

Multi-loop Controller with Multifunction Display

Model C7G

Overview

The C7G multi-loop controller with multifunction display can calculate diagnostic parameters (a health index) that help to predict the failure of connected equipment, in addition to calculations for PID control of process variables such as temperature, pressure, flow rate, pH, and liquid level.

The controller consists of a display unit with a 3.5-inch QVGA LCD touchscreen and a main unit capable of controlling up to four loops with an input sampling cycle of 10 ms and an indication accuracy of ± 0.1 % FS.

The display unit and main unit can be installed separately for installation flexibility and longer service life of the display unit in the case of a harsh environment.

A wide variety of interfaces, including Ethernet, RS-485 serial communication, microSD card, Micro USB port, and 7 digital input/outputs are provided as standard features.

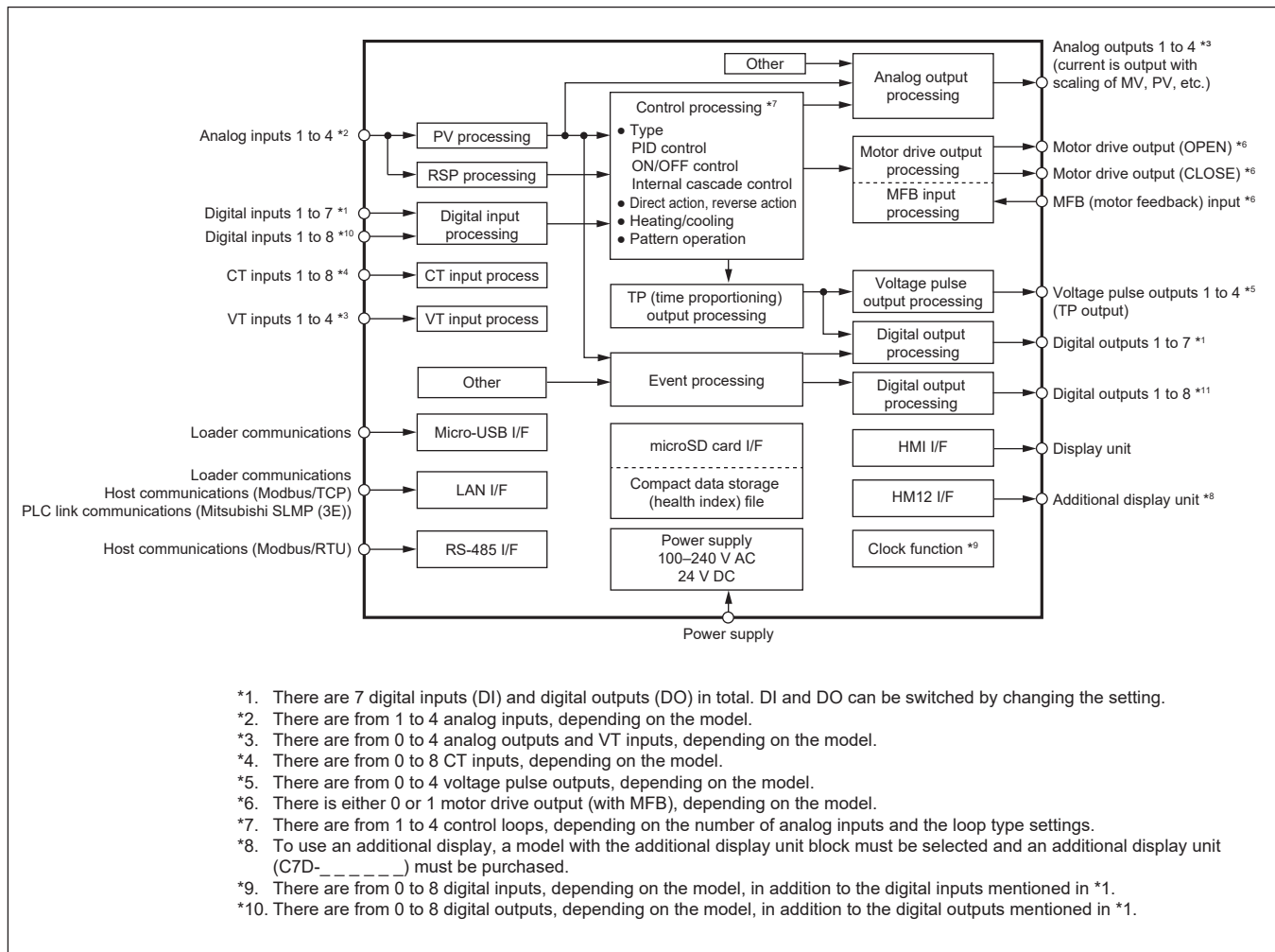
Setup, operation, and monitoring can be easily accomplished using the display unit and Smart Loader Package.



Features

- High-speed and high-accuracy control is available with an input sampling cycle as fast as 10 ms and an indication accuracy of ± 0.1 % FS. Process data can be stored with the compact data storage function (microSD card).
- Diagnostic and management information is created with our unique process data-processing technology (the health index function).
- One module can execute PID control for up to 4 loops.
- Various information is displayed on a 3.5-inch QVGA LCD with easy touchscreen operation.
- The display unit and main unit can be installed separately.
Standard distance: less than 30 m
If display unit is separately powered: 30 to 100 m
- Protective structure of display face: IP67
- Ethernet and RS-485 serial communication (Modbus) is supported as a standard feature.
- For setup and file management the SLP-C7 Smart Loader Package can be used.
- The C7G is powered through a Micro-USB cable, and parameters can be set using the Smart Loader Package even if the controller's power is off.

C7G Basic Functional Blocks



Specifications

Display unit (included) Additional display unit (C7D-_____)		Screen specifications	3.5-inch QVGA LCD
		Status display (LED)	1 (power)
		Operation buttons	Touchscreen (resistive) and 3 hardware buttons
		Power for display unit	Power from main unit if distance from main unit (display unit connector / additional display unit block) to display unit is less than 30 m Power from external power source (5 V DC) if distance from main unit (display unit connector / additional display unit block) to display unit is
		Protection rating	IP67 (front of display unit only)
		Interface language	English/Japanese (switchable)
		Service life of LCD	5 years (at ambient temperature of 25 °C and brightness setting 4, for half-life of back-light brightness)
DI (digital input)/ DO (digital output) block		No. of I/Os	7 max. (select DI, DO, or TP by setting), shared common Note: TP (time proportioning output) can be selected for output Nos. 4 to 7.
Digital input	Compatible output type	Non-voltage contacts or open collector (sink type)	
	Open terminal voltage	7 V max.	
	Terminal current (when shorted)	1 mA (under standard conditions)	
	On-state contact resistance (no-voltage contact)	500 Ω max. (under standard conditions)	
	Off-state contact resistance (no-voltage contact)	100 kΩ max. (under standard conditions)	
	Allowable on-state residual voltage for open collector	1 V max. (under standard conditions)	
	Allowable off-state residual current for open collector	100 μA max. (under standard conditions)	
	Input sampling cycle	10 ms	
	Minimum pulse width for ON detection	20 ms min. (10 ms sampling cycle), 50 ms min. (50 ms sampling cycle), 100 ms min. (100 ms sampling cycle)	
	Function assignment	LSP group selection, PID group selection, PV hold, fixed value output group selection, output linearization table group selection, switching of: RUN/READY*, AUTO/MANUAL*, LSP/RSP*, AT stop/start, control operation forward/reverse, Timer stop/start selection, Release all latches, RUN selection*, READY selection*, AUTO selection*, MANUAL selection*, Constant value operation / Pattern operation mode selection* / pattern operation*; ADVANCE*, HOLD*, G. SOAK cancellation, pattern selection. * indicates edge specification function.	
Digital output	Output method	Open collector (sink type)	
	Load voltage	4.5 to 28.8 V DC	
	Maximum load current	100 mA for each terminal	
	Overcurrent detection	130 mA or more When an overcurrent is detected, output is turned OFF and the status is checked every 5 seconds. If the status returns to normal, the output automatically returns to normal.	
	On-state residual voltage	0.5 V max. (under standard conditions)	
	Off-state leak current	100 μA max. (under standard conditions)	
	Function assignment	Select an event status or a standard bit code	
Time propor- tional output (TP)	Output method	Same as digital output	
	Number of outputs	4 max. (DI/DO terminals 4 to 7)	
	Min. OFF time / ON time	1 ms when time proportional cycle is less than 10 s. 250 ms when time proportional cycle is 10 s or more	

AI block		Input type	Full multi-range for thermocouple, resistance temperature detector (RTD), DC current, and DC voltage
		No. of control loops	4 loops max. (configurable by the loop type setting)
		Range type	☞ Table 1. Input types and ranges (p.10)
		Sampling cycle	10 ms, 50 ms, 100 ms (factory default: 50 ms)
		Burnout	Depends on the input range (☞ Table 1. Input types and ranges (p.10))
		Over-range judgment	Below -10 % or above 110 % of the range
		Decimal point position	0 to 4 digits after the decimal point are displayed. Values are displayed so that the entire value does not exceed 5 digits. (Note: Effective resolution depends on the range.)
	Thermocouple	Reference junction compensation accuracy	±0.5 °C (ambient temperature 21 to 27 °C, under standard conditions) ±1.5 °C (ambient temperature 0 to 50 °C, under standard conditions except for ambient temperature)
		Reference junction compensation method	Compensation within the C7G
		Input bias current	Input bias current: 0.12 µA max. (under standard conditions). Note: Current flows from the + terminal.
		Allowable input voltage	-1.5 to +1.5 V
	Resistance temperature detector (RTD)	Measuring current	1.0 mA (typical, from terminals A and B, under standard conditions)
		Allowable wiring resistance	85 Ω max. (per wire)
		Effect of wiring resistance	Effect of wiring resistance: 0.013 °C/Ω (under standard conditions, within allowable wiring resistance)
	DC voltage DC current	Input bias current	0 to 10 V range : 10 µA max. (under standard conditions) -10 to +10 V range: -10 to +10 µA (under standard conditions) 1–5 V or 0–5 V range: 5 µA max. (under standard conditions)
		Allowable input voltage	DC voltage input: -15 to +15 V DC current input: -1.5 to +1.5 V
		Input impedance	DC voltage input: 1 MΩ or more DC current input: 50 Ω
		Scaling	-32000 to +32000 U (5 digits within this range, max. 4 digits after the decimal point, reverse scaling possible)
AO-C block	Current output (1)	Type	4 to 20 mA DC / 0 to 20 mA DC
		Output type	Control output (MV), process value (PV), set value (SP), standard numerical code, etc.
		Accuracy	±0.1 % FS
		Allowable load resistance	600 Ω max.
		Output resolution	1/16000 min.
	CT (current) input (1)	Recommended current transformer	QN206A (hole dia. 5.8 mm, 800 turns), QN212A (hole dia. 12 mm, 800 turns) Note: Not UL-certified
		Measuring current range	0.4–50.0 A AC, 50/60 Hz (peak current: 71 A max., 800 turns, 1 power wire loop)
		Maximum allowable current	70 A AC (peak current: 99 A max. with 800 turns and 1 pass of the power wire)
		Indication accuracy	±1 % FS ± 1 digit (under standard conditions, CT accuracy is not included)
		Indication resolution	0.1 A AC
		Indication update cycle	100 ms
	VT (voltage) input (1)	Recommended voltage transformer	81406725-003 (primary side: 200V, secondary side: 10V) (not UL-certified)
		Voltage measurement range	24 to 240 V AC, 50/60 Hz (peak voltage: 339 V max.; transformer primary side 200 V, secondary side 10 V)
		Maximum allowable voltage	264 V AC (peak voltage: 373 V max.; transformer primary side: 200 V, secondary side: 10 V)
		Indication accuracy	±1 % FS ± 1 digit
		Indication resolution	0.1 V AC
		Input impedance	160 kΩ (typ)
		Indication update cycle	100 ms
V-P block	Voltage pulse output (1)	Output voltage	12 V DC +15/-10 % (under standard conditions)
		Allowable current	25 mA max.
		Load limit current	30 mA ±10 %
		OFF-state leak current	100 µA max. (under standard conditions)
		Output response time	100 µs max. for 10 %↔90 % of output voltage
	CT (current) input (2)	Specifications	Same as CT (current) input for the AO-C block

MOTOR block	Motor drive output relay	Contact configuration	Switching between OPEN output and CLOSE output (with function for turning both outputs OFF at the same time)
		Contact rating	250 V AC, 2 A (cos ϕ = 0.4); 24 V DC, 2.5 A (L/R = 0.7 ms)
		Contact voltage	250 V AC / 125 V DC max.
		Service life	100,000 cycles min. (at the rated specifications)
		Minimum requirements for switching	40 mA (when using 24 V DC power)
		Interlock	With prevention of simultaneous ON if contact welding occurs (when output of close side is ON, output of open side is forced OFF, meaning that close-side output is prioritized)
	MFB (motor feedback) input	Allowable potentiometer	100 to 2500 Ω (wiring resistance included)
		Indication accuracy	±0.5 % FS (under standard conditions)
		Sampling cycle	100 ms
		Operation at burnout	Y line break: downscale Other line break: upscale
DI block		Number of inputs	4 (common)
		Compatible output type	Non-voltage contacts or open collector
		Input type	Photocoupler (two-way)
		Rated input voltage	24 V DC, +20/-15 %
		Terminal current	4 mA (with 24 V DC input)
		ON voltage/current	19 V / 3 mA min.
		OFF voltage/current	7 V / 1 mA max.
		Input sampling cycle	10 ms
		Minimum pulse width for ON detection	20 ms min. (for a 10 ms sampling cycle)
			50 ms min. (for 50 ms sampling cycle)
			100 ms min. (for 100 ms sampling cycle)
Function assignment		LSP group selection, PID group selection, PV hold, fixed value output group selection, output linearization table group selection, switching of: RUN/READY*, AUTO/MANUAL*, LSP/RSP*, AT stop/start, control action forward/reverse, Timer stop/start selection, Release all latches, RUN selection*, READY selection*, Constant value operation / Pattern operation mode selection* / pattern operation*; ADVANCE*, HOLD*, G. SOAK cancellation, pattern selection. * indicates edge specification function.	
DO block		Number of outputs	4 (common)
		Output type	Open collector (sink type)
		Load voltage	4.5 to 28.8 V DC
		Maximum load current	100 mA for each terminal
		Overcurrent detection	130 mA and above When an overcurrent is detected, the output is turned OFF and the status is checked every 5 seconds. If the status returns to normal, the output automatically returns to normal.
		On-state residual voltage	0.5 V max. (under standard conditions)
		Off-state leak current	100 μA max. (under standard conditions)
		Function assignment	Select an event status or a standard bit code
CLOCK block (with battery)		Clock function	Hours, minutes, seconds, calendar (years 2000 to 2099, supports leap years)
		Clock accuracy	Monthly error of less than ±65 s (under standard conditions)
		Service life	10 years (battery life when not energized, under standard conditions)
		Built-in battery	Lithium battery
		Block replacement	Possible (optional parts sold separately)
HMI2 block		Number of connectable units	1
		Connector	RJ-45

Control unit	Control operation	PID control (reverse action, direct action, heating and cooling action), ON/OFF control (reverse action, direct action)	
	Control method	Continuous proportional, time proportional, position proportional, cascade	
	PID control	Proportional band (P)	0.1 to 3200 % (5 digits within this range, 4 digits max. after the decimal point)
		Integral time (I)	0 to 32000 s (5 digits within this range, 4 digits max. after the decimal point) No integral calculation when the setting is 0.
		Derivative time (D)	0 to 32000 s (5 digits within this range, 4 digits max. after the decimal point) No derivative calculation when the setting is 0.
		MV limits	-10 to +110 % (5 digits within this range, 4 digits max. after the decimal point)
		Manual reset	-10 to +110 % (5 digits within this range, 4 digits max. after the decimal point)
		Number of PID groups	8 groups (per loop)
		PID group selection	For constant-value operation (LSP, RSP), a PID group can be set for each SP group Alternatively, selection by the DI function or zone PID function is possible. For pattern operation, a PID group can be set for each segment. Alternatively, selection by the DI function or zone PID function is possible.
		MV change limit	0.0 to 10000 %/s (5 digits within this range, 4 digits max. after the decimal point) No limit when the setting is 0.0.
		Auto-tuning	PID automatic setting using the limit cycle method
		Control AT type	0: Normal, 1: Fast response, 2: Stable
		Control AT adjustment factor	0.0000 to 320.00 (specifiable for proportional band, integral time, and derivative time)
		Control cycle	Same as sampling cycle
	ON/OFF control	Differential	0 to 32000 (5 digits max.within this range 4 digits max.after the decimal point)
	SP (LSP: local SP)	Number of LSP groups	8 groups per loop
		SP ramp unit	0: s, 1: min, 2: h
		Ramp up and down slopes	0 to 32000
	Direct/reverse operation selection	Switchable	
	Heating/cooling control deadband	-100.0 to +100.0 %	
Analog input processing unit	Linear scaling low and high limits	-32000 to +32000 (5 digits within this range, 4 digits max. after the decimal point)	
	Filter	0.0000 to 120.00 s	
	Ratio	0.0010 to 10.000	
	Bias	-32000 to +32000 (5 digits within this range, 4 digits max. after the decimal point)	
	Square root drop out	0.0001 to 10.000 % No square root extraction if set to 0.0000	
Linear approximation function	Number of groups	8	
	Breakpoints per group	20	
	Available for	Analog input, analog output, etc.	
Event functions	Number of events	16	
	Operation types	PV high limit, PV low limit, PV high and low limits, deviation high limit, deviation low limit, deviation high and low limits, deviation high limit (final SP basis), deviation low limit (final SP reference), deviation high and low limits (final SP basis), SP high limit, SP low limit, SP high and low limits, MV high limit, MV low limit, MV high and low limits, MFB high and low limits, standard numerical code high limit, standard numerical code low limit, standard numerical code high and low limits, PV change rate, PV change rate high limit, PV change rate low limit, standard numerical code change rate high limit, standard numerical code change rate low limit, alarm (state), READY (state), MANUAL (state), RSP (state), AT running (state), SP ramp running (state), control direct action (state), control with estimated MFB (state), timer (state)	
	Main setting / subsetting	-32000 to +32000 (5 digits within this range, 4 digits max. after the decimal point)	
	Hysteresis	0 to 32000 (5 digits within this range, 4 digits max. after the decimal point)	
	READY mode operation	Selectable from "continuation" and "forced OFF."	
	Direct/reverse	Select the polarity to turn ON/OFF in event output	
	Standby	0: None, 1: Standby, 2: Standby + standby when the SP is modified	
	On-delay time	0 to 3200 s (4 digits within this range, 4 digits max. after the decimal point)	
	OFF-delay time	0 to 3200 s (4 digits within this range, 4 digits max. after the decimal point)	

Pattern operation functions		Number of patterns	16
		Number of segments	32 per pattern
		Segment setting method	Set by set point (SP) and time
		Time units	0.01 s, 0.1 s, 1 s, 1 min
		Functions	HOLD, G. SOAK (start point, end point), PV start, ADVANCE, cyclical operation, pattern link, etc.
		Operation end state	READY, END, constant-value
		Event	Segment events 1 to 32
		Time accuracy	Accuracy of built-in clock: less than ±140 s/month
Logical operation function		Number of logical operation	32
		Operation type	1: Calculation 1 (A and B) or (C and D) 2: Calculation 2 (A or B) and (C or D) 3: Calculation 3 (A or B or C or D) 4: Calculation 4 (A and B and C and D)
		ON delay	0 to 3200s(5 digits max.within this range 4 digits max.after the decimal point)
		OFF delay	0 to 3200s(5 digits max.within this range 4 digits max.after the decimal point)
		Reverse	0: Direct 1: Reverse 2: Rising 3: Falling
		Latch	0: Not latched 1: Latched when turned ON 2: Latched when turned OFF (Except for OFF when power is turned ON)
Numerical operation function		Number of unit	32
		Operation type	No operation aX+bY, Division, Switch selector, High selector, Low selector, Soft switching selector, High/low limiter, Change rate limiter, Lead/lag, Absolute value, Linearization table, Hold, One shot timer, Timer, Deviation monitor, Square-root extraction, Integration pulse output I, Integration pulse output II, Logarithm, Exponent, Derivation, Integration, Dead time, Moving average
Other functions			Time setting, unit character setting, key lock setting, fixed value output, power voltage compensation, resistance value calculation (from the VT input and CT input), reception monitoring, user-defined alarm, input assignment, virtual analog input,FF-FITTER
External communication	Ethernet	Transmission line type	Compliant with IEEE 802.3u 100BASE-TX (FastEthernet)
		Communication method	Full duplex
		No. of connections	4 (The total number of connections for Modbus/TCP and loader communications via Ethernet is 1 to 3, and the number of connections for PLC link communication is fixed at 1.)
		Transmission speed	100 Mbps max.
		No. of physical ports (connectors)	1 (RJ-45)
		Cable	UTP cable (4P) Cat 5e min. (straight) (ANSI/TIA/EIA-568-B both ends)
		Protocol:	Modbus/TCP, Mitsubishi SLMP (3E) (for PLC link communication), Loder communications via Ethernet
	RS-485 communication	Signal level	RS-485-compliant
		Network	Multidrop (up to 31 slave stations for 1 host station)
		Communications/synchronization type	Half-duplex, start-stop synchronization
		Maximum cable length	500 m max.
		No. of communication wires	3-wire system
		Transmission speed	9600, 19200, 38400, 57600, 115200 bps
		Terminating resistor	External (120 Ω, 1/2 W min.)
		Data length	8 bits
		Stop bits	1 or 2 bits
		Parity bit	Even parity, odd parity, or no parity
		Protocol	Modbus/RTU
	Loader communication	Dedicated PC loader	SLP-C7FJ91 (free version), SLP-C7-J91 (paid version)
		Cable	USB-to-Micro-USB (Type A/B) cable (USB 2.0 supported, 5 m max.) or Ethernet cable
		Power supply	When connected with a USB cable, the device can be powered by the PC and parameters can be changed.
Data storage		SD	microSD/SDHC-compliant (4 GB), for the compact data storage and health index functions

General specifications	Memory backup	EEPROM (durability: 1 million erase-write cycles min., for parameter settings)																																										
	Power consumption	AC models: 25 VA 10 W max. DC models: 12 W max.																																										
	Power-on inrush current	25 A max./10 ms max.																																										
	Start delay at power ON	10 s max. (the time until normal operation begins under standard conditions)																																										
	Allowable transient power loss	AC models: 20 ms max. DC models: 5 ms max.																																										
	Insulation resistance	20 MΩ min. (between power supply terminal (#1 or #2) and frame ground terminal (#3), with a 500 V DC megger)																																										
	Dielectric strength	AC models: 1500 V AC for 1 min Between AC power supply terminal (#1 or #2) and frame ground terminal (#3) Between AC power supply terminals (#1 or #2) and secondary terminals Between AC power supply terminal (#1 or #2) and motor block terminals (#1 to #3) Between motor block output terminals (#1 to #3) and frame ground terminal (#3) Between motor block output terminals (#1 to #3) and secondary terminals (excluding motor block output terminals (#1 to #3)) DC models 1500 V AC for 1 min Between motor block output terminals (#1 to #3) and frame ground terminal (#3) Between motor block output terminals (#1 to #3) and DC power supply terminal (#1 or #2) Between motor block output terminals (#1 to #3) and secondary terminals (excluding motor block output terminals (#1 to #3)) 500 V AC for 1 min Between DC power supply terminal (#1 or #2) and frame ground terminal (#3) Between DC power supply terminal (#1 or #2) and secondary terminals other than motor block output terminals (#1 to #3)																																										
	Case material	Main unit: Modified PPE (case), polycarbonate (board holder, front mask) Display unit: Modified PPE (case), polycarbonate (back cover), PET film (protective sheet)																																										
	Case color	Black																																										
	Regulations and approvals	<table><thead><tr><th></th><th>Regulations</th><th>Approvals</th><th>Remarks</th></tr></thead><tbody><tr><td>UL</td><td></td><td>QUYX.E246616</td><td>UL 61010-1 (UL-compliant models only)</td></tr><tr><td>cUL</td><td></td><td>QUYX7.E246616</td><td>CAN/CSA-C22.2 No. 61010-1-12 (UL-compliant models only)</td></tr><tr><td>CE</td><td>EMC</td><td></td><td>EN 61326-1 (For use in industrial locations)</td></tr><tr><td>CE</td><td>LVD</td><td></td><td>EN 61010-1</td></tr><tr><td>CE</td><td>RoHS</td><td></td><td>EN IEC63000</td></tr><tr><td>UKCA</td><td>2016 No.1091</td><td></td><td>EN 61326-1 (For use in industrial locations)</td></tr><tr><td>UKCA</td><td>2016 No.1101</td><td></td><td>EN 61010-1</td></tr><tr><td>UKCA</td><td>2012 No.3032</td><td></td><td>EN IEC63000</td></tr><tr><td>KC Mark</td><td></td><td>MSIP-REM-A2B-A131</td><td></td></tr></tbody></table> During EMC testing, the reading or output may fluctuate by ±10 % FS.				Regulations	Approvals	Remarks	UL		QUYX.E246616	UL 61010-1 (UL-compliant models only)	cUL		QUYX7.E246616	CAN/CSA-C22.2 No. 61010-1-12 (UL-compliant models only)	CE	EMC		EN 61326-1 (For use in industrial locations)	CE	LVD		EN 61010-1	CE	RoHS		EN IEC63000	UKCA	2016 No.1091		EN 61326-1 (For use in industrial locations)	UKCA	2016 No.1101		EN 61010-1	UKCA	2012 No.3032		EN IEC63000	KC Mark		MSIP-REM-A2B-A131	
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Overvoltage category	Category II (IEC 60364-4-443, IEC 60664-1)																																											
Installation	Main unit: Mounting on a DIN rail (standard) or on the display unit using the mounting bracket Display unit: Mounting using 3φ screws (standard) or the mounting bracket (mount in a 92 × 92 mm hole)																																											
Weight	Main unit: 500 g max. Display unit: 150 g max. Integrated mounting bracket : 150 g max.																																											
Built-in clock accuracy	Monthly error: Less than ±140 s The time is reset to 00:00:00, Jan. 1, 2000(default) upon power-on (including power restoration after a power loss). However, if the firmware version of the MAIN block is 3.* or earlier, the time is reset to 00:00:00, Jan. 1, 2014(default). Note: When using the CLOCK block (with battery), the specification for monthly difference is a maximum of ± 65 s, and the correct date and time are maintained even in a power failure. Note: In time processing of the pattern operation function, the built-in clock is not used. The CLOCK block (with battery) is not used.																																											

General specifications	Standard conditions	Ambient temperature	23 °C -2/+5 °C
		Ambient humidity	60 ±5 % RH
		Power	AC models: 105 V AC ±10 %. DC models: 24 V DC ±5 %
		Power frequency	AC models: 50 Hz ±1 %, 60 Hz ±1 %
		Vibration	0 m/s ²
		Shock	0 m/s ²
		Mounting angle	Main unit: Reference plane ±3°, Display unit: No restriction (if mounted separately from the main unit)
		Space	100 mm min. above and below, and on all sides (main unit); gang mounting acceptable (display unit)
	Operating conditions	Ambient temperature	0 to 50 °C (0 to 40 °C if main units are gang-mounted)
		Ambient humidity	10 to 90 % RH (without condensation)
		Rated power	AC models: 100 to 240 V AC (operating input voltage: 85 to 264 V AC) DC models: 24 V DC (operating input voltage: 20.4 to 28.8 V DC)
		Power frequency	AC models: 50 Hz ±2 % or 60 Hz ±2 %
		Vibration	0 to 5 m/s ² (10 to 60 Hz for 2 h each in x, y, and z directions)
		Shock	0 to 100 m/s ²
		Mounting angle	Reference plane ±10° for main unit and display unit in integrated mounting. No restriction for display unit in standard mounting.
		Altitude	2000 m max.
		Pollution degree	2
		Installation location	Indoors
		Space	For the main unit, leave at least 50 mm above, below, and in front of the unit. No space is needed on the right or left. For the display unit, no space is needed above, below, on the right, or on the left.
	Transportation and storage conditions	Ambient temperature	-20 to +70 °C
		Ambient humidity	10 to 95 % RH (without condensation)
		Vibration	0 to 10 m/s ² (10 to 60 Hz for 2 h each in x, y, and z directions)
		Shock	0 to 300 m/s ² (3 times each in x, y, and z directions)

Table 1. Input types and ranges

Input type	Range type Nos.	Sensor	Range		Accuracy	Resolution	Burnout
			Range (Celsius)	Range (Fahrenheit)			
Thermo-couple	1	K	-200 to +1200 °C	-300 to +2200 °F	±0.1 % FS ±1 digit *1	0.1 °C	Upscale (110 % FS)
	2	K	0 to 1200 °C	0 to 2200 °F	±0.1 % FS ± 1 digit	0.1 °C	
	3	K	0 to 800 °C	0 to 1500 °F	±0.1 % FS ± 1 digit	0.1 °C	
	4	K	0 to 600 °C	0 to 1100 °F	±0.1 % FS ± 1 digit	0.1 °C	
	5	K	0 to 400 °C	0 to 700 °F	±0.1 % FS ± 1 digit	0.1 °C	
	6	K	-200 to +400 °C	-300 to +700 °F	±0.1 % FS ±1 digit *1	0.1 °C	
	7	K	-200 to +200 °C	-300 to +400 °F	±0.1 % FS ±1 digit *1	0.1 °C	
	8	J	0 to 1200 °C	0 to 2200 °F	±0.1 % FS ± 1 digit	0.1 °C	
	9	J	0 to 800 °C	0 to 1500 °F	±0.1 % FS ± 1 digit	0.1 °C	
	10	J	0 to 600 °C	0 to 1100 °F	±0.1 % FS ± 1 digit	0.1 °C	
	11	J	-200 to +400 °C	-300 to +700 °F	±0.1 % FS ±1 digit *1	0.1 °C	
	12	E	0 to 800 °C	0 to 1500 °F	±0.1 % FS ± 1 digit	0.1 °C	
	13	E	0 to 600 °C	0 to 1100 °F	±0.1 % FS ± 1 digit	0.1 °C	
	14	T	-200 to +400 °C	-300 to +700 °F	±0.1 % FS ±1 digit *1	0.1 °C	
	15	R	0 to 1600 °C	0 to 3000 °F	±0.1 % FS ±1 digit *2	0.1 °C	
	16	S	0 to 1600 °C	0 to 3000 °F	±0.1 % FS ±1 digit *2	0.1 °C	
	17	B	0 to 1800 °C	0 to 3300 °F	±0.2 % FS ±1 digit *3	0.1 °C	
	18	N	0 to 1300 °C	0 to 2300 °F	±0.1 % FS ± 1 digit	0.1 °C	
	19	PLII	0 to 1300 °C	0 to 2300 °F	±0.1 % FS ± 1 digit	0.1 °C	Upscale (105 % FS)
	20	WRe5-26	0 to 1400 °C	0 to 2400 °F	±0.1 % FS ± 1 digit	0.1 °C	Upscale (110 % FS)
	21	WRe5-26	0 to 2300 °C	0 to 4200 °F	±0.1 % FS ± 1 digit	0.1 °C	
	23	PR40-20	0 to 1900 °C	0 to 3400 °F	±0.5 % FS ±1 digit *4	0.1 °C	

*1. For -200 to 0 °C, ±0.2 % FS ±1 digit

*2. For 0 to 100 °C, ±0.2 % FS ±1 digit

*3. For 0 to 260 °C, ±4 % FS ±1 digit. For 260 to 800 °C, ±0.4 % FS ±1 digit

*4. For 0 to 300 °C, ±2.5 % FS ±1 digit. For 300 to 800 °C, ±1.5 % FS ±1 digit

Input type	Range type Nos.	Sensor	Range		Accuracy	Resolution	Burnout
			Range (Celsius)	Range (Fahrenheit)			
Resistance temperature detector (RTD)	41	Pt100	-200 to +500 °C	-300 to +900 °F	±0.1 % FS ± 1 digit	0.1 °C	Upscale (110 % FS)
	43	Pt100	-200 to +200 °C	-300 to +400 °F	±0.1 % FS ± 1 digit	0.01 °C	
	45	Pt100	-100 to +300 °C	-150 to +500 °F	±0.1 % FS ± 1 digit	0.01 °C	
	47	Pt100	-100 to +200 °C	-150 to +400 °F	±0.1 % FS ± 1 digit	0.01 °C	
	49	Pt100	-100 to +150 °C	-150 to +300 °F	±0.1 % FS ± 1 digit	0.01 °C	
	51	Pt100	-50 to +200 °C	-50 to +400 °F	±0.1 % FS ± 1 digit	0.01 °C	
	53	Pt100	-50 to +100 °C	-50 to +200 °F	±0.1 % FS ± 1 digit	0.01 °C	
	55	Pt100	-60 to +40 °C	-60 to +100 °F	±0.1 % FS ± 1 digit	0.01 °C	
	57	Pt100	-40 to +60 °C	-40 to +140 °F	±0.1 % FS ± 1 digit	0.01 °C	
	59	Pt100	-10 to +60 °C	-10 to +140 °F	±0.1 % FS ± 1 digit	0.01 °C	
	61	Pt100	0 to 100 °C	0 to 200 °F	±0.1 % FS ± 1 digit	0.01 °C	
	63	Pt100	0 to 200 °C	0 to 400 °F	±0.1 % FS ± 1 digit	0.01 °C	
	65	Pt100	0 to 300 °C	0 to 500 °F	±0.1 % FS ± 1 digit	0.01 °C	
	67	Pt100	0 to 500 °C	0 to 900 °F	±0.1 % FS ± 1 digit	0.1 °C	
Linear	69	Pt100	-200 to +850 °C	-300 to +1550 °F	±0.1 % FS ± 1 digit	0.1 °C	900 °C, 1650 °F
	86	Voltage (V)	1 to 5 V	1 to 5 V	±0.1 % FS ± 1 digit	1/90000 min.	Downscale (-10 % FS)
	87	Voltage (V)	0 to 5 V	0 to 5 V	±0.1 % FS ± 1 digit		Burnout not detected (around 0 % FS)
	88	Voltage (V)	0 to 10 V	0 to 10 V	±0.1 % FS ± 1 digit		Burnout not detected (around 0 % FS)
	89	Current (mA)	0 to 20 mA	0 to 20 mA	±0.1 % FS ± 1 digit		Burnout not detected (around 0 % FS)
	90	Current (mA)	4 to 20 mA	4 to 20 mA	±0.1 % FS ± 1 digit		Downscale (-10 % FS)
	92	Voltage (V)	-10 to +10 V	-10 to +10 V	±0.1 % FS ± 1 digit		Burnout not detected (around 50 % FS)

Input type	Range type Nos.	Sensor	Range	Accuracy	Resolution	Burnout
Not used	0	None	Fixed at 0	---	---	---







! Handling Precautions

- Do not use Fahrenheit ranges in Japan.

Input sensor standards reference

Thermocouple K, E, J, T, B, R, S, N: JIS C 1602:2015
WRe 5-26: ASTM E988 - 96 (reapproved 2002) (JIS C 1602:2015, C Thermocouple)
PR40-20, PLII: ASTM E1751/E1751M-15
Resistance temperature detector Pt100: JIS C 1604:2013

Table 2. Compact data storage (CDS)

Item		“Data selection” setting		
		Standard	Custom	Ring
Save destination		microSD memory card	Same as on the left.	Same as on the left.
Folder	Root folder name	CDS	Same as on the left.	LOG
	Folder name	BLK _ _: a sequential number from 0 to 64	Same as on the left.	LOG _ _: Serial number from 001 to 100
	Maximum number of files in a folder	1,000	Same as on the left.	200
	Maximum number of files in the microSD memory card.	65,000	Same as on the left.	20,000
File	File name	xxxx_yyyyy_z.dat xxxx: number of power ON/OFF cycles yyyyy: number of files created since power ON z: File division classification (0: first file, 1: following file)	xxxx_yyyyy_z.csv xxxx: Number of power ON/OFF cycles yyyyy: Number of files created since power ON z: File division classification (0: first file, 1: following file)	xxx_yyyy.csv xxx: Same as _ in the folder name yyyy: Serial number from 0001 to 0200
	Management file name	None	Same as on the left.	xxx_yyyy.last xxx_yyyy: Same as the name of the last written file.
	Maximum file size for each file	Approx. 2 MB	Same as on the left.	Approx. 192 KB
	Character code	Characters: Shift-JIS (ASCII) Line feed: CR + LF (hexadecimal 0DH and 0AH) Delimiter: comma (,), 2CH in hexadecimal Decimal point: period (.), hexadecimal 2EH	Same as on the left.	Same as on the left.
Recording content	Health index data	Available*	None	Same as on the left.
	Section	Consists of the context section and time sequence data section.  Table 2-1. Sections of standard CDS (p.12) (for details).	Consists of the header section and data section.  Table 2-2. Sections of custom and loop CDS (p.12) (for details).	Same as on the left.
	Number of data items	10 data items × number of loops	Selectable from 1 to 40	Same as on the left.
	Data types	Records diagnostic data for enabled loops, including the PID constant, health index (specific R value, R value), SP, PV, and MV.  Table 2-2. Sections of custom and loop CDS (p.12) (for details).	Select from standard bit codes and standard numerical codes  Table 4. List of standard bit codes (p.13) and  Table 5. List of standard numerical codes (p.15) (for standard bit codes and standard numerical codes respectively).	Same as on the left.
Recording operation	Recording cycle	Selected from “Same as sampling cycle, 0.1 s, 1 s, 10 s, 1 min, and 10 min.”	Same as on the left.	Same as on the left.
	Start and stop	Selected from “DI1 to 2, events 1 to 16, and standard bit code”  Table 4. List of standard bit codes (p.13).	Same as on the left.	Same as on the left.
	Alarm concerning the number of files and capacity	An SD card error alarm is issued in any of the following cases. • When there is an attempt to write data exceeding the capacity of the microSD memory card • When there is an attempt to write a new file when there are 1,000 files in BLK64 (the last folder)	Same as on the left.	No alarm occurs as the oldest file is rewritten (however, if files recorded by standard or custom recording remain, an alarm may be issued).

* It is necessary to configure the settings for the health index.

Start the CDS and health index at the start of batch processing, and stop the CDS and health index when batch processing ends.

Table 2-1. Sections of standard CDS

Section	Data	Notes
Context section (From Section Context to SectionEnd)	P (Proportional band)	Records the setting when CDS starts.
	I (Integral time)	
	D (Derivative time)	
	OL (MV low limit)	
	OH (MV high limit)	
	SP high limit	
	Specific R value (diagnostic parameter)	Normalization responsiveness (Kp/Tp) (Gain is defined as Kp and time constant as Tp in the transfer function.) Calculated from the data when the PV is rising during batch processing. Records the definite value when CDS ends.
Time sequence data section (From Section TemporalData to SectionEnd) (Updated in each recording cycle)	Timestamp	Year, month, day, hour, minute, second, millisecond
	SP	
	PV	
	MV	
	R value	
	DT5	Varies depending on the type of output block to which the MV is assigned. AO-C block: RMS current (CT) V-P block: RMS current (CT1) Other: 0 (fixed) (However, fixed at 0 if heating MV and cooling MV are assigned)
	DT6	Varies depending on the type of output block to which the MV is assigned. AO-C block: RMS voltage (VT) V-P block: RMS current (CT2) Other: 0 (fixed) (However, fixed at 0 if heating MV and cooling MV are assigned)
	DT7	Varies depending on the type of output block to which the MV is assigned. AO-C block: Operation terminal (heater) resistance value (calculated from the CT input current and VT input voltage) Other: 0 (fixed)
	DT8	0 (fixed)
	DT9	
	DT10	

Table 2-2. Sections of custom and loop CDS

Section	Data	Notes
Header section (lines 1 to 2)	Data number	Standard bit code, standard numerical code
	Data name	
Data section (lines 3 and after)	Timestamp	Year, month, day, hour, minute, second, millisecond
	Data	Values for standard bits and standard numbers

Table 3. Health index


Diagnostic operation	Start and Stop	Select from DI 1 to 2, event 1 to 16, standard bit (can be set for each loop) Standard Bit Codes  Table 4. List of standard bit codes (p.13).
	Graph display	The health index graph bank displays the last 10 specific R values (diagnostic parameters) for each control loop as points and numbers on a graph.
Settings	R value scale	0 to 10 (specifies the result of calculation \times a power of 10)
	Ideal data	0.0000 to 32000
	Deviation low limit	0.0000 to 32000 (no low limit when 0.0000)
	Deviation high limit	0.0000 to 32000 (no high limit when 0.0000)
	SP high limit	-32000 to +32000

Table 4. List of standard bit codes

The range of standard bit codes is 1024 to 2047.

Codes not listed below are reserved for the system, so do not use them for configuration.

Standard bit code	Meaning of the standard bit codes	Standard bit code	Meaning of the standard bit codes	Standard bit code	Meaning of the standard bit codes
1024	Always 0 (Off)	1282	V-P terminal status (A1 block)	1409	User-defined bit 2
1025	Always 1 (On)	1283	V-P terminal status (B1 block)	1410	User-defined bit 3
1088	Event 1	1290	Result of numerical operation 1 (bit)	1411	User-defined bit 4
1089	Event 2	1291	Result of numerical operation 2 (bit)	1412	User-defined bit 5
1090	Event 3	1292	Result of numerical operation 3 (bit)	1413	User-defined bit 6
1091	Event 4	1293	Result of numerical operation 4 (bit)	1414	User-defined bit 7
1092	Event 5	1294	Result of numerical operation 5 (bit)	1415	User-defined bit 8
1093	Event 6	1295	Result of numerical operation 6 (bit)	1416	User-defined bit 9
1094	Event 7	1296	Result of numerical operation 7 (bit)	1417	User-defined bit 10
1095	Event 8	1297	Result of numerical operation 8 (bit)	1418	User-defined bit 11
1096	Event 9	1298	Result of numerical operation 9 (bit)	1419	User-defined bit 12
1097	Event 10	1299	Result of numerical operation 10 (bit)	1420	User-defined bit 13
1098	Event 11	1300	Result of numerical operation 11 (bit)	1421	User-defined bit 14
1099	Event 12	1301	Result of numerical operation 12 (bit)	1422	User-defined bit 15
1100	Event 13	1302	Result of numerical operation 13 (bit)	1423	User-defined bit 16
1101	Event 14	1303	Result of numerical operation 14 (bit)	1424	User-defined bit 17
1102	Event 15	1304	Result of numerical operation 15 (bit)	1425	User-defined bit 18
1103	Event 16	1305	Result of numerical operation 16 (bit)	1426	User-defined bit 19
1120	CT1 heater burnout detection (A2 block)	1306	Result of numerical operation 17 (bit)	1427	User-defined bit 20
1121	CT2 heater burnout detection (A2 block)	1307	Result of numerical operation 18 (bit)	1428	User-defined bit 21
1122	CT1 heater burnout detection (B2 block)	1308	Result of numerical operation 19 (bit)	1429	User-defined bit 22
1123	CT2 heater burnout detection (B2 block)	1309	Result of numerical operation 20 (bit)	1430	User-defined bit 23
1124	CT1 heater burnout detection (A1 block)	1310	Result of numerical operation 21 (bit)	1431	User-defined bit 24
1125	CT2 heater burnout detection (A1 block)	1311	Result of numerical operation 22 (bit)	1432	User-defined bit 25
1126	CT1 heater burnout detection (B1 block)	1312	Result of numerical operation 23 (bit)	1433	User-defined bit 26
1127	CT2 heater burnout detection (B1 block)	1313	Result of numerical operation 24 (bit)	1434	User-defined bit 27
1128	CT1 overcurrent detection (A2 block)	1314	Result of numerical operation 25 (bit)	1435	User-defined bit 28
1129	CT2 overcurrent detection (A2 block)	1315	Result of numerical operation 26 (bit)	1436	User-defined bit 29
1130	CT1 overcurrent detection (B2 block)	1316	Result of numerical operation 27 (bit)	1437	User-defined bit 30
1131	CT2 overcurrent detection (B2 block)	1317	Result of numerical operation 28 (bit)	1438	User-defined bit 31
1132	CT1 overcurrent detection (A1 block)	1318	Result of numerical operation 29 (bit)	1439	User-defined bit 32
1133	CT2 overcurrent detection (A1 block)	1319	Result of numerical operation 30 (bit)	1440	Result of logical operation 1
1134	CT1 overcurrent detection (B1 block)	1320	Result of numerical operation 31 (bit)	1441	Result of logical operation 2
1135	CT2 overcurrent detection (B1 block)	1321	Result of numerical operation 32 (bit)	1442	Result of logical operation 3
1136	CT1 short-circuit detection (A2 block)	1360	Segment event 1	1443	Result of logical operation 4
1137	CT2 short-circuit detection (A2 block)	1361	Segment event 2	1444	Result of logical operation 5
1138	CT1 short-circuit detection (B2 block)	1362	Segment event 3	1445	Result of logical operation 6
1139	CT2 short-circuit detection (B2 block)	1363	Segment event 4	1446	Result of logical operation 7
1140	CT1 short-circuit detection (A1 block)	1364	Segment event 5	1447	Result of logical operation 8
1141	CT2 short-circuit detection (A1 block)	1365	Segment event 6	1448	Result of logical operation 9
1142	CT1 short-circuit detection (B1 block)	1366	Segment event 7	1449	Result of logical operation 10
1143	CT2 short-circuit detection (B1 block)	1367	Segment event 8	1450	Result of logical operation 11
1168	DI/DO1 terminal status	1368	Segment event 9	1451	Result of logical operation 12
1169	DI/DO2 terminal status	1369	Segment event 10	1452	Result of logical operation 13
1170	DI/DO3 terminal status	1370	Segment event 11	1453	Result of logical operation 14
1171	DI/DO4 terminal status	1371	Segment event 12	1454	Result of logical operation 15
1172	DI/DO5 terminal status	1372	Segment event 13	1455	Result of logical operation 16
1173	DI/DO6 terminal status	1373	Segment event 14	1456	Result of logical operation 17
1174	DI/DO7 terminal status	1374	Segment event 15	1457	Result of logical operation 18
1208	DI1 terminal status (A3 block)	1375	Segment event 16	1458	Result of logical operation 19
1209	DI2 terminal status (A3 block)	1376	Segment event 17	1459	Result of logical operation 20
1210	DI3 terminal status (A3 block)	1377	Segment event 18	1460	Result of logical operation 21
1211	DI4 terminal status (A3 block)	1378	Segment event 19	1461	Result of logical operation 22
1212	DI1 terminal status (B3 block)	1379	Segment event 20	1462	Result of logical operation 23
1213	DI2 terminal status (B3 block)	1380	Segment event 21	1463	Result of logical operation 24
1214	DI3 terminal status (B3 block)	1381	Segment event 22	1464	Result of logical operation 25
1215	DI4 terminal status (B3 block)	1382	Segment event 23	1465	Result of logical operation 26
1224	DO1 terminal status (A1 block)	1383	Segment event 24	1466	Result of logical operation 27
1225	DO2 terminal status (A1 block)	1384	Segment event 25	1467	Result of logical operation 28
1226	DO3 terminal status (A1 block)	1385	Segment event 26	1468	Result of logical operation 29
1227	DO4 terminal status (A1 block)	1386	Segment event 27	1469	Result of logical operation 30
1228	DO1 terminal status (B1 block)	1387	Segment event 28	1470	Result of logical operation 31
1229	DO2 terminal status (B1 block)	1388	Segment event 29	1471	Result of logical operation 32
1230	DO3 terminal status (B1 block)	1389	Segment event 30	1504	At CDS start
1231	DO4 terminal status (B1 block)	1390	Segment event 31	1505	Loop 1 health index running
1280	V-P terminal status (A2 block)	1391	Segment event 32	1506	Loop 2 health index running
1281	V-P terminal status (B2 block)	1408	User-defined bit 1	1507	Loop 3 health index running

Standard bit code	Meaning of the standard bit codes
1508	Loop 4 health index running
1517	Display unit connection status
1518	Additional display unit connection status
1568	Loop 1 RUN/READY status
1569	Loop 2 RUN/READY status
1570	Loop 3 RUN/READY status
1571	Loop 4 RUN/READY status
1584	Loop 1 Auto/manual status
1585	Loop 2 Auto/Manual status
1586	Loop 3 Auto/Manual status
1587	Loop 4 Auto/Manual status
1600	Loop 1 AT stop/start status
1601	Loop 2 AT stop/start status
1602	Loop 3 AT stop/start status
1603	Loop 4 AT stop/start status
1608	Loop 1 AT error
1609	Loop 2 AT error
1610	Loop 3 AT error
1611	Loop 4 AT error
1616	Loop 1 LSP/RSP status
1617	Loop 2 LSP/RSP status
1618	Loop 3 LSP/RSP status
1619	Loop 4 LSP/RSP status
1648	Loop 1 SP ramp-up in progress
1649	Loop 2 SP ramp-up in progress
1650	Loop 3 SP ramp-up in progress
1651	Loop 4 SP ramp-up in progress
1652	Loop 1 SP ramp-down in progress
1653	Loop 2 SP ramp-down in progress
1654	Loop 3 SP ramp-down in progress
1655	Loop 4 SP ramp-down in progress
1670	Loop 1 pattern SP increase change limit in progress
1671	Loop 2 pattern SP increase change limit in progress
1672	Loop 3 pattern SP increase change limit in progress
1673	Loop 4 pattern SP increase change limit in progress
1674	Loop 1 pattern SP decrease change limit in progress
1675	Loop 2 pattern SP decrease change limit in progress
1676	Loop 3 pattern SP decrease change limit in progress
1677	Loop 4 pattern SP decrease change limit in progress
1712	Loop 1 pattern operation mode

Standard bit code	Meaning of the standard bit codes
1713	Loop 2 pattern operation mode
1714	Loop 3 pattern operation mode
1715	Loop 4 pattern operation mode
1720	Loop 1 HOLD status
1721	Loop 2 HOLD status
1722	Loop 3 HOLD status
1723	Loop 4 HOLD status
1728	Loop 1 END status
1729	Loop 2 END status
1730	Loop 3 END status
1731	Loop 4 END status
1736	Loop 1 G. SOAK status
1737	Loop 2 G. SOAK status
1738	Loop 3 G. SOAK status
1739	Loop 4 G. SOAK status
1792	All typical alarms (logical OR of all alarms be displayed)
1824	Loop 1 PV low limit error
1825	Loop 1 PV high limit error
1826	Loop 1 RSP low limit error
1827	Loop 1 RSP high limit error
1828	Loop 2 PV low limit error
1829	Loop 2 PV high limit error
1830	Loop 2 RSP low limit error
1831	Loop 2 RSP high limit error
1832	Loop 3 PV low limit error
1833	Loop 3 PV high limit error
1834	Loop 3 RSP low limit error
1835	Loop 3 RSP high limit error
1836	Loop 4 PV low limit error
1837	Loop 4 PV high limit error
1838	Loop 4 RSP low limit error
1839	Loop 4 RSP high limit error
1880	MFB input error
1884	Adjusting MFB
1888	Estimating MFB
1896	MFB adjustment error
1900	Motor drive output OPEN
1904	Motor drive output CLOSE
1920	Reception monitoring 1

Standard bit code	Meaning of the standard bit codes
1921	Reception monitoring 2
1922	Reception monitoring 3
1940	User-defined alarm 1
1941	User-defined alarm 2
1942	User-defined alarm 3
1943	User-defined alarm 4
1952	CT/VT input error (block A2 CT)
1953	CT/VT input error (block A2 VT)
1954	CT/VT input error (block B2 CT)
1955	CT/VT input error (block B2 VT)
1956	CT/VT input error (block A1 CT)
1957	CT/VT input error (block A1 VT)
1958	CT/VT input error (block B1 CT)
1959	CT/VT input error (block B1 VT)
1960	CT/CT input error (block A2 CT1)
1961	CT/CT input error (block A2 CT2)
1962	CT/CT input error (block B2 CT1)
1963	CT/CT input error (block B2 CT2)
1964	CT/CT input error (block A1 CT1)
1965	CT/CT input error (block A1 CT2)
1966	CT/CT input error (block B1 CT1)
1967	CT/CT input error (block B1 CT2)
1973	Memory error
1977	Battery error (CLOCK block)
1991	Block error
1992	SD card error
1993	Numerical operation alarm
1994	Buff. setting alarm
2000	Block alarm IO failure (block A1)
2001	Block alarm IO failure (block A2)
2002	Block alarm IO failure (block A3)
2003	Block alarm IO failure (block A4)
2004	Block alarm IO failure (block B1)
2005	Block alarm IO failure (block B2)
2006	Block alarm IO failure (block B3)
2007	Block alarm IO failure (block B4)
2008	Block alarm HMI block failure
2009	Block alarm SUB2 block failure (RS-485)
2010	Block alarm SUB1 block failure (DI DO)
2011	Block alarm MAIN block failure

Table 5. List of standard numerical codes

The range of the standard numerical codes is 2048 to 3071.

Codes not listed below are reserved for the system, so do not use them for configuration.

Standard numerical code No.	Meaning of the standard numerical codes	Standard numerical code No.	Meaning of the standard numerical codes	Standard numerical code No.	Meaning of the standard numerical codes
2048	Always 0.0	2416	Loop 1 MV	2742	CT1 Time proportioning current (block B1)
2111	User-defined value 1	2417	Loop 2 MV	2743	CT2 Time proportioning current (block B1)
2112	User-defined value 2	2418	Loop 3 MV	2752	Loop 1 definite R value
2113	User-defined value 3	2419	Loop 4 MV	2753	Loop 2 definite R value
2114	User-defined value 4	2432	Loop 1 MV for heating	2754	Loop 3 definite R value
2115	User-defined value 5	2433	Loop 2 MV for heating	2755	Loop 4 definite R value
2116	User-defined value 6	2434	Loop 3 MV for heating	2760	Loop 1 R value
2117	User-defined value 7	2435	Loop 4 MV for heating	2761	Loop 2 R value
2118	User-defined value 8	2448	Loop 1 MV for cooling	2762	Loop 3 R value
2119	User-defined value 9	2449	Loop 2 MV for cooling	2763	Loop 4 R value
2120	User-defined value 10	2450	Loop 3 MV for cooling	2768	AO-C percent output value (block A2)
2121	User-defined value 11	2451	Loop 4 MV for cooling	2769	AO-C percent output value (block B2)
2122	User-defined value 12	2464	MFB opening amount (estimated)	2770	AO-C percent output value (block A1)
2123	User-defined value 13	2472	MFB opening amount (actual value)	2771	AO-C percent output value (block B1)
2124	User-defined value 14	2479	MFB count value	2776	V-P percent output value (block A2)
2125	User-defined value 15	2496	CT1 measured current when output ON (block A2)	2777	V-P percent output value (block B2)
2126	User-defined value 16	2497	CT2 measured current when output ON (block A2)	2778	V-P percent output value (block A1)
2127	User-defined value 17	2498	CT1 measured current when output ON (block B2)	2779	V-P percent output value (block B1)
2128	User-defined value 18	2499	CT2 measured current when output ON (block B2)	2787	TP percent output value (DO4)
2129	User-defined value 19	2500	CT1 measured current when output ON (block A1)	2788	TP percent output value (DO5)
2130	User-defined value 20	2501	CT2 measured current when output ON (block A1)	2789	TP percent output value (DO6)
2131	User-defined value 21	2502	CT1 measured current when output ON (block B1)	2790	TP percent output value (DO7)
2132	User-defined value 22	2503	CT2 measured current when output ON (block B1)	2800	Result of numerical operation 1
2133	User-defined value 23	2512	CT1 measured current when output OFF (block A2)	2801	Result of numerical operation 2
2134	User-defined value 24	2513	CT2 measured current when output OFF (block A2)	2802	Result of numerical operation 3
2135	User-defined value 25	2514	CT1 measured current when output OFF (block B2)	2803	Result of numerical operation 4
2136	User-defined value 26	2515	CT2 measured current when output OFF (block B2)	2804	Result of numerical operation 5
2137	User-defined value 27	2516	CT1 measured current when output OFF (block A1)	2805	Result of numerical operation 6
2138	User-defined value 28	2517	CT2 measured current when output OFF (block A1)	2806	Result of numerical operation 7
2139	User-defined value 29	2518	CT1 measured current when output OFF (block B1)	2807	Result of numerical operation 8
2140	User-defined value 30	2519	CT2 measured current when output OFF (block B1)	2808	Result of numerical operation 9
2141	User-defined value 31	2528	Loop 1 deviation (PV - SP)	2809	Result of numerical operation 10
2142	User-defined value 32	2529	Loop 2 deviation (PV - SP)	2810	Result of numerical operation 11
2288	Virtual AI1	2530	Loop 3 deviation (PV - SP)	2811	Result of numerical operation 12
2289	Virtual AI2	2531	Loop 4 deviation (PV - SP)	2812	Result of numerical operation 13
2290	Virtual AI3	2544	CT input value (block A2)	2813	Result of numerical operation 14
2291	Virtual AI4	2545	CT input value (block B2)	2814	Result of numerical operation 15
2296	Virtual PV1	2546	CT input value (block A1)	2815	Result of numerical operation 16
2297	Virtual PV2	2547	CT input value (block B1)	2816	Result of numerical operation 17
2298	Virtual PV3	2548	VT input value (block A2)	2817	Result of numerical operation 18
2299	Virtual PV4	2549	VT input value (block B2)	2818	Result of numerical operation 19
2304	AI (block A4)	2550	VT input value (block A1)	2819	Result of numerical operation 20
2305	AI (block B4)	2551	VT input value (block B1)	2820	Result of numerical operation 21
2306	AI (block A3)	2552	Resistance (block A2)	2821	Result of numerical operation 22
2307	AI (block B3)	2553	Resistance (block B2)	2822	Result of numerical operation 23
2312	PV (block A4)	2554	Resistance (block A1)	2823	Result of numerical operation 24
2313	PV (block B4)	2555	Resistance (block B1)	2824	Result of numerical operation 25
2314	PV (block A3)	2656	Event 1 timer remaining time	2825	Result of numerical operation 26
2315	PV (block B3)	2657	Event 2 timer remaining time	2826	Result of numerical operation 27
2320	Loop 1 PV	2658	Event 3 timer remaining time	2827	Result of numerical operation 28
2321	Loop 2 PV	2659	Event 4 timer remaining time	2828	Result of numerical operation 29
2322	Loop 3 PV	2660	Event 5 timer remaining time	2829	Result of numerical operation 30
2323	Loop 4 PV	2661	Event 6 timer remaining time	2830	Result of numerical operation 31
2336	Loop 1 SP (in use)	2662	Event 7 timer remaining time	2831	Result of numerical operation 32
2337	LOOP2 SP (in use)	2663	Event 8 timer remaining time		
2338	Loop 3 SP (in use)	2664	Event 9 timer remaining time		
2339	Loop 4 SP (in use)	2665	Event 10 timer remaining time		
2352	Loop 1 SP (final value)	2666	Event 11 timer remaining time		
2353	Loop 2 SP (final value)	2667	Event 12 timer remaining time		
2354	Loop 3 SP (final value)	2668	Event 13 timer remaining time		
2355	Loop 4 SP (final value)	2669	Event 14 timer remaining time		
2368	Loop 1 current LSP	2670	Event 15 timer remaining time		
2369	Loop 2 current LSP	2671	Event 16 timer remaining time		
2370	Loop 3 current LSP	2736	CT1 Time proportioning current (block A2)		
2371	Loop 4 current LSP	2737	CT2 Time proportioning current (block A2)		
2384	Loop 1 RSP	2738	CT1 Time proportioning current (block B2)		
2385	Loop 2 RSP	2739	CT2 Time proportioning current (block B2)		
2386	Loop 3 RSP	2740	CT1 Time proportioning current (block A1)		
2387	Loop 4 RSP	2741	CT2 Time proportioning current (block A1)		

Model selection

Example: C7GA411CC0D00

Main unit					I/O slot				Other				Description	
Basic model No.			Comm.	Size	Slots A3, A4	Slots B3, B4	Slots A1, A2	Slots B1, B2	Option	Add'l proc.	Add'l spec.	Special support		
1	2	3	4	5	6	7	8	9	10	11	12	13		
C	7	G											Multi-loop controller with multifunction display	
			A										Communications (Ethernet, RS-485, USB), DI/DO (× 7, sink output, source input)	
				3									Integrated mounting *1	
				4									Standard (separate) mounting	
													Slot A3	Slot A4
1													PV1 (full-multi) × 1	AI
2													PV1 (full-multi) + RSP1 (full-multi) *2	AI
A													PV1 (full-multi) + DI (× 4) (external power source required)	DI
													Slot B3	Slot B4
0													None	
1													PV2 (full-multi) × 1	AI
2													PV2 (full-multi) + RSP2 (full-multi) *3	AI
A													PV2 (full-multi) + DI (× 4) (external power source required)	DI
B													PV2 (full multi) + clock (with battery)	CLOCK
													Slot A1	Slot A2
C													Current output (CT and VT inputs, 1 each) × 1	AO-C
V													Voltage pulse output (2 CT inputs) × 1	V-P
F													Current output (CT and VT inputs, 1 each) × 2	AO-C
W													Voltage pulse output (2 CT inputs) × 2	V-P
N													Current output (CT and VT inputs, 1 each) + voltage pulse output (2 CT inputs)	V-P
1													Current output (CT and VT inputs, 1 each) + DO (× 4) (sink output)	DO
2													Voltage pulse output (2 CT inputs) + DO (× 4) (sink output)	DO
													Slot B1	Slot B2
0													None	
C													Current output (CT and VT inputs, 1 each) × 1	AO-C
V													Voltage pulse output (2 CT inputs) × 1	V-P
F													Current output (CT and VT inputs, 1 each) × 2	AO-C
W													Voltage pulse output (2 CT inputs) × 2	V-P
N													Current output (CT and VT inputs, 1 each) + voltage pulse output (2 CT inputs)	V-P
G													Current output (CT and VT inputs, 1 each) + additional display unit	HMI2
H													Voltage pulse output (2 CT inputs) + additional display unit	HMI2
L													Current output (CT and VT inputs, 1 each) + clock (with battery)	CLOCK
P													Voltage pulse output (2 CT inputs) + clock (with battery)	CLOCK
1													Current output (CT and VT inputs, 1 each) + DO (× 4) (sink output)	DO
2													Voltage pulse output (2 CT inputs) × DO (× 4)(sink output)	DO
													0	None
													D	With inspection report
													Y	With traceability certificate
													0	AC power. CE, KC, UKCA-compliant
													D	DC power. CE, KC, UKCA-compliant
													A	AC power. CE, KC, UKCA, UL-compliant
													B	DC power. CE, KC, UKCA, UL-compliant
													0	No special support
													F	Overseas models: switchable between Celsius/Fahrenheit Do not use these models in Japan.

Condition:

The model No. selections indicated below are available if the specified conditions are satisfied.

If the 6th digit (slots A3, A4) is 2
If the 6th digit (slots A3, A4) is 2 or A
If the 9th digit (slots B1, B2) is O , C , V , F , W , ...
N , G , H , 1 , or 2

Symbol	Block Name	Description
AI	Analog Input	Full-multi range (thermocouple, RTD, DC current, DC voltage) input × 1
V-P	Voltage pulse output	Voltage pulse output (12 V DC) × 1 Input terminals for the current transformer (CT) for detecting heater burnout, overcurrent, and short circuit are included (× 2). ^{*4}
AO-C	Analog current output	Current output (4–20 mA DC / 0–20 mA DC) × 1 Input terminals for the current transformer (CT) for measuring current and the voltage transformer (VT) for measuring voltage are included (1 each). ^{*4}
HMI2	Additional display unit	Additional connector for the second display unit ^{*5}
CLOCK	Clock function	Clock (available for CDS and health index) with a battery
DI	Digital input	4 digital inputs (external power required)
DO	Digital output	4 digital outputs (sink output)

- *1. A integrated mounting bracket and a dedicated cable for connecting the display unit are included with the product.
- *2. RSP1 can be switched for use as PV3.
- *3. RSP2 can be switched for use as PV4.
- *4. Current transformer (CT) and voltage transformer (VT) are sold separately.
- *5. Additional display unit is sold separately.

- **Recommended models**

Current output	1 output	2 outputs	3 outputs	4 outputs
8–9th digits	C0	CC	FC	FF
Layout				
Analog Input	1 input	2 inputs	3 inputs	4 inputs
6–7th digits	10	11	21	22
Layout				

- **Block layout example**

Model No. 6th–9th digits and slot position

A	B	
8th digit	9th digit	1
		2
6th digit	7th digit	3
		4

Example: C7GA411CC0D00

A	B	
		1
AO-C	AO-C	2
		3
AI	AI	4

Model selection (models with motor output)

Example: C7GA410M00D00

Main unit					I/O slot				Other				Description	
Basic model No.			Comm.	Size	Slot A4	Slot B4	Slots A2-3, B2-3	Slots A1, B1	Option	Add'l proc.	Add'l spec.	Special support		
1	2	3	4	5	6	7	8	9	10	11	12	13		
C	7	G											Multi-loop controller with multifunction display	
			A										Communications (Ethernet, RS-485, USB), DI/DO (× 7, sink output, source input)	
				3									Integrated mounting*1	
				4									Standard (separate) mounting	
													Slot A4	
1													PV1 (full-multi)	AI
													Slot B4	
0													None	
1													PV2 (full-multi) *2	AI
													Slots A2-3, B2-3	
M													Motor drive output (with MFB input)	MOTOR
													Slot A1	Slot B1
0													None	
C													Current output (CT and VT inputs, 1 each) × 1	AO-C
V													Voltage pulse output (2 CT inputs) × 1	V-P
N													Current output (CT and VT inputs, 1 each) + voltage pulse output (2 CT inputs)	AO-C V-P
G													Current output (CT and VT inputs, 1 each) + additional display unit	AO-C HMI2
L													Current output (CT and VT inputs, 1 each) + clock (with battery)	AO-C CLOCK
1													Current output (CT and VT inputs, 1 each) + DO (× 4) (sink output)	AO-C DO
4													DO (× 4) (sink output) + clock (with battery)	DO CLOCK
													0	
													0	
													D	
													Y	
													0	
													D	
													A	
													B	
													0	
													F	
													0	No special support
													F	Overseas models: switchable between Celsius/Fahrenheit Do not use these models in Japan.

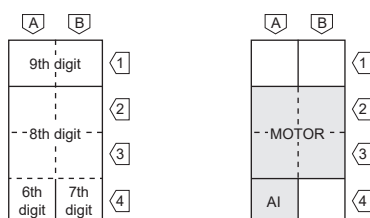
Symbol	Block Name	Description
AI	Analog Input	Full-multi range (thermocouple, RTD, DC current, DC voltage) input × 1
V-P	Voltage pulse output	Voltage pulse output (12 V DC) × 1 Input terminals for the current transformer (CT) for detecting heater burnout, overcurrent, and short circuit are included (× 2). *3
AO-C	Analog current output	Current output (4–20 mA DC / 0–20 mA DC) × 1 Input terminals for the current transformer (CT) for measuring current and the voltage transformer (VT) for measuring voltage are included (1 each). *3
MOTOR	Motor drive output	Motor drive output (100/200 V AC) forward (OPEN) output, reverse (CLOSE) output with MFB (motor feedback) input
HMI2	Additional display unit	Additional connector for the second display unit *4
CLOCK	Clock function	Clock (available for CDS and health index) with a battery
DO	Digital output	4 digital outputs (sink output)

- *1. A integrated mounting bracket and a dedicated cable for connecting the display unit are included with the product.
- *2. PV2 can be switched for use as RSP1.
- *3. Current transformer (CT) and voltage transformer (VT) are sold separately.
- *4. Additional display unit is sold separately.

● Block layout example

Model No. 6th to 9th digit and slot position

Example of C7GA410M00D00



Option parts

■ Additional display unit (sold separately)

Example: C7D-400D00

Main unit					Other					Description
Basic model No.				Installation method	Option 1	Option 2	Add'l proc.	Add'l spec.	Special support	
1	2	3	4	5	6	7	8	9	10	
C	7	D	-							Additional display unit for multi-loop controller with multifunction display
				3						Integrated mounting *
				4						Standard (separate) mounting
					0					English, Japanese
						0				None
							0			None
								D		With inspection report
									0	CE, KC, UKCA-compliant
									0	No special support

* A integrated mounting bracket is included.

■ Service parts (sold separately)

Part name	Model No.
SLP-C7 Smart Loader Package (free version) *1	SLP-C7FJ91
SLP-C7 Smart Loader Package (paid version)	SLP-C7-J91
Power terminal covers (10)	81447704-001
C7 (display unit) mounting method change kit *2	84503167-001
MicroSD card (for replacement)	84502552-001
CLOCK block (for replacement) *3	84501420-001
MOTOR block (for replacement) *3	84501421-001
Current transformer (5.8 mm in diameter)	QN206A
Current transformer (12 mm in diameter)	QN212A
Voltage transformer (for 200 V AC)	81406725-003

*1. Downloadable from our website

<https://www.azbil.com/products/factory/factory-product/controller-recorder/controller/index.html>

*2. A integrated mounting bracket, a dedicated cable for connecting the display unit, and standard gasket,gasket with 92 × 92 mm hole are included with the product.

*3. Mounting bracket for replacement is included.

Accessories

Applicable model No.	Part name	Qty.	Remarks
C7G _ 4	Standard gasket	1	For the display unit
	Display unit mounting screws (6 mm)	5	
	Display unit mounting screws (10 mm)	5	
	Set screws (for securing temporarily)	2	
C7G _ 3	Gasket with 92 × 92 mm hole	1	
	Integrated-mounting bracket	1	
	Display unit mounting screws (6 mm)	5	
	Integrated-mounting cable	1	

■ Model No. and loop type

The following table shows the possible combinations of model No. and loop type with regard to analog input.

OK: Combination is possible

Δ: Possible when the advanced loop type setting is enabled.

PV1: LOOP1 PV

PV2: LOOP2 PV

PV3: LOOP3 PV

PV4: LOOP4 PV

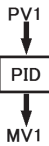
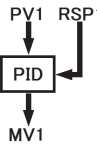
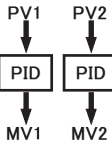
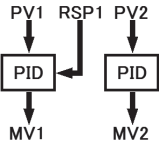
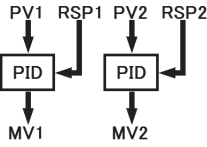
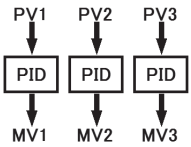
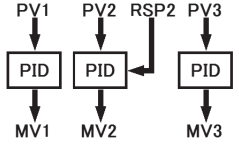
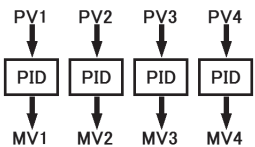
RSP1: RSP for loop 1

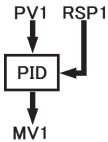
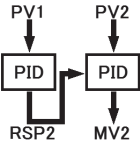
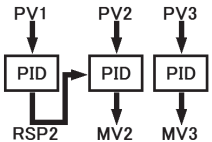
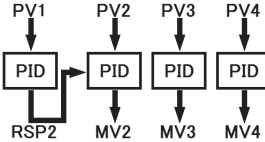
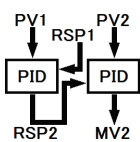
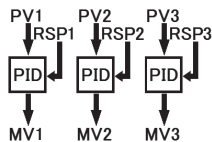
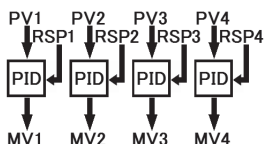
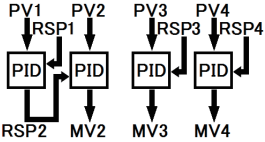
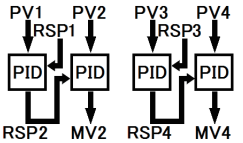
RSP2: RSP for loop 2

RSP3: RSP for loop 3

RSP4: RSP for loop 4

Unused: Although an analog input of the AI block is present, it is not assigned to the PV or RSP of the loop.

Loop type	6th and 7th digits of the model No. (C7GA _ _ _ _ _ _ _ _)				
	10/A0	20	11/1A/1B/A1/AA/AB	21/2A/2B	22
0: 1 loop 	OK A4: PV1	OK A4: PV1 A3: Not used	OK A4: PV1 B4: Not used	OK A4: PV1 A3: Not used B4: Not used	OK A4: PV1 A3: Not used B4: Not used B3: Not used
1: 1 loop, 1 RSP 	Δ	OK A4: PV1 A3: RSP1	Δ	OK A4: PV1 A3: RSP1 B4: Not used	OK A4: PV1 A3: RSP1 B4: Not used B3: Not used
2: 2 loops 	Δ	Δ	OK A4: PV1 B4: PV2	OK A4: PV1 A3: Not used B4: PV2	OK A4: PV1 A3: Not used B4: PV2 B3: Not used
3: 2 loops, 1 RSP 	Δ	Δ	Δ	OK A4: PV1 A3: RSP1 B4: PV2	OK A4: PV1 A3: RSP1 B4: PV2 B3: Not used
4: 2 loops, 2 RSPs 	Δ	Δ	Δ	Δ	OK A4: PV1 A3: RSP1 B4: PV2 B3: RSP2
5: 3 loops 	Δ	Δ	Δ	OK A4: PV1 A3: PV3 B4: PV2	OK A4: PV1 A3: PV3 B4: PV2 B3: Not used
6: 3 loops, 1 RSP 	Δ	Δ	Δ	Δ	OK A4: PV1 A3: PV3 B4: PV2 B3: RSP2
7: 4 loops 	Δ	Δ	Δ	Δ	OK A4: PV1 A3: PV3 B4: PV2 B3: PV4

Loop type	6th and 7th digits of the model No. (C7GA _ _ _ _ _)				
	10/A0	20	11/1A/1B/A1/AA/AB	21/2A/2B	22
8: 1 loop, 1 RSP 	Δ	Δ	OK A4: PV1 B4: RSP1	Δ	Δ
9: Internal cascade 	Δ	Δ	OK A4: PV1 (master) B4: PV2 (slave)	OK A4: PV1 (master) A3: None B4: PV2 (slave)	OK A4: PV1 (master) A3: None B4: PV2 (slave) B3: None
10: Internal cascade + 1 loop 	Δ	Δ	Δ	OK A4: PV1 (master) A3: PV3 B4: PV2 (slave)	OK A4: PV1 (master) A3: PV3 B4: PV2 (slave) B3: None
11: Internal cascade + 2 loops 	Δ	Δ	Δ	Δ	OK A4: PV1 (master) A3: PV3 B4: PV2 (slave) B3: PV4
12: Internal cascade, 1 RSP 	Δ	Δ	Δ	OK A4: PV1 (master) A3: RSP1 B4: PV2 (slave)	OK A4: PV1 (master) A3: RSP1 B4: PV2 (slave) B3: None
20: 3 loops, 3 RSPs 	Δ	Δ	Δ	Δ	Δ
21: 4 loops, 4 RSPs 	Δ	Δ	Δ	Δ	Δ
22: Internal cascade + 2 loops, 3 RSPs 	Δ	Δ	Δ	Δ	Δ
23: 2 internal cascades, 2 RSPs 	Δ	Δ	Δ	Δ	Δ

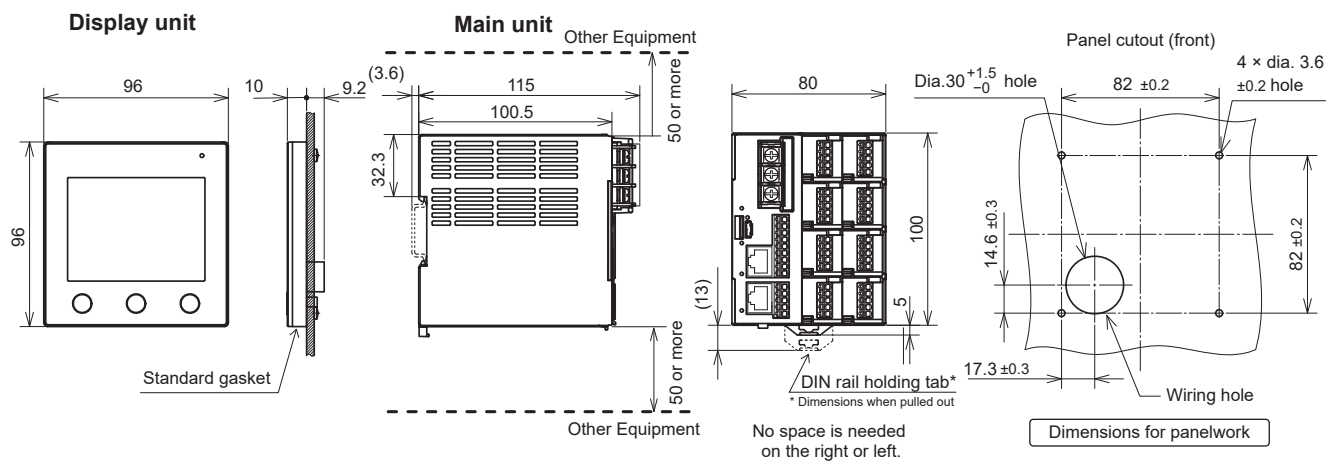
⚠ Handling Precautions

- The value of an unused AI cannot be displayed. To display the value of the AI, even if it is not a control target, assign it to PV in the loop type. However, since the AI is actually not controlled, it is not necessary to assign the MV to the analog output or DI/DO.
- If the advanced loop type setting is enabled for [Loop type], any loop type can be selected regardless of the model number.

External Dimensions

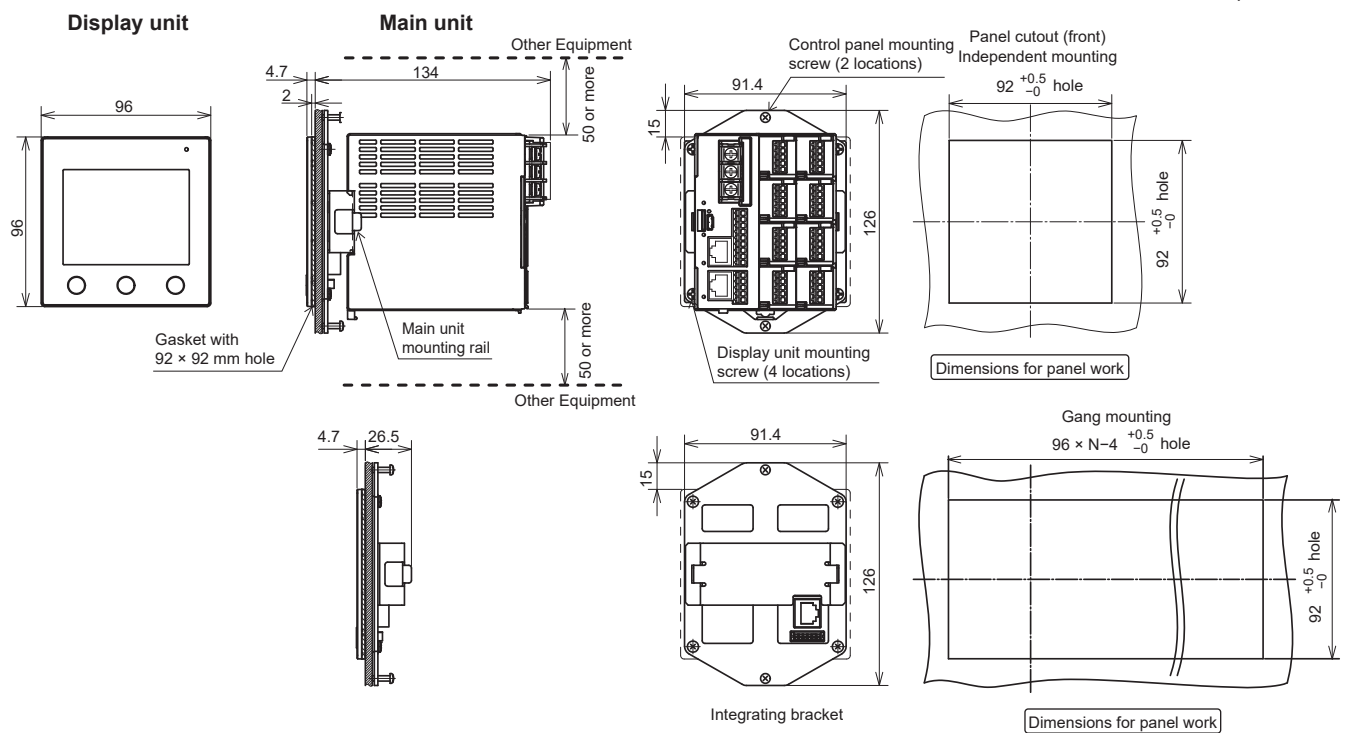
■ Standard Installation

(Unit: mm)



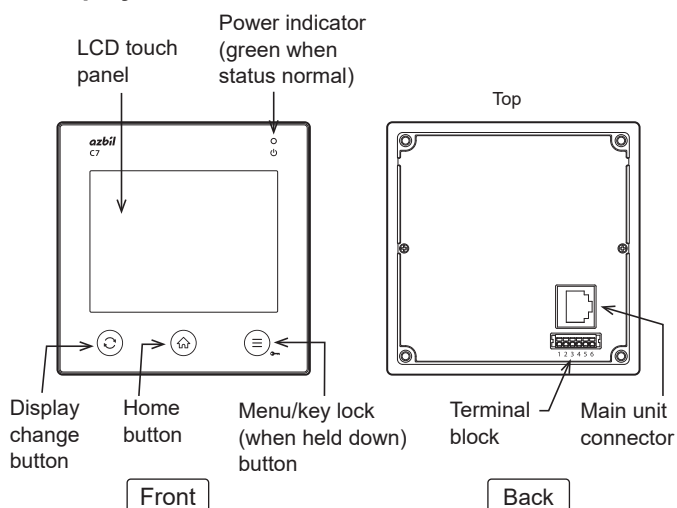
■ Integrated Installation

(Unit: mm)

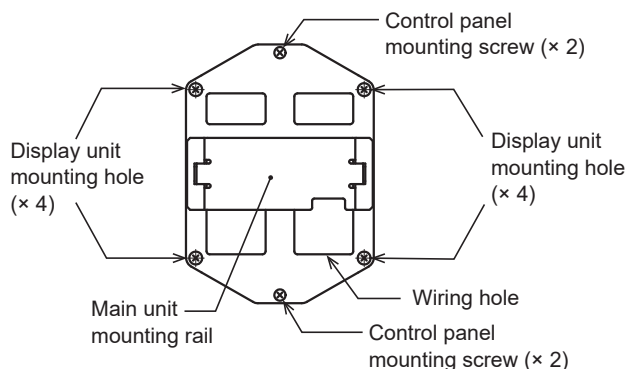


Part Names and Functions

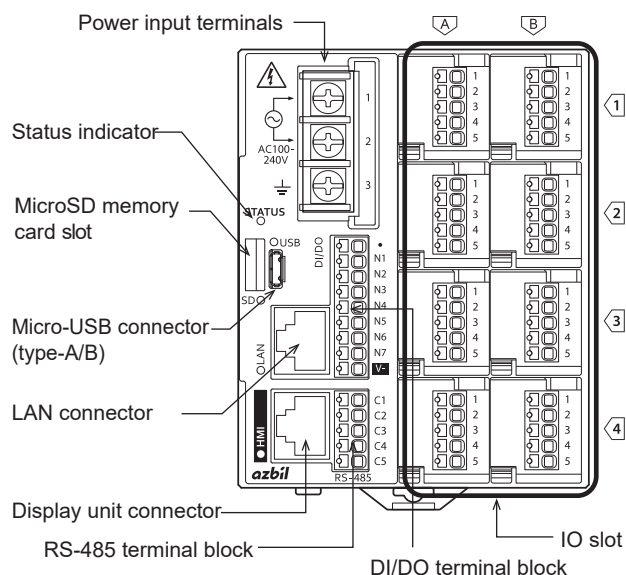
● Display unit



● Integrated mounting bracket (included with integrated mounting models)

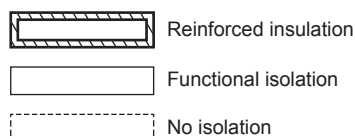


● Main unit



I/O isolation

Power input	AC		Internal circuit	Motor drive output		Motor block	
	DC	Frame ground		MFB input			
DI/DO block				AI block			
DI				DO			
LAN				AO-C block			
Analog output				VT input			CT input
RS-485 block				V-P block			
Voltage pulse output				CT1			CT2
USB				CLOCK block			
HMI block				HMI2 block			
DI block			DO block				



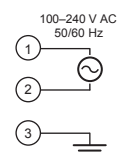
Wiring Precautions

Before touching the main unit or display unit, or removing/inserting cables, touch a grounded panel to discharge static electricity from your body.

■ Power input

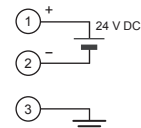
AC power

- 1: AC power supply live line
- 2: AC power neutral line
- 3: Frame ground



DC power

- 1: DC power +
- 2: DC power -
- 3: Frame ground



! Handling Precautions

- Before touching the power input terminal box, shut off the input power.
 - After completing the work, be sure to put the cover on the power input terminal block.
- Note: For power input use crimp terminals for M4 screws (max. width 8.5 mm). Proper tightening torque: 1.4 N·m

■ DI/DO Block (7 digital input/outputs, input/output selectable)

Either digital input or digital output (sink output) can be specified for each of terminals N1 to N7.

In the following wiring example, terminals N1–N4 are used for digital input and N5–N7 are used for digital output.

· : N.C. (Do not connect to this terminal.)

N1 : Digital input 1

N2 : Digital input 2

N3 : Digital input 3

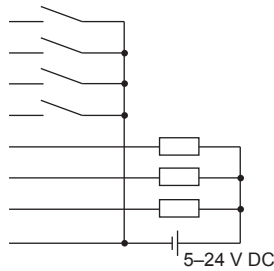
N4 : Digital input 4

N5 : Digital output 5

N6 : Digital output 6

N7 : Digital output 7

V- : COM (common terminal)



■ RS-485 Block

When connecting to the middle of the communication wire

C1 : — DA (+)

C2 : — DA (+)

C3 : — DB (-)

C4 : — DB (-)

C5 : — SG

When connecting to the end of the communication wire

C1 : — DA (+)

C2 : — DA (+)

C3 : — DB (-)

C4 : — DB (-)

C5 : — SG

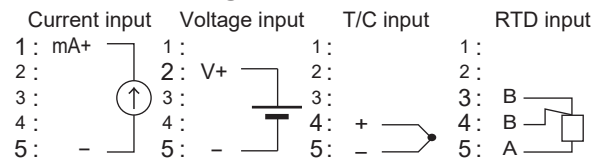
Terminating resistor

C1 and C2, and C3 and C4, are electrically continuous inside the port.

! Handling Precautions

- Connect a terminating resistor (120 Ω , 1/2 W) to both ends of the communication line. If a resistor with leads is used, insert the leads directly without using ferrules. Do not connect a terminating resistor to the middle part of the communication line.
- To connect two terminals together such as SG, use a crimp terminal without an insulation sleeve.

■ AI Block (analog input)



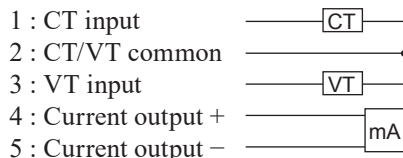
Allowable input voltage

DC current input: -1.5 to +1.5 V

DC voltage input: -15 to +15 V

Thermocouple input: -1.5 to +1.5 V

■ AO-C Block (current outputs / CT, VT inputs)



Maximum allowable input

CT: 90 mA AC and 130 mA peak, 1 V AC and 1.4 V peak

VT: 18 V AC and 26 V peak

Transient overvoltage

CT: supply voltage + 250 V

! Handling Precautions

- If using a current transformer with the UL model of this product, use a UL 2808-certified product in the UL XOBA or XOBA7 category. An uncertified current transformer cannot be used with the UL model.

■ V-P Block (voltage pulse outputs / 2 CT inputs)

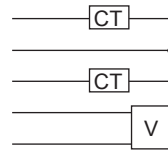
1 : CT1 input

2 : CT common

3 : CT2 input

4 : Voltage pulse output +

5 : Voltage pulse output -



Maximum input

CT: 90 mA AC and 130 mA peak, 1 V AC and 1.4 V peak

Transient overvoltage

CT: supply voltage + 250 V

Load current:

Voltage pulse output: 25 mA max.

! Handling Precautions

- If a current transformer is used for a UL-compliant model, the transformer must be compliant with UL 2808 (categories XOBA and XOBA7). Do not use an uncertified current transformer.

■ DI Block (4 digital inputs)

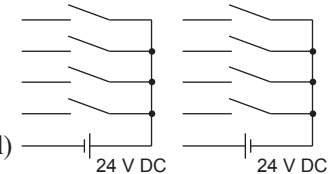
1 : Digital input 1

2 : Digital input 2

3 : Digital input 3

4 : Digital input 4

5 : COM (common terminal)



■ DO Block (4 digital outputs, sink output)

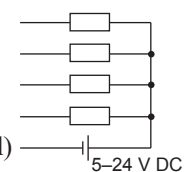
1 : Digital output 1

2 : Digital output 2

3 : Digital output 3

4 : Digital output 4

5 : COM (common terminal)



■ MOTOR Block (motor drive outputs and motor feedback inputs)

1 : OPEN

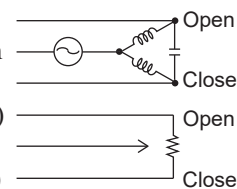
2 : Common

3 : CLOSE

4 : MFB (Y)

5 : MFB (T)

6 : MFB (G)



Contact rating:

For models other than UL-compliant models

2 A, 250 V AC (inductive load)

2.5 A, 24 V DC (inductive load)

For UL-compliant models

2 A, 250 V AC (general use)

FLA: 2A, 240 V AC (100 W)

Potentiometer for motor feedback

100 to 2500 Ω

! Handling Precautions

- UL-compliant models cannot be used at the 24 V DC contact rating.
- For the motor connection, use cables with a rated voltage of 300 V or more and a rated temperature of at least 60 $^{\circ}\text{C}$.

■ Ferrules

For details about the types and sizes of ferrules, see the table below.

Manufacturer: Phoenix Contact

Crimping tool: CRIMPFOX 6

- The use of ferrules to connect the I/O signal lines of this device is recommended.
- If you do not use ferrules, use the following types of wire.

DI/DO, RS-485, AI, AO-C, V-P, DI, DO:

Use 0.2 to 1.5 mm² solid or stranded wire and strip off 8 mm of insulation.

Display unit:

Use 0.2 to 0.5 mm² solid or stranded wire and strip off 6 mm of insulation.

- If using stranded wire, do not solder the end of the wire.

Insert it while pressing the release button straight with a flat-blade screwdriver.

DI/DO, RS-485, AI, AO-C, V-P, DI, DO

Model number	Product number	Cross section area [mm ²]	Notes
AI 0,25-8 YE	3203037	0.25 (24 AWG)	With insulating sleeve
AI 0,34-8-TQ	3203066	0.34 (22 AWG)	With insulating sleeve
AI 0,5-8 WH	3200014	0.50 (20 AWG)	With insulating sleeve
AI 0,75-8 GY	3200519	0.75 (18 AWG)	With insulating sleeve
A1-8	3202517	1.00 (18 AWG)	Without insulating sleeve. For crimping two wires, each 0.5 mm ² (in cross-sectional area), together
A1,5-7	3200263	1.50 (16 AWG)	Without insulating sleeve. For crimping two wires, each 0.75 mm ² (in cross-sectional area), together
AI-TWIN 2x0, 5-8 WH	3200933	0.50 (20 AWG)	With insulating sleeve. For crimping two wires, each 0.5 mm ² (in cross-sectional area), together
AI-TWIN 2x0, 75-8 GY	3200807	0.75 (18 AWG)	With insulating sleeve. For crimping two wires, each 0.75 mm ² (in cross-sectional area), together

MOTOR

Model number	Product number	Cross sectional area [mm ²]	Notes
AI0,75-8 BU	3200027	0.75 (18 AWG)	With insulating sleeve
AI1-8 RD	3200030	1.00 (18 AWG)	With insulating sleeve
AI1,5-8 RD	3201136	1.50 (16 AWG)	With insulating sleeve
AI2,5-10 BU	3202533	2.00 (14 AWG)	With insulating sleeve

HMI (display unit)

Model number	Product number	Cross sectional area [mm ²]	Notes
AI 0,25-6 YE	3203024	0.25 (24 AWG)	Without insulating sleeve When connecting an external power supply to the terminal block of display unit.

■ USB connection

Connect the device to the PC using a USB-MicroUSB cable (type A/B).

Note

- Use a data communication cable.

■ Inserting/removing micro SD Memory Card

To insert the card, push it all the way in. To eject the card, press it slightly.

Handling Precautions

- Do not insert or remove the card while the indicator near the connector is on.
- To avoid danger, shut off the power supply before inserting/removing a microSD because it is located near the power supply terminal.

■ LAN Cable for Ethernet

Use a LAN cable of Cat5E or higher for connection.

■ Connecting Main Unit and Display Unit

● For standard installation and additional display unit (cable length: less than 30 m)

Use a Cat5E or higher straight LAN cable to connect them. (Cat5E, T568A or T568B wiring, both ends RJ45 plug (8P8C modular))

Note 1. The main unit and display unit cannot be connected with a 4-core LAN cable.

- If the length of the cable between the main unit and the display unit is from 30 m to 100 m, an external power source must be connected for the display.

➞ the *User's Manual for C7G Multi-loop Controller with Multifunction Display*, No.CP-SP-1402E, (see Relevant USER'S Manual) for details.

● Wiring for integrating installation

Insert the ferrules (part of the cable for integrated mounting supplied with the product) with the specified colors into the terminal block of the display unit.

- | | |
|-----------------|----------------|
| 1: White/orange | 4: White/green |
| 2: Blue | 5: Green |
| 3: White/blue | 6: Brown |

Operation Check

When the power is turned on after connecting the main unit and display unit, the display turns on. The screen first displayed after power-on is called the initial screen.

- Display change button: Switches displays
- HOME button: Returns to the initial screen
- MENU/Key lock button: Displays a menu. Pressing the button for four seconds or longer leads to a key lock status in which only disabling of the key lock can be performed. Pressing the button for four seconds or longer again disables the key lock.

Troubleshooting

■ Model Number and Serial Number

Model number and serial number are printed on the front of the upper part of the main unit. Please refer to them when making an inquiry.

■ Handling Problems in Installation

First, check the following regarding wiring:

- Connectors are securely inserted into the ports.
- Connectors are inserted into the right ports.
- Wires are properly connected to the power terminal block.


● Power is not turned on

Status	Countermeasures
The status indicator on the main unit is off.	Check the the power input connections and voltage.
The status indicator on the main unit is lit green or the power indicator on the display unit is off.	Standard mounting: Check the LAN cable (8-core straight). Check the connectors. Integrated mounting: Check if the wiring on the back of the display unit is correct. Check connectors on the main unit.
The power indicator on the display unit is lit green and the LCD remains black.	There may be a problem with the device. Please contact us.
The status indicator on the main unit is lit red.	There may be a problem with the device. Please contact us.

● Blurry images on display

A thin protective film is sealed on the display to protect the product label in transportation. Remove the protective film. If it is hard to remove the film, use cellophane tape.

● Occurrence of an alarm

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