CP-UM-5445E

SDC45/46
Digital Indicating Controller
User's Manual
for Installation

Thank you for purchasing the SDC45/46 Digital Indicating Controller.

To ensure correct and safe operation of the SDC45/46, be sure to read and understand this user's manual.

Be sure to keep this manual nearby for handy reference.

RESTRICTIONS ON USE

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment.
Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

NOTICE

Be sure that the user receives this manual before the product is used.

Copying or duplicating this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact Yamatake Corporation.

In no event is Yamatake Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

MANUALS

This manual explains the handling precautions, mounting, wiring, PV range type and main specifications only.

See the separate manuals listed below for detailed handling procedures, setting methods, etc.

These manuals also contain information on using various functions. Please read them as necessary.

• SDC45/46	Displays and Settings	(CP-SP-1265E)
• SDC45A/46A	Installation and Configuration	(CP-SP-1218E)
• SDC45V/46V	Computational Functions	(CP-SP-1275E)
• SLP-C45	Smart Loader Package	(CP-UM-5458E)

Manuals can be downloaded from http://www.yamatake.com.

UNPACKING

Check the following items when removing the SDC45/46 from its package:

Item	Part No.	Qty.	Remarks
Mounting bracket	81405411-004	2	
Gasket (for SDC45)	81421863-001	1	
(for SDC46)	81421864-001	1	
User's manual	CP-UM-5445E	1	This manual
User's manual	CP-UM-5445	1	Japanese
Displays and Settings	CP-UM-5457	1	Japanese

If there is any problem with your order, please contact your sales representative immediately.

SAFETY PRECAUTIONS

WARNING
Warnings are indicated when mishandling this product might result in death or serious injury to the user.

CAUTION
Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to this product.

⚠ WARNING

- Before connecting the SDC45/46 to the measurement target or to external control circuits, make sure that the frame ground (FG) terminal is properly grounded with an earth of less than 100 Ω. Failure to so might cause an electric shock or fire.
- Incorrect wiring of the SDC45/46 can damage the SDC45/46 and lead to other hazards. Check that the SDC45/46 has been correctly wired before turning the power ON.
- Before wiring, removing or mounting the SDC45/46, be sure to turn the power OFF. Failure to do so might cause electric shock or device failure.
- Do not touch electrically charged parts such as the power terminals. Doing so might cause electric shock.
- Do not disassemble the SDC45/46. Doing so might cause electric shock or device failure.

⚠ CAUTION

- Use the SDC45/46 within the operating ranges recommended in the specifications (temperature, humidity, voltage, vibration, shock, mounting direction, atmosphere, etc.). Failure to do so might cause fire or device failure.
- Wire the SDC45/46 properly using the specified types of wire and following recognized installation methods. Failure to do so might cause electric shock, fire or device failure.
- Do not allow wire clippings, chips or water to enter the controller case. They might cause fire or device failure.
- Firmly tighten the terminal screws to the torque listed in the specifications. Insufficient tightening of terminal screws might cause electric shock or fire.
- Do not use unused terminals on the SDC45/46 as relay terminals. Doing so might cause electric shock, fire or device failure.
- We recommend attaching the terminal cover (sold separately) after wiring the SDC45/46. Failure to do so might cause electric shock.
- Use the relays within the recommended service life. Failure to do so might cause fire or device failure.
- Use Yamatake Corporation's SURGENON if there is a risk of power surges caused by lightning. Otherwise fire or device failure could result.
- Do not block ventilation holes. Doing so might cause fire or device failure.
- Do not operate the keys with a mechenical pencil or other sharp-tipped object. Doing so might cause device failure.
- After the power has been turned ON, the SDC45/46 does not operate for 2 to 60 s according to the settings. There-fore, great care should be taken if the relay output from the controller is used as an interlock signal.
- Dispose of the battery appropriately, following local regulations.

MOUNTING

■ Location

Install the controller in a location that meets the following criteria:

- Voltage to ground of 33 V r.m.s max., 46.7 V peak max., and 70 Vdc max.
- No high/low temperature/humidity.
- Free from sulfide gas or corrosive gas.
- Not dusty or sooty.
- Protected from direct sunlight, wind, and rain.
- Little mechanical vibration or shock.
- Not close to high voltage line, welding machine or other electrical noise generating source.
- At least 15 meters away from the high voltage ignition device for a boiler.
- No strong magnetic fields.
- No flammable liquid or gas.

■ Mounting procedure

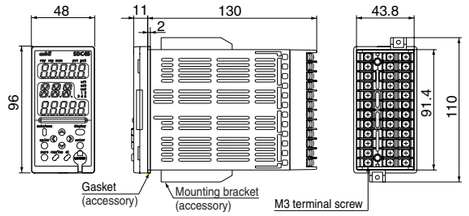
- Mount horizontally with the back not tilted more than 10 ° up or down.
- The mounting panel should be rigid and no more then 7 mm thick (5 mm max. when a gasket is used).

! Handling Precautions

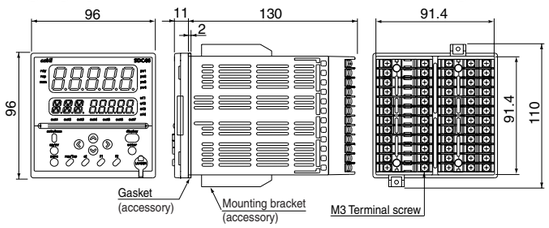
- When used as a waterproof unit, be sure to install a gasket.

■ External dimensions

• **SDC45** Unit: mm



• **SDC46** Unit: mm

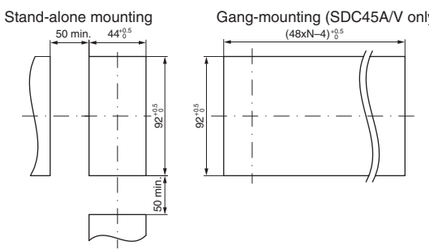


! Handling Precautions

- To fasten 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 full turn. Excessively tightening the screws may deform the controller case.

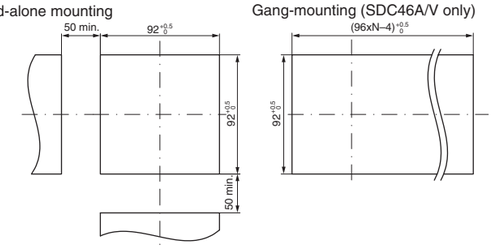
■ Panel cutout dimensions

• **SDC45** Unit: mm



• **SDC46** Unit: mm

Stand-alone mounting / Gang-mounting (SDC46A/V only)



! Handling Precautions

- For waterproof or dustproof use, be sure to mount with the stand-alone mounting method.
- Mount the SDC45R/46R with the stand-alone mounting method only.
- When three or more units are gang-mounted horizontally, the maximum allowable ambient temperature is 40 °C.
- Provide a space of at least 50 mm or more above and below the controller.

WIRING

Be sure to provide a switch within operator reach for shutting off the main power supply to the controller in the main supply wiring.
Also, in case of AC power supply models, the main supply wiring also requires a time-lagged (T) fuse rated at 1.0A, 250 V. (IEC127)

Symbols used on the wiring label on the controller side:

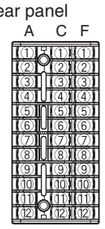
Symbol	Meaning
~	AC power supply
⎓	DC power supply
⚠	Caution, danger of electric shock
⚠	Caution

! Handling Precautions

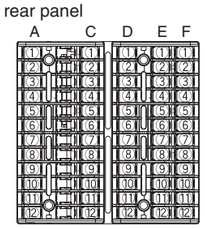
- Before wiring the SDC45/46, verify the controller's model No. and terminal Nos. written on the label on the side. Inspect all wiring once wiring work has been completed.
- Use M3 crimp-type terminal lugs for wiring to terminals.
- Leave a distance of at least 50 cm between I/O lead wires or communications lead wires and power lead wires. Also, do not pass these lead wires through the same conduit or wiring duct.
- Be careful not to allow any crimp-type terminal lugs to touch adjacent terminals.
- Be sure that any device or equipment which is connected to this controller has adequate insulation for the controller's power supply voltage and maximum I/O voltages.
- The controller requires 2 to 60 seconds according to the settings to start up once the power is turned ON. A warm-up time of at least 30 minutes is recommended to allow the controller to attain the specified accuracy.
- Prepare a heater current conductor to send a heater current through the current transformer. Do not use a heater current that exceeds the specified permissible current as this may damage the controller.
- The current transformer input cannot be used for phase control.
- Do not wire in the same duct for the motor drive terminals and the MFB input terminals and also do not use 6-core cable. Failure to follow the instruction might cause controller malfunction due to noise during motor startup operation.

● Wiring

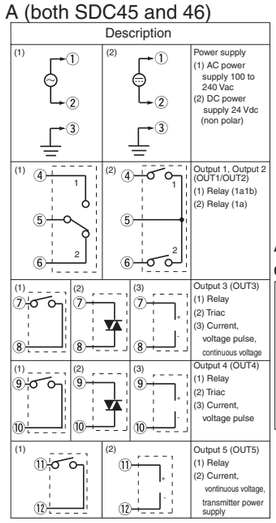
● SDC45 rear panel



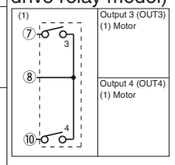
● SDC46 rear panel



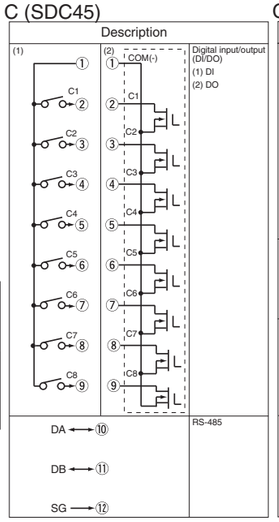
A (both SDC45 and 46)



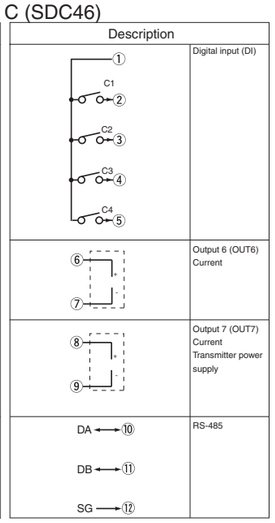
A (SDC46 Motor drive relay model)



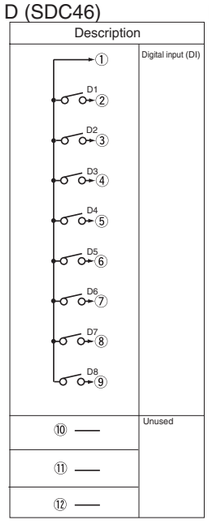
C (SDC45)



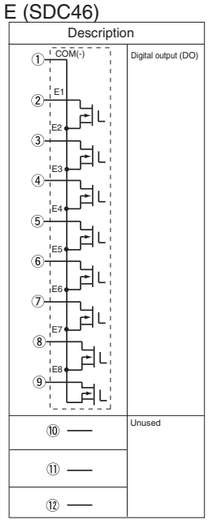
C (SDC46)



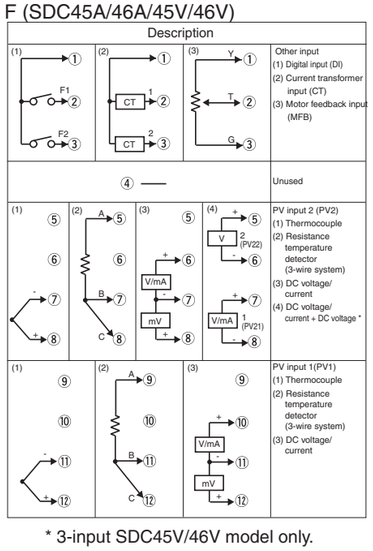
D (SDC46)



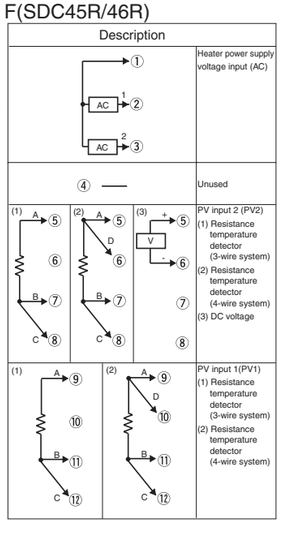
E (SDC46)



F (SDC45A/46A/45V/46V)



F(SDC45R/46R)



* 3-input SDC45V/46V model only.

● I/O isolation

Items surrounded by solid lines are isolated from other signals. Availability of inputs and outputs varies depending on the model number.

PV1	Internal circuit	OUT1
PV2/PV21/PV22		OUT2
DI-C1 to DI-C8		OUT3
DI-D1 to DI-D8		OUT4
DI-F1 to DI-F2		OUT5
MFB		OUT6
CT1/CT2/AC1/AC2		OUT7
		DO-C1 to DO-C8
		DO-E1 to DO-E8
		RS-485
		Loader

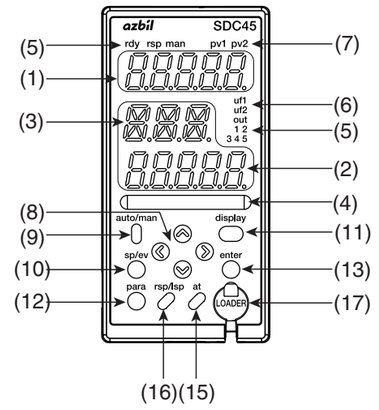
The power circuit is isolated from all inputs/outputs, communications and internal circuits.

⚠ Handling Precautions

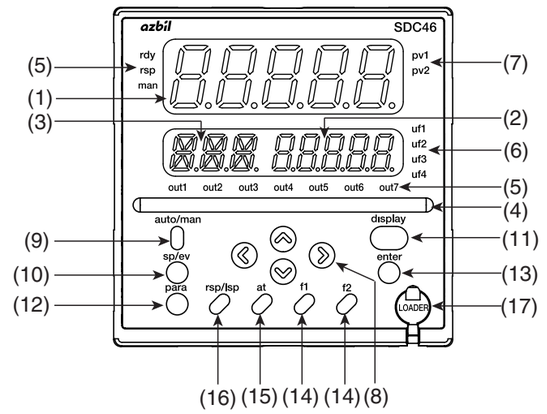
- The loader jack is not isolated from the internal circuits. Always put the cap on the loader jack when the loader is not used.
- On a motor driving relay model, OUT3 and OUT4 are not isolated.

NAMES AND FUNCTION OF PARTS

● SDC45 front panel



● SDC46 front panel



(1) Upper display: Displays PV (present temperature etc.) or setup items.

(2) Lower display: Displays SP (set temperature, etc.) and other parameters.

(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 indicator: Indicates MV or DI/DO status.

(5) Mode indicators:
rdy: Lights up in READY mode.
rsp: Lights up in RSP (remote setting input) mode.
man: Lights up in MANUAL mode.
out1-7: Light up when the output is ON (SDC45: out1-5).

(6) User function indicators:
uf1-4: Light under user-assigned conditions (SDC45: uf1, uf2).

(7) Loop number indicators:
pv1, pv2: Light up to indicate which loop has the displayed PV value.

(8) [∧], [∨],[<], [>] keys: Used to increment/decrement numeric values and shift between digits or settable items.

(9) [auto/man] key: Used to change AUTO/MANUAL mode.

(10) [sp/ev] key: Used to set the SP/EV bank.

(11) [display] key: Used to change the display contents in the operation display mode.

(12) [para] key: Used to set the PARA bank.

(13) [enter] key: Used in initiating setup and to confirm changed values.

(14) [f1], [f2] keys: Used for user-assigned functions (SDC46 only).

(15) [at] key: Used to execute/cancel auto-tuning, or for user-assigned functions.

(16) [rsp/lsp] key: Used to change between remote and local set point, or for user-assigned functions.

(17) Loader jack: Jack for connection of PC loader cable (with cap).

PV RANGE TABLE

Input indication accuracy differs depending on the sensor type. If PV-01 is set to a value that is not in the tables below, the input indication will be fixed at 0.0.

■ Thermocouple

On the 3-input model, thermocouple input cannot be used for PV21/22.
For the SDC45R/46R, thermocouple cannot be used.

PV-01 setting	Sensor type	Range		Input indication accuracy
1	K	-270.0 to +1372.0 °C	-454 to+2502 °F	Under -200 °C: ±20.0 °C, Under -100 °C: ±1.0 °C, Under 400 °C: ±0.5 °C, 400 °C and above: ±0.1 % rdg. ±1 digit
2	E	-270.0 to +1000.0 °C	-454 to+1832 °F	Under -200 °C: ±15.0 °C, Under -100 °C: ±1.0 °C, Under 400 °C: ±0.5 °C, 400 °C and above: ±0.1 % rdg. ±1 digit
3	J	-200.0 to +1200.0 °C	-328 to+2192 °F	Under -100 °C: ±1.0 °C, Under 400 °C: +0.5 °C, 400 °C and above: +0.1 % rdg. ±1 digit
4	T	-270.0 to +400.0 °C	-454 to +752 °F	Under -200 °C: ±10.0 °C, Under -100 °C: ±1.0 °C, -100 °C and above: ±0.5 °C
5	B	0.0 to 1800.0 °C	32 to 3272 °F	Under 260 °C: ±70 °C, Under 800 °C: ±4 °C, 800 °C and above: ±2 °C
6	R	-50.0 to +1768.0 °C	-58 to+3214 °F	Under 0 °C: ±4.0 °C, Under 1000 °C: ±2.0 °C, 1000 °C and above: ±0.1 % rdg. ±1 digit
7	S	-50.0 to +1768.0 °C	-58 to+3214 °F	
8	WRe5-26	0.0 to 2300.0 °C	32 to 4172 °F	Under 1400 °C: ±1.5 °C, 1400 °C and above: ±0.1 % rdg. ±1 digit
9	PR40-20	0.0 to 1900.0 °C	32 to 3452 °F	Under 300 °C: ±40 °C, Under 800 °C: ±20 °C, 800 °C and above: ±8 °C
10	Ni-Ni•Mo	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	Under 0 °C: ±4.0 °C, 0 °C and above: ±1.4 °C
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	Under 0 °C: ±1.0 °C, 0 °C and above: ±0.7 °C
14	DIN L	-200.0 to +900.0 °C	-328 to+1652 °F	Under 0 °C: ±1.5 °C, 0 °C and above: ±1.0 °C
15	Gold-iron/ Chromel	-273.0 to +27.0 °C	-459 to +80 °F	±1.5 °C

■ Resistance temperature detector

On the 3-input model, RTD input cannot be used for PV21/22.
For the linear input of the SDC45R/46R, an RTD cannot be used.
For the SDC45A/46A/45V/46V, 21, 22, 31 and 32 can be used.
For the SDC45R/46R, 23, 24, 33 and 34 can be used.

PV-01 setting	Sensor type	Wiring method	Range		Input indication accuracy
21	Pt100	3-wire system	-200.0 to +850.0°C	-328.0 to +1562.0 °F	±0.3°C
22		3-wire system	-200.00 to +300.00°C	-328.0 to +572.0 °F	±0.15°C
23		3-wire system	0.00 to 100.00°C	32.00 to 212.00 °F	±0.050°C
24		4-wire system	0.000to 32.000°C		
31	JPt100	3-wire system	-200.0 to +640.0°C	-328.0 to +1184.0 °F	±0.3°C
32		3-wire system	-200.00 to +300.00°C	-328.0 to +572.0 °F	±0.15°C
33		3-wire system	0.00 to 100.00°C	32.00 to 212.00 °F	±0.050°C
34		4-wire system	0.000to 32.000°C		

■ DC voltage, DC current

On the 3-input model, PV21 can be set to 41, 42, 49, 51, or 51; and PV22 can be set to 49, 50 or 51.
For the linear input of the SDC45R/46R, 47, 49 and 50 can be used.
For the RTD input of the SDC45R/46R, DC voltage or DC current cannot be used.

PV-01 setting	Input type	Range	Input indication accuracy
41	Current	4 to 20 mA	±0.1 % FS ± 1 digit
42		0 to 20 mA	
43	Voltage	0 to 10 mV	
44		-10 to +10 mV	
45		0 to 100 mV	
46		-100 to +100 mV	
47		0 to 1 V	
48		-1 to +1 V	
49		1 to 5 V	
50		0 to 5 V	
51		0 to 10 V	

ALARM CODE LIST

Alarm codes and countermeasures in case of abnormal operation of this controller.

Alarm code	Failure name	Cause	Corrective action
AL01	PV1 input failure (over-range)	Sensor burnout, incorrect wiring, incorrect PV1 range type setting.	Check the wiring, reset PV1 range type (Pv-01) or reset PV1 range upper/lower value. (Pv-04: range lower value, Pv-05: range upper value.)
AL02	PV1 input failure (under-range)		
AL03	PV2/PV21 input failure (over-range)	Sensor burnout, incorrect wiring, incorrect PV2/PV21 range type setting.	Check the wiring, reset PV2/PV21 range type (Pv-02) or reset PV2/PV21 range upper/lower value. (Pv-04: range lower value, Pv-05: range upper value.)
AL04	PV2/PV21 input failure (under-range)		
AL05	PV22 input failure (over-range)	Sensor burnout, incorrect wiring, incorrect PV22 range type setting.	Check the wiring, reset PV22 range type (Pv-01) or reset PV22 range upper/lower value. (Pv-04: range lower value, Pv-05: range upper value.)
AL06	PV22 input failure (under-range)		
AL21	MFB input failure	Burnout, incorrect wiring.	Check the wiring.
AL22	Motor adjustment failure	Burnout, incorrect wiring, Motor power shutdown.	Readjust the motor after checking the wiring and motor power.
AL25	CT1 input failure	CT input over-range	Check CT input.
AL26	CT2 input failure	Incorrect CT range type setting.	Reset CT input.
AL71	Abnormal PV1 CJ compensation	Abnormal terminal temperature. (thermocouple)	Check the ambient temperature.
AL72	Abnormal PV2 CJ compensation		
AL81	Battery low (SDC45V/46V only)	Dead battery	Replace the battery.
AL82	Internal clock failure (SDC45V/46V only)	Dead battery, Hardware failure.	Reset the clock after battery is replaced.. Replace the unit.
AL83	Board configuration problem	Hardware failure.	Replace the unit.
AL96	Main board failure		
AL97	Parameter failure	•Power was turned OFF while setting data. •Data is corrupted due to noise, etc.	Restart the system. Reset data or replace the unit. (AL97: setting data, AL98: adjustment data)
AL98	Adjustment data problem		
AL99	ROM failure	ROM (memory) is faulty.	Restart the system. Replace the unit.

MODEL SELECTION TABLE

■ SDC45A/V (with 14-digit model No.)

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C45A										Standard model
C45V										Computation function model
	1									1 input (1 full multiple) *1
	2									2 inputs (2 full multiple)
	3									3 inputs (1 full multiple, 2 linear) *2
		A								100 to 240 Vac
		D								24 Vdc
			1							1 form 1a1b relay
			2							2 form 1a relays
				C0						Current output (OUT 3)
				D0						Continuous voltage output (OUT 3)
				V0						Voltage pulse output (OUT 3)
				RR						2 form 1a relays
				CC						2 current outputs
				VV						2 voltage pulse outputs
				CV						Current (OUT 3) + voltage pulse (OUT 4)
				SS						Motor drive triac + MFB input
					0					None
					R					Form 1a relay
					C					Current output
					D					Continuous voltage output
					P					Transmitter power supply
						0				None
							0			2 digital inputs (DI-F1/2) *3
							1			10 digital inputs *4
							2			2 digital inputs + 8 digital outputs *3
							3			2 digital inputs + 8 digital outputs + RS-485 communication *3
							4			2 CT inputs *5
							5			2 CT inputs + 8 digital inputs *5
							6			2 CT inputs + 8 digital outputs *5
							7			2 CT inputs + 8 digital outputs + RS-485 communication *5
								0		None
								T		Tropicalization treatment
								K		Anti-sulfide treatment
								D		Inspection certificate
								B		Tropicalization treatment + inspection certificate
								L		Anti-sulfide treatment + inspection certificate
								Y		Complying with the traceability certification
								Z		Tropicalization treatment + Complying with the traceability certification
								X		Anti-sulfide treatment + Complying with the traceability certification
									0	None
									1	LEDs: all orange

*1: Not available for SDC45V.
*2: SDC45V only.
*3: There are no digital inputs if "SS" is selected for Output 3, 4.
*4: There are 8 digital inputs if "SS" is selected for Output 3, 4.
*5: Cannot be selected if "SS" is selected for Output 3, 4.

■ SDC46A/V (with 14-digit model No.)

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C46A										Standard model
C46V										Computation function model
	1									1 input (1 full multiple) *1
	2									2 inputs (2 full multiple)
	3									3 inputs (1 full multiple, 2 linear) *2
		A								100 to 240 Vac
		D								24 Vdc
			1							1 form 1a1b relay
			2							2 form 1a relays
				C0						Current output (OUT 3)
				D0						Continuous voltage output (OUT 3)
				V0						Voltage pulse output (OUT 3)
				RR						2 form 1a relays
				CC						2 current outputs
				VV						2 voltage pulse outputs
				CV						Current (OUT 3) + voltage pulse (OUT 4)
				SS						Motor drive triac + MFB input
				R1						Motor drive relay + MFB input
					0					None *4
					R					Form 1a relay *4
					C					Current output *4
					D					Continuous voltage output *4
					P					Transmitter power supply *4
						0				None
						1				Current output (OUT 6)
						2				Transmitter power supply (OUT 7)
						3				2 current outputs *3
						4				Current (OUT 6) + transmitter power supply (OUT 7)
							0			2 digital inputs (DI-F1/2) *5
							1			14 digital inputs *6
							2			14 digital inputs + 8 digital outputs *6
							3			14 digital inputs + 8 digital outputs + RS-485 communication *6
							4			2 CT inputs *7
							5			2 CT inputs + 12 digital inputs *7
							6			2 CT inputs + 12 digital inputs + 8 digital outputs *7
							7			2 CT inputs + 12 digital inputs + 8 digital outputs + RS-485 communication *7
								0		None
								T		Tropicalization treatment
								K		Anti-sulfide treatment
								D		Inspection certificate
								B		Tropicalization treatment + inspection certificate
								L		Anti-sulfide treatment + inspection certificate
								Y		Complying with the traceability certification
								Z		Tropicalization treatment + Complying with the traceability certification
								X		Anti-sulfide treatment + Complying with the traceability certification
									0	None
									1	LEDs: all orange

*1: Not available for SDC46V.
*2: SDC46V only.
*3: Not available if "CC" is selected for Output 3, 4 and "C" is selected for Output 5.
*4: Selection must be "0" if "R1" is selected for Output 3, 4.
*5: There are no digital inputs if "SS" or "R1" is selected for Output 3, 4.
*6: There are 12 digital inputs if "SS" or "R1" is selected for Output 3, 4.
*7: Not available if "SS" or "R1" is selected for Output 3, 4.

■ SDC45R

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C45R										High accuracy model (mask size: 48W X 96H mm)
	1									2 inputs (1 RTD, 1 linear)
	2									2 inputs (2 RTDs)
		A								100 to 240 Vac
		D								24 Vdc
			1							1 form 1a1b relay
			2							2 form 1a relays
				CC						2 current outputs
				VV						2 voltage pulse outputs
					R					Form 1a relay
						0				None
							0			2 AC inputs
							1			2 AC inputs + 8 digital inputs
							8			2 AC inputs + RS-485 communication
								D		Inspection certificate
								Y		Complying with the traceability certification
									0	None

■ SDC46R

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C46R										High accuracy model (mask size: 96W X 96H mm)
	1									2 inputs (1 RTD, 1 linear)
	2									2 inputs (2 RTDs)
		A								100 to 240 Vac
		D								24 Vdc
			1							1 form 1a1b relay
			2							2 form 1a relays
				CC						2 current outputs
				VV						2 voltage pulse outputs
					R					Form 1a relay
						0				None
						3				2 current outputs
							0			2 AC inputs
							1			2 AC inputs + 12 digital inputs
							8			2 AC inputs + RS-485 communication
								D		Inspection certificate
								Y		Complying with the traceability certification
									0	None

■ SDC45A (with 7-digit model No.)

Displays have all-orange LEDs.

Basic model No.	Set No.	Option 1	Option 2	Specifications
C45A				Standard model : 2 alarm outputs (OUT 1/2)
	0			None
		0		Regular type 1: 2 relay outputs (OUT 3/4) +1 current output (OUT 5) + 2 digital inputs (DI-F1/2)
		1		Regular type 2: 1 current output (OUT 3) + 1 voltage pulse output (OUT 4) + 1 relay output (OUT 5) + 2 digital inputs (DI-F1/2)
		2		Position proportion type 1: 2 triac outputs (OUT 3/4) + 1 relay output (OUT 5)
		3		Regular type 3: 2 current outputs (OUT 3/4) + transmitter power supply (24 Vdc) (OUT 5) + 2 digital inputs (DI-F1/2)
		4		Position proportion type 2: 2 triac outputs (output3/4) + transmitter power supply (24 Vdc) (OUT 5)
			0	None
			1	Communications (RS-485) + PV inputs 2 + 8 digital outputs
			2	PV input 2 + 8 digital outputs
			3	8 digital outputs
			4	PV input 2

■ SDC46A (with 7-digit model No.)

Displays have all-orange LEDs.

Basic model No.	Set No.	Option 1	Option 2	Specifications
C46A				Standard model : 2 alarm outputs (OUT 1/2) + 1 current output (OUT 6)
	0			None
		0		Regular type 1: 2 relay output (OUT 3/4) + 1 current output (OUT 5) + 2 digital inputs (DI-F1/2)
		1		Regular type 2: 1 current output (OUT 3) + 1 voltage pulse output (OUT 4) + 1 relay output (OUT 5) + 2 digital inputs (DI-F1/2)
		2		Position proportion type 1: 2 triac outputs (OUT 3/4) + 1 relay output (OUT 5)
		3		Regular type 3: 2 current outputs (OUT 3/4) + transmitter power supply (24 Vdc) (OUT 7) + 2 digital inputs (DI-F1/2)
		4		Position proportion type 2: 2 triac outputs (OUT 3/4) +1 relay output (OUT 5) transmitter power supply(24 Vdc) (OUT 7)
			0	None
			1	Communications (RS-485) + PV input 2 + 12 digital inputs + 8 digital outputs
			2	PV input 2 + 12 digital inputs + 8 digital outputs
			3	12 digital inputs +8 digital outputs
			4	PV input 2

MAINTENANCE

Cleaning: When removing dirt from the instrument, wipe it off with a soft cloth rag.
Part replacement: Do not replace any parts of this unit.
Fuse replacement: When replacing the fuse connected to the electric wiring, always use the specified standard fuse.
Standard IEC 127
Shut-down speed Slow-action type (T)
Rated voltage 250 V
Rated current 1.0 A

DIPOSAL (SDC45V/46V only)

EU

⚠ CAUTION

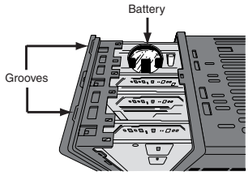
- When discarding this device, shut off the power and wait 10 minutes or longer before removing the battery. Failure to do so might cause an electric shock or burn.
- When the battery is removed, some settings and internal operation status data will be lost.
- Please dispose of used batteries properly, in accordance with local bylaws and regulations.

When discarding this device, remove the battery following the procedure given below, and then dispose of it appropriately, following local regulations.

■ Battery removal procedure

(1) Remove the case.
Insert the flat head of a screwdriver into the grooves (on the top, bottom, right and left sides) between the front panel and the case, and then gradually pull the case off while gently prying with the screwdriver.

(2) Remove the battery from the battery holder.
Pull the battery upward.



! Handling Precautions

- The SDC45V/46V has a built-in battery that is used for memory backup. To remove/replace the battery, except when discarding this device, contact Yamatake Corporation.

SPECIFICATIONS

■ PV input

Thermocouple: K, E, J, T, B, R, S, N (JIS C 1602-1995)
WRe5-26 (ASTM E988-96 (reapproved 2002)),
PR40-20 (ASTM E1751-00),
Ni-Ni•Mo (ASTM E1751-00),
PL II (ASTM E1751-00),
DIN U, DIN L (DIN 43710-1985)
Gold-iron/chromel (ASTM E1751-00)
Resistance temperature detector (RTD):
Pt100 (JIS C 1604-1997)
JPt100 (JIS C 1604-1989)
DC voltage (mV range): 0 to 10 mV, -10 to +10 mV, 0 to 100 mV, -100 to +100 mV
DC voltage (V range): 0 to 1 V, -1 to +1 V, 1 to 5 V, 0 to 5 V, 0 to 10 V
DC current: 4 to 20 mA, 0 to 20 mA
Sampling cycle: 25, 50, 100, 300 ms (determined by the sampling cycle setting) (SDC45A/46A)
100 ms (SDC45V/46V/45R/46R)
Indication accuracy (under standard conditions)
Thermocouple: ±0.1 % rdg. ±1 digit
(determined by the range and measured temperature)
Resistance temperature detector(RTD): ± 0.05 to 0.3 °C
(determined by the range)
DC voltage • DC current: ± 0.1 %FS ± 1 digit
Input impedance: 110 Ω or less for current input
Cold junction compensation accuracy:
± 0.5 °C (standard conditions)
± 1.0 °C (in the 0 to 50 °C ambient temperature range)
Cold junction compensation method:
Internal/external (0 °C only) compensation selectable

■ Motor feedback input (MFB)

Allowable potentiometer value:
100 to 2,500 Ω
Indication accuracy: ± 0.2 %FS (standard conditions)
Sampling cycle: 100 ms

■ Current transformer input

Compatible current transformer:
QN212A (ϕ12, 800 T)
QN206A (ϕ6, 800 T)
Input range: 0 to 50 Aac
Current measurement 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
Indication resolution: 0.1 Aac
Input impedance: 10 Ω (typ)

■ Heater power supply voltage input

Input frequency: 50 Hz/60 Hz
Input range: 0 to 12 Vac
Voltage measurement range:
0 to 13.2 Vac (Accuracy may be out of specifications for less than 0.5 Vac.)
Indication accuracy: ± 0.5 %FS ± 1 digit
Indication resolution: 0.01 Vac
Input impedance: 126 kΩ (typ)
Transformer for detecting heater power supply voltage:
81406725-003

■ External switch input

● Digital input (DI)

Connectable outputs: Dry contact or transistor (sink type)
Open terminal voltage: 7 Vdc ± 15 %*
Terminal current (during short-circuit): 3 to 7 mA*
Allowable ON contact resistance: 500 Ω max.*
Allowable OFF contact resistance: 100 kΩ min.*
Allowable ON residual voltage: 1.5 V max.*
Allowable OFF-state leakage current: 0.1 mA max.*
*Under standard conditions.

■ Control output
(Control output (OUT) • auxiliary output (AUX) • event output (EV))

● Relay output (outputs 1 and 2)

Contact configuration: 1a1b or 1a, selected by the model No.
Contact rating: 3A 250 Vac/30 Vdc 1a1b, resistance load
1A 250 Vac/30 Vdc 1a, resistance load
Contact voltage: 250 Vac max./125 Vdc max.
Life: Min. 100,000 operations
(under rated conditions)
Min. switching specifications:
100 mA/5 Vdc 1a1b
10 mA/5 Vdc 1a

● Relay output (outputs 3, 4 and 5)

Contact configuration: 1a
Contact rating: 3 A 250 Vac/30 Vdc (resistance load)
Contact voltage: 250 Vac max./125 Vdc max.
Life: Min. 100,000 operations
(under rated conditions)
Min. switching specifications:
100 mA/5 Vdc

● Current output

Output current: 4 to 20 mAdc(2.4 to 21.6 mAdc)
0 to 20 mAdc(0.0 to 22.0 mAdc)
Load resistance: 600 Ω max.
Output accuracy: ± 0.1 % FS max. (standard conditions)
Output resolution: 1/15000
Voltage (open): 23 Vdc max.

● Continuous voltage output

Output current: 0 to 5 Vdc (0.0 to 5.5 Vdc)
1 to 5 Vdc (0.6 to 5.4 Vdc)
0 to 10 Vdc (0.0 to 11.0 Vdc)
Load resistance: 1 kΩ min.
Load limit current: 21 mA max.
(standard value under standard conditions)
Output accuracy: ± 0.1 % FS max. (standard conditions)
Output resolution: 1/20000 (for 0 to 10 V)

● Voltage pulse output

Output current: 12 Vdc +15 %/-10 %
Load current: 30 mA max.
Load limit current: 52 mA
(standard value under standard conditions)
OFF-state leakage current:
0.1 mA max.

● Motor drive output (triac output)

Contact configuration: 1a
Compatible motors: ECM3000F1∗∗0
(100 Vac, relay contact input)

● Motor drive output (relay output)

Contact configuration: 1a + 1a
Contact rating: 2A 250 Vac max./(cosϕ=0.4)
2.5 A 24 Vdc (L/R=0.7 ms)
Contact voltage: 250 Vac max./125 Vdc max.
Life: Min. 100,000 operations
(under rated conditions)
Min. switching specifications:
40 mA/24 Vdc

● Transmitter power supply function

Output current: 24 Vdc ± 10 %
Load current: 30 mA max.
Load limit current: 45 mA
(standard value under standard conditions)

● Digital output (DO)

Output type: Transistor (sink type)
Load voltage: 4.5 to 28 Vdc
Load current: 70 mA max./point
500 mA max./unit
ON-state residual voltage:
0.5 V max.
OFF-state leakage current:
0.1 mA max.

■ RS-485 communications

Transmission line: RS-485, 3 wire multi-drop
Transmission speed: 4800, 9600, 19200, 38400 bps
Communication distance: 500 m max.
Connectable units: 32 max. (including master station)
Communication system: Half-duplex, start/stop synchronization
Terminating resistor: 150 Ω 1/2 W, at both ends of the line
Bit length: 8 bits/7 bits
Stop bit length: 1 or 2 bits
Parity bit: Even parity, odd parity, or no parity
Communication protocol: CPL, MODBUS conforming

■ Environmental conditions

● Standard conditions

Ambient temperature: 23 ± 2 °C (SDC45A/46A/45V/46V)
23 ± 0.1 °C (SDC45R/46R)
Ambient humidity: 60 ± 5 %RH
Rated power supply voltage:
105 Vac ± 1 % (100 to 240 Vac power model)
24 Vdc ± 5 % (100 to 240 Vac power model, SDC45A/46A/45V/46V)
24 Vdc ± 2 % (24 Vdc power model, SDC45R/46R)
Power frequency: 50 ± 1 Hz or 60 ± 1 Hz
(100 to 240 Vac power model)
Vibration resistance: 0 m/s^2
Shock resistance: 0 m/s^2
Mounting angle: Reference plane ± 3 °

● Operating conditions

Ambient temperature: 0 to 50 °C (SDC45A/46A/45V/46V)
20 to 25 °C (SDC45R/46R)
Ambient humidity: 10 to 90 %RH (without condensation)
Rated power supply voltage:
85 to 264 Vac (100 to 240 Vac power model)
21.6 to 26.4 Vdc (24 Vdc power model)
Power frequency: 50 ± 2 Hz or 60 ± 2 Hz
(100 to 240 Vac 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.

● 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)

■ Memory backup

Backup system: Serial EEPROM, battery and double layer capacitor for SRAM (SDC45V/SDC46V)
Number of rewrite operations:
Max. 100,000 for EEPROM; no limitation for SRAM
Backup life: EEPROM 10 years
SRAM
• 3 years by battery (at 10 to 35 °C ambient temperature, without connection to power)
• 30 min by double layer capacitor (while changing battery, at an ambient temperature of 35 °C or less, after capacitor is charged for 1 h or more)

■ Other specifications

Power consumption: 30 VA max.
(SDC45 100 to 240 Vac power model)
40 VA max.
(SDC46 100 to 240 Vac power model)
12 W max.
(SDC45 24 Vdc power model)
15 W max.
(SDC46 24 Vdc power model)
Power ON inrush current:
35 A max./10 ms max.
(100 to 240 Vac power model)
20 A max./10 ms max.
(24 Vdc power model)
Allowable transient power loss: 20 ms min.
Mass: Approx. 400g
(SDC45, including dedicated mounting bracket)
Approx. 700g
(SDC46, including dedicated mounting bracket)
Terminal screw tightening torque: 0.4 to 0.6 N•m
Protection: IP65 (under operating conditions)
Standards compliance: EN61010-1, EN61326
Overvoltage category: Category II (IEC60364-4-443, IEC60664-1)
Allowable pollution degree: Pollution degree 2

OPTIONAL PARTS LIST

Item	Parts No. or model No.
Mounting bracket (2 units)	81405411-003
Terminal cover*	81441420-001
Current transformer	QN212A (ϕ12)
	QN206A (ϕ6)
Transformer for detecting heater power supply voltage	81406725-003
Hard cover	81441421-001 (for SDC45)
	81441422-001 (for SDC46)

* 1 cover for SDC45, 2 for SDC46.

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Specifications are subject to change without notice. (08)

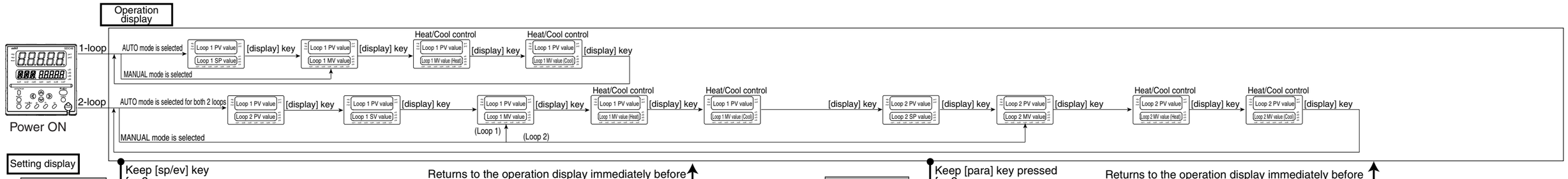
Yamatake Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL: http://www.azbil.com

1st Edition: Issued in Nov. 2007 (W)
5th Edition: Issued in Nov. 2008 (G)

Flowchart of key operations and displays

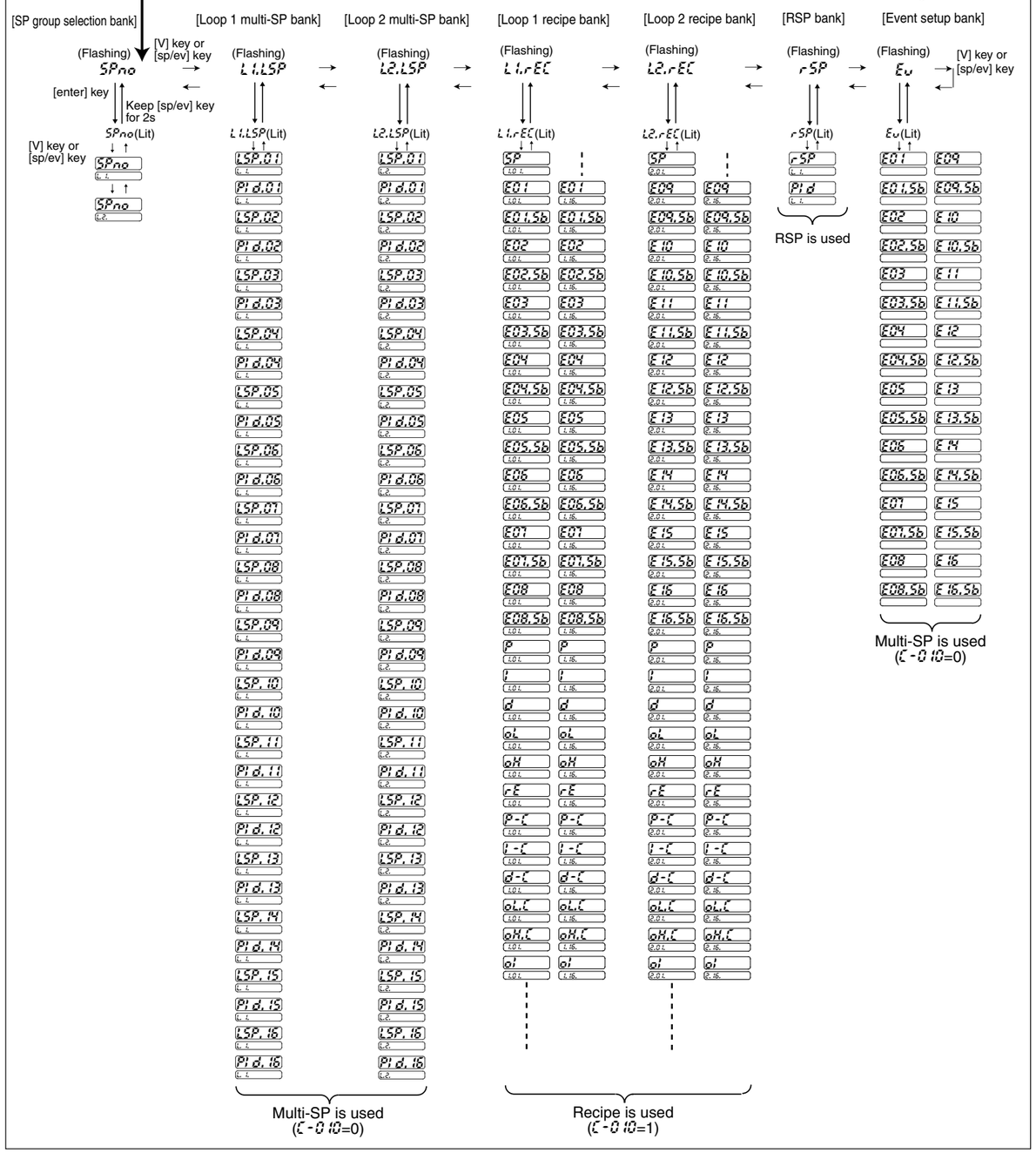


Setting display

SP/EV bank

Keep [sp/ev] key for 2s

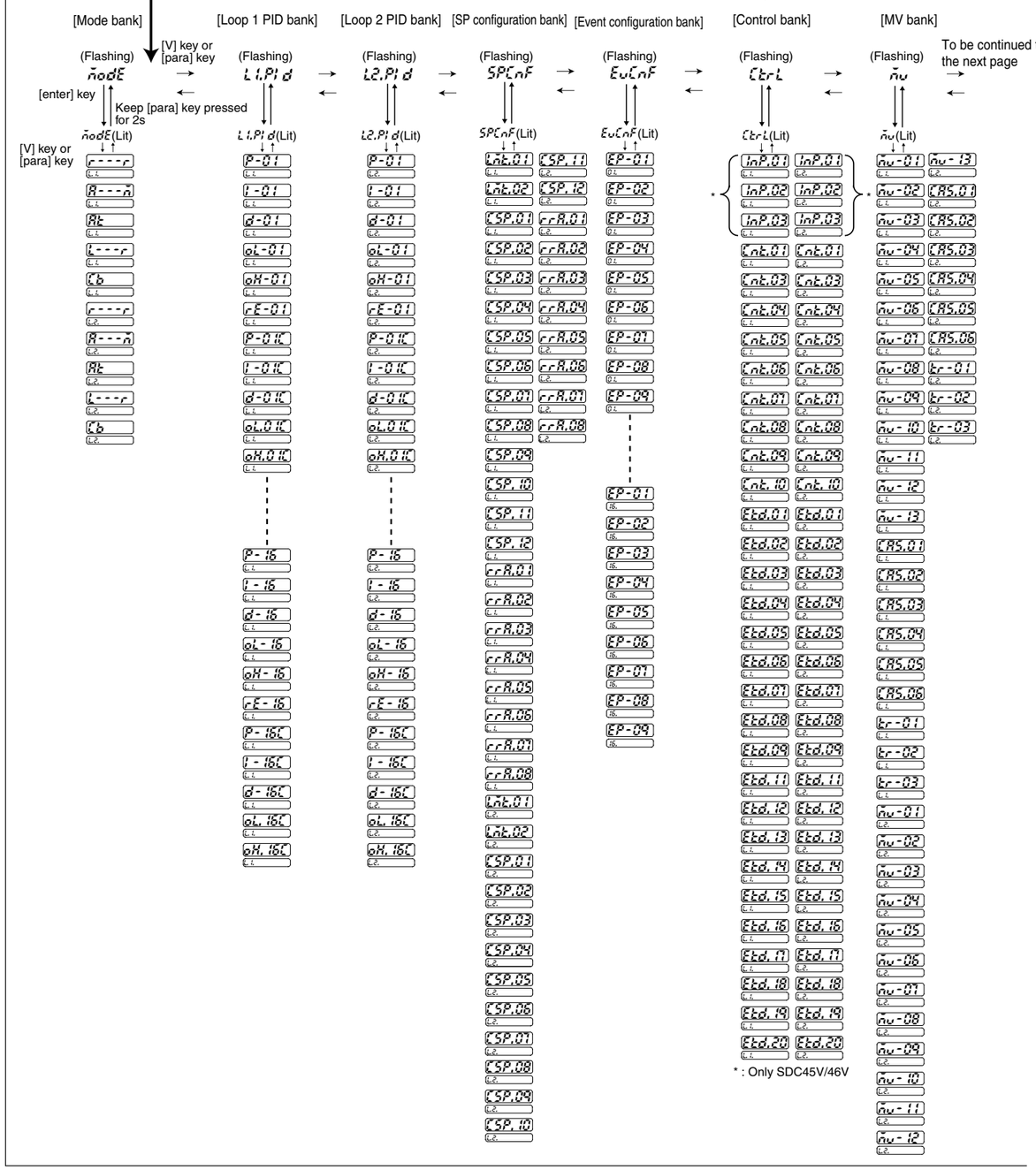
Returns to the operation display immediately before the SP/EV bank is displayed. [display] key



PARA bank

Keep [para] key pressed for 2s

Returns to the operation display immediately before the PARA bank is displayed. [display] key



■ Movement within bank
- Forward movement
  [sp/ev] key or [V] key (SP/EV bank)
  [para] key or [V] key (PARA bank)
- Backward movement
  [∧] key

PARA bank