

(6) Derivative time (D) setting

Command code : S D (53H, 44H)  
 Setting range: 1 to 1800 seconds

STX (02H)	No.	S	D	Sign	Derivative time setting value	Checksum	ETX (03H)
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● Command example

When setting the Derivative time value to 50 seconds (Instrument number: 0)

STX (02H)	(20H)	S (53H)	D (44H)	(20H)	0 (30H)	0 (30H)	5 (35H)	0 (30H)	6 (36H)	4 (34H)	ETX (03H)
50 seconds											

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
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Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(7) Anti-reset windup [ARW] setting

Command code : S W (53H, 57H)  
 Setting range: 0 to 100%

STX (02H)	No.	S	W	Sign	Anti-reset windup setting value	Checksum	ETX (03H)
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● Command example

When setting the Anti-reset windup value to 50%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	W (57H)	(20H)	0 (30H)	0 (30H)	5 (35H)	0 (30H)	5 (35H)	1 (31H)	ETX (03H)
50%											

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
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Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(8) Heater burnout alarm setting

(This item is not available to the MCD-150, MCD-550, MCR-100 and MCR-200 series.)

Command code : S H (53H, 48H)

Setting range: 0 to 100%

STX (02H)	No.	S	H	Sign	Heater burnout alarm setting value					Checksum	ETX (03H)
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● Command example

When setting the Heater burnout alarm value to 50%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	H (48H)	(20H)	0 (30H)	0 (30H)	5 (35H)	0 (30H)	6 (36H)	0 (30H)	ETX (03H)

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(9) Manual operation output setting

Command code : S M (53H, 4DH)

Setting range: When output limit is not used, 0 to 100%

When output limit is used, Output low limit to Output high limit value

STX (02H)	No.	S	M	Sign	Manual operation output value					Checksum	ETX (03H)
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● Command example

When setting the Manual operation output value to 80%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	M (4DH)	(20H)	0 (30H)	0 (30H)	8 (38H)	0 (30H)	5 (35H)	8 (38H)	ETX (03H)

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
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Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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- (10) Main control output proportional cycle setting  
(This item is not available to the MCD-150 series and MCD-550 series.)

Command code : S C (53H, 43H)  
Setting range: 1 to 120 seconds

STX (02H)	No.	S	C	Sign	Main control output proportional cycle setting value					Checksum	ETX (03H)
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- Command example

When setting the Main control output proportional cycle setting value to 15 seconds.  
(Instrument number: 0)

STX (02H)	(20H)	S (53H)	C (43H)	(20H)	0 (30H)	0 (30H)	1 (31H)	5 (35H)	6 (36H)	4 (34H)	ETX (03H)
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15 seconds

- Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
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Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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- (11) Sub control output proportional cycle setting  
(This item is not available to the MCD-150 series and MCD-550 series.)

Command code : S c (53H, 63H)  
Setting range: 1 to 120 seconds

STX (02H)	No.	S	c	Sign	Sub control output proportional cycle setting value					Checksum	ETX (03H)
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- Command example

When setting the Sub control output proportional cycle setting value to 15 seconds.  
(Instrument number: 0)

STX (02H)	(20H)	S (53H)	c (63H)	(20H)	0 (30H)	0 (30H)	1 (31H)	5 (35H)	4 (34H)	4 (34H)	ETX (03H)
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15 seconds

- Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(12) Sub control output proportional band setting

(This item is not available to the MCD-150 series and MCD-550 series.)

Command code : S p (53H, 70H)

Setting range: 1/10 to 10 times as many as the main control output proportional band (-10 to 10)

$$SPB(\%) = MPB \text{ setting value}(\%) \times \text{Multiplying factor}$$

where

SPB: Sub control output proportional band

MPB: Main control output proportional band

Relation between the Sub control output proportional band (SPB) setting value and Multiplying factor

SPB setting value	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
Multiplying factor	1/10	1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1	0

SPB setting value	0	1	2	3	4	5	6	7	8	9	10
Multiplying factor	0	1	2	3	4	5	6	7	8	9	10

STX (02H)	No.	S	p	Sign	Sub control output proportional band setting value					Checksum	ETX (03H)
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● Command examples

When setting the Sub control output proportional band setting value to 10.0%.  
(When the Main control output proportional band is 2.5%) (Instrument number: 0)

STX (02H)	(20H)	S (53H)	p (70H)	(20H)	0 (30H)	0 (30H)	0 (30H)	4 (34H)	3 (33H)	9 (39H)	ETX (03H)
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×4

When setting the Sub control output proportional band setting value to 1.0%.  
(When the Main control output proportional band is 2.5%) (Instrument number: 0)  
Approximate value 1.25% can be set applying the Multiplying factor 1/2.

STX (02H)	(20H)	S (53H)	p (70H)	- (20H)	0 (30H)	0 (30H)	0 (30H)	2 (32H)	2 (32H)	E (45H)	ETX (03H)
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×1/2

● Response

Acknowledgement (When the communication is normally performed.)

ACK (06H)

Negative acknowledgement (When the communication is abnormally performed.)

NAK (15H)

(13) Main control output differential setting

(This item is not available to the MCD-150 series and MCD-550 series.)

Command code : S F (53H, 46H)

Setting range: 0 to 100.0°C

STX (02H)	No.	S	F	Sign	Main control output differential setting value				Checksum	ETX (03H)
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● Command example

When setting the Main control output differential setting value to 1.0°C.  
(Instrument number: 0)

STX (02H)	No. (20H)	S (53H)	F (46H)	Sign (20H)	0 (30H)	0 (30H)	1 (31H)	0 (30H)	6 (36H)	6 (36H)	ETX (03H)
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1.0°C

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(14) Sub control output differential setting

(This item is not available to the MCD-150 series and MCD-550 series.)

Command code : S f (53H, 66H)

Setting range: 0 to 100.0°C

STX (02H)	No.	S	f	Sign	Sub control output differential setting value				Checksum	ETX (03H)
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● Command example

When setting the Sub control output differential setting value to 1.0°C.  
(Instrument number: 0)

STX (02H)	No. (20H)	S (53H)	f (66H)	Sign (20H)	0 (30H)	0 (30H)	1 (31H)	0 (30H)	4 (34H)	6 (36H)	ETX (03H)
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1.0°C

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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(15) Output high limit setting

Command code : S U (53H, 55H)

Setting range: Output low limit value to 100%.

(For the current output type, the range is Output low limit value to 110%.)

STX (02H)	No.	S	U	Sign	Output high limit setting value				Checksum	ETX (03H)
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● Command example

When setting the Output high limit setting value to 90%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	U (55H)	(20H)	0 (30H)	0 (30H)	9 (39H)	0 (30H)	4 (34H)	F (46H)	ETX (03H)
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90%

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
-----	-------

(16) Output low limit setting

Command code : S L (53H, 4CH)

Setting range: 0% to Output high limit value.

(For the current output type, the range is -10% to Output high limit value.)

STX (02H)	No.	S	L	Sign	Output low limit setting value				Checksum	ETX (03H)
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● Command examples

When setting the Output low limit setting value to 10%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	L (4CH)	(20H)	0 (30H)	0 (30H)	1 (31H)	0 (30H)	6 (36H)	0 (30H)	ETX (03H)
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10%

When setting the Output low limit setting value to -10%. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	L (4CH)	- (2DH)	0 (30H)	0 (30H)	1 (31H)	0 (30H)	5 (35H)	3 (33H)	ETX (03H)
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-10%

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
-----	-------

Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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5.2 Changing command

(1) Setting value Lock/Unlock designation

Command code: S K (53H, 4BH)  
 Data : 0000 [Unlock]  
           0001 [Lock mode 1]  
           0002 [Lock mode 2]  
           0003 [Lock mode 3]

STX (02H)	No.	S	K	Sign		Data		Checksum		ETX (03H)
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● Command example

When setting the Lock mode 1. (Instrument number: 0)

STX (02H)		S (53H)	K (4BH)		0 (30H)	0 (30H)	0 (30H)	1 (31H)	6 (36H)	1 (31H)	ETX (03H)
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Lock mode 1

● Unlock

The status lock canceled. All setting values can be changed.  
 Auto-tuning is performed in this mode.

● Lock mode 1

The setting values of Basic function setting mode: Main setting, Temperature alarms [A1, A2], Proportional band, Integral time, Derivative time, Anti-reset windup, Dead band and Heater burnout alarm cannot be changed.

● Lock mode 2

Only Main setting can be changed. Others are in locking status.

● Lock mode 3

Exclusive use for option ECC. It does not memorize the main setting value from the host computer [PC-600 (option SVTC)] into internal memory but reads the value directly. When the option ECC is not applied, do not designate the Lock mode 3.

● Response

Acknowledgement (When the communication is normally performed.)

ACK (06H)

Negative acknowledgement (When the communication is abnormally performed.)

NAK (15H)

(2) Auto/Manual control change

- Even if the option M (Manual operating output) is not applied, Auto/Manual control can be changed.

Command code: S N (53H, 4EH)

Data : 0000 [Automatic control]  
 0001 [Manual control]

STX (02H)	No.	S	N	Sign	Data				Checksum	ETX (03H)
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• Command examples

When changing the control to automatic. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	N (4EH)	(20H)	0 (30H)	0 (30H)	0 (30H)	0 (30H)	5 (35H)	F (46H)	ETX (03H)
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Automatic control

When changing the control to manual. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	N (4EH)	(20H)	0 (30H)	0 (30H)	0 (30H)	1 (31H)	5 (35H)	E (45H)	ETX (03H)
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Manual control

• Automatic control

In case of the proportional action, the control which manipulate the value in proportion to the deviation automatically.

• Manual control

No connection with the deviation, the control which manipulate the value by the setting value including front key operation.

• Balanceless-Bumpless function

The function not to change the output suddenly when the control mode is changed from automatic to manual and vice versa.

• Response

Acknowledgement (When the communication is normally performed.)

ACK (06H)

Negative acknowledgement (When the communication is abnormally performed.)

NAK (15H)



(3) Remote/Local status change

(This item is not available to the MCD-150, MCD-550, MCR-100 and MCR-200 series.)

- If the option E is not applied, the status cannot be changed.

Command code: **S R** (53H, 52H)

Data : 0000 [Local status]  
0001 [Remote status]

STX (02H)	No.	S	R	Sign	Data				Checksum	ETX (03H)
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● Command examples

When changing the status to Local. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	R (52H)	(20H)	0 (30H)	0 (30H)	0 (30H)	0 (30H)	5 (35H)	B (42H)	ETX (03H)
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Local status

When changing the status to Remote. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	R (52H)	(20H)	0 (30H)	0 (30H)	0 (30H)	1 (31H)	5 (35H)	A (41H)	ETX (03H)
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Remote status

● Remote status

The main setting value can be set by analog value from the external.

● Local status

The values can be set with the front keys.

- Do not change the setting values during auto-tuning in Remote status because if the setting value is changed during auto-tuning, something erroneous may occur on the auto-tuning result.

● Response

Acknowledgement (When the communication is normally performed.)

**ACK** (06H)

Negative acknowledgement (When the communication is abnormally performed.)

**NAK** (15H)

(4) Change of Auto-tuning Performance/Cancellation

Command code: S Y (53H, 59H)

Data : 0000 [Auto-tuning cancellation]  
 0001 [Auto-tuning performance]

STX (02H)	No.	S	Y	Sign	Data				Checksum	ETX (03H)
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● Command examples

When canceling the auto-tuning. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	Y (59H)	(20H)	0 (30H)	0 (30H)	0 (30H)	0 (30H)	5 (35H)	4 (34H)	ETX (03H)
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Auto-tuning cancellation

When performing the auto-tuning. (Instrument number: 0)

STX (02H)	(20H)	S (53H)	Y (59H)	(20H)	0 (30H)	0 (30H)	0 (30H)	1 (31H)	5 (35H)	3 (33H)	ETX (03H)
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Auto-tuning performance

● Response

Acknowledgement (When the communication is normally performed.)

ACK	(06H)
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Negative acknowledgement (When the communication is abnormally performed.)

NAK	(15H)
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