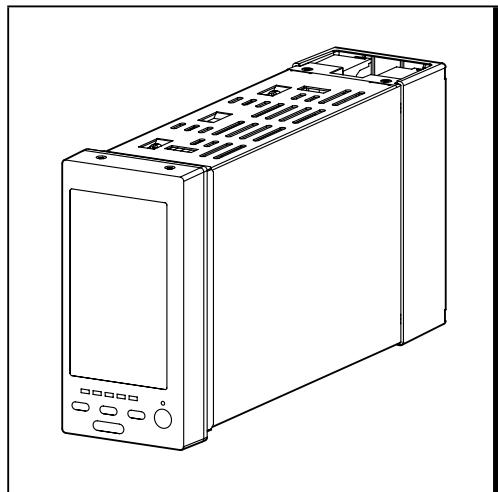


# **SC100/200 Series**

## **MULTI-FUNCTION PID CONTROLLER**

### **FUNCTION BLOCK LIST**



#### **Applicable Models**

**SC100**  
**SC110**  
**SC200**  
**SC210**  
**SC200W**  
**SC210W**

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# 1. INTRODUCTION

## ■ Symbols used in function block tables

- ◆ : Parameter is remotely modifiable by using Parameter Setter block.  
Refer to General Description of the Parameter Setter block (Model 79).
- ★ : Setting data  
Parameter is required or can be set in order to use the relevant function block.
- ITEMS without ◆ or ★ : ITEM is used to monitor operating status or values.
- : Parameter is always modifiable.
- ▲ : Parameter is modifiable when ITEM 01 (maintenance switch) is set to PROGRAM mode.
- \* : Parameter is modifiable when ITEM 01 (maintenance switch) is set to SIMULATION mode.

## ■ Function block limitation depending upon ROM version

Certain function blocks or functions (ITEM) may not be available depending upon ROM version of the controller. ROM version can be verified at GROUP 00, ITEM 99.

ROM version limitations are identified with symbols such as **SC 1.50**. Refer to Appendix 2. SC SERIES VERSION UPGRADE INFORMATION for supplementary information.

### Unavailable Functions

- Rate-of-Change Limit (Model 17)

### Limited Functions

- Basic PID (Model 21)
- Advanced PID (Model 22)
- Segment Linearizer (Model 58)
- Moving Average (Model 64)
- SCxxx Extension Field Terminal 1 (Model F72, F73, Group 04)
- SCxxx Extension Field Terminal 2 (Model F70, F71, F72, F73, Group 05)

## ■ Cold start and warm start

- Warm start executes the program and sequence from the start with holding the parameters.
- Cold start executes the program and sequence from the start with clearing the parameters.  
Cold start is recommended when the program and the sequence have been changed.
- Execute the cold start with following procedure.  
Execute from the “PU-2 screen” of programming unit (model: PU-2x) or builder software (model: SFEW3E).  
SC series can also execute from the “configuration view”.
- Procedure to execute cold start
  1. Enter [Group][0][0] and after (OK) is displayed, Enter [Item][0][1] [Data][1] [Enter].  
For SC series, a yellow line on the side of the display blinks and shifts to the configuration mode.
  2. Execute the reset operation. Enter [Item][0][3] [Data][2] [Enter]. The unit starts restarting.

## 2. FUNCTION BLOCKS COMMON TO ALL MODELS

<b>MODEL NAME</b>		<b>[GROUP]</b>
<b>SYSTEM COMMON TABLE</b>		
For SC100/200 Series		[G00]
For Remote I/O		[G00]
<b>CONTROL</b>		
BCA 21 Basic PID		[G02...03]
ECA 22 Advanced PID		[G02...03]
MVA 23 Manual Loader		[G02...03]
RSA 24 Ratio Setter		[G02...03]
IND 25 Indicator		[G02...03]
<b>COMMUNICATION TERMINALS</b>		
CDI 31 Di Receive Terminal		[G11...26]
CDO 32 Do Send Terminal		[G11...26]
CAI 33 Ai Receive Terminal		[G11...26]
CAO 34 Ao Send Terminal		[G11...26]
<b>OPERATIONS</b>		
<b>PULSE INPUT</b>		
QIP 44 Discrete Contact Input/Accumulated Value Output		[G30...61]
PAD 45 Pulse Adder		[G30...61]
QAM 46 Pulse/Analog Multiplication		[G30...61]
QSS 47 Pulse Accumulator		[G30...61]
QPO 48 Pulse Input/Discrete Contact Output	[G30...61]	
BPS 49 Batch Program		[G62...69]
<b>ARITHMETIC</b>		
ADS 51 Addition/Subtraction		[G30...61]
MLT 52 Multiplication		[G30...61]
DVD 53 Division		[G30...61]
<b>FUNCTIONS</b>		
SQR 54 Square Root Extractor		[G30...61]
ABS 55 Absolute Value		[G30...61]
NLN 56 Non-linear Gain, Deadband		[G30...61]
DRP 57 Low-end Cutout		[G30...61]
LIN 58 Segment Linearizer		[G72...79]
TCP 59 Temperature/Pressure Compensation		[G30...61]
<b>TIME FUNCTIONS</b>		
RCL 17 Rate of Change Limit		[G30...61]
LAG 60 First Order Lag		[G30...61]
2LG 61 First Order Lag with two time constants	[G30...61]	
RMP 62 Ramp Buffer		[G30...61]
MAJ 63 Mean Average		[G30...61]
RAV 64 Moving Average		[G30...61]
LED 65 Lead Time Computation		[G30...61]
DTM 66 Dead Time Computation		[G30...61]
DTC 67 Dead Time Compensation		[G30...61]

<b>MODEL NAME</b>		<b>[GROUP]</b>
<b>OPERATIONS (continued)</b>		
QNT 68 Accumulator		[G30...61]
PRG 69 Ramp Program Setter		[G72...79]
(58 Ramp Program by Segment Linearizer)		
<b>SIGNAL LIMITERS</b>		
HLL 70 High/Low Limiter		[G30...61]
DVL 71 Deviation Limiter		[G30...61]
<b>SIGNAL SELECTORS</b>		
SFT 18 Input Selector (with ramp control at switching)		[G30...61]
OTS 19 Output Selector		[G30...61]
INS 72 Input Selector (2 points)		[G30...61]
INE 85 Input Selector (8 points)		[G30...61]
MAX 73 Maximum Value Selector		[G30...61]
MIN 74 Minimum Value Selector		[G30...61]
CTS 75 Parameter Selector (2 points)		[G30...61]
CTE 86 Parameter Generator (8 points)		[G30...61]
<b>ALARM</b>		
PVA 76 High/Low Alarm		[G30...61]
DVA 77 Deviation Alarm		[G30...61]
VRA 78 Rate of Change Alarm (rate of change function)		[G30...61]
<b>OTHERS</b>		
PMS 79 Parameter Setter		[G30...61]
BCD 80 Numeral Converter		[G30...61]
QWT 81 Weight Totalizer (load cell input)		[G30...61]
ADT 82 Analog/Pulse Duration Converter		[G30...61]
AMM 83 Analog Signal Hold (max. value, momentary value or min. value)		[G30...61]
ITR 84 ITEM Reader		[G30...61]
<b>SEQUENTIAL CONTROL</b>		
DCN 87 Contact Distributor		[G30...61]
ACP 88 Analog Comparator		[G30...61]
ANN 89 Annunciator		[G30...61]
TMC 90 ON-OFF Timer		[G30...61]
TMR 91 Timer		[G30...61]
CTR 92 Counter		[G30...61]
ISW 93 Internal Switch		[G30...61]
SSW 94 System's Internal Switch		[G80]
SEQ 95 Sequential Control Program		[G81...92]

## System Common Table (for SC100/200 series)

GROUP [00] ★: Setting data				
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
00	●	0, 1	CD: N	Module switch (0: actual, 1: expansion) (Remark 1)
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Switching Group 00 maintenance switch affects all other groups.
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "※" marked data modifiable
02	IND			■ CONTROL STATUS INDICATION
		RUN		Running
		STOP		Stopped
03	▲			■ OPERATION COMMAND
		0	STOP	Stop
		1	HOT START	Hot start
		2	COLD START	Cold start
06	IND			■ Nest Bus TRANSMISSION STATUS INDICATION
		RUN		Transmitting
		STOP		Stopped
★ 08	▲			■ Nest Bus TRANSMISSION MODE
		0	0	Send/Receive mode C#: 00 to 0F
		1	1	Receive only mode C#: 10 to 1E (C# upper digit is automatically set to '1'. Data from upper bus cannot be received.)
★ 11	▲	50 to 3000 (100 to 3000 for SC200W, SC210W)	NNNN	■ COMPUTATION CYCLE (msec) Selectable in every 10 milliseconds
12	IND		NNN%	■ CONTROL LOAD RATE INDICATION (%)
13	●	0	NNN%	■ MAX. CONTROL LOAD RATE INDICATION (%) Reset when "0" is entered.
21	IND			■ SYSTEM STATUS INDICATION (error indication)
		ALLRIGHT		• EEPROM Data Base Failed All blocks proved normal
		GROUP NN		Abnormal block No. indication (NN: GROUP No.)
22	IND			• PV Abnormality (Pv 1 OR Pv 2) PV input H/L alarm status in the field terminal block indicated
		PV NORMAL		PV proved normal
		PV ABNORMAL		PV proved abnormal
23	IND			• MV Feedback Abnormality (Mv 1 OR Mv 2) deviation alarm status of MV check input and MV output in the field terminal block indicated
		MV NORMAL		MV feedback proved normal
		MV ABNORMAL		MV feedback proved abnormal
24	IND			• Block Abnormality (GROUP No. indicated)
		ALLRIGHT		All blocks proved normal
		GROUP NN		Abnormal block No. indication (NN: GROUP No.)
25	IND			• Control Overload
		LOAD: RIGHT		Appropriate control load
		LOAD: OVER		Control overload
26	IND			• Supervisory communication error
		COM: NN		Number of communication error events (NN)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
30	IND		COM: PER: NN	• Supervisory communication error Number of parity error events (NN)
31	IND		COM: FER: NN	• Supervisory communication error Number of framing error events (NN)
32	IND		COM: OER: NN	• Supervisory communication error Number of overrun error events (NN)
33	IND		COM: SER: NN	• Supervisory communication error Number of sum check error events (NN)
35	IND		ALLRIGHT	• Abnormal FB No. hold All blocks proved normal
			GROUP NN	Abnormal block No. indication (NN: GROUP No.)
36	IND		ER: NN	• Abnormality contents hold Abnormal block contents (NN)
40	●			■ COMPUTATION CYCLE SWITCHING FLAG
		0, 1	0	Normal
			1	Computation cycle switched Reset when "0" is entered. Once reset, "LOAD: RIGHT" is set in ITEM 25.
★ 51	▲	0 – F	CD : 0	■ CARD NO. REGISTRATION (Remark 2)
60	▲			■ RUN CONTACT ERROR RESET MODE (Remark 3)
		0, 1	RUN: 0	Automatic reset
			RUN: 1	Manual reset
61	●			■ RUN CONTACT ERROR RESET FLAG (Remark 3)
		0, 1	0	Normal
			1	Reset (valid when ITEM 60 is set to 'manual reset')
95	▲	1	BLOCK RELEASE (initial display *)	■ DELETE MODEL NO. COMMAND (Remark 4) Group 00, 01, 04, 05 or 80 are not deleted.
★ 96	IND	00 – 99	FIELD: 73	■ FIELD TERMINAL MODEL IDENTIFICATION
★ 97	▲		SC210	■ HARDWARE MODEL NO. INDICATION (max. 8 characters, for use in the supervisory system)
99	IND		DCSSC N.NN	■ ROM VERSION INDICATION

Remark 1: Only available with SC200W and SC210W

Remark 2: The controller is automatically reset when the card No. is changed.

Remark 3: ROM Version 1.50 or later

Remark 4: In case of SC200W and SC210W, the module specified at ITEM 00 'Module switch' is deleted.

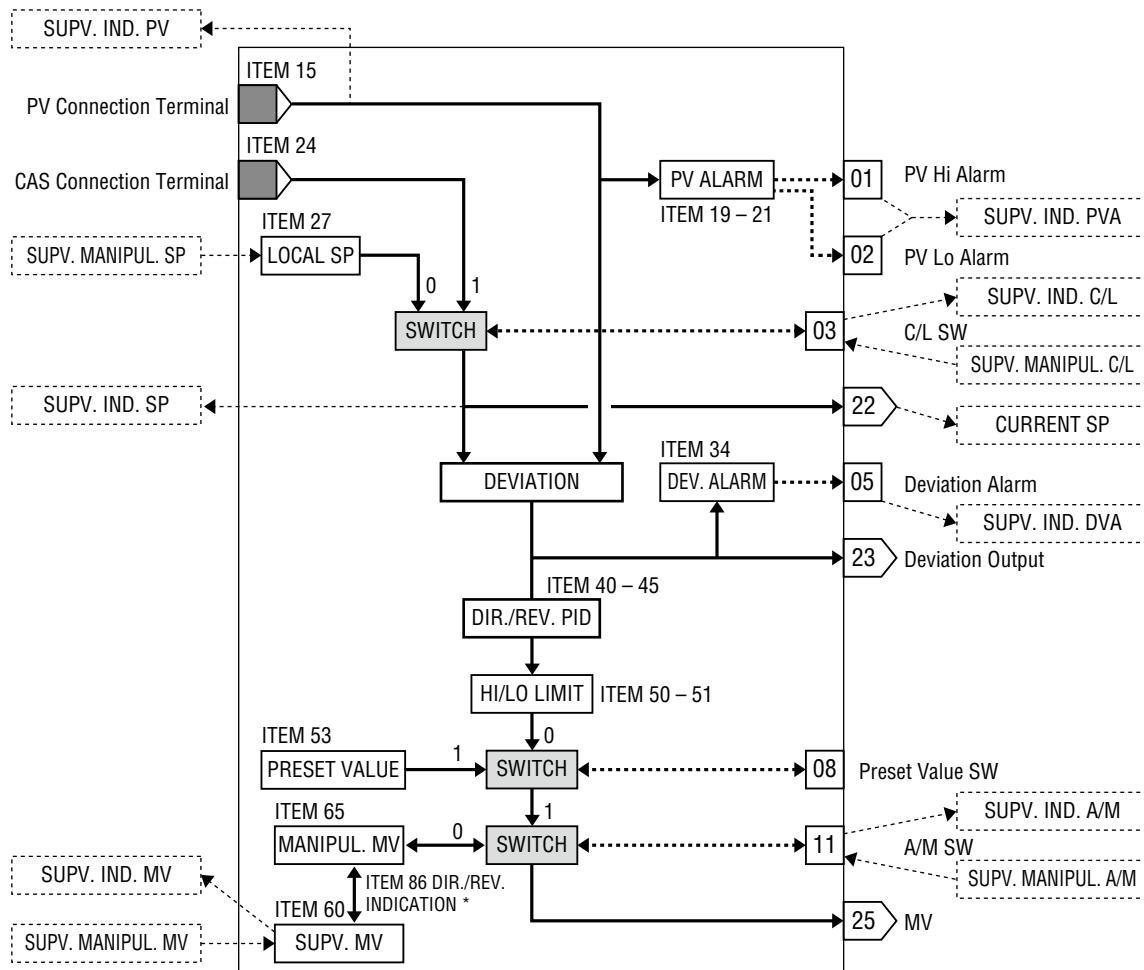
## System Common Table (for remote I/O)

<b>GROUP [00]</b>		★: Setting data		
<b>ITEM</b>	<b>MDFY</b>	<b>DATA INPUT</b>	<b>DISPLAY (e.g.)</b>	<b>CONTENTS</b>
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Switching Group 00 maintenance switch affects all other groups.
	0	MT: 0	MT: 0	MONITOR mode: data monitoring only
	1	MT: 1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND		RUN STOP	■ CONTROL STATUS INDICATION Running Stopped
	03	▲	STOP HOT START COLD START	■ OPERATION COMMAND Stop Hot start Cold start
	06	IND	RUN STOP	■ Nest Bus TRANSMISSION STATUS INDICATION Transmitting Stopped
★ 08	▲		0 1	■ Nest Bus TRANSMISSION MODE Send/Receive mode C#: 00 to 0F Receive only mode C#: 10 to 1E (C# upper digit is automatically set to '1'. Data from upper bus cannot be received.)
	★ 11	▲	0 1 2 3	■ COMPUTATION CYCLE 1 Sec 0.5 Sec 0.25 Sec 0.12 Sec
	12	IND	NNN%	■ CONTROL LOAD RATE INDICATION (%)
13	●	0	NNN%	■ MAX. CONTROL LOAD RATE INDICATION (%) Reset when "0" is entered.
21	IND		ALLRIGHT GROUP NN	■ SYSTEM STATUS INDICATION (error indication) • EEPROM Data Base Failed All blocks proved normal Abnormal block No. indication (NN: GROUP No.)
	22	IND	PV NORMAL PV ABNORMAL	• PV Abnormality (PV input H/L alarm status in the field terminal block indicated) PV proved normal PV proved abnormal
	23	IND	MV NORMAL MV ABNORMAL	• MV Feedback Abnormality (deviation alarm status of MV check input and MV output in the field terminal block indicated) MV feedback proved normal MV feedback proved abnormal
24	IND		ALLRIGHT GROUP NN	• Block Abnormality (GROUP No. indicated) All blocks proved normal Abnormal block No. indication (NN: GROUP No.)
	25	IND	LOAD: RIGHT LOAD: OVER	• Control Overload Appropriate control load Control overload

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
40	●	0, 1	0 1	■ COMPUTATION CYCLE SWITCHING FLAG Normal Computation cycle switched Reset when "0" is entered. Once reset, "LOAD: RIGHT" is set in ITEM 25.
95	▲	1	BLOCK RELEASE (initial display *)	■ DELETE MODEL NO. COMMAND Group 00, 01 or 80 are not deleted.
★ 96	IND	00 – 99	FIELD: 24	■ FIELD TERMINAL MODEL IDENTIFICATION
★ 97	▲		SML-A4	■ HARDWARE MODEL NO. INDICATION (max. 8 characters, for use in the supervisory system)
99	IND		18MF N.NN	■ ROM VERSION INDICATION

MODEL NO. <b>21</b>	BLOCK NAME <b>Basic PID</b>	MODEL NO. <b>21</b>
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ABBR: BCA



\*Direct action MV value is applied for internal processing regardless of ITEM 86 setting.

**GROUP [02, 03]** ◆: Automatically changeable parameters ★: Setting data

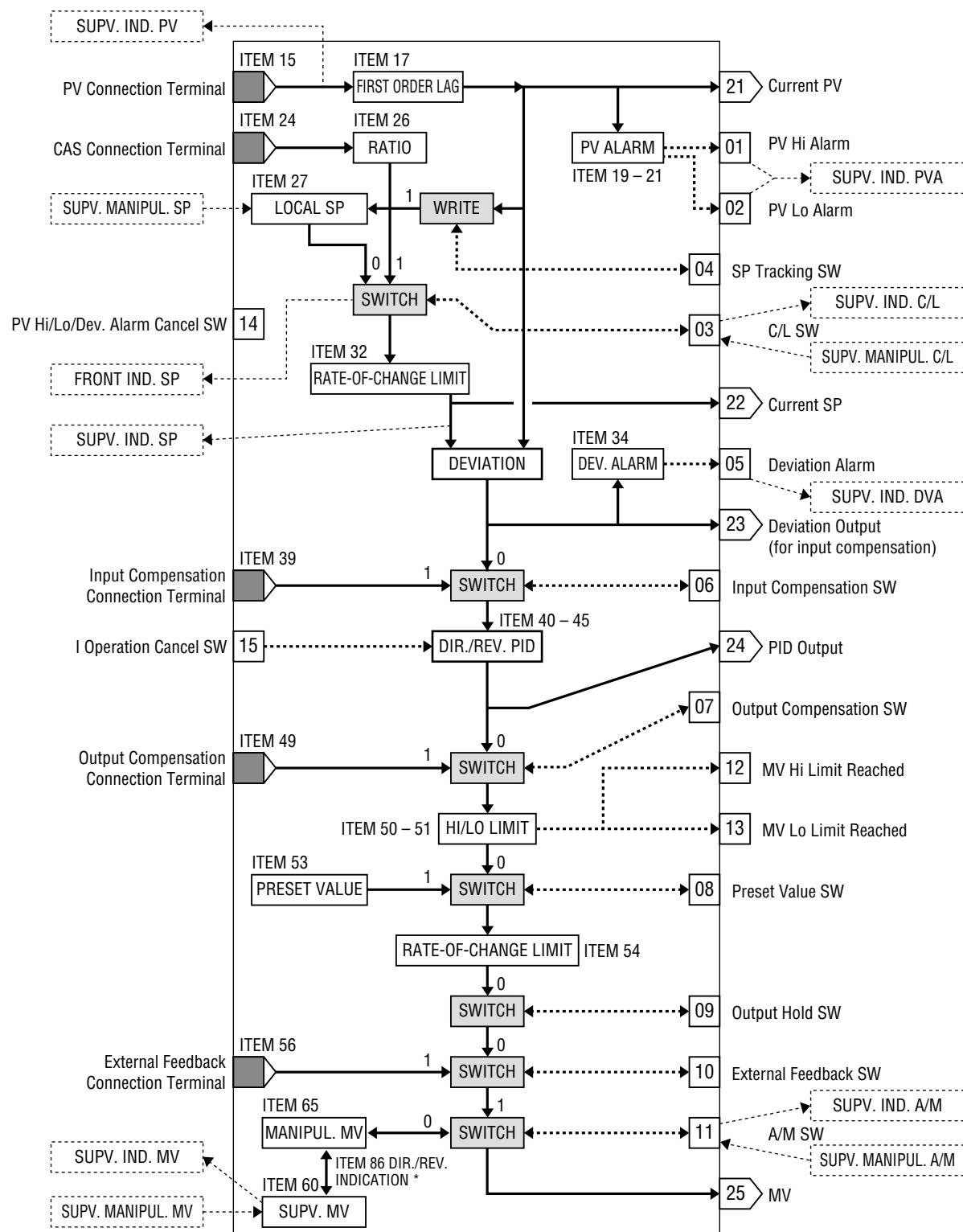
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 21		MD: 21	<b>BASIC PID (model)</b> ‘-’ to clear.
<b>PROCESS VALUE (PV)</b>				
★ 15	▲ GGNN	P#: 0121		PV connection terminal (error if not connected) GG: Group No. NN: terminal No.
16	▲ -15.00 – 115.00 %	PV: NNN.NN		PV %
◆ ★ 19	● -15.00 – 115.00 %	PH: NNN.NN		PV high alarm setpoint
◆ ★ 20	● -15.00 – 115.00 %	PL: NNN.NN		PV low alarm setpoint
◆ ★ 21	● 0.00 – 115.00 %	HS: NNN.NN		Hysteresis (deadband)
22	▲ 0, 1	01: N		PV high alarm
23	▲ 0, 1	02: N		PV low alarm

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
<b>SETPOINT VALUE (SP)</b>				
★ 24	▲	GGNN	C#: 0225	CAS connection terminal
25	▲	-15.00 – 115.00 %	SP: NNN.NN	CAS %
◆ ★ 27	●	-15.00 – 115.00 %	SP: NNN.NN	Local SP %
★ 29	▲	0, 1	SM: N	Setting mode (0: local, 1: cascade/local)
◆ 30	●	0, 1	03: N	C/L SW (0: local, 1: cascade)
33	▲	-15.00 – 115.00 %	22: NNN.NN	Current SP %
<b>DEVIATION</b>				
◆ ★ 34	●	0.00 – 115.00 %	DL: NNN.NN	Deviation alarm setpoint (hysteresis (deadband) in ITEM 21)
35	▲	0, 1	05: N	Deviation alarm
36	▲	±115.00 %	23: NNN.NN	Deviation output %
<b>CONTROL</b>				
★ 40	▲	0, 1	DR: N	Control direction (0: direct, 1: reverse [MV decreases with PV increase])
★ 41	▲	0, 1	DM: N	Derivative method (0: PV derivative, 1: deviation derivative)
◆ ★ 42	●	1 – 1000 %	PB: NNNN	Proportional band
◆ ★ 43	●	0.00 – 100.00 min.	TI: NNN.NN	Integral time (0.00: no integral action)
◆ ★ 44	●	0.00 – 10.00 min.	TD: NN.NN	Derivative time (0.00: no derivative action)
★ 45	▲	1, 2, 4, 8, 16, 32, 64	CP: NN	Control cycle (multiple of basic control cycle)
<b>CONTROL OUTPUT MV</b>				
◆ ★ 50	●	±115.00 %	MH: NNN.NN	Output high limit
◆ ★ 51	●	±115.00 %	ML: NNN.NN	Output low limit
52	▲	0, 1	08: N	Preset value SW (1: preset)
◆ ★ 53	●	±115.00 %	MI: NNN.NN	Preset value
◆ 59	●	0, 1	11: N	A/M SW (0: manual, 1: auto)
◆ 60	●	±115.00 %	MV: NNN.NN	Supervisory indication / manipulated MV %
◆ ★ 64	●	±115.00 %	RS: NNN.NN	Manual reset (usable when no I action is employed)
65	▲	±115.00 %	25: NNN.NN	MV %
★ 66	▲	0, 1	MS: N	Smooth tracking output with local SP change (0: without, 1: with)
★ 68	▲	0, 1	ARW: N	Integral action range (0: MH – ML, 1: set range) <b>SC 1.50</b>
★ 69	▲	±115.00 %	ARH: NNN.NN	Integral action high limit (valid when ITEM 68 is set to '1') <b>SC 1.50</b>
★ 70	▲	±115.00 %	ARL: NNN.NN	Integral action low limit (valid when ITEM 68 is set to '1') <b>SC 1.50</b>
★ 71	▲	0, 1		LOCAL SP limit range (0: PH – PL, 1: set range) <b>SC 1.70</b>
◆ ★ 72	●	-15.00 – 115.00 %	SH: NNN.NN	LOCAL SP high limit (valid when ITEM 71 is set to '1') <b>SC 1.70</b>
◆ ★ 73	●	-15.00 – 115.00 %	SL: NNN.NN	LOCAL SP low limit (valid when ITEM 71 is set to '1') <b>SC 1.70</b>
<b>SUPERVISORY INDICATION USE</b>				
★ 80	▲	alphanumeric	TG: XXX ....X	Tag name (10 characters max.)
★ 81	▲	alphanumeric	TC: XXXX ....X	Tag comment (16 characters max.)
★ 82	▲	±32000	MH: <u>15000</u>	Upper range (in engineering unit)
★ 83	▲	±32000	ML: <u>0</u>	Lower range (in engineering unit)
★ 84	▲	0, 1, 2, 3, 4, 5	DP: <u>1</u>	Decimal point position (from rightmost digit)
★ 85	▲	alphanumeric	TU: XXX ....X	Engineering unit (8 characters max.)
★ 86	▲	0, 1	MD: N	MV reverse indication (0: direct, 1: reverse) (1: send/receive 100 – 0% proportionally to 0 – 100%).

Refer to the "4. Control Blocks" of the "Function Block Application Manual (EM-6461-C)" for details of each ITEM.

MODEL NO.	BLOCK NAME	MODEL NO.
22	Advanced PID	22

ABBR: ECA



\*Direct action MV value is applied for internal processing regardless of ITEM 86 setting.

**GROUP [02, 03]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 22	MD: 22		<b>ADVANCED PID (model)</b> "—" to clear.
<b>PROCESS VALUE (PV)</b>				
★ 15	▲ GGNN	P#: 0121		PV connection terminal (error if not connected) GG: Group No. NN: terminal No.
16	▲ -15.00 – 115.00 %	PV: NNN.NN		PV %
◆★ 17	▲ 0.0 – 100.0 s	PT: NNN.N		PV first order lag time constant (0.0: without)
18	▲ -15.00 – 115.00 %	21: NNN.NN		Current PV %
◆★ 19	● -15.00 – 115.00 %	PH: NNN.NN		PV high alarm setpoint
◆★ 20	● -15.00 – 115.00 %	PL: NNN.NN		PV low alarm setpoint
◆★ 21	● 0.00 – 115.00 %	HS: NNN.NN		Hysteresis (deadband)
22	▲ 0, 1	01: N		PV high alarm
23	▲ 0, 1	02: N		PV low alarm
<b>SETPOINT VALUE (SP)</b>				
★ 24	▲ GGNN	C#: 0225		CAS connection terminal
25	▲ -15.00 – 115.00 %	SP: NNN.NN		CAS %
◆★ 26	● ±32.000	RT: NN.NNN		Ratio setting (signal % ratio)
◆★ 27	● -15.00 – 115.00 %	SP: NNN.NN		Local SP %
★ 29	▲ 0, 1	SM: N		Setting mode (0: local, 1: cascade/local)
◆ 30	▲ 0, 1	03: N		C/L SW (0: local, 1: cascade)
31	● 0, 1	04: N		SP tracking SW (0: OFF, 1: ON)
★ 32	● 0.00 – 115.00 %/s	SR: NNN.NN		SP rate-of-change limit (0.00: without)
33	▲ -15.00 – 115.00 %	22: NNN.NN		Current SP %
<b>DEVIATION</b>				
◆★ 34	● 0.00 – 115.00 %	DL: NNN.NN		Deviation alarm setpoint (hysteresis (deadband) in ITEM 21)
35	▲ 0, 1	05: N		Deviation alarm
36	▲ ±115.00 %	23: NNN.NN		Deviation output %
★ 37	▲ 0, 1	06: N		Input compensation SW (0: without, 1: with)
★ 38	▲ 0, 1, 2, 3	IM: N		Input compensation method (0: without, 1: addition, 2: subtraction, 3: substitution)
★ 39	▲ GGNN	I#: 0221		Input compensation connection terminal
<b>CONTROL</b>				
★ 40	▲ 0, 1	DR: N		Control direction (0: direct, 1: reverse [MV decreases with PV increase])
★ 41	▲ 0, 1	DM: N		Derivative method (0: PV derivative, 1: deviation derivative)
◆★ 42	● 1 – 1000 %	PB: NNNNN		Proportional band
◆★ 43	● 0.00 – 100.00 min.	TI: NNN.NN		Integral time (0.00: no integral action)
◆★ 44	● 0.00 – 10.00 min.	TD: NN.NN		Derivative time (0.00: no derivative action)
★ 45	▲ 1, 2, 4, 8, 16, 32, 64	CP: NN		Control cycle (multiple of basic control cycle)

Refer to the "4. Control Blocks" of the "Function Block Application Manual (EM-6461-C)" for details of each ITEM.

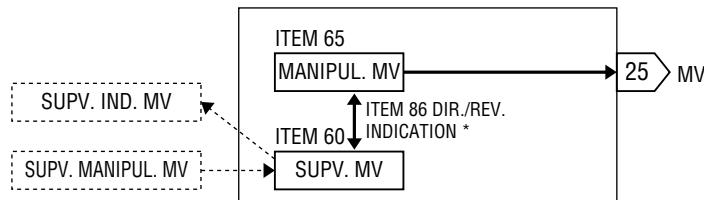
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
<b>CONTROL OUTPUT (MV)</b>				
46	▲	±115.00 %	24: NNN.NN	PID output %
★ 47	▲	0, 1	07: N	Output compensation SW (0: without, 1: with)
★ 48	▲	0, 1, 2, 3	OM: N	Output compensation method (0: without, 1: addition, 2: subtraction, 3: substitution)
★ 49	▲	GGNN	0#: 0221	Output compensation connection terminal
◆ ★ 50	●	±115.00 %	MH: NNN.NN	Output high limit
◆ ★ 51	●	±115.00 %	ML: NNN.NN	Output low limit
52	▲	0, 1	08: N	Preset value SW (1: preset)
◆ ★ 53	●	±115.00%	MI: NNN.NN	Preset value
◆ ★ 54	●	0.00 – 115.00 %/s	MR: NNN.NN	Output rate-of-change limit (0.00: without)
55	▲	0, 1	09: N	Output hold SW (0: without, 1: hold)
★ 56	▲	GGNN	M#: 0221	External feedback connection terminal
57	▲	±115.00 %	FV: NNN.NN	External feedback %
58	▲	0, 1	10: N	External feedback SW (0: without, 1: with)
◆ 59	●	0, 1	11: N	A/M SW (0: manual, 1: auto)
◆ 60	●	±115.00 %	MV: NNN.NN	Supervisory indication / manipulated MV %
61	▲	0, 1	12: N	MV high limit reached (Remark 1)
62	▲	0, 1	13: N	MV low limit reached (Remark 1)
63	▲	0, 1	14: N	PV alarm, deviation alarm function stop command (Remark 2)
◆ ★ 64	●	±115.00 %	RS: NNN.NN	Manual reset (usable when no I action is used.)
65	▲	±115.00 %	25: NNN.NN	MV %
★ 66	▲	0, 1	MS: N	Smooth tracking output with local SP change (0: without, 1: with)
67	▲	0, 1	15: N	Cancel I action SW (0: with I action, 1: cancel)
★ 68	▲	0, 1	ARW: N	Integral action range (0: MH – ML, 1: set range) <b>SC 1.50</b>
★ 69	▲	±115.00 %	ARH: NNN.NN	Integral action high limit (valid when ITEM 68 is set to '1') <b>SC 1.50</b>
★ 70	▲	±115.00 %	ARL: NNN.NN	Integral action low limit (valid when ITEM 68 is set to '1') <b>SC 1.50</b>
★ 71	▲	0, 1		LOCAL SP limit range (0: PH – PL, 1: set range) <b>SC 1.70</b>
◆ ★ 72	●	-15.00 – 115.00 %	SH: NNN.NN	LOCAL SP high limit (valid when ITEM 71 is set to '1') <b>SC 1.70</b>
◆ ★ 73	●	-15.00 – 115.00 %	SL: NNN.NN	LOCAL SP low limit (valid when ITEM 71 is set to '1') <b>SC 1.70</b>
<b>SUPERVISORY INDICATION USE</b>				
★ 80	▲	alphanumeric	TG: XXX ....X	Tag name (10 characters max.)
★ 81	▲	alphanumeric	TC: XXXX ....X	Tag comment (16 characters max.)
★ 82	▲	±32000	MH: 15000	Upper range (in engineering unit)
★ 83	▲	±32000	ML: 0	Lower range (in engineering unit)
★ 84	▲	0, 1, 2, 3, 4, 5	DP: 1	Decimal point position (from rightmost digit)
★ 85	▲	alphanumeric	TU: XXX ....X	Engineering unit (8 characters max.)
★ 86	▲	0, 1	MD: N	MV reverse indication (0: direct, 1: reverse) (1: send/receive 100 – 0% proportionally to 0 – 100%).

Remark 1: While the PID control loop is closed, it is turned to '0'. When the MV reaches the output limit, the relevant output turns to '1'. When the PID control is not activated (e.g. in manual control mode), both high and low limits turn to '1'.

Remark 2: With this switch set to '1', PV high/low alarm and deviation alarm functions are cancelled.

MODEL NO. 23	BLOCK NAME <b>Manual Loader</b>	MODEL NO. 23
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ABBR: MVA



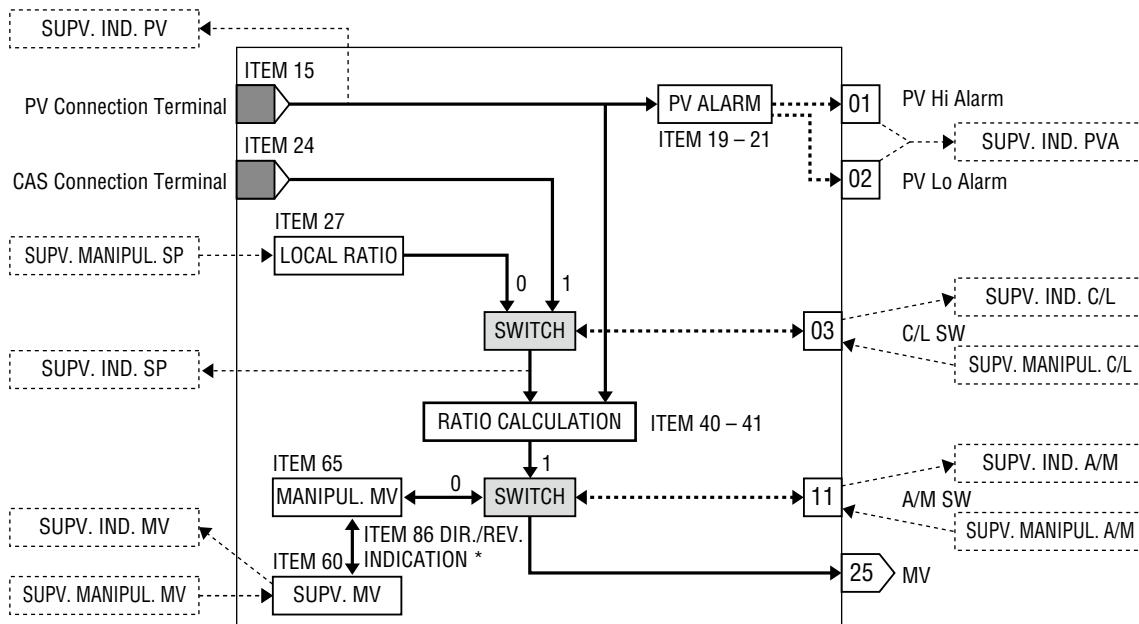
\*Direct action MV value is applied for internal processing regardless of ITEM 86 setting.

**GROUP [02, 03]**   ◆: Automatically changeable parameters   ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	23	MD: <u>23</u>	<b>MANUAL LOADER (model)</b> '-' to clear.
<b>OUTPUT</b>				
◆ 60	●	±115.00 %	MV: NNN.NN	Supervisory indication / manipulated MV %
65	▲	±115.00 %	25: NNN.NN	MV %
<b>SUPERVISORY INDICATION USE</b>				
★ 80	▲	alphanumeric	TG: XXX ....X	Tag name (10 characters max.)
★ 81	▲	alphanumeric	TC: XXXX ....X	Tag comment (16 characters max.)
★ 86	▲	0, 1	MD: N	MV reverse indication (0: direct, 1: reverse) (1: send/receive 100 – 0% proportionally to 0 – 100%).

MODEL NO.	BLOCK NAME	MODEL NO.
24	Ratio Setter	24

ABBR: RSA



\*Direct action MV value is applied for internal processing regardless of ITEM 86 setting.

$$\text{RATIO EQUATION} \quad MV = SP (PV - A_1) + B_1$$

MV : output (%)

SP :  $\pm 32.000$

PV : reference input (%)

A<sub>1</sub> : input bias (%)

B<sub>1</sub> : output bias (%)

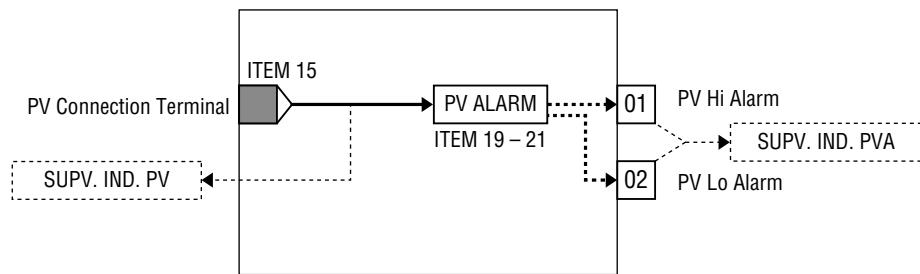
Note: Internal data  $\pm 32000$  ( $\pm 320.00\%$ ) is converted into  $\pm 32.000$  to give CAS SP ratio.

**GROUP [02, 03]**   ◆: Automatically changeable parameters   ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 24		MD: 24	RATIO SETTER (model) '–' to clear.
<b>PROCESS VALUE (PV)</b>				
★ 15	▲	GGNN	P#: 0221	PV connection terminal (error if not connected) GG: Group No. NN: terminal No.
16	▲	-15.00 – 115.00 %	PV: NNN.NN	PV %
◆ ★ 19	●	-15.00 – 115.00 %	PH: NNN.NN	PV high alarm setpoint
◆ ★ 20	●	-15.00 – 115.00 %	PL: NNN.NN	PV low alarm setpoint
◆ ★ 21	●	0.00 – 115.00 %	HS: NNN.NN	Hysteresis (deadband)
22	▲	0, 1	01: N	PV high alarm
23	▲	0, 1	02: N	PV low alarm
<b>OPERATION</b>				
★ 24	▲	GGNN	C#: 0221	CAS connection terminal
25	▲	±32.000	SP: NN.NNN	CAS SP ratio
◆ ★ 27	●	±32.000	SP: NN.NNN	Local SP ratio
★ 29	▲	0, 1	SM: N	Setting mode (0: local, 1: cascade/local)
◆ 30	●	0, 1	03: N	C/L SW (0: local, 1: cascade)
33	●	±32.000	SP: NN.NNN	Current SP ratio
◆ ★ 40	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> Input bias
◆ ★ 41	▲	±115.00 %	B1: NNN.NN	B <sub>1</sub> Output bias
<b>OUTPUT</b>				
◆ 59	●	0, 1	11: N	A/M SW (0: manual, 1: auto)
◆ 60	●	±115.00 %	MV: NNN.NN	Supervisory indication / manipulated MV %
65	▲	±115.00 %	25: NNN.NN	MV %
◆ ★ 72	●	±32.000	SH: NN.NNN	LOCAL SP ratio high limit <b>SC 1.70</b>
◆ ★ 73	●	±32.000	SL: NN.NNN	LOCAL SP ratio low limit <b>SC 1.70</b>
<b>SUPERVISORY INDICATION USE</b>				
◆ 80	▲	alphanumeric	TG: XXX ....X	Tag name (10 characters max.)
◆ 81	▲	alphanumeric	TC: XXXX ....X	Tag comment (16 characters max.)
◆ 82	▲	±32000	MH: <u>15000</u>	Upper range (in engineering unit)
◆ 83	▲	±32000	ML: <u>0</u>	Lower range (in engineering unit)
◆ 84	▲	0, 1, 2, 3, 4, 5	DP: <u>1</u>	Decimal point position (from rightmost digit)
◆ 85	▲	alphanumeric	TU: XXX ....X	Engineering unit (8 characters max.)
◆ 86	▲	0, 1	MD: N	MV reverse indication (0: direct, 1: reverse) (1: send/receive 100 – 0% proportionally to 0 – 100%).

MODEL NO.	BLOCK NAME	MODEL NO.
25	Indicator	25

ABBR: IND



**GROUP [02, 03]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 25		MD: 25	<b>INDICATOR (model)</b> '-' to clear.

#### PROCESS VALUE (PV)

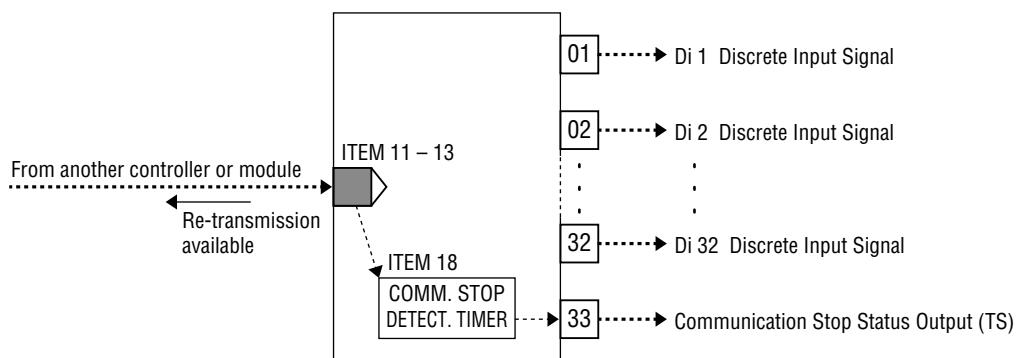
★ 15	▲	GGNN	P#: 0221	PV connection terminal (error if not connected) GG: Group No. NN: terminal No.
16	▲	-15.00 – 115.00 %	PV: NNN.NN	PV %
◆ ★ 19	●	-15.00 – 115.00 %	PH: NNN.NN	PV high alarm setpoint
◆ ★ 20	●	-15.00 – 115.00 %	PL: NNN.NN	PV low alarm setpoint
◆ ★ 21	●	0.00 – 115.00 %	HS: NNN.NN	Hysteresis (deadband)
22	▲	0, 1	01: N	PV high alarm
23	▲	0, 1	02: N	PV low alarm

#### SUPERVISORY INDICATION USE

★ 80	▲	alphanumeric	TG: XXX ....X	Tag name (10 characters max.)
★ 81	▲	alphanumeric	TC: XXXX ....X	Tag comment (16 characters max.)
★ 82	▲	±32000	MH: 15000	Upper range (in engineering unit)
★ 83	▲	±32000	ML: 0	Lower range (in engineering unit)
★ 84	▲	0, 1, 2, 3, 4, 5	DP: 1	Decimal point position (from rightmost digit)
★ 85	▲	alphanumeric	TU: XXX ....X	Engineering unit (8 characters max.)

MODEL NO.	BLOCK NAME	MODEL NO.
31	Di Receive Terminal	31

ABBR: CDI



### General Description

Used to receive discrete contact signals from other control cards, remote I/O devices and/or PC.

- Received contact state can be re-transmitted to the network.
- Signals can be remotely controlled with ON-OFF command from Sequential Control block when ITEM 11 is set to 'FE' (Sender is a PC).

### GROUP [11 – 26] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 31	MD: 31		DI RECEIVE TERMINAL (model) '-' to clear.
★ 11	▲ 00 – 3F	S#: 1A		00 – 3F: sender station No. FE: PC as sender FF: sender within the same Nest Bus
★ 12	▲ 0 – F	C#: 1		Sender card No.
★ 13	▲ 11 – 26	G#: 11		Sender group No.
★ 18	▲ 0.1 – 60.0 s	T: 1.0		Communication stop check time (no check when input from a PC)
★ 19	▲ 0, 1	RT: N		Re-transmission (0: without, 1: with)
21	▲ * 0, 1	01: N		Di 1 discrete input signal
22	▲ * 0, 1	02: N		Di 2 discrete input signal
:	:	:		:
30	▲ * 0, 1	10: N		Di 10 discrete input signal
31	▲ * 0, 1	11: N		Di 11 discrete input signal
:	:	:		:
40	▲ * 0, 1	20: N		Di 20 discrete input signal
41	▲ * 0, 1	21: N		Di 21 discrete input signal
:	:	:		:
50	▲ * 0, 1	30: N		Di 30 discrete input signal
51	▲ * 0, 1	31: N		Di 31 discrete input signal
52	▲ * 0, 1	32: N		Di 32 discrete input signal
53	▲ 0, 1	TS: N		Communication stop status indication (1: stop)

Remark: Be sure to perform a cold start on the device when the settings have been changed.

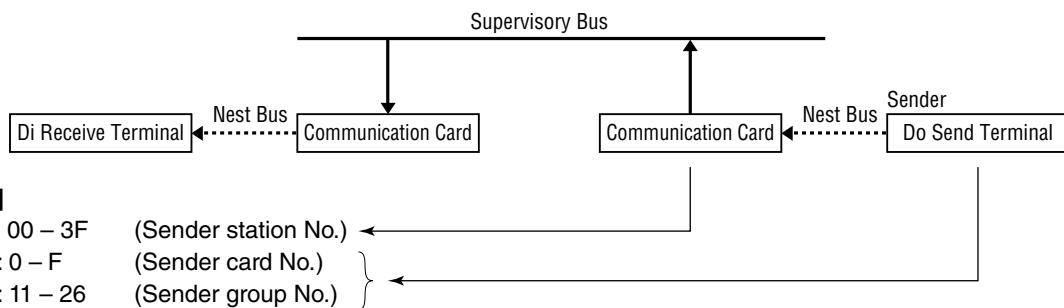
### ■ Input from Do Send Terminal within the Same Nest Bus



#### [Setting]

- ITEM 11: FF (Sender is within the same Nest Bus)
- ITEM 12: 0 – F (Sender card No.)
- ITEM 13: 11 – 26 (Sender group No.)

### ■ Input from Do Send Terminal on Remote Nest Bus



### ■ Input from PC



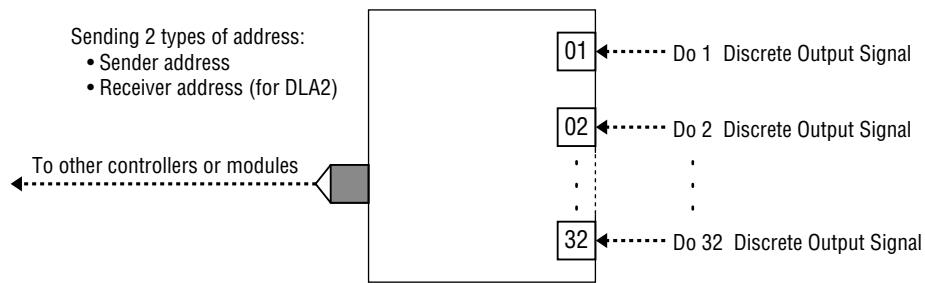
Specify ITEM 19 to '1' (re-transmission). The PC requires the setting to confirm feedback.

#### [Setting]

- ITEM 11: FE (Sender is a PC)
- ITEM 12: any No. (disregarded)
- ITEM 13: any No. (disregarded)
- ITEM 18: any value (disregarded)
- ITEM 19: 1 (re-transmission)

MODEL NO.	BLOCK NAME	MODEL NO.
32	Do Send Terminal	32

ABBR: CDO



### General Description

Used to send discrete contact signals to other control cards, remote I/O devices and/or PC.

- Sender address is automatically attached when transmitting.

### GROUP [11 – 26] ★: Setting data

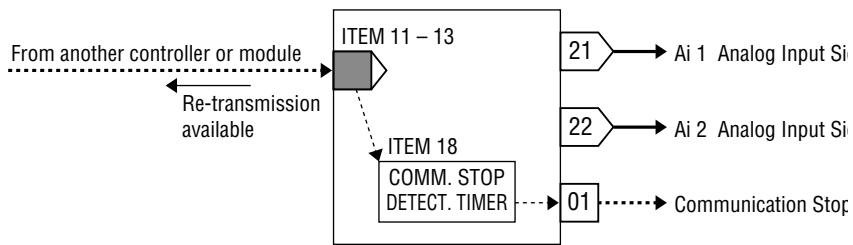
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	32	MD: <u>32</u>	Do SEND TERMINAL (model) '-' to clear.
★ 11	▲	0, 1, 2	TR: <u>0</u>	Transmission range 0: within the same Nest Bus 1: also to supervisory network 2: no transmission
★ 12	▲			Receiver address (for DLA2 use)
		0	RM: <u>0</u>	Not specified
		1	RM: <u>1</u>	Specified (ITEM 13 – 17)
★ 13	▲	00 – 3F	S#: <u>10</u>	Receiver station No.
★ 14	▲	0 – F	C#: <u>1</u>	Receiver card No.
★ 15	▲	11 – 26	G#: <u>11</u>	Receiver group No.
★ 16	▲	01 – 32	SN: <u>01</u>	Top output point No. of the receiver
★ 17	▲	01 – 32	N: <u>32</u>	Total number of points to be sent (counted from the top point No.)
21	▲*	0, 1	01: N	Do 1 discrete output signal status indication
22	▲*	0, 1	02: N	Do 2 discrete output signal status indication
:	:	:	:	:
30	▲*	0, 1	10: N	Do 10 discrete output signal status indication
31	▲*	0, 1	11: N	Do 11 discrete output signal status indication
:	:	:	:	:
40	▲*	0, 1	20: N	Do 20 discrete output signal status indication
41	▲*	0, 1	21: N	Do 21 discrete output signal status indication
:	:	:	:	:
50	▲*	0, 1	30: N	Do 30 discrete output signal status indication
51	▲*	0, 1	31: N	Do 31 discrete output signal status indication
52	▲*	0, 1	32: N	Do 32 discrete output signal status indication

### ■ Sender Address

Sender address is automatically set. ITEM 10 (model), ITEM 11 (transmission range) and ITEM 12: '0' are the minimum required settings.

MODEL NO.	BLOCK NAME	MODEL NO.
33	Ai Receive Terminal	33

ABBR: CAI



### General Description

Used to receive analog or accumulated pulse signals from other control cards, remote I/O devices and/or PC.

- Received contact status can be re-transmitted to the network.
- Re-transmitted data can be received by an Ai Receive Terminal on other card No.

### GROUP [11 – 26] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	33	MD: 33	Ai RECEIVE TERMINAL (model) '-' to clear.
★ 11	▲	00 – 3F	S#: 1A	00 – 3F: sender station No. FE: PC as sender FF: sender within the same Nest Bus
★ 12	▲	0 – F	C#: 1	Sender card No.
★ 13	▲	11 – 26	G#: 11	Sender group No.
★ 18	▲	0.1 – 60.0 s	T: 1.0	Communication stop check time (no check when input from a PC)
★ 19	▲	0, 1	RT: N	Re-transmission (0: without, 1: with)
21	▲*	-15.00 – 115.00 %	21: NNN.NN	Ai 1 analog input signal
22	▲*	-15.00 – 115.00 %	22: NNN.NN	Ai 2 analog input signal
23	▲	0, 1	TS: N	Communication stop status indication (1: stop)

Remark: Be sure to perform a cold start on the device when the settings have been changed.

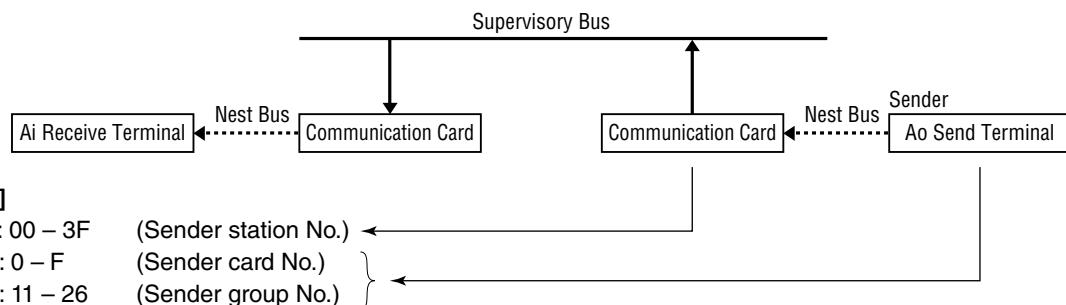
### ■ Input from Ao Send Terminal within the Same Nest Bus



#### [Setting]

- ITEM 11: FF (Sender is within the same Nest Bus)
- ITEM 12: 0 – F (Sender card No.)
- ITEM 13: 11 – 26 (Sender group No.)

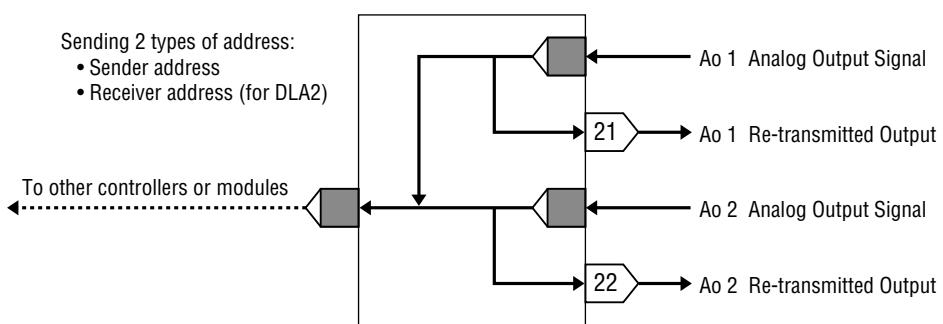
### ■ Input from Ao Send Terminal on Remote Nest Bus



■ Input from PC: Same as explained for Di Receive Terminal

MODEL NO.	BLOCK NAME	MODEL NO.
34	Ao Send Terminal	34

ABBR: CAO



### General Description

Used to send analog or accumulated pulse signals to other control cards, remote I/O devices and PC.

- Sender address is automatically attached.

### GROUP [11 – 26] ★: Setting data

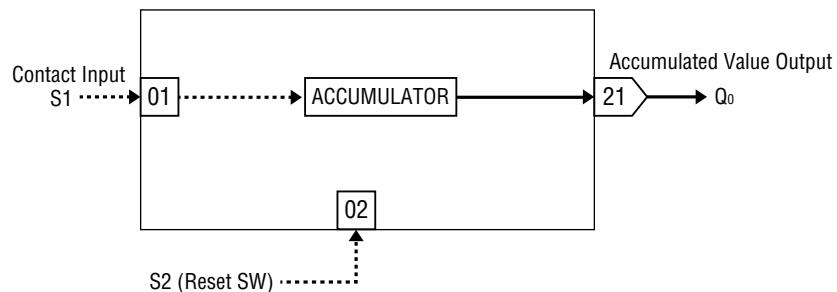
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	34	MD: 34	<b>Ao SEND TERMINAL (model)</b> '-' to clear.
★ 11	▲	0, 1, 2	TR: 0	Transmission range 0: within the same Nest Bus 1: also to supervisory network 2: no transmission
★ 12	▲			Receiver address (for DLA2 use)
		0	RM: 0	Not specified
		1	RM: 1	Specified (ITEM 13 – 15)
★ 13	▲	00 – 3F	S#: 10	Station No. of the receiver
★ 14	▲	0 – F	C#: 1	Card No. of the receiver
★ 15	▲	11 – 26	G#: 11	Group No. of the receiver
★ 18	▲	GGNN	1#: 3421	Ao 1 connection terminal (error if not connected)
★ 19	▲	GGNN	2#: 4621	Ao 2 connection terminal (no connection allowed)
21	▲*	-15.00 – 115.00 %	A1: NNN.NN	Ao 1 analog output signal
22	▲*	-15.00 – 115.00 %	A2: NNN.NN	Ao 2 analog output signal

### ■ Sender Address

Sender address is automatically set when transmitting. ITEM 10 (model), ITEM 11 (transmission range) and ITEM 12: '0' are the minimum required settings.

MODEL NO.	BLOCK NAME	MODEL NO.
44	Discrete Contact Input / Accumulated Value Output	44

ABBR: QIP



### General Description

Used to count number of rising edge of discrete contact input and converts into accumulated value. Contact input is supplied through Sequential Control Program block.

### Application

Using discrete contact input signals in place of pulse train input signals to count.

Maximum pulse rate must be at least twice as greater as the control cycle (GROUP 00, ITEM 11).

COMPUTATION CYCLE (GROUP 00, ITEM 11)	MAXIMUM PULSE RATE
0.25 sec	2 pulses/sec (7200 pulses/h)
0.5 sec	1 pulse/sec (3600 pulses/h)
1.0 sec	0.5 pulses/sec (1800 pulses/h)

### Operation

Counting from 0 up to 9999 is repeated and accumulated value is output.

Internal counter is reset when Reset SW S2 is turned to '1'.

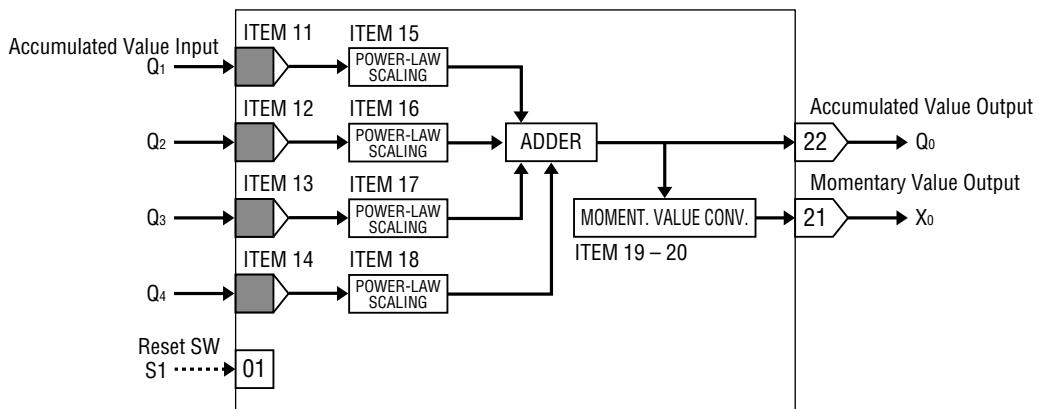
S2 is set to '1' at default setting.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0 – 9999	MC: NNNN	Q0 Accumulated value
04	▲	0, 1	S1: N	S1 Discrete input
05	▲	0, 1	S2: N	S2 Reset SW input (1: reset)
★ 10	▲ 44	MD: 44		<b>DISCRETE CONTACT INPUT / ACCUMULATED VALUE OUTPUT (model)</b> ‘-’ to clear.

MODEL NO.	BLOCK NAME	MODEL NO.
45	Pulse Adder	45

ABBR: PAD



### General Description

Used to add accumulated pulse inputs through 4 channels.

Each input can be scaled from 10 down to 0.001 times to adjust weight difference.

Internal counter is reset when Reset SW S1 is turned to '1'.

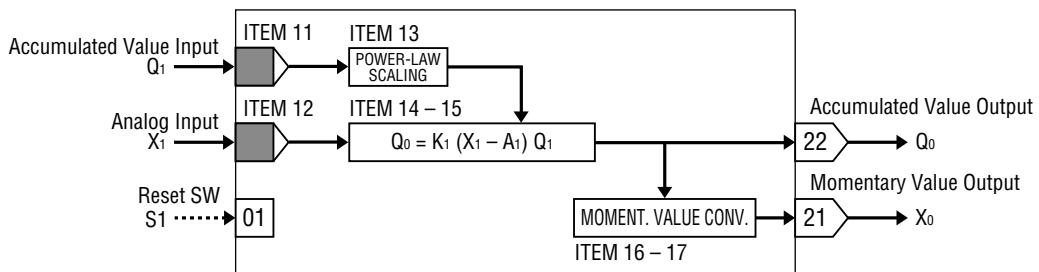
S1 is set to '1' at default setting.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0.00 – 115.00 %	21: NNN.NN	X <sub>0</sub> Momentary value output
04	▲	0 – 9999	22: NNNN	Q <sub>0</sub> Accumulated value output
05	▲	0, 1	S1: N	S1 Reset SW (1: reset)
★ 10	▲ 45	MD: 45		<b>PULSE ADDER (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	Q <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>1321</u>	Q <sub>2</sub> connection terminal (no connection allowed)
★ 13	▲	GGNN	3#: <u>1421</u>	Q <sub>3</sub> connection terminal (no connection allowed)
★ 14	▲	GGNN	4#: <u>1521</u>	Q <sub>4</sub> connection terminal (no connection allowed)
★ 15	▲	1, 0, -1, -2, -3	D1: <u>-1</u>	Q <sub>1</sub> power-law scaling
★ 16	▲	1, 0, -1, -2, -3	D2: <u>-1</u>	Q <sub>2</sub> power-law scaling
★ 17	▲	1, 0, -1, -2, -3	D3: <u>-1</u>	Q <sub>3</sub> power-law scaling
★ 18	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Q <sub>4</sub> power-law scaling (10 <sup>X</sup> X = 1: x10, 0: x1, -1: x0.1, -2: x0.01, -3:x0.001)
★ 19	▲	0.00 – 10000.00	VC: <u>1000.00</u>	Momentary value conversion factor or scaling rate (number of pulses per second at 100% momentary value input)
★ 20	▲	1 – 16	VR: <u>1</u>	Sample number for moving average in momentary value conversion

MODEL NO.	BLOCK NAME	MODEL NO.
46	Pulse/Analog Multiplication	46

ABBR: QAM



### General Description

Used to multiply accumulated pulse input by analog input.

Internal counter is reset when Reset SW S1 is turned to '1'.

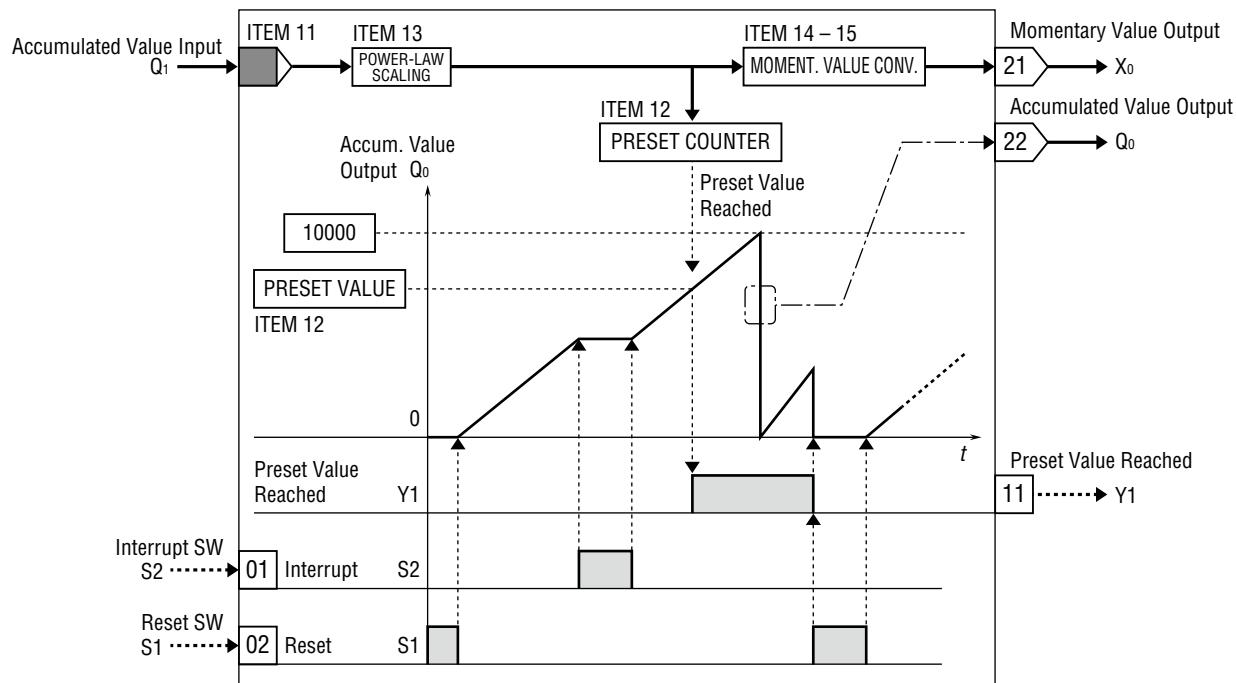
S1 is set to '1' at default setting.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0.00 – 115.00 %	21: NNN.NN	X0 Momentary value output
04	▲	0 – 9999	22: NNNN	Q0 Accumulated value output
05	▲	0, 1	S1: N	S1 Reset SW (1: reset)
★ 10	▲ 46	MD: 46		<b>PULSE/ANALOG MULTIPLICATION (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	Q1 connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>1321</u>	X1 connection terminal (error if not connected)
★ 13	▲	1, 0, -1, -2, -3	PD: <u>-1</u>	Q1 power-law scaling (10 <sup>X</sup> X = 1: x10, 0: x1, -1: x0.1, -2: x0.01, -3:x0.001)
★ 14	▲	0.000 – 32.000	K1: NN.NNN	K1 Gain
★ 15	▲	±115.00 %	A1: NNN.NN	A1 Bias
★ 16	▲	0.00 – 10000.00	VC: <u>1000.00</u>	Momentary value conversion factor or scaling rate (number of pulses per second at 100% momentary value input)
★ 17	▲	1 – 16	VR: <u>1</u>	Sample number for moving average in momentary value conversion

MODEL NO. 47	BLOCK NAME <b>Pulse Accumulator</b>	MODEL NO. 47
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ABBR: QSS



### General Description

Preset counter for accumulated value input with single stage.

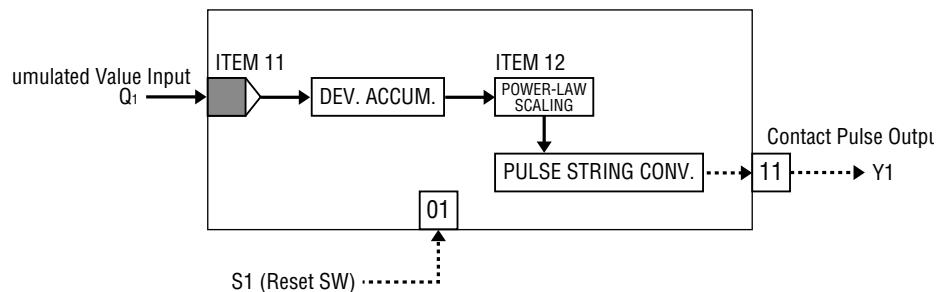
- No accumulation while Interrupt SW S2 is set to '1'.
- When Reset SW S1 is set to '1', counter value returns to zero, and 'Preset Value Reached' Output Y1 is turned to '0'.
- Accumulated Value Output  $Q_0$  returns to 0 count at 10000 counts. Fractions are then added.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0.00 – 115.00 %	21: NNN.NN	$X_0$ Momentary value output
04	▲	0 – 9999	22: NNNN	$Q_0$ Accumulated value output (When $Q_0$ is connected to analog input terminal of other function block, 9999 count becomes 99.99)
05	▲	0, 1	S1: N	S1 Reset SW (1: reset)
06	▲	0, 1	S2: N	S2 Interrupt SW (1: interrupt)
07	▲	0, 1	Y1: N	Y1 Preset value reached output
★ 10	▲ 47	MD: 47		<b>PULSE ACCUMULATOR (model)</b> '-' to clear.
★ 11	▲ GGNN	1#: 1221		$Q_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲ 0 – 9999	PS: NNNN		PS Preset value
★ 13	▲ 1, 0, -1, -2, -3	PD: -1		$Q_1$ power-law scaling ( $10^X$ X = 1: x10, 0: x1, -1: x0.1, -2: x0.01, -3: x0.001)
★ 14	▲ 0.00 – 10000.00	VC: 1000.00		Momentary value conversion parameter or scaling rate (number of pulses per second at 100% momentary value input)
★ 15	▲ 1 – 16	VR: 1		Sample number for moving average in momentary value conversion

MODEL NO.	BLOCK NAME	MODEL NO.
48	Pulse Input / Discrete Contact Output	48

ABBR: QPO

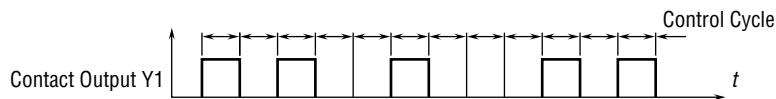


### General Description

Used to convert accumulated value input into contact pulses. Send the converted signals to Sequential Control Program block to output to a specific location.

### Operation

Pulse count added since last computation cycle is accumulated.  
Contact is turned on and off until the accumulated value reaches '0'.  
With Reset SW input, the input is stored in memory until next cycle.



- Minimum pulse cycle is twice as wide as the computation cycle (GROUP 00, ITEM 11). For example, with the cycle set to 0.5 second, 1 pulse/second is the fastest cycle.
- Change 'Power-Law Scaling' setting so that the accumulated difference is to be cleared with the maximum pulse rate.
- The internal counter is reset when Reset SW S1 is turned to '1'. S1 is set to '1' at default setting.

### Remark

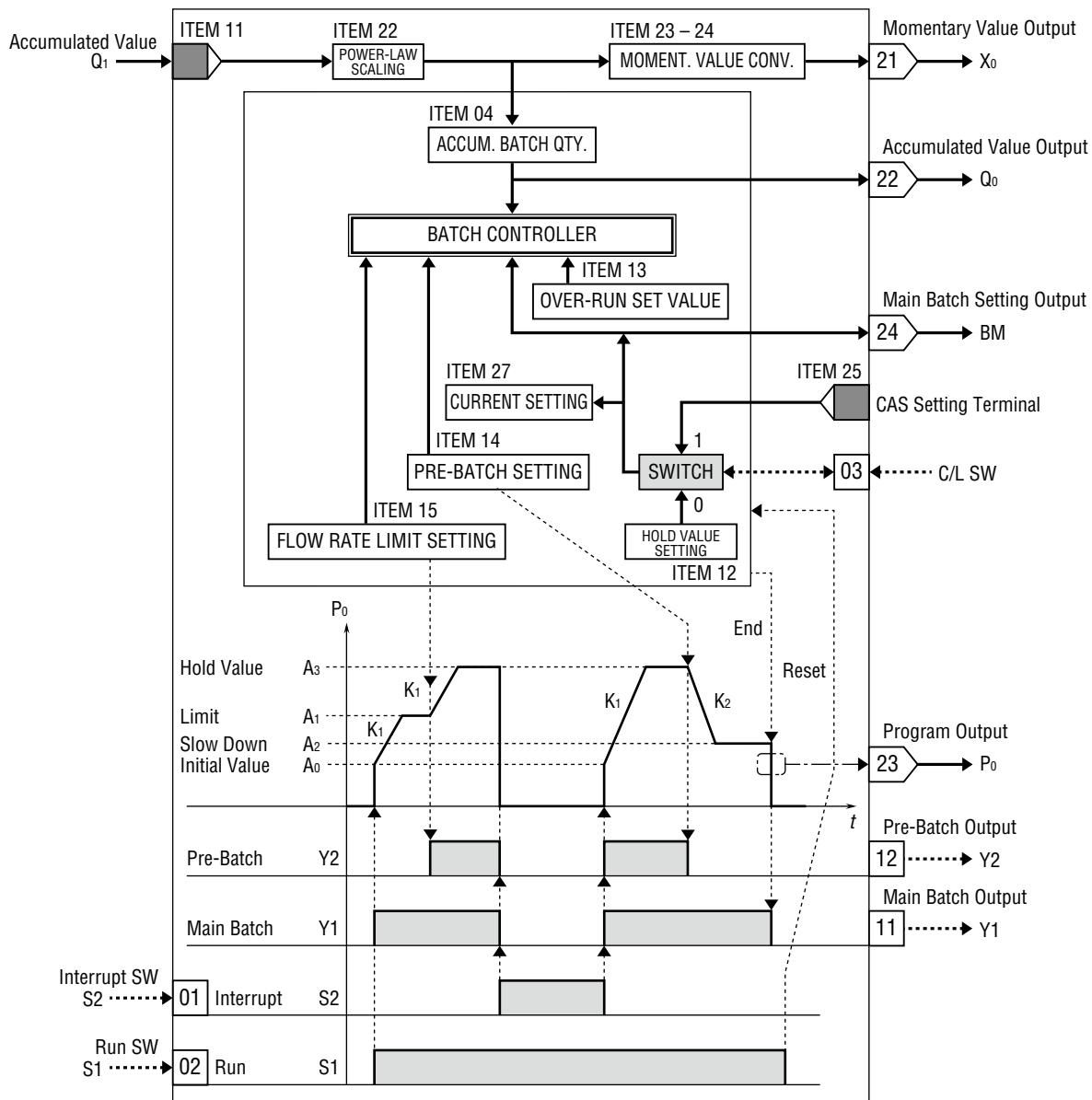
The maximum pulse count is limited to 9999.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0, 1	S1: N	S1 Reset SW (0: count, 1: reset)
04	▲	0, 1	Y1: N	Y1 Accumulated pulse output
★ 10	▲	48	MD: 48	<b>PULSE INPUT / DISCRETE CONTACT OUTPUT (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 0131	Q1 connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	0, -1, -2, -3	PD: -2	Q1 power-law scaling ( $10^x$ X = 0: x1, -1: x0.1, -2: x0.01, -3: x0.001)

MODEL NO. 49	BLOCK NAME <b>Batch Program</b>	MODEL NO. 49
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ABBR: BPS



### General Description

Two-stage batch programming is available. Pre-batch and main batch settings control contact and analog outputs.

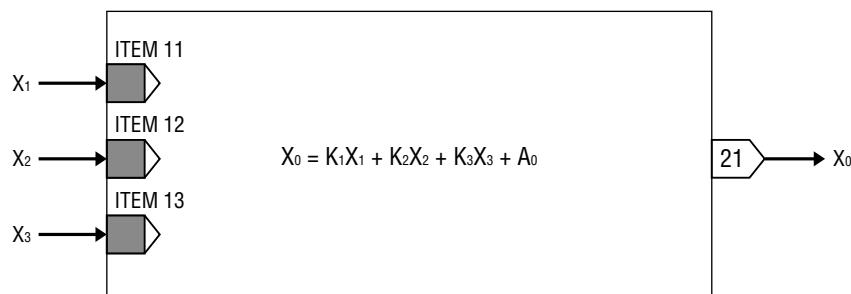
- The main batch and CAS settings cannot be changed after measuring operation has been started.
- When Interrupt SW S2 is turned on, the discrete output is turned off and the analog output approaches 0% in a ramp rate  $K_2$ . When the SW is off, it returns to Hold Value  $A_3$  in a ramp rate  $K_1$ .
- The Run SW S1 must be turned off to restart.
- For the pre-batch setting, set a count number to be subtracted from the main batch setting.
- Accumulated value output and main batch output are reset with Run SW turned off.

**GROUP [62 – 69]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0.00 – 115.00 %	21: NNN.NN	X <sub>0</sub> Momentary value output
04	▲	0 – 9999	22: NNNN	Q <sub>0</sub> Accumulated value output
05	▲	-15.00 – 115.00 %	23: NNN.NN	P <sub>0</sub> Program output
06	▲	0, 1	S1: N	S1 Run SW (0: reset, 1: run)
07	▲	0, 1	S2: N	S2 Interrupt SW (1: interrupt)
08	▲	0, 1	Y1: N	Y1 Main batch output
09	▲	0, 1	Y2: N	Y2 Pre-batch output
★ 10	▲ 49	MD: 49		<b>BATCH PROGRAM (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	Q: connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0 – 9999	BM: NNNN	BM Main batch setting output
◆ ★ 13	▲	0 – 9999	BO: NNNN	BO Overrun value (to be subtracted from BM)
◆ ★ 14	▲	0 – 9999	BP: NNNN	BP Pre-batch (to be subtracted from BM)
◆ ★ 15	▲	0 – 9999	BI: NNNN	BI Flow rate limit
◆ ★ 16	▲	0.00 – 115.00 %	A0: NNN.NN	A <sub>0</sub> Initial value (momentary value)
◆ ★ 17	▲	0.00 – 115.00 %	A1: NNN.NN	A <sub>1</sub> Flow rate limit (momentary value)
◆ ★ 18	▲	0.00 – 115.00 %	A2: NNN.NN	A <sub>2</sub> Slow-down value (momentary value)
◆ ★ 19	▲	0.00 – 115.00 %	A3: NNN.NN	A <sub>3</sub> Hold value (momentary value)
◆ ★ 20	▲	0.00 – 100.00 %/s	K1: NNN.NN	K <sub>1</sub> Up-ramp rate
◆ ★ 21	▲	0.00 – 100.00 %/s	K2: NNN.NN	K <sub>2</sub> Down-ramp rate
★ 22	▲	1, 0, -1, -2, -3	PD: -1	Q <sub>1</sub> power-law scaling (10 <sup>X</sup> X = 1: x10, 0: x1, -1: x0.1, -2: x0.01, -3: x0.001)
★ 23	▲	0.00 – 10000.00	XC: <u>1000.00</u>	Momentary value conversion parameter or scaling rate (number of pulses per second at 100% momentary value input)
★ 24	▲	1 – 16	XP: 1	Sample number for moving average in momentary value conversion
★ 25	▲	GGNN	C#: <u>1221</u>	CAS connection terminal GG: Group No. NN: terminal No.
◆ 26	▲	0, 1	O3: N	C/L SW (0: local, 1: cascade)
27	IND		SP: NNNN	Current SP (0 – 9999, in actual engineering unit)

MODEL NO.	BLOCK NAME	MODEL NO.
51	Addition / Subtraction	51

ABBR: ADS

**General Description:** Addition by 3 inputs.**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

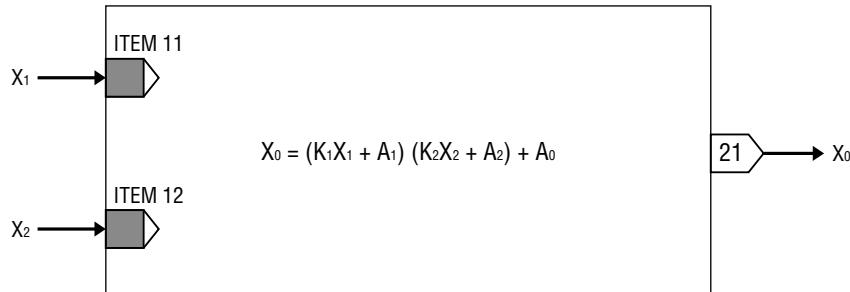
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	approx. ±327 %	21: NNN.NN	$X_0$ Output
07	▲	approx. ±327 %	X1: NNN.NN	$X_1$ Input
08	▲	approx. ±327 %	X2: NNN.NN	$X_2$ Input
09	▲	approx. ±327 %	X3: NNN.NN	$X_3$ Input
★ 10	▲	51	MD: 51	<b>ADDITION / SUBTRACTION (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X1 connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>2221</u>	$X_2$ connection terminal (no connection allowed)
★ 13	▲	GGNN	3#: <u>2321</u>	$X_3$ connection terminal (no connection allowed)
◆ ★ 14	▲	±10.000	K1: NN.NNN	$K_1$ Gain
◆ ★ 15	▲	±10.000	K2: NN.NNN	$K_2$ Gain
◆ ★ 16	▲	±10.000	K3: NN.NNN	$K_3$ Gain
◆ ★ 17	▲	±115.00 %	A0: <u>1.50</u>	$A_0$ Bias

Remark 1: Internal calculation employs 4-digit binary computation.

Remark 2: The block accepts input ranging from -327.68 through +327.67% (maximum range available for 2-digit binary computation). When the input value goes above or below this range, the output remains -327.68% or +327.67% and ITEM 02 indicates '11', error status.

MODEL NO.	BLOCK NAME	MODEL NO.
52	Multiplication	52

ABBR: MLT



**General Description:** Multiplication by 2 inputs.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

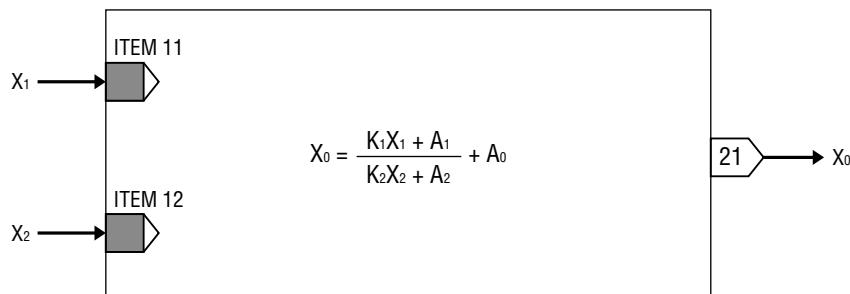
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	approx. ±327 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	approx. ±327 %	X1: NNN.NN	X <sub>1</sub> Input
08	▲	approx. ±327 %	X2: NNN.NN	X <sub>2</sub> Input
★ 10	▲	52	MD: 52	<b>MULTIPLICATION (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: 2221	X <sub>2</sub> connection terminal (no connection allowed)
◆ ★ 13	▲	±10.000	K1: NN.NNN	K <sub>1</sub> Gain
◆ ★ 14	▲	±10.000	K2: NN.NNN	K <sub>2</sub> Gain
◆ ★ 15	▲	±115.00 %	A0: 1.50	A <sub>0</sub> Bias
◆ ★ 16	▲	±115.00 %	A1: 1.50	A <sub>1</sub> Bias
◆ ★ 17	▲	±115.00 %	A2: 1.50	A <sub>2</sub> Bias

Remark 1: Internal calculation employs 4-digit binary computation.

Remark 2: The block accepts input ranging from -327.68 through +327.67% (maximum range available for 2-digit binary computation). When the input value goes above or below this range, the output remains -327.68% or +327.67% and ITEM 02 indicates ‘11’, error status.

MODEL NO.	BLOCK NAME	MODEL NO.
53	Division	53

ABBR: DVD



**General Description:** Division by 2 inputs.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

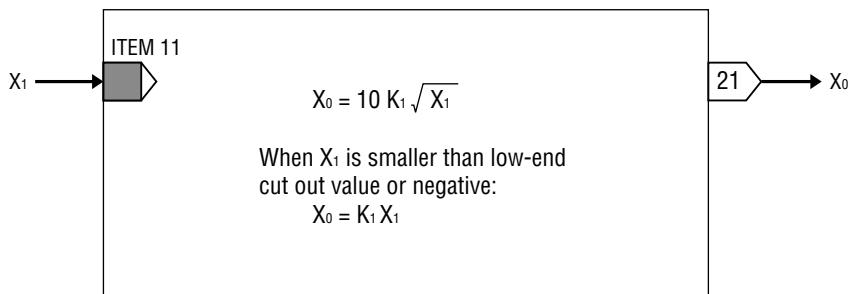
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	approx. ±327 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	approx. ±327 %	X1: NNN.NN	X <sub>1</sub> Input
08	▲	approx. ±327 %	X2: NNN.NN	X <sub>2</sub> Input
★ 10	▲	53	MD: <u>53</u>	DIVISION (model) ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>2221</u>	X <sub>2</sub> connection terminal (no connection allowed)
◆★ 13	▲	±10.000	K1: NN.NNN	K <sub>1</sub> Gain
◆★ 14	▲	±10.000	K2: NN.NNN	K <sub>2</sub> Gain
◆★ 15	▲	±115.00 %	A0: <u>1.50</u>	A <sub>0</sub> Bias
◆★ 16	▲	±115.00 %	A1: <u>1.50</u>	A <sub>1</sub> Bias
◆★ 17	▲	±115.00 %	A2: <u>1.50</u>	A <sub>2</sub> Bias

Remark 1: Internal calculation employs 4-digit binary computation.

Remark 2: The block accepts input ranging from -327.68 through +327.67% (maximum range available for 2-digit binary computation). When the input value goes above or below this range, the output remains -327.68% or +327.67% and ITEM 02 indicates '11', error status.

MODEL NO.	BLOCK NAME	MODEL NO.
54	Square Root Extractor	54

ABBR: SQR



### General Description

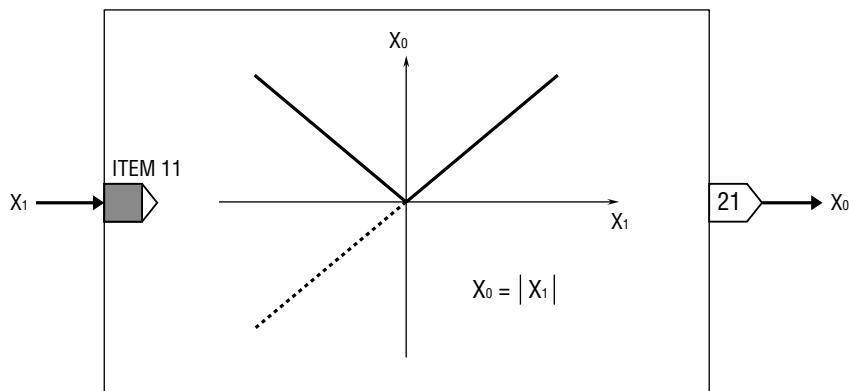
In order to extract square signal for a DP flowmeter, set  $K_1 = 1$ .  
If you need to change signal span, change  $K_1$  value.

**GROUP [30 – 61]** ◆: Automatically changeable parameters    ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲ 54		MD: 54	<b>SQUARE ROOT EXTRACTOR (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No.    NN: terminal No.
◆★ 12	▲	±10.000	K1: NN.NNN	K <sub>1</sub> Gain
◆★ 13	▲	0.00 – 115.00 %	A1: NNN.NN	A <sub>1</sub> Input low-end cutout setting

MODEL NO.	BLOCK NAME	MODEL NO.
55	Absolute Value	55

ABBR: ABS



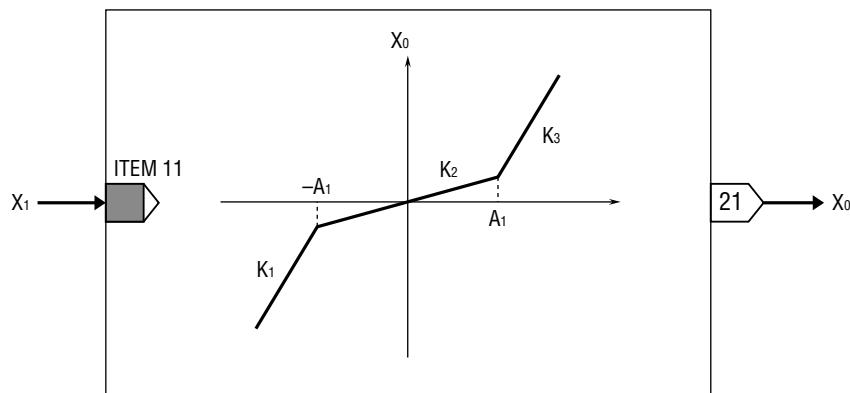
**General Description:** Used to output the absolute value of input signal.

**GROUP [30 – 61] ★: Setting data**

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0.00 – 115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	55	MD: 55	<b>ABSOLUTE VALUE (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.

MODEL NO.	BLOCK NAME	MODEL NO.
56	Non-Linear Gain, Deadband	56

ABBR: NLN



### General Description

Typical application is a non-linear PID control. The output is connected to the input compensation terminal of the PID module in substitution method.

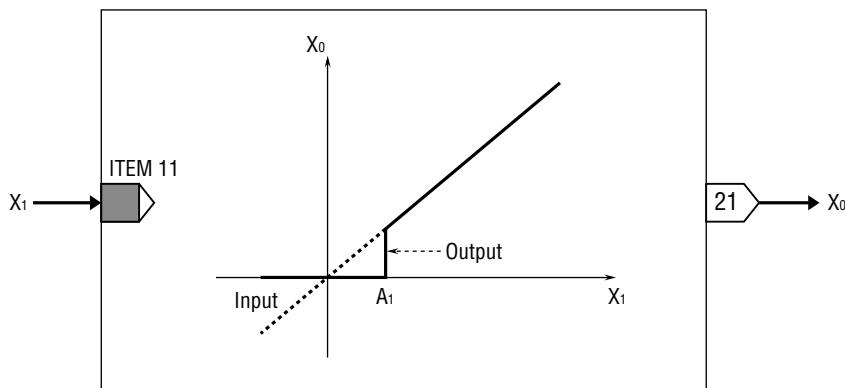
With  $K_2 = 0$ , deadband computation is available.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲ 56		MD: <u>56</u>	<b>NON-LINEAR GAIN, DEADBAND (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	±10.000	K1: NN.NNN	K <sub>1</sub> Gain
◆ ★ 13	▲	±10.000	K2: NN.NNN	K <sub>2</sub> Gain
◆ ★ 14	▲	±10.000	K3: NN.NNN	K <sub>3</sub> Gain
◆ ★ 15	▲	0.00 – 115.00 %	A1: 1.50	A <sub>1</sub> Segment point

MODEL NO.	BLOCK NAME	MODEL NO.
57	Low-end Cutout	57

ABBR: DRP



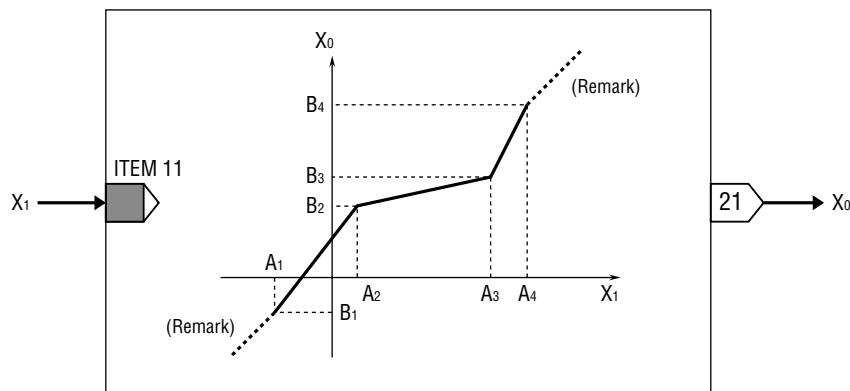
**General Description:** Used to forcibly output 0% when input signal goes below a setpoint.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	57	MD: 57	<b>LOW-END CUTOUT (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0.00 – 115.00 %	A1: NNN.NN	A1 Low-end cutout setting

MODEL NO.	BLOCK NAME	MODEL NO.
58	Segment Linearizer	58

ABBR: LIN



### General Description

The output is approximated with 16 segments. **SC 1.40**

The output is approximated with 7 segments with SC Ver 1.40 or earlier.

Both input and output signals are operational from -115% through +115%. If you need more number of segments, connect two or more Linearizer modules in series. Set only necessary number of segment points and leave others blank.

Remark: Output range out of segment point setting is provided in a 45-degree incline (input gain = output gain).

$A_1 < A_2 < A_3 < A_4 < A_5 < A_6 < A_7 < \dots < A_{16} < A_{17}$

**GROUP [72 – 79]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲	58	MD: 58	<b>SEGMENT LINEARIZER (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 21	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> Input 1
◆★ 22	▲	±115.00 %	B1: NNN.NN	B <sub>1</sub> Output 1
◆★ 23	▲	±115.00 %	A2: NNN.NN	A <sub>2</sub> Input 2
◆★ 24	▲	±115.00 %	B2: NNN.NN	B <sub>2</sub> Output 2
◆★ 25	▲	±115.00 %	A3: NNN.NN	A <sub>3</sub> Input 3
◆★ 26	▲	±115.00 %	B3: NNN.NN	B <sub>3</sub> Output 3
◆★ 27	▲	±115.00 %	A4: NNN.NN	A <sub>4</sub> Input 4
◆★ 28	▲	±115.00 %	B4: NNN.NN	B <sub>4</sub> Output 4
◆★ 29	▲	±115.00 %	A5: NNN.NN	A <sub>5</sub> Input 5
◆★ 30	▲	±115.00 %	B5: NNN.NN	B <sub>5</sub> Output 5
◆★ 31	▲	±115.00 %	A6: NNN.NN	A <sub>6</sub> Input 6
◆★ 32	▲	±115.00 %	B6: NNN.NN	B <sub>6</sub> Output 6
◆★ 33	▲	±115.00 %	A7: NNN.NN	A <sub>7</sub> Input 7
◆★ 34	▲	±115.00 %	B7: NNN.NN	B <sub>7</sub> Output 7
◆★ 35	▲	±115.00 %	A8: NNN.NN	A <sub>8</sub> Input 8
◆★ 36	▲	±115.00 %	B8: NNN.NN	B <sub>8</sub> Output 8

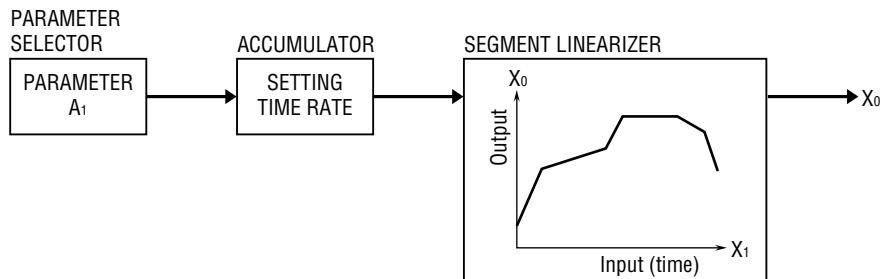
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
◆ ★ 37	▲	±115.00 %	A9: NNN.NN	A <sub>9</sub> Input 9 <b>SC 1.40</b>
◆ ★ 38	▲	±115.00 %	B9: NNN.NN	B <sub>9</sub> Output 9 <b>SC 1.40</b>
◆ ★ 39	▲	±115.00 %	A10: NNN.NN	A <sub>10</sub> Input 10 <b>SC 1.40</b>
◆ ★ 40	▲	±115.00 %	B10: NNN.NN	B <sub>10</sub> Output 10 <b>SC 1.40</b>
◆ ★ 41	▲	±115.00 %	A11: NNN.NN	A <sub>11</sub> Input 11 <b>SC 1.40</b>
◆ ★ 42	▲	±115.00 %	B11: NNN.NN	B <sub>11</sub> Output 11 <b>SC 1.40</b>
◆ ★ 43	▲	±115.00 %	A12: NNN.NN	A <sub>12</sub> Input 12 <b>SC 1.40</b>
◆ ★ 44	▲	±115.00 %	B12: NNN.NN	B <sub>12</sub> Output 12 <b>SC 1.40</b>
◆ ★ 45	▲	±115.00 %	A13: NNN.NN	A <sub>13</sub> Input 13 <b>SC 1.40</b>
◆ ★ 46	▲	±115.00 %	B13: NNN.NN	B <sub>13</sub> Output 13 <b>SC 1.40</b>
◆ ★ 47	▲	±115.00 %	A14: NNN.NN	A <sub>14</sub> Input 14 <b>SC 1.40</b>
◆ ★ 48	▲	±115.00 %	B14: NNN.NN	B <sub>14</sub> Output 14 <b>SC 1.40</b>
◆ ★ 49	▲	±115.00 %	A15: NNN.NN	A <sub>15</sub> Input 15 <b>SC 1.40</b>
◆ ★ 50	▲	±115.00 %	B15: NNN.NN	B <sub>15</sub> Output 15 <b>SC 1.40</b>
◆ ★ 51	▲	±115.00 %	A16: NNN.NN	A <sub>16</sub> Input 16 <b>SC 1.40</b>
◆ ★ 52	▲	±115.00 %	B16: NNN.NN	B <sub>16</sub> Output 16 <b>SC 1.40</b>
◆ ★ 53	▲	±115.00 %	A17: NNN.NN	A <sub>17</sub> Input 17 <b>SC 1.40</b>
◆ ★ 54	▲	±115.00 %	B17: NNN.NN	B <sub>17</sub> Output 17 <b>SC 1.40</b>

### ■ Ramp Program Utilizing Segment Linearizer

When the Segment Linearizer and Accumulator blocks are combined as shown in the figure below, a ramp program can be realized.

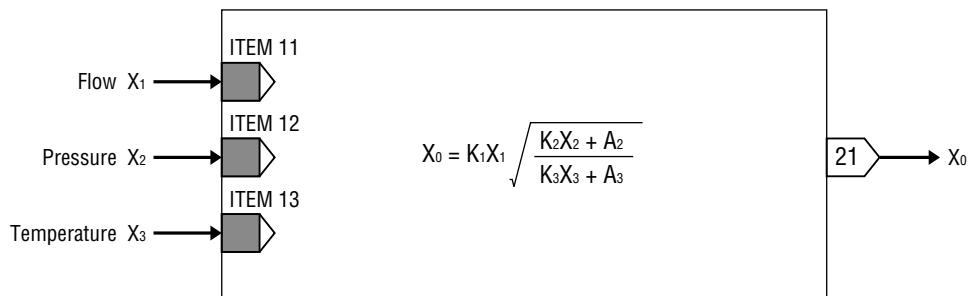
If there are not enough calibration points in one Linearizer block, connect multiple Linearizer blocks in series.

Interrupt SW S2 in Accumulator block stops time signal.



MODEL NO.	BLOCK NAME	MODEL NO.
59	Temperature/Pressure Compensation	59

ABBR: TCP



### General Description

Used to execute temperature/pressure compensation for a gaseous flow. The flow signal  $X_1$  must be linearized by Square Root Extractor before input.

Refer to the Function Block Application Manual to calculate gains and biases utilizing a normalization equation.

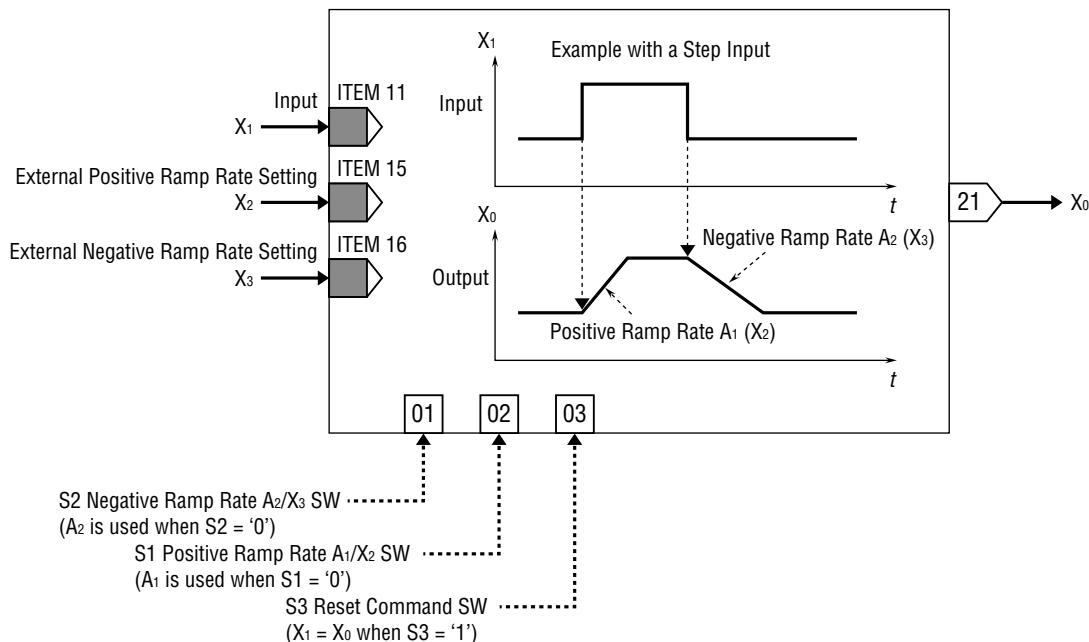
**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Flow input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Pressure input
09	▲	±115.00 %	X3: NNN.NN	$X_3$ Temperature input
★ 10	▲	59	MD: 59	<b>TEMPERATURE/PRESSURE COMPENSATION (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	$X_1$ Flow connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>2221</u>	$X_2$ Pressure connection terminal (Remark 1)
★ 13	▲	GGNN	3#: <u>2321</u>	$X_3$ Temperature connection terminal (Remark 1)
◆★ 14	▲	±10.000	K1: NN.NNN	K <sub>1</sub> Gain
◆★ 15	▲	±10.000	K2: NN.NNN	K <sub>2</sub> Gain
◆★ 16	▲	±10.000	K3: NN.NNN	K <sub>3</sub> Gain
◆★ 17	▲	±115.00 %	A2: <u>1.50</u>	A <sub>2</sub> Bias
◆★ 18	▲	±115.00 %	A3: <u>1.50</u>	A <sub>3</sub> Bias

Remark 1: When you need only either of pressure or temperature compensation, set '0000' to unused connection terminal and '100' % to unused bias (A<sub>2</sub> or A<sub>3</sub>).

MODEL NO. 17	BLOCK NAME <b>Rate of Change Limit</b> <span style="background-color: #cccccc; border: 1px solid black; padding: 0 2px;">SC 1.50</span>	MODEL NO. 17
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ABBR: RCL



### General Description

Used to limit input signal change within a negative ramp rate and a positive ramp rate.

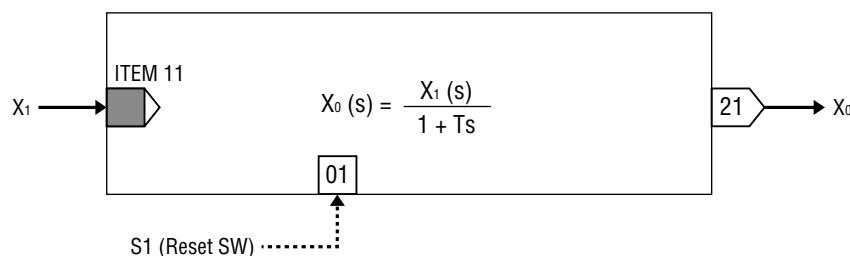
- When the input change rate is slower than the setting, the block outputs the same value as the input.
- With the ramp rate set to "0",  $X_1$  equals  $X_0$ .
- When  $X_2$  or  $X_3$  is not connected, parameters  $A_1$  or  $A_2$  is used.
- For the negative ramp rate  $A_2$  or the external negative ramp rate  $X_3$ , set an absolute value (positive signal). If a negative signal is provided,  $X_1$  equals  $X_0$ .

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	-15.00 – 115.00 %	X1: NNN.NN	$X_1$ Input
05	▲	0.00 – 115.00 %/C	X2: NNN.NN	$X_2$ External positive ramp rate
06	▲	0.00 – 115.00 %/C	X3: NNN.NN	$X_3$ External negative ramp rate
07	▲	0, 1	S1: N	S1 Positive ramp rate $A_1$ / $X_2$ SW
08	▲	0, 1	S2: N	S2 Negative ramp rate $A_2$ / $X_3$ SW
09	▲	0, 1	S3: N	S3 Reset command SW (1: reset)
★ 10	▲	17	MD: 17	<b>RATE OF CHANGE LIMIT (model)</b> '–' to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	0.00 – 115.00 %/C	A1: 3.50	$A_1$ Positive ramp rate
◆★ 13	▲	0.00 – 115.00 %/C	A2: 3.50	$A_2$ Negative ramp rate
★ 14	▲	0, 1	C: N	C Time unit (0: sec, 1: min)
★ 15	▲	GGNN	2#: 2221	$X_2$ connection terminal (no connection allowed)
★ 16	▲	GGNN	3#: 2321	$X_3$ connection terminal (no connection allowed)

MODEL NO.	BLOCK NAME	MODEL NO.
60	First Order Lag	60

ABBR: LAG



### General Description

Used to reduce unwanted pulsation in an input signal.

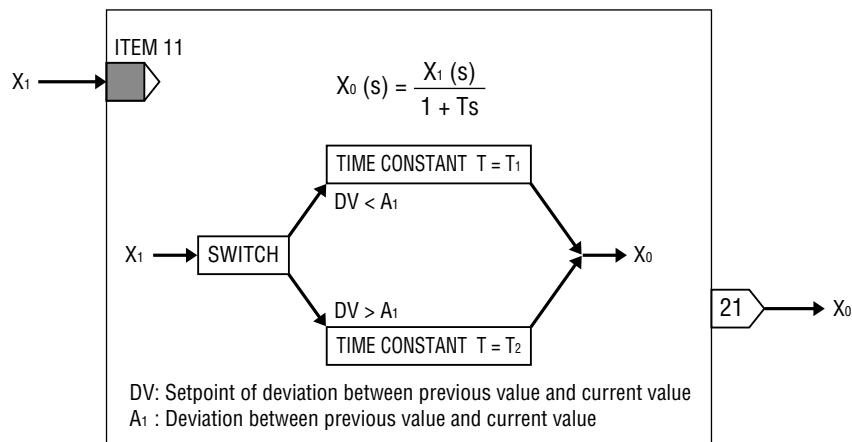
When Reset SW S1 is "1", the output signal equals input.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲	60	MD: 60	<b>FIRST ORDER LAG (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	0.0 – 100.0 s	T: NNN.N	T Time constant (0.0: no lag)

MODEL NO.	BLOCK NAME	MODEL NO.
61	First Order Lag with Two Time Constants	61

ABBR: 2LG



### General Description

Used to reduce unwanted pulsation in an input signal.

With a large input change, the output signal tracks quickly; while with a small change, the larger filter function is selected.

### Principle

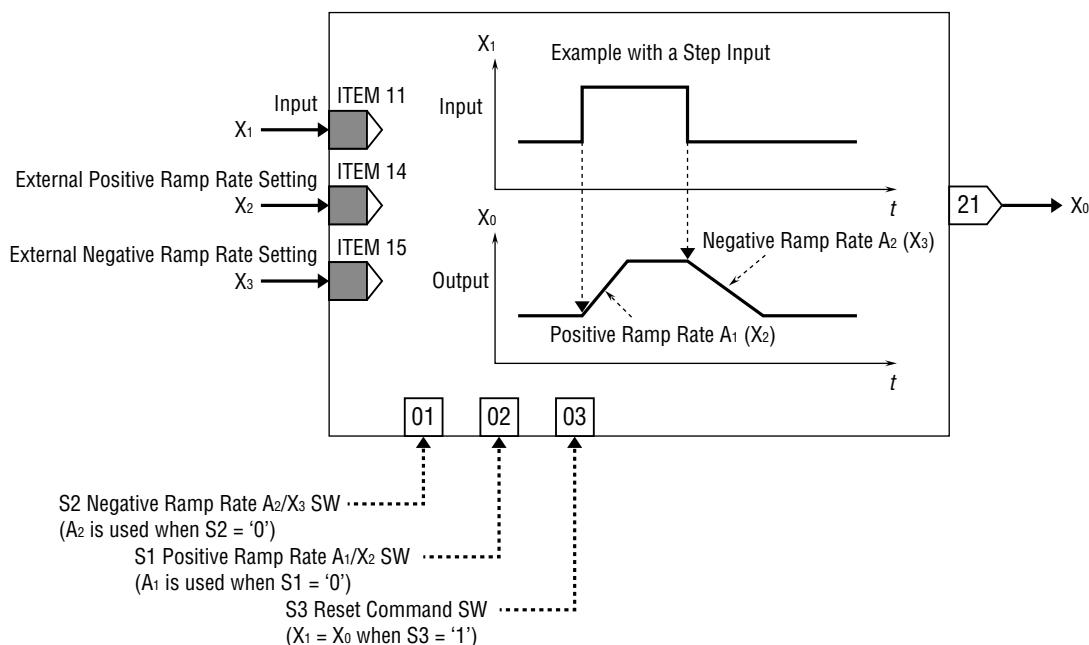
The module compares an input sample from the last one. When the difference  $A_1$  is smaller than the reference deviation setting DV, it chooses large time constant for sufficient buffer function. When the  $A_1$  is larger than the DV, it chooses small time constant for better response time.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	61	MD: 61	<b>FIRST ORDER LAG with Two Time Constants (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	0.0 – 100.0 s	T1: NNN.N	$T_1$ Time constant used with larger deviation (0.0: no lag)
◆★ 13	▲	0.00 – 115.00 %	DV: NNN.NN	DV Deviation
◆★ 14	▲	0.0 – 100.0 s	T2: NNN.N	$T_2$ Time constant used with smaller deviation (0.0: no lag)

MODEL NO. 62	BLOCK NAME <b>Ramp Buffer</b>	MODEL NO. 62
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ABBR: RMP



### General Description

Used to limit input signal change within a negative ramp rate and a positive ramp rate.

- When the input change rate is slower than the setting, the block outputs the same value as the input.
- With the ramp rate set to "0",  $X_1$  equals  $X_0$ .
- When  $X_2$  or  $X_3$  is not connected, parameters  $A_1$  or  $A_2$  is used.
- For the negative ramp rate  $A_2$  or the external negative ramp rate  $X_3$ , set an absolute value (positive signal). If a negative signal is provided,  $X_1$  equals  $X_0$ .

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	-15.00 – 115.00 %	X1: NNN.NN	$X_1$ Input
05	▲	0.00 – 115.00 %/s	X2: NNN.NN	$X_2$ External positive ramp rate
06	▲	0.00 – 115.00 %/s	X3: NNN.NN	$X_3$ External negative ramp rate
07	▲	0, 1	S1: N	S1 Positive ramp rate $A_1$ / $X_2$ SW
08	▲	0, 1	S2: N	S2 Negative ramp rate $A_2$ / $X_3$ SW
09	▲	0, 1	S3: N	S3 Reset command SW (1: reset)
★ 10	▲	62	MD: 62	<b>RAMP BUFFER (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	0.00 – 115.00 %/s	A1: 3.50	$A_1$ Positive ramp rate
◆★ 13	▲	0.00 – 115.00 %/s	A2: 3.50	$A_2$ Negative ramp rate
★ 14	▲	GGNN	2#: 2221	$X_2$ connection terminal (no connection allowed)
★ 15	▲	GGNN	3#: 2321	$X_3$ connection terminal (no connection allowed)

MODEL NO.	BLOCK NAME	MODEL NO.
63	Mean Average	63

ABBR: MAJ



### General Description

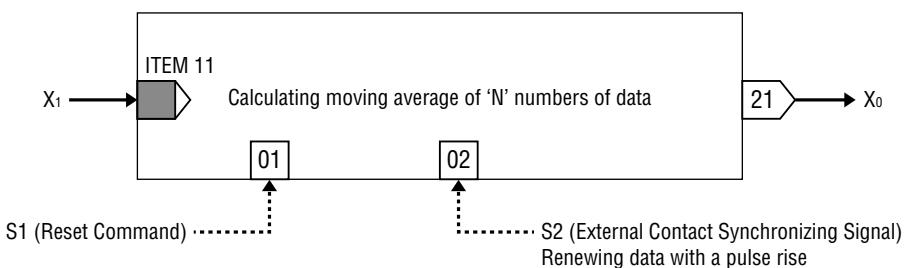
With N numbers of samples, the block discards U numbers of largest ones and L number of smallest ones, then outputs proportionally to the average of the rest.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
★ 10	▲	63	MD: <u>63</u>	<b>MEAN AVERAGE (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0.5 – 115.0 s	H: <u>0.5</u>	H Sampling cycle (min. 0.5 sec. increments)
◆ ★ 13	▲	1 – 8	N: <u>8</u>	N Number of samples to be calculated
◆ ★ 14	▲	0 – 7	U: <u>2</u>	U Number of largest samples to be discarded
◆ ★ 15	▲	0 – 7	L: <u>2</u>	L Number of smallest samples to be discarded

MODEL NO. <b>64</b>	BLOCK NAME <b>Moving Average</b>	MODEL NO. <b>64</b>
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ABBR: RAV



### General Description

With N numbers of samples, the block outputs proportionally to their average. When a new sample is added, it rejects the oldest sample and recalculates.

- Three sampling modes are available: (1) 0: time, (2) 1: computation cycle, and (3) 2: synchronized to external contact.
- With Reset SW S1 = 1, the output is equal to the input.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
05	▲	0, 1	S2: N	S2 External synchronization contact signal
★ 10	▲	<b>64</b>	<b>MD: 64</b>	<b>MOVING AVERAGE (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0.1 – 115.0 s	H: <u>0.5</u>	H Sampling cycle (min. 0.1 sec. increments) <b>SC 1.40</b> (Remark 1)
◆ ★ 13	▲	1 – 32	N: <u>8</u>	N Number of samples to be calculated <b>SC 1.40</b> (Remark 2)
★ 14	▲	0, 1, 2	SM: <u>2</u>	SM Sampling mode (0: time, 1: computation cycle, 2: synchronized to external contact)
★ 15	▲	0, 1	CM: <u>0</u>	CM Calculation mode <b>SC 1.40</b> (0: simple average, 1: true sample average)

Remark 1: Range 0.5 – 115.0 sec., min. 0.5 sec. increments for versions lower than SC Ver 1.40.

Remark 2: Range 1 – 16 for versions lower than SC Ver 1.40.

## ■ Calculation Mode

### • Simple Average

Averaging calculation is executed always with the number of samples specified with ITEM 13 when the reset switch (S1) is turned to '0'.

#### [Example]

Number of samples to be calculated: 4

Input 50% when the S1 is at '1'

Input changed to 60%, 70% and then 80% when the S1 is at '0'

(1) Reset SW : 1

Input 50% → 

50%	50%	50%	50%
-----	-----	-----	-----

 → Output  $(50+50+50+50) \div 4 = 50\%$

(2) Reset SW : 0

Input 60% → 

60%	50%	50%	50%
-----	-----	-----	-----

 → Output  $(60+50+50+50) \div 4 = 52.5\%$

(3) Next sampling cycle

Input 70% → 

70%	60%	50%	50%
-----	-----	-----	-----

 → Output  $(70+60+50+50) \div 4 = 57.5\%$

(4) Next sampling cycle

Input 80% → 

80%	70%	60%	50%
-----	-----	-----	-----

 → Output  $(80+70+60+50) \div 4 = 65\%$

### • True Sample Average

Averaging calculation is executed always with actual number of samples when the reset switch (S1) is turned to '0'.

The result is equal to the simple average when samples reaches the number of samples specified with ITEM 13.

#### [Example]

Number of samples to be calculated: 4

Input 50% when the S1 is at '1'

Input changed to 60%, 70% and then 80% when the S1 is at '0'

(1) Reset SW : 1

Input 50% → 

50%	50%	50%	50%
-----	-----	-----	-----

 → Output  $(50+50+50+50) \div 4 = 50\%$

(2) Reset SW : 0

Input 60% → 

60%	---	---	---
-----	-----	-----	-----

 → Output  $(60) \div 1 = 60\%$

(3) Next sampling cycle

Input 70% → 

70%	60%	---	---
-----	-----	-----	-----

 → Output  $(70+60) \div 2 = 65\%$

(4) Next sampling cycle

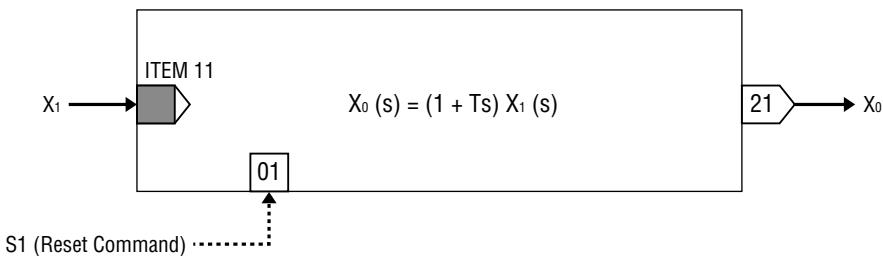
Input 80% → 

80%	70%	60%	---
-----	-----	-----	-----

 → Output  $(80+70+60) \div 3 = 70\%$

MODEL NO.	BLOCK NAME	MODEL NO.
65	Lead Time Computation	65

ABBR: LED



### General Description

This block is used to calculate lead time of control signal.

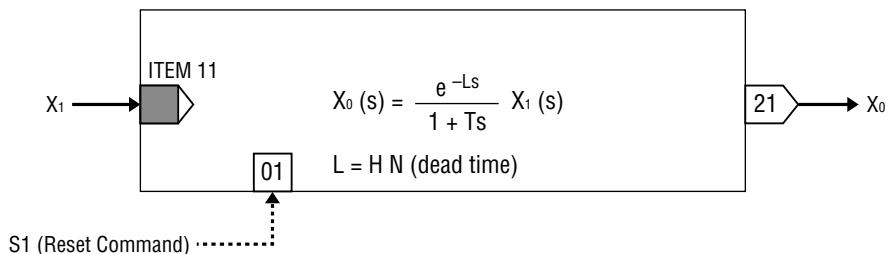
With Reset SW S1 = 1, the output is equal to the input.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X0 Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
07	▲	±115.00 %	X1: NNN.NN	X1 Input
★ 10	▲	65	MD: 65	<b>LEAD TIME COMPUTATION (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	X1 connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0.0 – 100.0 s	T: NNN.N	T Time constant (0.0: no lead)

MODEL NO.	BLOCK NAME	MODEL NO.
66	Dead Time Computation	66

ABBR: DTM



### General Description

The output is delayed by L seconds after the input. If you add lag time constant, the module calculates first order lag after the dead time.

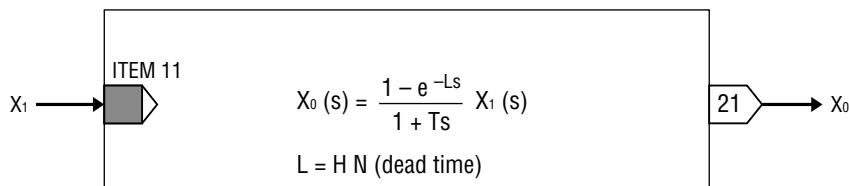
With Reset SW S1 = 1, the output is equal to the input.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲	66	MD: 66	<b>DEAD TIME COMPUTATION (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1# 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	▲	0.0 – 100.0 s	TC: NNN.N	TC Time constant (0.0: no lag)
◆ ★ 13	▲	0.5 – 115.0 s	H: 0.5	H Sampling cycle (min. 0.5 sec. increments)
◆ ★ 14	▲	0 – 8	N: 8	N Number of samples to be calculated (0: dead time = 0)

MODEL NO.	BLOCK NAME	MODEL NO.
67	Dead Time Compensation	67

ABBR: DTC



### General Description

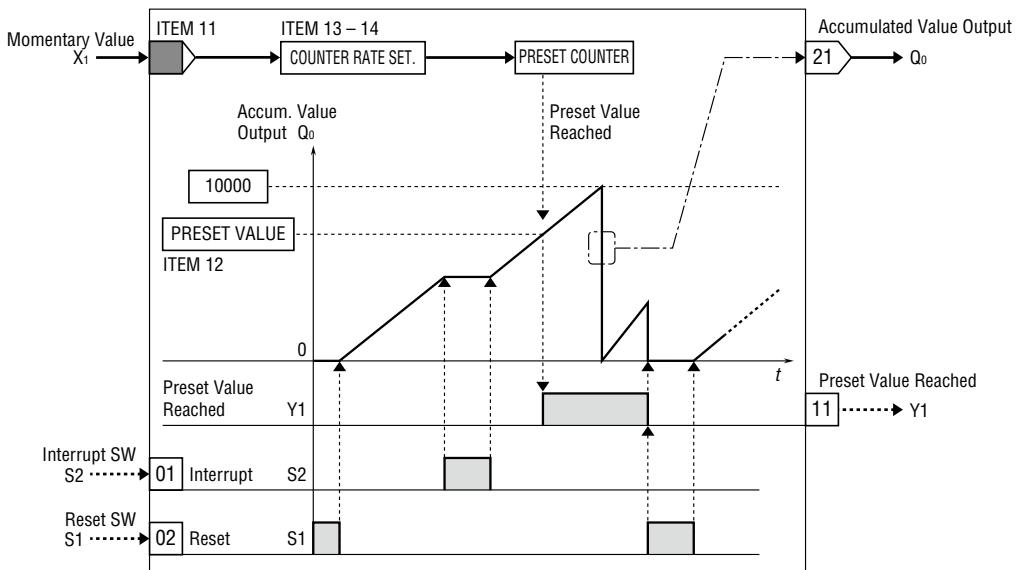
Used for Smith's dead time compensation. Typical application is for a process in which long dead time exists constantly. Refer to 'Function Block Application Manual' for the use of the block.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲ 67	MD: 67		<b>DEAD TIME COMPENSATION (model)</b> '–' to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> : connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	0.0 – 100.0 s	TC: NNN.N	TC Time constant (0.0: no lag)
◆★ 13	▲	0.5 – 115.0 s	H: 0.5	H Sampling cycle (min. 0.5 sec. increments)
◆★ 14	▲	0 – 8	N: 8	N Number of samples to be calculated (0: dead time = 0)

MODEL NO.	BLOCK NAME		MODEL NO.
68	Accumulator (momentary value input)		68

ABBR: QNT



### General Description

Used to continuously totalize analog signals and also as a preset counter.

- With Interrupt SW S2 set to '1'; the module does not count.
- With Reset SW S1 set to '1', accumulated value is reset to '0' while the Preset Value Reached Signal Y1 is turned off.
- The accumulated value output Q<sub>0</sub> returns automatically to 0 counts when the counter reaches 10000 counts. Fractions are not dropped but added.
- If the accumulated value output Q<sub>0</sub> is connected to an analog input terminal of another function block, 10000 counts are equal to 100.00%.

### Setting Example

You have a range of 0 – 150 m<sup>3</sup>/h as momentary value. You need 150 counts per hour, that is 1 count per 1 m<sup>3</sup>.

ITEM 13: 150 (counter rate K)

ITEM 14: 2 (time unit C)

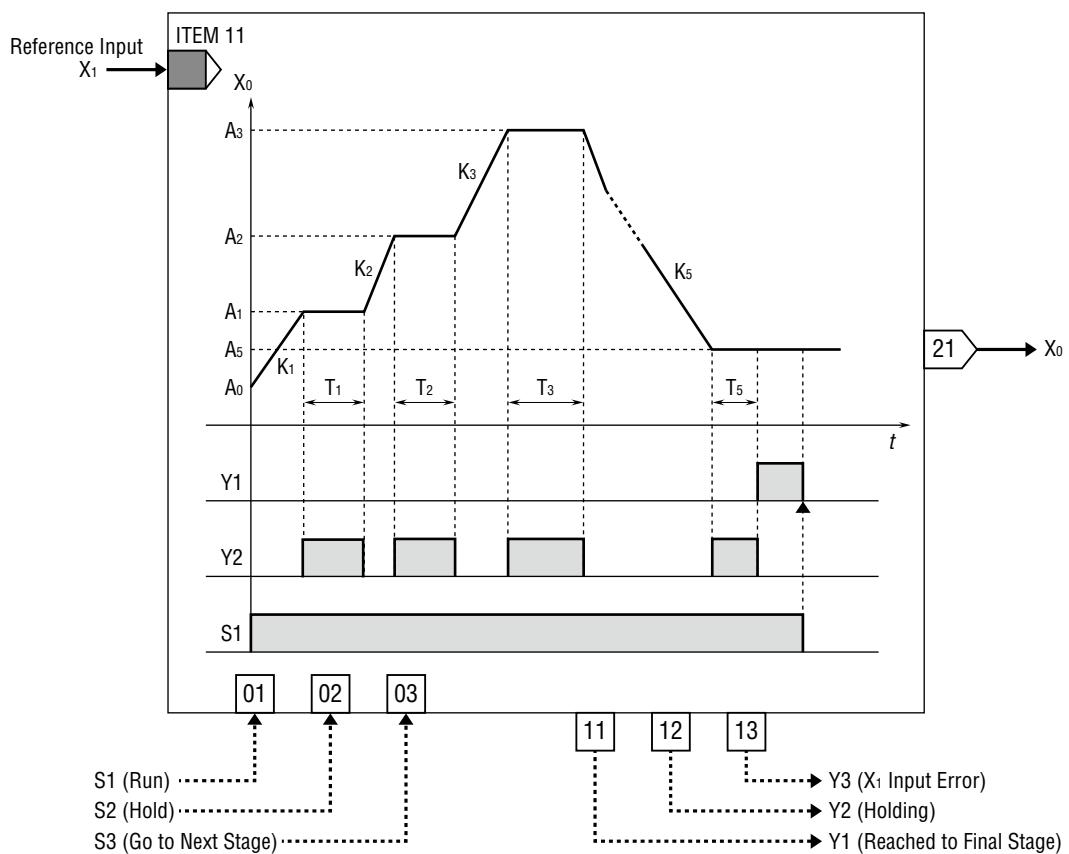
If you need 1500 counts per hour (1 count per 0.1 m<sup>3</sup>):

ITEM 13: 1500 (counter rate K)

GROUP [30 – 61]		◆: Automatically changeable parameters	★: Setting data	
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
04	▲	0.00 – 100.00	21: NNN.NN	Q <sub>0</sub> Accumulated value output (0 to 10000 counts are represented as 0.00 to 100.0%)
05	▲	0, 1	S1: N	S1 Reset SW (1: reset)
06	▲	0, 1	S2: N	S2 Interrupt SW (1: interrupt)
07	▲	0, 1	Y1: N	Y1 Preset value reached output
08	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲ 68	MD: 68		ACCUMULATOR (model) '-' to clear.
★ 11	▲ GGNN	1#: 1221		X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆ ★ 12	● 0 – 10000	PS: NNNN	PS	Preset value
★ 13	▲ 0.00 – 10000.00	K: NNNNN.NN	K	Counter rate (Set the number of counts you need the module counts with continuous 100% status for 'C' time duration [ITEM 14])
★ 14	▲ 0, 1, 2, 3	C: N	C	Time unit (0: sec, 1: min, 2: hour, 3: day)

MODEL NO.	BLOCK NAME	MODEL NO.
69	Ramp Program Setter	69

ABBR: PRG



### General Description

Ramp programming is done by setting ramp rates.

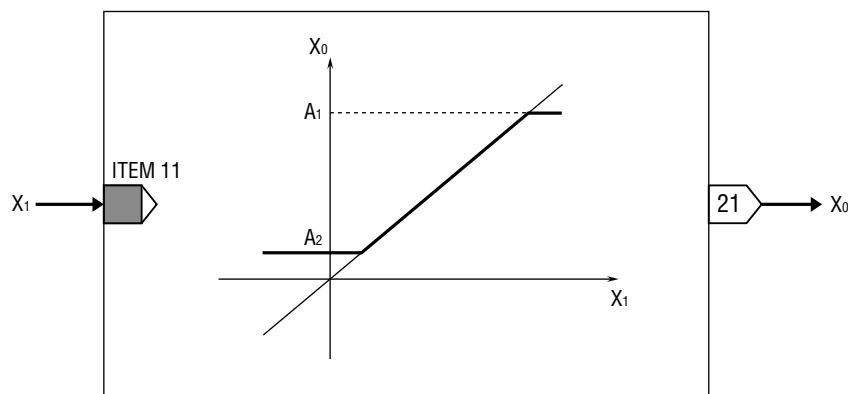
- Run SW S1 operates with '1', the program starts with reference input  $X_1$  and initial value  $A_0$ .
- Run SW S1 resets  $Y_1$ ,  $Y_2$  and  $Y_3$  with '0'. Output value  $X_0$  holds the output before reset.
- The program stops where it is when the Hold SW S2 is turned to '1'.
- The 'Hold' timer can be forcibly ended with an one-shot input of 'Go to Next Stage' SW S3.
- If you set a ramp rate  $K_n = 0$ , other parameters concerning this ramp ( $C_n$ ,  $A_n$ ,  $T_n$  and  $P_n$ ) are disregarded.
- If you do not use (do not connect) a reference input  $X_1$ , the program starts at the initial value  $A_0$  in the ramp rate  $K_1$ . If you have the  $X_1$ , it starts at the initial value  $X_1$  in the ramp rate  $K_1$ . However, if the  $K_1$  is set to a positive value and the  $X_1$  is greater than the Hold value  $A_1$ , or if the  $K_1$  is set to a negative value and the  $X_1$  is smaller than the  $A_1$ , the  $Y_3$  ( $X_1$  error status) is turned to '1' and the program does not start.

**GROUP [72 – 79]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Run SW (0: reset, 1: run)
05	▲	0, 1	S2: N	S2 Hold SW (1: hold)
06	▲	0, 1	S3: N	S3 Go to next stage SW (force-end the intermediate hold timer)
07	▲	0, 1	Y1: N	Y1 Reached to final stage
08	▲	0, 1	Y2: N	Y2 Holding
09	▲	0, 1	Y3: N	Y3 X <sub>1</sub> input error
★ 10	▲	69	MD: 69	<b>RAMP PROGRAM SETTER (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	±115.00 %	A0: NNN.NN	A <sub>0</sub> Initial value
◆★ 13	▲	±115.00 %/C1	K1: NNN.NN	K <sub>1</sub> Ramp rate
◆★ 14	▲	0, 1, 2	C1: N	C <sub>1</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 15	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> Hold value
◆★ 16	▲	0 – 1000	T1: NNNN	T <sub>1</sub> Hold time
◆★ 17	▲	0, 1, 2	P1: N	P <sub>1</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 18	▲	±115.00 %/C2	K2: NNN.NN	K <sub>2</sub> Ramp rate
◆★ 19	▲	0, 1, 2	C2: N	C <sub>2</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 20	▲	±115.00 %	A2: NNN.NN	A <sub>2</sub> Hold value
◆★ 21	▲	0 – 1000	T2: NNNN	T <sub>2</sub> Hold time
◆★ 22	▲	0, 1, 2	P2: N	P <sub>2</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 23	▲	±115.00 %/C3	K3: NNN.NN	K <sub>3</sub> Ramp rate
◆★ 24	▲	0, 1, 2	C3: N	C <sub>3</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 25	▲	±115.00 %	A3: NNN.NN	A <sub>3</sub> Hold value
◆★ 26	▲	0 – 1000	T3: NNNN	T <sub>3</sub> Hold time
◆★ 27	▲	0, 1, 2	P3: N	P <sub>3</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 28	▲	±115.00 %/C4	K4: NNN.NN	K <sub>4</sub> Ramp rate
◆★ 29	▲	0, 1, 2	C4: N	C <sub>4</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 30	▲	±115.00 %	A4: NNN.NN	A <sub>4</sub> Hold value
◆★ 31	▲	0 – 1000	T4: NNNN	T <sub>4</sub> Hold time
◆★ 32	▲	0, 1, 2	P4: N	P <sub>4</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 33	▲	±115.00 %/C5	K5: NNN.NN	K <sub>5</sub> Ramp rate
◆★ 34	▲	0, 1, 2	C5: N	C <sub>5</sub> Time unit (0: sec, 1: min, 2: hour)
◆★ 35	▲	±115.00 %	A5: NNN.NN	A <sub>5</sub> Hold value
◆★ 36	▲	0 – 1000	T5: NNNN	T <sub>5</sub> Hold time
◆★ 37	▲	0, 1, 2	P5: N	P <sub>5</sub> Time unit (0: sec, 1: min, 2: hour)

MODEL NO.	BLOCK NAME	MODEL NO.
70	High/Low Limiter	70

ABBR: HLL



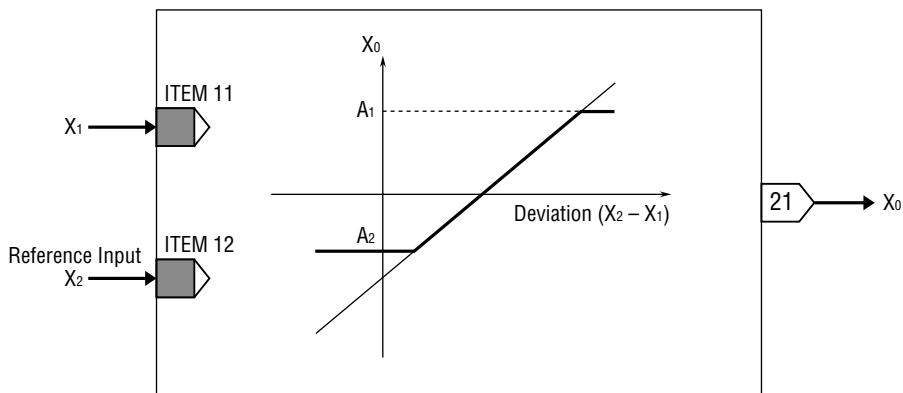
**General Description:** Used to limit analog input signal within a preset range.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	70	MD: <u>70</u>	<b>HIGH/LOW LIMITER (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> High limit
◆★ 13	▲	±115.00 %	A2: NNN.NN	A <sub>2</sub> Low limit

MODEL NO.	BLOCK NAME	MODEL NO.
71	Deviation Limiter	71

ABBR: DVL



### General Description

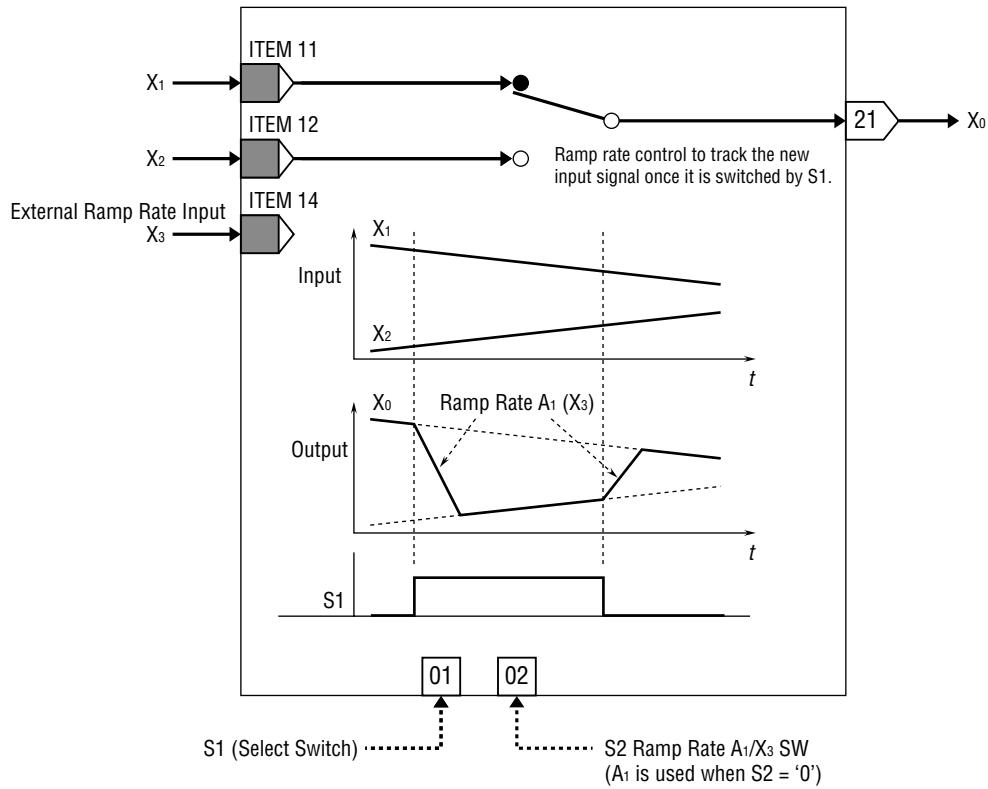
Used to calculate deviation between two analog inputs and limit the deviation within a preset range.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Reference input
★ 10	▲	71	MD: <u>71</u>	<b>DEVIATION LIMITER (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>1321</u>	$X_2$ connection terminal (error if not connected)
◆★ 13	▲	±115.00 %	A1: NNN.NN	$A_1$ High deviation limit
◆★ 14	▲	±115.00 %	A2: NNN.NN	$A_2$ Low deviation limit

MODEL NO. <b>18</b>	BLOCK NAME <b>Input Selector (with ramp control at switching)</b>	MODEL NO. <b>18</b>
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ABBR: SFT



### General Description

Used to select and output either one of two analog inputs.

### Operation

When S1 is set, the output  $X_0$  starts to track the selected input  $X_1$  or  $X_2$  at a ramp rate  $A_1$  or  $X_3$ .

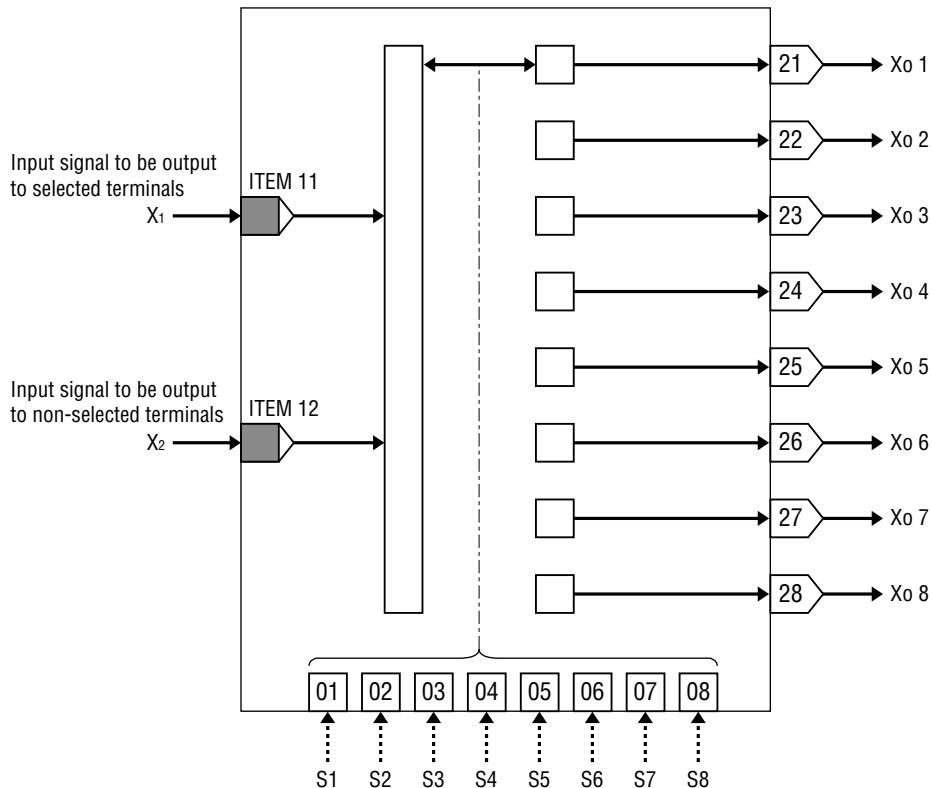
- With S1 = '0', the input  $X_1$  is selected.
- With the ramp rate set to 0, the output immediately tracks the selected input.
- External ramp rate  $X_3$ : Data range 0 – 10000 is converted into 0 – 100%.  $A_1$  is used when  $X_3$  is not connected. With negative input, the ramp rate equals 0.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	0, 1	S1: N	S1 Select SW (0: select $X_1$ , 1: select $X_2$ )
05	▲	0, 1	S2: N	S2 Ramp rate $A_1$ / $X_3$ SW
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Input
09	▲	0.00 – 115.00 %/s	X3: NNN.NN	$X_3$ Ramp rate by remote setting
★ 10	▲ 18	MD: 18		<b>INPUT SELECTOR (model)</b> '-' to clear.
★ 11	▲ GGNN	1#: 1221		$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲ GGNN	2#: 1321		$X_2$ connection terminal (no connection allowed)
◆★ 13	▲ 0.00 – 115.00 %/s	A1: 3.50		$A_1$ Ramp rate
★ 14	▲ GGNN	3#: 2321		$X_3$ connection terminal (no connection allowed)

MODEL NO. <b>19</b>	BLOCK NAME <b>Output Selector</b>	MODEL NO. <b>19</b>
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ABBR: OTS



### General Description

Used to route an input to a specified channel of 8 outputs.

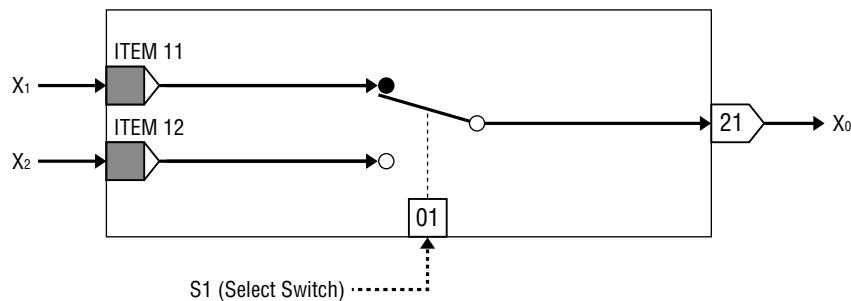
- S1 through S8 correspond respectively to Xo 1 through Xo 8.
- ITEM 12 set value is output at unconnected terminals.
- If more than one switch is selected, higher switch number (S1...S8) prevails.
- S1 through S8 are set to '0' at cold start.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	X <sub>1</sub> : NNN.NN	X <sub>1</sub> Input
04	▲	±115.00 %	X <sub>2</sub> : NNN.NN	X <sub>2</sub> Input
★ 10	▲ 19		MD: 19	OUTPUT SELECTOR (model) '-' to clear.
★ 11	▲ GGNN		1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲ GGNN		2#: 1321	X <sub>2</sub> connection terminal (no connection allowed) X <sub>2</sub> is provided to non-selected channels. 0% is output if not connected.
21	▲	0, 1	01: N	S1 Select SW
22	▲	0, 1	02: N	S2 Select SW
23	▲	0, 1	03: N	S3 Select SW
24	▲	0, 1	04: N	S4 Select SW
25	▲	0, 1	05: N	S5 Select SW
26	▲	0, 1	06: N	S6 Select SW
27	▲	0, 1	07: N	S7 Select SW
28	▲	0, 1	08: N	S8 Select SW

MODEL NO.	BLOCK NAME	MODEL NO.
72	Input Selector (2 points)	72

ABBR: INS



### General Description

Used to select and output either one of two analog inputs.

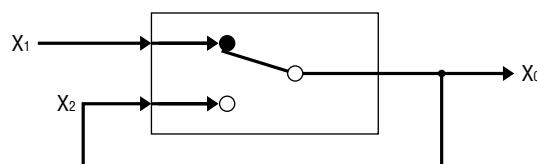
With S1 = '0', the input X<sub>1</sub> is selected.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Select SW (0: select X <sub>1</sub> )
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
08	▲	±115.00 %	X2: NNN.NN	X <sub>2</sub> Input
★ 10	▲	72	MD: 72	<b>INPUT SELECTOR (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: 1321	X <sub>2</sub> connection terminal (no connection allowed)

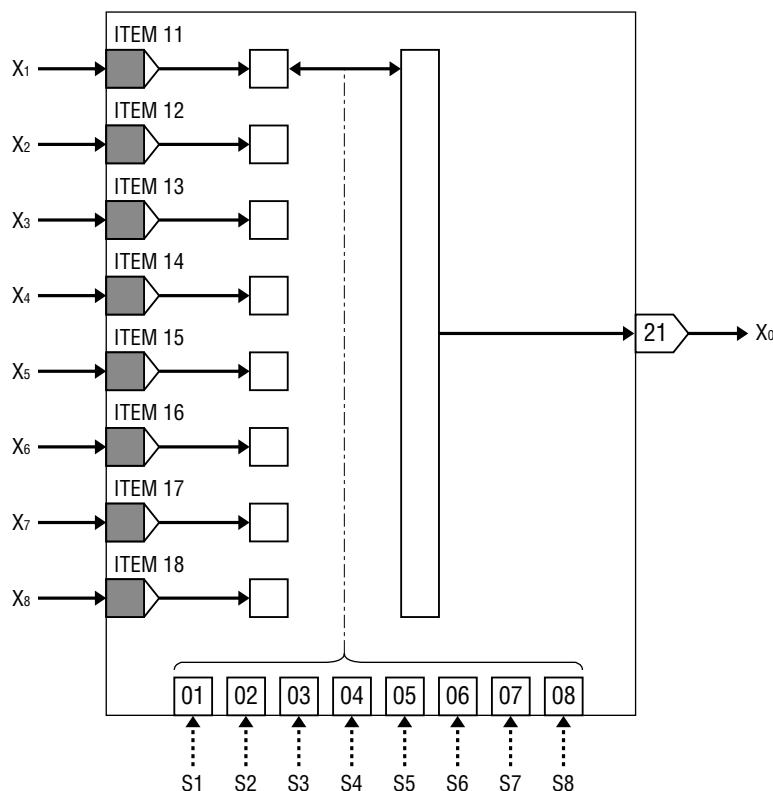
### ■ Signal Hold

The output signal can be held if you connect the output X<sub>0</sub> to the input X<sub>2</sub> and turn Select SW S1 on as shown in the figure below.



MODEL NO.	BLOCK NAME	MODEL NO.
85	Input Selector (8 points)	85

ABBR: INE



### General Description

Used to select and output either one of eight analog inputs.

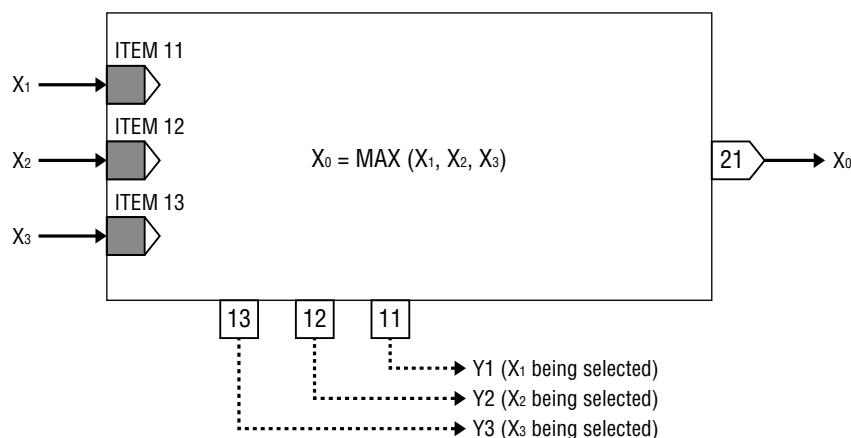
- S1 through S8 correspond respectively to the input X<sub>1</sub> through X<sub>8</sub>. With none selected, the output X<sub>0</sub> equals 0%.
- With more than one switch is set to '1'; larger number channel among S1 through S8 is valid.
- The input X<sub>1</sub> must be connected. Error is given if not connected.
- If the connected input connection terminal is not registered, the output X<sub>0</sub> equals 0%.
- S1 through S8 are set to '0' as default value at cold start.

**GROUP [30 – 61] ★: Setting data**

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
★ 10	▲	85	<b>MD: 85</b>	<b>8-POINT INPUT SELECTOR (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> : connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: <u>1222</u>	X <sub>2</sub> : connection terminal (no connection allowed)
★ 13	▲	GGNN	3#: <u>1321</u>	X <sub>3</sub> : connection terminal (no connection allowed)
★ 14	▲	GGNN	4#: <u>1322</u>	X <sub>4</sub> : connection terminal (no connection allowed)
★ 15	▲	GGNN	5#: <u>1421</u>	X <sub>5</sub> : connection terminal (no connection allowed)
★ 16	▲	GGNN	6#: <u>1422</u>	X <sub>6</sub> : connection terminal (no connection allowed)
★ 17	▲	GGNN	7#: <u>1521</u>	X <sub>7</sub> : connection terminal (no connection allowed)
★ 18	▲	GGNN	8#: <u>1522</u>	X <sub>8</sub> : connection terminal (no connection allowed)
21	▲	0, 1	01: N	S1 X <sub>1</sub> select SW
22	▲	0, 1	02: N	S2 X <sub>2</sub> select SW
23	▲	0, 1	03: N	S3 X <sub>3</sub> select SW
24	▲	0, 1	04: N	S4 X <sub>4</sub> select SW
25	▲	0, 1	05: N	S5 X <sub>5</sub> select SW
26	▲	0, 1	06: N	S6 X <sub>6</sub> select SW
27	▲	0, 1	07: N	S7 X <sub>7</sub> select SW
28	▲	0, 1	08: N	S8 X <sub>8</sub> select SW

MODEL NO.	BLOCK NAME	MODEL NO.
73	Maximum Value Selector	73

ABBR: MAX



### General Description

Used to select and output the largest of three analog inputs.

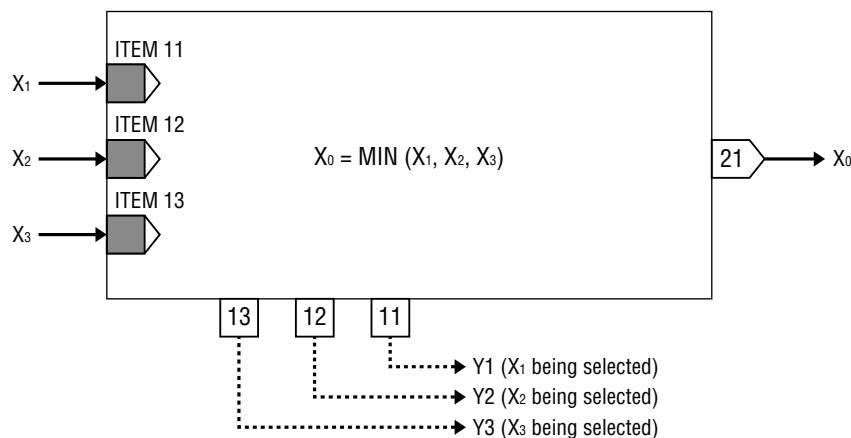
Status monitor output Y1 – Y3 indicates which input is currently selected.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	0, 1	Y1: N	Y1 $X_1$ being selected
05	▲	0, 1	Y2: N	Y2 $X_2$ being selected
06	▲	0, 1	Y3: N	Y3 $X_3$ being selected
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Input
09	▲	±115.00 %	X3: NNN.NN	$X_3$ Input
★ 10	▲	73	MD: 73	MAXIMUM VALUE SELECTOR (model) ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: 1321	$X_2$ connection terminal (no connection allowed)
★ 13	▲	GGNN	3#: 1421	$X_3$ connection terminal (no connection allowed)

MODEL NO.	BLOCK NAME	MODEL NO.
74	Minimum Value Selector	74

ABBR: MIN



### General Description

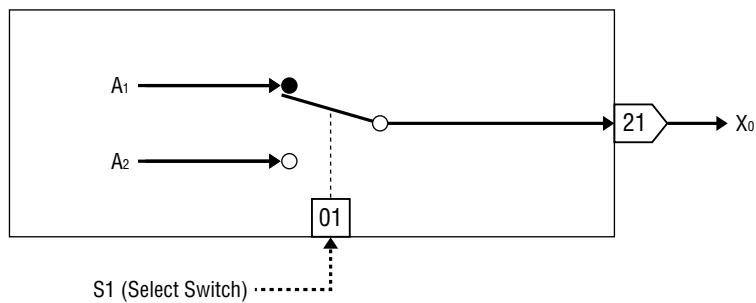
Used to select and output the smallest of three analog inputs.  
Status monitor output Y1 – Y3 indicates which input is currently selected.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	0, 1	Y1: N	Y1 $X_1$ being selected
05	▲	0, 1	Y2: N	Y2 $X_2$ being selected
06	▲	0, 1	Y3: N	Y3 $X_3$ being selected
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Input
09	▲	±115.00 %	X3: NNN.NN	$X_3$ Input
★ 10	▲	74	MD: 74	MINIMUM VALUE SELECTOR (model) ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No.    NN: terminal No.
★ 12	▲	GGNN	2#: 1321	$X_2$ connection terminal (no connection allowed)
★ 13	▲	GGNN	3#: 1421	$X_3$ connection terminal (no connection allowed)

MODEL NO. 75	BLOCK NAME <b>Parameter Selector (2 points)</b>	MODEL NO. 75
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ABBR: CTS

**General Description**

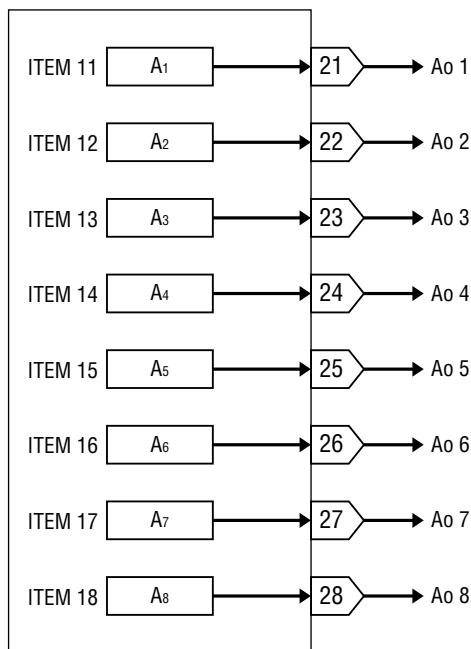
Used to select and output either one of two parameters.

With S1 = '0', the parameter A<sub>1</sub> is selected.**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Select SW (0: select A <sub>1</sub> , 1: select A <sub>2</sub> )
★ 10	▲ 75		MD: 75	<b>PARAMETER SELECTOR (model)</b> ‘-’ to clear.
◆ ★ 11	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> Parameter
◆ ★ 12	▲	±115.00 %	A2: NNN.NN	A <sub>2</sub> Parameter

MODEL NO.	BLOCK NAME	MODEL NO.
86	Parameter Generator (8 points)	86

ABBR: CTE



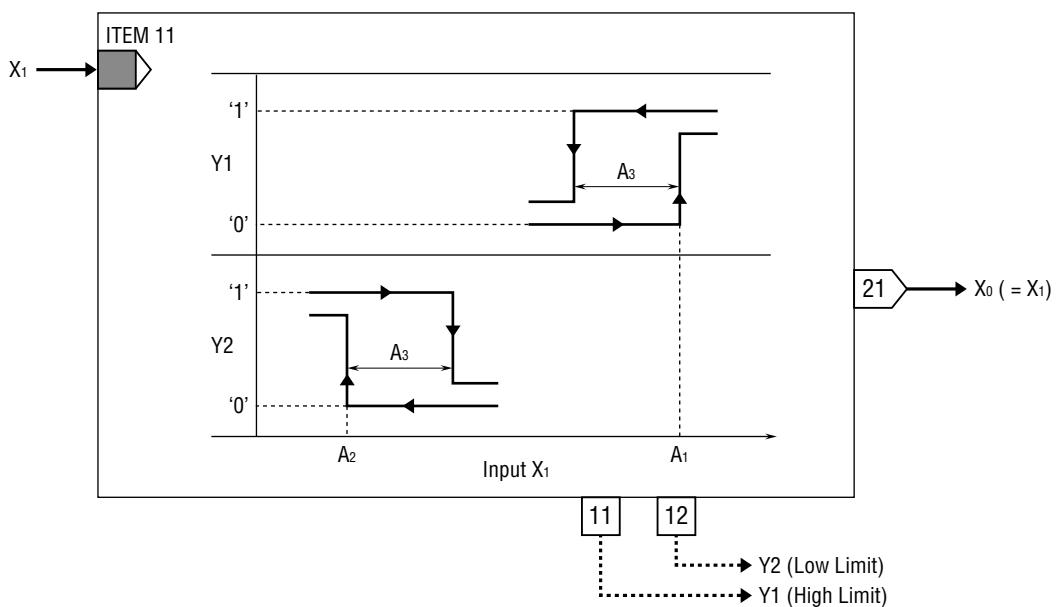
**General Description:** Eight constant parameters are generated.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	86	MD: <u>86</u>	<b>PARAMETER GENERATOR (model)</b> ‘-’ to clear.
◆ ★ 11	▲	±115.00 %	21: NNN.NN	A <sub>1</sub> Parameter
◆ ★ 12	▲	±115.00 %	22: NNN.NN	A <sub>2</sub> Parameter
◆ ★ 13	▲	±115.00 %	23: NNN.NN	A <sub>3</sub> Parameter
◆ ★ 14	▲	±115.00 %	24: NNN.NN	A <sub>4</sub> Parameter
◆ ★ 15	▲	±115.00 %	25: NNN.NN	A <sub>5</sub> Parameter
◆ ★ 16	▲	±115.00 %	26: NNN.NN	A <sub>6</sub> Parameter
◆ ★ 17	▲	±115.00 %	27: NNN.NN	A <sub>7</sub> Parameter
◆ ★ 18	▲	±115.00 %	28: NNN.NN	A <sub>8</sub> Parameter

MODEL NO.	BLOCK NAME	MODEL NO.
76	High/Low Alarm	76

ABBR: PVA



### General Description

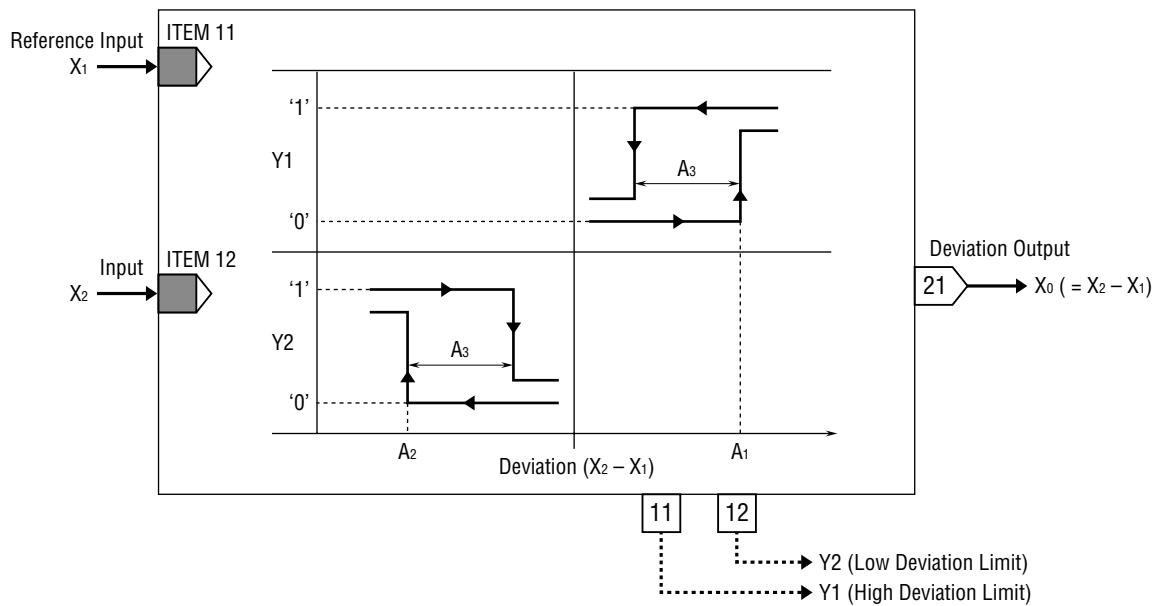
The block provides alarm contact outputs for high and low limit. Both output Y1 and Y2 respectively have hysteresis (deadband) A<sub>3</sub>. There is no interference between high setpoint A<sub>1</sub> and low setpoint A<sub>2</sub>.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	Y1: N	Y1 High alarm output
05	▲	0, 1	Y2: N	Y2 Low alarm output
07	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
★ 10	▲	76	MD: <u>76</u>	<b>HIGH/LOW ALARM (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	▲	±115.00 %	A1: NNN.NN	A <sub>1</sub> High setpoint
◆★ 13	▲	±115.00 %	A2: NNN.NN	A <sub>2</sub> Low setpoint
◆★ 14	▲	0.00 – 115.00 %	A3: NNN.NN	A <sub>3</sub> Hysteresis (deadband)

MODEL NO.	BLOCK NAME	MODEL NO.
77	Deviation Alarm	77

ABBR: DVA



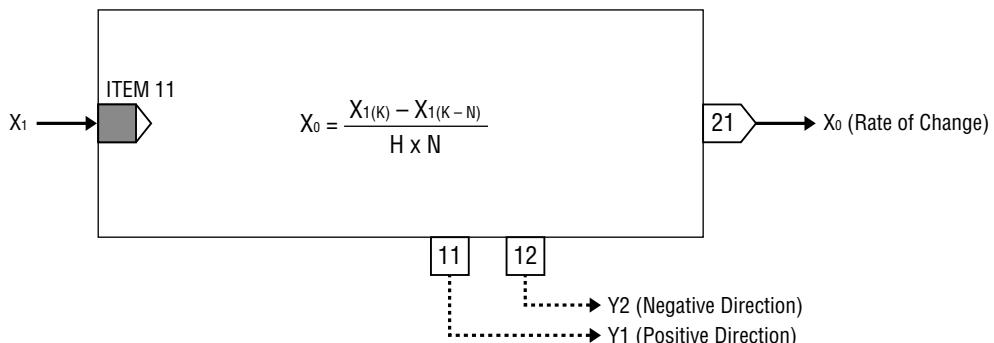
**General Description:** The block provides alarm contact outputs for the deviation of two input signals.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output (deviation)
04	▲	0, 1	Y1: N	Y1 High deviation alarm output
05	▲	0, 1	Y2: N	Y2 Low deviation alarm output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Reference input
08	▲	±115.00 %	X2: NNN.NN	$X_2$ Input
★ 10	▲	77	MD: 77	<b>DEVIATION ALARM (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	GGNN	2#: 1222	$X_2$ connection terminal (error if not connected)
◆★ 13	▲	±115.00 %	A1: NNN.NN	$A_1$ High setpoint
◆★ 14	▲	±115.00 %	A2: NNN.NN	$A_2$ Low setpoint
◆★ 15	▲	0.00 – 115.00 %	A3: NNN.NN	$A_3$ Hysteresis (deadband)

MODEL NO. <b>78</b>	BLOCK NAME <b>Rate of Change Alarm</b>	MODEL NO. <b>78</b>
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ABBR: VRA



### General Description

The block calculates the difference between the present sample value  $X_{1(K)}$  with another  $X_{1(K-N)}$  stored N samples before, and divides it by the elapsed time ( $H \times N$  [seconds]) to obtain its rate of change.

If the rate of change is greater than the positive rate  $A_1$ , the output  $Y_1$  turns to '1'.

If the rate of change is smaller than the negative rate  $A_2$ , the output  $Y_2$  turns to '1'.

Both setpoints respectively have hysteresis  $A_3$ .

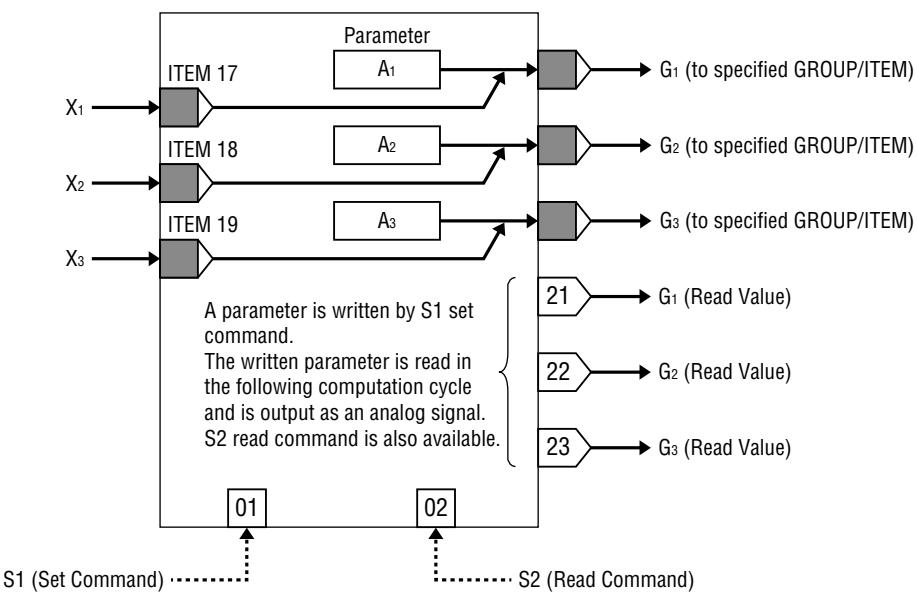
Negative direction setpoint  $A_2$  must be set to a positive value.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output (change rate)
04	▲	0, 1	Y1: N	Y1 Positive direction alarm output
05	▲	0, 1	Y2: N	Y2 Negative direction alarm output
07	▲	±115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	78	MD: 78	<b>RATE OF CHANGE ALARM (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	0.5 – 115.0 s	H: 0.5	H Sampling cycle (min. 0.5 sec. increments)
★ 13	▲	1 – 8	N: 8	N Number of samples to be calculated
◆★ 14	▲	0.00 – 115.00 %/s	A1: 3.50	A1 Positive direction setpoint
◆★ 15	▲	0.00 – 115.00 %/s	A2: 3.50	A2 Negative direction setpoint
◆★ 16	▲	0.00 – 115.00 %	A3: NNN.NN	A3 Hysteresis (deadband)

MODEL NO. 79	BLOCK NAME <b>Parameter Setter</b>	MODEL NO. 79
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ABBR: PMS



### General Description

When Set Command SW S1 is turned to '1', the module rewrites parameters in specified function blocks.

- Changeable parameters (ITEM) are marked with '◆' in the Function Block List (2 byte data only).
- Decimal point position of an analog range will be disregarded. The one used in the rewritten ITEM will be used.
- Written parameters can be read at the analog terminals 21, 22 and 23.
- Typical applications of External Parameters:
  - Setting PID parameters using Ai Receive Terminal.
  - Changing function parameters
  - Changing parameters for a math function module according to the result of another function module.

### WARNING !

Use OUTPUT SHOT commands for S1 and S2.

Parameters in each function block can be rewritten approx. one hundred thousand (100,000) times (according to nominal specification of the EEPROM).

For example, if you rewrite a parameter every one hour, the EEPROM is usable approx. eleven years.

Please consider this information carefully when you design an application of this function block.

When setting ITEM No. for each output connecting terminal, do not use contact (0, 1) or 1 byte (-128 to 127) numbers.

**GROUP [30 – 61] ★: Setting data**

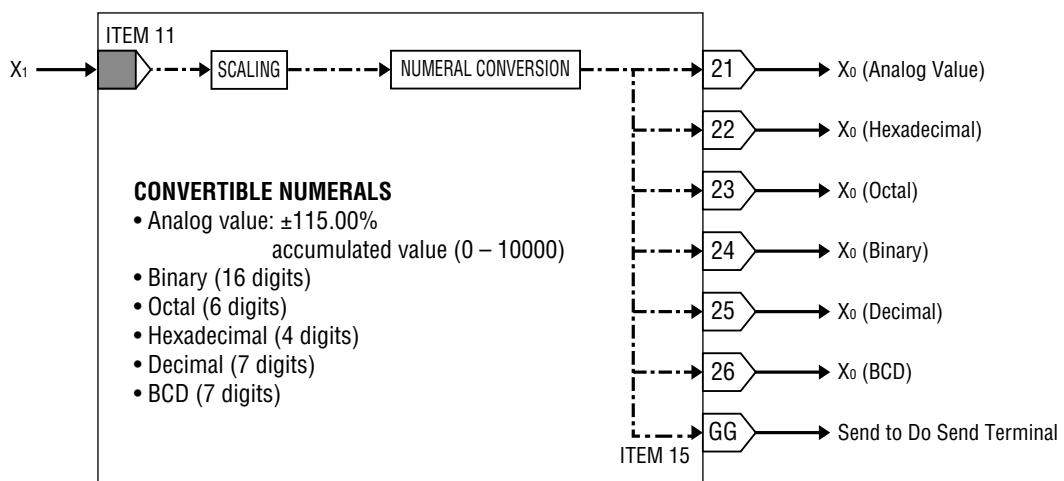
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
04	▲	0, 1	S1: N	S1 Set command SW
05	▲	±115.00 %	X1: NNN.NN	X <sub>1</sub> Input
06	▲	±115.00 %	X2: NNN.NN	X <sub>2</sub> Input
07	▲	±115.00 %	X3: NNN.NN	X <sub>3</sub> Input
★ 10	▲	79	<b>MD: 79</b>	<b>PARAMETER SETTER (model)</b> ‘-’ to clear.
★ 11	▲	GGII	G1: <u>3014</u>	G <sub>1</sub> output connection terminal GG: Group No. II: Item No.
★ 12	▲	GGII	G2: <u>3114</u>	G <sub>2</sub> output connection terminal
★ 13	▲	GGII	G3: <u>3215</u>	G <sub>3</sub> output connection terminal
<b>INTERNAL PARAMETER SETTING</b>		Data range corresponds to that used in the destination ITEM (decimal point not included)		
★ 14	▲	±32000	A1: XXXXX	A <sub>1</sub> Parameter
★ 15	▲	±32000	A2: XXXXX	A <sub>2</sub> Parameter
★ 16	▲	±32000	A3: XXXXX	A <sub>3</sub> Parameter
<b>EXTERNAL PARAMETER SETTING</b>		GG: Group No. NN: terminal No. (analog or discrete) With GGNN = 0 or no connection, internal parameter setting will have a priority.		
★ 17	▲	GGNN	X1: <u>1101</u>	X <sub>1</sub> connection terminal (no connection allowed)
★ 18	▲	GGNN	X2: <u>1221</u>	X <sub>2</sub> connection terminal (no connection allowed)
★ 19	▲	GGNN	X3: <u>1321</u>	X <sub>3</sub> connection terminal (no connection allowed)
<b>PARAMETER READING</b>				
20	▲	0, 1	S2: N	S2 Read command SW
21	▲	±115.00 %	21: <u>0.14</u>	G <sub>1</sub> Read value (Remark 1)
22	▲	±115.00 %	22: <u>1.00</u>	G <sub>2</sub> Read value (Remark 1)
23	▲	±115.00 %	23: <u>12.34</u>	G <sub>3</sub> Read value (Remark 1)

Remark 1: Decimal Point Position

Analog data is provided automatically with two decimal places. However, actual decimal point position depends upon data of the destination. For example, if you read the proportional band of a PID control as 100%, 1.00 is indicated. Likewise, if you read a gain of a computing module, the gain 1.234 will be indicated as 12.34.

MODEL NO.	BLOCK NAME	MODEL NO.
80	Numeral Converter	80

ABBR: BCD



### General Description

The input value is converted and output at the specified numeric terminal. It may not be converted appropriately if a terminal other than one for analog signal is used.

**GROUP [30 – 61] ★: Setting data**

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output indication (analog value)
04	▲	0000 – FFFF	22: NNNN	X <sub>0</sub> Output indication (hexadecimal)
05	▲	000000 – 177777	23: NNNNNN	X <sub>0</sub> Output indication (octal)
06	▲	00.... – 11....	24: NN....	X <sub>0</sub> Output indication (binary, 16 digits) (13 upper digits)
07	▲	0 – 1000000	25: NNNNNNN	X <sub>0</sub> Output indication (decimal, 7 digits)
08	▲	0.000000 – 1000000	26: NNNNNNNN	X <sub>0</sub> Output indication (BCD, 7 digits)
09	▲	NNNN....	X1: NNNNN...	Input indication (according to numeral of input)
<b>★ 10</b>	<b>▲ 80</b>		<b>MD: 80</b>	<b>NUMERAL CONVERTER (model) '-' to clear.</b>
<b>[INPUT]</b>				
★ 11	▲	GGNN	1#: <u>1221</u>	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No. Set N = 00 when input from Di/Do communication terminal.
★ 12	▲	0, 1, 2, 3, 4, 5	IN: N	Numeral of input signal 0: analog value      3: binary (16 digits) 1: hexadecimal (4 digits)      4: decimal (7 digits) 2: octal (6 digits)      5: BCD (7 digits)
<b>[OUTPUT]</b>				
★ 15	▲	GG (11 – 26)	GG: <u>12</u>	G <sub>1</sub> output connection terminal (no connection allowed) GG: Group No. of Do communication terminal
★ 16	▲	0, 1, 2, 3, 4, 5	OT: N	Numeral of output signal 0: analog value      3: binary (16 digits) 1: hexadecimal (4 digits)      4: decimal (7 digits) 2: octal (6 digits)      5: BCD (7 digits)
<b>[SCALING]</b>				
★ 17	▲	0, 1, 2	SC: N	Scaling mode (0: without, 1: with span, 2: with offset + span)
<b>[SCALING RANGE WITH ANALOG INPUT]</b> (decimal point position for BCD output)				
★ 20	▲	±32000	MH: <u>15000</u>	Upper range (at 100% input)
★ 21	▲	±32000	ML: <u>0</u>	Lower range (at 0% input)
★ 22	▲	0, 1, 2, 3, 4, 5	DP: <u>1</u>	Decimal point position (from rightmost position)
<b>[SCALING RANGE BETWEEN NUMERALS OTHER THAN ANALOG SIGNAL]</b>				
★ 23	▲	NNNN....N	X1: <u>0</u>	X <sub>1</sub> value
★ 24	▲	NNNN....N	Y1: <u>0</u>	Y <sub>1</sub> value
★ 25	▲	NNNN....N	X2: <u>FFFF</u>	X <sub>2</sub> value
★ 26	▲	NNNN....N	Y2: <u>1000000</u>	Y <sub>2</sub> value

Remarks:

With ITEM 12 'Numeral of input signal' set to '1: hexadecimal (4 digits)', add '0' at the top of the value for ITEM 23 'X<sub>1</sub> value' or ITEM 25 'X<sub>2</sub> value', if it should start with 'D'.

Apply the same principle for ITEM 24 'Y<sub>1</sub> value' or ITEM 26 'Y<sub>2</sub> value', with ITEM 15 'Numeral of output signal' set to '1: hexadecimal (4 digits)'.

**■ Scaling of Analog Input (mode 1: with span)**

Analog input (0 – 100.00%) is converted into engineering unit value by its span. Zero point is equal to 0.

A typical application of this scaling function is to "indicate analog signal in an engineering unit on the Digital Indicator (model: ABD)".

ANALOG INPUT → SCALING: INPUT% × (MH – ML) → OUTPUT NUMERAL CONVERSION → OUTPUT

Only when the converted result is output in BCD, decimal point position and negative range can be included in the scaling.  
When it is output in decimals, negative range is included.

When the value converted into an engineering unit is output in other numeral systems, negative range is output as 0.

## ■ Scaling of Analog Input (mode 2: with span + offset)

Analog input (0 – 100.00%) is converted into engineering unit value by its span and offset.

ANALOG INPUT → SCALING: INPUT% x (MH – ML) + ML → OUTPUT NUMERAL CONVERSION → OUTPUT

Only when the converted result is output in BCD, decimal point position and negative range can be included in the scaling.  
When it is output in decimals, negative range is included.

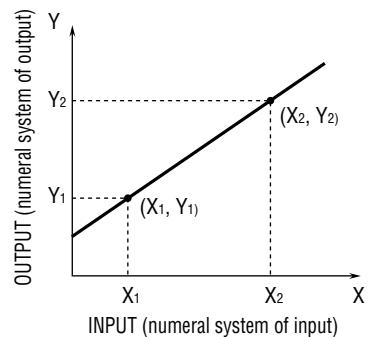
When the value converted into an engineering unit is output in other numeral systems, absolute value of negative range is output.

## ■ Scaling of Numerals Other Than Analog Input

The value is scaled without minus sign or decimal point. The scaling is performed according to data between two points as shown in the figure below.

The numeral system of analog value at the analog output terminal '21' is the same as that of output signal.

If you need to use an input signal in a numeral other than analog for some computation block, first convert the signal into analog utilizing this numeral conversion block. Then input the converted analog signal to the computation block and then send the result back to another numeral conversion block.

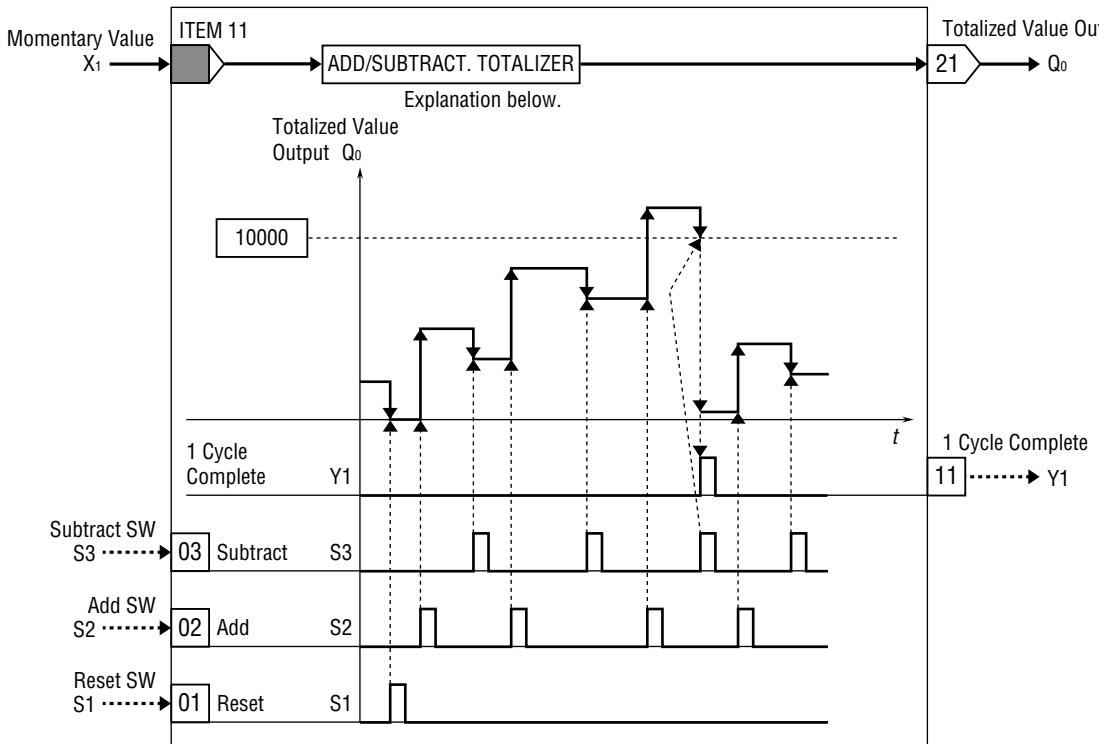


## ■ Signal Assignment in the Communication Terminal Block for Discrete I/O

ASSIGN.	DECIMAL*	BCD		HEXADECIMAL		OCTAL		BINARY		ASSIGN.		
		Weight (W)	W Contents	W	Contents	W	Contents	Weight	Contents			
1	1	1	Decimal point	1	LSD	1	LSD	1	LSD	1		
2	2	2	position (from	2	x 1	2	x 1	2	2nd LSD	2		
3	4	4	LSB)	4		4		4	3rd LSD	3		
4	8	1	(±) Sign	8		1	2nd LSD	8	4th LSD	4		
5	16	1	LSD	1	2nd LSD	2	x 8	16	5th LSD	5		
6	32	2	x 1	2	x 16	4		32	6th LSD	6		
7	64	4		4		1	3rd LSD	64	7th LSD	7		
8	128	8		8		2	x 64	128	8th LSD	8		
9	256	1	2nd LSD	1	3rd LSD	4		256	9th LSD	9		
10	512	2	x 10	2	x 256	1	4th LSD	512	10th LSD	10		
11	1024	4		4		2	x 512	1024	11th LSD	11		
12	2048	8		8		4		2048	12th LSD	12		
13	4096	1	3rd LSD	1	4th LSD	1	5th LSD	4096	13th LSD	13		
14	8192	2	x 100	2	x 4096	2	x 4096	8192	14th LSD	14		
15	16384	4		4		4		16384	15th LSD	15		
16	32768	8		8		1	x 32768	32768	16th LSD	16		
17	65536	1	4th LSD	LSB = Least Significant Bit LSD = Least Significant Digit								
18	131072	2	x 1000									
19	262144	4										
20	524288	8										
21		1	5th LSD									
22	Reserved	2	x 10000									
23		4										
24		8										
25		1	6th LSD									
26	Reserved	2	x 100000									
27		4										
28		8										
29	Reserved			7h LSD								
30				1								
31	Reserved			Reserved								
32												

MODEL NO. <b>81</b>	BLOCK NAME <b>Weight Totalizer</b>	MODEL NO. <b>81</b>
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ABBR: QWT



### General Description

The block is used for a hopper scale to totalize ingredient weight by adding total weight and subtracting tare weight.

- Setting Reset SW to '1' will adjust the totalized value to '0'.
- Add SW and Subtract SW will be provided by shot signals in Sequential Control block.
- Measured signal will be totalized by Add SW, while subtracted by Subtract SW.
- Totalized Value Output  $Q_0$ , in addition mode, continues counting even after the counter reaches 10000. It returns to 0 only if the counts still exceeds 10000 after a subtraction signal is received and applied. The fractions of 10000 counts will not be dropped but added at this point.
- '1 Cycle Completed' output  $Y_1$  is connected to a Counter block so that it can totalize the weight. When the accumulation of  $Q_0$  signal reaches 10000 and returns to 0 count, the  $Y_1$  is turned on for 1 computation cycle duration.
- If you connect the Totalized Value Output  $Q_0$  to an analog input terminal of another function block, 10000 counts will be converted as 100.00%.

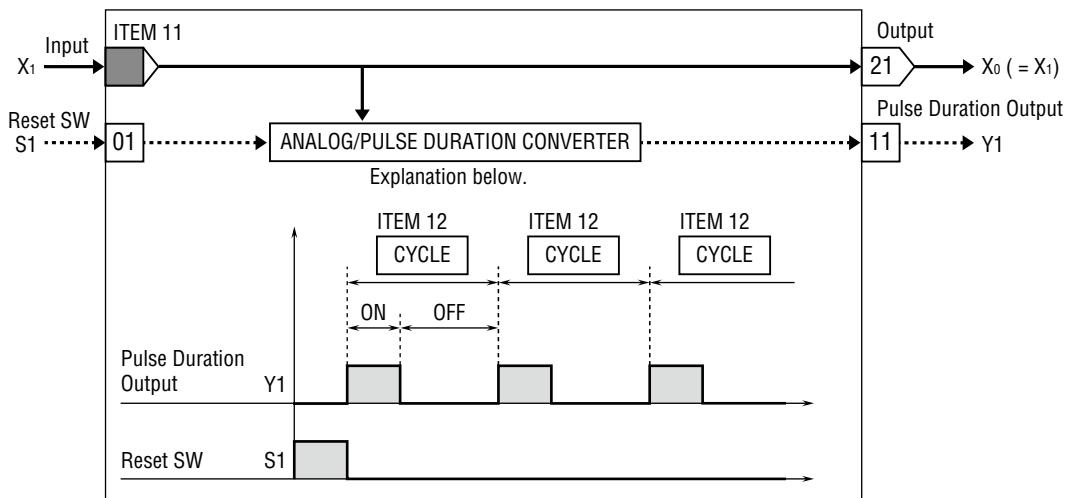
It is recommended that application is designed so that the totalized value remains within the maximum value of 10000.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
04	▲	0 – 10000	21: NNNNN	$Q_0$ Totalized value output
05	▲	0, 1	S1: N	S1 Reset SW (1: reset)
06	▲	0, 1	S2: N	S2 Add SW (1: add)
07	▲	0, 1	S3: N	S3 Subtract SW (1: subtract)
08	▲	0, 1	Y1: N	Y1 1 cycle complete output
09	▲	-15.00 – 115.00 %	X1: NNN.NN	$X_1$ Input
★ 10	▲	81	MD: 81	<b>WEIGHT TOTALIZER (model)</b> '-' to clear.
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.

MODEL NO.	BLOCK NAME		MODEL NO.
82	Analog/Pulse Duration Converter		82

ABBR: ADT



### General Description

The ON/OFF output duration ratio, in a constant cycle duration, is proportional to the input signal.

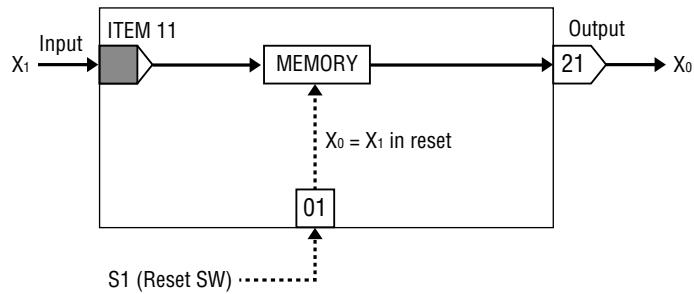
- With the input below 0%, the output Y1 is set to '0' for a whole cycle duration. With the input over 100%, the output Y1 is set to '1' for a whole cycle duration.
- While Reset SW is set to '0', the output Y1 repeatedly turns on and off ('1' - '0') according to the input X1.
- The minimum time resolution is 0.1 second. However, it cannot be shorter than the computation cycle.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	X <sub>0</sub> Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
05	▲	0, 1	Y1: N	Y1 Pulse duration output
★ 10	▲	82	MD: <u>82</u>	<b>ANALOG/PULSE DURATION CONVERTER (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1#: 1221	X <sub>1</sub> connection terminal (error if not connected) GG: Group No. NN: terminal No.
◆★ 12	●	0 – 1000 s	CT: NNNN	CT Pulse cycle time

MODEL NO.	BLOCK NAME		MODEL NO.
83	Analog Signal Hold		83

ABBR: AMM



### General Description

Used to hold either of the maximum, the minimum or the momentary value of an input signal.

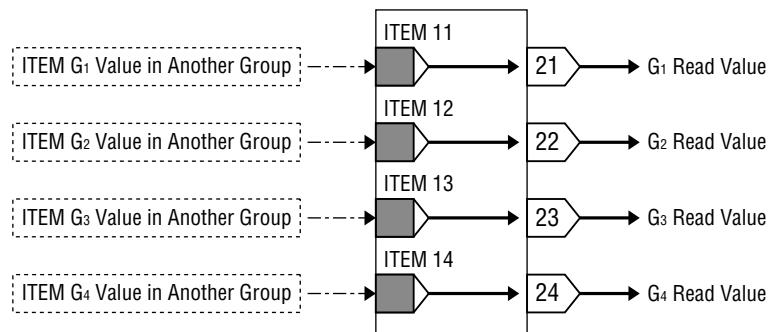
- With Reset SW S1 set to '1', the output  $X_0$  equals the input  $X_1$ . To reset, use a shot command ON signal in Sequential Control block.
- The momentary value hold mode: the momentary value is stored in memory with an one-shot input S1.

### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	±115.00 %	21: NNN.NN	$X_0$ Output
04	▲	0, 1	S1: N	S1 Reset SW (1: reset)
★ 10	▲	83	MD: 83	<b>ANALOG SIGNAL HOLD (model) ‘-’ to clear.</b>
★ 11	▲	GGNN	1#: 1221	$X_1$ connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	0, 1, 2	MM: N	Hold mode (0: minimum, 1: momentary, 2: maximum)

MODEL NO. <b>84</b>	BLOCK NAME <b>ITEM Reader</b>	MODEL NO. <b>84</b>
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ABBR: ITR

**General Description**

Used to read parameters, analog values, switch status and internal computation value from ITEMS of another GROUP.

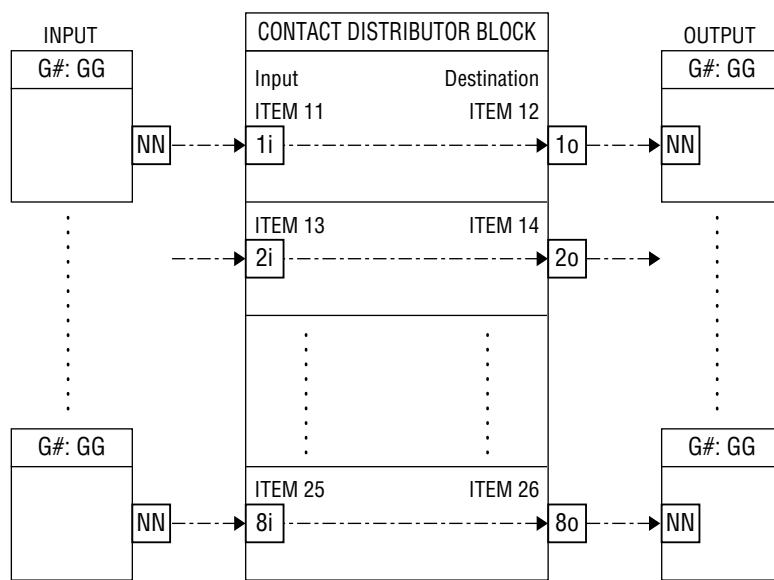
**GROUP [30 – 61]** ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	<b>84</b>	<b>MD: 84</b>	<b>ITEM READER (model)</b> ‘-’ to clear.
★ 11	▲	GGII	G1: <u>3014</u>	G1 connection terminal (error if not connected) GG: Group No. II: Item No.
★ 12	▲	GGII	G2: <u>3114</u>	G2 connection terminal (no connection allowed)
★ 13	▲	GGII	G3: <u>3215</u>	G3 connection terminal (no connection allowed)
★ 14	▲	GGII	G4: <u>3326</u>	G4 connection terminal (no connection allowed)
21	▲	NNNNNN	21: <u>14</u>	G1 Read value (Remark 1)
22	▲	NNNNNN	22: <u>-100</u>	G2 Read value (Remark 1)
23	▲	NNNNNN	23: <u>1234</u>	G3 Read value (Remark 1)
24	▲	NNNNNN	24: <u>12345</u>	G4 Read value (Remark 1)

Remark 1: ITEM 21 – 24 are indicated in 16-bit binary. Therefore, the decimal point of the original ITEM location is lost. If another block enters a value from the ITEM for which only positive range is available (for example, 0 – 64000) and then this block reads the value, it is converted and indicated as approx. ±320.00%.

MODEL NO. 87	BLOCK NAME <b>Contact Distributor</b>	MODEL NO. 87
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ABBR: DCN



### General Description

Used to connect 1 point discrete input to 1 point discrete output.

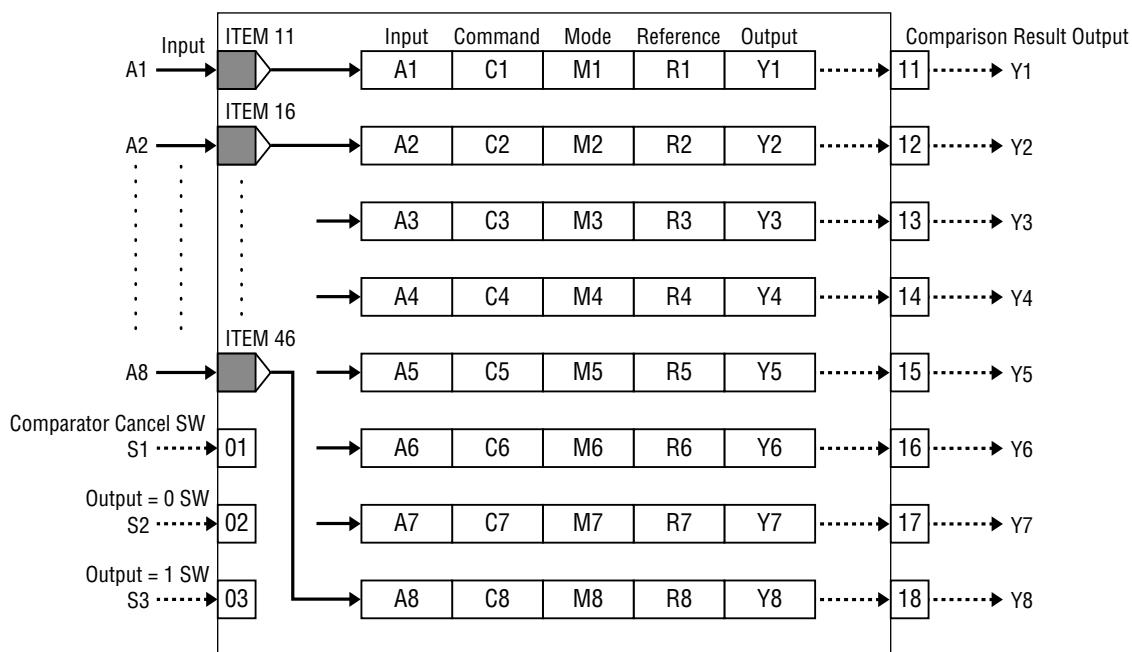
- 8 pairs can be specified without utilizing Sequential Control Program block.
- Beneficial for connecting directly between a Field Terminal and a Communication Terminal.

**GROUP [30 – 61] ★: Setting data**

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	87	<b>MD: 87</b>	<b>CONTACT DISTRIBUTOR (model)</b> ‘-’ to clear.
★ 11	▲	GGNN	1I : GGNN	1i Input terminal GG: Group No. NN: terminal No.
★ 12	▲	GGNN	10: GGNN	1o Destination terminal
★ 13	▲	GGNN	2I : GGNN	2i Input terminal
★ 14	▲	GGNN	20: GGNN	2o Destination terminal
★ 15	▲	GGNN	3I : GGNN	3i Input terminal
★ 16	▲	GGNN	30: GGNN	3o Destination terminal
★ 17	▲	GGNN	4I : GGNN	4i Input terminal
★ 18	▲	GGNN	40: GGNN	4o Destination terminal
★ 19	▲	GGNN	5I : GGNN	5i Input terminal
★ 20	▲	GGNN	50: GGNN	5o Destination terminal
★ 21	▲	GGNN	6I : GGNN	6i Input terminal
★ 22	▲	GGNN	60: GGNN	6o Destination terminal
★ 23	▲	GGNN	7I : GGNN	7i Input terminal
★ 24	▲	GGNN	70: GGNN	7o Destination terminal
★ 25	▲	GGNN	8I : GGNN	8i Input terminal
★ 26	▲	GGNN	80: GGNN	8o Destination terminal
31	▲	0, 1	D1: N	1i (Di 1) Discrete input
32	▲	0, 1	D2: N	2i (Di 2) Discrete input
33	▲	0, 1	D3: N	3i (Di 3) Discrete input
34	▲	0, 1	D4: N	4i (Di 4) Discrete input
35	▲	0, 1	D5: N	5i (Di 5) Discrete input
36	▲	0, 1	D6: N	6i (Di 6) Discrete input
37	▲	0, 1	D7: N	7i (Di 7) Discrete input
38	▲	0, 1	D8: N	8i (Di 8) Discrete input

MODEL NO.	BLOCK NAME	MODEL NO.
88	Analog Signal Comparator	88

ABBR: ACP



### General Description

Used to compare an analog input with a preset parameter (reference) or with another analog input. 8 channels are available.

- Commands (Cn)
  - 1 : An Larger than (>) Rn
  - 2 : An Equal to (=) Rn
  - 3 : An Smaller than (<) Rn
- References (Rn)
  - With Mode (Mn) : 0, Reference (Rn) is a preset parameter ( $\pm 115.00\%$ )
  - With Mode (Mn) : 1, Reference (Rn) is an input terminal number (GGNN).

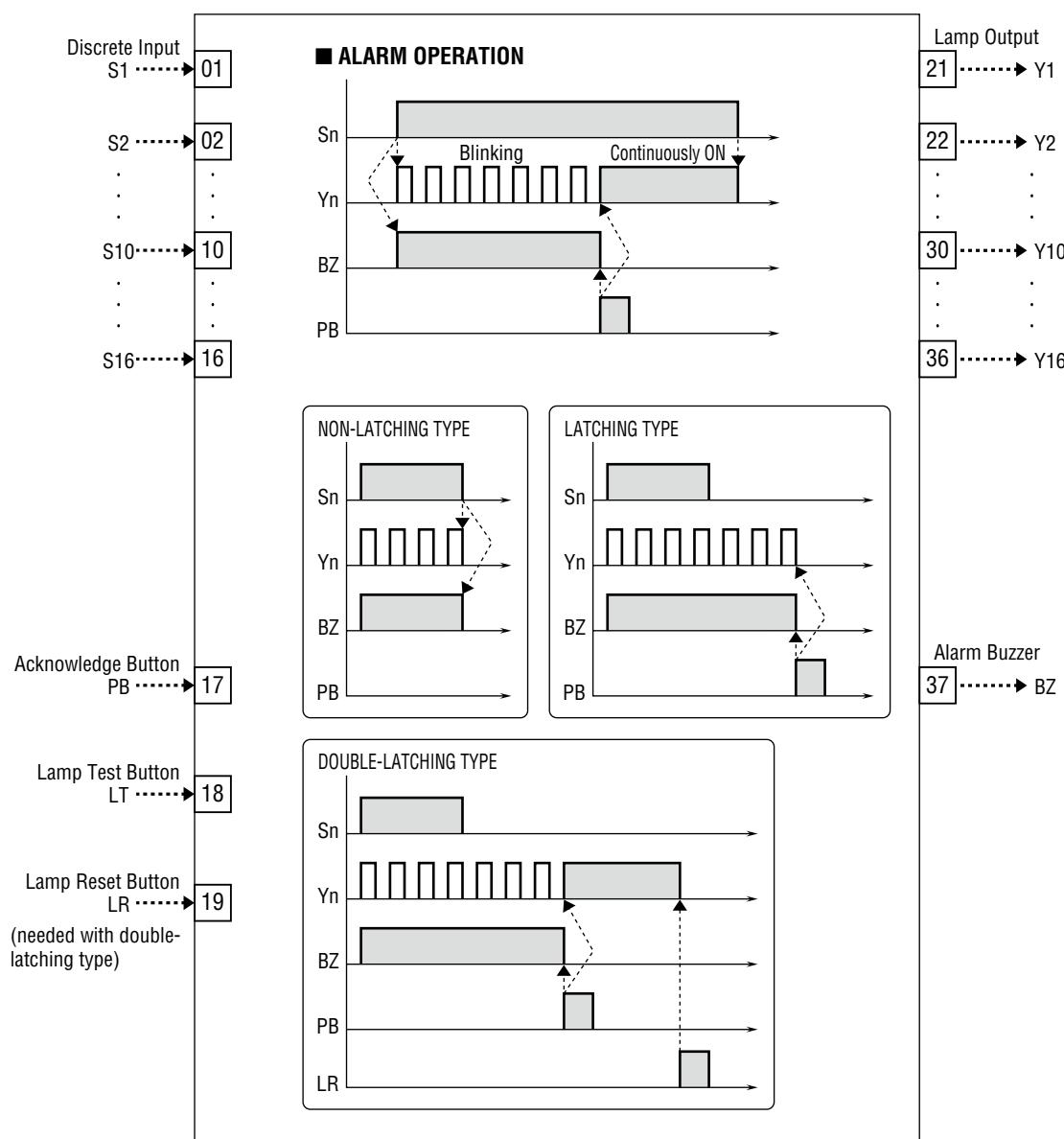
### GROUP [30 – 61] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0, 1	S1: N	S1 Comparator cancel SW (1: cancel)
04	▲	0, 1	S2: N	S2 Output = 0 command SW
05	▲	0, 1	S3: N	S3 Output = 1 command SW
★ 10	▲	88	MD: 88	<b>ANALOG SIGNAL COMPARATOR (model)</b> '-' to clear.
★ 11	▲	GGNN	A1: GGNN	A1 Input connection terminal (error if not connected) GG: Group No. NN: terminal No.
★ 12	▲	0, 1, 2, 3	C1: N	C1 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 13	▲	0, 1	M1: N	M1 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 14	▲	$\pm 115.00\%$ or GGNN	R1: NNNNNN	R1 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
15	▲	0, 1	Y1: N	Y1 Comparison result output

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 16	▲	GGNN	A2: GGNN	A2 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 17	▲	0, 1, 2, 3	C2: N	C2 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 18	▲	0, 1	M2: N	M2 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 19	▲	±115.00 % or GGNN	R2: NNNNNN	R2 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
20	▲	0, 1	Y2: N	Y2 Comparison result output
★ 21	▲	GGNN	A3: GGNN	A3 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 22	▲	0, 1, 2, 3	C3: N	C3 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 23	▲	0, 1	M3: N	M3 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 24	▲	±115.00 % or GGNN	R3: NNNNNN	R3 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
25	▲	0, 1	Y3: N	Y3 Comparison result output
★ 26	▲	GGNN	A4: GGNN	A4 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 27	▲	0, 1, 2, 3	C4: N	C4 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 28	▲	0, 1	M4: N	M4 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 29	▲	±115.00 % or GGNN	R4: NNNNNN	R4 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
30	▲	0, 1	Y4: N	Y4 Comparison result output
★ 31	▲	GGNN	A5: GGNN	A5 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 32	▲	0, 1, 2, 3	C5: N	C5 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 33	▲	0, 1	M5: N	M5 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 34	▲	±115.00 % or GGNN	R5: NNNNNN	R5 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
35	▲	0, 1	Y5: N	Y5 Comparison result output
★ 36	▲	GGNN	A6: GGNN	A6 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 37	▲	0, 1, 2, 3	C6: N	C6 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 38	▲	0, 1	M6: N	M6 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 39	▲	±115.00 % or GGNN	R6: NNNNNN	R6 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
40	▲	0, 1	Y6: N	Y6 Comparison result output
★ 41	▲	GGNN	A7: GGNN	A7 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 42	▲	0, 1, 2, 3	C7: N	C7 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 43	▲	0, 1	M7: N	M7 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 44	▲	±115.00 % or GGNN	R7: NNNNNN	R7 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
45	▲	0, 1	Y7: N	Y7 Comparison result output
★ 46	▲	GGNN	A8: GGNN	A8 Input connection terminal (no connection allowed) GG: Group No. NN: terminal No.
★ 47	▲	0, 1, 2, 3	C8: N	C8 Command (0: none, 1: larger, 2: equal, 3: smaller)
★ 48	▲	0, 1	M8: N	M8 Mode (reference signal type) (0: % value, 1: connection terminal GGNN)
★ 49	▲	±115.00 % or GGNN	R8: NNNNNN	R8 Reference signal (% value or connection terminal) GG: Group No. NN: terminal No.
50	▲	0, 1	Y8: N	Y8 Comparison result output

MODEL NO.	BLOCK NAME	MODEL NO.
89	Annunciator	89

ABBR: ANN



Lamp output Yn resetting by lamp reset button LR is valid only when Sn input is in normal status.

**General Description:** Annunciator block for alarm.

#### 1. Discrete input mode

- Normally Open (N.O.): Abnormality when the contact is turned on. → Lamp starts blinking.
- Normally Closed (N.C.): Abnormality when the contact is turned off. → Lamp starts blinking.

#### 2. Alarm mode

- Non-Latching: If the discrete input is back to normal, the lamp stops blinking and the buzzer sound turns off even before the Acknowledge button is turned on.
- Latching: Even after the discrete input is back to normal, the lamp continues blinking and the buzzer sound continues until the Acknowledge button is turned on.
- Double-Latching: Even after the discrete input is back to normal, the lamp continues blinking and the buzzer sound continues until the Acknowledge button is turned on. When the Acknowledge button is pressed after the discrete input has been back to normal, the lamp remains on (continuously) until the Lamp Reset button is pressed.

### 3. First-out function

First-out function is used to find the discrete contact signal which turned first among several.

The lamp for the one which turned in the first computation cycle blinks though the lamps for the others which turned in the following computation cycles are continuously on. When the Acknowledge button is pressed, the lamp for the first one stops blinking.

When a new series of alarm is triggered, the lamps changes status according to the First-Out function.

This function is available for Latching and Double-Latching alarm modes.

### 4. Communication terminal assignment of the I/O contacts.

- Discrete inputs/lamp outputs can be assigned in 16-point unit to a Di Receive Terminal or Do Send Terminal.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

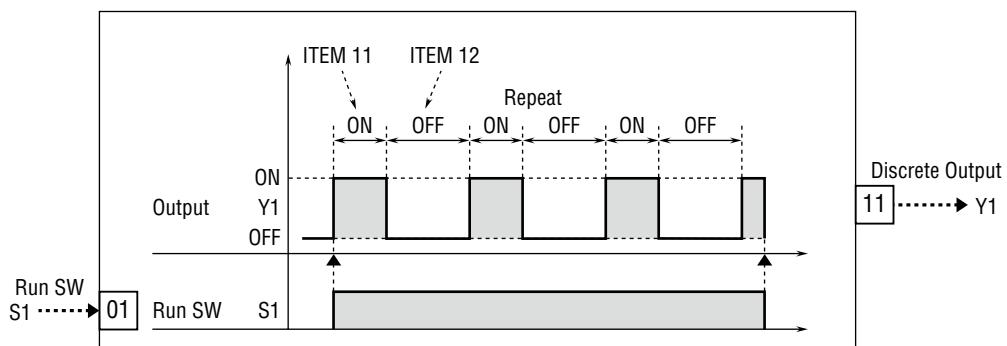
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲ 89		MD: 89	<b>ANNUNCIATOR (model)</b> ‘-’ to clear.
★ 11	▲ 0, 1		SM: N	Discrete input mode (0: N.O., 1: N.C.)
★ 12	▲ 0, 1, 2		MD: N	Alarm mode (0: non-latching, 1: latching, 2: double-latching)
★ 13	▲ 0, 1		FO: N	First-Out (0: without, 1: with)
◆★ 14	▲ 1 – 64		CP: NN	Lamp ON-OFF time (multiple of computation cycle)
★ 15	▲ 00, 11 – 26		SN: NN	Group No. of Communication Terminal for discrete inputs (S1 – S16) (00: without)
★ 16	▲ 0, 1		SP: N	Assigned group of Communication Terminal for discrete inputs (S1 – S16) (0: 1 – 16, 1: 17 – 32)
★ 17	▲ 0, 1		SS: N	Assignment of pushbutton input to Communication Terminal (0: without, 1: with) (Remark 1)
★ 18	▲ 00, 11 – 26		YN: NN	Group No. of Communication Terminal for discrete outputs (Y1 – Y16) (00: without)
★ 19	▲ 0, 1		YP: N	Assigned group of Communication Terminal for discrete outputs (Y1 – Y16) (0: 1 – 16, 1: 17 – 32)
★ 20	▲ 0, 1		YS: N	Assignment of buzzer output to Communication Terminal (0: without, 1: with) (Remark 2)
21	▲ 0, 1		01: N	S 1 Discrete input indication
22	▲ 0, 1		02: N	S 2 : : : : : : : :
:	:	:	:	:
:	:	:	:	:
30	▲ 0, 1		10: N	S10 : : : : : : : :
:	:	:	:	:
36	▲ 0, 1		16: N	S16 : : : : : : : :
37	▲ 0, 1		17: N	Acknowledge button PB
38	▲ 0, 1		18: N	Lamp test button LT
39	▲ 0, 1		19: N	Lamp reset button LR
41	▲ 0, 1		21: N	Y 1 Lamp output indication
42	▲ 0, 1		22: N	Y 2 : : : : : : : :
:	:	:	:	:
:	:	:	:	:
50	▲ 0, 1		30: N	Y10 : : : : : : : :
:	:	:	:	:
56	▲ 0, 1		36: N	Y16 : : : : : : : :
57	▲ 0, 1		37: N	Alarm buzzer sound BZ

Remark 1: With ITEM 17 ‘Assignment of pushbutton input to Communication Terminal’ set to ‘1: with’, the pushbutton is assigned to a discrete input next to S1..S16, i.e. the 17th terminal of Di Receive Terminal or Do Send Terminal (assign lamp test button for 18th, assign lamp reset button for 19th). In this case, ITEM 16 must be set to ‘0: 1 – 16’.

Remark 2: With ITEM 20 ‘Assignment of buzzer output to Communication Terminal’ set to ‘1: with’, the buzzer is assigned to a lamp output next to Y1..Y16, i.e. the 17th terminal of Do Send Terminal. In this case, ITEM 19 must be set to ‘0: 1 – 16’.

MODEL NO. <b>90</b>	BLOCK NAME <b>ON-OFF Timer</b>	MODEL NO. <b>90</b>
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ABBR: TMC



### General Description

The discrete output Y1 is turned on/off repeatedly in the preset time duration.

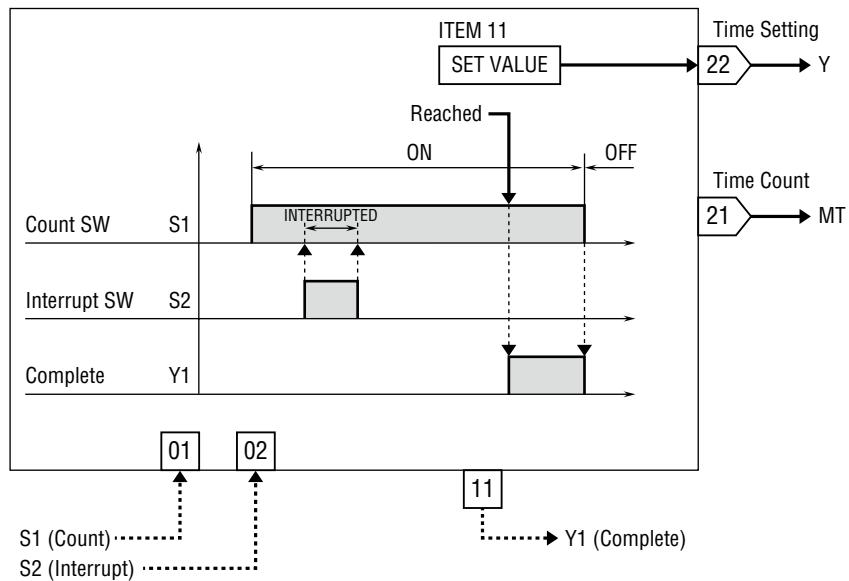
- The minimum duration is 0.1 second, provided it is longer than the computation cycle.
- While Run SW S1 is set to '1', the Y1 is turned on/off repeatedly.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0	ER: NN	MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
02	IND	No input	OT: NNNNN	Error indication (00: normal, 01 – 90: error)
03	▲	0 – 10000	FT: NNNNN	Elapsed ON time count
04	▲	0 – 10000		Elapsed OFF time count
05	▲	0, 1	S1: N	S1 Run SW (1: run)
06	▲	0, 1	Y1: N	Y1 Discrete output
★ 10	▲	90	MD: 90	<b>ON-OFF TIMER (model)</b> '-' to clear.
◆ ★ 11	▲	0 – 10000	ON: NNNNN	ON time setting
◆ ★ 12	▲	0 – 10000	OF: NNNNN	OFF time setting
★ 13	▲	0, 1, 2, 3	TU: N	TU Time unit (0: sec, 1: min, 2: hour, 3: 0.1 sec)

MODEL NO. <b>91</b>	BLOCK NAME <b>Timer</b>	MODEL NO. <b>91</b>
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ABBR: TMR



### General Description

Used to count number of pulse rises of the internal clock (every 0.1 sec.) and output Complete status signal Y1 ON ('1') when it reaches the setpoint.

The counter can be started by turning on the S1 to '1', and be reset by turning it off ('0'). Counting is halted when the S2 is set to '1'.

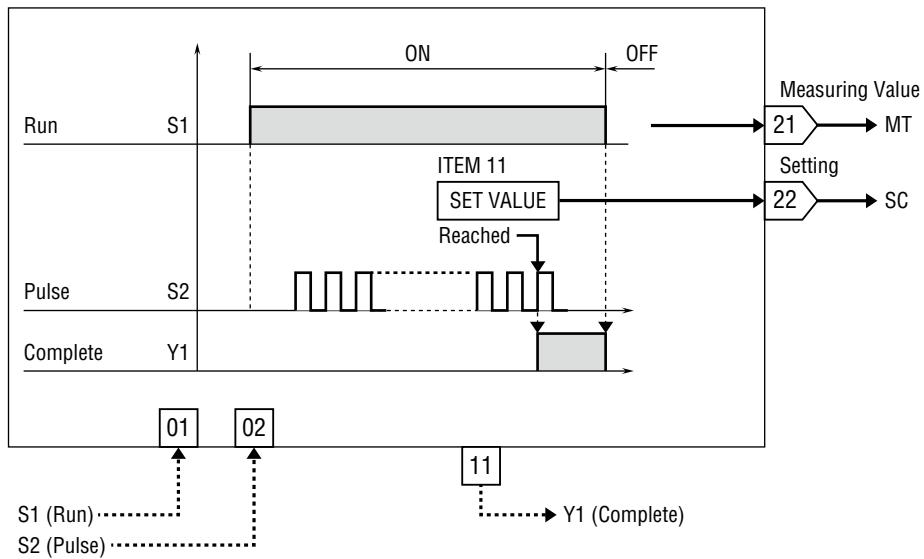
The minimum resolution when the time unit (TU) is set to 'seconds' is equal to the computation cycle. When the cycle is 0.12 second, the minimum resolution will be 0.25 second.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0 – 10000	MT: NNNNN	MT Elapsed time count
04	▲	0, 1	S1: N	S1 Count SW (0: reset, 1: count)
05	▲	0, 1	S2: N	S2 Interrupt SW (1: interrupt)
06	▲	0, 1	Y1: N	Y1 Complete status
★ 10	▲	91	MD: 91	<b>TIMER (model)</b> '-' to clear.
◆ ★ 11	▲	0 – 10000	Y: NNNNN	Y Time setting
★ 12	▲	0, 1, 2, 3	TU: N	TU Time unit (0: sec, 1: min, 2: hour, 3: 0.1 sec)

MODEL NO. 92	BLOCK NAME Counter	MODEL NO. 92
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ABBR: CTR



### General Description

Used to count number of pulse rises of input signal while Run SW S1 is on ('1'). When it reaches the setpoint, it outputs Complete status signal Y1 ON ('1').

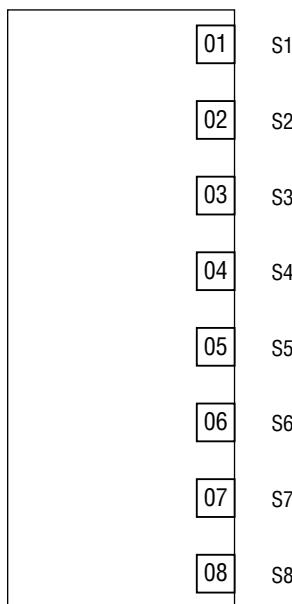
The Y1 signal is reset by turning off the S1 ('0').

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	0 – 10000	MT: NNNNN	MT Count value
04	▲	0, 1	S1: N	S1 Run SW (0: reset, 1: run)
05	▲	0, 1	S2: N	S2 Pulse input SW
06	▲	0, 1	Y1: N	Y1 Complete status
★ 10	▲ 92	MD: 92		<b>COUNTER (model)</b> ' to clear.
◆ ★ 11	▲ 0 – 10000	SC: NNNNN		SC Count setting

MODEL NO.	BLOCK NAME	MODEL NO.
93	Internal Switch	93

ABBR: ISW



### General Description

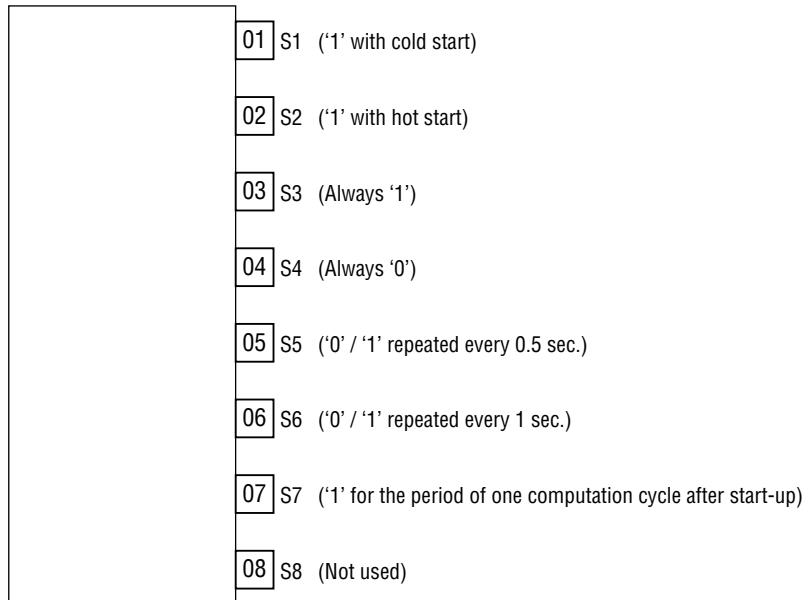
The block is used in a sequential control to store calculation status of a logic calculation in progress.

**GROUP [30 – 61]** ◆: Automatically changeable parameters ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
★ 10	▲	93	MD: <u>93</u>	<b>INTERNAL SWITCH (model)</b> ‘-’ to clear.
◆ 11	▲	0, 1	01: N	S1 Internal switch
◆ 12	▲	0, 1	02: N	S2 Internal switch
◆ 13	▲	0, 1	03: N	S3 Internal switch
◆ 14	▲	0, 1	04: N	S4 Internal switch
◆ 15	▲	0, 1	05: N	S5 Internal switch
◆ 16	▲	0, 1	06: N	S6 Internal switch
◆ 17	▲	0, 1	07: N	S7 Internal switch
◆ 18	▲	0, 1	08: N	S8 Internal switch

MODEL NO.	BLOCK NAME	MODEL NO.
94	System's Internal Switch	94

ABBR: SSW



### General Description

The system determines the most appropriate switch status for the user's application.

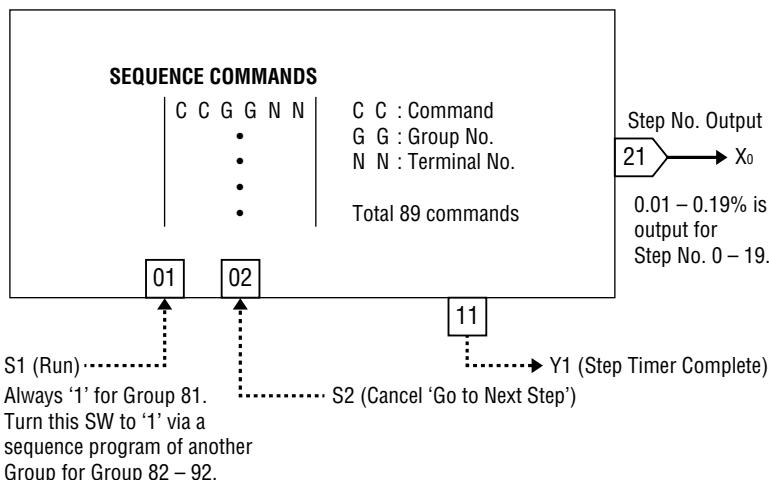
### GROUP [80]

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
<b>10</b>	▲	<b>94</b>	<b>MD: 94</b>	<b>SYSTEM'S INTERNAL SWITCH (model)</b> '-' to clear.
11	IND	0, 1	01: N	S1 '1' with cold start
12	IND	0, 1	02: N	S2 '1' with hot start
13	IND	1	03: 1	S3 Always '1'
14	IND	0	04: 0	S4 Always '0'
15	IND	0, 1	05: N	S5 '0' / '1' repeated every 0.5 second
16	IND	0, 1	06: N	S6 '0' / '1' repeated every 1 second
17	IND	0, 1	07: N	S7 '1' for the period of one computation cycle after start-up
18	IND	0, 1	08: N	S8 Reserved for the system

Note: The System's Internal Switch block, registered in Group 80 at default setting, cannot be deleted.

MODEL NO.	BLOCK NAME	MODEL NO.
95	Sequential Control Program	95

ABBR: SEQ



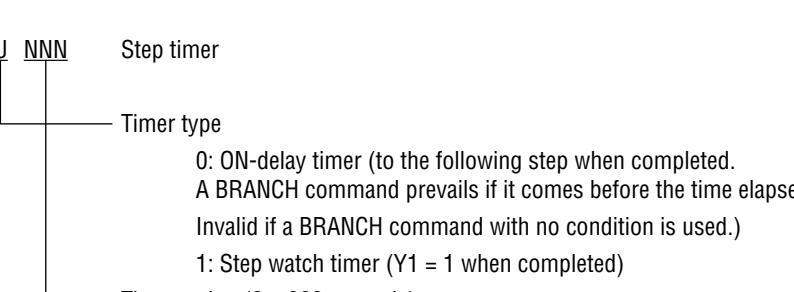
### General Description

The block is used for relay sequence control and step sequence control by utilizing sequence commands.

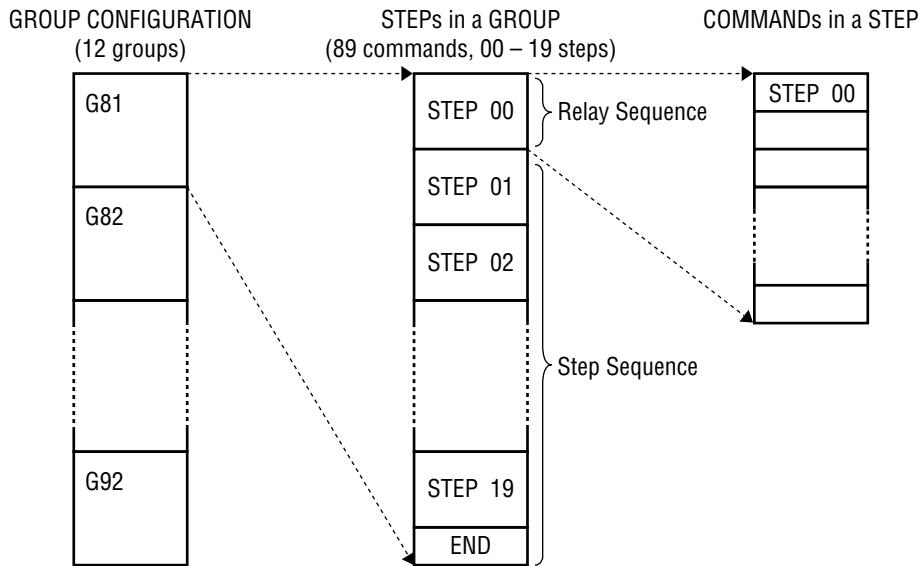
#### GROUP [81 – 92] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
03	▲	00 – 19	ST: NN	Step No.
04	▲	0 – 999 s	TS: NNN	Step timer setting
05	▲	0 – 999 s	TM: NNN	Elapsed step timer count
06	▲	0, 1	S1: N	S1 Run SW
07	▲	0, 1	S2: N	S2 Cancel 'go to next step' SW
08	▲	0, 1	Y1: N	Y1 Step timer complete status
★ 10	▲	95	MD: 95	<b>SEQUENTIAL CONTROL PROGRAM</b> (model) '-' to clear.
★ 11	▲	CCGGNN	13: 0000	Sequence command (Step Command for ITEM 11)
★ 12	▲	CCGGNN	CC: GGNN	:
:	:	:	:	CC: Command
:	:	:	:	GG: Group No.
★ 99	▲	CCGGNN	CC: GGNN	NN: Terminal No.

## ■ Command List

FUNCTION	ABBR	COMMAND CC GG NN	EXPLANATION
END	ED	00 00 00	End of a block (described in the last ITEM)
<b>CONDITIONING COMMANDS</b>			
INPUT	IN	01 GG NN	The first contact in a relay circuit
INPUT NOT	NI	02 GG NN	The first contact in a relay circuit (true in an opposite condition)
AND	AD	03 GG NN	Series contact in a relay circuit
AND NOT	NA	04 GG NN	Series contact in a relay circuit (true in an opposite condition)
OR	OR	05 GG NN	Parallel contact in a relay circuit
OR NOT	NR	06 GG NN	Parallel contact in a relay circuit (true in an opposite condition)
<b>OUTPUT COMMANDS</b>			
OUTPUT	OT	07 GG NN	Equivalent to a coil in a relay circuit
OUTPUT NOT	NO	08 GG NN	Equivalent to a coil in a relay circuit (true in an opposite condition)
OUTPUT ON	ON	09 GG NN	Equivalent to a set coil in a relay circuit
OUTPUT OFF	OF	10 GG NN	Equivalent to a reset coil in a relay circuit
OUTPUT SHOT	SH	11 GG NN	One-shot output in a relay circuit <ul style="list-style-type: none"> <li>• Turned on for the duration of only one computation cycle.</li> <li>• Max. 100 types of outputs in all Groups.</li> </ul>
<b>BRANCH COMMAND</b>			
BRANCH	BR	12 GG SS	If condition is true, go to a specified step in a specified block (GG: block No., SS: step No.) SS: 01 – 19
		12 00 SS	If condition is true, go to a specified step in the same block (GG = 00, 00 specifies the same block) SS: 01 – 19
<b>STEP COMMAND</b>			
STEP	ST	13 00 SS	Declare step No. (SS: step No., 00 – 19) <ul style="list-style-type: none"> <li>• Any number can be assigned for SS. Used in order from the smallest number.</li> <li>• SS: 00 Operates at any time (relay sequence)</li> <li>• SS: 01 – 19 Either one of SS's operates (step sequence)</li> </ul>
<b>STEP TIMER</b>			
TIMER	TM	14 U NNN	Step timer  <ul style="list-style-type: none"> <li>0: ON-delay timer (to the following step when completed. A BRANCH command prevails if it comes before the time elapsed. Invalid if a BRANCH command with no condition is used.)</li> <li>1: Step watch timer (Y1 = 1 when completed)</li> </ul> Time setting (0 – 999 seconds)
NOP	NP	15 00 00	No control operation (used when you need to delete commands without changing other ITEM No.s)

## ■ Configuration of 12 Sequential Control Blocks



### LINKING BETWEEN GROUPS

If you need for your program more than available 89 commands in one Group, you can link between one Group and another. Total 1,068 commands are available if all Groups are linked.

- Relay Sequence (Step 00): Results at a certain stage of sequence are written in the Internal Switch block. These results are picked up as input to another Group so that it continues the sequence.
- Step Sequence (Step 01 – 19): A Branch command is used to link with another Group. Only Steps 01 – 19 are available for linking.

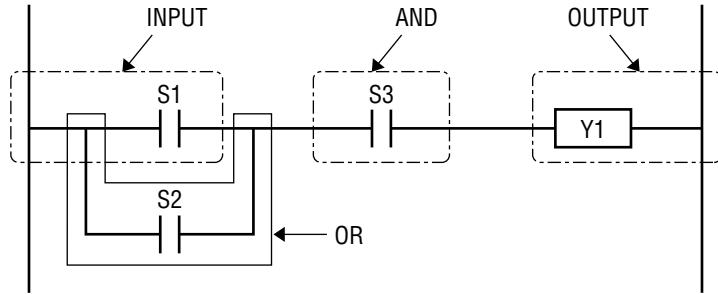
### S1 (RUN SW)

- The S1 for Group 81 are always set to '1'. The ones for Group 82 – 92 are set to '0' at the start. A command from another sequence program turn the S1 to '1' when it is used.
- With S1 at '1', Step 00 and 01 starts operating.
- With S1 at '0', the operation is stopped and returns to Step 01.

### S2 (cancel 'Go to next step' SW)

- With S2 at '1', the operation continues within the step currently in operation.
- With S2 at '0', the operation restarts where it was stopped.
- In a step sequence, the S2 is turned to '1' when the operation is branched to another Group.
- In a step sequence, the S2 is turned to '0' before the operation is branched to another Group if the S2 of this another group is set to '1'.

## ■ Example of Sequence Control Program



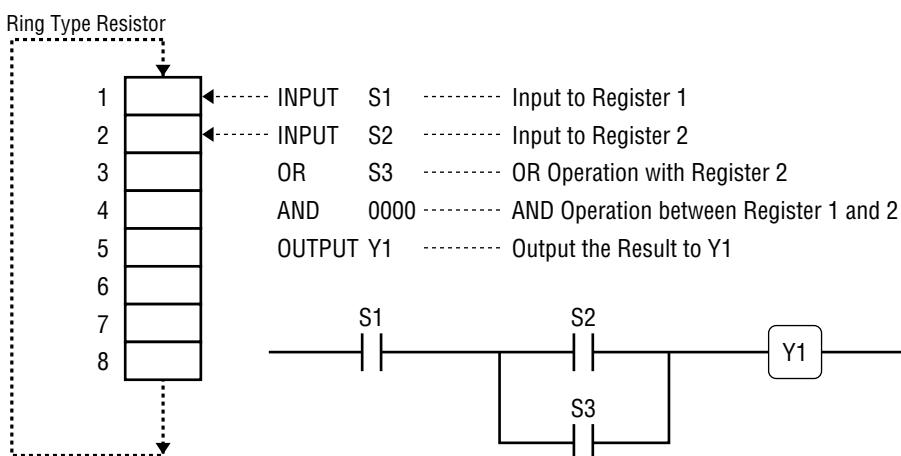
Describing Terminal No. (e.g. **0111**)

ITEM	DATA	
11	13 0000	----- STEP 00 ----- Declaring STEP 00. Used always.
12	01 GGNN	----- INPUT S1
13	05 GGNN	----- OR S2
14	03 GGNN	----- AND S3
15	07 GGNN	----- OUTPUT Y1
16	00 0000	----- END ----- END command at the end of ITEM.

## ■ Processing a Logic Operation Command without Input Address

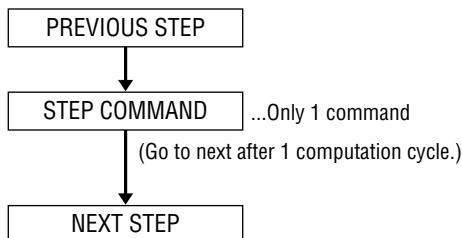
Conditioning commands without input (GGNN = 0000) address are used in case of the following:

Max. 8 INPUT, INPUT NOT commands can be used in series. Operations between registers are executed in order from the last programmed register No.

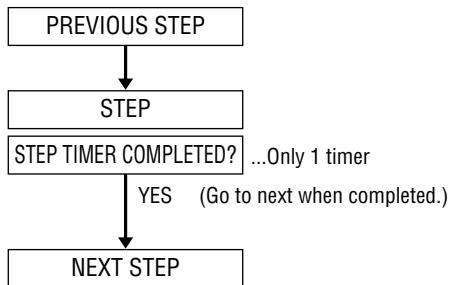


## ■ Operation Example within One Step

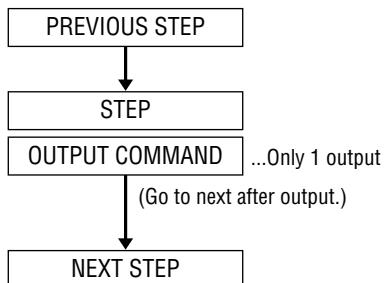
### (1) 1 step command



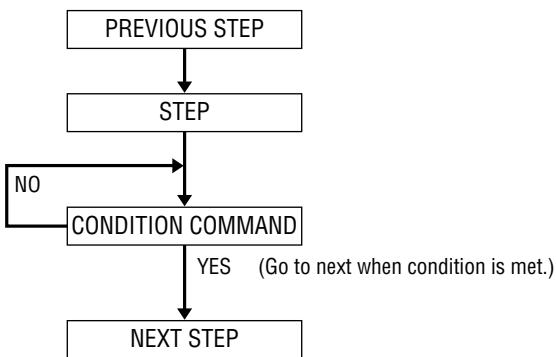
### (2) 1 step timer



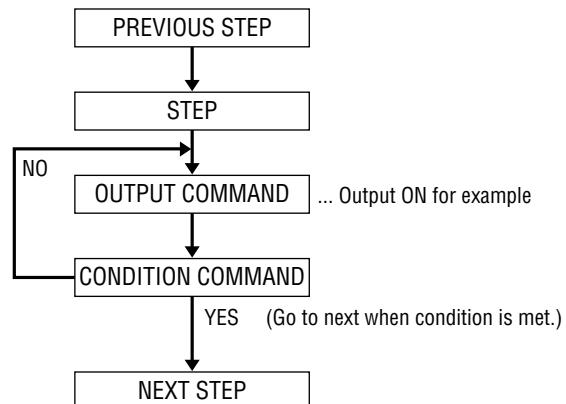
### (3) Step with output only



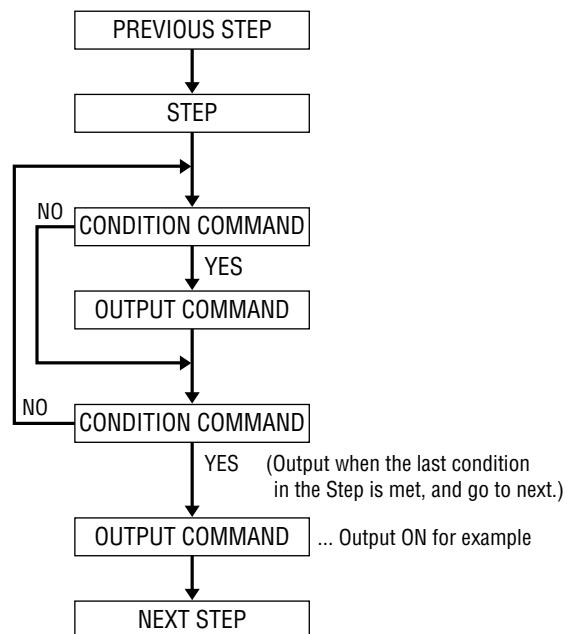
### (4) Step with conditioning only



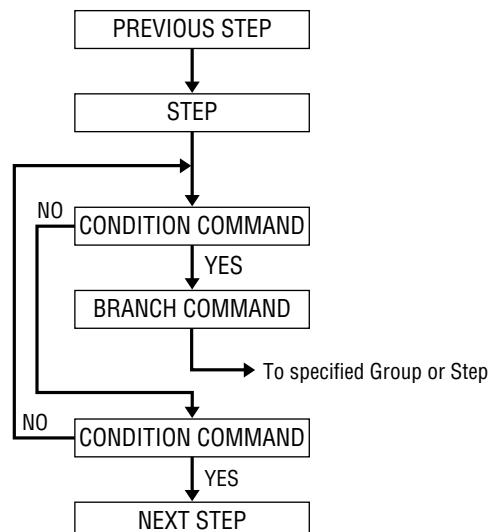
### (5) Describing condition after output



### (6) Describing output after conditioning



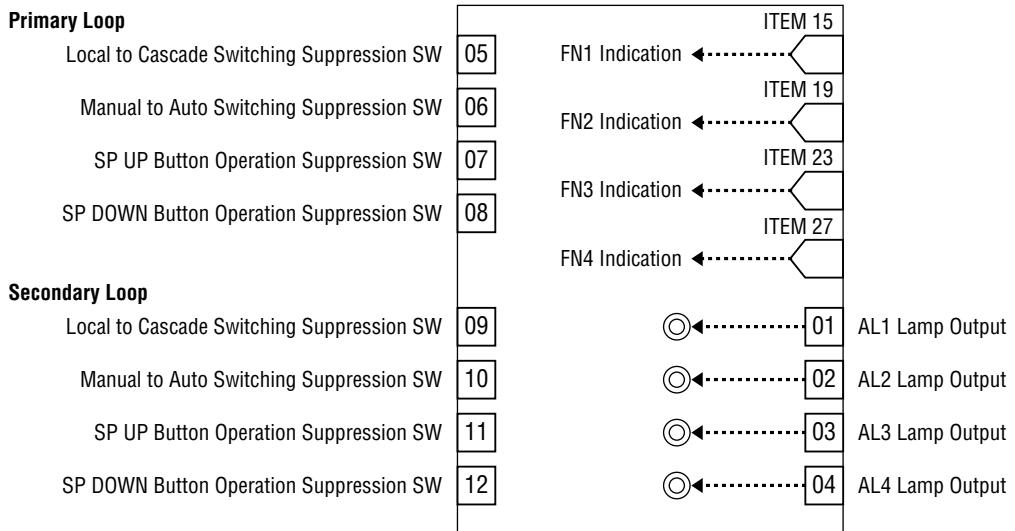
### (7) Branching with multiple conditions



### 3. FIELD TERMINAL BLOCKS

ABBR	MODEL NO.	I/O TYPE
F70	SC100	Ai 6 + Ao 4 + Di/Pi 6 + Do 6 Field Terminal Extension Field Terminal 1 Extension Field Terminal 2
F71	SC200	Ai 6 + Ao 4 + Di/Pi 6 + Do 6 Field Terminal Extension Field Terminal 1 Extension Field Terminal 2
F72	SC110	Ai 6 + Ao 4 + Di/Pi 6 + Do 6 Field Terminal Extension Field Terminal 1 Extension Field Terminal 2
F73	SC210	Ai 6 + Ao 4 + Di/Pi 6 + Do 6 Field Terminal Extension Field Terminal 1 Extension Field Terminal 2
F24	SML-A4	Di 8
F25	SML-C7	Do 8
F25	SML-C8	Do 8
F26	SML-E5	Di 4 + Do 4
F27	SML-G3	Ai 8
F28	SML-G4	Ai 4
F29	SML-M4	Ao 4
F14	SML-P4	Pi 4
F31	SML-R3	Ai 4 + Ao 4
F32	SML-S5	Ai 4 + Di 4
F33	SML-S6	Ao 4 + Do 4

ABBR F70	FIELD TERMINAL <b>SC100 Field Terminal</b>	ABBR F70
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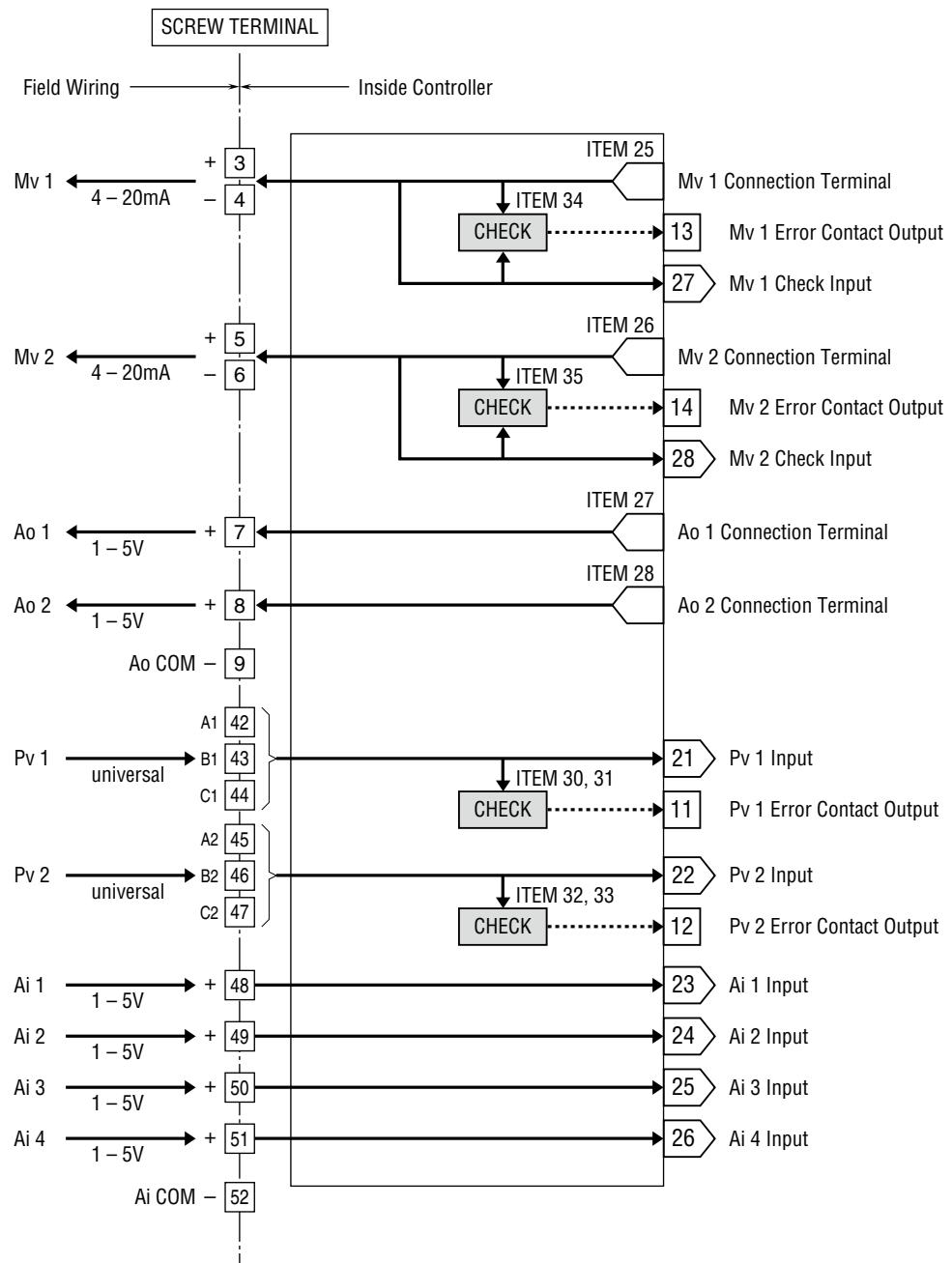

**GROUP [01]** ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXX	AL4 comment (max. 4 characters)
<b>CONTROL</b>				
Primary Loop				
51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Secondary Loop				
55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Common Items				
61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button <b>SC 1.70</b>
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button <b>SC 1.70</b>

Remark 1: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

Remark 2: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.

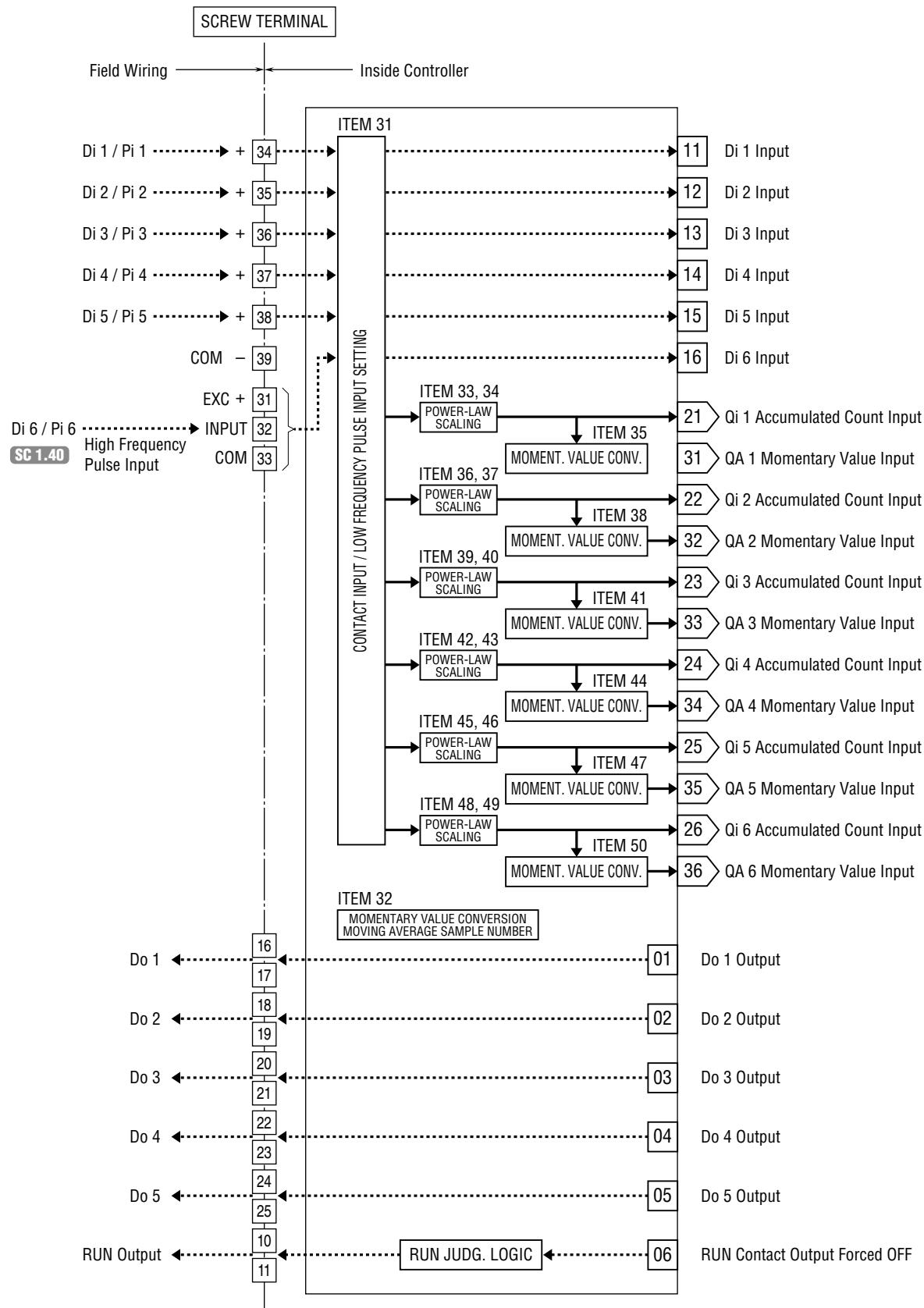


ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [04] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0: -10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V      6: K      13: C      19: Pt100 (JIS '97, IEC) 1: -1-1 V      7: E      14: N      20: Pt100 (JIS '89) 2: 0-10 V      8: J      15: U      21: JPt100 (JIS '89) 3: 1-5 V      9: T      16: L      22: Pt50 (JIS '81) 4: 0-1 V      10: B      17: P      23: Ni100 5: 4-20 mA      11: R      18: PR      24: MS 12: S      19: Pt100 (JIS '97, IEC) 13: C      20: Pt100 (JIS '89) 14: N      21: JPt100 (JIS '89) 15: U      22: Pt50 (JIS '81) 16: L      23: Ni100 17: P      24: MS 18: PR      25: DS
				(Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)



ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [05] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	QA 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	Qi 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6) <b>SC 1.40</b>

Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

ABBR F71	FIELD TERMINAL SC200 Field Terminal	ABBR F71
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### Primary Loop

Local to Cascade Switching Suppression SW



Manual to Auto Switching Suppression SW

SP UP Button Operation Suppression SW

SP DOWN Button Operation Suppression SW

### Secondary Loop

Local to Cascade Switching Suppression SW



Manual to Auto Switching Suppression SW

SP UP Button Operation Suppression SW

SP DOWN Button Operation Suppression SW

### GROUP [01] ★: Setting data

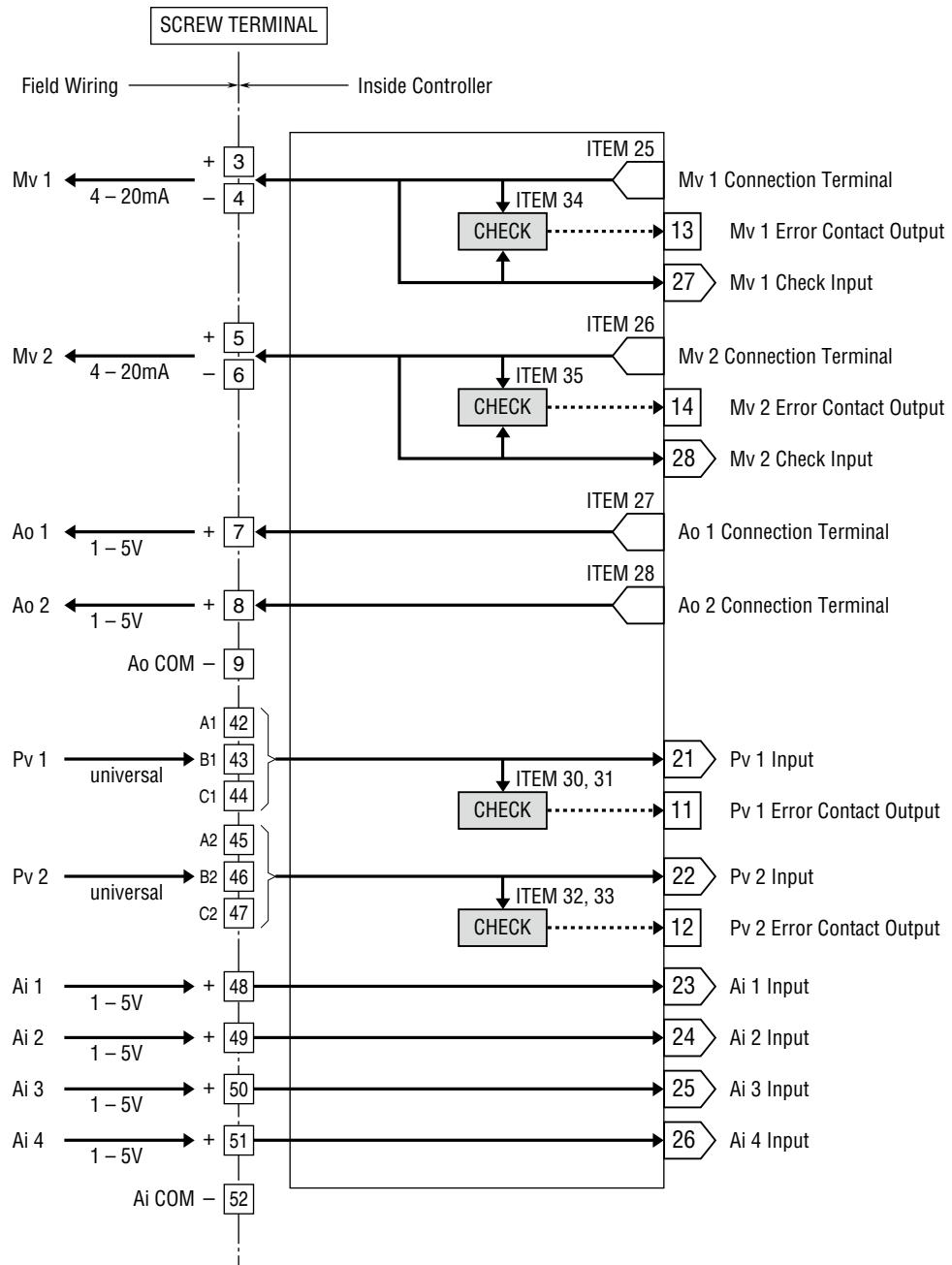
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
10	IND	11	MD: 11	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXXX	AL4 comment (max. 4 characters)
CONTROL (Remark 1)				
Primary Loop				
51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Secondary Loop				
55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Common Items				
61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button <b>SC 1.70</b>
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button <b>SC 1.70</b>

Remark 1: Control by a host device connected via Modbus prevails the local setting.

Remark 2: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

Remark 3: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.

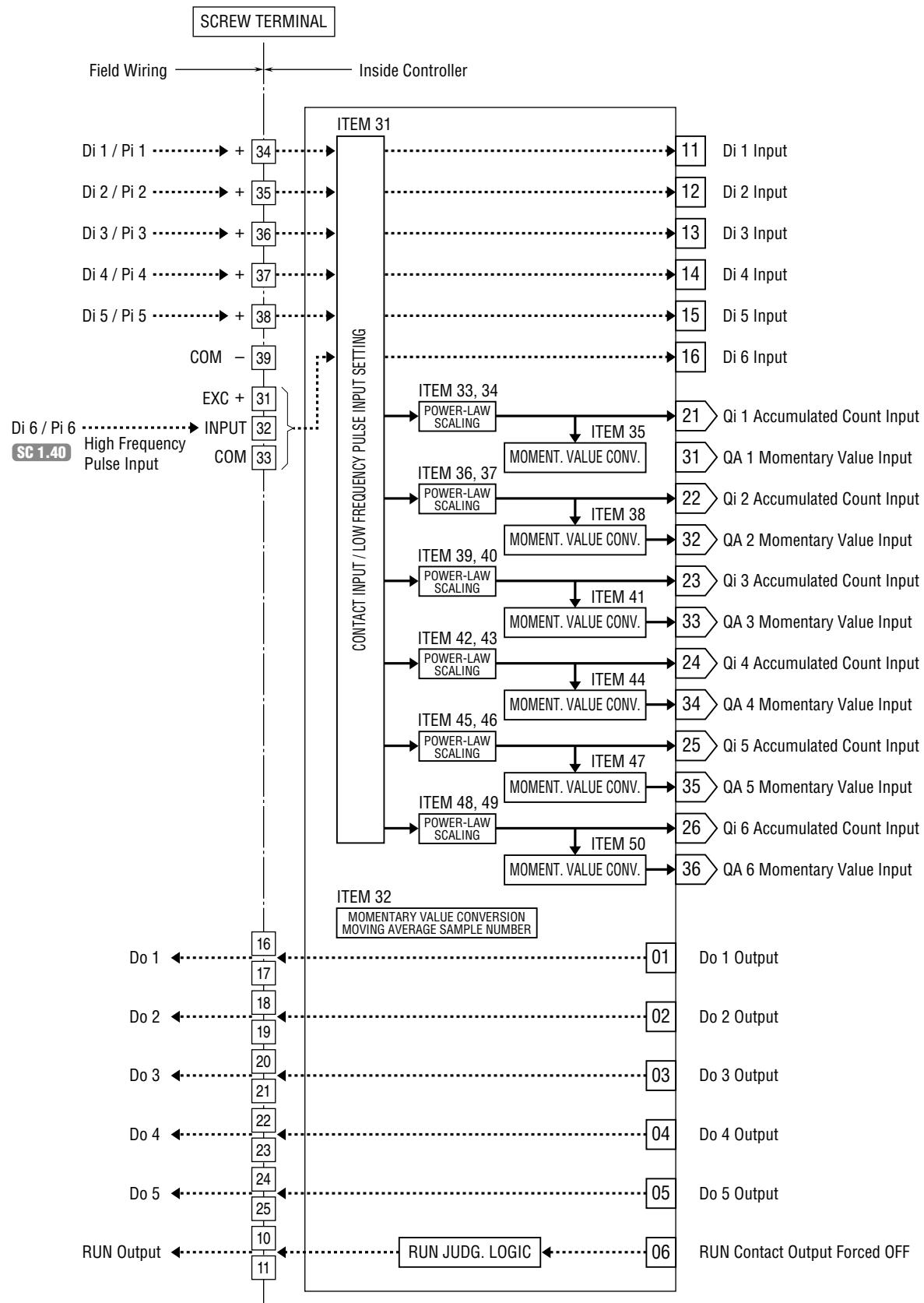


ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [04] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0: -10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V      6: K      13: C      19: Pt100 (JIS '97, IEC) 1: -1-1 V      7: E      14: N      20: Pt100 (JIS '89) 2: 0-10 V      8: J      15: U      21: JPt100 (JIS '89) 3: 1-5 V      9: T      16: L      22: Pt50 (JIS '81) 4: 0-1 V      10: B      17: P      23: Ni100 5: 4-20 mA      11: R      18: PR      24: MS 12: S      19: Pt100 (JIS '97, IEC) 13: C      20: Pt100 (JIS '89) 14: N      21: JPt100 (JIS '89) 15: U      22: Pt50 (JIS '81) 16: L      23: Ni100 17: P      24: MS 18: PR      25: DS
				(Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)



## GROUP [05] ★: Setting data

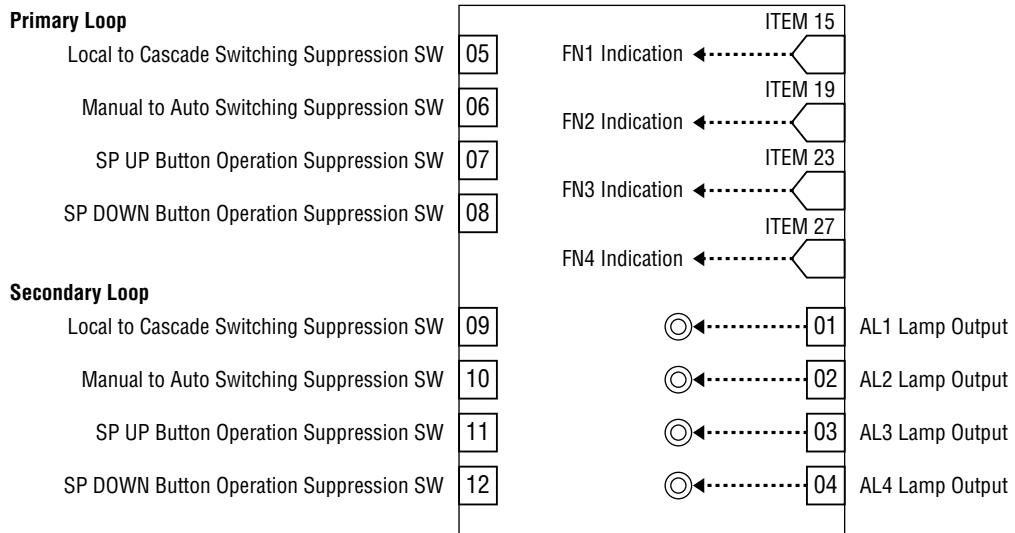
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
	S	MT: S		SIMULATION mode: “*” marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6) <b>SC 1.40</b>

Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

ABBR F91	FIELD TERMINAL SC200W Field Terminal	ABBR F91
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**GROUP [01]** ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
		S	MT: S	SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXXX	AL4 comment (max. 4 characters)

**CONTROL** (Remark 1)

Primary Loop

51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

Secondary Loop

55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

Common Items

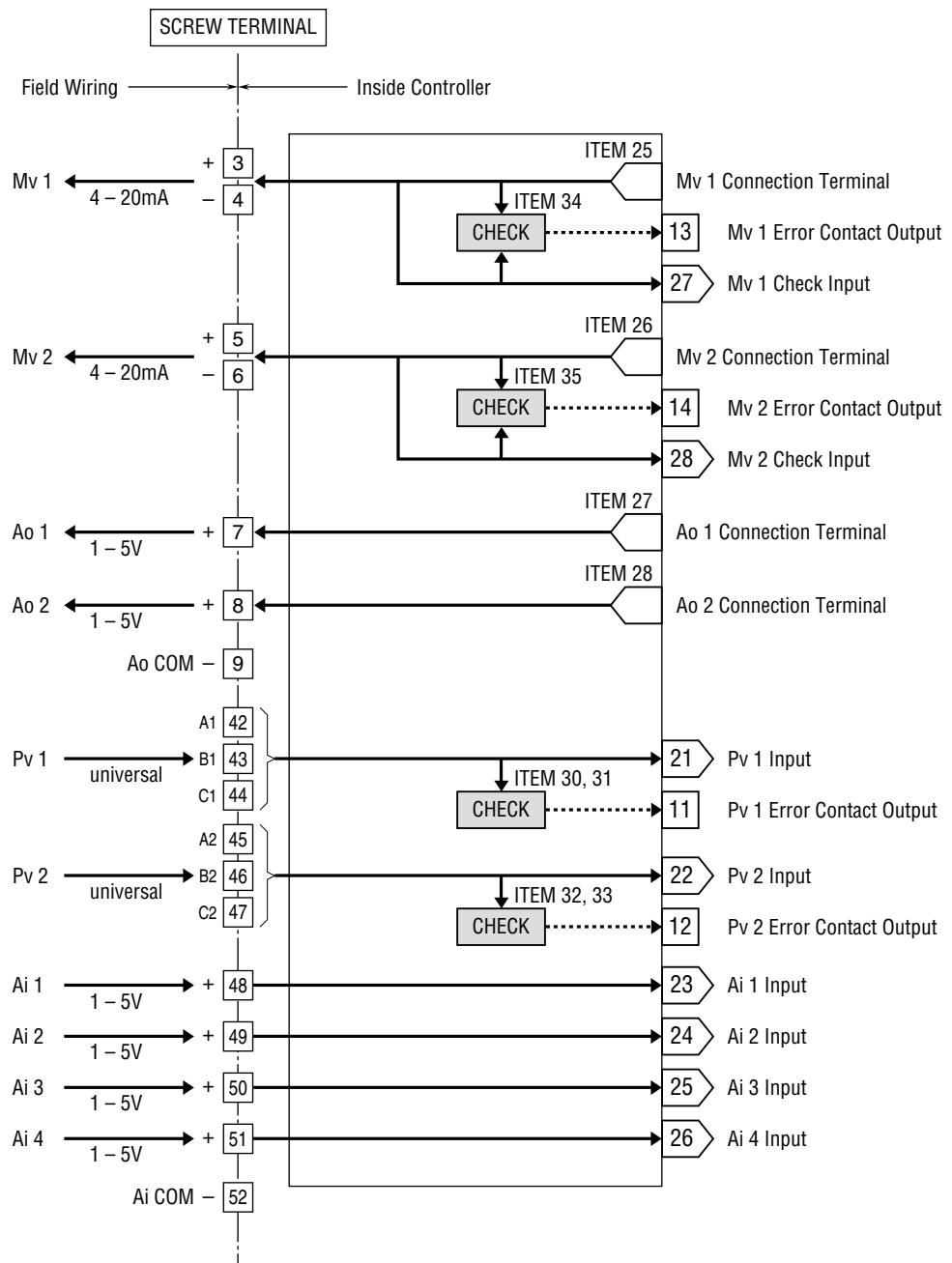
61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON)
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON)
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON)
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON)
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button

Remark 1: Control by a host device connected via Modbus prevails the local setting.

Remark 2: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

Remark 3: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.

ABBR F91	FIELD TERMINAL <b>SC200W Extension Field Terminal 1</b>	ABBR F91
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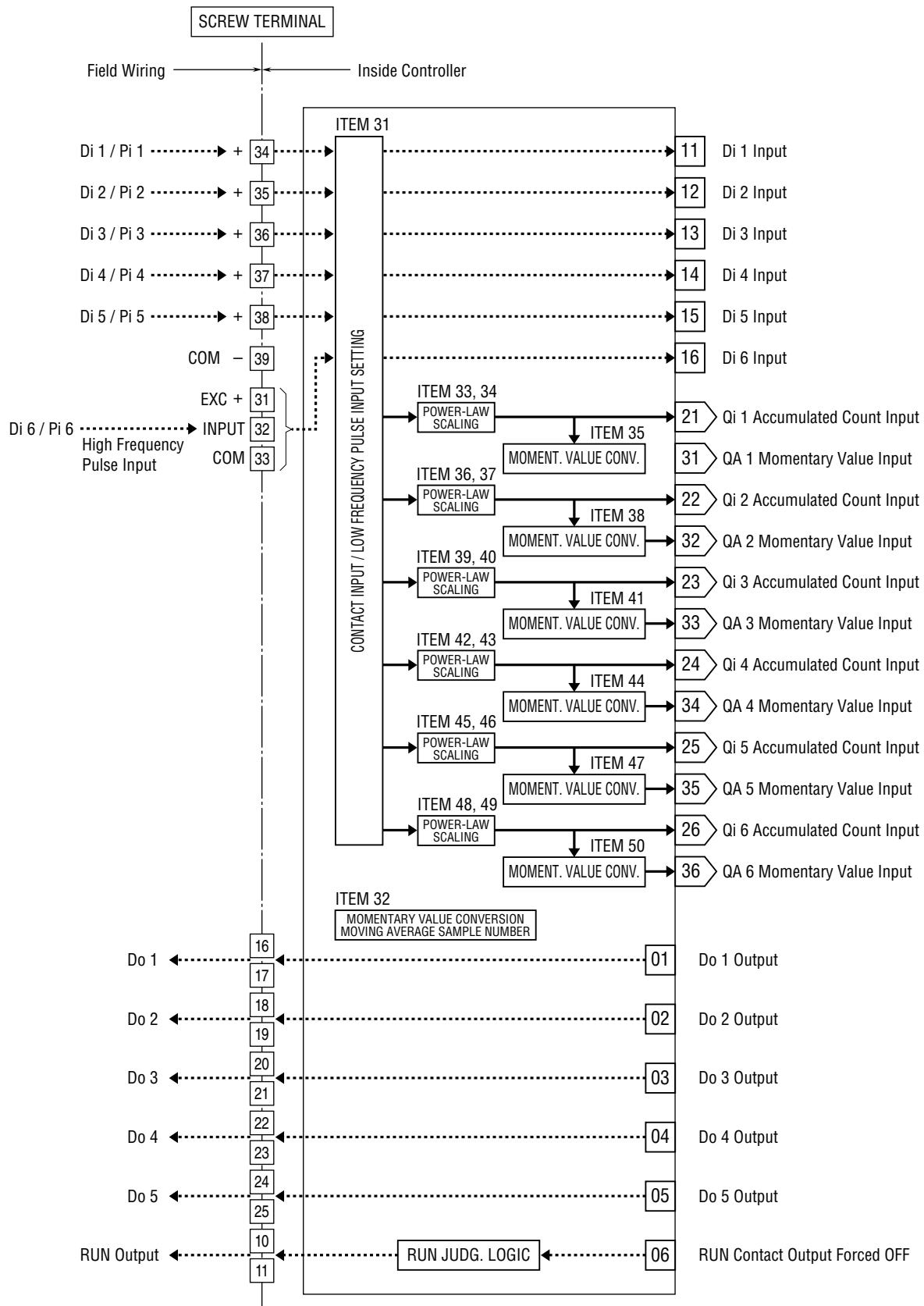
ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

**GROUP [04]**

★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0:-10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V      6: K      13: C      19: Pt100 (JIS '97, IEC) 1: -1-1 V      7: E      14: N      20: Pt100 (JIS '89) 2: 0-10 V      8: J      15: U      21: JPt100 (JIS '89) 3: 1-5 V      9: T      16: L      22: Pt50 (JIS '81) 4: 0-1 V      10: B      17: P      23: Ni100 5: 4-20 mA      11: R      18: PR      24: MS 12: S      19: Pt100 (JIS '97, IEC) 13: C      20: Pt100 (JIS '89) 14: N      21: JPt100 (JIS '89) 15: U      22: Pt50 (JIS '81) 16: L      23: Ni100 17: P      24: MS 18: PR      25: DS
				(Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)



ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

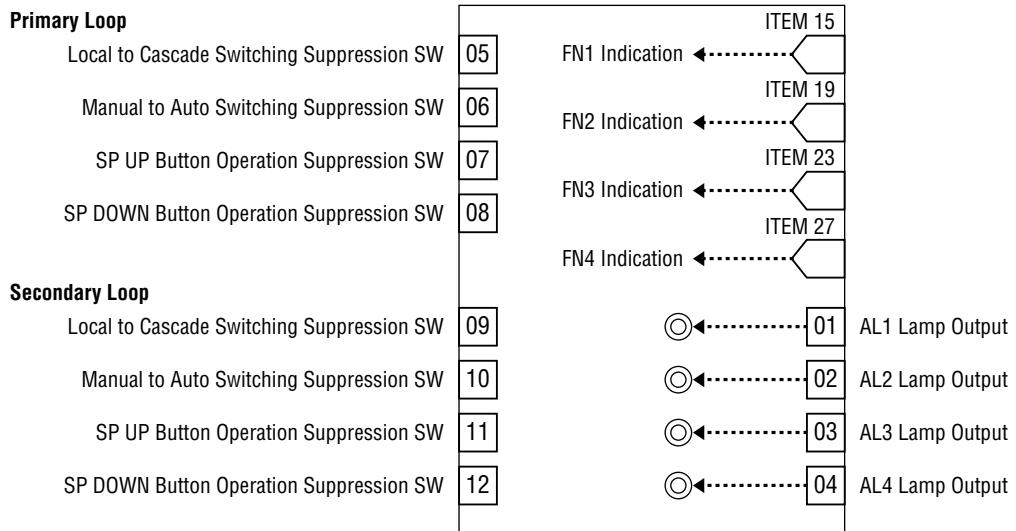
## GROUP [05] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
	S	MT: S		SIMULATION mode: “*” marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6)

Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

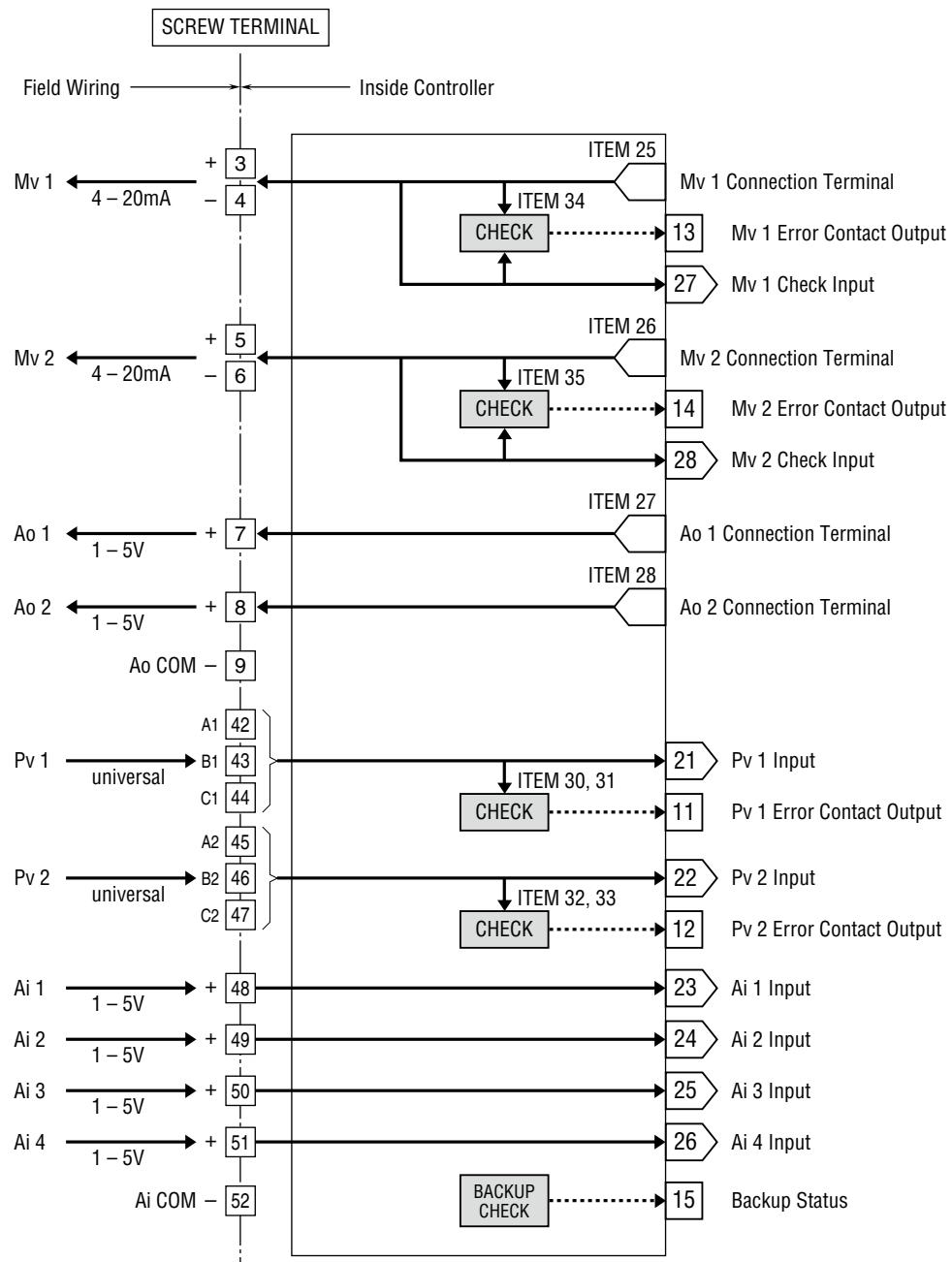

**GROUP [01] ★: Setting data**

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		<p>■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2</p>
	0	MT: 0	MT: 0	MONITOR mode: data monitoring only
	1	MT: 1	MT: 1	PROGRAM mode: "▲" marked data modifiable
	S	MT: S	MT: S	SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXX	AL4 comment (max. 4 characters)
<b>CONTROL</b>				
Primary Loop				
51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Secondary Loop				
55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)
Common Items				
61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button <b>SC 1.70</b>
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button <b>SC 1.70</b>

Remark 1: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

Remark 2: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.

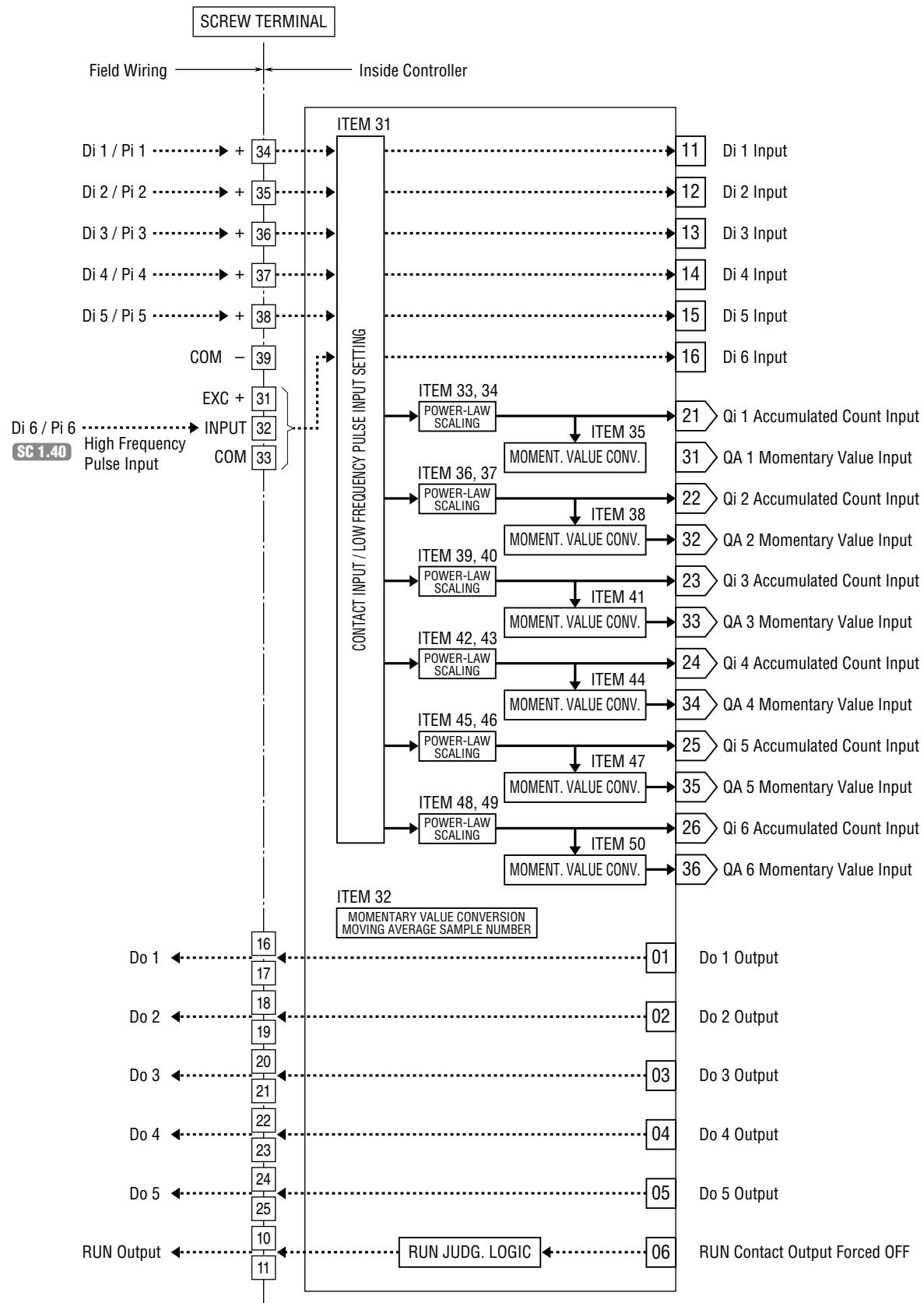


ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [04] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0:-10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V      6: K      12: S      19: Pt100 (JIS '97, IEC) 1: -1-1 V      7: E      13: C      20: Pt100 (JIS '89) 2: 0-10 V      8: J      14: N      21: JPt100 (JIS '89) 3: 1-5 V      9: T      15: U      22: Pt50 (JIS '81) 4: 0-1 V      10: B      16: L      23: Ni100 5: 4-20 mA      11: R      17: P      24: MS 18: PR      25: DS (Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)
<b>BACKUP (Mv 2)</b>				
80	▲	-15.00 – 115.00 %	MVB: NNN.NN	Manual loading MV
★ 81	▲	0, 1	BSW: NNN.NN	Automatic switching (0: disable, 1: enable)
★ 82	▲	0, 1	BMD: NNN.NN	Backup output mode (0: track back, 1: preset value)
★ 83	▲	0.00 – 115.00 %/s	BVL: NNN.NN	Output rate-of-change limit (0.00: no limit applied)
★ 84	▲	-15.00 – 115.00 %	BFV: NNN.NN	Preset value (applied with ITEM 82 DATA 1)
★ 85	▲	0, 1	BBL: N	Backup recovery mode (0: auto tracking, 1: manual tracking)
★ 86	▲	2, 3	BGR: N	Backup GROUP
87	▲	0, 1	15: N	Backup status (0: normal, 1: backup) <b>SC 1.50</b>



ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [05] ★: Setting data

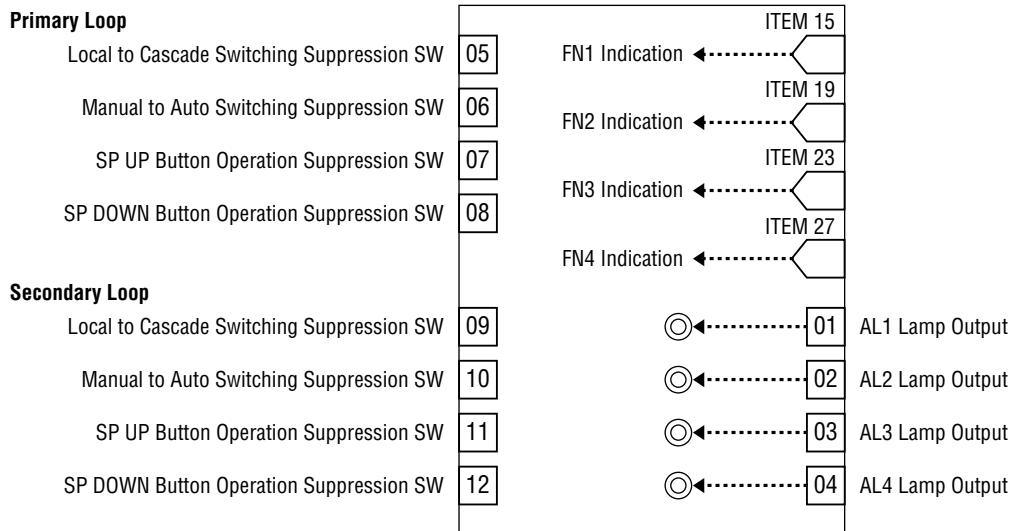
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
	S	MT: S		SIMULATION mode: “*” marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6) <b>SC 1.40</b>

Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

ABBR F73	FIELD TERMINAL SC210 Field Terminal	ABBR F73
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**GROUP [01]** ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXXX	AL4 comment (max. 4 characters)

**CONTROL** (Remark 1)

Primary Loop

51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

Secondary Loop

55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

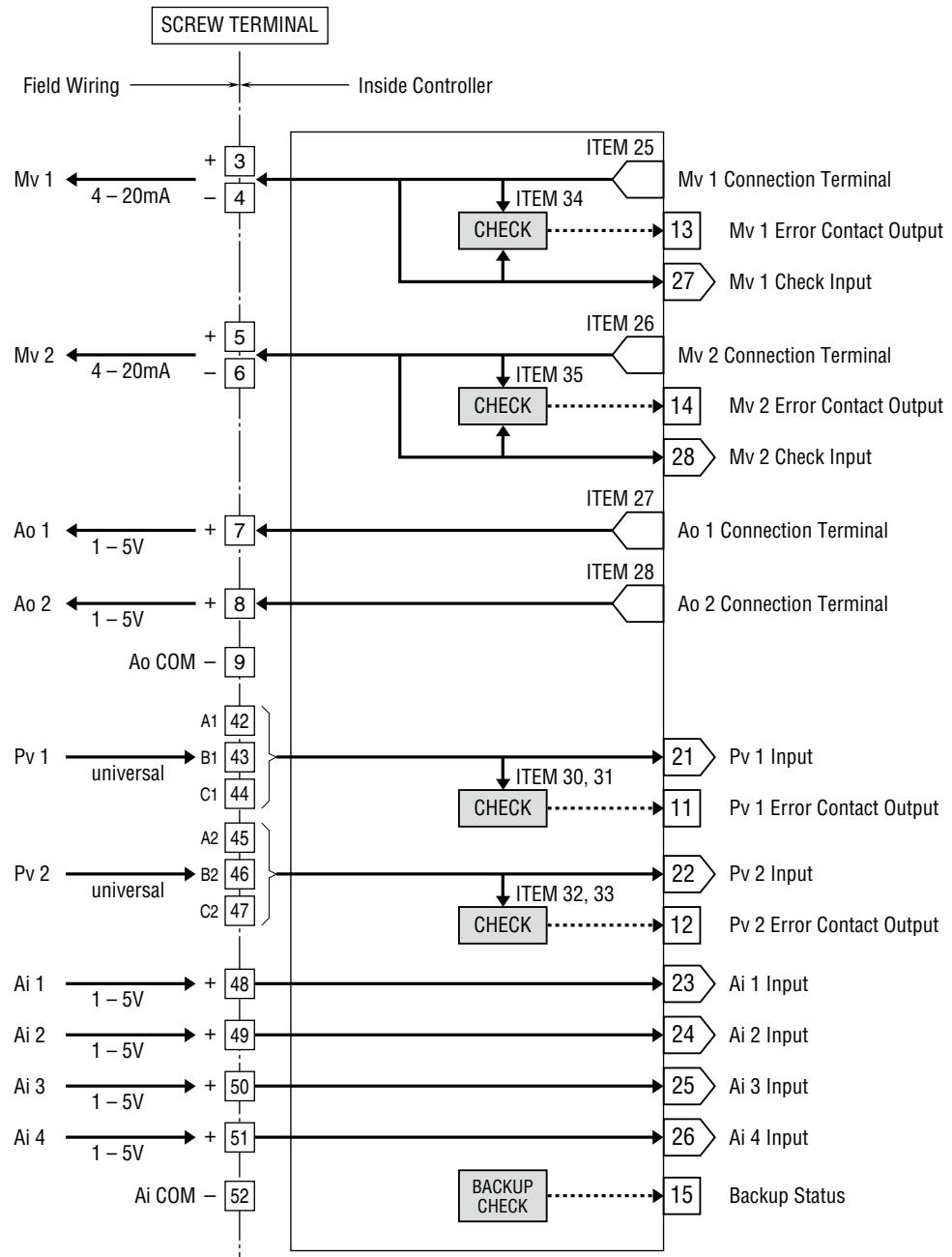
Common Items

61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON) <b>SC 1.70</b>
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button <b>SC 1.70</b>
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button <b>SC 1.70</b>

Remark 1: Control by a host device connected via Modbus prevails the local setting.

Remark 2: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

Remark 3: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.

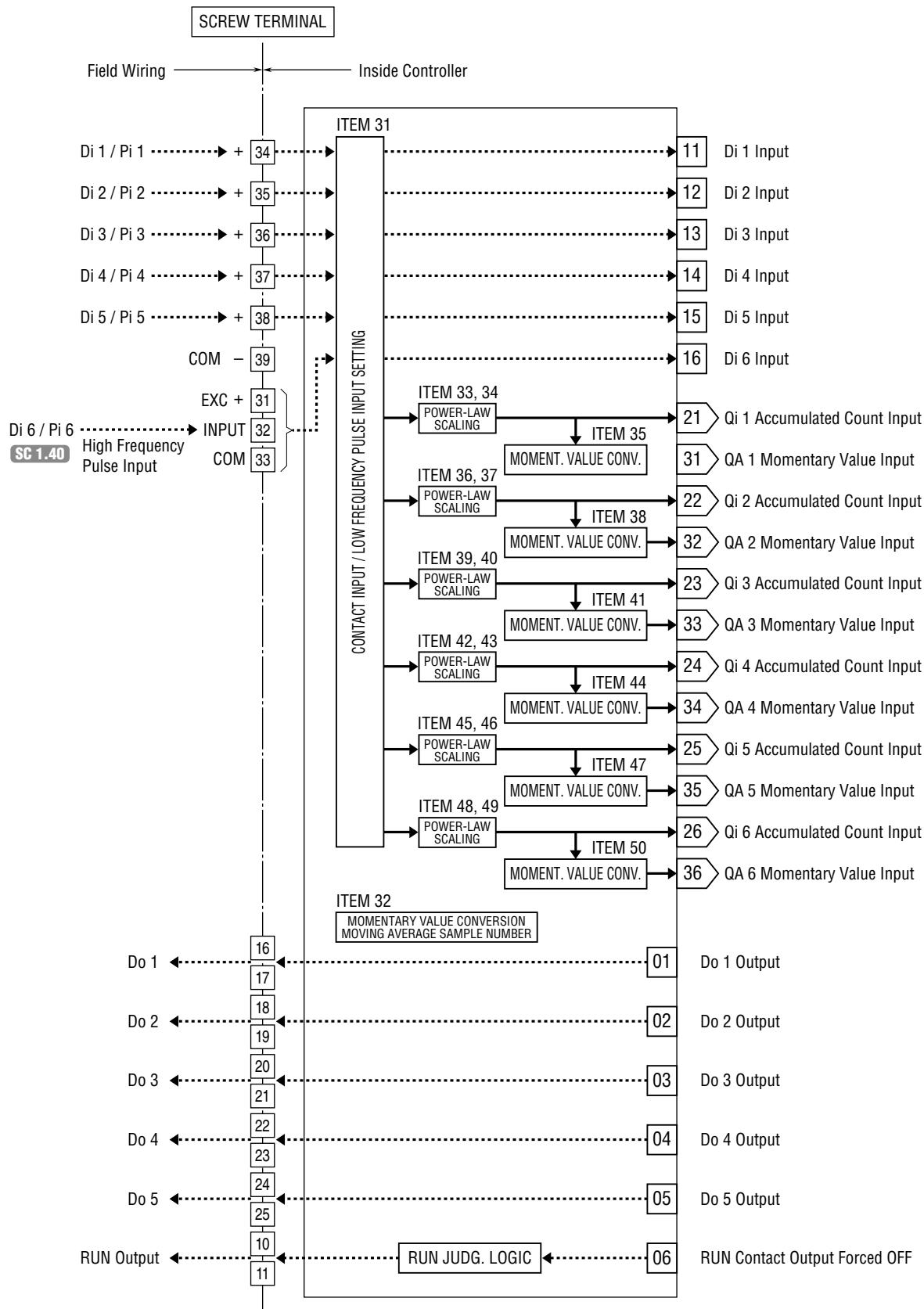


ITEM 02 has no error indication. It is indicated in GROUP 01 (Field Terminal).

## GROUP [04] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0: -10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V 6: K 12: S 19: Pt100 (JIS '97, IEC) 1: -1-1 V 7: E 13: C 20: Pt100 (JIS '89) 2: 0-10 V 8: J 14: N 21: JPt100 (JIS '89) 3: 1-5 V 9: T 15: U 22: Pt50 (JIS '81) 4: 0-1 V 10: B 16: L 23: Ni100 5: 4-20 mA 11: R 17: P 24: MS 18: PR 25: DS  (Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)
<b>BACKUP (Mv 2)</b>				
80	▲	-15.00 – 115.00 %	MVB: NNN.NN	Manual loading MV
★ 81	▲	0, 1	BSW: NNN.NN	Automatic switching (0: disable, 1: enable)
★ 82	▲	0, 1	BMD: NNN.NN	Backup output mode (0: track back, 1: preset value)
★ 83	▲	0.00 – 115.00 %/s	BVL: NNN.NN	Output rate-of-change limit (0.00: no limit applied)
★ 84	▲	-15.00 – 115.00 %	BFV: NNN.NN	Preset value (applied with ITEM 82 DATA 1)
★ 85	▲	0, 1	BBL: N	Backup recovery mode (0: auto tracking, 1: manual tracking)
★ 86	▲	2, 3	BGR: N	Backup GROUP
87	▲	0, 1	15: N	Backup status (0: normal, 1: backup) <b>SC 1.50</b>



## GROUP [05] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
	S	MT: S		SIMULATION mode: “*” marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6) <b>SC 1.40</b>

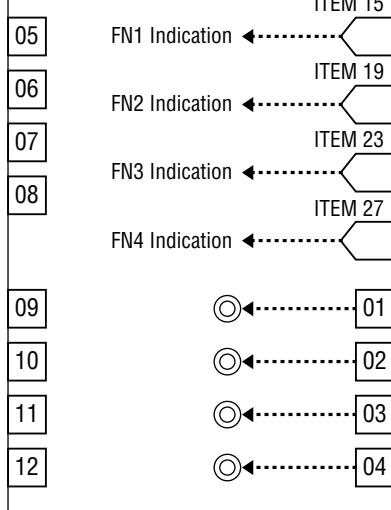
Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

ABBR F93	FIELD TERMINAL <b>SC210W Field Terminal</b>	ABBR F93
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**Primary Loop**

Local to Cascade Switching Suppression SW



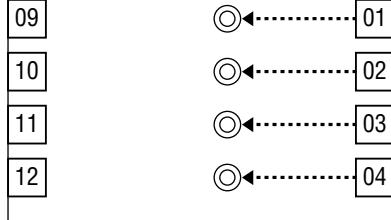
Manual to Auto Switching Suppression SW

SP UP Button Operation Suppression SW

SP DOWN Button Operation Suppression SW

**Secondary Loop**

Local to Cascade Switching Suppression SW



Manual to Auto Switching Suppression SW

SP UP Button Operation Suppression SW

SP DOWN Button Operation Suppression SW

**GROUP [01]** ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0	MT: 0	MONITOR mode: data monitoring only
	1	MT: 1	MT: 1	PROGRAM mode: "▲" marked data modifiable
	S	MT: S	MT: S	SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error) Extension Field Terminal 1 and 2 included
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>INDICATION</b>				
★ 11	▲	2, 3	GR: 2	Primary loop Group No. (valid after reset)
★ 12	▲	0, 1	M1: N	Primary MV operational range (0: ±115%, 1: -15 – +115%)
★ 13	▲	0, 1	M2: N	Secondary MV operational range (0: ±115%, 1: -15 – +115%)
★ 15	▲	GGNN	1F: 3121	FN1 connection terminal for indication GG: Group No. NN: terminal No.
★ 16	▲	±32000	1H: 15000	FN1 upper range (in engineering unit)
★ 17	▲	±32000	1L: 0	FN1 lower range (in engineering unit)
★ 18	▲	0, 1, 2, 3, 4, 5	1D: 1	FN1 decimal point position (from rightmost digit)
★ 19	▲	GGNN	2F: GGNN	FN2 connection terminal for indication GG: Group No. NN: terminal No.
★ 20	▲	±32000	2H: NNNNN	FN2 upper range (in engineering unit)
★ 21	▲	±32000	2L: NNNNN	FN2 lower range (in engineering unit)
★ 22	▲	0, 1, 2, 3, 4, 5	2D: N	FN2 decimal point position (from rightmost digit)
★ 23	▲	GGNN	3F: GGNN	FN3 connection terminal for indication GG: Group No. NN: terminal No.
★ 24	▲	±32000	3H: NNNNN	FN3 upper range (in engineering unit)
★ 25	▲	±32000	3L: NNNNN	FN3 lower range (in engineering unit)
★ 26	▲	0, 1, 2, 3, 4, 5	3D: N	FN3 decimal point position (from rightmost digit)
★ 27	▲	GGNN	4F: GGNN	FN4 connection terminal for indication GG: Group No. NN: terminal No.
★ 28	▲	±32000	4H: NNNNN	FN4 upper range (in engineering unit)
★ 29	▲	±32000	4L: NNNNN	FN4 lower range (in engineering unit)
★ 30	▲	0, 1, 2, 3, 4, 5	4D: N	FN4 decimal point position (from rightmost digit)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 31	▲	alphanumeric	T1: XXX...X	FN1 tag name (max. 10 characters)
★ 32	▲	alphanumeric	T2: XXX...X	FN2 tag name (max. 10 characters)
★ 33	▲	alphanumeric	T3: XXX...X	FN3 tag name (max. 10 characters)
★ 34	▲	alphanumeric	T4: XXX...X	FN4 tag name (max. 10 characters)
★ 35	▲	alphanumeric	U1: XXX...X	FN1 engineering unit (max. 8 characters)
★ 36	▲	alphanumeric	U2: XXX...X	FN2 engineering unit (max. 8 characters)
★ 37	▲	alphanumeric	U3: XXX...X	FN3 engineering unit (max. 8 characters)
★ 38	▲	alphanumeric	U4: XXX...X	FN4 engineering unit (max. 8 characters)
39	▲ *	0, 1	01: N	AL1 lamp output
40	▲ *	0, 1	02: N	AL2 lamp output
41	▲ *	0, 1	03: N	AL3 lamp output
42	▲ *	0, 1	04: N	AL4 lamp output
★ 43	▲	alphanumeric	L1: XXXXX	AL1 comment (max. 4 characters)
★ 44	▲	alphanumeric	L2: XXXXX	AL2 comment (max. 4 characters)
★ 45	▲	alphanumeric	L3: XXXXX	AL3 comment (max. 4 characters)
★ 46	▲	alphanumeric	L4: XXXXX	AL4 comment (max. 4 characters)

**CONTROL** (Remark 1)

Primary Loop

51	▲ *	0, 1	05: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
52	▲ *	0, 1	06: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
53	▲ *	0, 1	07: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
54	▲ *	0, 1	08: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

Secondary Loop

55	▲ *	0, 1	09: N	Local to Cascade switching suppress. SW (0: permit, 1: prohibit)
56	▲ *	0, 1	10: N	Manual to Auto switching suppress. SW (0: permit, 1: prohibit)
57	▲ *	0, 1	11: N	SP UP button operation suppress. SW (0: permit, 1: prohibit)
58	▲ *	0, 1	12: N	SP DOWN button operation suppress. SW (0: permit, 1: prohibit)

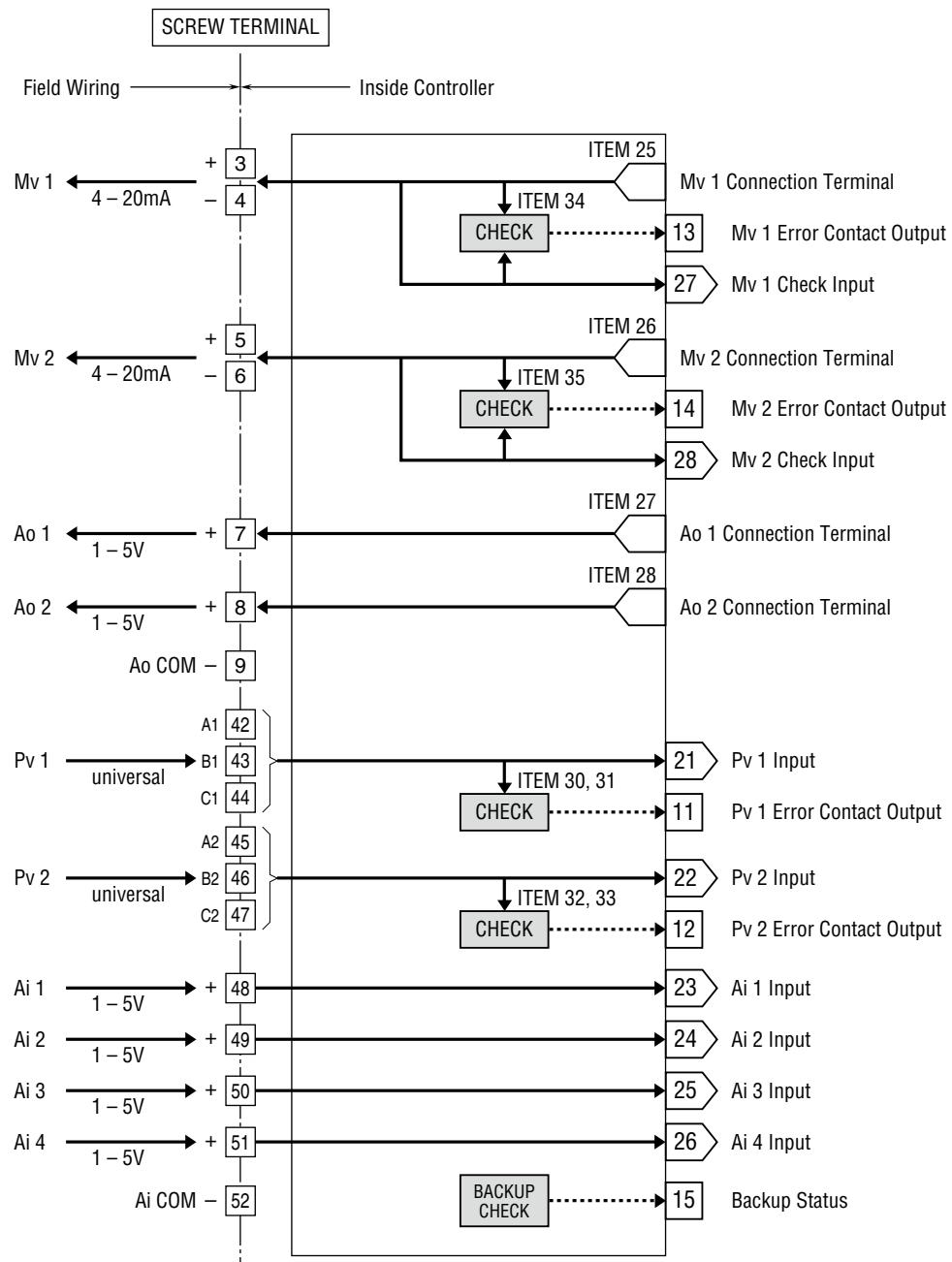
Common Items

61	▲	0, 1	21: 0	SP UP button operation status (0: OFF, 1: ON)
62	▲	0, 1	22: 0	SP DOWN button operation status (0: OFF, 1: ON)
63	▲	0, 1	23: 0	MV UP button operation status (0: OFF, 1: ON)
64	▲	0, 1	24: 0	MV DOWN button operation status (0: OFF, 1: ON)
★ 71	▲	10 – 100 s/100%	ST: 40	Time of holding SP UP or DOWN button
★ 72	▲	10 – 100 s/100%	ST: 40	Time of holding MV UP or DOWN button

Remark 1: Control by a host device connected via Modbus prevails the local setting.

Remark 2: ITEM 61 – 64: Please perform button operations with two times more than computation cycle.

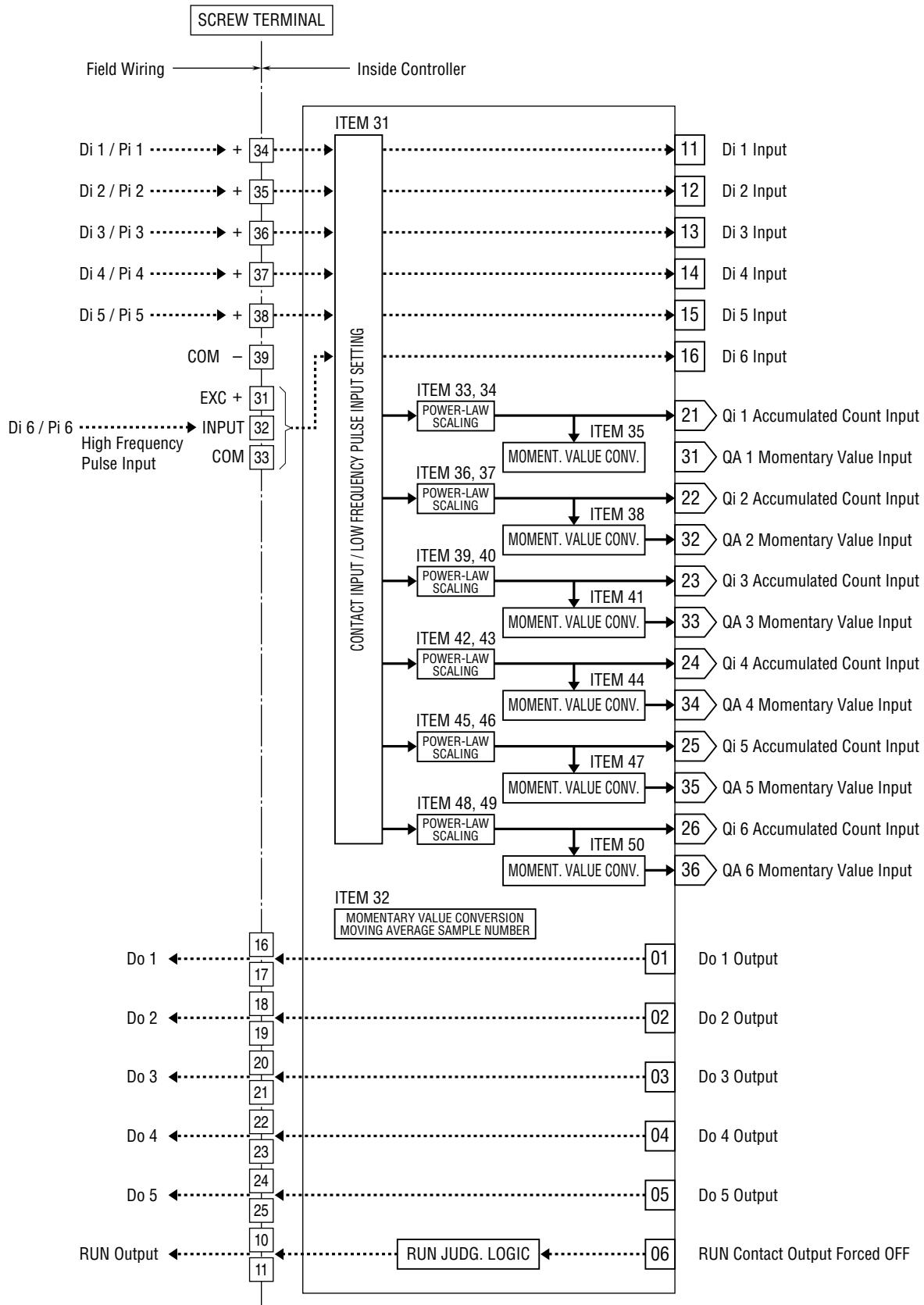
Remark 3: ITEM 61 – 64: Obtains button operation status regardless of screen functions such as A/M and C/L.



## GROUP [04] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
<b>10</b>	<b>IND</b>	<b>12</b>	<b>MD: 12</b>	<b>EXTENSION FIELD TERMINAL 1 (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Pv 1 input
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Pv 2 input
13	▲ *	-15.00 – 115.00 %	23: NNN.NN	Ai 1 input
14	▲ *	-15.00 – 115.00 %	24: NNN.NN	Ai 2 input
15	▲ *	-15.00 – 115.00 %	25: NNN.NN	Ai 3 input
16	▲ *	-15.00 – 115.00 %	26: NNN.NN	Ai 4 input
17	▲ *	-15.00 – 115.00 %	27: NNN.NN	Mv 1 check input
18	▲ *	-15.00 – 115.00 %	28: NNN.NN	Mv 2 check input
19	▲ *	±320.00Unit	29: NNN.NNUnit	Pv 1 input in engineering unit value
20	▲ *	±320.00Unit	30: NNN.NNUnit	Pv 2 input in engineering unit value
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	MV1: NNN.NN	Mv 1 output
22	▲	-15.00 – 115.00 %	MV2: NNN.NN	Mv 2 output
23	▲	-15.00 – 115.00 %	AO1: NNN.NN	Ao 1 output
24	▲	-15.00 – 115.00 %	AO2: NNN.NN	Ao 2 output
<b>ANALOG OUTPUT CONNECTION TERMINAL</b>				
★ 25	▲	GGNN	M1#: <u>0225</u>	Mv 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 26	▲	GGNN	M2#: <u>0225</u>	Mv 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 27	▲	GGNN	A1#: <u>0225</u>	Ao 1 connection terminal (error if not connected) GG: Group No. NN : terminal No.
★ 28	▲	GGNN	A2#: <u>0225</u>	Ao 2 connection terminal (error if not connected) GG: Group No. NN : terminal No.
<b>PV / MV SETTING</b>				
★ 30	▲	-15.00 – 115.00 %	PH1: NNN.NN	Pv 1 high alarm setpoint (for error judgment)
★ 31	▲	-15.00 – 115.00 %	PL1: NNN.NN	Pv 1 low alarm setpoint (for error judgment)
★ 32	▲	-15.00 – 115.00 %	PH2: NNN.NN	Pv 2 high alarm setpoint (for error judgment)
★ 33	▲	-15.00 – 115.00 %	PL2: NNN.NN	Pv 2 low alarm setpoint (for error judgment)
★ 34	▲	0.00 – 115.00 %	ML1: NNN.NN	Mv 1 deviation alarm setpoint (for error judgment)
★ 35	▲	0.00 – 115.00 %	ML2: NNN.NN	Mv 2 deviation alarm setpoint (for error judgment)
★ 36	▲	MM	TP1: MM	Pv 1 input type [MM: input type No.] 12: S 19: Pt100 (JIS '97, IEC) 0:-10-10 V 6: K 13: C 20: Pt100 (JIS '89) 1: -1-1 V 7: E 14: N 21: JPt100 (JIS '89) 2: 0-10 V 8: J 15: U 22: Pt50 (JIS '81) 3: 1-5 V 9: T 16: L 23: Ni100 4: 0-1 V 10: B 17: P 24: MS 5: 4-20 mA 11: R 18: PR 25: DS
(Set ITEM37...39 for Pv 1 input type 6...23)				
★ 37	▲	-272.0 – 3000.0	HT1: NNNN.N	Pv 1 upper range temperature
★ 38	▲	-272.0 – 3000.0	LT1: NNNN.N	Pv 1 lower range temperature
★ 39	▲	0, 1	CJ1: N	Pv 1 cold junction compensation (0: Without, 1: With)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 40	▲	MM	TP2: MM	Pv 2 input type [MM: input type No.] 0:-10-10 V      6: K      13: C      19: Pt100 (JIS '97, IEC) 1: -1-1 V      7: E      14: N      20: Pt100 (JIS '89) 2: 0-10 V      8: J      15: U      21: JPt100 (JIS '89) 3: 1-5 V      9: T      16: L      22: Pt50 (JIS '81) 4: 0-1 V      10: B      17: P      23: Ni100 5: 4-20 mA      11: R      18: PR      24: MS 12: S      19: Pt100 (JIS '97, IEC) 13: C      20: Pt100 (JIS '89) 14: N      21: JPt100 (JIS '89) 15: U      22: Pt50 (JIS '81) 16: L      23: Ni100 17: P      24: MS 18: PR      25: DS
				(Set ITEM41...43 for Pv 1 input type 6...23)
★ 41	▲	-272.0 – 3000.0	HT2: NNNN.N	Pv 2 upper range temperature
★ 42	▲	-272.0 – 3000.0	LT2: NNNN.N	Pv 2 lower range temperature
★ 43	▲	0, 1	CJ2: N	Pv 2 cold junction compensation (0: without, 1: with)
44	▲ *	0, 1	11: N	Pv 1 error contact output
45	▲ *	0, 1	12: N	Pv 2 error contact output
46	▲ *	0, 1	13: N	Mv 1 error contact output
47	▲ *	0, 1	14: N	Mv 2 error contact output
<b>ANALOG I/O ZERO/SPAN ADJUSTMENTS</b>				
★ 50	▲	±115.00 %	PZ1: <u>0.00</u>	Pv 1 zero adjustment (zero bias)
★ 51	▲	±3.2000	PS1: <u>1.0000</u>	Pv 1 span adjustment (gain)
★ 52	▲	±115.00 %	PZ2: <u>0.00</u>	Pv 2 zero adjustment (zero bias)
★ 53	▲	±3.2000	PS2: <u>1.0000</u>	Pv 2 span adjustment (gain)
★ 54	▲	±115.00 %	MZ1: <u>0.00</u>	Mv 1 zero adjustment (zero bias)
★ 55	▲	±3.2000	MS1: <u>1.0000</u>	Mv 1 span adjustment (gain)
★ 56	▲	±115.00 %	MZ2: <u>0.00</u>	Mv 2 zero adjustment (zero bias)
★ 57	▲	±3.2000	MS2: <u>1.0000</u>	Mv 2 span adjustment (gain)
★ 58	▲	±115.00 %	IZ1: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 59	▲	±3.2000	IS1: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 60	▲	±115.00 %	IZ2: <u>0.00</u>	Ai 2 zero adjustment (zero bias)
★ 61	▲	±3.2000	IS2: <u>1.0000</u>	Ai 2 span adjustment (gain)
★ 62	▲	±115.00 %	IZ3: <u>0.00</u>	Ai 3 zero adjustment (zero bias)
★ 63	▲	±3.2000	IS3: <u>1.0000</u>	Ai 3 span adjustment (gain)
★ 64	▲	±115.00 %	IZ4: <u>0.00</u>	Ai 4 zero adjustment (zero bias)
★ 65	▲	±3.2000	IS4: <u>1.0000</u>	Ai 4 span adjustment (gain)
★ 66	▲	±115.00 %	CZ1: <u>0.00</u>	Mv 1 check input zero adjustment (zero bias)
★ 67	▲	±3.2000	CS1: <u>1.0000</u>	Mv 1 check input span adjustment (gain)
★ 68	▲	±115.00 %	CZ2: <u>0.00</u>	Mv 2 check input zero adjustment (zero bias)
★ 69	▲	±3.2000	CS2: <u>1.0000</u>	Mv 2 check input span adjustment (gain)
★ 70	▲	±115.00 %	OZ1: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 71	▲	±3.2000	OS1: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 72	▲	±115.00 %	OZ2: <u>0.00</u>	Ao 2 zero adjustment (zero bias)
★ 73	▲	±3.2000	OS2: <u>1.0000</u>	Ao 2 span adjustment (gain)
<b>BACKUP (Mv 2)</b>				
80	▲	-15.00 – 115.00 %	MVB: NNN.NN	Manual loading MV
★ 81	▲	0, 1	BSW: NNN.NN	Automatic switching (0: disable, 1: enable)
★ 82	▲	0, 1	BMD: NNN.NN	Backup output mode (0: track back, 1: preset value)
★ 83	▲	0.00 – 115.00 %/s	BVL: NNN.NN	Output rate-of-change limit (0.00: no limit applied)
★ 84	▲	-15.00 – 115.00 %	BFV: NNN.NN	Preset value (applied with ITEM 82 DATA 1)
★ 85	▲	0, 1	BBL: N	Backup recovery mode (0: auto tracking, 1: manual tracking)
★ 86	▲	2, 3	BGR: N	Backup GROUP
87	▲	0, 1	15: N	Backup status (0: normal, 1: backup)



## GROUP [05] ★: Setting data

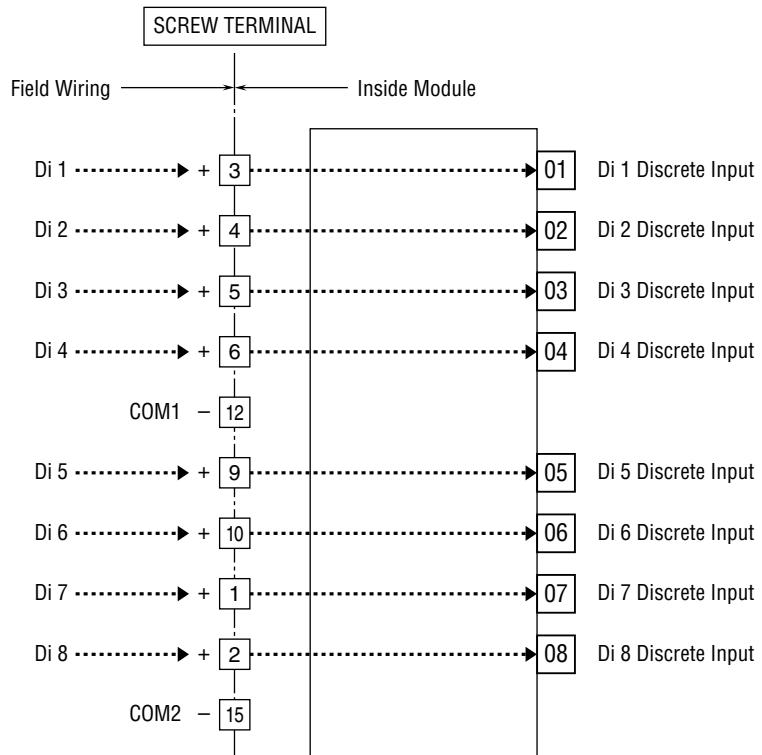
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command) Same mode for Extension Field Terminal 1 and 2
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: “▲” marked data modifiable
	S	MT: S		SIMULATION mode: “*” marked data modifiable
<b>10</b>	<b>IND</b>	<b>13</b>	<b>MD: 13</b>	<b>EXTENSION FIELD TERMINAL 2 (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1 or 0 – 9999	11: N or 21: NNNN	Di 1 input indication or Qi 1 accumulated count indication
12	▲ *	0, 1 or 0 – 9999	12: N or 22: NNNN	Di 2 input indication or Qi 2 accumulated count indication
13	▲ *	0, 1 or 0 – 9999	13: N or 23: NNNN	Di 3 input indication or Qi 3 accumulated count indication
14	▲ *	0, 1 or 0 – 9999	14: N or 24: NNNN	Di 4 input indication or Qi 4 accumulated count indication
15	▲ *	0, 1 or 0 – 9999	15: N or 25: NNNN	Di 5 input indication or Qi 5 accumulated count indication
16	▲ *	0, 1 or 0 – 9999	16: N or 26: NNNN	Di 6 input indication or Qi 6 accumulated count indication
17	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value indication
18	▲ *	-15.00 – 115.00 %	32: NNN.NN	QA 2 momentary value indication
19	▲ *	-15.00 – 115.00 %	33: NNN.NN	QA 3 momentary value indication
20	▲ *	-15.00 – 115.00 %	34: NNN.NN	QA 4 momentary value indication
21	▲ *	-15.00 – 115.00 %	35: NNN.NN	QA 5 momentary value indication
22	▲ *	-15.00 – 115.00 %	36: NNN.NN	QA 6 momentary value indication
<b>DISCRETE OUTPUT INDICATION</b>				
23	▲ *	0, 1	01: N	Do 1 output indication
24	▲ *	0, 1	02: N	Do 2 output indication
25	▲ *	0, 1	03: N	Do 3 output indication
26	▲ *	0, 1	04: N	Do 4 output indication
27	▲ *	0, 1	05: N	Do 5 output indication
28	▲ *	0, 1	06: N	RUN contact output forced OFF (1: OFF)
<b>PULSE INPUT SETTING</b>				
★ 31	▲		PD: NNNNN	Di/Pi selection (0 = Di, 1 = Pi) (10 <sup>0</sup> : Di 1, 10 <sup>1</sup> : Di 2, 10 <sup>2</sup> : Di 3, 10 <sup>3</sup> : Di 4, 10 <sup>4</sup> : Di 5) (Remark 1) Di 6 is specified in ITEM 52
★ 32	▲	1-16	KR: NN	Pi moving average sample number for momentary value conversion
★ 33	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 34	▲	0.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 35	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 36	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 37	▲	0.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 38	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 39	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 40	▲	0.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 41	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 momentary value conversion factor (number of pulses per second at 100% momentary value input)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 42	▲	1, 0, -1, -2, -3	D4: <u>-1</u>	Qi 4 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 43	▲	0.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
★ 44	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 45	▲	1, 0, -1, -2, -3	D5: <u>-1</u>	Qi 5 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 46	▲	0.0000 – 6.4000	S5: N.NNNN	Qi 5 scaling factor
★ 47	▲	0.00 – 10000.00	K5: NNNNN.NN	QA 5 momentary value conversion factor (number of pulses per second at 100% momentary value input)
★ 48	▲	1, 0, -1, -2, -3	D6: <u>-1</u>	Qi 6 power-law scaling (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)
★ 49	▲	0.0000 – 6.4000	S6: N.NNNN	Qi 6 scaling factor
★ 50	▲	0.00 – 10000.00	K6: NNNNN.NN	QA 6 momentary value conversion factor (number of pulses per second at 100% momentary value input)
<b>DISCRETE OUTPUT SETTING</b>				
★ 51	▲	0, 1	DM: N	Abnormality contact output mode (0: Normal, 1: All contact outputs OFF at RUN contact OFF)
<b>HIGH SPEED PULSE INPUT SETTING</b>				
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6)

Remark 1: ITEM 31: Di/Pi selection

Pulse outputs become undefined when 'Di' is selected; while discrete outputs become undefined when 'Pi' is selected.

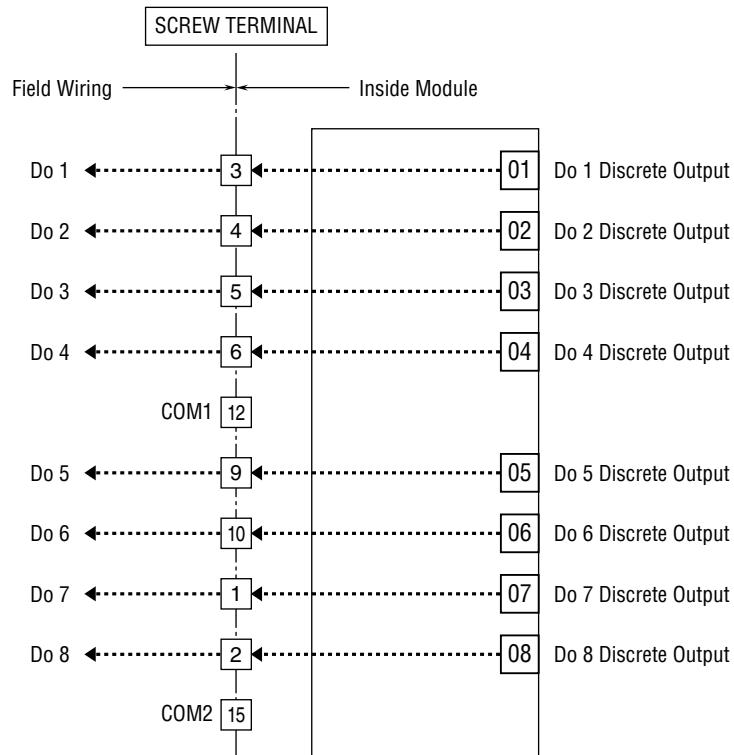
ABBR F24	FIELD TERMINAL <b>SML-A4 Field Terminal</b>	ABBR F24
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#### GROUP [01]

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
	S		MT: S	SIMULATION mode: “*” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1	01: N	Di 1 discrete input
12	▲ *	0, 1	02: N	Di 2 :
13	▲ *	0, 1	03: N	Di 3 :
14	▲ *	0, 1	04: N	Di 4 :
15	▲ *	0, 1	05: N	Di 5 :
16	▲ *	0, 1	06: N	Di 6 :
17	▲ *	0, 1	07: N	Di 7 :
18	▲ *	0, 1	08: N	Di 8 :

ABBR F25	FIELD TERMINAL <b>SML-C7, -C8 Field Terminal</b>	ABBR F25
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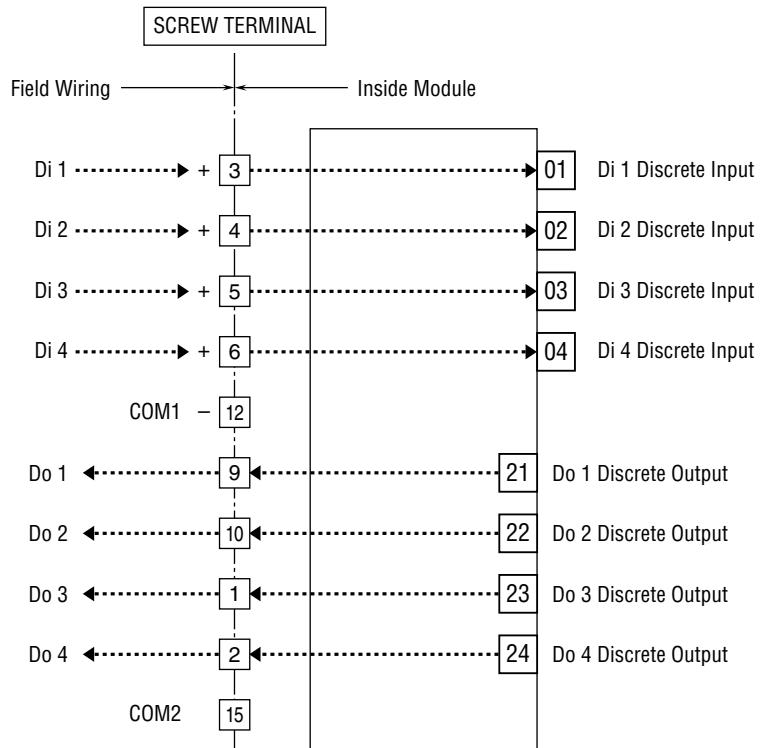
#### GROUP [01]

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>

#### DISCRETE OUTPUT INDICATION

11	▲	0, 1	01: N	Do 1 discrete output
12	▲	0, 1	02: N	Do 2 :
13	▲	0, 1	03: N	Do 3 :
14	▲	0, 1	04: N	Do 4 :
15	▲	0, 1	05: N	Do 5 :
16	▲	0, 1	06: N	Do 6 :
17	▲	0, 1	07: N	Do 7 :
18	▲	0, 1	08: N	Do 8 :

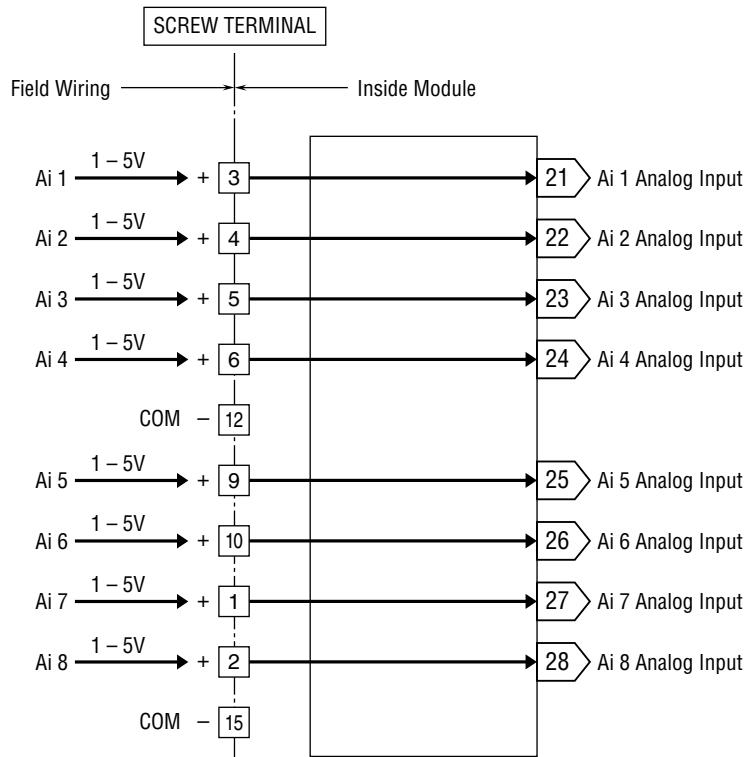
ABBR <b>F26</b>	<b>FIELD TERMINAL</b> <b>SML-E5 Field Terminal</b>	ABBR <b>F26</b>
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#### GROUP [01]

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0		MT: 0	MONITOR mode: data monitoring only
	1		MT: 1	PROGRAM mode: “▲” marked data modifiable
	S		MT: S	SIMULATION mode: “*” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1	01: N	Di 1 discrete input
12	▲ *	0, 1	02: N	Di 2 :
13	▲ *	0, 1	03: N	Di 3 :
14	▲ *	0, 1	04: N	Di 4 :
<b>DISCRETE OUTPUT INDICATION</b>				
31	▲	0, 1	21: N	Do 1 discrete output
32	▲	0, 1	22: N	Do 2 :
33	▲	0, 1	23: N	Do 3 :
34	▲	0, 1	24: N	Do 4 :

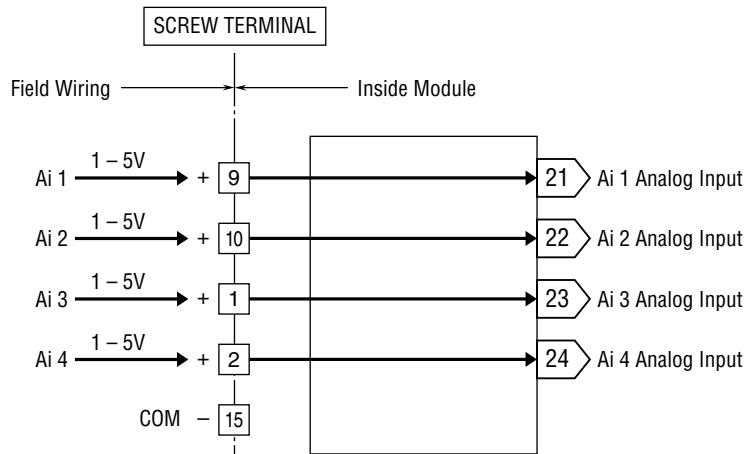
ABBR F27	FIELD TERMINAL <b>SML-G3 Field Terminal</b>	ABBR F27
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## GROUP [01] ★: Setting data

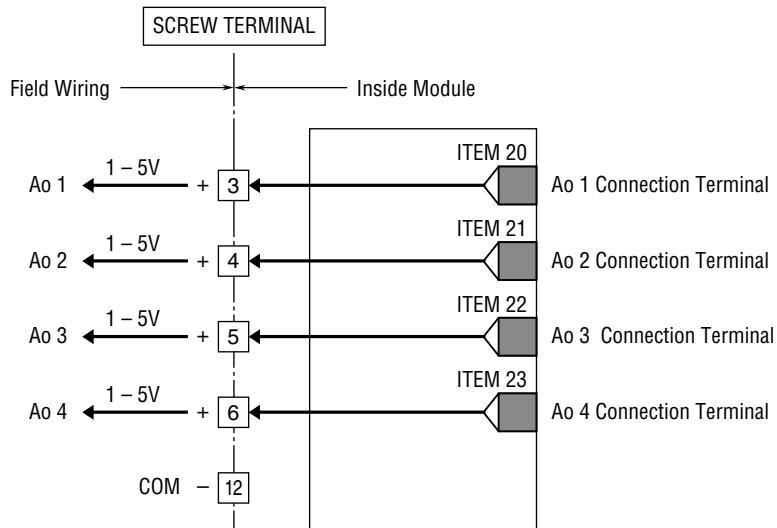
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>ANALOG INPUT INDICATION</b>				
21	▲ *	-15.00 – 115.00 %	21: NNN.NN	Ai 1 input indication
22	▲ *	:	22: :	Ai 2 :
23	▲ *	:	23: :	Ai 3 :
24	▲ *	:	24: :	Ai 4 :
25	▲ *	:	25: :	Ai 5 :
26	▲ *	:	26: :	Ai 6 :
27	▲ *	:	27: :	Ai 7 :
28	▲ *	:	28: :	Ai 8 :
<b>ANALOG INPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 31	▲	±115.00 %	1Z: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 32	▲	±3.2000	1S: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 33	▲	±115.00 %	2Z: <u>0.00</u>	Ai 2 zero
★ 34	▲	±3.2000	2S: <u>1.0000</u>	Ai 2 span
★ 35	▲	±115.00 %	3Z: <u>0.00</u>	Ai 3 zero
★ 36	▲	±3.2000	3S: <u>1.0000</u>	Ai 3 span
★ 37	▲	±115.00 %	4Z: <u>0.00</u>	Ai 4 zero
★ 38	▲	±3.2000	4S: <u>1.0000</u>	Ai 4 span
★ 39	▲	±115.00 %	5Z: <u>0.00</u>	Ai 5 zero
★ 40	▲	±3.2000	5S: <u>1.0000</u>	Ai 5 span
★ 41	▲	±115.00 %	6Z: <u>0.00</u>	Ai 6 zero
★ 42	▲	±3.2000	6S: <u>1.0000</u>	Ai 6 span
★ 43	▲	±115.00 %	7Z: <u>0.00</u>	Ai 7 zero
★ 44	▲	±3.2000	7S: <u>1.0000</u>	Ai 7 span
★ 45	▲	±115.00 %	8Z: <u>0.00</u>	Ai 8 zero
★ 46	▲	±3.2000	8S: <u>1.0000</u>	Ai 8 span

ABBR F28	FIELD TERMINAL <b>SML-G4 Field Terminal</b>	ABBR F28
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**GROUP [01]** ★: Setting data

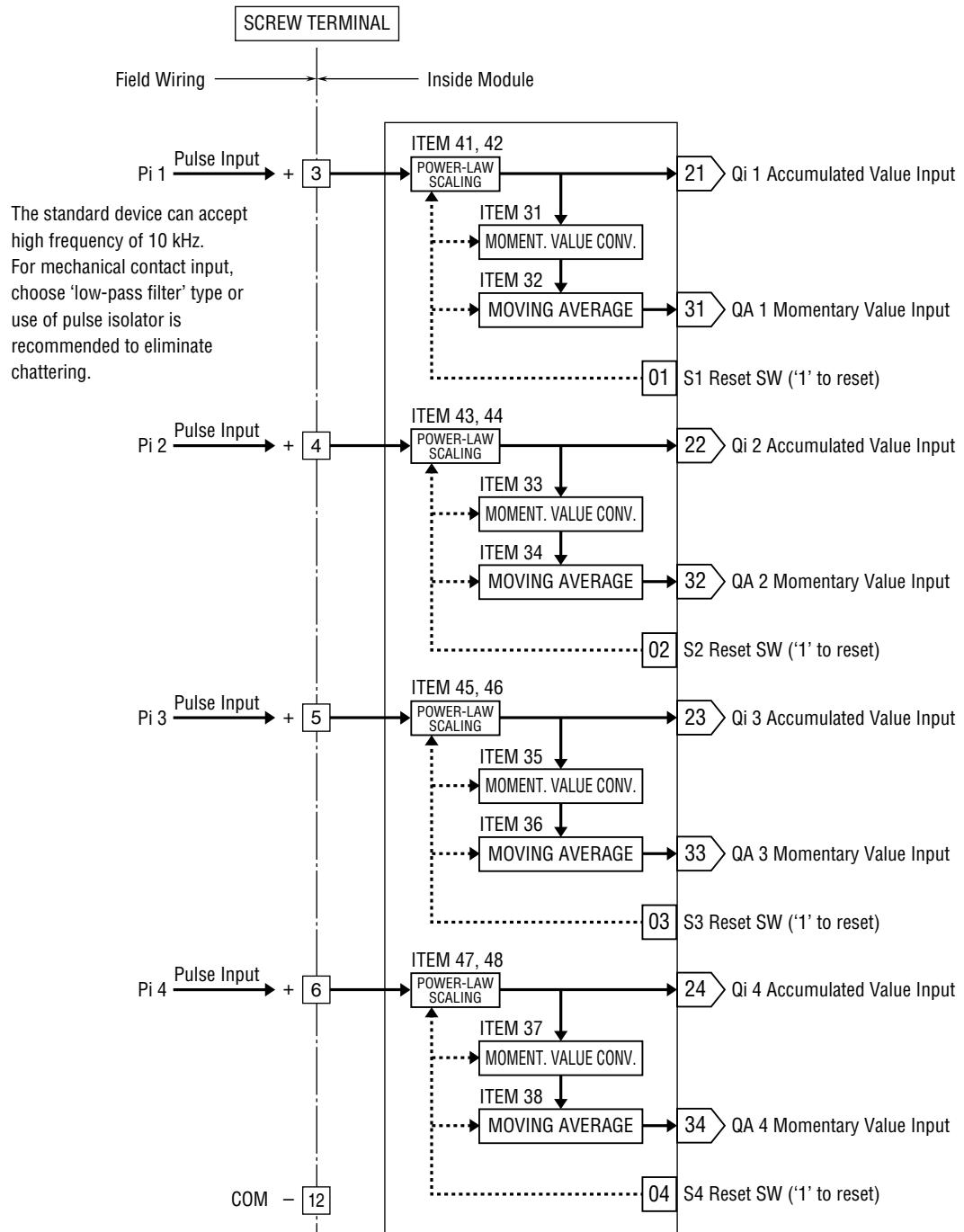
ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>ANALOG INPUT INDICATION</b>				
21	▲ *	-15.00 – 115.00 %	21: NNN.NN	Ai 1 input indication
22	▲ *	:	22: :	Ai 2 :
23	▲ *	:	23: :	Ai 3 :
24	▲ *	:	24: :	Ai 4 :
<b>ANALOG INPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 31	▲	±115.00 %	1Z: 0.00	Ai 1 zero adjustment (zero bias)
★ 32	▲	±3.2000	1S: 1.0000	Ai 1 span adjustment (gain)
★ 33	▲	±115.00 %	2Z: 0.00	Ai 2 zero
★ 34	▲	±3.2000	2S: 1.0000	Ai 2 span
★ 35	▲	±115.00 %	3Z: 0.00	Ai 3 zero
★ 36	▲	±3.2000	3S: 1.0000	Ai 3 span
★ 37	▲	±115.00 %	4Z: 0.00	Ai 4 zero
★ 38	▲	±3.2000	4S: 1.0000	Ai 4 span

ABBR F29	FIELD TERMINAL <b>SML-M4 Field Terminal</b>	ABBR F29
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**GROUP [01]**

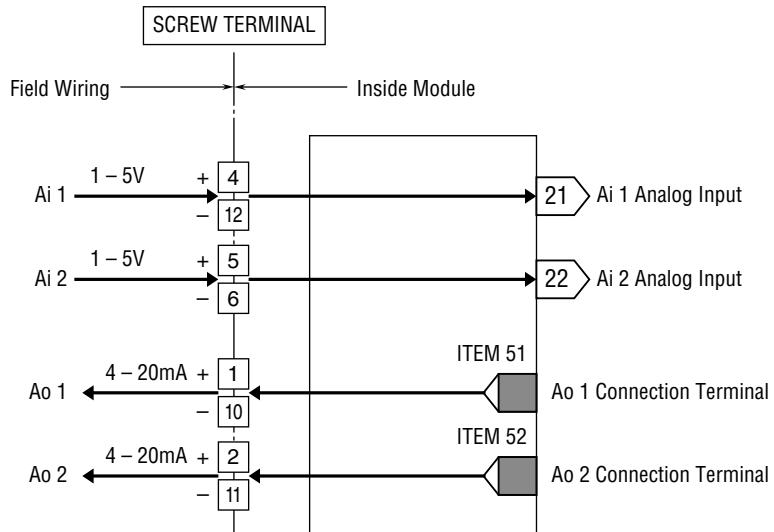
★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: “▲” marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>ANALOG OUTPUT INDICATION</b>				
03	▲	-15.00 – 115.00 %	01: NNN.NN	Ao 1 output indication
04	▲	:	02: :	Ao 2 :
05	▲	:	03: :	Ao 3 :
06	▲	:	04: :	Ao 4 :
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>ANALOG OUTPUT CONNECTION TERMINAL</b> GG: GROUP NO., NN: TERMINAL NO.				
★ 20	▲	GGNN	1#: 0225	Ao 1 connection terminal (error if not connected)
★ 21	▲	GGNN	2#: 1121	Ao 2 connection terminal (error if not connected)
★ 22	▲	GGNN	3#: 1122	Ao 3 connection terminal (error if not connected)
★ 23	▲	GGNN	4#: 1221	Ao 4 connection terminal (error if not connected)
<b>ANALOG OUTPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 36	▲	±115.00 %	1Z: 0.00	Ao 1 zero adjustment (zero bias)
★ 37	▲	±3.2000	1S: 1.0000	Ao 1 span adjustment (gain)
★ 38	▲	±115.00 %	2Z: 0.00	Ao 2 zero
★ 39	▲	±3.2000	2S: 1.0000	Ao 2 span
★ 40	▲	±115.00 %	3Z: 0.00	Ao 3 zero
★ 41	▲	±3.2000	3S: 1.0000	Ao 3 span
★ 42	▲	±115.00 %	4Z: 0.00	Ao 4 zero
★ 43	▲	±3.2000	4S: 1.0000	Ao 4 span



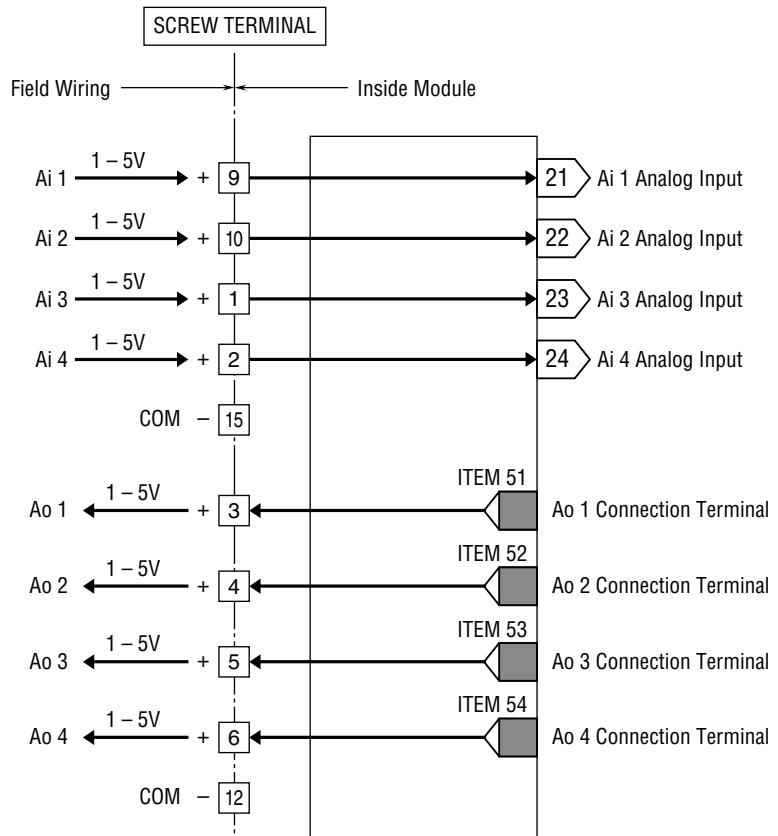
## GROUP [01] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>MOMENTARY VALUE INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	31: NNN.NN	QA 1 momentary value input indication
12	▲ *	:	32: :	QA 2 :
13	▲ *	:	33: :	QA 3 :
14	▲ *	:	34: :	QA 4 :
<b>ACCUMULATED VALUE INPUT INDICATION</b>				
21	▲ *	0 – 9999	21: NNNN	Qi 1 accumulated value input indication (unit: count)
22	▲ *	:	22: :	Qi 2 :
23	▲ *	:	23: :	Qi 3 :
24	▲ *	:	24: :	Qi 4 :
<b>MOMENTARY VALUE CONVERSION FACTOR</b> (number of pulses per second at 100% momentary value input)				
★ 31	▲	0.00 – 10000.00	K1: NNNNN.NN	QA 1 conversion factor
★ 32	▲	1 – 16	V1: 1	QA 1 moving average sample number
★ 33	▲	0.00 – 10000.00	K2: NNNNN.NN	QA 2 conversion factor
★ 34	▲	1 – 16	V2: 1	QA 2 moving average sample number
★ 35	▲	0.00 – 10000.00	K3: NNNNN.NN	QA 3 conversion factor
★ 36	▲	1 – 16	V3: 1	QA 3 moving average sample number
★ 37	▲	0.00 – 10000.00	K4: NNNNN.NN	QA 4 conversion factor
★ 38	▲	1 – 16	V4: 1	QA 4 moving average sample number
<b>ACCUMULATED VALUE POWER-LAW SCALING</b> (10's power 1: x 10, 0: x 1, -1: x 0.1, -2: x 0.01, -3: x 0.001)				
★ 41	▲	1, 0, -1, -2, -3	D1: -1	Qi 1 power-law scaling
★ 42	▲	1.0000 – 6.4000	S1: N.NNNN	Qi 1 scaling factor
★ 43	▲	1, 0, -1, -2, -3	D2: -1	Qi 2 power-law scaling
★ 44	▲	1.0000 – 6.4000	S2: N.NNNN	Qi 2 scaling factor
★ 45	▲	1, 0, -1, -2, -3	D3: -1	Qi 3 power-law scaling
★ 46	▲	1.0000 – 6.4000	S3: N.NNNN	Qi 3 scaling factor
★ 47	▲	1, 0, -1, -2, -3	D4: -1	Qi 4 power-law scaling
★ 48	▲	1.0000 – 6.4000	S4: N.NNNN	Qi 4 scaling factor
<b>RESET INPUT</b>				
51	▲ *	0, 1	01: N	S1 reset SW
52	▲ *	0, 1	02: N	S2 reset SW
53	▲ *	0, 1	03: N	S3 reset SW
54	▲ *	0, 1	04: N	S4 reset SW


**GROUP [01]**      ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "※" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Ai 1 input indication
12	▲ *	-15.00 – 115.00 %	22: NNN.NN	Ai 2 input indication
<b>ANALOG INPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 21	▲	±115.00 %	1Z: 0.00	Ai 1 zero adjustment (zero bias)
★ 22	▲	±3.2000	1S: 1.0000	Ai 1 span adjustment (gain)
★ 23	▲	±115.00 %	2Z: 0.00	Ai 2 zero
★ 24	▲	±3.2000	2S: 1.0000	Ai 2 span
<b>ANALOG OUTPUT INDICATION</b>				
41	▲	-15.00 – 115.00 %	01: NNN.NN	Ao 1 output indication
42	▲	-15.00 – 115.00 %	02: NNN.NN	Ao 2 output indication
<b>ANALOG OUTPUT CONNECTION TERMINAL</b> GG: GROUP NO., NN: TERMINAL NO.				
★ 51	▲	GGNN	1#: 0225	Ao 1 connection terminal (error if not connected)
★ 52	▲	GGNN	2#: 1121	Ao 2 connection terminal (error if not connected)
<b>ANALOG OUTPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 61	▲	±115.00 %	1Z: 0.00	Ao 1 zero adjustment (zero bias)
★ 62	▲	±3.2000	1S: 1.0000	Ao 1 span adjustment (gain)
★ 63	▲	±115.00 %	2Z: 0.00	Ao 2 zero
★ 64	▲	±3.2000	2S: 1.0000	Ao 2 span

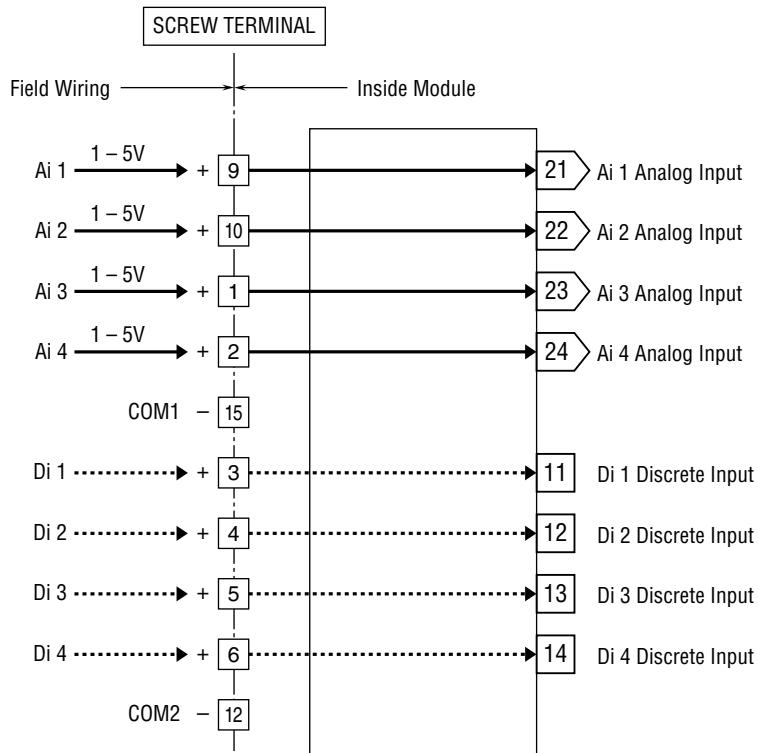
ABBR F31	FIELD TERMINAL <b>SML-R3 Field Terminal</b>	ABBR F31
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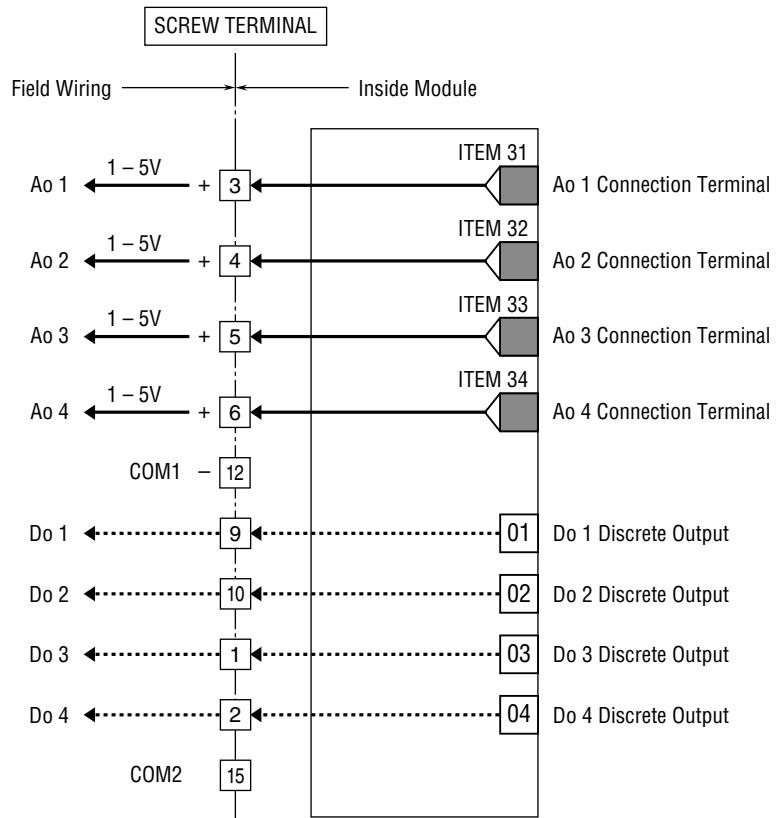
## GROUP [01] ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>ANALOG INPUT INDICATION</b>				
11	▲ *	-15.00 – 115.00 %	21: NNN.NN	Ai 1 input indication
12	▲ *	:	22: :	Ai 2 :
13	▲ *	:	23: :	Ai 3 :
14	▲ *	:	24: :	Ai 4 :
<b>ANALOG INPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 21	▲	±115.00 %	1Z: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 22	▲	±3.2000	1S: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 23	▲	±115.00 %	2Z: <u>0.00</u>	Ai 2 zero
★ 24	▲	±3.2000	2S: <u>1.0000</u>	Ai 2 span
★ 25	▲	±115.00 %	3Z: <u>0.00</u>	Ai 3 zero
★ 26	▲	±3.2000	3S: <u>1.0000</u>	Ai 3 span
★ 27	▲	±115.00 %	4Z: <u>0.00</u>	Ai 4 zero
★ 28	▲	±3.2000	4S: <u>1.0000</u>	Ai 4 span
<b>ANALOG OUTPUT INDICATION</b>				
41	▲	-15.00 – 115.00 %	01: NNN.NN	Ao 1 output indication
42	▲	:	02: :	Ao 2 :
43	▲	:	03: :	Ao 3 :
44	▲	:	04: :	Ao 4 :
<b>ANALOG OUTPUT CONNECTION TERMINAL</b> GG: GROUP NO., NN: TERMINAL NO.				
★ 51	▲	GGNN	1#: <u>0225</u>	Ao 1 connection terminal (error if not connected)
★ 52	▲	GGNN	2#: <u>1121</u>	Ao 2 connection terminal (error if not connected)
★ 53	▲	GGNN	3#: <u>1122</u>	Ao 3 connection terminal (error if not connected)
★ 54	▲	GGNN	4#: <u>1221</u>	Ao 4 connection terminal (error if not connected)
<b>ANALOG OUTPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 61	▲	±115.00 %	1Z: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 62	▲	±3.2000	1S: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 63	▲	±115.00 %	2Z: <u>0.00</u>	Ao 2 zero
★ 64	▲	±3.2000	2S: <u>1.0000</u>	Ao 2 span
★ 65	▲	±115.00 %	3Z: <u>0.00</u>	Ao 3 zero
★ 66	▲	±3.2000	3S: <u>1.0000</u>	Ao 3 span
★ 67	▲	±115.00 %	4Z: <u>0.00</u>	Ao 4 zero
★ 68	▲	±3.2000	4S: <u>1.0000</u>	Ao 4 span

ABBR F32	FIELD TERMINAL <b>SML-S5 Field Terminal</b>	ABBR F32
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**GROUP [01]**      ★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
	0	MT: 0		MONITOR mode: data monitoring only
	1	MT: 1		PROGRAM mode: "▲" marked data modifiable
	S	MT: S		SIMULATION mode: "*" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>DISCRETE INPUT INDICATION</b>				
11	▲ *	0, 1	11: N	Di 1 discrete input
12	▲ *	0, 1	12: N	Di 2 : Di 3 : Di 4 :
13	▲ *	0, 1	13: N	
14	▲ *	0, 1	14: N	
<b>ANALOG INPUT INDICATION</b>				
21	▲ *	-15.00 – 115.00 %	21: NNN.NN	Ai 1 input indication
22	▲ *	-15.00 – 115.00 %	22: NNN.NN	Ai 2 : Ai 3 : Ai 4 :
23	▲ *	-15.00 – 115.00 %	23: NNN.NN	
24	▲ *	-15.00 – 115.00 %	24: NNN.NN	
<b>ANALOG INPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 31	▲	±115.00 %	1Z: <u>0.00</u>	Ai 1 zero adjustment (zero bias)
★ 32	▲	±3.2000	1S: <u>1.0000</u>	Ai 1 span adjustment (gain)
★ 33	▲	±115.00 %	2Z: <u>0.00</u>	Ai 2 zero
★ 34	▲	±3.2000	2S: <u>1.0000</u>	Ai 2 span
★ 35	▲	±115.00 %	3Z: <u>0.00</u>	Ai 3 zero
★ 36	▲	±3.2000	3S: <u>1.0000</u>	Ai 3 span
★ 37	▲	±115.00 %	4Z: <u>0.00</u>	Ai 4 zero
★ 38	▲	±3.2000	4S: <u>1.0000</u>	Ai 4 span



**GROUP [01]**

★: Setting data

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
01	●	(always modifiable)		■ MAINTENANCE SWITCH (lock command)
		0	MT: 0	MONITOR mode: data monitoring only
		1	MT: 1	PROGRAM mode: "▲" marked data modifiable
02	IND	No input	ER: NN	Error indication (00: normal, 01 – 90: error)
<b>10</b>	<b>IND</b>	<b>11</b>	<b>MD: 11</b>	<b>FIELD TERMINAL (model)</b>
<b>DISCRETE OUTPUT INDICATION</b>				
11	▲	0, 1	01: N	Do 1 discrete output
12	▲	0, 1	02: N	Do 2 :
13	▲	0, 1	03: N	Do 3 :
14	▲	0, 1	04: N	Do 4 :
<b>ANALOG OUTPUT INDICATION</b>				
21	▲	-15.00 – 115.00 %	01: NNN.NN	Ao 1 output indication
22	▲	-15.00 – 115.00 %	02: NNN.NN	Ao 2 :
23	▲	-15.00 – 115.00 %	03: NNN.NN	Ao 3 :
24	▲	-15.00 – 115.00 %	04: NNN.NN	Ao 4 :
<b>ANALOG OUTPUT CONNECTION TERMINAL</b> GG: GROUP NO., NN: TERMINAL NO.				
★ 31	▲	GGNN	1#: <u>0225</u>	Ao 1 connection terminal (error if not connected)
★ 32	▲	GGNN	2#: <u>1121</u>	Ao 2 connection terminal (error if not connected)
★ 33	▲	GGNN	3#: <u>1122</u>	Ao 3 connection terminal (error if not connected)
★ 34	▲	GGNN	4#: <u>1221</u>	Ao 4 connection terminal (error if not connected)
<b>ANALOG OUTPUT ZERO/SPAN ADJUSTMENTS</b>				
★ 41	▲	±115.00 %	1Z: <u>0.00</u>	Ao 1 zero adjustment (zero bias)
★ 42	▲	±3.2000	1S: <u>1.0000</u>	Ao 1 span adjustment (gain)
★ 43	▲	±115.00 %	2Z: <u>0.00</u>	Ao 2 zero
★ 44	▲	±3.2000	2S: <u>1.0000</u>	Ao 2 span
★ 45	▲	±115.00 %	3Z: <u>0.00</u>	Ao 3 zero
★ 46	▲	±3.2000	3S: <u>1.0000</u>	Ao 3 span
★ 47	▲	±115.00 %	4Z: <u>0.00</u>	Ao 4 zero
★ 48	▲	±3.2000	4S: <u>1.0000</u>	Ao 4 span

# 4. EXPLANATIONS

## 4.1 GENERAL DESCRIPTION

### • Only One Software for All Devices

Every module in the MsysNet system utilizes one common software, except for the Field Terminal specifically used for each of them. If you learn how to configure one module, you will understand all others.

### • No Computer Language: Software Function Blocks

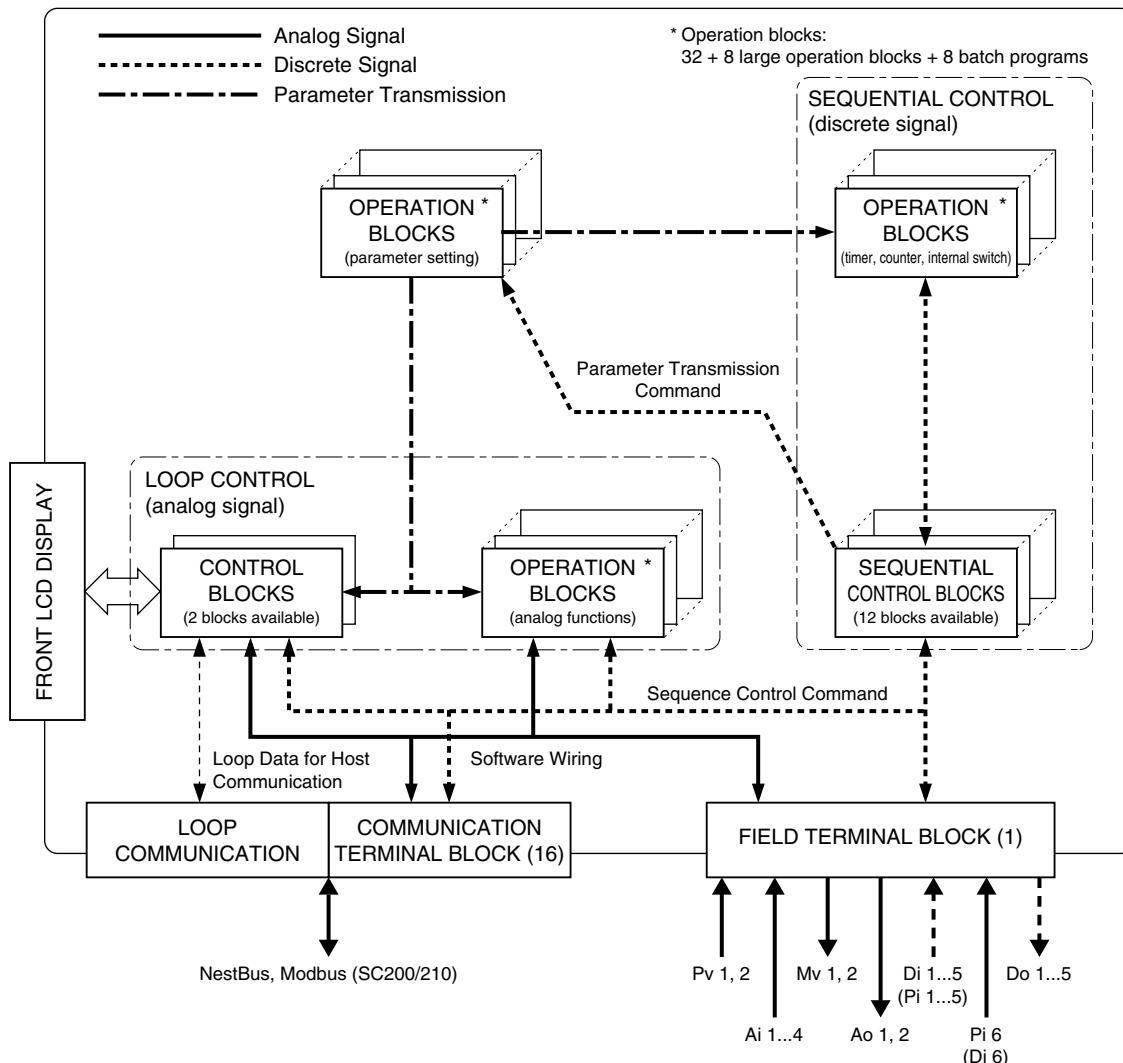
The MsysNet system does not use any specialized computer language, but the “Software Function Blocks”. It incorporates programming concepts for PID controllers, computation modules or PLCs which are familiar to users.

### • User-Friendly Parameter Setting Software

Loop Configuration Builder software for the SC100/200 Series (model: SFEW3E) is available. With the builder software, you can build configuration files, copy them, save them, and print them.

## 4.2 RELATION BETWEEN FUNCTION BLOCKS

- Close connection between PID control and sequential control
- I/O point expansion via software terminal blocks
- Automatic parameters and setpoints change via “Parameter Setter” block

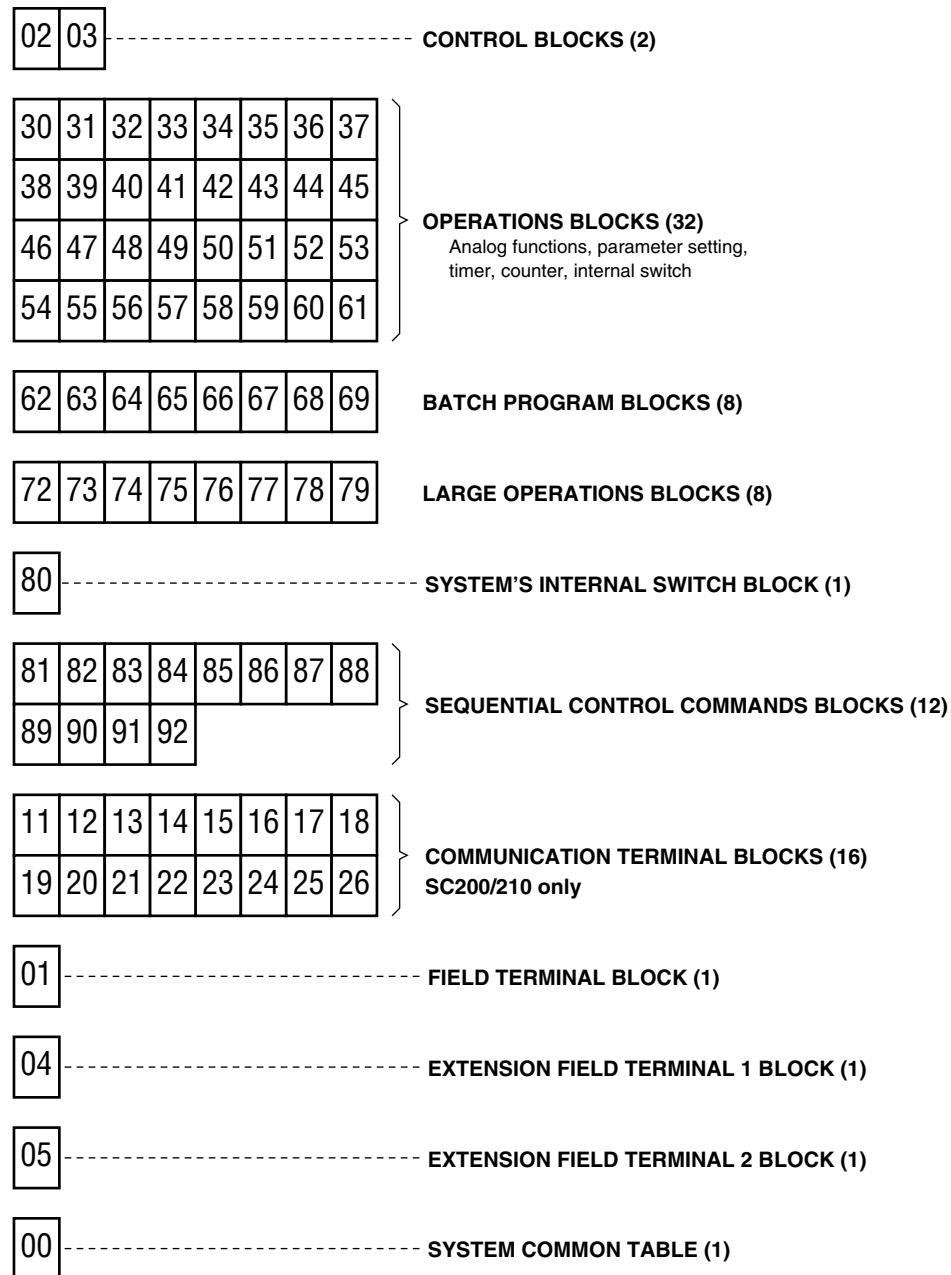


### 4.3 FUNCTION BLOCK ALLOCATIONS

Capability of one module of the SC100/200 Series, number and type of function blocks and their allocations, would be well explained if you imagine an instrument panel.

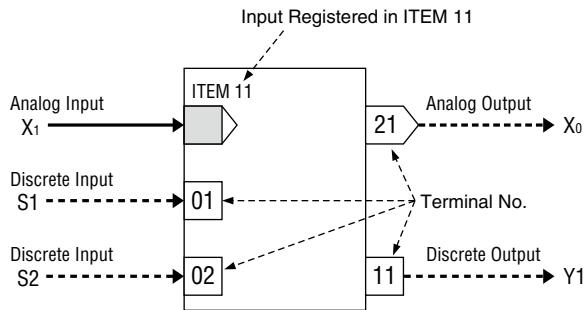
- Number of instruments mountable in one instrument panel is as shown in the figure below. A Group No. means allocation No. in the panel.
- You choose a Group No. and program a Function Block model in ITEM 10. Then all other available ITEMS will be shown according to the function model.
- For the Field Terminal block, users cannot change the model setting.

No. in each block indicates GROUP No.



## 4.4 CONNECTING BETWEEN FUNCTION BLOCKS

### 4.4.1 EXAMPLE OF CONNECTION TERMINALS REPRESENTATION IN A FUNCTION BLOCK



### 4.4.2 CONNECTING ANALOG SIGNALS

- Input signal: Group No. and Terminal No. of the signal you need to input (GGNN) is described in a designated ITEM of the target function block.
- Output signal: Output terminal No. is determined for each function block type.

#### [Example]

If Basic PID block needs to input PV signal from Field Terminal block, the terminal No. of PV signal is represented as 0421 (04: Group No., 21: Terminal No.). Then you write 0421 in ITEM 15 in the PID block.

#### [Analog Connection Terminal '0099']

When one or more analog output terminals in Field Terminal block are not used, set '0099' to these terminals if they give errors when not connected.

### 4.4.3 CONNECTING DISCRETE SIGNALS

Discrete I/O terminals are available in function blocks. You can process these I/O signals via relay logic programs in Sequential Control Program block or via Contact Distributor block.

#### Relay Logic Program

- Discrete input: Discrete input terminal No. is allocated to a coil in relay logic program. It can be input also as discrete signal of the relay logic.
- Discrete output: Discrete output terminal No. pre-determined for each function block type is input as discrete signal of the relay logic.

#### Contact Distributor

A discrete input is connected to a discrete output just like analog signals. Combination of terminals for discrete input and output is registered in the Contact Distributor block.

### 4.4.4 PARAMETER SETTER

Various parameters and their output connection terminals (location of the parameter) are preset in Parameter Setter function block and sent when necessary via a trigger signal from Sequential Control Program block.

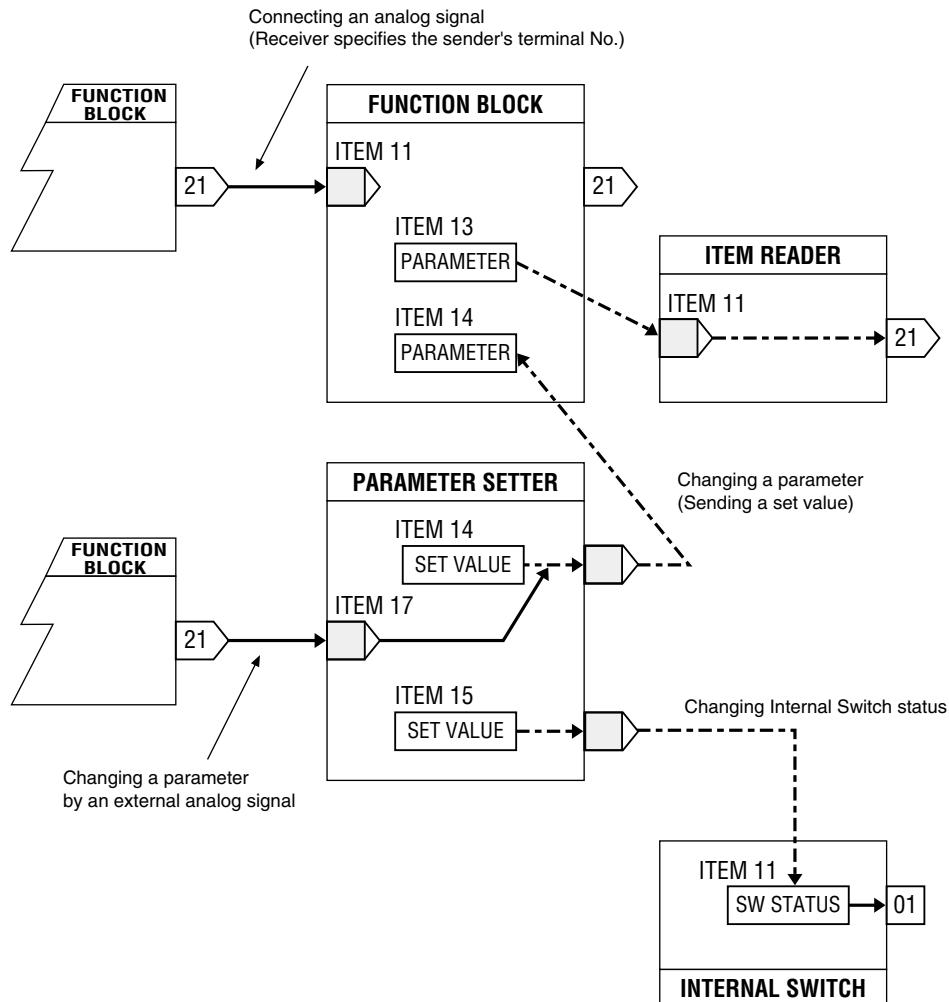
#### WARNING !

Parameters in the Parameter Setter block are rewritable up to 100 000 times. For example, if parameters are updated every one hour, the memory will reach its usable limit in approx. 11 years.

#### 4.4.5 ITEM READER

Parameters are converted into analog signals via this ITEM Reader block.

(Figures are examples.)



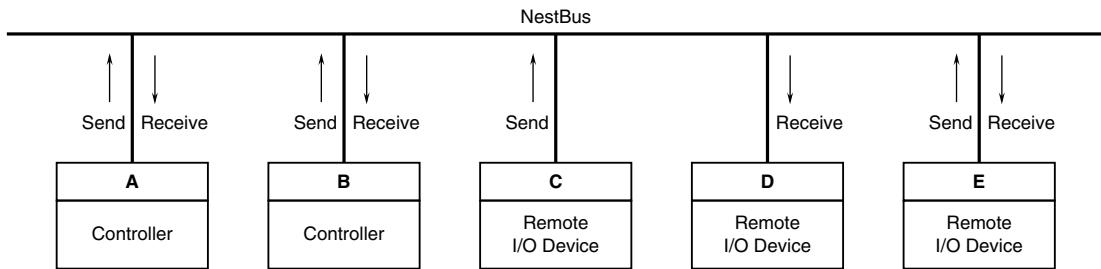
## 4.5 SOFTWARE COMMUNICATION BY COMMUNICATION TERMINALS

Communication Terminal blocks are used for sending/receiving analog signals and discrete signals between hardware modules.

### Sending and Receiving Principles

Token passing protocol is used in this system. A token (right to transmit) goes around nodes (devices connected to the network). Each device, in its turn, broadcasts transmission data to the network. Other devices listen to them and take in necessary data. There are four (4) communication terminal blocks as following:

- Di Receive Terminal: Discrete input, 32 points
- Do Send Terminal: Discrete output, 32 points
- Ai Receive Terminal: Analog input, 2 points
- Ao Send Terminal: Analog output, 2 points

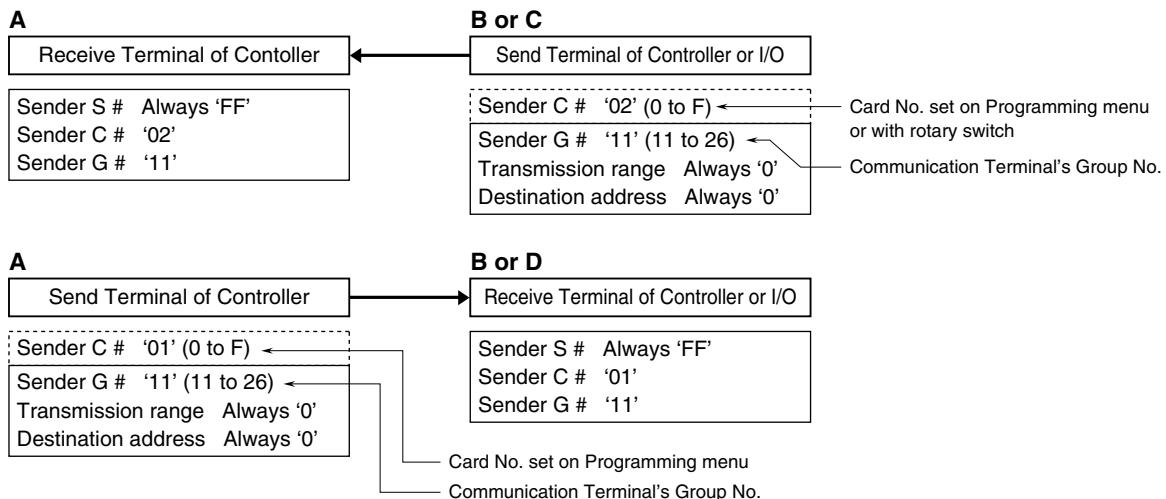


For transmitting data from the device A to the device B in the example shown above, first set necessary data in Send Terminal of the device A and broadcasts them to the network. Then set in Receive Terminal of the device B with specifying the device A, and take in the data from the network.

Transmission data are broadcasted to the network together with their sender address. If another device requires to receive one of these data, set in its Receive terminal with the required sender address.

### Address Setting Example

The following is an example of actual setting to transmit between the Controller A and B (or remote I/O C or D) mentioned in the above figure. In the figure below, boxes in solid line indicate data set in ITEMS of Communication Terminal blocks. Those in broken line indicates those set by other means such like Programming menu on the Controller or DIP switches of remote I/O device.



## Appendix 1. FUNCTION BLOCK ERROR CODES

The following shows the meaning of error codes indicated in ITEM 02 of each function block.

CODE	EXPLANATIONS
ER : 00	Normal
ER : 01	Connection terminal 1 undefined
ER : 02	Connection terminal 2 undefined
ER : 03	Connection terminal 3 undefined
ER : 04	Connection terminal 4 undefined
ER : 05	Connection terminal 5 undefined
ER : 06	Connection terminal 6 undefined
ER : 07	Connection terminal 7 undefined
ER : 08	Connection terminal 8 undefined
ER : 09	Connection terminal 9 undefined
ER : 10	Computation error: Divided by '0'
ER : 11	Computation error: Result out of boundary*
ER : 20	Communication terminal error: Not received
ER : 21	Communication terminal error: Connected external device error
ER : 22	Internal connected device error
ER : 70	Invalid block combination
ER : 80	Sequence error: Invalid command
ER : 81	Sequence error: Undefined connection terminal
ER : 87	Sequence error: Non-registered step
ER : 88	Sequence error: Register overflow
ER : 89	Sequence error: One-shot overflow
ER : 90	EEPROM data base failed**

\*  $32767 < \text{result} < -32768$

\*\* When the error is indicated, write '1' at GROUP 00, ITEM 95 to execute BLOCK RELEASE in PROGRAM mode, or execute download after the EEPROM is cleared by the Loop Configuration Software.

## Appendix 2. SC SERIES VERSION UPGRADE INFORMATION

### ■ V 1.40 or later

- Model 58 Segment Linearizer: 16 segments are available instead of 7.
- Model 64 Moving Average  
ITEM 12: Sampling 0.5 – 115.0 seconds (min. 0.5 sec. increments) → 0.1 – 115.0 seconds (min. 0.1 sec. increments)  
ITEM 13: Number of samples 1 – 16 → 1 – 32  
ITEM 15: Calculation mode (new ITEM)
- Model F70, F71, F72, F73 SCxxx Extension Field Terminal 2  
ITEM 52: Di/Pi selection (new ITEM). Pi 6 (high speed pulse input) can be replaced with Di 6 (discrete input).

ITEM added to F70, F71, F72, F73 SCxxx Extension Field Terminal 2 block

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 52	▲	0, 1	PD6: N	Di/Pi selection (0: Di 6, 1: Pi 6)

### ■ V 1.50 or later

- System Common Table (for SC100/200 series): Manual resetting of RUN contact is available.

ITEMs added to System Common Table (for SC100/200 series)

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
60	▲			■ RUN CONTACT ERROR RESET MODE
		0, 1	RUN: 0	Automatic reset
			RUN: 1	Manual reset
61	●			■ RUN CONTACT ERROR RESET FLAG
		0, 1	0	Normal
			1	Reset (valid when ITEM 60 is set to 'manual reset')

- Model 21 Basic PID, Model 22 Advanced PID: Effective range setting for the anti-reset windup function is available.

ITEMs added to PID blocks

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
★ 68	▲	0, 1	ARW: N	Integral action range (0: MH – ML, 1: set range)
★ 69	▲	±115.00 %	ARH: NNN.NN	Integral action high limit (valid when ITEM 68 is set to '1')
★ 70	▲	±115.00 %	ARL: NNN.NN	Integral action low limit (valid when ITEM 68 is set to '1')

- Model 17 Rate of Change Limit block is available.
- Model F72, F73 SC110/SC210 Extension Field Terminal 1: Backup status is available.

ITEM added to F72, F73 SC110/SC210 Extension Field Terminal 1 block

ITEM	MDFY	DATA INPUT	DISPLAY (e.g.)	CONTENTS
87	▲	0, 1	15: N	Backup status (0: normal, 1: backup)