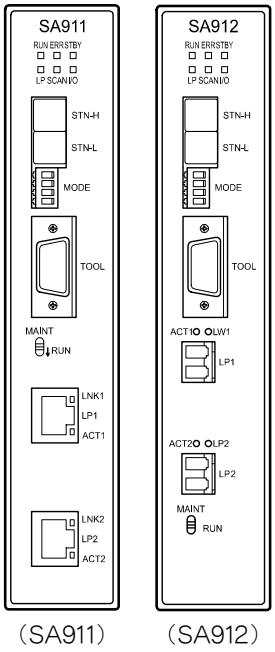
■General

The Unified Controller nv series, a line of Toshiba's industrial controllers, takes over the traits of the existing lineup, "Integrated Controller V series." The nv series is equipped with an I/O system called "TC-net I/O," which is based on the industry's first 100-Mbps double loop network. As a result, the high speed performance required in the electric control field as well as the online maintainability required in the instrumentation field can be simultaneously achieved by the same hardware. Thus, the nv series provides the unified surveillance/control system featuring the high speed performance, reliability and economic efficiency not just in the instrumentation field but also in the electric control and electric power fields.

The TC-net I/O, a high speed serial I/O system, is designed to connect modules for outputting/inputting analog values such as temperature, pressure and flow rate as well as digital values such as ON/OFF signals of the power supply and switches to controllers via a high speed serial circuit. The TC-net I/O is used to configure a system for sending and receiving I/O data from each module to and from controllers.



(SA911) (SA912)

Fig. 1 TC net I/O module

■Features

The TC-net I/O system has the following features.

(1) The industry's first high speed serial I/O system
It is the industry's first field I/O system that enables a transmission speed of 100 Mbps and the double loop configuration. The system can collect high speed I/O data, and the minimum preset time for collection cycle is 100 μs. In the standard setup, the transmission path has a double loop configuration (for sending and receiving lines). Furthermore, the double-loop network may be provided as a duplexed configuration.

(2)High reliability and maintainability
The system offers a high reliability while ensuring "instrumentation online maintenance (hot plug, etc.)" and "high speed electric control" at the same time. The system uses a double loop transmission network that includes sending and receiving lines. Furthermore, the network may be provided as a duplexed configuration. Thanks to the quadruplex lines, the system has a mechanism to maintain the transmission even when the lines are disconnected at up to three points.

⚠ SAFETY INSTRUCTIONS

- This product was designed and manufactured for use in general manufacturing equipment systems (for process control, production line control, etc.). It was not designed or manufactured for use with equipment employed under circumstances which pose a direct threat to human life, or with systems consisting of such equipment. Before using this product for such purposes, please consult a sales representative.
- This product was manufactured under rigorous quality control. However, when employing this product with facilities which may pose a threat to human life, or with facilities for which serious consequences may be foreseen, please tale special care to ensure the construction of a system which is safe with respect to system operation, maintenance and management.
- This product requires electrical and mechanical installation. Please consult your vendor, a specialized service provider, or a Toshiba sales representative regarding installation.
Improper installation may result in electric shocks or fire.
- Please read all related documentation prior to use of this product, and use product only as described in the documentation.

■System Configuration

TC-net I/O system can be used in single system configuration or in duplex system configuration.

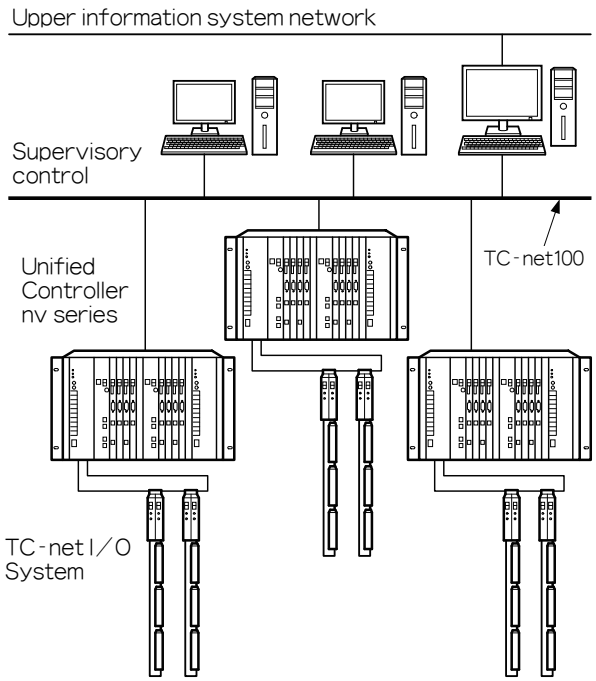


Fig. 2 System configuration example (optical transmission line)

●Single system configuration

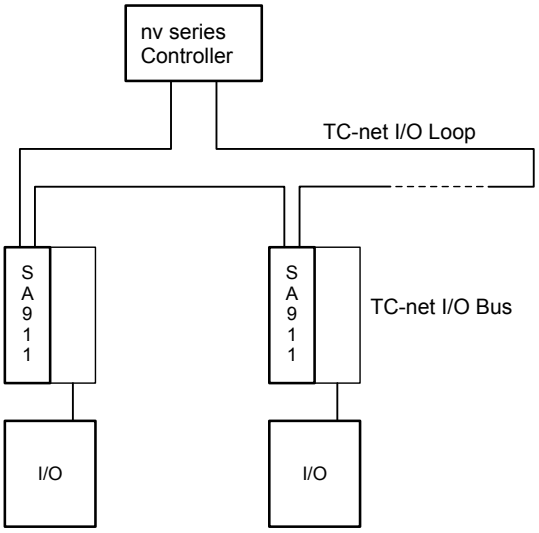


Fig. 3 Single configuration

●Duplex system configuration

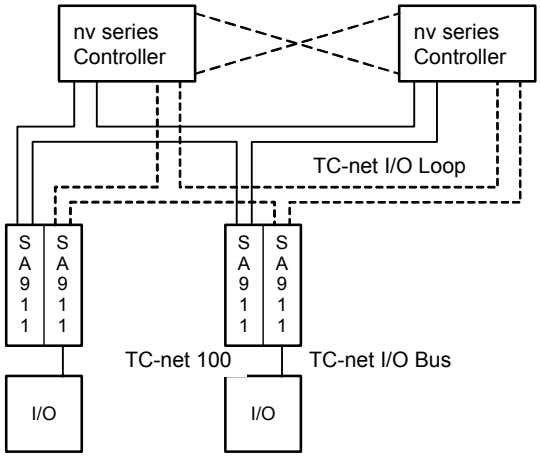


Fig. 4 Duplex configuration

■Specifications

●Modules

Table 1 TC-net I/O Module list

Category	Pet name	Product code	Product outline
TC-net I/O adaptor	SA911	HSA911**S	TC-net I/O adaptor (Electric)
	SA912	HSA912**S	TC-net I/O adaptor (Optical)
	SA931	HSA931**S	TC-net I/O adaptor (for LP918B)
	SA941	HSA941**S	TC-net I/O adaptor (Electric, for AI959B/AO969)
	SA942	HSA942**S	TC-net I/O adaptor (Optical, for AI959B/AO969B)
TC-net I/O module	DI934	HDI934**S	24VDC 32-point digital input
	DI934I	HDI934I*S	24VDC 32-point digital input with digital filter: low input current model
	DI934S	HDI934S*S	24VDC 32-point digital input with strobe
	DI934T	HDI934T*S	DC12/24V 8mA 32-point digital input
	DI935	HDI935**S	24VDC 64-point digital input
	DI936	HDI936**S	Insulated 12-24VDC 16-point digital input
	DI937	HDI937**S	24VDC 16-point contact input module
	DI944	HDI944**S	48VDC 32-point digital input
	DI947	HDI947**S	DC48V 4mA 16-point contact input module
	IN956	HIN956**S	Insulated 100/120VAC/DC 16-point digital input
	IN966	HIN966**S	Insulated 200/240VAC 16-point digital input
	DO934	HDO934**S	24VDC-100mA 32-point digital output
	DO935	HDO935**S	24VDC-50mA 64-point digital output
	DO936	HDO936**S	DC24V-2AFET output
	RO966	HRO966**S	Insulated contact (24VDC/240VAC-2A)16-point output
	AC963	HAC963**S	100/240VAC-2A 16-point triac output
	AI914	HAI914**S	Insulated 0-5V 4-point analog input
	AI918	HAI918**S	Insulated 0-5V 14bit 10ms 8-point analog input
	AI918D	HAI918D*S	Insulated 0-20mA 14bit 10ms 8-point analog input with distributor
	AI918F	HAI918F*S	Insulated 0-5V 16bit 10ms 8-point analog input
	AI919	HAI919**S	Non-insulated 0-5V 16-point analog input
	AI928	HAI928**S	Insulated 0-20mA 8-point input 0.5ms 14bit
	AI929D	HAI929D*S	Non-insulated 4-20mA 16point analog input (with distributor)
	AI959B	HAI959B*S	analog input module: used in combination with signal conditioner
	AI969	HAI969**S	Insulated mV/V 16-point analog input with gain adjustment function
	TC919	HTC919**S	Insulated thermocouple 16-point input
	RT918	HRT918**S	Insulated RTD 8-point input
	RT918C	HRT918C*S	Non-insulated RTD 8-point input
	AO928	HAO928**S	Insulated 0-20mA 8-point analog output
	AO928F	HAO928F*S	Insulated 0-20mA 8-point analog output (16bit)
	AO929	HAO929**S	Non-insulated 0-20mA 16-point analog output
	AO969B	HAO969B*S	Analog output module: used in combination with signal conditioner
	PI918	HPI918**S	1-phrase 8-point pulse input module (Up Count,12-24V)
	PI924	HPI924**S	2-phrase 4-point pulse input module (Up/Down Count,12-24V)
	PI948	HPI948**S	Voltage instrumentation input: 8-point pulse input module
TC-net I/O compound module	LP918B	HLP918B*S	Loop module AI:12ch, MV:8ch, DI:8ch, DO:8ch
TC-net I/O special module	FL911	HFL911**S	FL-net module
Signal conditioner	CISO5	-	mV voltage input isolator: DC 5-200 mV
	CISO6	-	Current input isolator: 1-5 VDC
	CISO7	-	Voltage input isolator: DC 4-20 mA
	CDIS7	-	2-wire transmitter current input isolator: DC 4-20 mA
	CTC**	-	Thermocouple temperature input isolator: JIS thermocouple input
	CRTD*	-	RTD temperature input isolator
	CCTI1	-	CT input isolator; AC signal CCTI1-11: AC 0~1 A, CCTI1-21: AC 0-5 A
Signal conditioner	CPTI1	-	PT input isolator, AC signal CPTI1-11: 0-100 VAC, CPTI1-21: 0-110 VAC, CPTI1-31: 0-150 VAC, CPTI1-41: 0-250 VAC
	CISO8	-	Current output isolator: DC 4-20 mA
Base unit	BU901	HBU901**S	For SA911
	BU902A	HBU902A*S	With terminal block for I/O (Common bar supported)
	BU903A	HBU903A*S	With terminal block for I/O(250Ω terminated installation supported, Short bar supported)
	BU904A	HBU904A*S	With terminal block for I/O (dedicated to thermocouple input, Common bar supported)
	BU905	HBU905**S	Connector type base module

Category	Pet name	Product code	Product outline
Base unit	BU906A	HBU906A*S	With terminal block for power DI/O (Common bar supported)
	BU928F	HBU928F*S	Base unit for LP918 8-slot type
	BU929F	HBU929F*S	General purpose base unit 8-slot type
	UTBA7	-	Analog input terminal block unit
	UTBA8	-	Analog output terminal block unit
Option	CN9C3	HCN9C3**S	Connection cable(3cm, I/O)
	CN9C9	HCN9C9**S	Connection cable(9cm)
	CN9R5	HCN9R5**S	Cross cable (50cm)
	CN910S	HCN910S*S	Extension cable (1m)
	CN920S	HCN920S*S	extension cable (2m)
	TR901	HTR901**S	Terminating connector
	TR928	HTR928**S	250Ω current/Power conversion module x 8 (with switch)
	TR929	HTR929**S	250Ω current/Power conversion module x 16 (with switch)
	EX911	HEX911**S	I/O check adaptor (for other than power)
	EX912	HEX912**S	I/O check adaptor (for power)
	BB921	HBB921**S	For Common bar BU902A/BU904A/BU906A
	BB931	HBB931**S	For Short bar BU903A
	UMAS3C	-	Marshaling unit for VLCPX1/2
	UMAS4C	-	Marshaling unit for VLCPX4

●Common specifications

Table 2 Common specifications

Item	Specification
Operating temperature	0 to 55ºC
Storage temperature	-40 to 70ºC
Humidity	0 to 95%RH (no condensation)
Vibration (when not energized)	5 ≤ f < 9Hz: Half amplitude 3.1mm 9 ≤ f < 150Hz: Constant acceleration 9.8m/s^2
Shock (when not energized)	147m/s^2 (3-axis direction)
Grounding	D-class grounding with ground resistance of 100Ω or less (prescribed by the Japanese Ministerial Ordinance)
Atmosphere	No corrosive gas
Dust density	0.3mg/m^3 or less (no conductive dust)
Withstand voltage (TC-net I/O loop part)	500VAC, 1 minute

●SA911 and BU901 specifications

Table 3 SA911/BU901 specifications

Category	Item	Specification
Performance specification	Fault detection	Watchdog timer error Memory ECC error (common memory) Bus timeout error, etc.
TC-net I/O loop specification	System	Electric
	Topology	Loop
	Transmission speed	100Mbps
	Redundancy	Redundant loop
	Number of nodes connected	Up to 254 nodes
	Number of I/O adaptors connected	Up to 32 adaptors
	Transmission cable	Category 5 UTP with shield
	Connection connector	RJ-45
	Maximum cable length	Up to 10m
	Total extension	Up to 100m
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more Middle-speed scan: 1ms or more
	Scan transmission capacity	64kW/system (1024 blocks/system) Maximum transmission capacity 32kW/node

Category	Item	Specification
TC-net I/O Bus specification	System	Electric (non-insulated)
	Topology	Bus
	Transmission speed	10Mbps
	Redundancy	Redundant I/O bus
	Interface	RS-485
	Number of I/O modules connected	Up to 16 modules
	Transmission cable	Dedicated cable
	Total extension	Up to 5m (including the base unit length)
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more
	Scan transmission capacity	64kW/ system Maximum transmission capacity 32kW/ slot
Module specification	Cooling method	Natural air cooling
	Dimensions	SA911: 35 × 185 × 94.5mm BU901: 72 × 200 × 30mm
	Weight	SA911: 250g or less BU901: 220g or less
	Power supply	20.4VDC to 26.4VDC (24VDC + 10% - 15%) Supplied from BU901 power terminal block
	Current consumption	24VDC-400mA or less (SA911/1 unit)
Accessories	Terminating connector	For I/O bus (TR901), two units attached to BU901

●SA912 and BU901 specifications

Table 4 SA912/BU901 specifications

Category	Item	Specification
Performance specification	Fault detection	Watchdog timer error Memory ECC error (common memory) Bus timeout error, etc.
TC-net I/O loop specification	System	Optical
	Topology	Loop
	Transmission speed	100Mbps
	Redundancy	Redundant loop
	Number of nodes connected	Up to 254 nodes
	Number of I/O adaptors connected	Up to 32 adaptors
	Transmission cable	Optical fiber (core diameter/clad 50/125, 62.5/125)
	Connection connector	Optical module
	Maximum cable length	2km
	Total extension	4km
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more Middle-speed scan: 1ms or more
	Scan transmission capacity	64kW/system (1024 blocks/system) Maximum transmission capacity 32kW/node

Category	Item	Specification
TC-net I/O bus specification	System	Electric (non-insulated)
	Topology	Bus
	Transmission speed	10Mbps
	Redundancy	Redundant I/O bus
	Interface	RS-485
	Number of I/O modules connected	Up to 16 modules
	Transmission cable	Dedicated cable
	Total extension	Up to 5m (including the base unit length)
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more
	Scan transmission capacity	64kW/ system Maximum transmission capacity 32kW/ slot
Module specification	Cooling method	Natural air cooling
	Dimensions	SA912: 35 × 185 × 94.5mm BU901: 72 × 200 × 30mm
	Weight	SA912: 250g or less BU901: 220g or less
	Power supply	20.4VDC to 26.4VDC (24VDC + 10% - 15%) Supplied from BU901 power terminal block
	Current consumption	24VDC-400mA or less (SA912/1 unit)
Accessories	Terminating connector	For I/O bus (TR901), two units attached to BU901

●24VDC system power supply specifications

Table 5 System power supply specifications

Category	Specification	Remark
Power voltage range	20.4V to 26.4V (24V + 10% - 15%)	
Ripple voltage	24V 5% or less (p-p)	
Protection circuit	Shall have overcurrent protection and overvoltage protection circuits. Overvoltage protection should be detected in the range of 27V to 33V.	

●SA931 specifications

Table 6 SA931 specifications

Category	Item	Specification
Performance specification	Fault detection	Watchdog timer error Memory ECC error (common memory) Bus timeout error, etc.
TC-net I/O loop specification	System	Electric
	Topology	Loop
	Transmission speed	100Mbps
	Redundancy	Redundant loop
	Number of nodes connected	Up to 254 nodes
	Number of I/O adaptors connected	Up to 32 adaptors
	Transmission cable	Category 5 UTP with shield
	Connection connector	RJ-45
	Maximum cable length	Up to 10m
	Total extension	Up to 100m
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more Middle-speed scan: 1ms or more
	Scan transmission capacity	64kW/system (1024 blocks/system) Maximum transmission capacity 32kW/node

Category	Item	Specification
TC-net I/O bus specification	System	Electric (non-insulated)
	Topology	Bus
	Transmission speed	10Mbps
	Redundancy	Redundant I/O bus
	Interface	RS-485
	Number of I/O modules connected	SA911:Up to16 I/O modules SA931:Up to 8 pairs of redundant LP918B or single 8 units
	Transmission cable	BU928F/BU929F mother board and extension I/O cable
	Total extension	Up to 3m
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more
	Scan transmission capacity	64kW/system Maximum transmission capacity 32kW/slot
Module specification	Cooling method	Natural air cooling
	Dimensions	35×185×94.5mm
	Weight	250g or less
	Power supply	20.4VDC to 26.4VDC (24VDC+10%-15%) Supplied from BU928F/BU929F power terminal block
	Current consumption	24VDC-400mA or less (SA911/1 unit)

●SA941/BU901 specifications

Table 7 SA941/BU901 specifications

Category	Item	Specification
Performance specification	Fault detection	Watchdog timer error Memory ECC error (common memory) Bus timeout error, etc.
TC-net I/O loop specification	System	Electric
	Topology	Loop
	Transmission speed	100Mbps
	Redundancy	Redundant loop
	Number of nodes connected	Up to 254 nodes
	Number of I/O adaptors connected	Up to 32 adaptors
	Transmission cable	Category 5 UTP with shield
	Connection connector	RJ-45
	Maximum cable length	Up to 10m
	Total extension	Up to 100m
	Communication service	Scan transmission/message transmission
	Scan cycle	High-speed scan: 100µs or more Middle-speed scan: 1ms or more
	Scan transmission capacity	64kW/system (1024 blocks/system) Maximum transmission capacity 32kW/node

Category	Item		Specification
TC-net I/O bus specification	System		Electric (non-insulated)
	Topology		Bus
	Transmission speed		10Mbps
TC-net I/O bus specification	Redundancy		Redundant I/O bus
	Interface		RS-485
	Number of I/O modules connected		SA941 : Up to 8 (total unit number of UTBA7 and UTBA8)
	Transmission cable		From BU90 to BTBA7, BTBA8 Between UTBAn and UTBAn
	Total extension		Up to 5m
	Communication service		Scan transmission/message transmission
	Scan cycle		High-speed scan: 100µs or more
	Scan transmission capacity		64kW/system Maximum transmission capacity 32kW/slot
Module specification	Cooling method		Natural air cooling
	Dimensions	SA941	35×185×95mm
		BU901	72×200×30mm
	Weight	SA941	250g or less
		BU901	220g or less
	Power supply		20.4VDC to 26.4VDC (24VDC+10%-15%) Supplied from BU901F power terminal block
	Current consumption		24VDC-400mA or less (SA941/1 unit)

●I/O base unit specifications

Table 8 I/O base unit standard

Item	I/O base unit model (Note1)				
	BU902A	**BU903A**	**BU904A**	**BU905**	**BU906A**
Usage	For general I/O (for 32-point or less)	For analog input/output (for options)	For analog input	For digital input/output (for 64-point)	For digital power (large current, high voltage) input/output
Applicable I/O	DI934, DI934I, DI934T, DI934S, DI936, DI937, DI944, DI947, DO934, AI928, AI929D, AI969, RT918, RT918C, AO928, AO928F, AO929, PI918, PI924, PI948 (Note 3)	AI914, AI918, AI918D, AI918F, AI919, AI969, TR928, TR929 (Note 3)	TC919 (Note 3)	DI934S, DI934T, DI935, DO935 Less than 64-point I/O module (Note 2) (Note 3)	IN956, IN966, AC963, DO936, RO966
External line connection terminal	M3.5 screw terminal block	M3.5 screw terminal block	M3.5 screw terminal block	Connector (by 16-point)	M3.5 screw terminal block
I/O connection connector	DIN 64pin	DIN 64pin	DIN 64pin	DIN 64pin DIN 50pin	DIN (TYPE E) 48pin
Option connector	None	Terminating resistor connector (DIN 32pin)	None	None	None
Common bar /short bar	BB921 applicable	BB931 applicable	BB921 applicable	None	BB921 applicable
Withstand voltage (alone)	1500VAC, 1 minute Between all external lines and ground (However, the module has 500VAC.)	1500VAC, 1 minute Between all external lines and ground (However, the module has 500VAC.)	1500VAC, 1 minute Between all external lines and ground (However, the module has 500VAC.)	500VAC, 1 minute Between all external lines and ground	1500VAC, 1 minute (1)Between all external lines and ground (2)Between external line terminals
Insulating resistance (alone)	10MΩ or more (500VDC megger)	10MΩ or more (500VDC megger)	10MΩ or more (500VDC megger)	10MΩ or more (500VDC megger)	10MΩ or more (500VDC megger)
Outside dimensions (mm) (without protrusions)	72W×200H×82D	72W×200H×82D	72W×200H×82D	72W×200H×30D	72W×200H×82D
Weight	450g or less	450g or less	450g or less	250g or less	500g or less
Accessory	Connecting cable (CN9C3, 3cm) x 1	Connecting cable (CN9C3, 3cm) x 1	Connecting cable (CN9C3, 3cm) x 1 Cold junction compensation terminal (JC911) 1 unit	Connecting cable (CN9C3, 3cm) x 1	Connecting cable (CN9C3, 3cm) x 1

(Note1) Modules with a suffix “A” to specify the base unit type are with common bar or the short bar. The common bar or the short bar cannot be added to the modules of the base unit type without the suffix “A.”

(Note2) This indicates modules in “Applicable I/O” column for BU902A above.

(Note3) These I/O modules can be mounted on the I/O base unit, BU929F. Digital power modules for BU906A cannot be mounted on BU929F.

Table 9 BU928F specifications

Item	Specification	
Pet name	BU928F	
Name	Loop base unit	
Applicable TC-net I/O adaptor	SA931	
Applicable module	LP918B	
Number of available units	SA931	Up to 2 units
	LP918B	Single: Up to 4 units
		Redundant: Up to 8 units (4 pairs)
Unit expansion	Up to 1 unit can be added with the TC-net I/O bus cable (3Y8C1576G001/3Y8C1577G001).	
External terminal block connection connector	CN 1, 3, 5, 7: Second half of the input/output signal (AI7 to AI12, MV5 to MV8,DI5 to DI8, DO5 to DO8) CN 2, 4, 6, 8: First half of the input/output signal (AI1 to AI6, MV1 to MV4,DI1 to DI4, DO1 to DO4)	
Power supply terminal block	TB1	For system 24V power supply
	TB2	For MV external 24V power supply
Insulating resistance	10MΩ or more (between all input/output lines and system, between all input/output lines and FG, between system and FG)	
Withstand voltage	500VAC, 1 minute (between all input/output lines and system, between all input/output lines and FG, between system and FG)	
Surface treatment	Trivalent chromium plating	
Applicable cable	Cable for UMASnC (3Y8C1573G001), Cable for VTBUX85C (3Y8C1574G001)	
Outside dimensions (mm)	480W×289H×140D	
Weight	6kg or less	

Table 10 BU929F specifications

Item	Specification	
Pet name	BU929F	
Name	I/O base unit	
Applicable TC-net I/O adaptor	SA911	
Applicable module	DI934I, DO934, AI969, TC919, RT919, PI948, AO928	
Number of available units	SA911	Up to 2 units
	I/O module	Up to 8 units
Unit expansion	Up to 1 unit can be added with the TC-net I/O bus cable (3Y8C1576G001/3Y8C1577G001).	
External terminal block connection connector	■CN1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A Analog system: CH1 to CH16 Digital system: CH1 to CH32 ■CN1B, 2B, 3B, 4B, 5B, 6B, 7B, 8B* Analog system: Not used Digital system: CH33 to CH64 * Not used in TOSDIC DPCS. ■TB11 to 18 Dedicated CJC for TC919 (for external connection)	
Power supply terminal block	TB1	For system 24V power supply
	TB2	For DIO external 24V power supply (For TOSDIC DPCS, it cannot be used because it is supplied from the external terminal block cable.)
	TB3	For AI/AO external 24V power supply (It is used when an analog input/output module requiring an external power supply is used.)
Insulating resistance	10MΩ or more (between all input/output lines and system, between all input/output lines and FG, between system and FG)	
Withstand voltage	500VAC, 1 minute (between all input/output lines and system, between all input/output lines and FG, between system and FG)	
Surface treatment	Trivalent chromium plating	
Applicable cable	Generic straight cable for VTBUX3n (3Y8C1566G001) VTBUX32 to VPINX12 dedicated cable (3Y8C1567G001) VTBUX32 to VAOPX1 dedicated cable (3Y8C1569G001) Cable for VTBUX34 (3Y8C1568G001)	
Outside dimensions (mm)	480W×289H×140D	
Weight	6kg or less	

Table 11 UTBA7 unit specifications

Item		Specification
Pet name		UTBA7
Number of input points		16-point
Applicable signal conditioner		CISO5 (mV voltage input isolator) CISO6 (current input isolator) CISO7 (voltage input isolator) CDIS7 (2-wire transmitter current input isolator) CTC** (thermocouple temperature input isolator) CRTD* (RTD temperature input isolator) CCTI1 (CT input isolator) CPTI1 (PT input isolator)
Number of signal conditioner		Up to 16 units of above-mentioned signal conditioners can be used in combination.
Applicable analog input module		AI959B
Number of analog input module		1 unit in the signal configuration
Installation style		Vertically mounted on a DIN rail, or fixed with screws
External terminal block	Terminal block	Screw-supporting type terminal block (M3.5 screws, 32 ports) x 2 units
	Size of applicable power supply	2 mm2 or smaller, up to 2 pieces

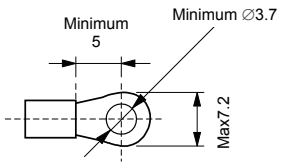
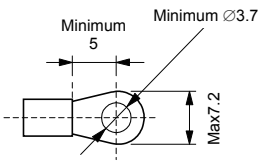
Item		Specification
External terminal block	Applicable crimp terminal	
	Terminal screw tightening torque	0.833 to 1.127N·m
TC-net I/O bus terminal block	Terminal block	Connector terminal block (M3.5 screws, 8 ports)
	Terminal screw tightening torque	0.83 to 1.13 N·m
Power supply terminal block	Terminal block	Connector terminal block (M3.5 screws, 4 ports)
	Terminal screw tightening torque	0.83 to 1.13 N·m
	Applicable wire size	2mm^2 or less
Insulating resistance		100MΩ or more 500VDC megger (FG - internal circuit - external input signal)
Withstand voltage		500VAC 1 minute(FG - internal circuit - external input signal)
Outside dimensions (mm)		110W×493H×150D (without protrusions)
Weight		1500g or less

Table 12 UTBA8 unit specifications

Item		Specification
Pet name		UTBA8
Number of input points		16-point
Applicable signal conditioner		CISO8 (current output isolator)
Number of signal conditioner		Up to 16 units of above-mentioned signal conditioners can be used in combination.
Applicable analog input module		AO969B
Number of analog input module		1 unit in the signal configuration
Installation style		Vertically mounted on a DIN rail, or fixed with screws
External terminal block	Terminal block	Screw-supporting type terminal block (M3.5 screws, 32 ports) x 2 units
	Size of applicable power supply	2 mm^2 or smaller, up to 2 pieces
	Applicable crimp terminal	

Item		Specification
External terminal block	Terminal screw tightening torque	0.83 to 1.13 N·m
TC-net I/O bus terminal block	Terminal block	Connector terminal block (M3.5 screws, 8 ports)
	Terminal screw tightening torque	0.83 to 1.13 N·m
Power supply terminal block	Terminal block	Connector terminal block (M3.5 screws, 4 ports)
	Terminal screw tightening torque	0.83 to 1.13 N·m
	Applicable wire size	2mm^2 or less
Insulating resistance		100MΩ or more 500VDC megger (FG - internal circuit - external input signal)
Withstand voltage		500VAC 1 minute (FG - internal circuit - external input signal)
Outside dimensions (mm)		110W×493H×150D (without protrusions)
Weight		1500g or less

●I/O Module Specifications

Table 13 DI934/DI944 specifications

Item		Specification	
Pet name		DI934	DI944
Input type		Shared with sink/source	
Number of input points		32-point	
Insulation type		Photo-coupler insulation	
Rated input voltage (external supply)		24VDC + 10%/ - 15%	48VDC + 10%/ -15%
Rated input current		5.2mA (for external power supply of 24VDC)	2.6mA (for external power supply of 48VDC)
Digital filter		Common setting in filter time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20 30, 40, 50, 75, 100, 200, 300msec	
Digital hold		Common setting in hold time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec	
Operating voltage	Minimum ON voltage	16.8V	33.6V
	Maximum OFF voltage	6.0V	12V
Common configuration	Number of commons	2 (insulation between systems)	
	Number of input points per common	16-point + Power interruption detection input (selectable)/common	
	Common polarity	Nonpolar	
Input signal display		For each point: LED display, illuminating when ON, logic side	
Module state display		RUN display (green), ALM display (red)	
Fault diagnosis		Based on transmission state	
Applicable base unit		BU902A, BU905	
Current consumption		Internal: 24VDC-50mA or less	
Internal heat generated		Approx. 5W(external 48VDC all points ON)	
Insulating resistance		10MΩ or more (500VDC megger)	
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit) 500VAC, 1 minute when installed to BU905	
Outside dimensions (mm)		35W × 185H × 95D	
Weight		200g or less	

Table 14 DI934I specifications

Item		Specification
Pet name		DI934I
Input type		Shared with sink/source
Number of input points		32-point
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		24VDC +10%/-15% (supplied from VTBUX3* via the dedicated cable) (Can be supplied from BU929F TB2)
Rated input current		4mA (for external power supply of 24VDC)
Digital filter		Common setting in filter time … module 0.25,0.5,1,2,3,4,5,10,20,30,40,50, 75,100,200,300msec
Digital hold		Common setting in hold time … module 0.25,0.5,1,2,3,4,5,10,20,30,40,50, 75,100,200,300msec
Operating voltage	Minimum ON voltage	16.8V
	maximum OFF voltage	6.0V
Common configuration	Number of commons	2 (insulation between systems)
	Number of input points per common	16-point + Power interruption detection input (selectable)/common
	Common polarity	Nonpolar
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		External power supply error, transmission error
Applicable base unit		BU929F
Current consumption		Internal: 24VDC-70mA or less
Internal heat generated		Approx. 5W(external 24VDC all points ON)
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit) 500VAC, 1 minute when installed to BU928F
Outside dimensions (mm)		35W×185H×95D
Weight		200g or less

Table 15 DI934S specifications

Item		Specification			
Pet name		DI934S			
Input class		DC input			
Input type		Source input (shared with sink/source in DI mode)			
Number of input points		Data: 32-point (16-point x 2 systems), strobe: 2-point (occupied data: 2W)			
Insulation type		Photo-coupler insulation (data 16-point – strobe 1-point unit), 2 systems			
Rated input voltage (external power supply 24V)		24VDC (+ side common)			
Input voltage variable range (External 24V power supply)		21.6 to 26.4VDC			
Rated input current	Data 32-point	Approx. 5.2mA (for 24VDC)			
	Strobe 2-point	Approx. 10mA (for 24VDC)			
Input impedance	Data 32-point	3.3kΩ (for 24VDC)			
	Strobe 2-point	2.2kΩ(for 24VDC)			
Input operating voltage	Minimum ON voltage	16.8V			
	Maximum OFF voltage	4.8V			
Input mode changeover		Strobe mode		DI mode	
Strobe detection mode changeover		Strobe ON edge detection or strobe OFF edge detection			
		16bit-1 strobe (set at shipping), 32bit-1 strobe (selectable)			
Filter setting changeover		No	Yes	No	
Response time	OFF→ON	10µs or less	10ms or less	84µs or less	
	OFF→ON	15µs or less	15ms or less	122µs or less	

Item		Specification		
Data setup time		Before strobe edge 150µs or more	Before strobe edge 150ms or more	
Data hold time		After strobe edge 15µs or more	After strobe edge 15ms or more	
Strobe pulse width		Both of ON or OFF pulse width 30µs or more	Both of ON or OFF pulse width 50ms or more	
Module state display		Green LED: RUN, inputs, illuminates when strobe ON, Red LED: ALM		
External connection		36P fixed M3.5 screw terminal base (BU902A), connector type (BU905)		
Common configuration	Number of commons	2		
	Number of input points per common	(Data 16-point + strobe 1-point) /common		
	Common polarity	+ polar		
Derating condition		No		
Power supply voltage (internal 24V)		24VDC + 10%, -15%		
Current consumption (internal 24V)		24VDC-80mA or less		
Insulating resistance		10MΩ or more (500VDC megger)		
Withstand voltage		1500VAC, 1 minute (between input systems, between external circuit and internal circuit)		
Outside dimensions (mm)		35W × 185H × 95D (mm)		
Weight		210g or less		
Installation		Vertical and horizontal installation (external line is downside)		

Table 16 DI934T specifications

Item		Specification
Pet name		DI934T
Number of input points		32-point
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		12-24VDC +10%/-15%
Rated input current		7.7mA (for external power supply of 24VDC)
Digital filter		Common setting in filter time … module 0.25,0.5,1,2,3,4,5,10,20,30,40,50, 75,100,200,300msec
Digital hold		Common setting in hold time … module 0.25,0.5,1,2,3,4,5,10,20,30,40,50, 75,100,200,300msec
Operating voltage	Minimum ON voltage	9.6V (DI signal)
	Maximum OFF voltage	3.6V (DI signal)
Common configuration	Number of commons	2 (insulation between systems)
	Number of input points per common	16-point + Power interruption detection input (selectable)/common
	Common polarity	Nonpolar
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Based on transmission state
External connection		36p terminal fixing type M3.5 screw terminal block (BU902A), connector type (BU905)
Current consumption		Internal: 24VDC-50mA or less
Internal heat generated		Approx. 7W (external 24VDC all points ON)
Temperature derating condition		Yes; Refer to temperature derating.
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit) 500VAC, 1 minute when installed to BU905
Outside dimensions (mm)		35W×185H×95D
Weight		200g or less

Table 17 DI935 specifications

Item		Specification
Pet name		DI935
Input type		Shared with sink/source
Number of input points		64-point
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		24VDC + 10%/ - 15%
Rated input current		4mA (for external power supply of 24VDC)
Digital filter		Common setting in filter time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Digital hold		Common setting in hold time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Operating voltage	Minimum ON voltage	16.8V
	Maximum OFF voltage	6V
Common configuration	Number of commons	4 (insulation between systems)
	Number of input points per common	16-point + power interruption detection input (selectable)/common
	Common polarity	Nonpolar
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Based on transmission state
Applicable base unit		BU905
Current consumption		Internal: 24VDC-70mA or less
Internal heat generated		Approx. 8W
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		500VAC, 1 minute (between systems, between external circuit and internal circuit)
Outside dimensions (mm)		35W × 185H × 95D
Weight		400g or less
Installation		Vertical installation only (no horizontal installation)

Table 18 DI936 specifications

Item		Specification
Pet name		DI936
Input type		Shared with sink/source
Number of input points		16-point
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		12 to 24VDC + 10%/ - 15%
Rated input current		9.6mA (for external power supply of 24VDC)
Digital filter		Common setting in filter time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Digital hold		Common setting in hold time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Operating voltage	Minimum ON voltage	9.6V
	Maximum OFF voltage	3.6V
Common configuration	Number of commons	16 (insulation between channels)
	Number of input points per common	1 point/common
	Common polarity	Nonpolar
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Based on transmission state
Applicable base unit		BU902A
Current consumption		Internal: 24VDC-40mA or less
Internal heat generated		Approx. 5W (external 24VDC all points ON)
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between external and internal circuits), 500VAC, 1 minute when installed to BU905 500VDC, 1 minute between systems
Outside dimensions (mm)		35W × 185H × 95D
Weight		200g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 19 DI937 specifications

Item		Specification
Pet name		DI937
Input type		Contact input
Number of input points		16-point
Insulation type		Photo-coupler insulation
External power supply		12 to 24VDC + 10%/ - 10% 180mA
Contact current		9.6mA (for external power supply of 24VDC)
Input impedance		2.4k to 2.7kΩ
Digital filter		Common setting in filter time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Digital hold		Common setting in hold time … module 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 75, 100, 200, 300msec
Minimum voltage between terminals during ON		10.8V
Maximum voltage between terminals during OFF		3.6V
Common configuration	Number of commons	1
	Number of input points per common	16-point
	Common polarity	Based on power supply connection polarity
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Based on transmission state
Applicable base unit		BU902A
Current consumption		Internal: 24VDC-40mA or less
Internal heat generated		Approx. 5W
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between external and internal circuits) 500VAC, 1 minute when installed to BU905
Internal protection element		Poly-switch (external power supply input part)
Outside dimensions (mm)		35W × 185H × 95D
Weight		200g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 20 IN956 specifications

Item		Specification
Pet name		IN956
Input type		Shared with sink/source
Number of input points		16-point (each point insulated)
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		100/120VAC/DC + 10%/ - 15%
Rated input current		15mA (at 100VAC) 2.3mA (at 110VDC)
Input operating voltage	Minimum ON voltage	80VAC/DC
	Maximum OFF voltage	20VAC/DC
Input response time	OFF→ON	20ms or less (AC), 10ms or less (DC)
	ON→OFF	50ms or more
Common configuration	Number of commons	16 (each point insulated)
	Common polarity	Nonpolar
Input signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Based on transmission state
Applicable base unit		BU906A
Derating condition		Number of simultaneous ON points is restricted (See the figure below)
Current consumption		Internal: 24VDC-50mA or less
Internal heat generated		Approx. 8W
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit)
Outside dimensions (mm)		35W × 185H × 95D
Weight		400g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 21 IN966 specifications

Item		Specification
Pet name		IN966
Input class		AC input
Number of input points		16-point (each point insulation)
Insulation type		Photo-coupler insulation
Rated input voltage (external supply)		200 to 240VAC
Input voltage variable range		170 to 264VAC
No. of input power voltage frequency		50/60Hz(47 to 63Hz)
Rated input current		10mA (200VAC, for 50Hz)
Input impedance		22kΩ (50Hz), 18kΩ (60Hz)
Input operation voltage	Minimum ON voltage	140VAC
	Maximum OFF voltage	50VAC
Input response time	OFF→ON	15ms or less
	ON→OFF	15ms or less
Module state display		Green LED: RUN, input, illuminating when ON, Red LED: ALM
External connection		36P fixed type M3.5 screw terminal base (BU906A)
Common configuration	Number of commons	16 (each point insulated)
	Number of input points per common	1-point
Derating condition		None
Power supply voltage (internal 24V)		24VDC＋10%, -15%
Current consumption (internal 24V)		24VDC-50mA or less
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external and internal circuits)
Outside dimensions (mm)		35W × 185H × 95D
Weight		230g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 22 AC963 specifications

Item		Specification
Pet name		AC963
Output class		Triac output
Number of output points		16-point, 1-word output
Insulation type		Photo-coupler insulation
Rated load voltage		100 to 240VAC (50Hz/60Hz)
Load voltage variable range		24 to 264VAC (47 to 63Hz)
Maximum load current		2A/point
Saturation voltage during ON		1.5V or less
Leak current during OFF		1mA or less (100VAC, 50Hz), 2.4mA or less (AC200V, 50Hz)
Minimum switching current		100mA(24VAC), 50mA(100 to 240VAC)
Maximum rush current		20A/20ms (1-pooint), 40A/20ms (1common)
Output response time	OFF→ON	1ms or less
	ON→OFF	1ms-1/2 cycle or less
Output signal display		Green LED: illuminating when output ON
Module state display		RUN display (green), ALM display (red)
External connection		36P fixed type M3.5 screw terminal base (BU906A)
Common configuration		2 point/common (however, 1 point each for external common wiring)
Derating condition		Ambient temperature 0 to 40°C: Grand total 10A or less Ambient temperature 40°C to 55°C: Grand total 8A or less
Power supply voltage		24VDC＋10%, -15%
Current consumption		24VDC-80mA or less
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external and internal circuits)
24V power supply fuse		Available
Surge elimination circuit		CR snubber circuit, varistor
Outside dimensions (mm)		35W × 185H × 95D
Weight		360g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 23 DO934 specifications

Item		Specification
Pet name		DO934
Output type		Sink output
Number of output points		32-point
Insulation type		Photo-coupler insulation
Rated load voltage		12 to 24VDC + 10%/ - 15%
Maximum load current		100mA/point
Operating voltage	Output ON voltage	0.4V or less
	Leak current during OFF	0.1mA or less (at 24VDC)
Response time	OFF→ON	1ms or less
	ON→OFF	1ms or less
Common configuration	Number of commons	2 (insulation between systems)
	Number of output points per common	16-point /common
	Common polarity	Negative
Output setting for transmission interruption		Output hold/output OFF can be selected
Output signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Transmission state, blown fuse, external power supply error
External connection		BU902A, BU905
Current consumption		Internal: 24VDC-60mA or less
Internal heat generated		Approx. 3W
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit) 500VAC, 1 minute when installed to BU905
Built-in fuse		2A × 2
Surge removal circuit		Diode
Outside dimensions (mm)		35W × 185H × 95D
Weight		200g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 24 DO935 specifications

Item		Specification
Pet name		DO935
Output type		sink output
Number of output points		64-point
Insulation type		Photo-coupler insulation
Rated load voltage		24VDC + 10%/ - 15%
Maximum load current		50mA/point
Operating voltage	Output ON voltage	0.4V or less
	Leak current during OFF	0.1mA or less (at 24VDC)
Response time	OFF→ON	1ms or less
	ON→OFF	1ms or less
Common configuration	Number of commons	4 (insulation between systems)
	Number of output points per common	16-point /common
	Common polarity	Negative
Output setting for transmission interruption		Output hold/output OFF can be selected
Output signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Transmission state, external power supply error
Applicable base unit		BU905
Current consumption		Internal: 24VDC-100mA or less
Internal heat generated		Approx. 4W
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		500VAC, 1 minute (between systems, between external circuit and internal circuit)
Built-in fuse		2A × 4
Surge removal circuit		Diode
Outside dimensions (mm)		35W × 185H × 95D
Weight		400g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 25 DO936 specifications

Item		Specification
Pet name		DO936
Output class		FET output
Output type		Sink output
Number of output points		16-point
Insulation type		Transformer insulation
Rated load voltage		12 to 24VDC
Load voltage variable range		10 to 30VDC
Maximum load current		2A/point
saturation voltage during ON		1.5V or less
Leak current during OFF		0.1mA or less (at 24VDC)
Output response time	OFF→ON	1ms or less
	ON→OFF	1ms or less
Output signal display		Green LED: illuminating when output ON
Module state display		RUN display (green), ALM display (red)
External connection		36P fixed type M3.5 screw terminal base (BU906A)
Common configuration		Each point common
Derating condition		None
Power supply voltage (internal 24V)		24VDC+10%, -15%
Current consumption (internal 24V)		24VDC-90mA or less
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between external and internal circuits) 500VAC, 1 minute (between systems)
DO internal fuse		Not available (protection fuse is installed on outside)
Surge elimination circuit		Diode
Outside dimensions (mm)		35W × 185H × 95D
Weight		210g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 26 RO966 specifications

Item		Specification
Pet name		RO966
Output type		Relay output with a contact
Number of output points		16-point (each point independent)
Insulation type		Photo-coupler insulation
Rated load voltage		100 to 240VAC, 24VDC
Maximum load current		2A/point
Contact ON resistance		50 MΩor less (initial value)
Leak current during OFF		None
Minimum open/close voltage current		5VDC, 10mA
Response time	OFF→ON	10ms or less
	ON→OFF	10ms or less
Output signal display		For each point: LED display, illuminating when ON, logic side
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Transmission state, external power supply error
Applicable base unit		BU906A
Current consumption		Internal: 24VDC-50mA or less
Relay driving power supply (external)		Rated voltage: 24VDC (21.6 to 26.4VDC) Rated current: 145mA (when all points ON)
Internal heat generated		Approx. 4W
Mechanical life		2 million times or more
Built-in fuse		None
Insulating resistance		10MΩ or more (500VDC megger)
Withstand voltage		1500VAC, 1 minute (between systems, between external circuit and internal circuit)
Outside dimensions (mm)		35W × 185H × 95D
Weight		400g or less
Installation		Vertical and horizontal installation (external line is downside)

(Note) The overload protection fuse is attached externally.

Table 27 AI914 specifications

Item	Specification
Pet name	AI914
Number of input channels	4ch(insulation between channels)
Input signal	0-5V
Conversion cycle	1msec or less/4 channels
A/D conversion resolution	0-16000 counts (0-5V)
Reference accuracy	±0.1%/within full scale
Temperature drift	100ppm/ºC or less
Input impedance	1MΩ or more (within specified input range)(2kΩ or more for reverse polarity connection)
Input disconnection characteristic	Down scale
Maximum input level	-15 to +24V
Input filter time constant	CR filter: Approx. 2ms
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU
Current consumption	Internal: 24VDC-70mA or less
Internal heat generated	1.5W or less
Insulating resistance	10MΩ or more (500VDC megger)(between insulations)
Withstand voltage	500VAC, 1 minute (between insulations) 1500VAC or more for each insulating part
Applicable base unit	BU903A
Outside dimensions (mm)	35W × 185H × 95D
Weight	200g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 28 AI918 specifications

Item	Specification
Pet name	AI918
Input class	Voltage input
Number of input channels	8CH
Insulation type	Insulation between each channel
Input signal	0 to 5V
Input impedance	500kΩor more
Conversion cycle	10ms/8 channel
A/D conversion resolution	0 to 64000 counts (0 to 5V) (14 bits resolution)
Reference input accuracy	±0.1%/Within the full scale
Temperature drift	±0.1%/10°C
Power supply variable	±0.1%/24VDC±10%
Allowable maximum input level	Within ±24V
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU
24VDC power supply voltage	24VDC + 10%, -15%
24VDC current consumption	50mA or less
Insulating resistance	10MΩ or more (500MVDC megger) (between insulations)
Withstand voltage	500VAC, 1 minute (between insulations)
External connection	36P fixed type M3.5 screw terminal base (BU903A)
Outside dimensions (mm)	35W × 185H × 95D
Weight	240g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 29 AI919 specifications

Item	Specification
Pet name	AI919
Number of input channels	16ch (batch insulation, common throughout side N)
Input signal	0 to 5V
Conversion cycle	50msec or less/16 channels
A/D conversion resolution	0 to 64000 counts (0-5V), 14 bits resolution
Reference input accuracy	±0.1%/Within the full scale
Temperature drift	100ppm/ºC or less
Input impedance	1MΩ or more
Input disconnection characteristic	Downscale
Input filter time constant	CR filter: Approx. 10ms
Maximum input level	±30V
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU
Current consumption	Internal: 24VDC-70mA or less
Internal heat generated	1.5W or less
Insulating resistance	10MΩ or more (500MVDC megger) (between insulations)
Withstand voltage	500VAC, 1 minute (between insulations)
External connection	BU903A (end terminal resistance TR929: 0-20mA can be selected for input by installation)
Outside dimensions (mm)	35W × 185H × 95D
Weight	200g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 30 AI928 specifications

Item	Specification
Pet name	AI928
Input class	Power supply input
Number of input channels	8CH
Insulation type	Transformer insulation between each channel
Input signal	0 to 20mA
Input impedance	250Ω
Conversion cycle	0.5ms/8 channel
A/D conversion resolution	0 to 64000 counts (0-20mA) (14 bits resolution)
Reference input accuracy	±0.2%/Within the full scale (target±0.1%)
Temperature drift	±0.1%/(10℃)
Power supply variable	±0.1%/(24VDC±10%)
Allowable maximum input level	30mA
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU
Power supply voltage (internal 24V)	24VDC+10%, -15%
Current consumption (internal 24V)	24VDC – 50mA or less
Insulating resistance	10MΩ or more (500MVDC megger) (between insulations)
Withstand voltage	500VAC, 1 minute (between insulations)
External connection	36P fixed type M3.5 screw terminal base (BU902A)
Outside dimensions (mm)	35W × 185H × 95D
Weight	240g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 31 AI929D specifications

Item	Specification
Pet name	AI929D
Number of input channels	16ch (batch insulation, common throughout side N)
Input signal	0-20mA
Conversion cycle	50msec or less/16 channels
A/D conversion resolution	0 to 64000 counts (0-20mA), 14bit resolution
Reference input accuracy	±0.1%/within full scale
Temperature drift	100ppm/ºC or less
Distributor	External 24VDC (±10%) to be distributed to channels after input (built-in overcurrent protection) Internal voltage drop: 3V or less, internal current consumption: 15mA or less
Input impedance	250Ω
Input disconnection characteristic	Downscale
Input filter time constant	CR filter · Approx. 10ms

Item	Specification
Maximum input level	21mA
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU, external power disconnection
Current consumption	Internal: 24VDC-70mA or less
Internal heat generated	3.2W or less
Insulating resistance	10MΩ or more (500MVDC meggar between insulations)
Withstand voltage	500VAC, 1 minute (between insulations)
Built-in circuit protection element	Poly-switch (24VDC external input)
Applicable base unit	BU902A
Outside dimensions (mm)	35W × 180H × 95D
Weight	400g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 32 AI959B specifications

Item		Specification
Pet name		AI959B
Number of input points		16 points
Input signal		1-5 VDC (signal conditioner output voltage)
Applicable signal conditioner		CISO5, CISO6, CISO7, CDIS7, CTC**, CRTD*, CPIN1, CPOT1, CPTI1, CCTI1
Applicable terminal block unit		UTBA7
Unit of input isolation	Module (alone)	All points isolated
	System	All points isolated by the use of signal conditioner
Internal logic - analog input isolation		No isolation
Analog input conversion resolution		16 bits
Data format		12,800-64,000 counts/1-5 V (0-100%) Minimum count: 0 Maximum count: 65,535
Data update cycle		25 ms/16 points
Reference input accuracy	AI959B	±0.1%/FS @ 25 ºC /+24 V
	System	Above-described module input accuracy added with signal conditioner accuracy
Over-range input accuracy		±3% /(0-65,535) max.
CMRR		100 db or higher (50 Hz/60 Hz) (combined with signal conditioner)
Temperature drift		±0.015% FS/ ºC max. (standard: 25 ºC)
Supply voltage drift		±0.1%/FS max.
Input disconnection characteristic		Downscale (without signal conditioner) (Set according to the signal conditioner specifications when the input signal is disconnected.)

Item		Specification
Input disconnection detection time		10 sec or less (during the time period until the sensor error H or L alarm is generated upon input signal disconnection)
Redundant configuration		Not applicable
Online attachment/detachment		OK (by the operation of the hot swap setting switch)
Fault diagnosis		Analog reference voltage, CPU, memory, power supply error, transmission status
Module status display		RUN display (green), ALM display (red), STAND-BY (green)
Power supply	Supply method	From UTBA7 via connector
	Supply voltage (system power supply)	+24 VDC +10%/-15%
	Allowable ripple	1% p-p (max.)
	Current consumption (system power supply)	+24 VDC; 120 mA or lower
	Maximum allowable voltage	+30 VDC
	Inrush current	5 A (max.)
	CPU reset voltage	+3.0 VDC (built-in supply voltage)
	Allowable instantaneous power failure	Continuous operation if 1 ms or less at +24 V
	Built-in circuit protection element	Fuse
Insulating resistance		100 MΩ or higher (500 DCV megger) (between FG and internal circuit)
Withstand voltage		500 VAC, 1 min (between FG and internal circuit)
Outside dimensions (mm)		40W×90H×95D (without protrusions)
Weight		400g

Table 33 AI969 specifications

Item	Specification
Pet name	AI969
Number of input channels	16ch (insulation between channels)
Input signal	mV/V input -5 to +5V, -1 to +1V, -100 to +100mV, -50 to +50mV, -20 to +20mV, -10 to +10mV Each channel can be set independently
Conversion cycle	0.8s/16 channels or less
A/D conversion resolution	0 to 32000 (with negative values, sign+15bit format)
Reference input accuracy Temperature drift	5V range: ±0.1%F.S.
	1V range: ±0.1%F.S.
	100mV range: ±0.12%F.S.
	50mV range: ±0.12%F.S.
	20mV range: ±0.15%F.S.
	10mV range: ±0.15%F.S.
CMRR	100dB or more (100VAC-50/60Hz)
Input impedance	1MΩ or more
Input disconnection characteristic	Downscale Burnout function: Converges within 0 to ±640 counts at 5V range (within ±2%F.S.)(within 10sec after disconnection)
A/D conversion correction processing	Zero, gain correction by microcomputer
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	A/D conversion operation, transmission, CPU
Current consumption	Internal: 24VDC-150mA or less
Internal heat generated	2.4W or less
Allowable short interruption	Continuous operation for 1ms or less
Insulating resistance	10MΩ or more (500VDC) (between all input lines and system, between all input lines and FG, between system and FG, between input channels)
Withstand voltage	500VAC/1 minute (between all input lines and system, between all input lines and FG, between system and FG) AC175V/1 minute (between input channels)
Applicable base unit	BU929F
Outside dimensions (mm)	35W×185H×95D
Weight	250g or less

Table 34 TC919 specifications

Item		Specification
Pet name		TC919
Number of input channels		16ch (insulation between channels)
Input signal		Thermocouple : B, R, S, J, K, T, E; each point can be set independently
Conversion cycle		0.8s/16 channels or less
A/D conversion resolution		0 to 32000(32767)
Reference input accuracy	B	600 to 1700ºC(±0.13%)
	R	0 to 1000ºC(±0.18%), 0 to 1600ºC(±0.2%), 800 to 1600ºC(±0.12%)
	S	0 to 1000ºC(±0.14%), 0 to 1600ºC(±0.17%), 800 to 1600ºC(±0.14%)
	J	0 to 200ºC(±0.12%), 0 to 400ºC(±0.1%), 0 to 600ºC(±0.1%), 300 to 600ºC(±0.1%)
	K	0 to 300ºC(±0.12%), 0 to 600ºC(±0.1%), 0 to 1200ºC(±0.1%), 600 to 1200ºC(±0.1%), -50 to 100ºC(±0.2%)
	T	0 to 300ºC (±0.1%), -50 to 100ºC(±0.2%)
	E	0 to 200ºC(±0.1%), 0 to 400ºC(±0.1%), 0 to 600ºC(±0.1%), 0 to 800ºC(±0.1%), -50 to 100ºC(±0.2%)
Cold junction compensation accuracy		Within ±1ºC
Temperature drift		±0.015%/ºC
Input impedance		1MΩ or more
Input disconnection characteristic		Upscale/downscale can be selected
Input disconnection detection time		Within 1 second
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		A/D conversion operation, transmission, CPU
Current consumption		Internal: 24VDC-100mA or less
Internal heat generated		2.4W or less
Insulating resistance		10MΩ or more (between channels, external and internal, analog and external power supply)
Withstand voltage		500VAC, 1 minute (between external and internal, analog and external power supply) 175VAC, 1 minute (between channels)
Applicable base unit		BU904A
Outside dimensions (mm)		35W × 185H × 95D
Weight		350g or less
Installation		Vertical installation only, no horizontal installation

Table 35 RT918C specifications

Item		Specification
Pet name		RT918C
Number of input channels		8ch (non-insulated between channels)
Input signal		3-wire RTD (resistance-temperature detector：Pt100, JPt100); each point can be set independently
Conversion cycle		0.8s/8 channels or less
A/D conversion resolution		0 to 32000 (with negative values, sign + 15bit format)
Reference input accuracy (Range: 0-100%)	Pt100	0 to 150ºC (±0.1%), 0 to 300ºC (±0.1%), 0 to 500ºC (±0.1%), -50 to 100ºC (±0.1%), -150 to 50ºC (±0.1%)
	JPt100	0 to 150ºC (±0.1%), 0 to 300ºC (±0.1%), 0 to 500ºC (±0.1%), -50 to 100ºC (±0.1%), -150 to 50ºC (±0.1%)
Temperature drift		±0.015%/ºC
Sensor current		Approx. 1mA
Input disconnection characteristic		Upscale (factory setting)
Input disconnection detection time		Within 2 seconds (within 6 seconds upon B line disconnection)
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Power voltage low, A/D conversion operation, transmission, CPU
Current consumption		Internal: 24VDC-80mA or less
Internal heat generated		2W or less
Withstand voltage		500VAC, 1 min (between external and internal circuits, between analog and external power supply)
Applicable base unit		BU902A
Outside dimensions (mm)		35W × 185H × 95D
Weight		250g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 36 RT918 specifications

Item		Specification
Pet name		RT918
Number of input channels		8ch (non-insulated between channels)
Input signal		3-wire RTD (resistance-temperature detector ： Pt100, JPt100); each point can be set independently
Conversion cycle		0.8s/8 channels or less
A/D conversion resolution		0 to 32000 (with negative values, sign + 15bit format)
Reference input accuracy (Range: 0-100%)	Pt100	0 to 150ºC (±0.1%), 0 to 300ºC (±0.1%), 0 to 500ºC (±0.1%), -50 to 100ºC (±0.1%), -150 to 50ºC (±0.1%)
	JPt100	0 to 150ºC (±0.1%), 0 to 300ºC (±0.1%), 0 to 500ºC (±0.1%), -50 to 100ºC (±0.1%), -150 to 50ºC (±0.1%)
Temperature drift		±0.015%/ºC
Sensor current		Approx. 1mA
Input disconnection characteristic		Upscale (factory setting)
Input disconnection detection time		Within 2 seconds (within 6 seconds upon B line disconnection)
Module state display		RUN display (green), ALM display (red)
Fault diagnosis		Power voltage low, A/D conversion operation, transmission, CPU
Current consumption		Internal: 24VDC to 120mA or less
Internal heat generated		2.4W or less
Insulating resistance		10MΩ or more (between external and internal circuits, between analog and external power supply)
Withstand voltage		500VAC, 1 min (between external and internal circuits, between analog and external power supply)
Applicable base unit		BU902A
Outside dimensions (mm)		35W × 185H × 95D
Weight		250g or less
Installation		Vertical and horizontal installation (external line is downside)

Table 37 AO928/AO928F specifications

Item	Specification
Pet name	AO928/AO928F
Number of output channels	8ch (insulation between channels)
Output signal	0 to 20mA
Output load range	0-600Ω, L load 10H or less
D/A conversion resolution	0-64000 counts→0-20mA (AO928 has 14bit resolution; AO928F has 16bit resolution)
Reference output accuracy	±0.1%/within full scale (1% or less output: ±0.5%/full scale)
Load fluctuation	Within ±0.05%(with respect to 250Ω)
Temperature drift	±0.01%/ºC or less
Output ripple	±0.1%/within full scale (10KHz or less)
D/A conversion cycle	1ms or less/8 channels
Output response delay time	Output of 90% established within 0.4ms after data write (resistance load)
Output setting for transmission interruption	Output hold/output OFF can be selected
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	Output signal read-back, power voltage low, transmission, CPU
Current consumption	Internal: 24VDC-70mA or less, External: 24VDC-220mA or less
Internal heat generated	5W or less
Built-in circuit protection element	Poly-switch (24VDC external power supply)
Insulating resistance	10MΩ or more (between insulations)
Withstand voltage	500VAC, 1 minute (between insulations)
Applicable base unit	BU903A
Outside dimensions (mm)	35W × 185H × 95D
Weight	400g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 38 AO929 specifications

Item	Specification
Pet name	AO929
Number of output channels	16ch (non-insulation between channels: common with N side)
Output signal	0 to 20mA
Output load range	0 to 600Ω, L load 10H or less
D/A conversion resolution	0-64000 counts→ 0-20mA (14bit resolution)
Reference output accuracy	±0.125%/within full scale
Load fluctuation	Within ±0.05% (with respect to 250Ω)
Temperature drift	±0.01%/ºC or less
Output ripple	±0.1%/within full scale (10KHz or less)
Conversion cycle	20ms or less/16 channels
Output setting for transmission interruption	Output hold/output OFF can be selected
Module state display	RUN display (green), ALM display (red), HOLD display (green)
Fault diagnosis	Power voltage low, transmission, CPU
Current consumption	Internal: 24VDC-60mA or less, External: 24VDC-350mA or less
Internal heat generated	9W or less
Built-in circuit protection element	Poly-switch (24VDC external power supply)
Insulating resistance	10MΩ or more (external and internal)
Withstand voltage	500VAC, 1 minute (external and internal)
Applicable base unit	BU902A
Outside dimensions (mm)	35W × 180H × 95D
Weight	400g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 39 AO969B specifications

Item		Specification
Pet name		AO969B
Number of input points		16 points
Input signal		0.4-2 VDC (converted into 4-20 mA DC signal by signal conditioner)
Applicable signal conditioner		CISO8
Applicable terminal block unit		UTBA8
Unit of input isolation	Module (alone)	All points non-isolated
	System	All points isolated by the use of signal conditioner
Internal logic - analog input isolation		No isolation
Analog output conversion resolution		2.0475 V/20.475 mA/655,355 counts (0.4 V/4 mA/12,800 counts, 2.0 V/20 mA/64,000 counts)
Data format		16 bits (128,000-64,000 counts/0.4-2.0 V)
Data update cycle		25 ms/16 points
Reference input accuracy	AO969B	±0.1%/FS @ 25℃/+24 V
	System	Above-described module input accuracy added with signal conditioner accuracy
Over-range output accuracy		±0.5% (0-65,535) max.
Temperature drift		±0.01% FS/ºC max. (with respect to the reference value: 25ºC)
Supply voltage drift		±0.1%/FS max.
Redundant configuration		Not applicable
Online attachment/detachment		OK (by the operation of the hot swap setting switch)
Fault diagnosis		Analog output read-back*1, output disconnection detection*2, transmission bus, CPU, memory, power supply error *1 Diagnoses the voltage from AO969B. *2 Diagnosed by CISO8

Item		Specification
Output designation upon error		CPU error, memory error, transmission bus error (reception disabled for a predetermined time period) HOLD designation (output hold), RESET designation (output at all points OFF) * Upon the detection of read-back error or output disconnection, the output hold operation is carried out irrespective of the HOLD or RESET designation.
Module status display		RUN display (green), ALM display (red), STAND-BY (green)
Power supply	Supply method	From UTBA8 via connector
	Supply voltage (system power supply)	+24 VDC +10%/-15%
	Allowable ripple	1% p-p (max.)
	Current consumption (system power supply)	+24 VDC 150 mA or lower
	Maximum allowable voltage	+30 VDC
	Inrush current	5 A (max.)
	CPU reset voltage	+3.0 VDC (built-in supply voltage)
	Allowable instantaneous power failure	+24 V 1 ms (min.)
	Built-in circuit protection element	Fuse
Insulating resistance		100 MΩ or higher (500 VDC megger) (between FG and internal circuit)
Withstand voltage		500 VAC 1 min (between FG and internal circuit)
Outside dimensions (mm)		40W × 90H × 95D (without protrusions)
Weight		400g

Table 40 PI918 specifications

Item	Specification
Pet name	PI918
Number of input channels	1 phrase 8ch (insulation, with gate input)
Input signal	12-24V voltage pulse (9.6 to 26.4V)
Counter	15bit up counter
Input current	8-12mA (12 to 24V)
Range of number of input frequency	Low speed (contact): DC to 50Hz High speed (semiconductor): DC to 50KHz
Minimum pulse width	Low speed: 9ms (ON/OFF) High speed: 9μs （ON/OFF）
Pulse threshold level	4-8V (between input terminals)
Common setting (parameter)	(1) Input filter low speed: DC to 50Hz/High speed: DC to 50kHz (2) Internal reference pulse 100Hz, 1kHz, 10kHz, 50kHz (3) Speed (frequency) measurement period 0.1s, 0.2s, 0.5s, 1s (4) Prohibition/Permission of external gate control
Setting for each channel (parameter)	Soft gate control, comparison function, number of frequency counter, pulse width measurement, master/slave counter, internal/external selection within pulse.
Module state display	RUN display (green), ALM display (red), external input display (green)
Fault diagnosis	Transmission
Current consumption	Internal: 24VDC-100mA or less
Internal heat generated	7W or less
Insulating resistance	10MΩ or more (between external circuit and internal circuit)
Withstand voltage	500VAC, 1 minute (between external circuit and internal circuit)
Applicable base unit	BU902A
Outside dimensions (mm)	35W × 185H × 95D
Weight	200g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 41 PI924 specifications

Item	Specification
Pet name	PI924
Number of input channels	2 phrase 4ch, with gate input (each insulation)
Input signal	12-24V pulse (9.6 to 26.4V)
Counter	16bit (-32768 to +32767) up/down counter (A phase leading up, B phase leading down)
Input current	8-12mA (input voltage 12-24V)
Range of number of input frequency	DC to 50KHz
Minimum pulse width	6μs (ON/OFF)
Pulse threshold level	4- 8V (between input terminals)
Common setting (parameter)	(1) internal reference pulse 100Hz,1kHz,10kHz,50kHz (2) Prohibition/Permission of external gate control
Setting for each channel (parameter)	Alarm function, hold function, duty function, internal/external selection within pulse.
Module state display	RUN display (green), ALM display (red), external input display (green)
Fault diagnosis	Transmission
Current consumption	Internal: 24VDC-100mA or less
Internal heat generated	6W or less
Insulating resistance	10MΩ or more (between external circuit and internal circuit)
Withstand voltage	500VAC, 1 minute (between external circuit and internal circuit)
Applicable base unit	BU902A
Outside dimensions (mm)	35W × 185H × 95D
Weight	200g or less
Installation	Vertical and horizontal installation (external line is downside)

Table 42 PI948 specifications

Item	Specification
Pet name	PI948
Number of input channels	8ch (no insulation between channels)
Input signal	No-voltage contact pulse, voltage pulse; each point can be set independently
Counter	16-bit up counter
Input current (no-voltage contact pulse)	7mA (24VDC)
Input resistance (voltage pulse)	During energization: 10kΩ or more
	Not during energization: 10kΩ or more
Input frequency range	No-voltage contact pulse: DC to 50Hz
	Voltage pulse: DC to 10kHz
Rated input voltage	No-voltage contact pulse ON Potential between external power supply voltage (+) to PI(+) ≥ 18V (or 200Ω or less between input terminals) OFF Potential between external power supply voltage (+) to PI(+) ≤ 4V (or 15kΩ or more between input terminals)
	Voltage pulse: 2 to 30Vp-p
DC bias during voltage pulse	1 to 13VDC
Minimum pulse width	No-voltage contact pulse: 10msec (ON/OFF)
	Voltage pulse: 50μseC (ON/OFF)

Item	Specification
Pulse threshold voltage setting	1 to D(13) are set with the setting switches in the module front. The setting numbers correspond to threshold voltages. Example: Setting A=10V Setting 5=5V Setting B=11V for no-voltage pulse
Module state display	RUN display (green), ALM display (red)
Fault diagnosis	Power voltage low, reference input pulse error, external power supply error, transmission, CPU
Current consumption	Internal: 24VDC-100mA or less
External power supply voltage	24VDC +10%/-15%
Allowable short interruption	Continuous operation for 1ms or less
Insulating resistance	10MΩ or more(500VDC) (between all input lines and system, between all input lines and FG, between system and FG)
Withstand voltage	500VAC/1 minute (between all input lines and system, between all input lines and FG, between system and FG)
Applicable base unit	BU929F
Outside dimensions (mm)	35W×185H×95D
Weight	400g or less

●TC-net I/O compound module

Table 43 LP918B specifications

Item		Specification	
Pet name		LP918B	
Input/ output	Analog input (PV)	Input signal	1-5VDC
		Number of points	12 channels (insulation between channels)
		Insulation unit	Insulation between channels (withstand voltage: 175Vac)
		Input resistance	1MΩ or more (during energization/power failure)
		Conversion cycle	150msec/12 channels
		Resolution	16 bits
		Conversion data	12,800 to 64,000/1-5VDC
		Reference input accuracy	±0.1%/F.S.(load resistance 250Ω)
		Temperature drift	100ppm/°C or less
		Allowable input voltage	±10V
		Input disconnection characteristic	Downscale
		CMRR	100dB or more (100VAC,50/60Hz)
	Operation output (MV)	Output signal	4VDC-20mA
		Number of points	8 channels (no insulation between channels)
		Insulation unit	No insulation between channels
		Resolution	12 bits
		Conversion data	12,800 to 64,000 count/4VDC-20mA
		Output response	100msec (0→90%)
		Output load resistance range	0 to 600Ω
		Reference output accuracy	±0.2%/F.S.
		Temperature drift	±0.15%F.S./10°C
		Dedicated external power supply	24VDC±10% (supplied from BU928F TB2)
	Auxiliary input (DI)	Input signal	No-voltage contact
		Number of points	8 channels

Item		Specification	
Input/ output	Auxiliary input (DI)	Insulation unit	No insulation between channels
		Input threshold	On: 200Ω or less Off: 100kΩ or more
		Power voltage	24VDC±10% (supplied from VTBUX3* via dedicated cable) (shared with the external power supply for DO)
	Auxiliary output (DO)	Output signal	FET open drain
		Number of points	8 channels
		Insulation unit	No insulation between channels
		Output current	30VDC or less 0.1A or less (resistance load)
		Power voltage	24VDC±10%(supplied from VTBUX3* via dedicated cable)(shared with the external power supply for DI)
Redundancy		Available	
Module state display		RUN display (green), ALM display (red), STBY display (green)	
Fault diagnosis		Output signal read-back, ADC reference input, redundancy input diagnosis (with SA931), external power supply voltage low, power voltage low, transmission, CPU	
Current consumption		System power supply: 24VDC-150mA or less External power supply for MV: 24VDC-300mA or less External power supply for DIO: 24VDC-150mA or less	
Allowable short interruption		Continuous operation for 1ms or less	
Insulating resistance		10MΩ or more (between external and internal circuits)	
Withstand voltage		500VAC,1 minute (between external and internal circuits)	
Applicable TC-net I/O adaptor		SA931	
Applicable base unit		BU928F	
Outside dimensions (mm)		35W×185H×95D	
Weight		400g or less	

●TC-net I/O special module

Table 44 FL911 specifications

Category	Item	Specification
	Pet name	FL911
Transmission specifications	Applicable standard	IEEE 802.3u 100BASE-TX
	Media access method	CSMA/CD method
	Data transmission speed	10Mbps/100Mbps
	Ethernet frame	DIX format
	Topology	Star
	Transmission path	Single bus
	Transmission cable/cable length	Category 5 Twisted pair cable： Max.100m
	Node count	Up to 254 nodes/system
	Maximum number of FL911 modules installed	Up to 16 modules/controller
	Communication interface	100BASE-TX、10BASE-T(auto switching)
		RJ-45 connector
Functional specifications	Protocol	UDP/IP, FA link protocol
	Transmission method	Cyclic transmission

Category	Item	Specification
Serial specifications	Data transmission speed	Max. 9600bps
	Synchronization method	Asynchronous
	Transmission cable	Cross cable with 9-pin-9-pin D-sub connector
	Cable length	Max. 15m
	Communication method	Half duplex
	Communication setting	Parity bit: None Character length: 8 bits Stop bit: 1 bit
Current consumption		DC24V - 0.5A or less
Grounding		D-class grounding with ground resistance of 100Ω or less (proposed by the Japanese Ministerial Ordinance)
Cooling		Natural air cooling
Applicable base unit		BU901
Outside dimensions (mm)		35W×185H×95D
Weight		250g or less

(Note) Perform a transmission check of transmission data in the application level.

●Signal Conditioner

Table 45 CISO5 specifications

Category	Item	Specification
Pet name		CISO5
Input block specifications	Input signal	mVDC voltage
	Span	DC 5-200 mV Standard range : CISO5-11: 0-10 mV CISO5-21: 0-20 mV CISO5-31: 0-50 mV CISO5-41: 0-100 mV CISO5-51: 0-200 mV Other ranges also available.
	Input resistance	1 MΩor higher (1 MΩor higher upon power failure)
	Allowable input voltage	30 VDC continuous
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	For voltage output: 2 mA
	Minimum output voltage	-0.6 VDC (Typ.)
	Maximum output voltage	+7 VDC (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Burnout	Downscale
Reference performance	Conversion accuracy	Within ±0.1% FS (at 25±5ºC)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10ºC
	Standard response time	Approx. 2 Hz-3 dB
	Input disconnection characteristic	Downscale: during the time period until the output reaches 1 V upon disconnection with 100% input
		Approx. input span (mV) × 0.1 sec or less

Category	Item	Specification
Reference performance	CMRR	100 dB or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated
	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55ºC Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V – 20mA or less
	Storage temperature	-10 to +60ºC
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
	Hot swap	OK
Material	Housing	ABS resin (UL-94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 46 CISO6 specifications

Category	Item	Specification
Pet name		CISO6
Input block specifications	Input signal	DC 4-20 mA Standard range CISO6-11: DC 4-20 mA
	Input resistance	250 Ω
	Internal voltage drop	5 V
	Allowable input voltage	40 mA continuous
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	For voltage output: 2 mA
	Minimum output voltage	-0.6 VDC (Typ.)
	Maximum output voltage	+7 VDC (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Burnout	Downscale
Reference performance	Conversion accuracy	Within ±0.1% of maximum input signal (at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Response speed	80 ms or less (0-90%) @ 100% step input
	Input disconnection characteristic	Downscale: during the time period until the output reaches 1 V upon disconnection with 100% input
		Approx. 60 ms or less
	CMRR	100 db or higher (500 VAC, 50/60 Hz)

Category	Item	Specification
Reference performance	Signal isolation	Input - first output - second output - power supply; isolated
	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply; isolated
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37. 90.1-1989
	Operating environment	Temperature: 0-55℃ Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V – 20mA or less
	Storage temperature	-20 to +75℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated base (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
	Hot swap	OK
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 47 CISO7 specifications

Category	Item	Specification
Pet name		CISO7
Input block specifications	Input signal	1-5 VDC Standard range CISO7-11: 1-5 VDC Other ranges also available.
	Input resistance	1 MΩor higher (1 MΩor higher upon power failure)
	Allowable input voltage	30 VDC continuous
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	2 mA
	Minimum output voltage	-0.6 VDC (Typ.)
	Maximum output voltage	+7 VDC (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Burnout	Downscale
Reference performance	Conversion accuracy	Within ±0.1% of maximum input signal (at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Response speed	80 ms or less (0-90%) @ 100% step input
	Input disconnection characteristic	Downscale: during the time period until the output reaches 1 V upon disconnection with 100% input
		CISO7: Approx. 7 sec or less
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated

Category	Item	Specification
Reference performance	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37. 90.1-1989
	Operating environment	Temperature: 0-55℃ Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V – 20mA or less
	Storage temperature	-20 to +75℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 48 CDIS7 specifications

Category	Item	Specification
Pet name		CDIS7
Input block specifications	Input signal	Standard range of various kinds of 2-wire transmitters at DC 4-20 mA CDIS7-11: DC 4-20 mA
	Input resistance	250 Ω
	Transmitter power supply	Output voltage: EX (V) = 26 - (250 × input current) DC Maximum current: approx. 24 mA (Typ.)
	Transmitter load resistance	550 Ω or lower
	Limit current for short-circuit protection	24 mA (Typ.)
	Allowable short circuit duration	No limit
	Transmitter power supply switch	The power supply can be turned ON/OFF by a slide switch on the front face.
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	2 mA
	Minimum output voltage	-0.6 VDC (Typ.)
	Maximum output voltage	+7 VDC (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
Reference performance	Conversion accuracy	Within ±0.1% of maximum input signal (at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Response speed	80 ms or less (0-90%) @ 100% step input

Category	Item	Specification
Reference performance	Input disconnection characteristic	Downscale: during the time period until the output reaches 1 V upon disconnection with 100% input
		Approx. 60 ms or less
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated
	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55℃; Humidity: 90% RH or lower
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V – 60mA or less
	Storage temperature	-20 to +75℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 49 CTC specifications**

Category	Item	Specification			
Pet name		CTCK2/ CTCJ2/ CTCE2/ CTCR2/ CTCS2/ CTCT2			
Input block specifications	Input signal	JIS thermocouple			
	Span	Standard range	K (CA) type	CTCK2-1*: 0-300ºC	CTCK2-2*: 0-600ºC
				CTCK2-3*: 0-1200ºC	CTCK2-4*: 600-1200ºC
			J (IC) type	CTCJ2-1*: 0-200ºC	CTCJ2-2*: 0-400ºC
				CTCJ2-3*: 0-600ºC	CTCJ2-4*: 300-600ºC
			E (CRC) type	CTCE2-1*: 0-200ºC	CTCE2-2*: 0-400ºC
				CTCE2-3*: 0-600ºC	CTCE2-4*: 0-800ºC
			R type	CTCR2-1*: 0-1000ºC	CTCR2-2*: 0-1600ºC
				CTCR2-3*: 800-1600ºC	
			S type	CTCS2-1*: 0-1000ºC	CTCS2-2*: 0-1600ºC
				CTCS2-3*: 800-1600ºC	
			T type	CTCT2-1*: 0-300ºC	
		1: Input disconnection characteristic: upscale 2: Input disconnection characteristic: downscale Other standard ranges also available. (Thermoelectromotive force should be 3 mV or higher.)			
	Input resistance	1 MΩ or higher (1 MΩor higher @ rated input upon power failure)			
	Allowable signal source resistance	1 kΩ			
	Allowable input voltage	30 VDC continuous			
	Cold junction compensation method	A temperature sensor is mounted on the dedicated terminal block unit (UTBA7).			
	Linearizer	Built-in linearizer (up to 6 segments)			
Output block specifications	Output signal	First output: 1-5 VDC			
		Second output: 1-5 VDC			
	Maximum output current	2 mA			
	Minimum output voltage	0.6 VDC (Typ.)			
	Maximum output voltage	+7 VDC (Typ.)			
	Zero point adjustment range	Approx. ±5% in terms of input (The range can be varied by a trimmer on the panel front face.)			
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face)			
	Burnout	Downscale/ upscale (Refer to the type list)			

Category	Item	Specification
Reference performance	Conversion accuracy	Within ±(0.1% FS + 0.3ºC (temperature sensor accuracy) + linearization accuracy) (at 25±5ºC) *The linearization accuracy may be varied depending on the measurement span. (0.1% FS typ.)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10ºC
	Input disconnection characteristic	Downscale: during the time period until the output reaches 1 V upon disconnection with 100% input
		Approx. input span (mV) × 0.1 sec or less
		Upscale: during the time period until the output reaches 5 V upon disconnection with 0% input
		Approx. input span (mV) × 0.1 sec or less
	Response speed	150 ms or less (0-90%) @ 100% step input
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated
	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55ºC Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V - 25mA or less
	Storage temperature	-20 to +75ºC
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 50 CRTD* specifications

Category	Item	Specification			
Pet name		CRTD4/ CRTD5			
Input block specifications	Input signal	JIS resistance temperature detector			
	Span	Standard range	Pt (JIS '89)	CRTD4-1 1: 0-150ºC	CRTD4-21: 0-300ºC
				CRTD4-3 1: 0-500ºC	CRTD4-41: -50 - +100ºC
				CRTD4-5 1: -150 - +50ºC	
			JPt (JIS '89)	CRTD5-1 1: 0-150ºC	CRTD5-21: 0-300ºC
				CRTD5-3 1: 0-500ºC	CRTD5-41: -50 - +100ºC
				CRTD5-5 1: -150 - +50ºC	
		Other standard ranges also available.			
	Excitation current	Approx. 1 mA			
	Input resistance	1 MΩor higher (10 kΩ or higher upon power failure)			
	Input lead wire resistance	200 Ω or lower per lead wire			
Output block specifications	Output signal	First output: 1-5 VDC			
		Second output: 1-5 VDC			
	Maximum output current	2 mA			
	Minimum output voltage	0.6 VDC (Typ.)			
	Maximum output voltage	+7 VDC (Typ.)			
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)			
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)			
	Burnout	Upscale (in any case of A, B or B')			

Category	Item	Specification
Reference performance	Conversion accuracy	Within ±(0.15% FS + 0.1℃) (at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Input disconnection characteristic	Upscale: during the time period until the output reaches 5 V upon disconnection with 0% input 30 ms or less
	Response speed	150 ms or less (0-90%) @ 100% step input
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated
	Insulating resistance	100 MΩ or higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55℃ Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V - 25mA or less
	Storage temperature	-10 - +60℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
	Hot swap	OK
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 51 CCTI1 specifications

Category	Item	Specification
Pet name		CCTI1
Input block specifications	Input signal	AC signal CCTI1-11: AC 0-1 A CCTI1-21: AC 0-5 A
	Input resistance	CCTI1-11: 5 MΩ CCTI1-21: 25 MΩ
	Allowable input voltage	Continuous: 120% rated input Instant: rated input × 10 (for 3 sec)
	Crest factor	3 or lower
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	2 mA
	Minimum output voltage	+1 VDC (Typ.)
	Maximum output voltage	+7 V (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
Reference performance	Conversion accuracy	Within ±0.25% of maximum input signal (10% or more of span at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Response speed	0.4 sec or less (0-90%) @ 100% step input
	Input disconnection characteristic	Downscale: during the time period until the output reaches 10% upon disconnection with 100% input
		0.6 sec or less
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated

Category	Item	Specification
Reference performance	Insulating resistance	100 MΩ or higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55℃; Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V - 30mA or less
	Storage sigunarliosate mperature	-20 to +75℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7) The shunt resistor supplied with the product should be attached to the terminal block (with fittings A and B).
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 55 g
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 52 CPTI1 specifications

Category	Item	Specification
Pet name		CPTI1
Input block specifications	Input signal	AC signal CPTI1-11: 0-100 VAC CPTI1-21: 0-110 VAC CPTI1-31: 0-150 VAC CPTI1-41: 0-250 VAC
	Input resistance	1 MΩ or higher (upon power failure: 1 MΩ or higher)
	Allowable input voltage	Continuous: 120% rated input Instant: rated input × 1.5 (for 5 sec)
	Crest factor	3 or lower
Output block specifications	Output signal	First output: 1-5 VDC
		Second output: 1-5 VDC
	Maximum output current	2 mA
	Minimum output voltage	+1 VDC (Typ.)
	Maximum output voltage	+7 V (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
Reference performance	Conversion accuracy	Within ±0.25% of maximum input signal (10% or more of span at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Response speed	0.4 sec or less (0-90%) @ 100% step input
	Input disconnection characteristic	Downscale: during the time period until the output reaches 10% upon disconnection with 100% input
		0.6 sec or less
	CMRR	100 db or higher (500 VAC, 50/60 Hz)
	Signal isolation	Input - first output - second output - power supply; isolated

Category	Item	Specification
Reference performance	Insulating resistance	100 MΩor higher (@ 500 VDC) Input - first output - second output - power supply
	Withstand voltage	Input - [first output, second output, power supply]: 1,500 VDC; 1 min First output - second output - power supply: 500 VAC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55℃; Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V - 30mA or less
	Storage temperature	-20 to +75℃
	Applicable module	AI959B (analog input module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA7)
	Wiring method	Wiring on dedicated terminal block unit (UTBA7) The shunt resistor supplied with the product should be attached to the terminal block (with fittings A and B).
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 55 g
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

Table 53 CISO8 specifications

Category	Item	Specification
Pet name		CISO8
Input block specifications	Input signal	0.4-2 VDC CISO8-11
	Input resistance	1 MΩor higher
	Allowable input voltage	30 VDC continuous max.
Output block specifications	Output signal	DC 4-20 mA
	Maximum output load	750 Ω
	Minimum output current	DC 0 mA (Typ.)
	Maximum output current	DC +24 mA (Typ.)
	Zero point adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
	Span adjustment range	Approx. ±2% of span (The range can be varied by a trimmer on the panel front face.)
Reference per formance	Conversion accuracy	±0.125% or less of maximum input signal (at 25±5℃)
	Temperature characteristic	±0.2% or less of span with respect to variation of 10℃
	Standard response time	13 ms or less (0-90%) @ 100% step input
	Input disconnection characteristic	Downscale: during the time period until the output reaches 4 mA upon disconnection with 100% input
		Approx. 1.5 sec or less
	Output disconnection characteristic	Open collector output (maximum rating: 35 V, 4 mA): The transistor is turned ON when the output falls below the detection voltage.
	Detection current	Approx. 2 mA
	Detection voltage time constant	Approx. 1 sec (0-63%)
	CMRR	100 db or higher (500 VAC, 50/60 Hz)

Category	Item	Specification
Reference per formance	Signal isolation	Input - output - power supply; isolated
	Insulating resistance	100 MΩ or higher (@ 500 VDC) Input - output - power supply
	Withstand voltage	Input - power supply : 500 VAC; 1 min Output - [input, power supply]: 1,500 VDC; 1 min
	SWC	Compliant with ANSI/IEEE C37.90.1-1989
	Operating environment	Temperature: 0-55℃ Humidity: 90% RH or lower (no condensation)
	Power supply	24 VDC±10%
	Power supply sensitivity	Within ±0.1% of output value (when variation = 10%)
	Power supply fuse	300-mA fuse
	Power consumption	DC24V - 45mA or less
	Storage temperature	-20 to +75℃
	Applicable module	AO969B (analog output module)
Installation & shape	Installation method	Installation on dedicated terminal block unit (UTBA8)
	Wiring method	Wiring on dedicated terminal block unit (UTBA8)
	Outside dimensions (mm)	W 19.5 × H 53 × D 84
	Weight	Approx. 80 g
	Hot swap	OK
Material	Housing	ABS resin (UL94 5V)
	Board	Double sided glass epoxy board
	Damp proof treatment	HumiSeal coating (polyurethane resin, xylene, ethylbenzene)

■Marshaling Unit Specifications

Table 54 UMAS3C specifications

Item	Specification
Pet name	UMAS3C
Name	Marshaling unit (for VLCPX1/VLCPX2)
Applicable base unit	BU928F
Applicable terminal block unit	VTBUX1, VTBUX5
Terminal block connection connector	CN1, 2: For BU928F connection CN11, 13: For VTBUX1 connection Cn12, 14: For VTBUX5 connection
Applicable cable	Cable for BU928F (3Y8C1573G001)
Outside dimensions (mm)	200W×274H×25D
Weight	1.2kg or less

Table 55 UMAS4C specifications

Item	Specification
Pet name	UMAS4C
Name	Marshaling unit (for VLCPX4)
Applicable base unit	BU928F
Applicable terminal block unit	VTBUX8, VTBUX5
Terminal block connection connector	CN1A, 1 B: For BU928F connection CN11A, 11B: For VTBUX8 connection CN13A, 16A, 13B, 16B: For VTBUX5 connection
Applicable cable	Cable for BU928F (3Y8C1573G001)
Outside dimensions (mm)	200W×274H×25D
Weight	1.2kg or less

■Outside Dimensions

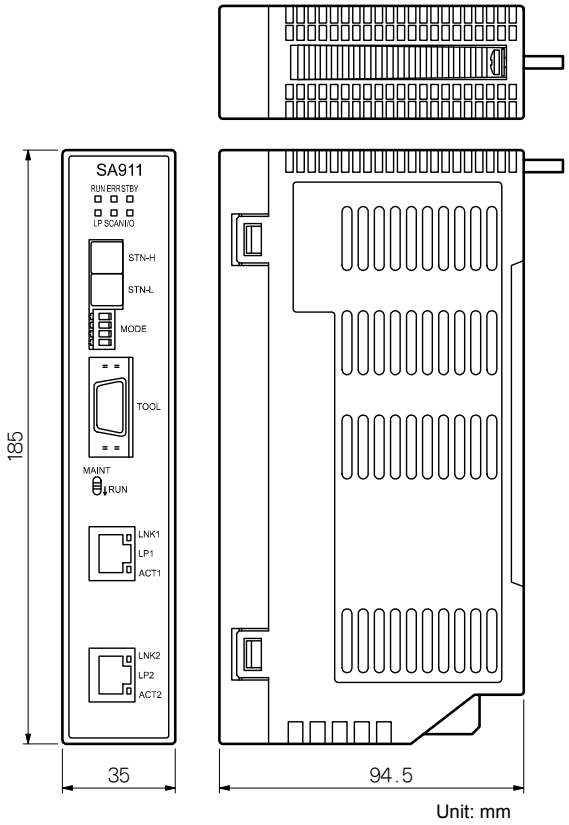


Fig. 5 SA911/ SA931/ SA941 outside dimension

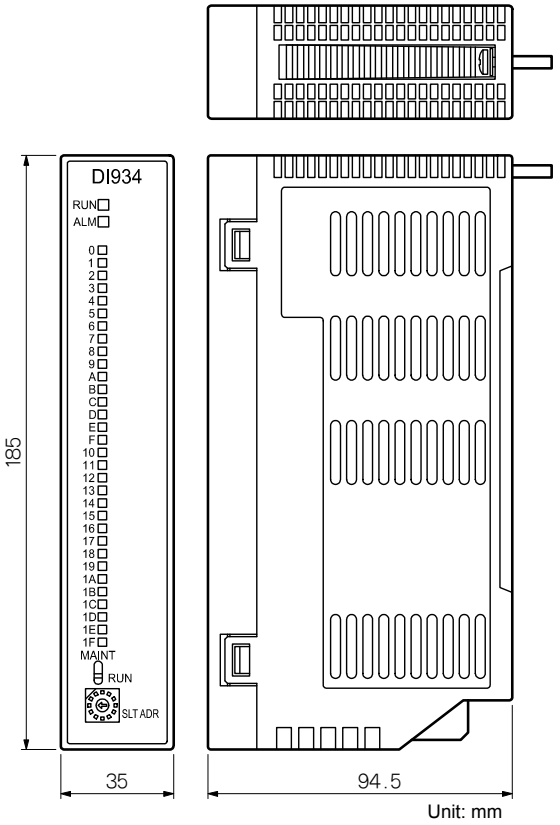


Fig. 7 I/O module outside dimension

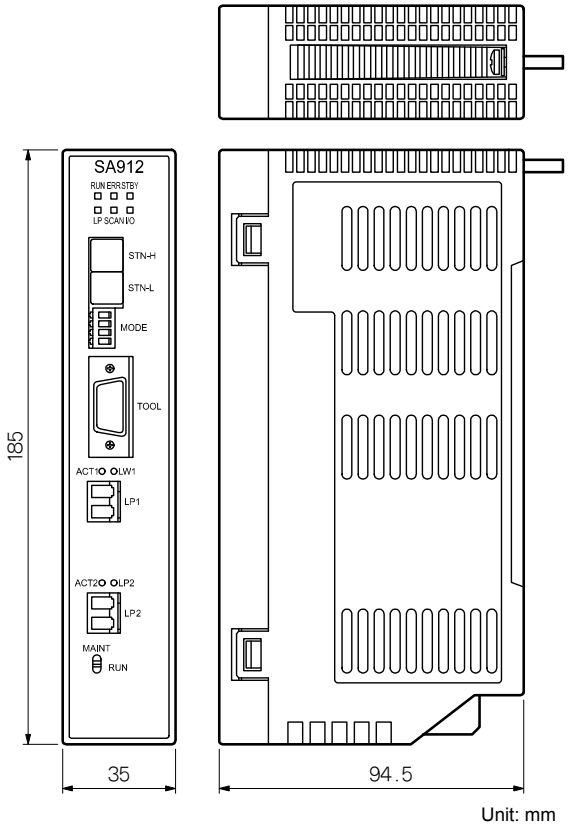


Fig. 6 SA912 outside dimension

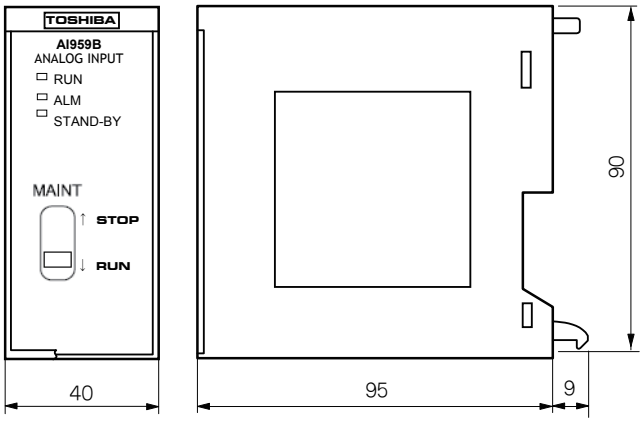


Fig. 8 AI959B outside dimension

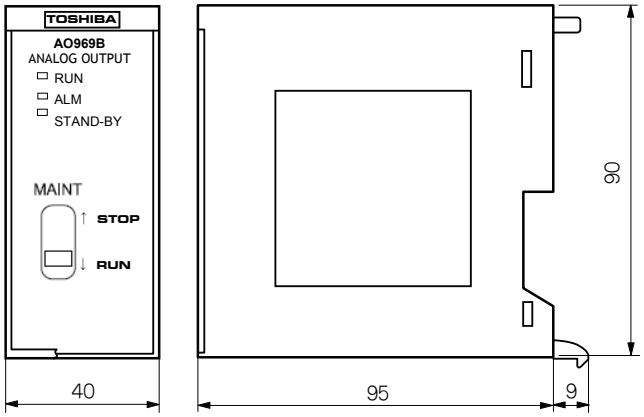


Fig. 9 AO969B outside dimension

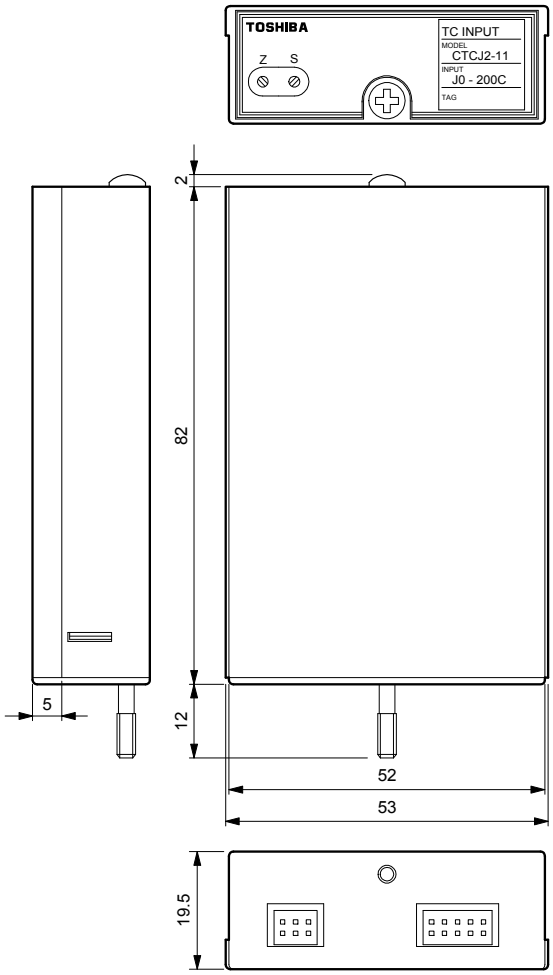


Fig. 11 Signal conditioner outside dimension

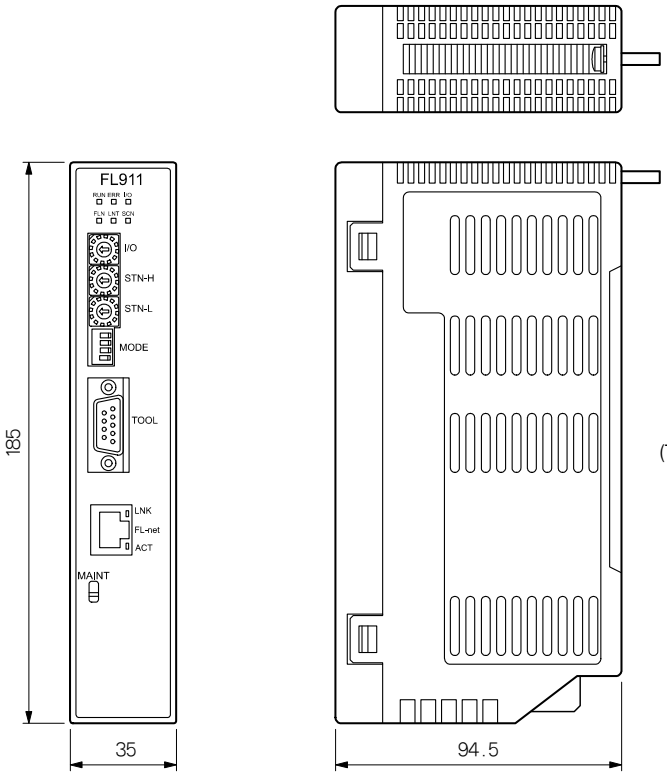


Fig. 10 FL911 outside dimension

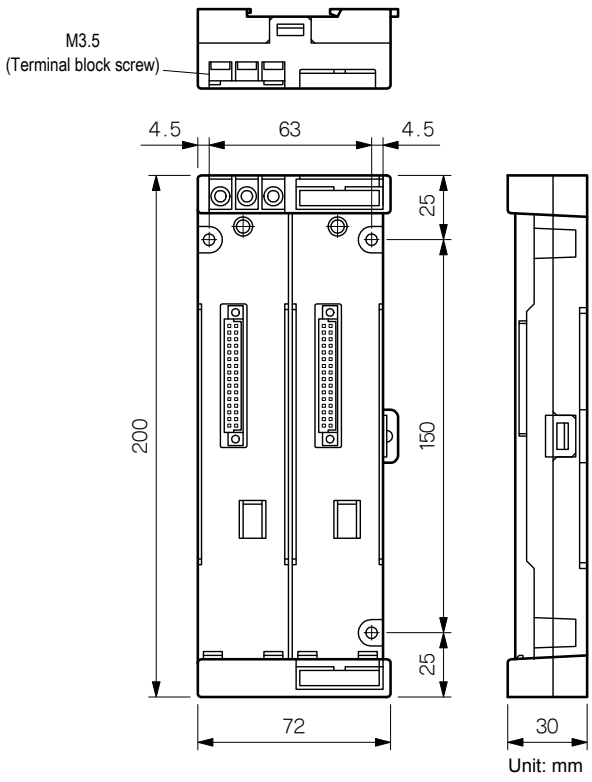
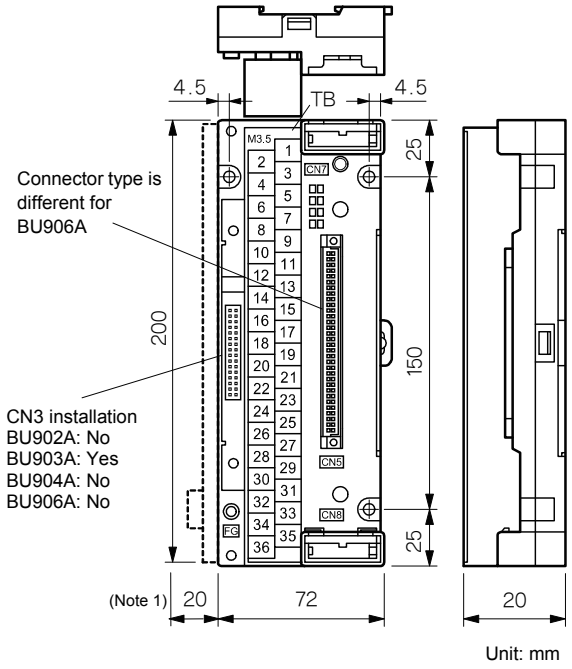


Fig. 12 BU901 outside dimension



(Note 1) The common bar/short bar can be attached to BU902A/903A/904A/906A, however, make sure to secure this wiring space because the maximum of 20mm of wiring terminal will protrude to the left.

Fig. 13 BU902A/903A/904A/906A outside dimension

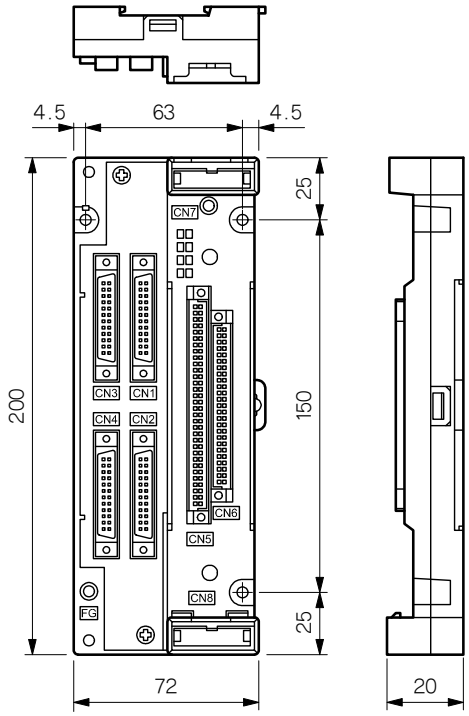


Fig. 14 BU905 outside dimension

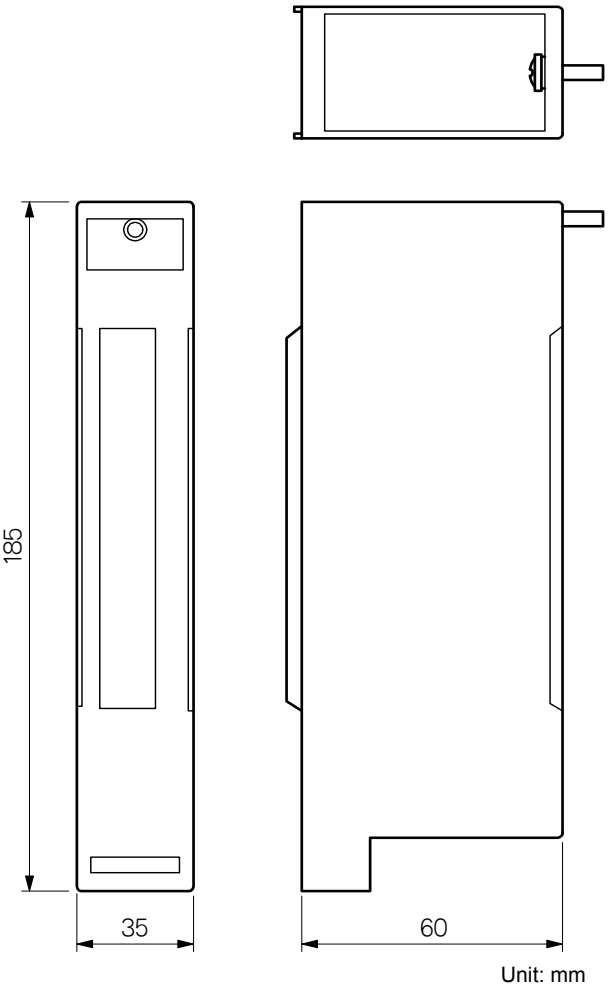


Fig. 15 EX911/EX912 outside dimension

Printed in Japan
©May 2009 (TDOC) 1st edition