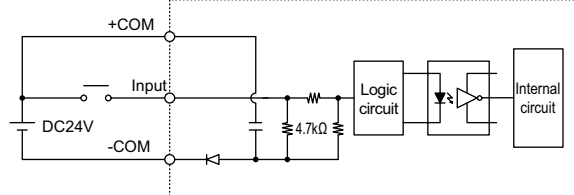
Output circuit



Type : NPN open collector output
 (Minus common type)
 Photo-coupler isolation format
Load : 24VDC, 50mA/point

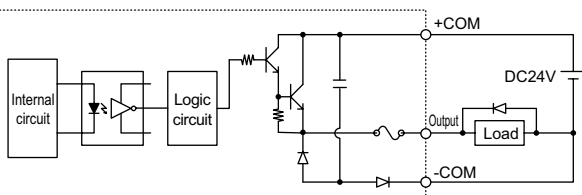
PNP type I/O circuit details

Input circuit



Type : DC input (minus common type)
 Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.5mA
 ON voltage : 19.6Vmin (4.5mA)
 OFF voltage : 4.9Vmax (1.1mA)

Output circuit



Type : PNP open collector output
 (Plus common type)
 Photo-coupler isolation format
Load : 24VDC, 50mA/point

Accessories and part options

TS-S2/TS-SH/TS-X/TS-P



Standard accessories

Power connector

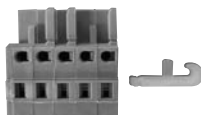


Model KCC-M4421-00

TS-S2
TS-SH
TS-SD

Power connector (AC100V specifications)

Included when 100V model is purchased

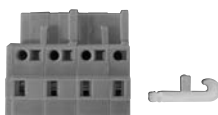


Model KCA-M5382-00

TS-X
TS-P

Power connector (AC200V specifications)

Included when 200V model is purchased



Model KAS-M5382-00

LCC140
TS-X
TS-P
SR1-X
SR1-P
RCX320
RCX221
RCX222
RCX340

EXT connector

For braking power and safety circuit connections.



Model KCA-M5370-00

TS-X
TS-P

Dummy connector



Model KCA-M5163-00

TS-S2
TS-SH
TS-X
TS-P

I/O cables (2m/20-core×2)



Model KCA-M4421-20

TS-S2
TS-SH
TS-X
TS-P

Absolute battery

Absolute battery basic specifications

Item	For TS-X	For TS-SH
Battery type	Lithium metallic battery	
Battery capacity	3.6V / 1,650mAh	3.6V / 2,700mAh
Data holding time	About 1 year (in state with no power applied)	
Dimensions	φ18 × L60mm	φ17 × L53mm
Weight	24g	21g



For TS-X



For TS-SH

Model KCA-M53G0-10 (For TS-X)
KCA-M53G0-02 (For TS-SH)

Note. The absolute battery is subject to wear and requires replacement. If trouble occurs with the memory then remaining battery life is low so replace the absolute battery. The battery replacement period depends on usage conditions. But generally you should replace the battery after about 1 year counting the total time after connecting to the controller and left without turning on the power.

TS-X
TS-SH
RCX320
RCX340

CC-Link connector (CC-Link specifications)

Included when CC-Link model is purchased



Connector



Jump socket

Model Connector^{Note.} KCA-M4872-00
Jump socket KCA-M4873-00

Note. This is a single connector type. (Insert two connectors into a branching socket.)

TS-S2
TS-SH
TS-X
TS-P

See next page for optional parts

Options

● Handy terminal HT1/HT1-D

P.698



		HT1	HT1-D
Model	3.5m	KCA-M5110-0J	KCA-M5110-1J
	10m	KCA-M5110-6J	KCA-M5110-7J
Enable switch		—	3-position
CE marking		Not supported	Applicable

TS-S2
TS-SH
TS-X
TS-P

● Support software TS-Manager

P.688



Model	KCA-M4966-0J (Japanese)
	KCA-M4966-0E (English)

TS-S2
TS-SH
TS-X
TS-P
TS-SD

● TS-Manager environment

OS	Windows 2000, XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.1.4.5 or later)
CPU	Exceeding the environment recommended by the OS being used
Memory	Exceeding the environment recommended by the OS being used
Hard disk	Vacant capacity of more than 20MB in the installation destination drive
Communication port	Serial (RS-232C), USB
Applicable controllers	TS series

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

● Data cables

Communication cable for TS-Manager.
Select from USB cable or D-sub cable.



Model	USB type (5m)	KCA-M538F-A0
	D-Sub type (5m)	KCA-M538F-01

Note. USB driver for communication cable can also be downloaded from our website.

TS-S2
TS-SH
TS-X
TS-P
TS-SD

● Daisy chain and gateway connection cable



Model	KCA-M532L-00 (300mm)
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TS-S2
TS-SH
TS-X
TS-P
TS-SD

● CC-Link termination connector (CC-Link specifications)



Model	KCA-M4874-00
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TS-S2
TS-SH
TS-X
TS-P

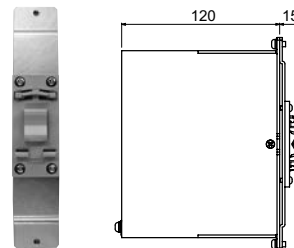
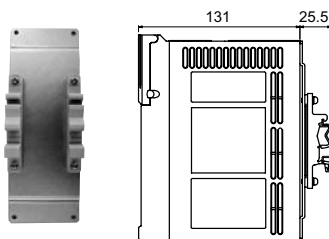
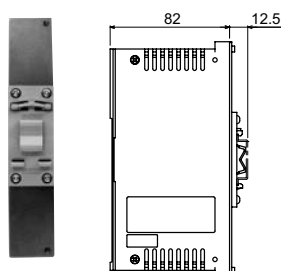
● TS-Monitor (LCD monitor) P.702



Model	For TS-X	KCA-M5119-00
	For TS-P	KCA-M5119-10

TS-X
TS-P

● DIN rail mounting bracket (This bracket is provided in TS-SH as standard equipment.)



Model	For TS-S2
	KCC-M499A-00

TS-S2

Model	For TS-X / TS-P
	KCA-M499A-00

TS-X
TS-P

Model	For TS-X / TS-P with RGT
	KCA-M499A-10

TS-X
TS-P