MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

AZBIL

C45A2A1C000300

DIGITAL INDICATING TEMPERATURE CONTROLLER

Used with the applicable SDC45A configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Azbil SDC45A/46A specification CP-SS-1840E-08; C45A ordering guide and general specifications

Single Loop Controller

Model C45A/C46A

Overview

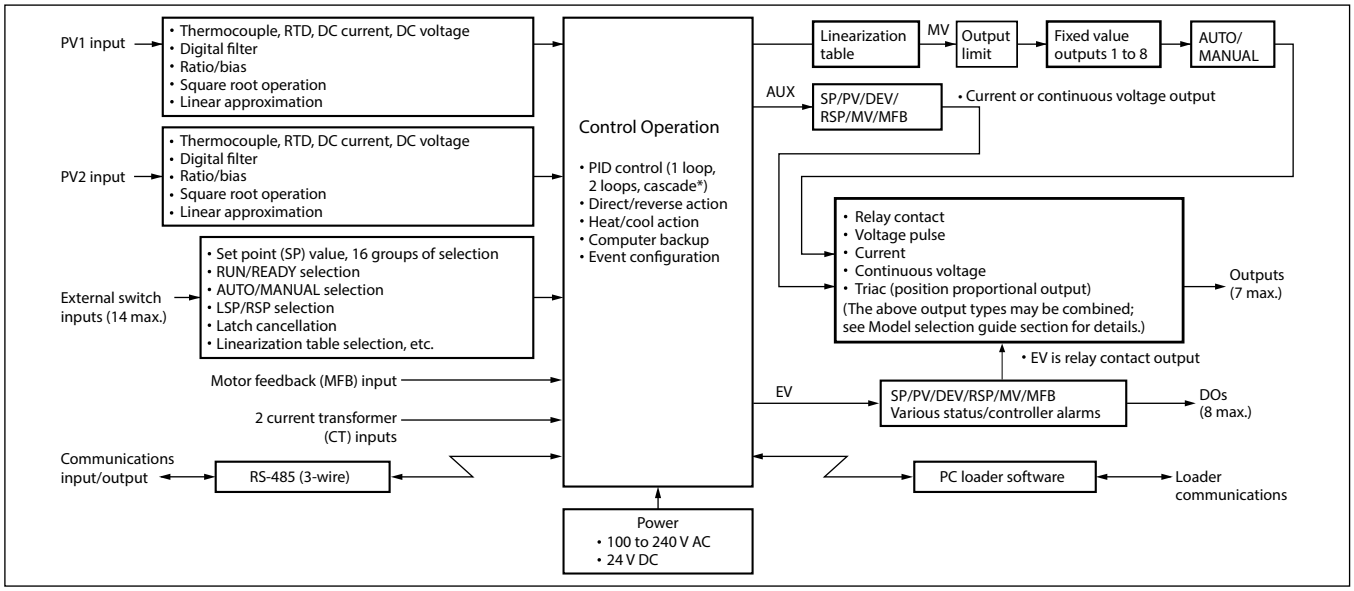
The C45A/C46A (hereafter C45A or C46A) is a highly advanced, high-precision compact single loop controller, featuring dual 5-digit indicators, an input sampling cycle of 25 ms, indication accuracy of ±0.1 % of reading, and up to 2 control loops. It offers PID control using the latest "RationaLOOP" algorithms.
Up to seven control outputs (depending on the model) are available, selectable from relay contact, voltage pulse, triac (for position proportional output), current, continuous voltage, and transmitter power (24 V DC).
Additionally, the controller can be configured with as many as 14 digital inputs (DIs) and 8 digital outputs (DOs). A mode change function to handle automatic equipment operation, a variety of alarms, and various status outputs are provided to support safe operation. Easy
setup and monitoring from a PC are available using the Smart Loader Package.



Features

- Control, ranging from cascade to backup control, is available for 1 or 2 loops.
- High-speed 25 ms sampling cycle and accuracy of ±0.1 % rdg.
- Ample room for indication of vital information on dual 7-segment, 5-digit LED displays and an auxiliary 11-segment, 3-digit LED display
- Full multi-range input, allowing input type to be freely changed between thermocouple, RTD, current and volt-age
- Heat/cool control, using two control outputs
- Using the optional transmitter power supply function, a pressure transmitter can be directly connected.
- IP65 protection for the front panel
- Up to 16 recipe settings involving SP, event settings, etc., and 8 groups of fixed-value control output settings support automatic operation of equipment.
- Support for nonlinear processes using input/output broken line linear approximation tables
- Customizable parameter keys and LED
- A variety of inputs and outputs
- 2 inputs, 7 outputs, 14 DIs, 8 DOs, 2 CT inputs, RS-485 communications
- RoHS-compliant

Basic function block of model C45A/C46A



Specifications

Analog input	Input type	Full multi-range input: thermocouple, RTD, DC current and DC voltage
	Input sampling time	25 ms, 50 ms, 100 ms, 300 ms (according to the setting)
	Input bias current (under standard conditions)	Thermocouple input: DC voltage (mV-range) input: 0.2 µA (flowed out from the positive (+) terminal.) When the thermocouple/mV input burnout setup is set at "upscale at burnout": 0.05 µA (flowed out from the positive (+) terminal or flowed into the positive (+) terminal) When the thermocouple/mV input burnout setup is set at "unknown at burnout." DC voltage (V-range) input: 1 µA max. (flowed out from the positive (+) terminal or flowed into the positive (+) terminal) Each of 0 to 1 V and -1 to +1 V ranges 5 µA max. (flowed into the positive (+) terminal.) Each of 1 to 5 V and 0 to 5 V ranges 10 µA max. (flowed into the positive (+) terminal.) 0 to 10 V range
	Input impedance	Thermocouple input: 1 MΩ min. DC voltage input: 1 MΩ min. DC current input: 110 Ω max.
	Measuring current	RTD input: 1 mA ± 0.02 mA Flowed out from the terminals A and C to the terminal B.
	Influence of wiring resistance (under standard conditions)	RTD input: 0.02 °C/Ω max., wiring resistance is 85 Ω max.
	Allowable wiring resistance	RTD input: 85 Ω max. including the Zener barrier resistance per RTD.
	Allowable input voltage	Thermocouple input: -1.0 to +3.5 V DC voltage (mV-range) input: -1.0 to +2.5 V DC voltage (V-range) input: -10 to +25 V DC current input: -1 to +4 V
	Burnout indication	Varies with input range
	Cold junction compensation accuracy	±0.5 °C (under standard conditions) ±1.0 °C Ambient temperature, 0 to 50 °C (under other standard conditions)
	Cold junction compensation method	Internal/external (0 °C only) compensation selectable
	Scaling	-19999 to +32000U (Linear DC voltage/current input only. Reverse scaling and decimal point repositioning available. Effective resolution depends on the range.)
Indicators and configuration	PV, SP indication	5-digit, 7-segment LED. PV: green or orange (depending on the model) upper display. SP: lower orange display.
	Auxiliary indication	3-digit, 11-segment orange LED
	Multi-status indicator	12-segment LED, green or orange (depending on the model). Displays status of control output, alarm, RUN/READY, etc.
	No. of status displays	C45A: 17, C46A: 19 LED displays
	Operation keys	C45A: 11, C46A: 13 rubber keys
	Number of local set points	16 groups
	Memory storage system	EEPROM
	Indicating range	-19999 to +32000U (or to the SP limit, if it is set)
	SP limits	Lower limit: -19999 to upper limit value. Upper limit: lower limit value to 32000U.
	SP ramp	0.0 to 3200.0 s, min, or h (both up- and down-ramp), Disabled if 0.0 is selected.
	Input readout accuracy	±0.1% FS ±1 digit (depending on the range; see Table 1)
	Indicating range	See Table 1
Digital input (DI)	Number of inputs	C45A: 10 max. C46A: 14 max.
	Types of connectable outputs	Dry contact or transistor (sink type)
	Open terminal voltage	7 V DC±15 % (under standard conditions)
	Terminal current (during short-circuit)	3 to 7 mA
	Allowable ON contact resistance	500 Ω max.
	Allowable OFF contact resistance	100 kΩ min.
	Allowable open-collector ON-state residual current	1.5 V or less (under standard conditions)
	Allowable open-collector OFF-state leakage current	0.1 mA max.
	Computation cycle	25 ms, 50 ms, 100 ms, 300 ms (depending on the setting)
	Min. detection holding time	2 times the input sampling cycle
	Assignable functions	RUN/READY, AUTO/MANUAL, REMOTE/LOCAL, auto tuning start/stop, control action direct/reverse selection, SP group/recipe group selection, fixed value outputs 1 to 8 selection, linear approximation table selection, computer backup selection

Control	PID control	Proportional band (P)	0.1 to 3200.0 %
		Integral time (I)	0 to 32000, 0.0 to 3200.0, 0.00 to 320.00 seconds
		Derivative time (D)	0 to 32000, 0.0 to 3200.0, 0.00 to 320.00 seconds
		MV limit	Lower limit: -10.0 to upper limit % Upper limit: lower limit to +110.0 %
		Manual reset	-10.0 to +110.0 %
		Number of PID groups	16
		PID group selection	By console or DI
		MV change limit	0.00 to 320.00 %/s, no limit at 0.0 %
		Auto tuning	Automatic PID value setting by limit cycle method. Additionally, one of the following 3 control characteristics can be selected: • Standard • Quick disturbance response • Less up/down fluctuation
		Position proportional dead zone	0.5 to 25.0 %
		Heat/cool dead zone	-100.0 to +100.0 %
	Direct/reverse action selection	Available	
Output	Relay contact, form 1a (outputs 1 & 2)	Contact rating: 250 V AC/30 V DC, 1 A (resistive load) Contact voltage: 250 V AC or less / 30 V DC or less Service life: 100,000 cycles or more (rated load) Min. switching specifications: 10 mA/5 V DC	
	Relay contact, form 1a1b (outputs 1 & 2)	Contact rating: 250 V AC/30 V DC, 3 A (resistive load) Contact voltage: 250 V AC or less / 30 V DC or less Service life: 100,000 cycles or more (rated load) Min. switching specifications: 100 mA/5 V DC	
	Relay contact, form 1a (outputs 3 to 5)	Contact rating: 250 V AC/30 V DC, 3 A (resistive load) Contact voltage: 250 V AC or less / 12 DC or less Service life: 100,000 cycles or more (rated load) Min. switching specifications: 100 mA/5 V DC	
	Triac (outputs 3 & 4, position proportional output)	Compatible motors: ECM3000F1_ _ _ (100 V AC, relay contact input)	
	Motor drive relay	Contact configuration: 1a (output 3) + 1a (output 4) Contact rating: 2 A 250 V AC max./cosf=0.4) 2.5 A 24 V DC (L/R=0.7 ms) Contact voltage: 250 V AC max./125 V DC max. Life: Min. 100,000 operations (rated load) Min. switching specifications: 40 mA/24 V DC	
	Current (outputs 3 to 7)	Output current: 4 to 20 mA DC (2.4 to 21.6 mA DC) 0 to 20 mA DC (0.0 to 22.0 mA DC) Load resistance: 600 Ω or less Output accuracy: ±0.1 % FS or less (under standard conditions) Output resolution: 1/15000 or more (in the 0 to 20 mA DC FS range) Voltage (open): 23 V DC or less	
	Voltage pulse	Output voltage: 12 V DC+15 %/-10 % Load current: 30 mA or less	
	Continuous voltage	Output voltage: 0 to 5 V DC (0.0 to 5.5 V DC) 1 to 5 V DC (0.6 to 5.4 V DC) 0 to 10 V DC (0.0 to 11.0 V DC) Load resistance: 1 kΩ or more Load limit current: 21 mA (standard value under standard conditions) Output accuracy: ±0.1 % FS or less (under standard conditions) Output resolution: 1/20000 or more (for 0 to 10 V)	
	Transmitter power supply function	Output voltage: 24 V DC±10% Load current: 30 mA or less Load limit current: 45 mA (standard value under standard conditions)	

Digital output (DO)	Event types (assignable to relay output)	PV direct, PV reverse, deviation direct, deviation reverse, absolute value deviation direct, absolute value deviation reverse, MV direct, MV reverse, RSP direct, RSP reverse, SP direct, SP reverse, sum of all alarms, PV range alarm, controller alarm, manual status, READY status, local status, auto tuning execution	
	Settable ranges	PV (direct, reverse): -19999 to +32000U RSP (direct, reverse): -19999 to +32000U Deviation (direct, reverse): -19999 to +32000U Absolute value deviation (direct, reverse): 0 to +32000U MV (direct, reverse): -10.0 to +110.0 %	
	Operation differential (hysteresis) setting range	0 to 200U (except MV, MFB event, process alarm) 0.0 to 20.0 % for MV, MFB event, process alarm	
	ON delay time	0.1 to 3200.0 seconds	
	Output operation	ON/OFF action, latch action	
	Output rating	Output type: Transistor (sink type) Load resistance: 4.5 to 28 V DC Load current: 70 mA/output max. 500 mA/all outputs max.	
Auxiliary output	Number of outputs	4 max. assignable	
	Output types	PV, SP, DEV, RSP, MV, MFB, etc. can be selected	
	Output method	Current or continuous voltage	
Communications	Communications system	Protocol	RS-485
		Network	Multidrop. Slave station only. Connect up to 31 units.
		Data flow	Half-duplex
		Synchronization method	Start/stop synchronization
	Interface	Transmission system	Balance (differential) type
		Transmission type	Bit serial
		Transmit/receive lines	3
		Speed	4800, 9600, 19200, 38400 bps
		Distance	500 m max.
		Protocol	RS-485 (3-wire type)
	Message characters	Character configuration	9 to 12 bits/character
		Data length	7 or 8 bits
		Stop bit length	1 or 2 bits
		Parity bit	Even parity, odd parity, or non-parity
PC loader	Communications line	3-wire type	
	Communications speed	38400 bps (fixed)	
	Recommended cable	Dedicated cable	
Current transformer (CT) input	Number of inputs	2	
	Detection function	When control output is ON: heater line break or overcurrent detection When control output is OFF: final control device short circuit detection	
	Input device	Current transformer (sold separately), 800 turns • QN212A, 5.8 mm dia. hole • QN206A, 12 mm dia. hole	
	Input range	AC 0.0 to 50.0 A	
	Measurement current range	0.0 to 55.0 Aac (accuracy may be out of specifications for less than 0.4 Aac.)	
	Indication accuracy	±3 %FS ±1 digit (50/60 Hz, when measuring the sine wave)	
	Indication resolution	AC 0.1 A	
General specifications	Memory backup	EEPROM	
	Power	AC100 to 240 V (100 to 240 V AC power model) DC24V (24 V DC power model)	
	Power consumption	30 VA max. (C45A: 100 to 240 V AC power model) 40 VA max. (C46A: 100 to 240 V AC power model) 12 W max. (C45A: 24 V DC power model) 15 W max. (C46A: 24 V DC power model)	
	Power ON inrush current	35 A max./10 ms max. (100 to 240 V AC power model) 20 A max./10 ms max. (24 V DC power model)	
	Power ON operation	Reset time: 6 s max. (time until normal operation starts under standard conditions)	
	Allowable transient power loss	20 ms min.	
	Insulation resistance	20 MΩ or more between power supply terminal 1 or 2 and FG terminal 3 (500 V DC megger)	
	Dielectric strength	1500 V AC for 1 min (100 to 240 V AC power model), 500 V AC for 1 min (24 V DC power model) • Between power supply terminal 1 or 2 or FG terminal 3 and secondary terminal • Between power supply terminal 1 or 2 and FG terminal 3	

General specifications	Standard conditions	Ambient temperature	23±2 °C
		Ambient humidity	60±5 % RH
		Power voltage	105 V AC ± 1 % (100 to 240 V AC power model) 24 V DC ± 5 % (24 V DC power model)
		Power frequency	50±1 Hz or 60±1 Hz (100 to 240 V power model)
		Vibration resistance	0 m/s^2
		Shock resistance	0 m/s^2
		Mounting angle	Reference plane ±3°
		Clear space	100 mm min. vertically and horizontally
	Operating conditions	Ambient temperature	0 to 50 °C
		Ambient humidity	10 to 90 % RH (without condensation)
		Power voltage	85 to 264 V AC (100 to 240 V AC power model), 21.6 to 26.4 V DC (24 V DC power model)
		Power frequency	50±2 Hz or 60±2 Hz (100 to 240 V AC power model)
		Vibration resistance	0 to 2 m/s^2 (10 to 60 Hz for 2 h each in X, Y, and Z directions)
		Shock resistance	0 to 10 m/s^2
		Mounting angle	Reference plane ±10°
		Altitude	2000 m max.
		Clear space	50 mm min. above and below
	Transportation conditions	Ambient temperature	-20 to +70 °C
		Ambient humidity	10 to 95 % RH (without condensation)
		Vibration resistance	0 to 5 m/s^2 (10 to 60 Hz for 2 h each in X, Y, and Z directions)
		Shock resistance	0 to 500 m/s^2 (3 times each in X, Y, and Z directions)
	Front panel protection	IP65 (under operating conditions)	
	Console and case material	PPO, Modified PPE	
	Console and case color	Black	
	Standards compliance	EN61010-1, EN61326-1 (For use in industrial locations) During EMC testing, the reading or output may fluctuate by ±10 %FS. UL61010-1, CAN/CSA C22.2 No.61010-1 *1	
	Overvoltage category	Category II (IEC60364-4-443, IEC60664-1)	
	Mounting	Panel mounted (with dedicated mounting bracket)	
	Mass	C45A: Approx. 400 g (including dedicated mounting bracket) C46A: Approx. 700 g (including dedicated mounting bracket)	

Accessories (included)	**Part name**	**Model**	**Optional parts (sold separately)**	**Part name**	**Model**
	Mounting brackets (2)	81405411-004		Mounting brackets (2)	81405411-003
	Gasket	81421863-001 (for C45A)		Current transformer	QN206A (5.8 mm dia. hole)
		81421864-001 (for C46A)			QN212A (12 mm dia. hole)
	User's manual	CP-UM-5445E		Hard cover	81441421-001 (for C45A)
					81441422-001 (for C46A)
				Terminal cover	81441420-001 *2

*1: Depends on the model.

*2: 1 for C45A, 2 for C46A

Table 1. Input types and ranges

Input type	Pv-01	Sensor type	Range		Accuracy
Thermocouple	1	K	-270.0 to +1372.0 °C	-454 to +2502 °F	±0.1 % rdg. ±1 digit *1
	2	E	-270.0 to +1000.0 °C	-454 to +1832 °F	±0.1 % rdg. ±1 digit *2
	3	J	-200.0 to +1200.0 °C	-328 to +2192 °F	±0.1 % rdg. ±1 digit *3
	4	T	-270.0 to +400.0 °C	-454 to +752 °F	±0.5 °C *4
	5	B	0.0 to 1800.0 °C	32 to 3272 °F	±2.0 °C *5
	6	R	-50.0 to +1768.0 °C	-58 to +3214 °F	±0.1 % rdg. ±1 digit *6
	7	S	-50.0 to +1768.0 °C	-58 to +3214 °F	±0.1 % rdg. ±1 digit *6
	8	W (WRe5-26)	0.0 to 2300.0 °C	32 to 4172 °F	±0.1 % rdg. ±1 digit *7
	9	PR40-20	0.0 to 1900.0 °C	32 to 3452 °F	±8.0 °C *8
	10	Ni-NiMo	0.0 to 1300.0 °C	32 to 2372 °F	±1.4 °C
	11	N	-200.0 to +1300.0 °C	-328 to +2372 °F	±1.4 °C *9
	12	PL II	0.0 to 1390.0 °C	32 to 2534 °F	±1.4 °C
	13	DIN U	-200.0 to +600.0 °C	-328 to +1112 °F	±0.7 °C *10
	14	DIN L	-200.0 to +900.0 °C	-328 to +1652 °F	±1.0 °C *11
	15	Gold-iron/Chromel	-273.0 to +27.0 °C	-459 to +80 °F	±1.5 °C
RTD	21	Pt100	-200.0 to +850.0 °C	-328.0 to +1562.0 °F	±0.3 °C
	22		-200.00 to +300.00 °C	-328.00 to +572.00 °F	±0.15 °C
	31	JPt100	-200.0 to +640.0 °C	-328.0 to +1184.0 °F	±0.3 °C
	32		-200.00 to +300.00 °C	-328.00 to +572.00 °F	±0.15 °C
Linear (DC voltage /current)	41	Current	4 to 20 mA		±0.1 % FS ±1 digit
	42		0 to 20 mA		±0.1 % FS ±1 digit
	43	Voltage	0 to 10 mV		±0.1 % FS ±1 digit
	44		-10 to +10 mV		±0.1 % FS ±1 digit
	45		0 to 100 mV		±0.1 % FS ±1 digit
	46		-100 to +100 mV		±0.1 % FS ±1 digit
	47		0 to 1 V		±0.1 % FS ±1 digit
	48		-1 to +1 V		±0.1 % FS ±1 digit
	49		1 to 5 V		±0.1 % FS ±1 digit
	50		0 to 5 V		±0.1 % FS ±1 digit
	51		0 to 10 V		±0.1 % FS ±1 digit

*1: At 400 °C or higher.
±0.5 °C (-100 to less than +400 °C)
±1.0 °C (-200 to less than -100 °C)
±20.0 °C (Less than -200 °C)

*2: At 400 °C or higher.
±0.5 °C (-100 to less than +400 °C)
±1.0 °C (-200 to less than -100 °C)
±15.0 °C (Less than -200 °C)

*3: At 400 °C or higher.
±0.5 °C (-100 to less than +400 °C)
±1.0 °C (Less than -100 °C)

*4: At -100 °C or higher.
±1.0 °C (-200 to less than -100°C)
±10.0 °C (Less than -200 °C)

*5: At 800 °C or higher.
±4.0 °C (260 to less than 800 °C)
±70 °C (Less than 260 °C)

*6: At 1000 °C or higher.
±2.0 °C (0 to less than 1000 °C)
±4.0 °C (Less than 0 °C)

*7: At 1400 °C or higher.
±1.5 °C (Less than 1400 °C)

*8: At 800 °C or higher.
±20.0 °C (300 to less than 800 °C)
±40.0 °C (Less than 300 °C)

*9: At 0 °C or higher.
±4.0 °C (Less than 0 °C)

*10: At 0 °C or higher.
±1.0 °C (Less than 0 °C)

*11: At 0 °C or higher.
±1.5 °C (Less than 0 °C)

■ Standards for input sensors

● Thermocouple

K, E, J, T, B, R, S, N: JIS C 1602-1995
WRe5-26: ASTM E988-96
PR40-20: ASTM E1751-00
Ni-NiMo: ASTM E1751-00
PL II: ASTM E1751-00
DIN U, DIN L: DIN 43710-1985
Gold-iron/Chromel: ASTM E1751-00

● RTD

Pt 100, JPt 100: JIS C 1604-1989

■ Model C45A selection guide

● Choose the appropriate type of model number:

- **Detailed model number**
  Specifications required for a particular application can be selected in detail, allowing purchase of the optimal device (especially useful for equipment manufacturers).
- **Combined function model number**
  Easy selection from premade combinations of required functions. Selections have multiple I/Os, so these devices can be used flexibly for a variety of application requirements (especially useful for engineering manufacturers and factory maintenance staff).

● Detailed model No.

I | II | III | IV | V | VI | VII | VIII | IX | X **Ex.: C45A1A1C000000**

I	II	III	IV	V	VI	VII	VIII	IX	X	Descriptions
Basic model	Inputs	Power	Outputs 1 and 2	Outputs 3 and 4	Output 5	Outputs 6 and 7	Options	Additional features 1	Additional features 2	
C45A										Standard model
	1									1 full multiple input
	2									2 full multiple inputs
		A								100 to 240 V AC
		D								24 V DC [*3]
			1							1a1b relay: 1
			2							1a relay: 2
				C0						Current (OUT3)
				D0						Continuous voltage (OUT3)
				V0						Voltage pulse (OUT3)
				RR						1a relay + 1a relay
				CC						Current + current
				VV						Voltage pulse + voltage pulse
				CV						Current (OUT3) + voltage pulse (OUT4)
				SS						Motor drive (triac), MFB input: 1
					0					None
					R					1a relay
					C					Current
					D					Continuous voltage
					P					Power supply for signal transmitter
						0				None
							0			DI: 2 (terminals F1 and F2) [*1]
							1			DI: 10 [*2]
							2			DI: 2, DO: 8 [*1]
							3			DI: 2, DO: 8, RS-485 [*1]
							4			CT input: 2 [*3]
							5			CT input: 2, DI: 8 [*3]
							6			CT input: 2, DO: 8 [*3]
							7			CT input: 2, DO: 8, RS-485 [*3]
								0		None
								D		With inspection data
								Y		With traceability certification
									0	None
									1	Orange color for all LEDs
									A	UL-marked product
									B	UL-marked product, orange LEDs only

*1 When "SS" is selected for outputs 3 and 4, DI: 0.
*2 When "SS" is selected for outputs 3 and 4, DI: 8.
*3 When "SS" is selected for outputs 3 and 4, this option code is not selectable.

* Additionally, tropicalization and anti-sulfidation treatments can be ordered. However, there are some specifications restrictions. For details, contact the azbil Group.

● Combined function model No. (with orange LEDs for all displays; power: 100 to 240 V AC)

I | II | III | IV **Ex.: C45A000**

I	II	III	IV	Descriptions
Basic model No.	Set No.	Option 1	Option 2	
C45A				Standard model, with 2 alarm outputs
	0			(Reserved for future use)
		0		Regular type 1: Plus 1 current output, 2 relay outputs, and 2 DIs
		1		Regular type 2: Plus 1 current output, 1 voltage pulse output, 1 relay output, and 2 DIs
		2		Position proportion type: Plus 1 relay output, and 2 triac outputs
		3		Regular type 3: Plus 2 current outputs, transmitter power supply (24 V), and 2 DIs
		4		Position proportion type 2: Plus transmitter power supply (24 V), and 2 triac outputs
			0	None
			1	RS-485 communications, PV input 2, 8 DOs
			2	PV input 2, 8 DOs
			3	8 DOs
			4	PV input 2

■ Model C46A selection guide

● Choose the appropriate type of model number:

- **Detailed model number**
  Specifications required for a particular application can be selected in detail, allowing purchase of the optimal device (especially useful for equipment manufacturers).
- **Combined function model number**
  Easy selection from premade combinations of required functions. Selections have multiple I/Os, so these devices can be used flexibly for a variety of application requirements (especially useful for engineering manufacturers and factory maintenance staff).

● Detailed model No.

I | II | III | IV | V | VI | VII | VIII | IX | X **Ex.: C46A1A1C000000**

I	II	III	IV	V	VI	VII	VIII	IX	X	Descriptions
Basic model	Inputs	Power	Outputs 1 and 2	Outputs 3 and 4	Output 5	Outputs 6 and 7	Options	Additional features 1	Additional features 2	
C46A										Standard model
	1									1 full multiple input
	2									2 full multiple inputs
		A								100 to 240 V AC
		D								24 V DC [*4]
			1							1a1b relay: 1
			2							1a relay: 2
				C0						Current (OUT3)
				D0						Continuous voltage (OUT3)
				V0						Voltage pulse (OUT3)
				RR						1a relay + 1a relay
				CC						Current + current
				VV						Voltage pulse + voltage pulse
				CV						Current (OUT3) + voltage pulse (OUT4)
				SS						Motor drive triac, MFB input: 1
				R1						Motor drive relay, MFB input: 1
					0					None [*4]
					R					1a relay [*4]
					C					Current [*4]
					D					Continuous voltage [*4]
					P					Power supply for signal transmitter [*4]
						0				None
						1				Current (OUT6)
						2				Power supply for signal transmitter (OUT7)
						3				Current + current [*1]
						4				Current (OUT6) + power supply for signal transmitter (OUT7)
							0			DI: 2 (terminals F1 and F2) [*2]
							1			DI: 14 [*3]
							2			DI: 14, DO: 8 [*3]
							3			DI: 14, DO: 8, RS-485 [*3]
							4			CT input: 2 [*4]
							5			CT input: 2, DI: 12 [*4]
							6			CT input: 2, DI: 12, DO: 8 [*4]
							7			CT input: 2, DI: 12, DO: 8, RS-485 [*4]
								0		None
								D		With inspection data
								Y		With traceability certification
									0	None
									1	Orange color for all LEDs
									A	UL-marked product
									B	UL-marked product, orange LEDs only

*1 When "CC" is selected for outputs 3 and 4, and "C" for output 5, this code 3 is not selectable.
*2 When "SS" or "R1" is selected for outputs 3 and 4, DI: 0.
*3 When "SS" or "R1" is selected for outputs 3 and 4, DI: 12.
*4 When "SS" or "R1" is selected for outputs 3 and 4, this option code is not selectable.

* Additionally, tropicalization and anti-sulfidation treatments can be ordered. However, there are some specifications restrictions. For details, contact the azbil Group.

● Combined function model No. (with orange LEDs for all displays; power: 100 to 240 V AC)

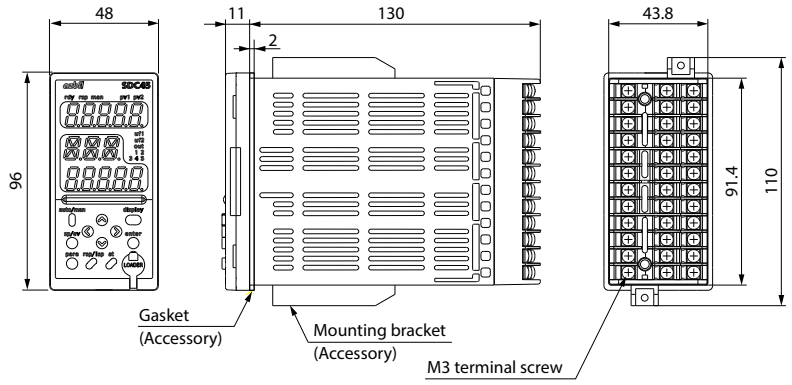
I	II	III	IV	Ex.: C46A000

I	II	III	IV	Descriptions
Basic model No.	**Set No.**	**Option 1**	**Option 2**	
C46A				Standard model, with 1 current output and 2 alarm outputs
	0			(Reserved for future use)
		0		Regular type 1: Plus 1 current output, 2 relay outputs, and 2 DIs
		1		Regular type 2: Plus 1 current output, 1 voltage pulse output, 1 relay output, and 2 DIs
		2		Position proportion type: Plus 1 relay output, and 2 triac outputs
		3		Regular type 3: Plus 2 current outputs, transmitter power supply (24 V), and 2 DIs
		4		Position proportion type 2 : Plus 2 triac outputs, 1 relay output, and transmitter power supply (24 V)
			0	None
			1	RS-485 communications, PV input 2, 12 DIs, 8 DOs
			2	PV input 2, 12 DIs, 8 DOs
			3	2 DIs, 8 DOs
			4	PV input 2

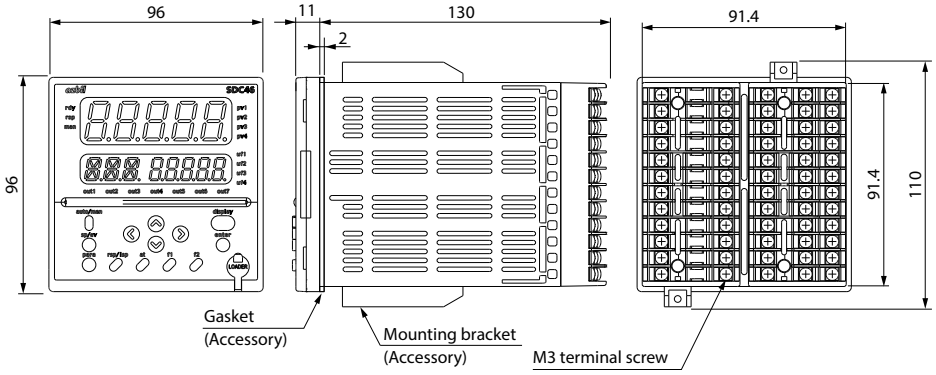
Dimensions

(Unit: mm)

● C45A



● C46A



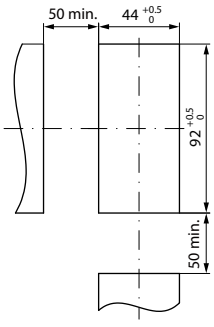
! Handling Precautions

- When fastening this controller onto the panel, tighten the mounting bracket screws until there is no play between the bracket and panel, and then turn one more turn. Overtightening the screws may deform the controller case.

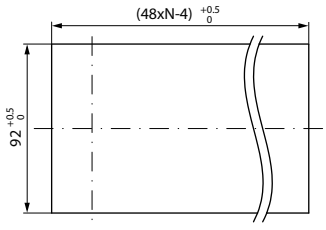
● Panel cutout diagram

• C45A

Stand-alone mounting

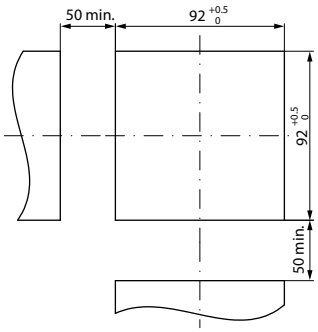


Gang-mounting

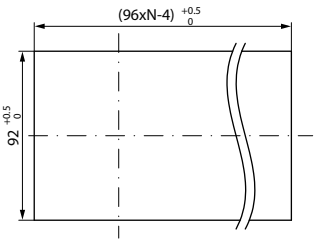


• C46A

Stand-alone mounting



Gang-mounting

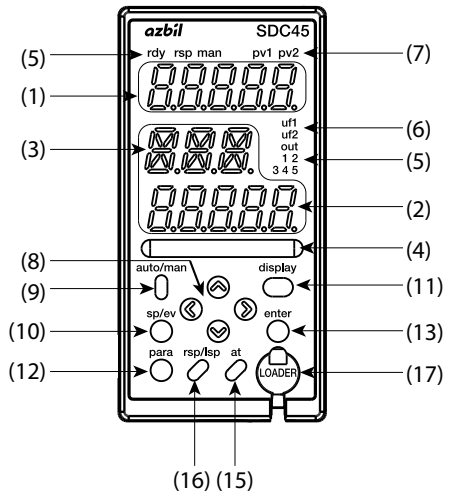


! Handling Precautions

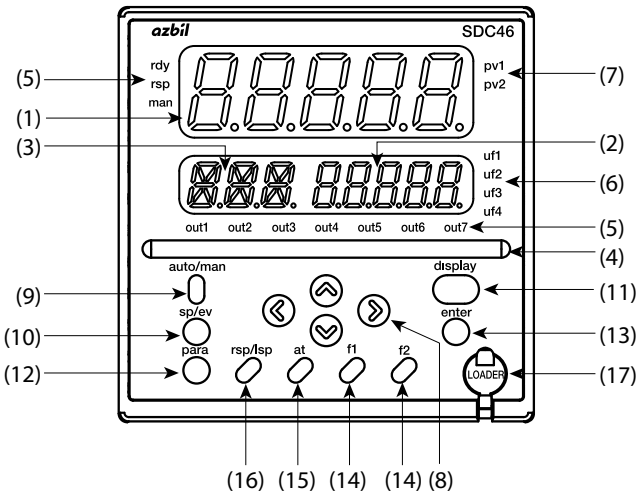
- If three or more units are gang-mounted horizontally, the maximum allowable ambient temperature is 40 °C.

Console parts and functions

● C45A Front Panel



● C46A Front Panel



(1) Upper display: for PV values (present temperature, etc.) or setup items.

(2) Lower display: for SP values (set temperature, etc.) or other parameter values.

(3) Auxiliary display:
Displays group No., loop* No., and channel No. of setup item.
* The series of connections from PV input to PID operation through to control output is generically called a loop.

(4) Multi-status (MS) indicator:
for MV, DI/DO status, etc.

(5) Mode indicator lights
- rdy: Ready
- rsp: Remote setup input
- man: Manual
- out1-7: Control outputs 1-7, (1-5 for C45A)

(6) User function indicators
- uf1-4: Display user-assigned items, (uf1, 2 for C45A)

(7) Loop number indicators
- pv1, pv2: Indicate the loop number of the displayed PV value

(8) ∨, ∧, <, >: Increment numeric values and shift between digits or settable items.

(9) auto/man: Changes AUTO/MANUAL mode.

(10) sp/ev: Selects or sets LOCAL SP or EVENT.

(11) display: Changes the display contents in operation display mode.

(12) para: Changes the setting mode.

(13) enter: Used during setup, especially to finalize the user's selection of a value.

(14) f1-f2: Perform user-assigned functions (C46A only).

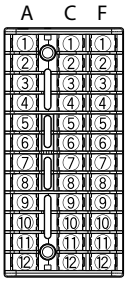
(15) at: For auto-tuning executing/cancellation, or for user-assigned functions.

(16) rsp/lsp: Changes between remote and local set point, or executes user-assigned functions.

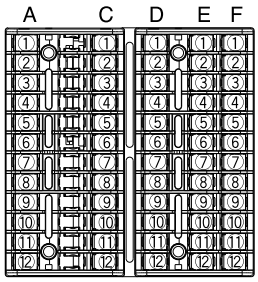
(17) Loader jack: For connection of PC loader cable.

Terminal connections

C45A Back



C46A Back



A (C45A/46A)

Details	
(1) ① ② ③ (2) ① ② ③	Power supply (1) AC power supply 100 to 240 V AC (2) DC power supply 24 V DC (non polar)
(1) ④ 1 ⑤ 2 ⑥ (2) ④ 1 ⑤ 2 ⑥	Outputs 1, 2 (OUT1/OUT2) (1) Relay (1a1b) (2) Relay (1a)
(1) ⑦ ⑧ (2) ⑦ ⑧ (3) ⑦ + − ⑧	Output 3 (OUT3) (1) Relay (2) Triac (3) Current, voltage pulse, continuous voltage
(1) ⑨ ⑩ (2) ⑨ ⑩ (3) ⑨ + − ⑩	Output 4 (OUT4) (1) Relay (2) Triac (3) Current, voltage pulse
(1) ⑪ ⑫ (2) ⑪ + − ⑫	Output 5 (OUT5) (1) Relay (2) Current, continuous voltage, transmitter power supply

A (C46A Motor drive relay model)

Details	
(1) ⑦ 3 ⑧ ⑩ 4	Output 3 (OUT3) (1) Motor
	Output 4 (OUT4) (1) Motor

C (C45A)

Details	
(1) ① C1 ② C2 ③ C3 ④ C4 ⑤ C5 ⑥ C6 ⑦ C7 ⑧ C8 ⑨ (2) ① COM(+) ② C1 ③ C2 ④ C3 ⑤ C4 ⑥ C5 ⑦ C6 ⑧ C7 ⑨ C8	Digital input/output (DI/DO) (1) DI (2) DO
DA ⟷ ⑩ DB ⟷ ⑪ SG ⟶ ⑫	RS-485 communications

C (C46A)

Details	
① C1 ② C2 ③ C3 ④ C4 ⑤	Digital input (DI)
⑥ + ⑦ −	Output 6 (OUT6) Current
⑧ + ⑨ −	Output 7 (OUT7) Current Transmitter power supply
DA ⟷ ⑩ DB ⟷ ⑪ SG ⟶ ⑫	RS-485 communications

D (C46A)

Details	
① D1 ② D2 ③ D3 ④ D4 ⑤ D5 ⑥ D6 ⑦ D7 ⑧ D8 ⑨	Digital input (DI)
⑩ ——	Unused
⑪ ——	
⑫ ——	

E (C46A)

Details	
① COM(+) ② E1 ③ E2 ④ E3 ⑤ E4 ⑥ E5 ⑦ E6 ⑧ E7 ⑨ E8	Digital output (DO)
⑩ ——	Unused
⑪ ——	
⑫ ——	

F (C45A/C46A)

Details	
(1) ① F1 ② F2 ③ (2) ① CT 1 ② CT 2 ③ (3) Y ① T ② G ③	Other input (1) Digital input (DI) (2) Current transformer input (CT) (3) Motor feedback input (MFB)
④ ——	Unused
(1) ⑤ ⑥ − ⑦ + ⑧ (2) ⑤ A ⑥ B ⑦ C ⑧ (3) ⑤ + ⑥ V/mA − ⑦ mV + ⑧	PV input 2 (PV2) (1) Thermocouple (2) RTD (3-wire) (3) DC voltage/ current
(1) ⑨ ⑩ − ⑪ + ⑫ (2) ⑨ A ⑩ B ⑪ C ⑫ (3) ⑨ + ⑩ V/mA − ⑪ mV + ⑫	PV input 1 (PV1) (1) Thermocouple (2) RTD (3-wire) (3) DC voltage/ current

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