(Not for use in Japan)

No. CP-SP-1275E

SDC45V/46V
Digital Indicating Controller
User's Manual
for
Computational Functions

Thank you for purchasing an Azbil Corporation product.

This manual contains information for ensuring the correct use of this product. It also provides necessary information for installation, maintenance, and troubleshooting.

This manual should be read by those who design and maintain equipment that uses this product. Be sure to keep this manual nearby for handy reference.

Azbil Corporation

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 the azbil Group.

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

Conventions Used in This Manual

■ The following conventions are used in this manual:

Handling Precautions:
Handling Precautions indicate items that the user should pay attention to when handling the SDC45V/46V.

Note: Notes indicate information that might benefit the user.

☞: This indicates the item or page that the user is requested to refer to.

(1), (2), (3): Numbers within parentheses indicate steps in a sequence or parts of an explanation.

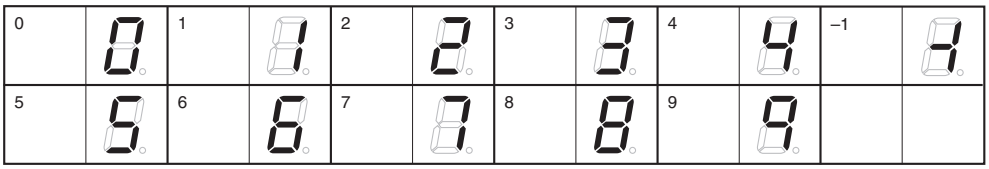
[para] key, [<] key: Indicates keys on the panel.

"man" LED: Indicates various indicators on this unit.

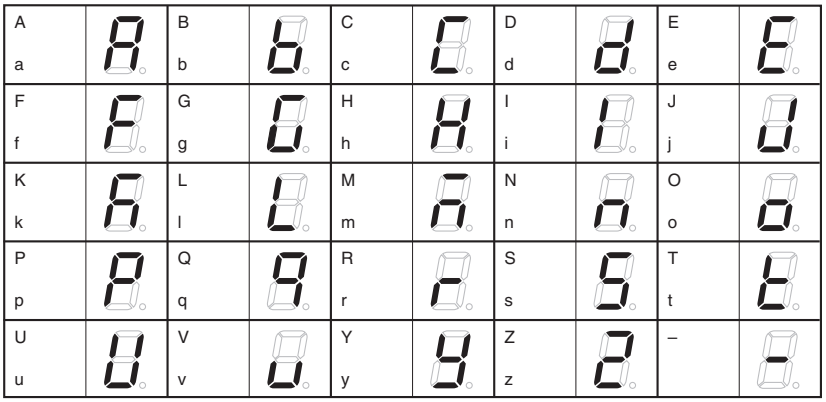
>>: Indicates the result of an operation, details displayed on the personal computer or other devices, or the state of the device after operation.

- **Numeric value and character display on LED**
  - **7-segment LED**

Numeric values: The 7-segment LED expresses numeric values as follows:



Alphabetical characters: The 7-segment LED expresses alphabetical characters shown below. There are some alphabetical characters, which are not displayed on the LED.



Handling Precautions

- As shown above, numeric value "2" and alphabetic character "Z" are shown in the same manner.
  Accordingly, numeric value "5" and alphabetic character "S", as well as numeric value "9" and alphabetic character "Q" are also shown in the same manner.

● 11-segment LED

Numeric values: The 11-segment LED expresses numeric values as follows:

0		1		2		3		4	
5		6		7		8		9	

Alphabetical characters: The 11-segment LED expresses alphabetical characters shown below. There are some alphabetical characters, which are not displayed on the LED.

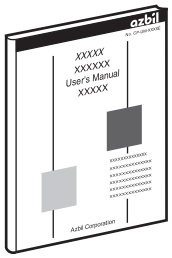
A a		B b		C c		D d		E e		F f	
G g		H h		I i		J j		K k		L l	
M m		N n		O o		P p		Q q		R r	
S s		T t		U u		V v		W w		X x	
Y y		Z z									

! Handling Precautions

- As shown above, numeric value "5" and alphabetic character "S" are shown in the same manner.

The Role of This Manual

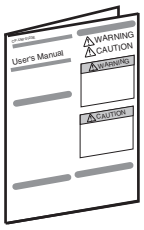
A total of 5 different manuals are available for the SDC45V/46V. Read them as necessary for your specific requirements. If a manual you require is not available, contact the azbil Group or its dealer.



SDC45V/46V Digital Indicating Controller User's Manual for Computational Functions

Manual No. CP-SP-1275E

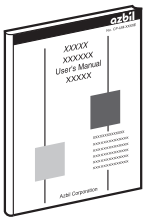
This manual.
It describes the computation functions of the SDC45V/46V. Please read it together with the Installation and Configuration manual (CP-SP-1218E) and the Displays and Settings manual (CP-SP-1265E).



SDC45/46 Digital Indicating Controller Installation Instructions

Manual No. CP-UM-5445JE

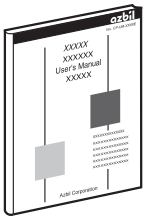
This manual is supplied with the SDC45/46. Personnel in charge of design and/or manufacture of a system using the SDC45/46 must thoroughly read this manual. This manual describes the safety precautions, installation, wiring, primary specifications, and transitions of key operations and displays. For further information about operation, refer to another manual, Installation and Configuration.



SDC45/46 Digital Indicating Controller User's Manual for Displays and Settings

Manual No. CP-SP-1265E

The manual is a reference document necessary to set or change data. The manual lists up the displays, setup items, setting ranges, and initial values.



SDC45A/46A Digital Indicating Controller User's Manual for Installation and Configuration

Manual No. CP-SP-1218E

Personnel in charge of design, manufacture, operation, and/or maintenance of a system using SDC45/46 must thoroughly read this manual. This manual also describes the installation, wiring, connections for communication, all functions and settings of the SDC45/46, operating procedures, troubleshooting, and detailed specifications.

SLP-C45 Smart Loader Package for the SDC45/46 Digital Indicating Controller

Manual No. CP-UM-5458E

This manual is supplied with the SLP-C45 Smart Loader Package. The manual describes the software used to make various settings for the SDC45/46 using a personal computer. Personnel in charge of design or setting of a system using SDC45/46 must thoroughly read this manual. The manual describes installation of the software into a personal computer, operation of the personal computer, various functions, and setup procedures.

Organization of This User's Manual

This manual is organized as follows:

Flowchart of key operations and displays

This section summarizes the flowchart of key operations and displays of the SDC45/46 in the diagram so as to describe them.

Chapter 1. MODEL SELECTION TABLE

This chapter describes the model selection of the SDC45V/46V.

Chapter 2. WIRING

This chapter describes the wiring procedures of the SDC45V/46V.

Chapter 3. FUNCTION SETUP

Tells how to configure the settings and assignments required to operate the computational functions of the SDC45V/46V.

Chapter 4. SAMPLE SETTINGS

This chapter gives examples of actual settings used for different applications.

Chapter 5. ALARM CODE LIST

Contains a table of the alarm codes of the SDC45V/46V.

Chapter 6. LIST OF SETTING DATA AND COMMUNICATION DATA

Contains a table of the settings and communication data of the SDC45V/46V.

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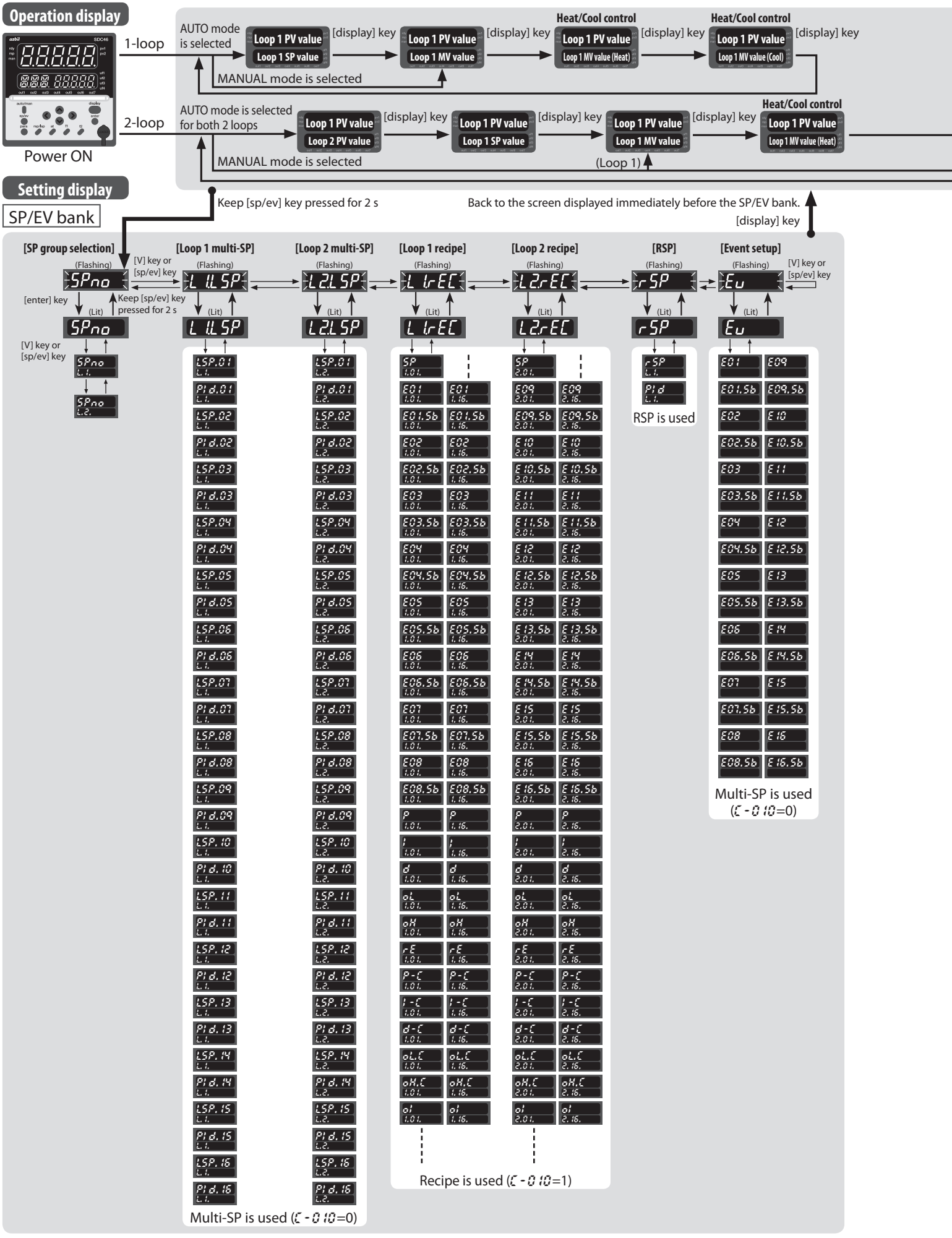
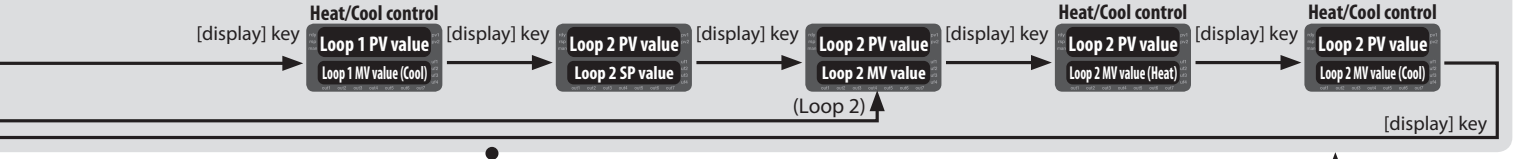
Flowchart of key operations and displays

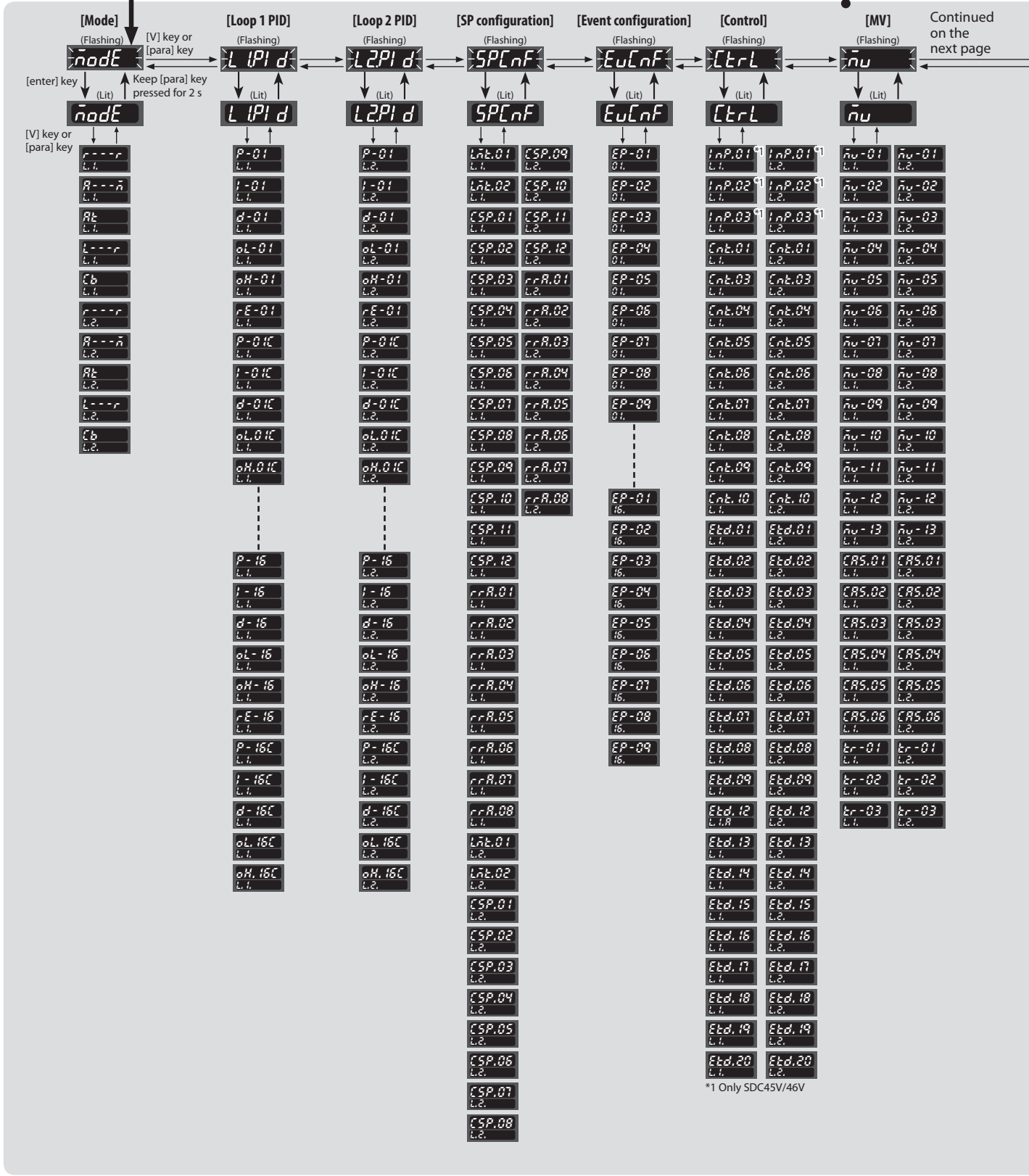




PARA bank

Keep [para] key pressed for 2 s

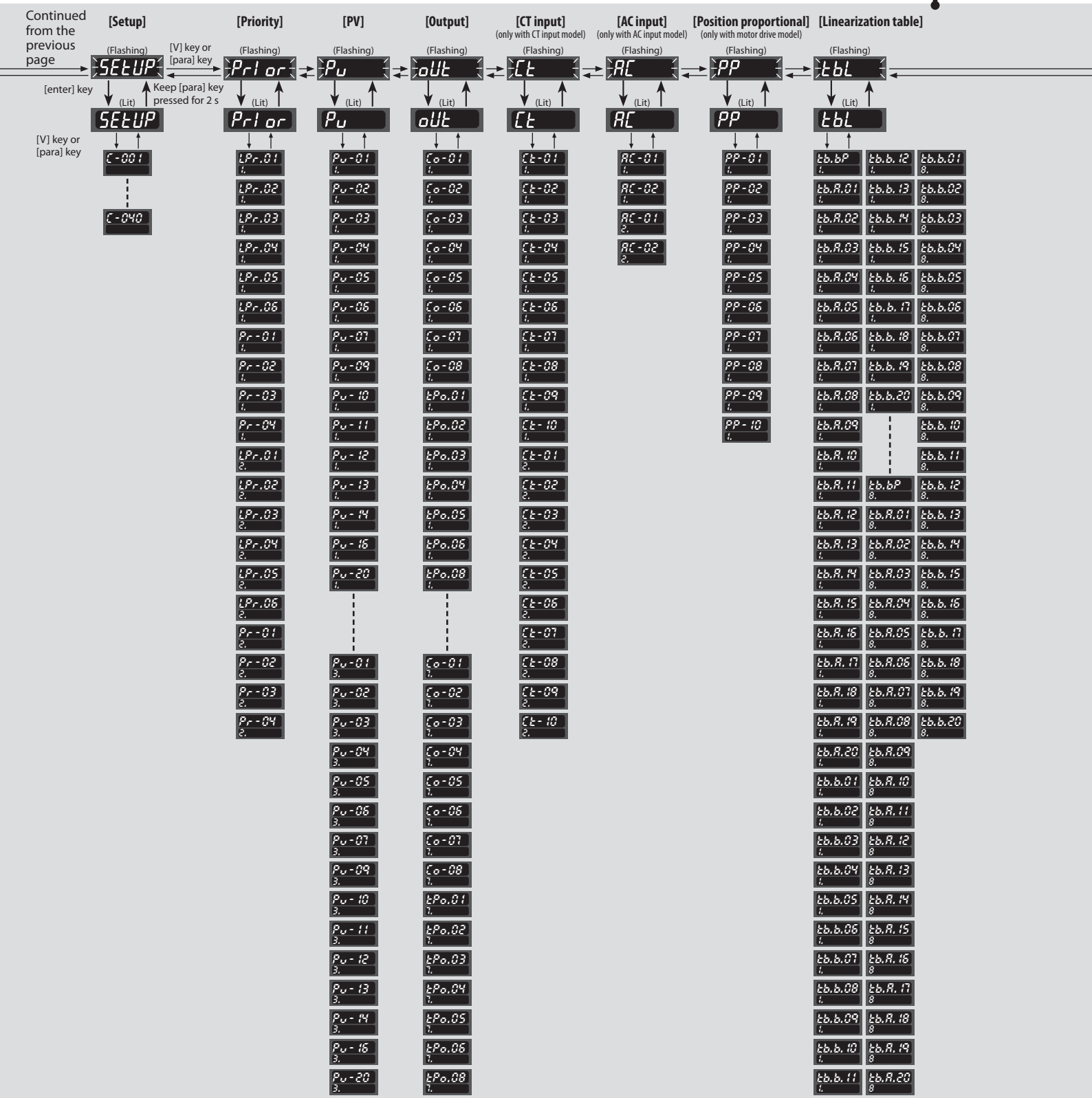
Back to the screen displayed immediately before the PARA bank.
[display] key

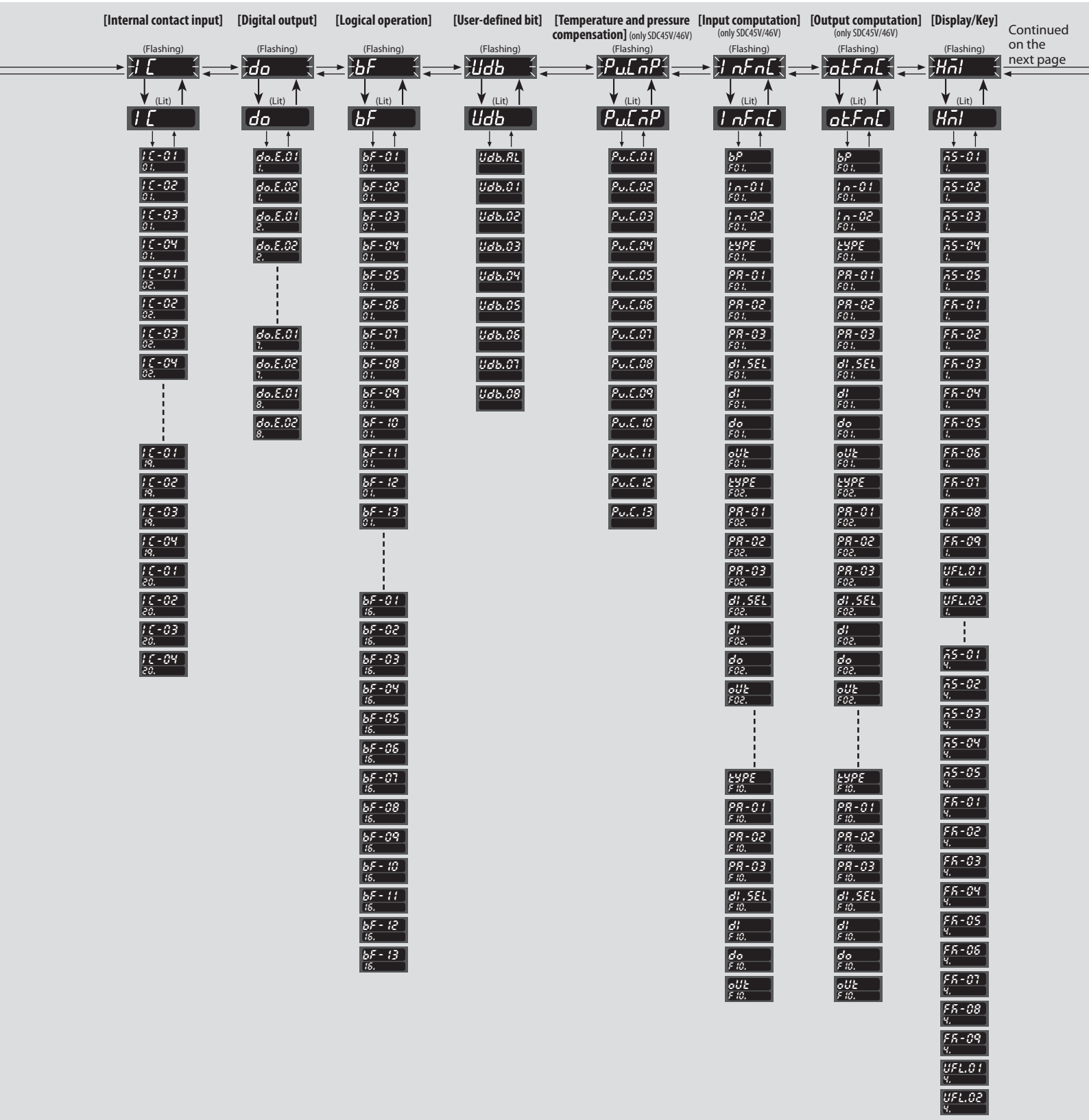


Back to the screen displayed immediately before the PARA bank.

[display] key

PARA bank

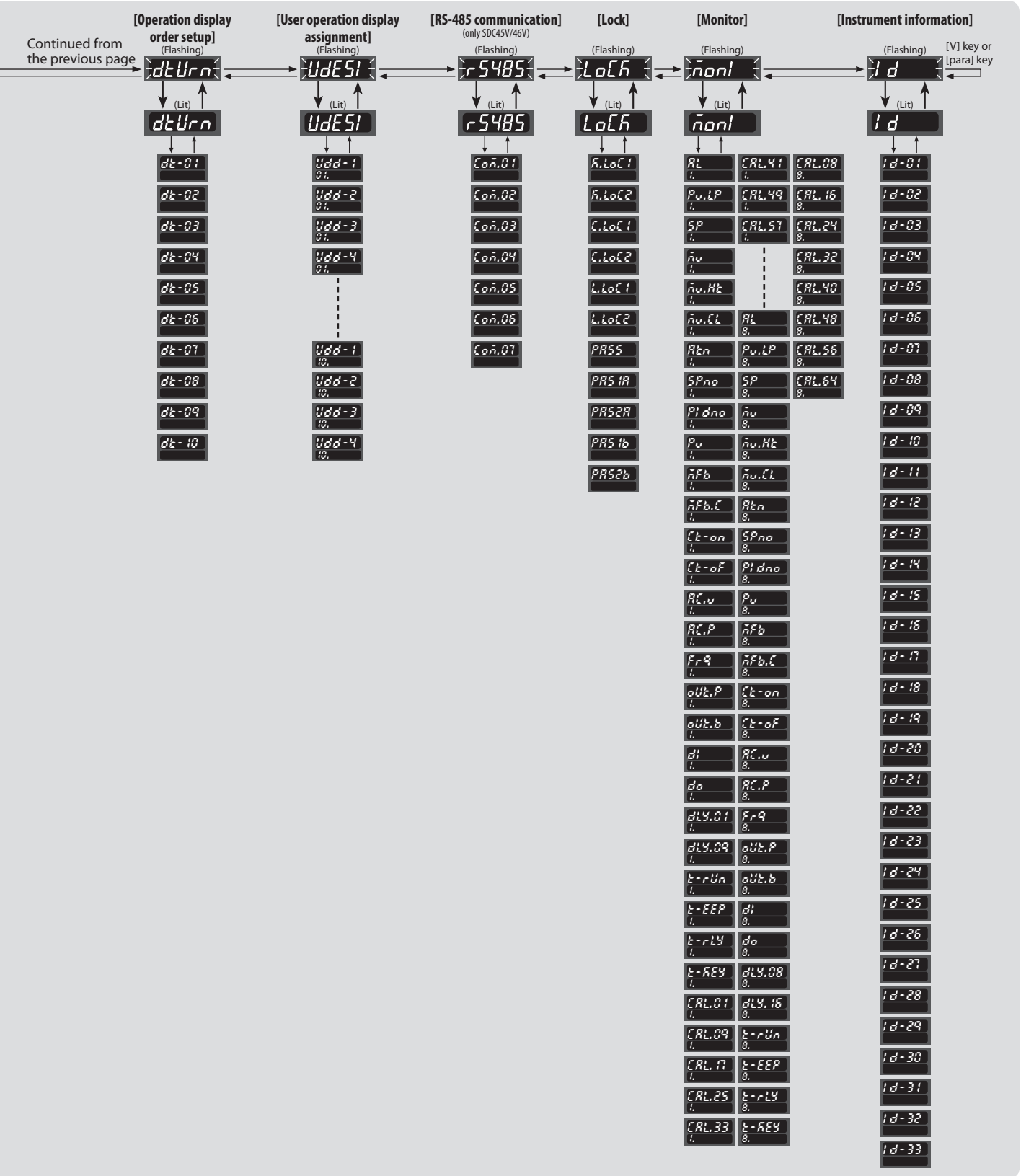



[Internal contact input]
[Digital output]
[Logical operation]
[User-defined bit]
[Temperature and pressure compensation] (only SDC45V/46V)
[Input computation] (only SDC45V/46V)
[Output computation] (only SDC45V/46V)
[Display/Key]
(Flashing)
(Lit)
Continued on the next page

Note: Bank names are enclosed in brackets, [ ]

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

PARA bank



Chapter 1. MODEL SELECTION TABLE

■ SDC45V

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C45V										Computation function model
	2									2 inputs (2 full multiple)
	3									3 inputs (1 full multiple, 2 linear)
		A								100 to 240 V AC
		D								24 V DC
			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 (OUT4)
				SS						Motor drive triac + MFB input *5
					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) *1
							1			10 digital inputs *2
							2			2 digital inputs + 8 digital outputs *1
							3			2 digital inputs + 8 digital outputs + RS-485 communication *1
							4			2 CT inputs *3
							5			2 CT inputs + 8 digital inputs *3
							6			2 CT inputs + 8 digital outputs *3
							7			2 CT inputs + 8 digital outputs + RS-485 communication *3
								0		None *4
								D		Inspection certificate
								Y		Complying with the traceability certification
									0	None
									1	LEDs: all orange
									A	UL-marked product
									B	UL-marked product, orange LEDs only

*1 There are no digital inputs if "SS" is selected for Output 3, 4.

*2 There are 8 digital inputs if "SS" is selected for Output 3, 4.

*3 Cannot be selected if "SS" is selected for Output 3, 4.

*4 Tropicalization and anti-sulfidation treatments can be ordered. However, there are some restrictions on the specifications. For details, please contact the azbil Group.

*5 AC Power supply model only.

■ SDC46V

Basic model No.	Input model	Power supply	Output 1, 2	Output 3, 4	Output 5	Output 6, 7	Option	Addition 1	Addition 2	Specifications
C45V										Computation function model
	2									2 inputs (2 full multiple)
	3									3 inputs (1 full multiple, 2 linear)
		A								100 to 240 V AC
		D								24 V DC
			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 (OUT4)
				SS						Motor drive triac + MFB input *7
				R1						Motor drive relay + MFB input *7
					0					None *2
					R					Form 1a relay *2
					C					Current output *2
					D					Continuous voltage output *2
					P					Transmitter power supply *2
						0				None
						1				Current output (OUT 6)
						2				Transmitter power supply (OUT 7)
						3				2 current outputs *1
						4				Current (OUT 6) + transmitter power supply (OUT 7)
							0			2 digital inputs (DI-F1/2) *3
							1			14 digital inputs *4
							2			14 digital inputs + 8 digital outputs *4
							3			14 digital inputs + 8 digital outputs + RS-485 communication *4
							4			2 CT inputs *5
							5			2 CT inputs + 12 digital inputs *5
							6			2 CT inputs + 12 digital inputs + 8 digital outputs *5
							7			2 CT inputs + 12 digital inputs + 8 digital outputs + RS-485 communication *5
								0		None *6
								D		Inspection certificate
								Y		Complying with the traceability certification
									0	None
									1	LEDs: all orange
									A	UL-marked product
									B	UL-marked product, orange LEDs only

*1 Not available if "CC" is selected for Output 3, 4 and "C" is selected for Output 5..

*2 Selection must be "0" if "R1" is selected for Output 3, 4.

*3 There are no digital inputs if "SS" or "R1" is selected for Output 3, 4.

*4 There are 12 digital inputs if "SS" or "R1" is selected for Output 3, 4.

*5 Not available if "SS" or "R1" is selected for Output 3, 4.

*6 Tropicalization and anti-sulfidation treatments can be ordered. However, there are some restrictions on the specifications. For details, please contact the azbil Group.

*7 AC Power supply model only.

Chapter 2. WIRING

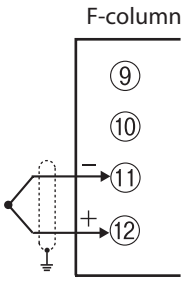
2 - 1 PV Input Connections

! Handling Precautions

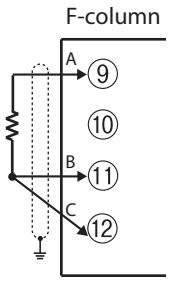
- Do not apply a voltage exceeding the allowable input voltage described in the specifications to each input. Doing so might cause the unit to malfunction.
- Make the connections properly while carefully checking the input polarities.
- Always use shielded wires for input wiring.
- When using a thermocouple for the input, take appropriate measures so that the terminal is not exposed to the wind. Failure to do so might cause an error to occur.

■ PV1 connections

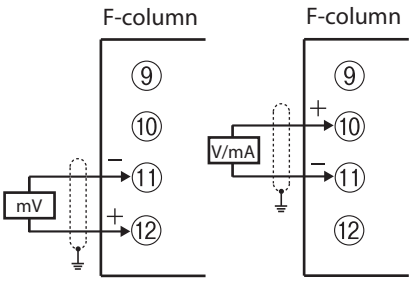
- **Thermocouple sensor**



- **RTD sensor**



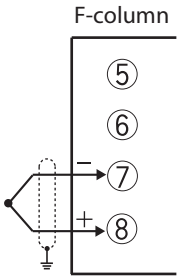
- **Linear voltage/linear current sensor**



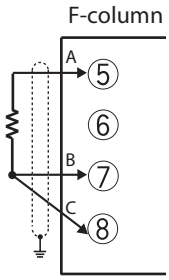
- When the range type is 43 to 46 (0 to 10 mV, -10 to +10 mV, 0 to 100 mV, -100 to +100 mV), terminal Nos. (11) and (12) are used.
- When the range type is 41, 42, and 47 to 51 (4 to 20 mA, 0 to 20 mA, 0 to 1 V, -1 to +1 V, 1 to 5 V, 0 to 5 V, 0 to 10 V), terminal Nos. (10) and (11) are used.

■ PV2 connections (2 inputs model)

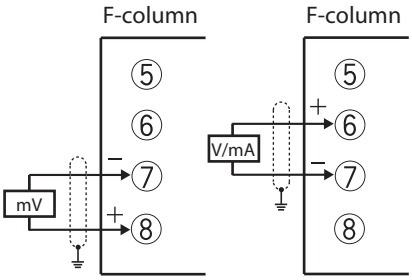
- **Thermocouple sensor**



- **RTD sensor**



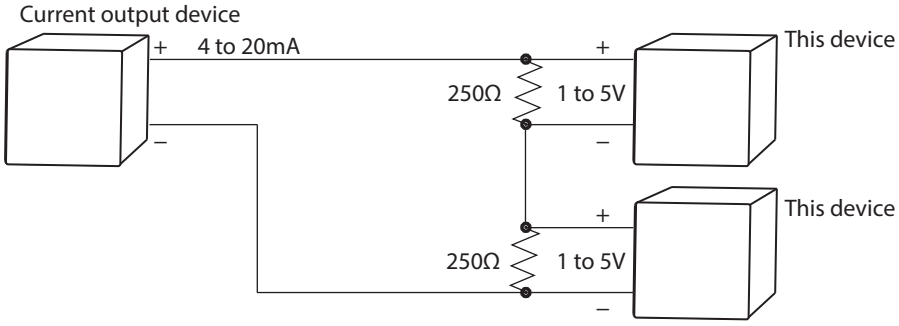
- **Linear voltage/linear current sensor**



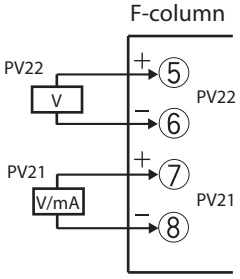
- When the range type is 43 to 46 (0 to 10 mV, -10 to +10 mV, 0 to 100 mV, -100 to +100 mV), terminal Nos. (7) and (8) are used.
- When the range type is 41, 42, and 47 to 51 (4 to 20 mA, 0 to 20 mA, 0 to 1 V, -1 to +1 V, 1 to 5 V, 0 to 5 V, 0 to 10 V), terminal Nos. (6) and (7) are used.

■ Current input connection

The current input circuit of this device is shut off when the instrument power is turned off.
If multiple current input circuits are connected in series, and if the instrument power supplies can be turned off individually, connect the separately-sold resistor (81401325) and set the range type to voltage.



■ Connection of PV21 and PV22 (3 inputs model)



* PV21 and PV22 are not isolated.

Chapter 3. FUNCTION SETUP

3 - 1 Loop Type

■ Overview

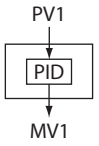
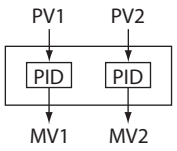
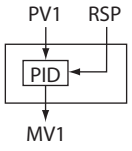
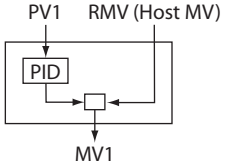
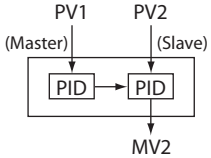
One set of PID control operations is called a loop. Major functions included in a loop are:

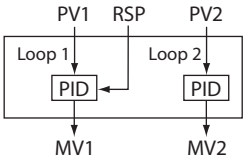
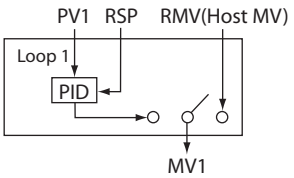
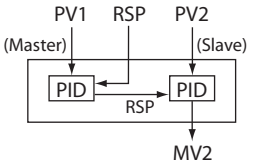
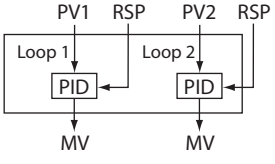
- PV
- SP
- MV
- Mode

■ Loop type

The loop type (control method) can be selected as desired by changing the settings. 2-input models can be set from 0 to 4. 3-input models can be set from 0 to 7. PV, RSP and MV signals from the host computer use the data assigned by the settings in the loop control bank.

Bank	Item display	Item name	Settings
SETUP	C-001	Loop type	0: 1-loop, 1: 2-loop (independent), 2: 1-loop (with RSP), 3: 1-loop (computer backup), 4: 1-loop (internal cascade), 5: 2-loop with RSP in one loop, 6: 1 loop (computer back-up with RSP), 7: 1-loop (internal cascade with RSP), 8: 2 loops (RSP)

Loop type	
0: 1 loop	
1: 2 loops (Independent)	
2: 1 loop (RSP)	
3: 1 loop (Computer backup)	
4: 1 loop (Internal cascade)	

Loop type	
5: 2 loops with an RSP on one side	
6: 1 loop (Computer backup with an RSP)	
7: 1 loop (Internal cascade with an RSP)	
8: 2 loops (RSP)	

■ SDC45V/46V data assignment

By changing the settings on the SDC45V/56V, the PV, RSP and MV signal from the host computer can be assigned as desired.

Bank	Item display	Item name	Settings	Initial value
CtrL	InP.01	PV assignment	Setting range: 0 to 3071 0: NOP 1: PV1 (input channel) 2: PV2/21(input channel) 3: PV22 (input channel) 4: Results of input computation 5: Flow rate (corrected for temperature and pressure) 6 to 2047: NOP 2048 to 3071: Standard numerical codes	1 for loop1, 2 for loop2
	InP.02	RSP assignment		0(NOP)
	InP.03	RMV assignment		0(NOP)

Auxiliary display indicates L1 for loop 1, and L2 for loop 2.
In the case of NOP (no operation), calculation is done with a fixed value of 0.0 as the data assignment.

3 - 2 Input Type

The input indication accuracy may vary depending on the type of sensor. 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.

Pv-01 set value	Sensor type	Range					
1	K	-270.0	to	+1372.0 °C	-454	to	+2502 °F
2	E	-270.0	to	+1000.0 °C	-454	to	+1832 °F
3	J	-200.0	to	+1200.0 °C	-328	to	+2192 °F
4	T	-270.0	to	+400.0 °C	-454	to	+752 °F
5	B	0.0	to	1800.0 °C	32	to	3272 °F
6	R	-50.0	to	+1768.0 °C	-58	to	+3214 °F
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
9	PR40-20	0.0	to	1900.0 °C	32	to	3452 °F
10	Ni-Ni•Mo	0.0	to	1300.0 °C	32	to	2372 °F
11	N	-200.0	to	+1300.0 °C	-328	to	+2372 °F
12	PL II	0.0	to	1390.0 °C	32	to	2534 °F
13	DIN U	-200.0	to	+600.0 °C	-328	to	+1112 °F
14	DIN L	-200.0	to	+900.0 °C	-328	to	+1652 °F
15	Gold-iron/chromel	-273.0	to	+27.0 °C	-459	to	+80 °F

■ Resistance temperature detector (RTD)

On the 3-input model, RTD input cannot be used for PV21/22.

Pv-01 set value	Sensor type	Range					
21	Pt100	-200.0	to	+850.0 °C	-328.0	to	+1562.0 °F
22		-200.0	to	+300.0 °C	-328.0	to	+572.0 °F
31	JPt100	-200.0	to	+640.0 °C	-328.0	to	+1184.0 °F
32		-200.0	to	+300.0 °C	-328.0	to	+572.0 °F

■ DC voltage/DC current

On the 3-input model, PV21 can be set to 41, 42, 49, 50, or 51;
and PV22 can be set to 49, 50 or 51.

Pv-01 set value	Sensor type	Range		
41	Current	4	to	20 mA
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

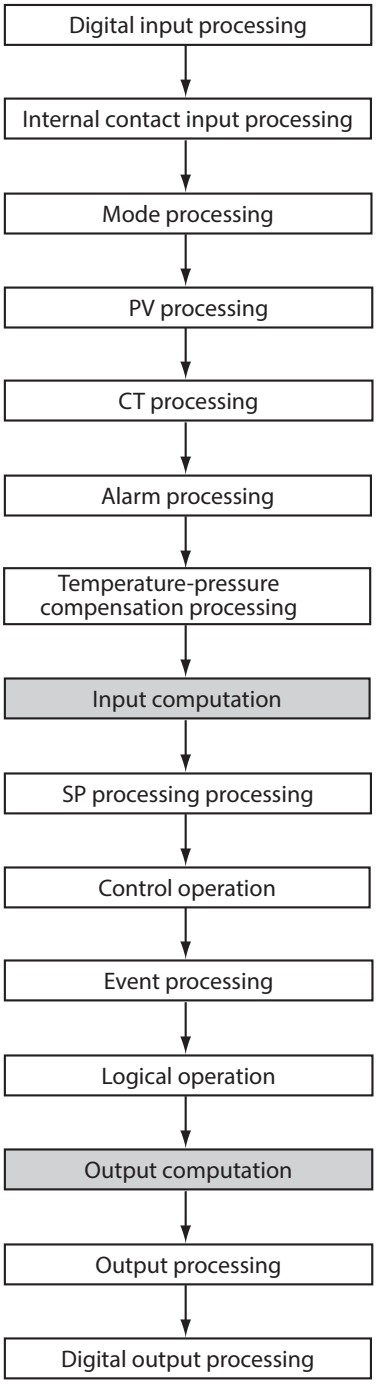
3 - 3 Computation Functions

■ Overview

The SDC45V/46V has input and output computation functions. Input computation can be used for PV processing or for switching between 2 inputs. Output computation can be used for MV processing or for switching between 2 inputs. Input and output computation are used the same way, and operate in the same way, but the timing of their execution differs.

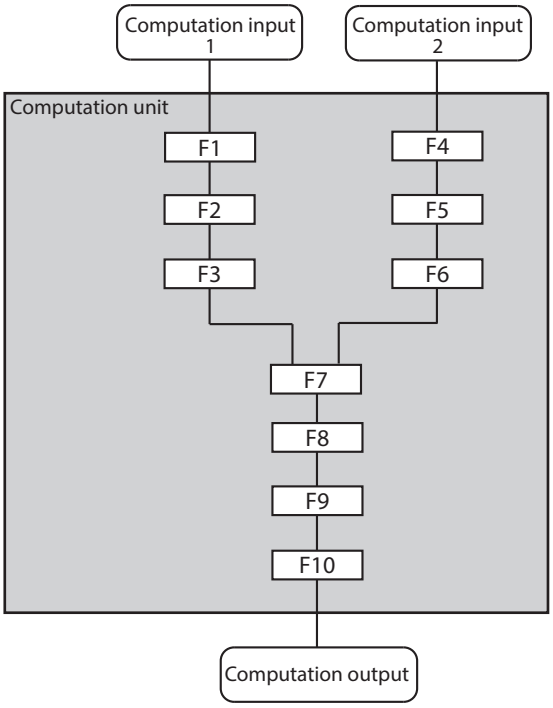
■ Timing of execution of computational functions

[Processing flow for each sampling cycle]



■ Computation patterns

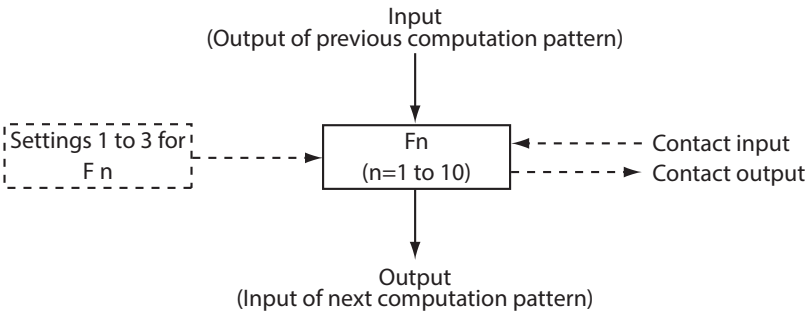
More than twenty types of mathematical/logical operation can be assigned to up to 10 computation patterns (F1 to F10).



- PV and MV can be assigned to computation input 1 and computation input 2.
- Computation patterns are executed in numerical order from F1 to F10.
- Computation output is a standard numerical value.

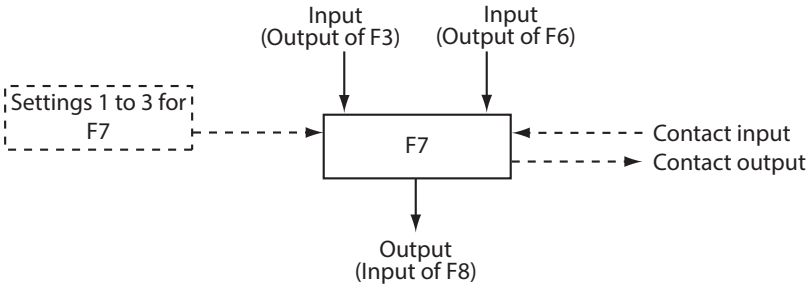
■ Components of computation patterns (F1 to F10)

● Other than F7



- 1-input, 1-output computation types can be assigned.
- Settings 1 to 3 are used within the computation pattern. Details differ depending on the computation type.
- Contact input is defined by a standard bit code. When ON, computation is started or stopped. Details differ depending on the computation type.
- Contact output data is used for monitoring the status of the computation. Details differ depending on the computation type.

● **F7**



- 2-input, 1-output computations can be assigned.
- If a 1-input, 1-output computation is assigned to F7, set the operation type of operation units (F4 to F6) to NOP (no operation).

🕮 Note

- When 2-input/1-output operation type is assigned to the operation units other than F7, the operation is done with the operation type = NOP (no operation).

■ Mathematical/logical operations

The table below lists the mathematical/logical operations and tells whether settings 1–3 and contact I/O are available (✓) or not available (-) for each operation.

Bank	Display item	Item name	Descriptions		Setting 1	Setting 2	Setting 3	Contact input	Contact output
in.FnC and ot.FnC	TYPE	Mathe-matical/ logical operations	0:NOP	No operation	-	-	-	-	-
			1:FLT	First-order lag filter	✓	-	-	✓	-
			2:R/B	Ratio/Bias	✓	✓	-	✓	-
			3:HLL	High/low limiter	✓	✓	-	✓	✓
			4:DRL	Change rate limiter	✓	✓	✓	✓	✓
			5:LED	Differentiation	✓	✓	-	✓	-
			6:L/L	Advance/delay	✓	✓	-	✓	-
			7:ABS	Absolute value	-	-	-	✓	-
			8:TBL	Linearization table	-	-	✓	✓	-
			9:MAX	Maximum value hold	-	-	-	✓	-
			10:MIN	Minimum value hold	-	-	-	✓	-
			11:HLD	Hold	-	-	-	✓	-
			12:PRS	Preset value	✓	-	-	✓	-
			13:SPR	Soft preset value	✓	✓	✓	✓	-
			14 to 30:NOP	No operation	-	-	-	-	-
			31:ADD	Addition/subtraction	✓	✓	✓	✓	-
			32:MUL	Multiplication	-	-	-	✓	-
			33:DIV	Division	-	-	-	✓	-
			34:HSE	High selector	-	-	-	✓	✓
			35:LSE	Low selector	-	-	-	✓	✓
			36:SWS	Switch selector	-	-	-	✓	✓
			37:CPS	Change point selector	✓	✓	-	✓	✓
			38:SSS	Soft switching selector	✓	-	✓	✓	✓

- Operations up to and including No. 30 are 1-input, 1-output.
- Operations No. 31 and following are 2-input, 1-output, and can be assigned to F7 only.

● **0: No operation (NOP)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: Not used.
Contact output: OFF

• Operation details
The input is output as is.

• Note
Assigned when no operation is desired. When NOP is assigned to F7, the output of F3 is output as is.

● **1: First-order lag filter (FLT)**

Setting 1: Filter constant value (setting range: 0.0 to 3200.0 s)
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: OFF

• Operation details
First delay operation.

● **2: Ratio/bias (R/B)**

Setting 1: Ratio (setting range: -19.999 to +32.000)
Setting 2: Bias (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 3: Not used.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: OFF

• Operation details
Output = input x ratio + bias

• Note
Used also for a fixed value or for doing the four basic arithmetic operations.

● **3: High/low limiter (HLL)**

Setting 1: High limit value (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 2: Low limit value (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 3: Not used.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: ON when limit reached

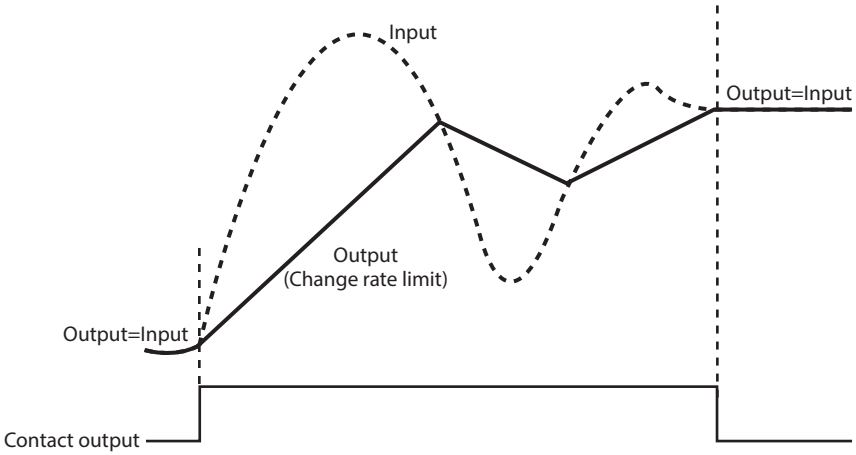
• Operation details
The input, limited as necessary by the high/low limit, is output.
If the relation of settings 1 and 2 is such that high limit < low limit, the high/low limit values are reversed before the operation is executed.

● **4: Change rate limiter (DRL)**

Setting 1: Max. increase rate (setting range: 0 to 32000 U, with decimal point determined by setting 3)
Setting 2: Max. decrease rate (setting range: 0 to 32000 U, with decimal point determined by setting 3)
Setting 3: Engineering unit of change rate
0: No decimal point/s
1: No decimal point/min
2: No decimal point/h
3: 0.1/s
4: 0.1/min
5: 0.1/h
6: 0.01/s
7: 0.01/min
8: 0.01/h
9: 0.001/s
10: 0.001/min
11: 0.001/h
Contact input: When ON, the limit operation is reset.
Contact output: ON when limit reached

• Operation details

The change rate, limited as necessary by the increase/decrease limits, is output.



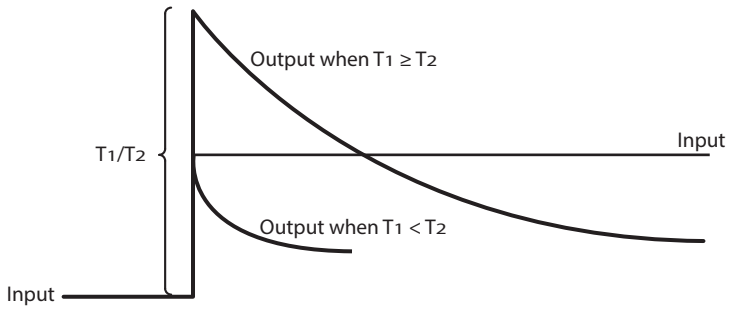
● **5: Differentiation (LED)**

Setting 1: Advance time (setting range: 0.0 to 3200.0 s)
Setting 2: Delay time (setting range: 0.0 to 3200.0 s)
Setting 3: Not used.
Contact input: When ON, output at 0.0.
Contact output: OFF

• Operation details

$$\text{Output} = \frac{T_1 \cdot S}{1+T_2 \cdot S} \times \text{Input}$$

(T_1:Advance time T_2:Delay time)



The formula shown below is used for internal computation, where Ts is the operation cycle, and INPUTprev. and OUTPUTprev. are respectively the previous input and output.

$$\text{OUT} = \frac{T_2}{T_S + T_2} \times \text{OUTPUT}_{\text{prev.}} + \frac{T_1}{T_S + T_2} \times (\text{INPUT} - \text{INPUT}_{\text{prev.}})$$

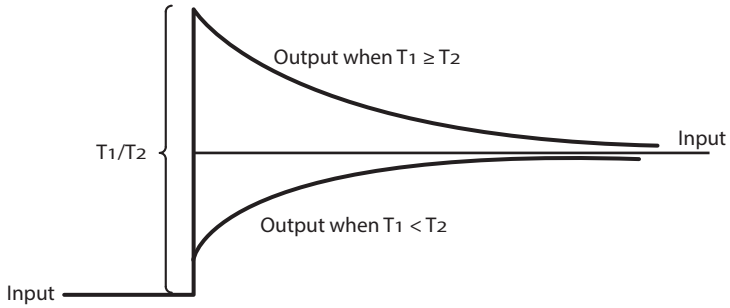
• Note:
When $T_1 > 16 \times T_2$, the calculation is automatically done as $T_1 = 16 \times T_2$.

● **6: Advance/delay (L/L)**

Setting 1: Advance time (setting range: 0.0 to 3200.0s)
Setting 2: Delay time (setting range: 0.0 to 3200.0s)
Setting 3: Not used.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: OFF

$$\text{Output} = \frac{T_1 \cdot S}{1+T_2 \cdot S} \times \text{Input}$$

(T_1:Advance time T_2:Delay time)



• Note:
When $T_1 > 16 \times T_2$, the calculation is automatically done as $T_1 = 16 > T_2$.

● **Absolute value (ABS)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: OFF

• Operation details

The absolute value of the input is output.

● **8: Linearization table (TBL)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Definition of linearization table (setting range: 0 to 8). When setting is 0, the input is output as is.
Contact input: When ON, operation is NOP (input is output as is).
Contact output: OFF

• Operation details

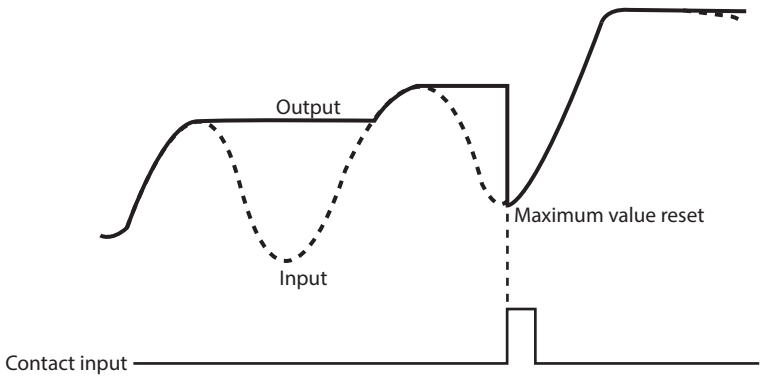
Linear approximation is processed using the linearization table indicated by the linearization table group definition setting.

● **9: Maximum value hold (MAX)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, maximum value is reset.
Contact output: OFF

• Operation details

The maximum value up to the present time is output. When the contact input is turned ON, the maximum value is reset, and output is set equal to input.

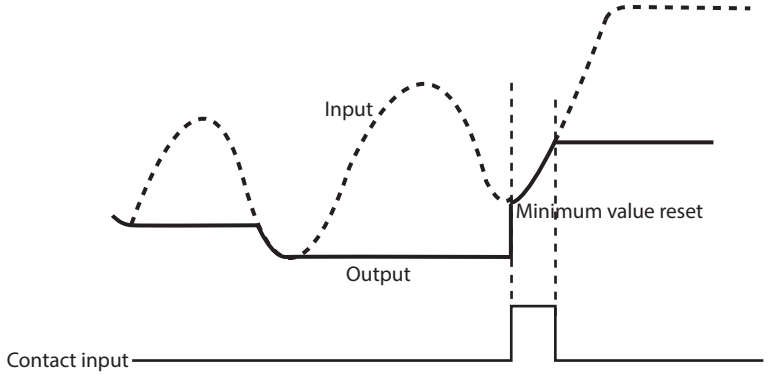


● **10: Minimum value hold (MIN)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, minimum value is reset.
Contact output: OFF

• Operation details

The minimum value up to the present time is output. When the contact input is turned ON, the minimum value is reset, and output is set equal to input.



● **11: Hold (HLD)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, continue output at the same level.
Contact output: OFF

• Operation details

When contact input is ON, the output is maintained as is.
When contact input is OFF, output is set equal to the input.

● **12: Preset value (PRS)**

Setting 1: Preset value (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, the preset value is output.
Contact output: OFF

• Operation details

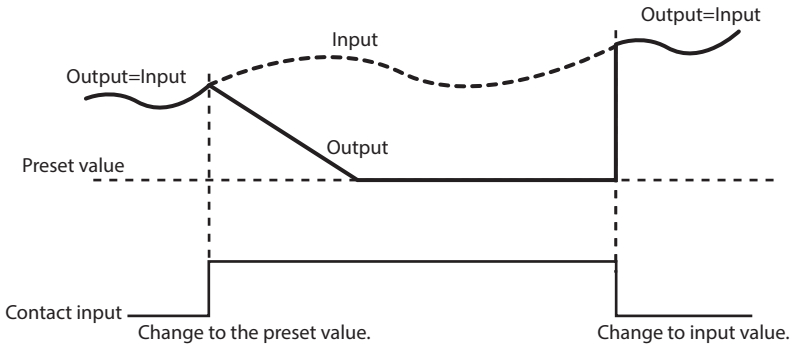
When contact input is ON, output is set equal to the preset value.
When contact input is OFF, output is set equal to the input.

● **13: Soft (slow) preset value (SPR)**

Setting 1: Preset value (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 2: Slope (setting range: 0 to 32000U, with decimal point determined by setting 3)
Setting 3: Engineering unit of slope
0: No decimal point/s
1: No decimal point/min
2: No decimal point/h
3: 0.1/s
4: 0.1/min
5: 0.1/h
6: 0.01/s
7: 0.01/min
8: 0.01/h
9: 0.001/s
10: 0.001/min
11: 0.001/h
Contact input: When ON, preset value is output.
Contact output: OFF

• Operation details

When the contact input is changed from OFF to ON, the output is set equal to the preset value during the slope operation.
If the preset value is changed while the contact input is ON, the output is set equal to the new preset value. When the contact input is OFF, output = input.



● **31: Addition/subtraction (ADD)**

Setting 1: Coefficient A(setting range: -19999 to +32000U, with decimal point determined by setting 3)
Setting 2: Coefficient B(setting range: -19999 to +32000U, with decimal point determined by setting 3)
Setting 3: Decimal point
0: No decimal point
1: 1 digit after decimal point
2: 2 digits after decimal point
3: 3 digits after decimal point
4: 4 digits after decimal point
Contact input: When ON, operation is NOP (input1 is output as is).
Contact output: OFF

• Operation details
Output = coefficient A × input 1 + coefficient B × input 2

• Note
When coefficient A = coefficient B = 0.5, the operation result is the average (arithmetic mean).

● **32: Multiplication (MUL)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input When ON, operation is NOP (input1 is output as is).
Contact output: OFF

• Operation details
Output = input 1 × input 2

● **33: Division (DIV)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, operation is NOP (input1 is output as is).
Contact output: OFF

• Operation details
Output = input 1 ÷ input 2

• Note
When the input 2 is set equal to 0, not operated (input 1 is output as is).

● **34: High selector (HSE)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, operation is NOP (input1 is output as is).
Contact output: OFF when input 1 is output, and ON when input 2 is output.

• Operation details
After comparison of input 1 and input 2, the larger one is output.

● **35: Low selector (LSE)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When ON, operation is NOP (input1 is output as is).
Contact output: OFF when input 1 is output, and ON when input 2 is output.

• Operation details

After comparison of input 1 and input 2, the smaller one is output.

● **36: Switch selector (SWS)**

Setting 1: Not used.
Setting 2: Not used.
Setting 3: Not used.
Contact input: When OFF, input 1 is output. When ON, input 2 is output.
Contact output: OFF when input 1 is output, and ON when input 2 is output.

• Operation details

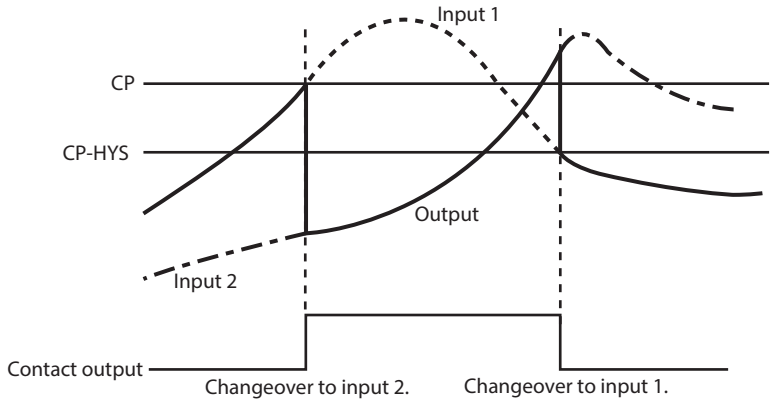
When contact input is OFF, input 1 is output.
When contact input is ON, input 2 is output.

● **37: Change point selector (CPS)**

Setting 1: Change point (setting range: -19999 to +32000U, decimal point position is based on the dP setting.)
Setting 2: Hysteresis (setting range: 0 to 32000U, decimal point position is based on the dP setting.)
Setting 3: Not used.
Contact input: When ON, operation is NOP (input1 is output as is).
Contact output: OFF when input 1 is output, and ON when input 2 is output.

• Operation details

If input 1 is equal to or greater than the change point, the output is set equal to input 2. Afterwards, if input 1 is less than change point - hysteresis, the output is set equal to input 1.

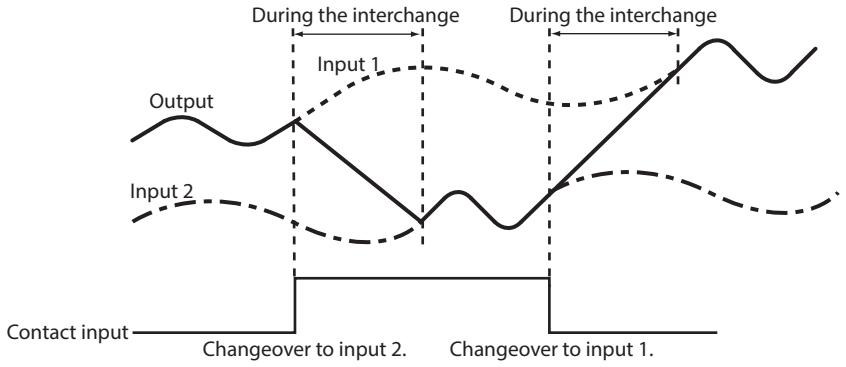


● **38: Soft (slow) switching selector (SSS)**

Setting 1: Slope (setting range: 0 to 32000U, with decimal point determined by setting 3)
Setting 2: Not used.
Setting 3: Engineering unit of slope
0: No decimal point/s
1: No decimal point/min
2: No decimal point/h
3: 0.1/s
4: 0.1/min
5: 0.1/h
6: 0.01/s
7: 0.01/min
8: 0.01/h
9: 0.001/s
10: 0.001/min
11: 0.001/h
Contact input: When OFF, input 1 is output. When ON, input 2 is output.
Contact output: OFF when input 1 is output, ON when input 2 is output, and OFF when during the interchange.

• Operation details

When the contact input is OFF, input 1 is output. When the contact input is ON, input 2 is output. Input 1 and input 2 are interchanged during the slope operation.



■ Important supplemental information

● High/low limits

• Range limits of settings

For settings 1 to 3, the setting range (high/low limit value) differs according to the mathematical/logical operations. If the set value exceeds the allowable range, the operation is carried out using the highest/lowest allowable value.

Mathematical/logical operations		High/low limit in internal operations		
		Setting 1 (PR-01)	Setting 2 (PR-02)	Setting 3 (PR-03)
0:NOP	No operation	-	-	-
1:FLT	First-order lag filter	0.0 to 3200.0 s	-	-
2:R/B	Ratio/bias	-19.999 to + 32.000	-19999 to + 32000 U	-
3:HLL	High/low limiter	-19999 to + 32000 U	-19999 to + 32000 U	-
4:DRL	Change rate limiter	0 to 32000 U	0 to 32000 U	0 to 11
5:LED	Differentiation	0.0 to 3200.0 s	0.0 to 3200.0 s	-
6:L/L	Advance/delay	0.0 to 3200.0 s	0.0 to 3200.0 s	-
7:ABS	Absolute value	-	-	-
8:TBL	Linearization table	-	-	0 to 8 *
9:MAX	Maximum value hold	-	-	-
10:MIN	Minimum value hold	-	-	-
11:HLD	Hold	-	-	-
12:PRS	Preset value	-19999 to + 32000 U	-	-
13:SPR	Soft preset value	-19999 to + 32000 U	0 to 32000 U	0 to 11
14 to 30:	NOP No operation	-	-	-
31:ADD	Addition/subtraction	-19999 to + 32000 U	-19999 to + 32000 U	0 to 4
32:MUL	Multiplication	-	-	-
33:DIV	Division	-	-	-
34:HSE	High selector	-	-	-
35:LSE	Low selector	-	-	-
36:SWS	Switch selector	-	-	-
37:CPS	Change point selector	-19999 to +32000 U	0 to 32000 U	-
38:SSS	Soft switching selector	0 to 32000 U	-	0 to 11

* : If the high/low limit is exceeded, the operation is carried out with a setting of "0".

A blank box in the table indicates nonuse for the operation type. In this case, the setting range accessed by communications is as follows:
Setting 1: -19999 to + 32000
Setting 2: -19999 to + 32000
Setting 3: 0 to 255

• Limits of operation processing

The computation unit does not do any limit processing on the operation result. The user can set limits as necessary using the high/low limiter (HLL).

● **Initialization of operation unit**

In the following cases, the internal data of all operation units is initialized (reset):

- When the power is turned on.
- When the loop type setting (C-001) in the setup bank (SETUP) is changed.

● **Operation accuracy**

Operations are performed with a single-precision floating point decimal.

3 - 4 Power Failure Detection

■ Overview

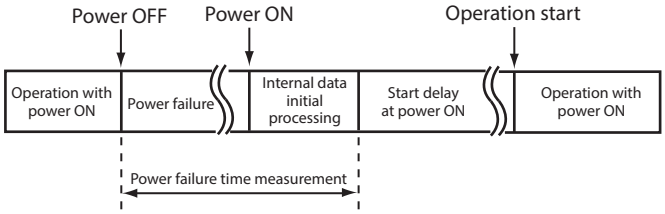
The occurrence/nonoccurrence of a power supply interruption can be checked. In addition, when a startup method and hot start power failure high limit have been set, the SDC45V/46V can use the hot start function.

■ Bank and settings

Bank	Item display	Item name	Settings	Initial value	Remarks
SETUP	C-017	Startup method	0: Cold start 1: Hot start	0	
	C-018	Max. power failure time for hot start	5 to 32000 s	5	Can be set if the startup method is set to hot start.
	C-019	Power failure detection	(Can be write 0 only) 0: No power interruption 1: Power interrupted in excess of cold start or else hot start power failure upper limit time. 2: Power interrupted for less than the hot start power failure upper limit time.	–	When power is restored after a power failure, the device can be set automatically to 1 or 2. The user can change the setting only to 0.

■ Measurement of power failure time

When the startup method (C-017) is set to 1 (hot start), the duration of the power failure is measured by the device as shown in the figure below.
The result of comparison between the duration of the power failure and the value set for hot start power failure upper limit time (C-018) is shown by the power failure detection function (C-019).



Note

- Time required for initial processing of internal device data is 5 s max.

■ How to check for power failure

After power is restored, the occurrence of a power failure is shown in C-019 (power failure detection) in the setup bank (SETUP).

C-019 is set to 2 (power interrupted for less than the hot start power failure upper limit time) only when the following conditions are satisfied:

- When the startup method (C-017) is set to 1 (hot start).
- When power is restored after a power failure that does not last as long as the hot start power failure upper limit time (C-018).

In addition, power failure information (C-019) is reflected as a standard bit code (power failure detection). Internal contact input and logical operations can be utilized for processing of a power failure recovery.

■ How to reset the power failure detection

Power failure detection (C-019) can be reset to 0. A connected host device can check the power supply status by setting C-019 to 0 and then monitoring its value. To turn the standard bit (power failure detection) OFF, set power failure detection (C-019) to 0.

3 - 5 Hot Start

The SDC45V/46V has a hot start function. When hot start is used, and power is restored after a power failure, control operation starts from the MV in use when the power failure occurred, and control fluctuation is kept to a minimal level.

■ How to use the function

Set the startup method (C-07) in the setup bank (SETUP) to 1 (hot start). To define a maximum power failure time for a hot start, set the hot start power failure upper limit time (C-08).

■ Conditions for hot start

A: Immediately after recovery from power failure, the power failure detection (C-09) value is 2 (power failure for a time less than the hot start power failure upper limit time).
B: AUTO-RUN status (MV = PID control output)
C: MANUAL mode both before power failure and just after the recovery from power failure.

Under the following combinations of conditions, a hot start is used.

- When conditions A and B are both met.
- When conditions A and C are both met.

When power is restored after a power failure and the conditions are other than the above combinations, a hot start is not used.

■ Operating specifications

- When conditions A and B are met.
  Control operation starts using the MV (PID control output) in use before the power failure as the initial output of PID control. Bumpless initialization keeps any undesired control operation at a minimum.
- When conditions A and C are realized.
  The manual MV in use before the power failure is continuously output.

■ Backed up data

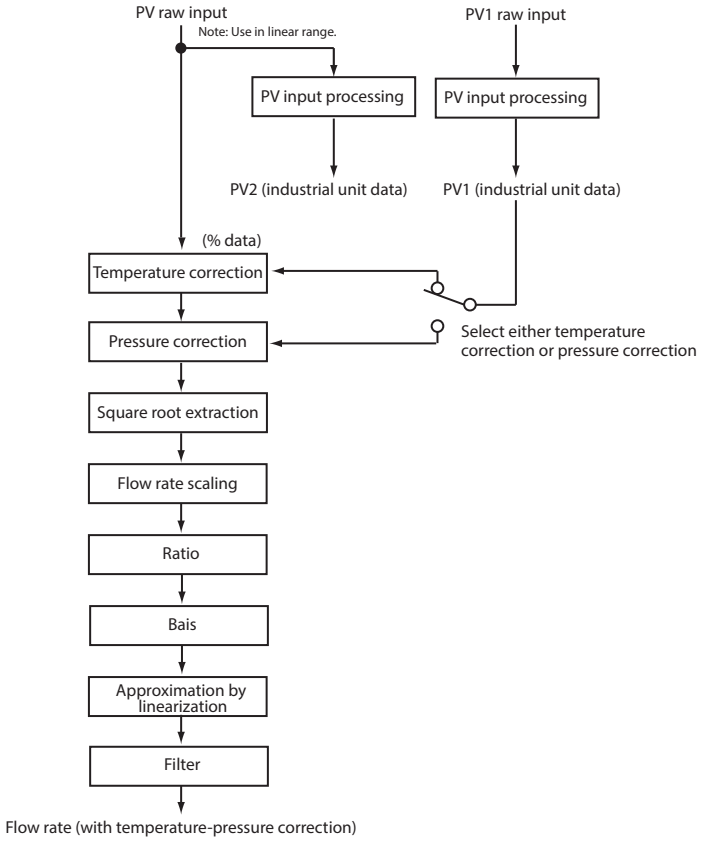
The data backed up when the power fails is the MV calculated for control.
The internal data used in the control calculation is not backed up.

■ How to check the status of hot start and reset

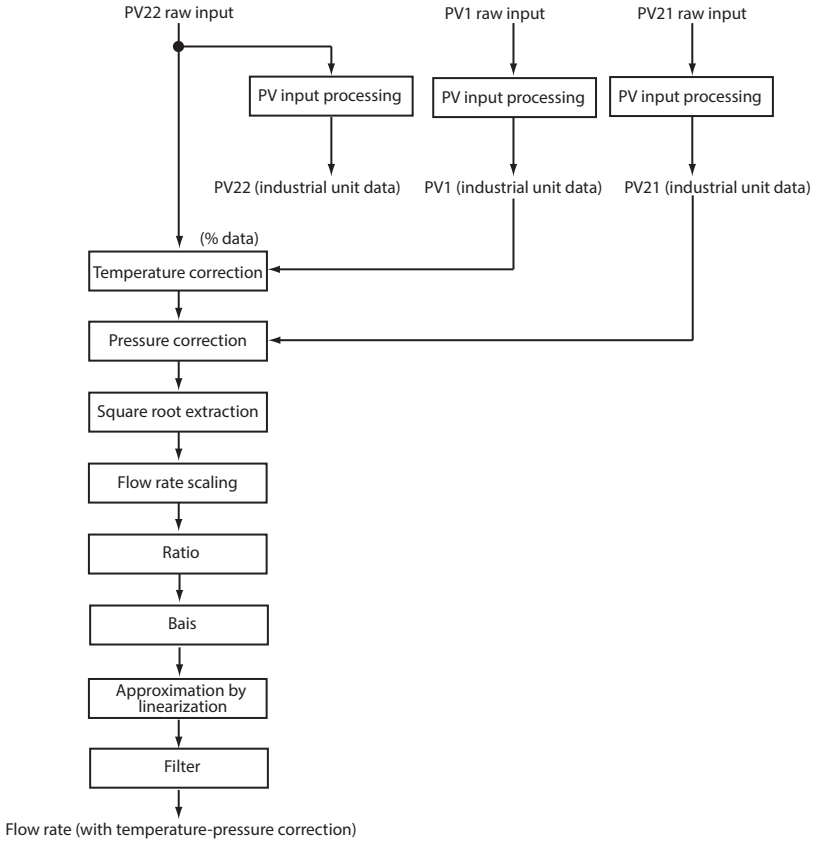
Status can be checked for each loop by the standard bit code for PID hot start detection. To turn the PID hot start detection bit OFF, set power failure detection (C-09) to 0.

3 - 6 Temperature-Pressure Correction

■ 2 inputs model



■ 3 inputs model



■ Temperature correction

For the flow rate signal, the equation below is used for temperature correction.

$$\text{Corrected flow rate signal (\%)} = \frac{\text{Design temperature} + \text{CV}^*}{\text{PV input for temp. correction} + \text{CV}^*} \times \text{Flow rate signal (\%)}$$

* : Where CV is a constant.

The decimal point for design temperature is set by the decimal point position (Pu-02) assigned for temperature correction in the PV input bank (Pu).

The constant CV is the following values depending on the temperature unit:

Temperature unit	Constant value (CV)
Celsius	273.15
Fahrenheit	459.67
K (Kelvin)	0.0

The temperature unit is determined by the following settings:

PV range type assigned for temperature correction	Temperature unit
For thermocouple or RTD	The temperature unit (Pu-03) selected in the PV bank (Pu)
For linear (DC) range	Unit selected for temperature correction (Pu.C.02) in the temperature-pressure correction bank (Pu.CnP)

■ Pressure correction

For the flow rate signal, the equation below is used for pressure correction.

$$\text{Corrected flow rate signal (\%)} = \frac{\text{PV input for pressure correction} + \text{CP}^*}{\text{Design pressure} + \text{CP}^*} \times \text{Flow rate signal (\%)}$$

* : Where CP is a constant.

The decimal point for design pressure is set by the decimal point position (Pu-02) assigned for pressure correction in the PV input bank (Pu).
The unit of pressure is set by the pressure unit (Pu.C.04) assigned in the temperature-pressure correction bank (Pu.CnP).

The constant CP is the values shown below, depending on the pressure unit:

Pressure unit	CP
MPa	0.101325
kPa	101.325
Pa	101325
kg/cm^2	1.03323
mmH_2O	10332.3

■ Flow rate scaling

The temperature-pressure correction, as well as a corrected flow rate signal (%) with square root extraction, are scaled based on the low limit (0%) and high limit (100%) settings.

■ Operating specifications if settings are abnormal

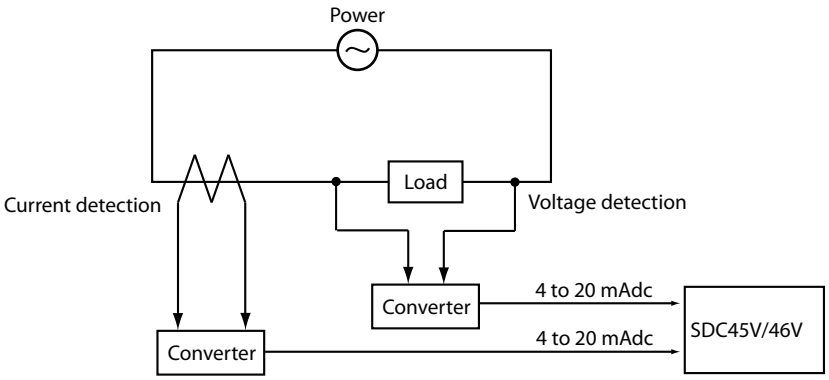
Under the conditions specified below, temperature-pressure correction is not done. The flow rate (with temperature-pressure correction) is 0.0.

- When the input of flow rate signal is not a linear range (D.C.).
- When the input of pressure signal is not a linear range.
- When the correction method (Pu.C.01) on the 2-input model is set to 3 (temperature-pressure correction).

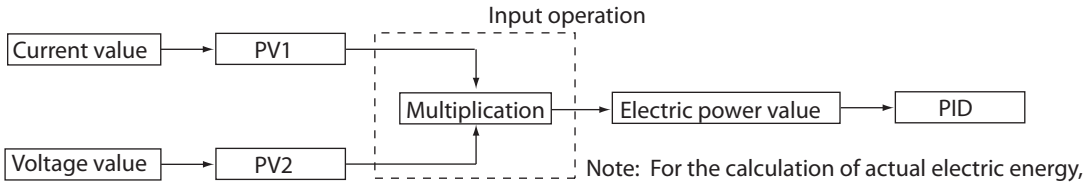
Chapter 4. SAMPLE SETTINGS

This chapter gives examples of settings configured using the SLP-C45 Smart Loader Package.

- **Example 1: Calculation of PV from 2 PV inputs**
  - **Electric power control for heater**



  - **Signal flow**

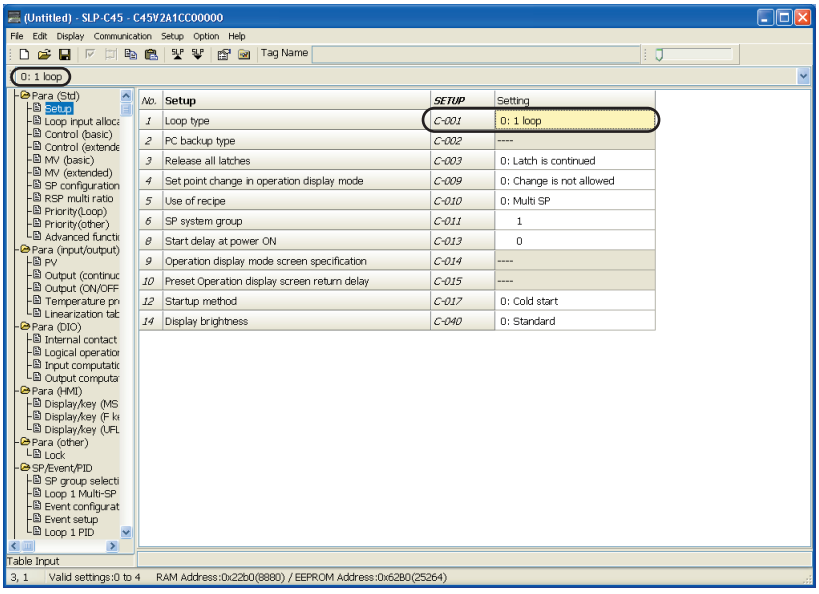


Note: For the calculation of actual electric energy, take the power factor of the load into consideration.

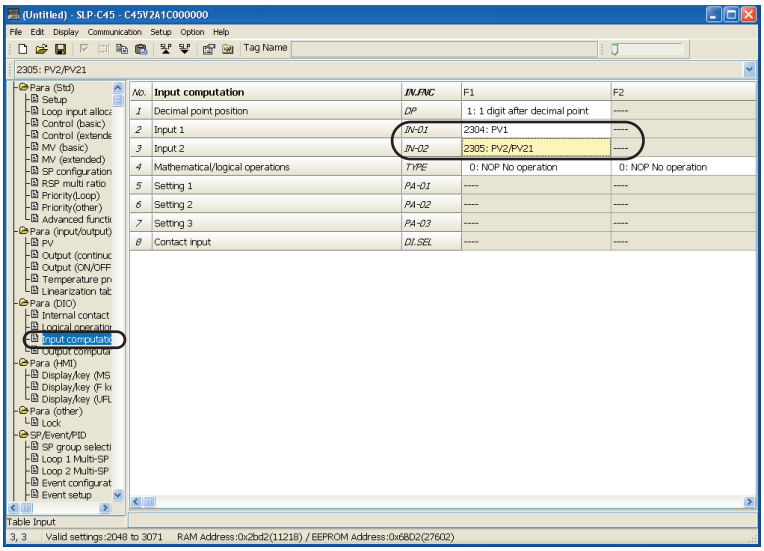
* The product of input 1 X input 2 is used as the PV value for PID calculation.

  - **Settings**

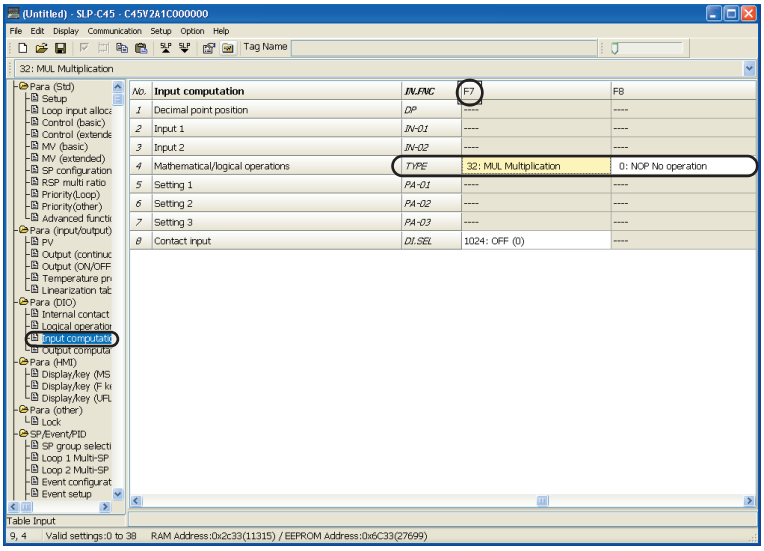
(1) Select [Setup] → [Loop type (C-001)], and set to [0:1 loop].
(2) Select [PV], and set PV1 and PV2 for current and voltage ranges respectively.



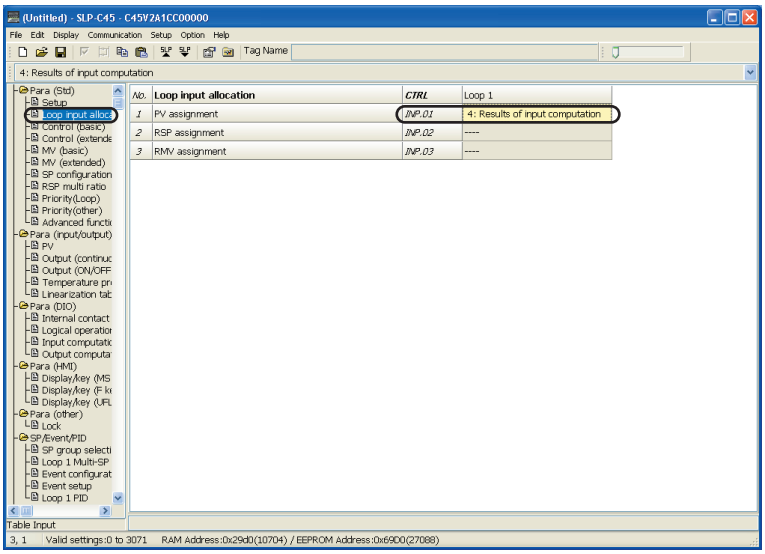
(3) Select [Input computation], and set [Input 1] and [Input 2] in F1 to [2304: PV1] and [2305: PV2/PV21] respectively.



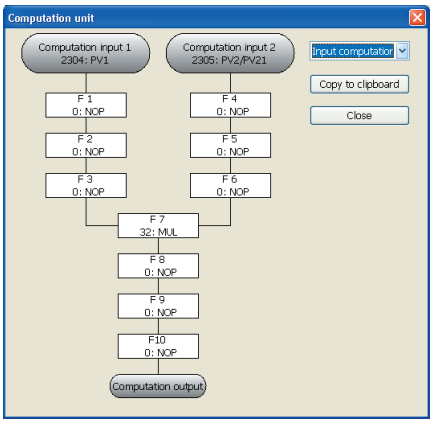
(4) Select [Operation [F7]], and set the [Mathematical/logical operations] to [32: MUL Multiplication].



(5) Select [Loop input allocation], and set [PV assignment] to [4: Results of input computation].



>> The settings are used in the input computation as follows:

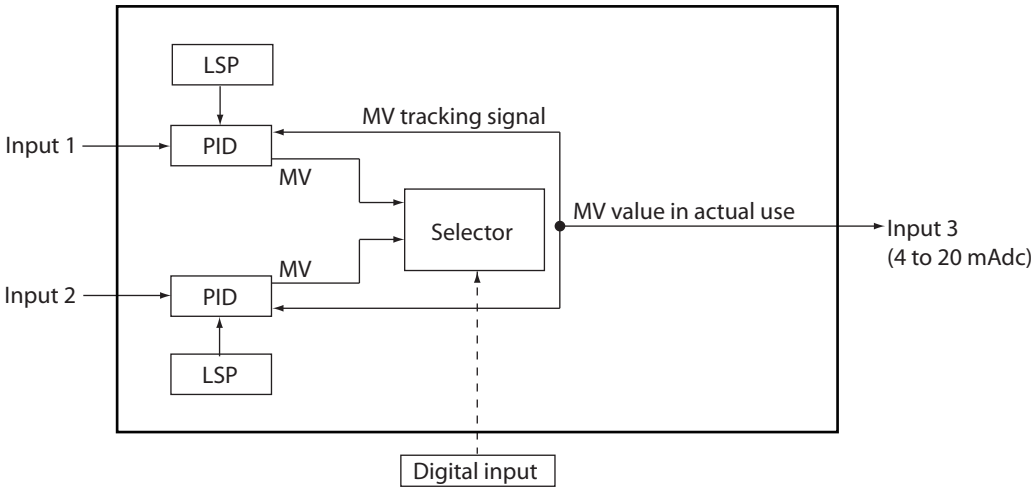


● Example 2: Control one actuator continuously while switching between 2 inputs

● Electric power control for heater

Switching between sensors using different industrial units (pressure to temperature, current to temperature)

● Signal flow

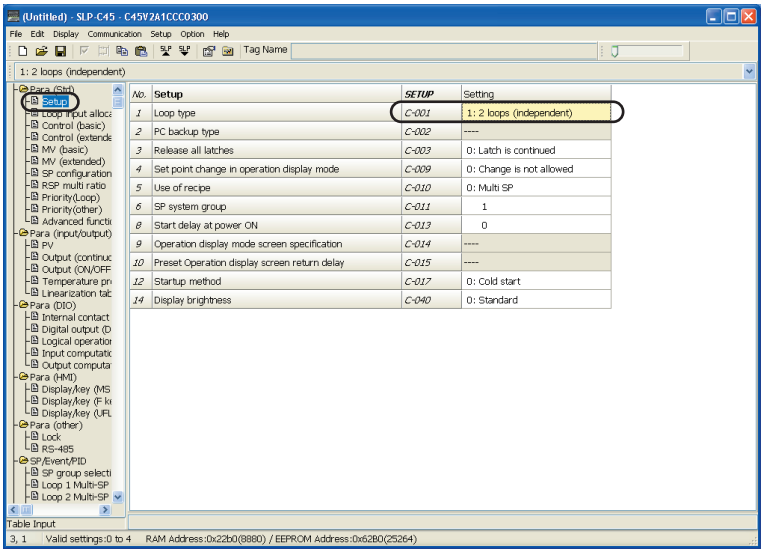


Note: With an MV tracking signal, bumpless control (without control output irregularity) can be continued even if inputs 1 and 2 are switched. For digital input, use No. 1 of line F.

● Stettings

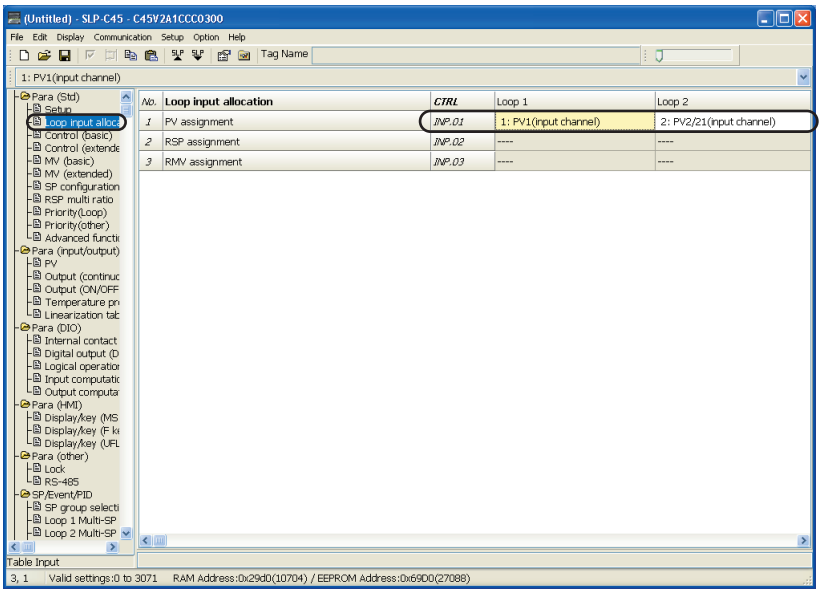
(1) Select [Setup] → [Loop type (C-001)], and set to [1: 2 loops (independent)].

(2) Select [PV], and set the input ranges for PV1 and PV2.



No.	Setup	SETUP	Setting
1	Loop type	C-001	1: 2 loops (independent)
2	PC backup type	C-002	----
3	Release all latches	C-003	0: Latch is continued
4	Set point change in operation display mode	C-009	0: Change is not allowed
5	Use of recipe	C-010	0: Multi SP
6	SP system group	C-011	1
8	Start delay at power ON	C-013	0
9	Operation display mode screen specification	C-014	----
10	Preset Operation display screen return delay	C-015	----
12	Startup method	C-017	0: Cold start
14	Display brightness	C-040	0: Standard

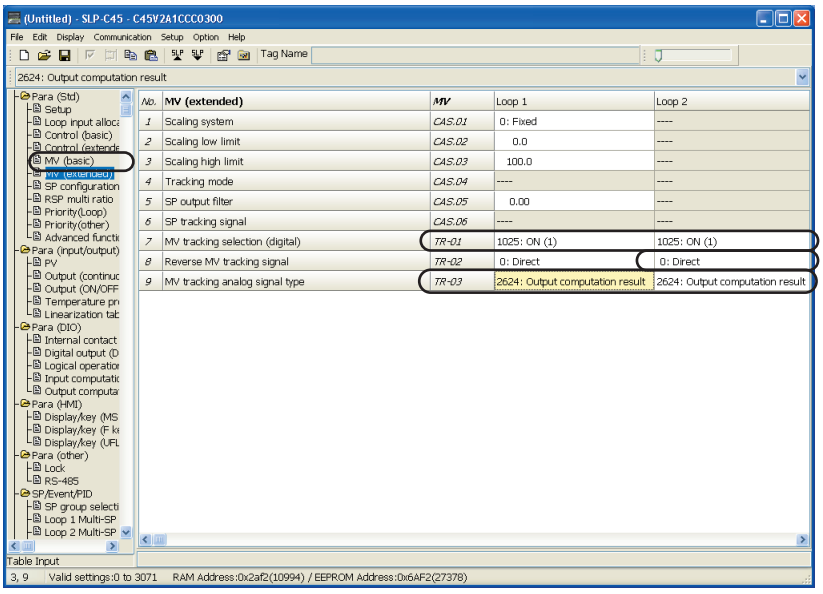
(3) Select [Loop input allocation], and assign [1: PV1] and [2: PV2] to [Loop 1] and [Loop 2] respectively.



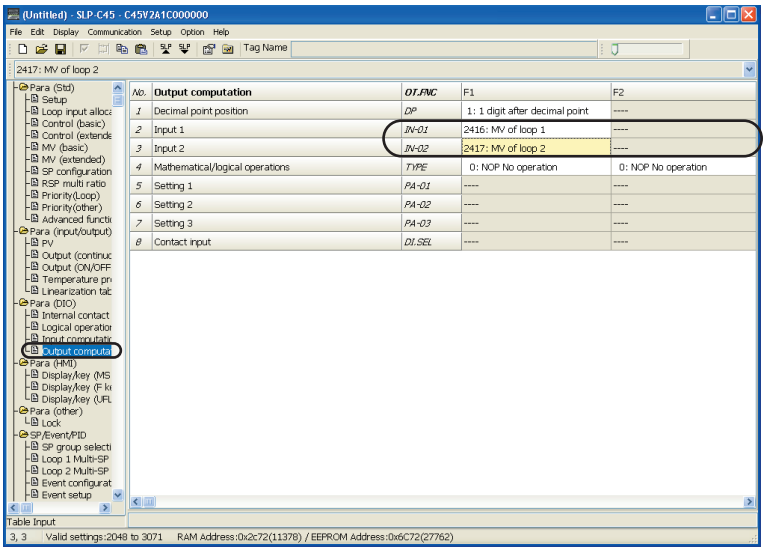
(4) Select [MV (extended)], and set [MV tracking selection (digital)] to [1176: Terminal status of D1-F1] for both loops 1 and 2.

(5) Set [Reverse MV tracking signal] to [1: Reverse] for loop 2.

(6) Set [MV tracking analog signal type] to [2624: Output computation result] for both loops 1 and 2.

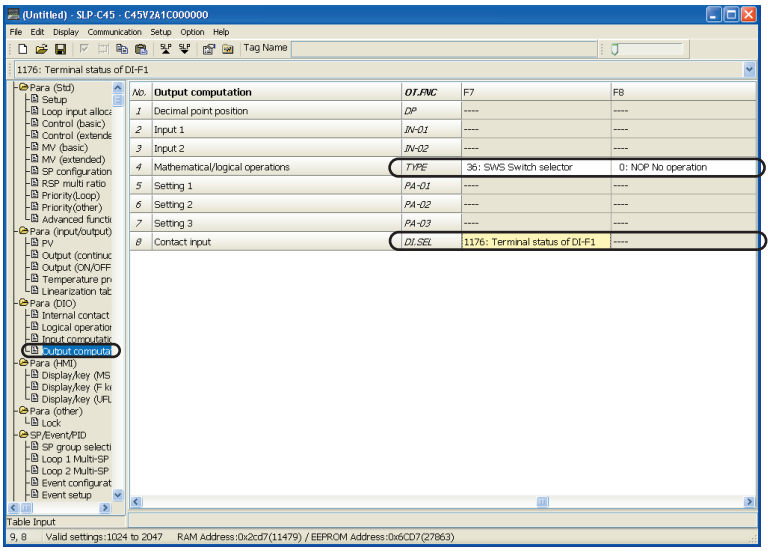


(7) Select [Output computation], and for Operation F1 assign [2416: MV of loop 1] and [2417: MV of loop 2] to [Input 1] and [Input 2] respectively.

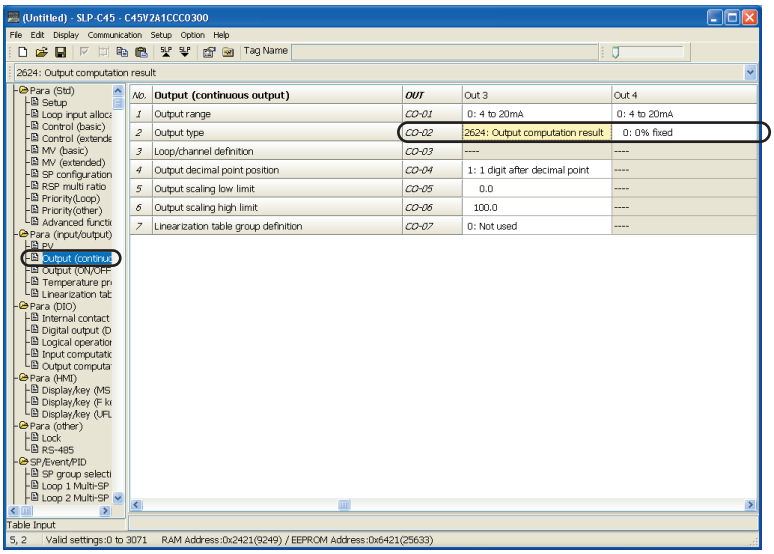


(8) Select [Operation [F7]], and assign [36: SWS Switch selector] to [Mathematical/logical operations].

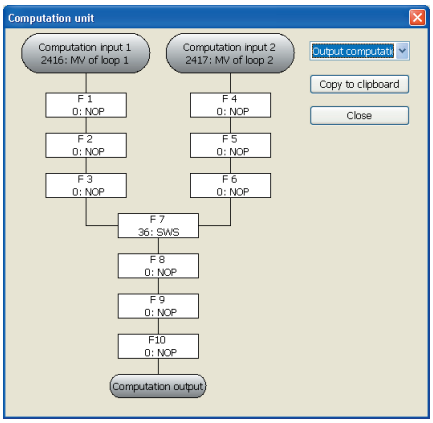
(9) Set [Contact input] to [1176: Terminal status of DI-F1].



(10) Select [Output (continuous output)] and set [Output type] to [2624: Output computation result].



>> The settings are used as follows in the output computation:



Chapter 5. ALARM CODE LIST

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 or reset PV1 range type (Pu-01). Reset PV1 range high/low limits (Pu-04: Range low limit, Pu-05: Range high limit.)
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 or reset PV2/PV21 range type (Pu-01). Reset PV2/PV21 range high/low limits (Pu-04: Range low limit, Pu-05: Range high limit.)
AL04	PV2/PV21 input failure (under-range)		
AL05	PV22 input high limit failure (SDC45V/46V only)	Sensor burnout, incorrect wiring, incorrect PV22 range type setting.	Check the wiring or reset PV22 range type (Pu-01). Reset PV22 range high/low limits (Pu-04: Range low limit, Pu-05: Range high limit.)
AL06	PV22 input low limit failure (SDC45V/46V only)		
AL17	Control range error	Incorrect control range	Reset the control range high and low limits. (CnL.05: range low limit for control, CnL.06: range high limit for control)
AL21	MFB input error	Line break, incorrect wiring	Check the wiring
AL22	Motor adjustment error	Line break, incorrect wiring Motor power supply cut-off	Check the wiring,Check the power to the motor, Readjustment
AL25	CT1 input error	CT over range Incorrect setting of CT input	Check the CT input Reset the CT input
AL26	CT2 input error		
AL71	Abnormal PV1 CJ compensation	Abnormal terminal temperature (thermocouple).	Check the ambient temperature.
AL72	Abnormal PV2 CJ compensation		
AL81	Battery voltage drop (SDC45V/46V only)	Weak battery	Replace the battery.
AL82	Built-in clock error (SDC45V/46V only)	Weak battery, Hardware failure	Reset the clock after battery replacement
AL83	Board configuration problem	Hardware failure	Replace the unit.
AL96	Main board error		
AL97	Parameter failure	Power was turned OFF while setting data. Data is corrupted due to noise, etc.	Restart the system. Reset data (AL97: setting data, AL98: tuning data) or replace the unit.
AL98	Adjustment data problem		
AL99	ROM failure	ROM (memory) is faulty.	Restart the system. Replace the unit.

Chapter 6. LIST OF SETTING DATA AND COMMUNICATION DATA

6 - 1 Control Bank (Ctrl)

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
InP.01	L.1.	PV assignment	0: NOP 1: PV1 (input channel) 2: PV2/21 (input channel) 3: PV22 (input channel) 4: Results of input computation 5: Flow rate (corrected for temperature and pressure) Note: For other settings, see remarks in far right column.	1		• Can be set from 0 to 3071, but many numbers are undefined and should not be used. For details, see the Standard Numerical Codes list. • Cannot be set on the SDC45A/46A.
InP.02	L.1.	RSP assignment		0		
InP.03	L.1.	RMV assignment		0		
Cnt.01	L.1.	Loop PV/SP decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point 3: 3 digits after decimal point 4: 4 digits after decimal point	1		
Cnt.03	L.1.	Control action	0: Reverse (heat) 1: Direct (cool) 2: Heat/cool	0		
Cnt.04	L.1.	Control algorithm	0: PID-A (deviation derivative) 1: Ra-PID 2: PID-B (PV derivative)	0		
Cnt.05	L.1.	Control range low limit	-19999 to +32000 U	0		The decimal point position is determined by the decimal point positions for the loop PV/SP.
Cnt.06	L.1.	Control range high limit		1000		
Cnt.07	L.1.	AT type	0: Normal (regular control characteristics) 1: Immediate response (control characteristics for fast response to external disturbance) 2: Stable (control characteristics that minimize up/down PV fluctuation)	0		
Cnt.08	L.1.	Heat/cool control dead zone	-100.0 to +100.0 %	0.0		
Cnt.09	L.1.	Initial PID control output	-10.0 to +110.0 %	0.0		
Cnt.10	L.1.	Abnormal PV definition	0: If a PV alarm (AL01 to AL06) occurs 1: If a PV1 alarm (AL01 or AL02) occurs 2: If a PV2/21 alarm (AL03 or AL04) occurs 3: If a PV22 alarm (AL05 or AL06) occurs	0		Cannot be set on the SDC45A/46A.
Etd.01	L.1.	PID control initialization	0: Auto 1: Not initialized 2: Initialized (if SP value different from the current value is input)	0		
Etd.02	L.1.	Integral time/derivative time decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point	0		Affected by the decimal point positions for integral time and derivative time.
Etd.03	L.1.	Output after AUTO • MANUAL change	0: Bumpless transfer 1: Preset	0		
Etd.04	L.1.	Preset MANUAL value	-10.0 to +110.0 %	0.0		When the power is turned ON, if the operation mode is MANUAL, the MV is preset MANUAL value.
Etd.05	L.1.	MV increase change limit	0.00: No limit 0.01 to 320.00 %/s	0.00		
Etd.06	L.1.	MV decrease change limit		0.00		
Etd.07	L.1.	Heat/cool selection	0: Normal 1: Energy saving	0		
Etd.08	L.1.	MV low limit for AT	-10.0 to +110.0 %	0.0		
Etd.09	L.1.	MV high limit for AT		100.0		
Etd.12	L.1.	Zone operation selection	0: Selected by SP value 1: Selected by PV value	0		If zone PID is used, set the PID group selection priority to "Zone PID function".
Etd.13	L.1.	Zone 1	-19999 to +32000 U	3200.0		The decimal point position is determined by the decimal point positions for the loop PV/SP.
Etd.14	L.1.	Zone 2				
Etd.15	L.1.	Zone 3				
Etd.16	L.1.	Zone 4				
Etd.17	L.1.	Zone 5				
Etd.18	L.1.	Zone 6				
Etd.19	L.1.	Zone 7				
Etd.20	L.1.	Zone hysteresis	0 to 32000 U	5.0		

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
InP.01	L.2.	PV assignment	0: NOP 1: PV1 (input channel) 2: PV2/21 (input channel) 3: PV22 (input channel) 4: Results of input computation 5: Flow rate (corrected for temperature and pressure) Note: For other settings, see remarks in far right column.	2		• Can be set from 0 to 3071, but many numbers are undefined and should not be used. FFor details, see the Standard Numerical Codes list. • Cannot be set on the SDC45A/46A.
InP.02	L.2.	RSP assignment		-		
InP.03	L.2.	RMV assignment		-		
CnL.01	L.2.	Loop PV/SP decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point 3: 3 digits after decimal point 4: 4 digits after decimal point	1		
CnL.03	L.2.	Control action	0: Reverse (heat) 1: Direct (cool) 2: Heat/cool	0		
CnL.04	L.2.	Control algorithm	0: PID-A (deviation derivative) 1: Ra-PID 2: PID-B (PV derivative)	0		
CnL.05	L.2.	Control range low limit	-19999 to +32000 U	0		The decimal point position is determined by the decimal point positions for the loop PV/SV.
CnL.06	L.2.	Control range high limit		1000.0		
CnL.07	L.2.	AT type	0: Normal (regular control characteristics) 1: Immediate response (control characteristics for fast response to external disturbance) 2: Stable (control characteristics that minimize up/down PV fluctuation)	0		
CnL.08	L.2.	Heat/cool control dead zone	-100.0 to +100.0 %	0.0		
CnL.09	L.2.	Initial PID control output	-10.0 to +110.0 %	0.0		
CnL.10	L.2.	Abnormal PV definition	0: If a PV alarm (AL01 to AL06) occurs 1: If a PV1 alarm (AL01 or AL02) occurs 2: If a PV2/21 alarm (AL03 or AL04) occurs 3: If a PV22 alarm (AL05 or AL06) occurs	0		Cannot be set on the SDC45A/46A.
Etd.01	L.2.	PID control initialization	0: Auto 1: Not initialized 2: Initialized (if SP value different from the current value is input)	0		
Etd.02	L.2.	Integral time/derivative time decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point	0		Affected by the decimal point positions for integral time and derivative time.
Etd.03	L.2.	Output after AUTO • MANUAL change	0: Bumpless transfer 1: Preset	0		
Etd.04	L.2..	Preset MANUAL value	-10.0 to +110.0 %	0.0		When the power is turned ON, if the operation mode is MANUAL, the MV is preset MANUAL value.
Etd.05	L.2.	MV increase change limit	0.00: No limit 0.01 to 320.00 %/s	0.00		
Etd.06	L.2.	MV decrease change limit		0.00		
Etd.07	L.2.	Heat/cool selection	0: Normal 1: Energy saving	0		
Etd.08	L.2.	MV low limit for AT	-10.0 to +110.0 %	0.0		
Etd.09	L.2.	MV high limit for AT		100.0		
Etd.12	L.2.	Zone operation selection	0: Selected by SP value 1: Selected by PV value	0		If zone PID is used, set the PID group selection priority to "Zone PID function".
Etd.13	L.2.	Zone 1	-19999 to +32000 U	3200.0		The decimal point position is determined by the decimal point positions for the loop PV/SP.
Etd.14	L.2.	Zone 2				
Etd.15	L.2.	Zone 3				
Etd.16	L.2.	Zone 4				
Etd.17	L.2.	Zone 5				
Etd.18	L.2.	Zone 6				
Etd.19	L.2.	Zone 7				
Etd.20	L.2.	Zone hysteresis	0 to 32000 U	5.0		

6 - 2 Temperature-Pressure Correction Bank (Pu.CnP)

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
Pu.C.01		Compensation method	0: No compensation 1: Temperature compensation 2: Pressure compensation 3: Temperature and pressure compensation	0		
Pu.C.02		Unit for temperature correction	0: Celsius (°C) 1: Fahrenheit (°F) 2: Kelvin (K)	0		Setting cannot be changed if PV1 is a thermocouple or RTD.
Pu.C.03		Design temperature for temperature correction	-1999.9 to +3200.0	0.0		
Pu.C.04		Unit for pressure correction	0: MPa 1: kPa 2: Pa 3: kg/cm^2 4: mmH_20	0		
Pu.C.05		Design pressure for pressure correction	-1999.9 to +3200.0	0.0		
Pu.C.06		Decimal point position (for flow rate setting)	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point 3: 3 digits after decimal point 4: 4 digits after decimal point	1		
Pu.C.07		Flow rate scaling low limit	-19999 to +32000	0.0		The decimal point position is determined by the decimal point position for the flow rate setting.
Pu.C.08		Flow rate scaling high limit		100.0		
Pu.C.09		Square root extraction dropout	0.0: Square root extraction is not used. 0.1 to 10.0 %	0.0		
Pu.C.10		Filter	0.00: No filter 0.01 to 120.00 s	0.0		
Pu.C.11		Bias	-19999 to +32000	0.0		
Pu.C.12		Ratio	0.001 to 32.000	1.000		
Pu.C.13		Linearization table group definition	0: Not used 1: Group 1 2: Group 2 3: Group 3 4: Group 4 5: Group 5 6: Group 6 7: Group 7 8: Group 8	0		

6-3 Input Computation Bank (In.FnC)

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
dP	F01.	Decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point 3: 3 digits after decimal point 4: 4 digits after decimal point	1		
In.01	F01.	Input 1	2048 to 3071	2048		See the Standard Numerical Codes list.
In.02	F01.	Input 2		2048		
tYPE	F01.	Mathematical/logical operations	0:NOP No operation 1:FLT First-order lag filter 2:R/B Ratio/bias 3:HLL High/low limiter 4:DRL Change rate limiter 5:LED Differentiation 6:L/L Advance/delay 7:ABS Absolute value 8:TBL Linearization table 9:MAX Maximum value hold 10:MIN Minimum value hold 11:HLD Hold 12:PRS Preset value 13:SPR Soft preset value	0		
PA-01	F01.	Setting 1	-19999 to +32000 U	0.0		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
PA-02	F01.	Setting 2		0.0		
PA-03	F01.	Setting 3		0		
di.SEL	F01.	Contact input	1024 to 2047	1024		See the Standard Numerical Codes list.
di	F01.	Contact input monitor	0:OFF 1:ON	-		
do	F01.	Contact output monitor		-		
oUt	F01.	Computation unit output check point value	-19999 to +32000 U	-		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
tYPE	F02.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PA-01	F02.	Setting 1		0.0		
PA-02	F02.	Setting 2		0.0		
PA-03	F02.	Setting 3		0		
di.SEL	F02.	Contact input		1024		
di	F02.	Contact input monitor		-		
do	F02.	Contact output monitor		-		
oUt	F02.	Computation unit output check point value		-		
tYPE	F03.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PA-01	F03.	Setting 1		0.0		
PA-02	F03.	Setting 2		0.0		
PA-03	F03.	Setting 3		0		
di.SEL	F03.	Contact input		1024		
di	F03.	Contact input monitor		-		
do	F03.	Contact output monitor		-		
oUt	F03.	Computation unit output check point value		-		
tYPE	F04.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PA-01	F04.	Setting 1		0.0		
PA-02	F04.	Setting 2		0.0		
PA-03	F04.	Setting 3		0		
di.SEL	F04.	Contact input		1024		
di	F04.	Contact input monitor		-		
do	F04.	Contact output monitor		-		
oUt	F04.	Computation unit output check point value		-		
tYPE	F05.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PA-01	F05.	Setting 1		0.0		
PA-02	F05.	Setting 2		0.0		
PA-03	F05.	Setting 3		0		
di.SEL	F05.	Contact input		1024		
di	F05.	Contact input monitor		-		
do	F05.	Contact output monitor		-		
oUt	F05.	Computation unit output check point value		-		

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
TYPE	F06.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F06.	Setting 1		0.0		
PR-02	F06.	Setting 2		0.0		
PR-03	F06.	Setting 3		0		
di.SEL	F06.	Contact input		1024		
di	F06.	Contact input monitor		-		
do	F06.	Contact output monitor		-		
oUt	F06.	Computation unit output check point value		-		
TYPE	F07.	Mathematical/logical operations	0:NOP No operation 1:FLT First-order lag filter 2:R/B Ratio/bias 3:HLL High/low limiter 4:DRL Change rate limiter 5:LED Differentiation 6:L/L Advance/delay 7:ABS Absolute value 8:TBL Linearization table 9:MAX Maximum value hold 10:MIN Minimum value hold 11:HLD Hold 12:PRS Preset value 13:SPR Soft preset value 14 to 30: No operation 31:ADD Addition/subtraction 32:MUL Multiplication 33:DIV Division 34:HSE High selector 35:LSE Low selector 36:SWS Switch selector 37:CPS Change point selector 38:SSS Soft switching selector	0		14 to 38 can be set with computation unit 07 only.
PR-01	F07.	Setting 1	19999 to +32000 U	0.0		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
PR-02	F07.	Setting 2		0.0		
PR-03	F07.	Setting 3	0 to 255	0		
di.SEL	F07.	Contact input	1024 to 2047	1024		See the Standard Numerical Codes list.
di	F07.	Contact input monitor	0: OFF 1: ON	-		
do	F07.	Contact output monitor		-		
oUt	F07.	Computation unit output check point value	-19999 to +32000 U	-		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
TYPE	F08.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F08.	Setting 1		0.0		
PR-02	F08.	Setting 2		0.0		
PR-03	F08.	Setting 3		0		
di.SEL	F08.	Contact input		1024		
di	F08.	Contact input monitor		-		
do	F08.	Contact output monitor		-		
oUt	F08.	Computation unit output check point value		-		
TYPE	F09.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F09.	Setting 1		0.0		
PR-02	F09.	Setting 2		0.0		
PR-03	F09.	Setting 3		0		
di.SEL	F09.	Contact input		1024		
di	F09.	Contact input monitor		-		
do	F09.	Contact output monitor		-		
oUt	F09.	Computation unit output check point value		-		
TYPE	F10.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F10.	Setting 1		0.0		
PR-02	F10.	Setting 2		0.0		
PR-03	F10.	Setting 3		0		
di.SEL	F10.	Contact input		1024		
di	F10.	Contact input monitor		-		
do	F10.	Contact output monitor		-		
oUt	F10.	Computation unit output check point value		-		

6-4 Output Computation Bank (oC.FnC)

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
dP	F01.	Decimal point position	0: No decimal point 1: 1 digit after decimal point 2: 2 digits after decimal point 3: 3 digits after decimal point 4: 4 digits after decimal point	1		
In.01	F01.	Input 1	2048 to 3071	2048		See the Standard Numerical Codes list.
In.02	F01.	Input 2		2048		
tYPE	F01.	Mathematical/logical operations	0:NOP No operation 1:FLT First-order lag filter 2:R/B Ratio/bias 3:HLL High/low limiter 4:DRL Change rate limiter 5:LED Differentiation 6:L/L Advance/delay 7:ABS Absolute value 8:TBL Linearization table 9:MAX Maximum value hold 10:MIN Minimum value hold 11:HLD Hold 12:PRS Preset value 13:SPR Soft preset value	0		
PR-01	F01.	Setting 1	-19999 to +32000 U	0.0		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
PR-02	F01.	Setting 2		0.0		
PR-03	F01.	Setting 3		0		
di.SEL	F01.	Contact input	1024 to 2047	1024		See the Standard Numerical Codes list.
di	F01.	Contact input monitor	0:OFF 1:ON	-		
do	F01.	Contact output monitor		-		
oUt	F01.	Computation unit output check point value	-19999 to +32000 U	-		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
tYPE	F02.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F02.	Setting 1		0.0		
PR-02	F02.	Setting 2		0.0		
PR-03	F02.	Setting 3		0		
di.SEL	F02.	Contact input		1024		
di	F02.	Contact input monitor		-		
do	F02.	Contact output monitor		-		
oUt	F02.	Computation unit output check point value		-		
tYPE	F03.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F03.	Setting 1		0.0		
PR-02	F03.	Setting 2		0.0		
PR-03	F03.	Setting 3		0		
di.SEL	F03.	Contact input		1024		
di	F03.	Contact input monitor		-		
do	F03.	Contact output monitor		-		
oUt	F03.	Computation unit output check point value		-		
tYPE	F04.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F04.	Setting 1		0.0		
PR-02	F04.	Setting 2		0.0		
PR-03	F04.	Setting 3		0		
di.SEL	F04.	Contact input		1024		
di	F04.	Contact input monitor		-		
do	F04.	Contact output monitor		-		
oUt	F04.	Computation unit output check point value		-		
tYPE	F05.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F05.	Setting 1		0.0		
PR-02	F05.	Setting 2		0.0		
PR-03	F05.	Setting 3		0		
di.SEL	F05.	Contact input		1024		
di	F05.	Contact input monitor		-		
do	F05.	Contact output monitor		-		
oUt	F05.	Computation unit output check point value		-		

Display	Loop number (auxiliary display)	Item	Settings and descriptions	Initial value	User setting	Remarks
TYPE	F06.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F06.	Setting 1		0.0		
PR-02	F06.	Setting 2		0.0		
PR-03	F06.	Setting 3		0		
di.SEL	F06.	Contact input		1024		
di	F06.	Contact input monitor		-		
do	F06.	Contact output monitor		-		
oUt	F06.	Computation unit output check point value		-		
TYPE	F07.	Mathematical/logical operations	0:NOP No operation 1:FLT First-order lag filter 2:R/B Ratio/bias 3:HLL High/low limiter 4:DRL Change rate limiter 5:LED Differentiation 6:L/L Advance/delay 7:ABS Absolute value 8:TBL Linearization table 9:MAX Maximum value hold 10:MIN Minimum value hold 11:HLD Hold 12:PRS Preset value 13:SPR Soft preset value 14 to 30: No operation 31:ADD Addition/subtraction 32:MUL Multiplication 33:DIV Division 34:HSE High selector 35:LSE Low selector 36:SWS Switch selector 37:CPS Change point selector 38:SSS Soft switching selector	0		14 to 38 can be set with computation unit 07 only.
PR-01	F07.	Setting 1	-19999 to +32000 U	0.0		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
PR-02	F07.	Setting 2		0.0		
PR-03	F07.	Setting 3	0 to 255	0		
di.SEL	F07.	Contact input	1024 to 2047	1024		See the Standard Numerical Codes list.
di	F07.	Contact input monitor	0: OFF 1: ON	-		
do	F07.	Contact output monitor		-		
oUt	F07.	Computation unit output check point value	-19999 to +32000 U	-		The decimal point position is determined by the setting for the decimal point position in the input computation bank.
TYPE	F08.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F08.	Setting 1		0.0		
PR-02	F08.	Setting 2		0.0		
PR-03	F08.	Setting 3		0		
di.SEL	F08.	Contact input		1024		
di	F08.	Contact input monitor		-		
do	F08.	Contact output monitor		-		
oUt	F08.	Computation unit output check point value		-		
TYPE	F09.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F09.	Setting 1		0.0		
PR-02	F09.	Setting 2		0.0		
PR-03	F09.	Setting 3		0		
di.SEL	F09.	Contact input		1024		
di	F09.	Contact input monitor		-		
do	F09.	Contact output monitor		-		
oUt	F09.	Computation unit output check point value		-		
TYPE	F10.	Mathematical/logical operations	Same as for F01.	0		Same as for F01.
PR-01	F10.	Setting 1		0.0		
PR-02	F10.	Setting 2		0.0		
PR-03	F10.	Setting 3		0		
di.SEL	F10.	Contact input		1024		
di	F10.	Contact input monitor		-		
do	F10.	Contact output monitor		-		
oUt	F10.	Computation unit output check point value		-		

6 - 5 List of Communication Data

The following shows the meanings of the symbols stated in the "RAM/EEPROM Read/Write" columns:

No symbol : Possible.
□ : Possible according to the conditions.
△ : Possible, but data is invalid.
× : Impossible.

Handling Precautions

- When reading the EEPROM address, data in the RAM is read in the same manner as reading of the RAM address.

Decimal point information

-:	No decimal point
1 to 3:	Decimal point position (original value of data is multiplied by 10, 100, or 1000)
LP1 and 2:	Determined by the settings for the loop 1 or loop 2 in the control bank ("loop PV/SV decimal point position").
PV1 and 2:	Determined by the settings for PV1 or PV2 in the PV bank ("decimal point position").
RMP1 and 2:	Determined by the settings for loop 1 or loop 2 in the SP configuration bank ("SP ramp unit").
PID1 and 2:	Determined by the settings for loop 1 or loop 2 in the control bank ("integral time/derivative time decimal point position").
OUT1 to 7:	Determined by the settings for outputs 1 through 7 in the output bank ("output decimal point position").
EV1 to 7:	Determined by the settings for event Nos. 1 through 16 in the event configuration bank ("decimal point position").
Linearizations 1 to 8:	Determined by the settings for Linearizations 1 through 8 in the Linearization table bank ("breakpoint decimal point position").
MS1 to 3:	Determined by the settings for priorities 1 through 3 in the display/key bank ("MS display decimal point position").
PV22:	Determined by the decimal point position setting for PV22 in the PV bank.
FL:	Determined by the setting in the temperature-pressure correction bank for decimal point position (for flow rate setting).
I-F:	Determined by the setting for decimal point position in the input computation bank.
I-F01 to I-F10:	Determined by the mathematical/logical operation type of computation patterns F01 to F10 in the input computation bank.
O-F:	Determined by the setting for decimal point position in the output computation bank.
O-F01 to O-F10:	Determined by the mathematical/logical operation type of computation units F01 to F10 in the output computation bank.

RD/WD/RU/WU commands of CPL communication:

Use hexadecimal data addresses.

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
Control	Loop 1	Abnormal PV definition	8057	1F79	24441	5F79					–	
	Loop 2	Abnormal PV definition	8073	1F89	24457	5F89					–	
	Loop 1	PV assignment	10704	29D0	27088	69D0					–	
		RSP assignment	10705	29D1	27089	69D1					–	
		RMV assignment	10706	29D2	27090	69D2					–	
	Loop 2	PV assignment	10720	29E0	27104	69E0					–	
		RSP assignment	10721	29E1	27105	69E1					–	
		RMV assignment	10722	29E2	10722	29E2					–	
MV	Loop 1	SP tracking signal	10965	2AD5	27349	6AD5					–	
		MV tracking selection	10992	2AF0	27376	6AF0					–	
		Reverse MV tracking signal	10993	2AF1	27377	6AF1					–	
		MV tracking analog signal type	10994	2AF2	27378	6AF2					–	
	Loop 2	SP tracking signal	10973	2ADD	27357	6ADD					–	
		MV tracking selection	11000	2AF8	27384	6AF8					–	
		Reverse MV tracking signal	11001	2AF9	27385	6AF9					–	
		MV tracking analog signal type	11002	2AFA	27386	6AFA					–	
Setup		Set point change in operation display mode	8816	2270	25200	6270					–	
		Operation display mode screen specification	8821	2275	25205	6275					–	
		Preset Operation display screen return delay	8822	2276	25206	6276					–	
		Power supply frequency	8823	2277	25207	6277					–	
		Startup method	8824	2278	25208	6278					–	Cannot be read/ written on the SDC45A/46A.
		Max. power failure time for hot start	8825	2279	25209	6279					–	
		Power failure detection	8826	227A	25210	627A					–	
		Year	8844	228C	25228	628C					–	Cannot be read/ written on the SDC45A/46A.
		Month/day	8845	228D	25229	628D					–	
		Hour/minute	8846	228E	25230	628E					–	
Priority		Operation display changeover	8978	2312	25362	6312					–	
		Linearization group table for position proportional control	8979	2313	25363	6313					–	
PV	PV22	Range type	9088	2380	25472	6380					–	Cannot be written on the SDC45A/46A. Can be set on the 3-input model of SDC 45V/46V.
		Decimal point position	9089	2381	25473	6381					–	
		Temperature unit	9090	2382	25474	6382					–	
		Range low limit	9091	2383	25475	6383					PV22	
		Range high limit	9092	2384	25476	6384					PV22	
		(Cold junction compensation)	9093	2385	25477	6385					–	
		(Zener barrier adjustment)	9094	2386	25478	6386					2	
		(Reserved for future use.)	9095	2387	25479	6387	×	×	×	×	–	
		Linear scaling low limit	9096	2388	25480	6388					PV22	
		Linear scaling high limit	9097	2389	25481	6389					PV22	
		Square root extraction dropout	9098	238A	25482	638A					1	
		Filter	9099	238B	25483	638B					2	
		Bias	9100	238C	25484	638C					PV22	
		Ratio	9101	238D	25485	638D					3	

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
PV	PV22	(Reserved for future use.)	9102	238E	25486	638E	×	×	×	×	–	Cannot be written on the SDC45A/46A. Can be set on the 3-input model of SDC45V/46V.
		Thermocouple·mV input burnout	9103	238F	25487	638F					–	
		(Reserved for future use.)	9104	2390	25488	6390	×	×	×	×	–	
		(Reserved for future use.)	9105	2391	25489	6391	×	×	×	×	–	
		(Reserved for future use.)	9106	2392	25490	6392	×	×	×	×	–	
		Linearization table group definition	9107	2393	25491	6393					–	
Position proportional		Output type	9440	24E0	25824	64E0					–	
		Control method selection	9441	24E1	25825	64E1					–	
		Dead zone	9442	24E2	25826	64E2					1	
		Long service life	9443	24E3	25827	64E3					–	
		Automatic adjustment	9444	24E4	25828	64E4					–	
		Fully closed calibration value	9445	24E5	25829	64E5					–	
		Fully open calibration value	9446	24E6	25830	64E6					–	
		Time to open fully (calibration value)	9447	24E7	25831	64E7					1	
		Loop designation	9448	24E8	25832	64E8					–	
		Linearization table group definition	9449	24E9	25833	64E9					–	
Temperature-pressure correction		Compensation method	10928	2AB0	27312	6AB0					–	Cannot be read/ written on the SDC45A/46A.
		Unit for temperature correction	10929	2AB1	27313	6AB1					–	
		Design temperature for temperature correction	10930	2AB2	27314	6AB2					1	
		Unit for pressure correction	10931	2AB3	27315	6AB3					–	
		Design pressure for pressure correction	10932	2AB4	27316	6AB4					1	
		Decimal point position (for flow rate setting)	10933	2AB5	27317	6AB5					–	
		Flow rate scaling low limit	10934	2AB6	27318	6AB6					FL	
		Flow rate scaling high limit	10935	2AB7	27319	6AB7					FL	
		Square root extraction dropout	10936	2AB8	27320	6AB8					1	
		Filter	10937	2AB9	27321	6AB9					2	
		Bias	10938	2ABA	27322	6ABA					FL	
		Ratio	10939	2ABB	27323	6ABB					3	
		Linearization table group definition	10940	2ABC	27324	6ABC					–	
CT input	CT1	CT type	11152	2B90	27536	6B90					–	
		CT measurement wait time	11153	2B91	27537	6B91					–	
		Number of CT turns	11154	2B92	27538	6B92					–	
		Number of CT power wire loops	11155	2B93	27539	6B93					–	
		Heater burnout detection current value	11156	2B94	27540	6B94					1	
		Over-current detection current value	11157	2B95	27541	6B95					1	
		Short-circuit detection current value	11158	2B96	27542	6B96					1	
		Hysteresis	11159	2B97	27543	6B97					1	
		Delay time	11160	2B98	27544	6B98					1	
		Condition for restoration of unmeasured value	11161	2B99	27545	6B99					–	

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
CT input	CT2	CT type	11168	2BA0	27552	6BA0					–	
		CT measurement wait time	11169	2BA1	27553	6BA1					–	
		Number of CT turns	11170	2BA2	27554	6BA2					–	
		Number of CT power wire loops	11171	2BA3	27555	6BA3					–	
		Heater burnout detection current value	11172	2BA4	27556	6BA4					1	
		Over-current detection current value	11173	2BA5	27557	6BA5					1	
		Short-circuit detection current value	11174	2BA6	27558	6BA6					1	
		Hysteresis	11175	2BA7	27559	6BA7					1	
		Delay time	11176	2BA8	27560	6BA8					1	
		Condition for restoration of unmeasured value	11177	2BA9	27561	6BA9					–	
Input operation	F01	Decimal point position	11216	2BD0	27600	6BD0					–	Cannot be read/ written on the SDC45A/46A.
		Input 1	11217	2BD1	27601	6BD1					–	
		Input 2	11218	2BD2	27602	6BD2					–	
		Mathematical/logical operations	11219	2BD3	27603	6BD3					–	
		Setting 1	11220	2BD4	27604	6BD4					I-F01	
		Setting 2	11221	2BD5	27605	6BD5					I-F01	
		Setting 3	11222	2BD6	27606	6BD6					I-F01	
		Contact input	11223	2BD7	27607	6BD7					–	
		Contact input monitor	11224	2BD8	27608	6BD8		×		×	–	
		Contact output monitor	11225	2BD9	27609	6BD9		×		×	–	
		Operation unit output checkpoint value	11226	2BDA	27610	6BDA		×		×	I-F	
	F02	Mathematical/logical operations	11235	2BE3	27619	6BE3					–	
		Setting 1	11236	2BE4	27620	6BE4					I-F02	
		Setting 2	11237	2BE5	27621	6BE5					I-F02	
		Setting 3	11238	2BE6	27622	6BE6					I-F02	
		Contact input	11239	2BE7	27623	6BE7					–	
		Contact input monitor	11240	2BE8	27624	6BE8		×		×	–	
		Contact output monitor	11241	2BE9	27625	6BE9		×		×	–	
		Operation unit output checkpoint value	11242	2BEA	27626	6BEA		×		×	I-F	
	F03	Mathematical/logical operations	11251	2BF3	27635	6BF3					–	
		Setting 1	11252	2BF4	27636	6BF4					I-F03	
		Setting 2	11253	2BF5	27637	6BF5					I-F03	
		Setting 3	11254	2BF6	27638	6BF6					I-F03	
		Contact input	11255	2BF7	27639	6BF7					–	
		Contact input monitor	11256	2BF8	27640	6BF8		×		×	–	
		Contact output monitor	11257	2BF9	27641	6BF9		×		×	–	
		Operation unit output checkpoint value	11258	2BFA	27642	6BFA		×		×	I-F	
	F04	Mathematical/logical operations	11267	2C03	27651	6C03					–	
		Setting 1	11268	2C04	27652	6C04					I-F04	
		Setting 2	11269	2C05	27653	6C05					I-F04	
		Setting 3	11270	2C06	27654	6C06					I-F04	
		Contact input	11271	2C07	27655	6C07					–	
		Contact input monitor	11272	2C08	27656	6C08		×		×	–	
		Contact output monitor	11273	2C09	27657	6C09		×		×	–	
		Operation unit output checkpoint value	11274	2C0A	27658	6C0A		×		×	I-F	

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
Input operation	F05	Mathematical/logical operations	11283	2C13	27667	6C13					–	Cannot be read/ written on the SDC45A/46A.
		Setting 1	11284	2C14	27668	6C14					I-F05	
		Setting 2	11285	2C15	27669	6C15					I-F05	
		Setting 3	11286	2C16	27670	6C16					I-F05	
		Contact input	11287	2C17	27671	6C17					–	
		Contact input monitor	11288	2C18	27672	6C18		×		×	–	
		Contact output monitor	11289	2C19	27673	6C19		×		×	–	
		Operation unit output checkpoint value	11290	2C1A	27674	6C1A		×		×	I-F	
	F06	Mathematical/logical operations	11299	2C23	27683	6C23					–	
		Setting 1	11300	2C24	27684	6C24					I-F06	
		Setting 2	11301	2C25	27685	6C25					I-F06	
		Setting 3	11302	2C26	27686	6C26					I-F06	
		Contact input	11303	2C27	27687	6C27					–	
		Contact input monitor	11304	2C28	27688	6C28		×		×	–	
		Contact output monitor	11305	2C29	27689	6C29		×		×	–	
		Operation unit output checkpoint value	11306	2C2A	27690	6C2A		×		×	I-F	
	F07	Mathematical/logical operations	11315	2C33	27699	6C33					–	
		Setting 1	11316	2C34	27700	6C34					I-F07	
		Setting 2	11317	2C35	27701	6C35					I-F07	
		Setting 3	11318	2C36	27702	6C36					I-F07	
		Contact input	11319	2C37	27703	6C37					–	
		Contact input monitor	11320	2C38	27704	6C38		×		×	–	
		Contact output monitor	11321	2C39	27705	6C39		×		×	–	
		Operation unit output checkpoint value	11322	2C3A	27706	6C3A		×		×	I-F	
	F08	Mathematical/logical operations	11331	2C43	27715	6C43					–	
		Setting 1	11332	2C44	27716	6C44					I-F08	
		Setting 2	11333	2C45	27717	6C45					I-F08	
		Setting 3	11334	2C46	27718	6C46					I-F08	
		Contact input	11335	2C47	27719	6C47					–	
		Contact input monitor	11336	2C48	27720	6C48		×		×	–	
		Contact output monitor	11337	2C49	27721	6C49		×		×	–	
		Operation unit output checkpoint value	11338	2C4A	27722	6C4A		×		×	I-F	
	F09	Mathematical/logical operations	11347	2C53	27731	6C53					–	
		Setting 1	11348	2C54	27732	6C54					I-F09	
		Setting 2	11349	2C55	27733	6C55					I-F09	
		Setting 3	11350	2C56	27734	6C56					I-F09	
		Contact input	11351	2C57	27735	6C57					–	
		Contact input monitor	11352	2C58	27736	6C58		×		×	–	
		Contact output monitor	11353	2C59	27737	6C59		×		×	–	
		Operation unit output checkpoint value	11354	2C5A	27738	6C5A		×		×	I-F	
	F10	Mathematical/logical operations	11363	2C63	27747	6C63					–	
		Setting 1	11364	2C64	27748	6C64					I-F10	
		Setting 2	11365	2C65	27749	6C65					I-F10	
		Setting 3	11366	2C66	27750	6C66					I-F10	
		Contact input	11367	2C67	27751	6C67					–	
		Contact input monitor	11368	2C68	27752	6C68		×		×	–	
		Contact output monitor	11369	2C69	27753	6C69		×		×	–	
		Operation unit output checkpoint value	11370	2C6A	27754	6C6A		×		×	I-F	

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
Output operation	F01	Decimal point position	11376	2C70	27760	6C70					–	Cannot be read/ written on the SDC45A/46A.
		Input 1	11377	2C71	27761	6C71					–	
		Input 2	11378	2C72	27762	6C72					–	
		Mathematical/logical operations	11379	2C73	27763	6C73					–	
		Setting 1	11380	2C74	27764	6C74					O-F01	
		Setting 2	11381	2C75	27765	6C75					O-F01	
		Setting 3	11382	2C76	27766	6C76					O-F01	
		Contact input	11383	2C77	27767	6C77					–	
		Contact input monitor	11384	2C78	27768	6C78		×		×	–	
		Contact output monitor	11385	2C79	27769	6C79		×		×	–	
		Operation unit output checkpoint value	11386	2C7A	27770	6C7A		×		×	O-F	
	F02	Mathematical/logical operations	11395	2C83	27779	6C83					–	
		Setting 1	11396	2C84	27780	6C84					O-F02	
		Setting 2	11397	2C85	27781	6C85					O-F02	
		Setting 3	11398	2C86	27782	6C86					O-F02	
		Contact input	11399	2C87	27783	6C87					–	
		Contact input monitor	11400	2C88	27784	6C88		×		×	–	
		Contact output monitor	11401	2C89	27785	6C89		×		×	–	
		Operation unit output checkpoint value	11402	2C8A	27786	6C8A		×		×	O-F	
	F03	Mathematical/logical operations	11411	2C93	27795	6C93					–	
		Setting 1	11412	2C94	27796	6C94					O-F03	
		Setting 2	11413	2C95	27797	6C95					O-F03	
		Setting 3	11414	2C96	27798	6C96					O-F03	
		Contact input	11415	2C97	27799	6C97					–	
		Contact input monitor	11416	2C98	27800	6C98		×		×	–	
		Contact output monitor	11417	2C99	27801	6C99		×		×	–	
		Operation unit output checkpoint value	11418	2C9A	27802	6C9A		×		×	O-F	
	F04	Mathematical/logical operations	11427	2CA3	27811	6CA3					–	
		Setting 1	11428	2CA4	27812	6CA4					O-F04	
		Setting 2	11429	2CA5	27813	6CA5					O-F04	
		Setting 3	11430	2CA6	27814	6CA6					O-F04	
		Contact input	11431	2CA7	27815	6CA7					–	
		Contact input monitor	11432	2CA8	27816	6CA8		×		×	–	
		Contact output monitor	11433	2CA9	27817	6CA9		×		×	–	
		Operation unit output checkpoint value	11434	2CAA	27818	6CAA		×		×	O-F	
	F05	Mathematical/logical operations	11443	2CB3	27827	6CB3					–	
		Setting 1	11444	2CB4	27828	6CB4					O-F05	
		Setting 2	11445	2CB5	27829	6CB5					O-F05	
		Setting 3	11446	2CB6	27830	6CB6					O-F05	
		Contact input	11447	2CB7	27831	6CB7					–	
		Contact input monitor	11448	2CB8	27832	6CB8		×		×	–	
		Contact output monitor	11449	2CB9	27833	6CB9		×		×	–	
		Operation unit output checkpoint value	11450	2CBA	27834	6CBA		×		×	O-F	

Bank name	No.	Item name	RAM address		EEPROM address		RAM		EEPROM		Decimal point information	Remarks
			Decimal	Hexadecimal	Decimal	Hexadecimal	Read	Write	Read	Write		
Output operation	F06	Mathematical/logical operations	11459	2CC3	27843	6CC3					–	Cannot be read/ written on the SDC45A/46A.
		Setting 1	11460	2CC4	27844	6CC4					O-F06	
		Setting 2	11461	2CC5	27845	6CC5					O-F06	
		Setting 3	11462	2CC6	27846	6CC6					O-F06	
		Contact input	11463	2CC7	27847	6CC7					–	
		Contact input monitor	11464	2CC8	27848	6CC8		×		×	–	
		Contact output monitor	11465	2CC9	27849	6CC9		×		×	–	
		Operation unit output checkpoint value	11466	2CCA	27850	6CCA		×		×	O-F	
	F07	Mathematical/logical operations	11475	2CD3	27859	6CD3					–	
		Setting 1	11476	2CD4	27860	6CD4					O-F07	
		Setting 2	11477	2CD5	27861	6CD5					O-F07	
		Setting 3	11478	2CD6	27862	6CD6					O-F07	
		Contact input	11479	2CD7	27863	6CD7					–	
		Contact input monitor	11480	2CD8	27864	6CD8		×		×	–	
		Contact output monitor	11481	2CD9	27865	6CD9		×		×	–	
		Operation unit output checkpoint value	11482	2CDA	27866	6CDA		×		×	O-F	
	F08	Mathematical/logical operations	11491	2CE3	27875	6CE3					–	
		Setting 1	11492	2CE4	27876	6CE4					O-F08	
		Setting 2	11493	2CE5	27877	6CE5					O-F08	
		Setting 3	11494	2CE6	27878	6CE6					O-F08	
		Contact input	11495	2CE7	27879	6CE7					–	
		Contact input monitor	11496	2CE8	27880	6CE8		×		×	–	
		Contact output monitor	11497	2CE9	27881	6CE9		×		×	–	
		Operation unit output checkpoint value	11498	2CEA	27882	6CEA		×		×	O-F	
	F09	Mathematical/logical operations	11507	2CF3	27891	6CF3					–	
		Setting 1	11508	2CF4	27892	6CF4					O-F09	
		Setting 2	11509	2CF5	27893	6CF5					O-F09	
		Setting 3	11510	2CF6	27894	6CF6					O-F09	
		Contact input	11511	2CF7	27895	6CF7					–	
		Contact input monitor	11512	2CF8	27896	6CF8		×		×	–	
		Contact output monitor	11513	2CF9	27897	6CF9		×		×	–	
		Operation unit output checkpoint value	11514	2CFA	27898	6CFA		×		×	O-F	
	F10	Mathematical/logical operations	11523	2D03	27907	6D03					–	
		Setting 1	11524	2D04	27908	6D04					O-F10	
		Setting 2	11525	2D05	27909	6D05					O-F10	
		Setting 3	11526	2D06	27910	6D06					O-F10	
		Contact input	11527	2D07	27911	6D07					–	
		Contact input monitor	11528	2D08	27912	6D08		×		×	–	
		Contact output monitor	11529	2D09	27913	6D09		×		×	–	
		Operation unit output checkpoint value	11530	2D0A	27914	6D0A		×		×	O-F	

6-6 Standard Bit Codes and Standard Numerical Codes

■ Standard bit codes

The range of the standard bit codes is 1024 to 2047.
Codes not stated in the list are undefined. Therefore, do not use such codes
The standard bit codes are set values common to the following items:

- Output type (*oPo.01*) of output bank (ON/OFF output)
- Input type (*IC-02*) of internal contact input bank
- Output type (*doC.01*, *doE.01*) of digital output (C/E-column terminal)
- Input assignment A/B/C/D (*bF-02* to *bF-05*) of logical operation
- Lighting conditions (*AS-01*) for display and key bank (MS display)
- Lighting conditions (*UFL-01*) for display and key bank (UFLED setting)
- Tracking selection (*CAS-04*) of MV bank
- MV tracking selection (*tr-01*) of MV bank
- Condition for restoring the status before measurement (*Ct-10*) in the CT bank
- Contact input (*di.SEL*) of the input calculation bank and the output calculation bank

Standard bit code	Meaning of standard bit
1024	OFF (0)
1025	ON (1)
1088	Event 1
1089	Event 2
1090	Event 3
1091	Event 4
1092	Event 5
1093	Event 6
1094	Event 7
1095	Event 8
1096	Event 9
1097	Event 10
1098	Event 11
1099	Event 12
1100	Event 13
1101	Event 14
1102	Event 15
1103	Event 16
1120	CT1 Heater burnout detection
1121	CT2 Heater burnout detection
1124	CT1 Over-current detection
1125	CT2 Over-current detection
1128	CT1 Short-circuit detection
1129	CT2 Short-circuit detection
1152	Terminal status of DI-C1
1153	Terminal status of DI-C2
1154	Terminal status of DI-C3
1155	Terminal status of DI-C4
1156	Terminal status of DI-C5
1157	Terminal status of DI-C6
1158	Terminal status of DI-C7
1159	Terminal status of DI-C8
1160	Terminal status of DI-D1
1161	Terminal status of DI-D2

Standard bit code	Meaning of standard bit
1162	Terminal status of DI-D3
1163	Terminal status of DI-D4
1164	Terminal status of DI-D5
1165	Terminal status of DI-D6
1166	Terminal status of DI-D7
1167	Terminal status of DI-D8
1176	Terminal status of DI-F1
1177	Terminal status of DI-F2
1216	Terminal status of DO-C1
1217	Terminal status of DO-C2
1218	Terminal status of DO-C3
1219	Terminal status of DO-C4
1220	Terminal status of DO-C5
1221	Terminal status of DO-C6
1222	Terminal status of DO-C7
1223	Terminal status of DO-C8
1232	Terminal status of DO-E1
1233	Terminal status of DO-E2
1234	Terminal status of DO-E3
1235	Terminal status of DO-E4
1236	Terminal status of DO-E5
1237	Terminal status of DO-E6
1238	Terminal status of DO-E7
1239	Terminal status of DO-E8
1280	OUT1 (ON/OFF status)
1281	OUT2 (ON/OFF status)
1282	OUT3 (ON/OFF status)
1283	OUT4 (ON/OFF status)
1284	OUT5 (ON/OFF status)
1285	OUT6 (ON/OFF status)
1286	OUT7 (ON/OFF status)
1408	User defined bit 1
1409	User defined bit 2
1410	User defined bit 3

Standard bit code	Meaning of standard bit
1411	User defined bit 4
1412	User defined bit 5
1413	User defined bit 6
1414	User defined bit 7
1415	User defined bit 8
1440	Results of logical operation 1
1441	Results of logical operation 2
1442	Results of logical operation 3
1443	Results of logical operation 4
1444	Results of logical operation 5
1445	Results of logical operation 6
1446	Results of logical operation 7
1447	Results of logical operation 8
1448	Results of logical operation 9
1449	Results of logical operation 10
1450	Results of logical operation 11
1451	Results of logical operation 12
1452	Results of logical operation 13
1453	Results of logical operation 14
1454	Results of logical operation 15
1455	Results of logical operation 16
1504	Key status (auto/man)
1505	Key status (sp/ev)
1506	Key status (para)
1507	Key status (rsp/lsp)
1508	Key status (at)
1509	Key status (f1)
1510	Key status (f2)
1511	Key status (up)
1512	Key status (left)
1513	Key status (right)
1514	Key status (down)
1515	Key status (display)
1516	Key status (enter)
1545	Communication status (Normal receipt on a byte basis)
1547	Communication status (Normal transmission on a byte basis)
1548	Communication status (An error received)
1549	Power failure detection
1568	RUN/READY status of loop 1
1569	RUN/READY status of loop 2
1584	AUTO/MANUAL status of loop 1
1585	AUTO/MANUAL status of loop 2
1600	AT stop /AT status of loop 1
1601	AT stop /AT status of loop 2
1616	LSP/RSP status of loop 1
1617	LSP/RSP status of loop 2
1648	During SP ramp of loop 1 (ramp-up)
1649	During SP ramp of loop 2 (ramp-up)
1664	During SP ramp of loop 1 (ramp-down)
1665	During SP ramp of loop 2 (ramp-down)

Standard bit code	Meaning of standard bit
1696	Backup/through output status of loop 1
1792	All typical alarms (logical OR of all alarms to be displayed)
1824	PV input high limit alarm (PV1)
1825	PV input high limit alarm (PV2/PV21)
1826	PV input high limit alarm (PV22)
1840	PV input low limit alarm (PV1)
1841	PV input low limit alarm (PV2/PV21)
1842	PV input low limit alarm (PV22)
1856	CJ input alarm (PV1)
1857	CJ input alarm (PV2)
1880	MFB1 input error
1888	MFB1 estimation in progress
1896	MFB1 adjustment error
1952	CT1 input alarm
1953	CT2 input alarm
1968	Parameter failure
1969	Adjustment value failure (CPU board)
1970	Adjustment value failure (PV board)
1972	ROM failure (CPU board)
1973	ROM failure (PV board)

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Standard bit code	Meaning of standard bit
1344	Input computation contact input (F01)
1345	Input computation contact input (F02)
1346	Input computation contact input (F03)
1347	Input computation contact input (F04)
1348	Input computation contact input (F05)
1349	Input computation contact input (F06)
1350	Input computation contact input (F07)
1351	Input computation contact input (F08)
1352	Input computation contact input (F09)
1353	Input computation contact input (F10)
1360	Input computation contact output (F01)
1361	Input computation contact output (F02)
1362	Input computation contact output (F03)
1363	Input computation contact output (F04)
1364	Input computation contact output (F05)
1365	Input computation contact output (F06)
1366	Input computation contact output (F07)
1367	Input computation contact output (F08)
1368	Input computation contact output (F09)
1369	Input computation contact output (F10)
1376	Output computation contact input (F01)
1377	Output computation contact input (F02)
1378	Output computation contact input (F03)
1379	Output computation contact input (F04)
1380	Output computation contact input (F05)
1381	Output computation contact input (F06)
1382	Output computation contact input (F07)
1383	Output computation contact input (F08)
1384	Output computation contact input (F09)
1385	Output computation contact input (F10)
1392	Output computation contact output (F01)
1393	Output computation contact output (F02)
1394	Output computation contact output (F03)
1395	Output computation contact output (F04)
1396	Output computation contact output (F05)
1397	Output computation contact output (F06)
1398	Output computation contact output (F07)
1399	Output computation contact output (F08)
1400	Output computation contact output (F09)
1401	Output computation contact output (F10)
1550	Hot start detection for loop 1 PID
1551	Hot start detection for loop 2 PID
1975	Battery voltage alarm
1976	RTC alarm

■ Standard numerical codes

The range of the standard numerical codes is 2048 to 3071.
Codes not stated in the list are undefined. Therefore, do not use such codes.
The standard numerical codes are set values common to the following items:

- Output type (Co-02) of output bank (continuous output)
- Lighting status (n5-02) of display and key bank (MS display)
- PV, RSP, RMV assignment (InP.01–InP.03) in the control bank
- SP tracking signal (CA5.06) in the MV bank
- MV tracking signal (tr-03) in the MV bank
- Inputs 1 and 2 (In-01–In-02) in the input calculation bank and the output calculation bank
- Displayed data (Udd-2, Udd-4) in the user-defined operation display creation bank

Standard numerical code	Meaning of standard bit
2304	PV1
2305	PV2/PV21
2320	PV of loop 1 (used for PID control)
2321	PV of loop 2 (used for PID control)
2336	SP of loop 1 (in use)
2337	SP of loop 2 (in use)
2352	SP of loop 1 (finally attained value)
2353	SP of loop 2 (finally attained value)
2384	SP output of loop 1
2416	MV of loop 1
2417	MV of loop 2
2432	Heat MV of loop 1
2433	Heat MV of loop 2
2448	Cool MV of loop 1
2449	Cool MV of loop 2
2464	MFB1 (Motor opening feedback value 1) (including estimation)
2480	MFB1 (Motor opening feedback value 1) (measurement value)
2496	CT1 current when output ON
2497	CT2 current when output ON
2512	CT1 current when output OFF
2513	CT2 current when output OFF
2528	Deviation of loop 1 (PV-SP)
2529	Deviation of loop 2 (PV-SP)
2544	AC1 value measurement voltage
2545	AC2 value measurement voltage
2560	AC1 value percent data
2561	AC2 value percent data
2656	Event 1 delay remaining time
2657	Event 2 delay remaining time
2658	Event 3 delay remaining time
2659	Event 4 delay remaining time
2660	Event 5 delay remaining time
2661	Event 6 delay remaining time
2662	Event 7 delay remaining time
2663	Event 8 delay remaining time

Standard numerical code	Meaning of standard bit
2664	Event 9 delay remaining time
2665	Event 10 delay remaining time
2666	Event 11 delay remaining time
2667	Event 12 delay remaining time
2668	Event 13 delay remaining time
2669	Event 14 delay remaining time
2670	Event 15 delay remaining time
2671	Event 16 delay remaining time
2720	MV for position proportioning 1

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Standard bit code	Meaning of standard bit
2306	PV22
2592	Flow rate (with temperature pressure compensation)
2599	Input computation result (F01)
2600	Input computation result (F02)
2601	Input computation result (F03)
2602	Input computation result (F04)
2603	Input computation result (F05)
2604	Input computation result (F06)
2605	Input computation result (F07)
2606	Input computation result (F08)
2607	Input computation result (F09)
2608	Input computation result (F10)
2615	Output computation result (F01)
2616	Output computation result (F02)
2617	Output computation result (F03)
2618	Output computation result (F04)
2619	Output computation result (F05)
2620	Output computation result (F06)
2621	Output computation result (F07)
2622	Output computation result (F08)
2623	Output computation result (F09)
2624	Output computation result (F10)

Revision History of CP-SP-1275E

Printed	Edn	Revised pages	Description
May 2008	**1**		
Apr. 2012	**2**		Company name changed.
Feb. 2013	**3**	31 to 33	Explanation of the "● Example 2: Control one actuator continuously while switching between 2 inputs" changed.
July 2018	**4**	D-1 to D-5 1, 2 4 5 35 44 to 49 50, 51 52	Flowchart of key operations and displays was changed. Model selection was changed. "Current input connection" section was added. Loop type 8, "2 loop (RSP)" was added. The alarm code AL17 was added. Decimal notation was added. Standard bits were added. Standard numerical codes were added.

Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products.
You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope

1.1 Warranty period

Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place.
Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

(1) Failure caused by your improper use of azbil product
(noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
(2) Failure caused for other reasons than Azbil Corporation's product;
(3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;
(4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;
(5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or
(6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2. Ascertainment of suitability

You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

(1) Regulations and standards or laws that your Equipment is to comply with.
(2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
(3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down.
You are required to provide your Equipment with safety design such as fool-proof design, *1 and fail-safe design*2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance, *3 fault tolerance,*4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

*1. A design that is safe even if the user makes an error.
*2. A design that is safe even if the device fails.
*3. Avoidance of device failure by using highly reliable components, etc.
*4. The use of redundancy.

3. Precautions and restrictions on application

Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).
Any Azbil Corporation's products shall not be used for/with medical equipment.
The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.
In addition,
you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below.
Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
(2) For use of specific purposes, such as:
* Nuclear energy/radiation related facilities
[For use outside nuclear energy controlled areas] [For use of Azbil Corporation's Limit Switch For Nuclear Energy]
* Machinery or equipment for space/sea bottom
* Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]
* Antidisaster/crime-prevention equipment

* Burning appliances
* Electrothermal equipment
* Amusement facilities
* Facilities/applications associated directly with billing

(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
(5) Machinery or equipment that may affect human lives, human bodies or properties
(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.
Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.
In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.
Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.
System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.
For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason.
For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice.
For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.
For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9. Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service.
Accordingly, a separate fee will be charged in any of the following cases:

(1) Installation, adjustment, guidance, and attendance at a test run
(2) Maintenance, inspection, adjustment, and repair
(3) Technical guidance and technical education
(4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

-MEMO-

azbil

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Specifications are subject to change without notice. (09)

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