

## SECTION 3

# Basic Temperature Control Commands

This section describes the basic temperature control commands.

3-1	Set Point Write: WS	.....
3-2	Set Point Read: RS	.....
3-3	Process Value Read: RX	.....
3-4	Output Value Read: RO	.....
3-5	Proportional Band Write: WB	.....
3-6	Proportional Band Read: RB	.....
3-7	Integral Time Write: WN	.....
3-8	Integral Time Read: RN	.....
3-9	Derivative Time Write: WV	.....
3-10	Derivative Time Read: RV	.....
3-11	Control Period Write: WT	.....
3-12	Control Period Read: RT	.....
3-13	Output Operation (Normal/Reverse) Write: WU	.....
3-14	Output Operation (Direct/Reverse) Read: RU	.....
3-15	Alarm Mode Write: W#	.....
3-16	Alarm Mode Read: R#	.....
3-17	Alarm Temperature Write: W%	.....
3-18	Alarm Temperature Read: R%	.....
3-19	Memory Bank Designation Write: WM	.....
3-20	Memory Bank Designation Read: RM	.....
3-21	Hysteresis Write: WH	.....
3-22	Hysteresis Read: RH	.....
3-23	Status Read: RX	.....
3-24	Error Read: RU	.....

### 3-1 Set Point Write: WS

#### Function

This command is used to write the set point required for temperature control to a control point.



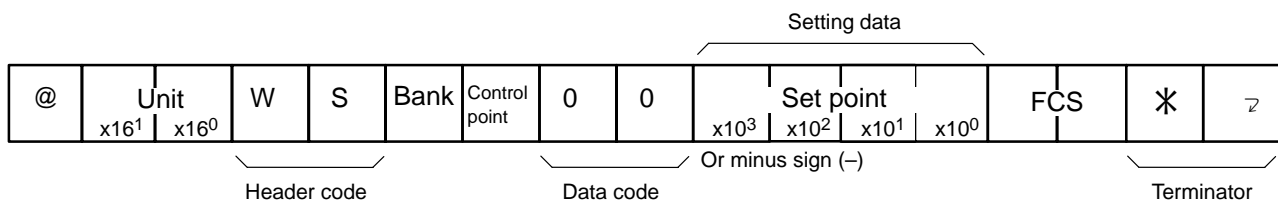
1. Setting Unit Write (Wt) must be used to set the temperature setting unit of a control point to 1 or 0.1.
2. Set Point Write (WS) cannot be used at the designated control point being auto-tuned.
3. The possible setting data range will be -1,999 to 9,999 if the E5ZD-SDL Setting Display Unit is used with the E5ZE after pin number 4 of the FUNCTION switch is set to ON and the temperature setting unit is set to 0.1.

#### Setting Data Range

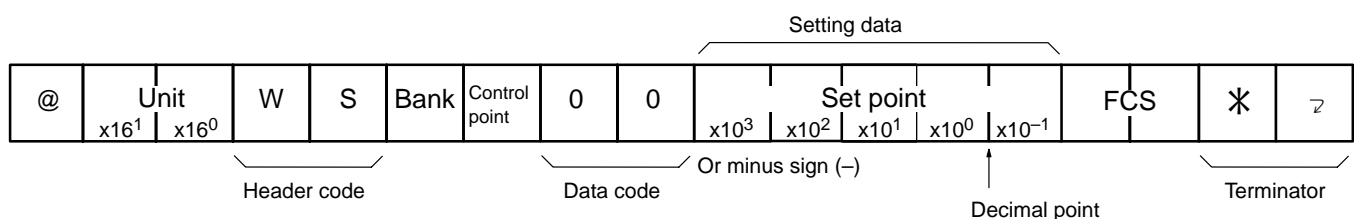
Setting unit		1		0.1	
°C or °F		°C	°F	°C	°F
Default		0000		00000	
Setting Data	K	-200 to 1300	-300 to 2300	-2000 to 13000	-3000 to 23000
	J	-100 to 0850	-100 to 1500	-1000 to 08500	-1000 to 15000
	R	0000 to 1700	0000 to 3000	00000 to 17000	00000 to 30000
	S	0000 to 1700	0000 to 3000	00000 to 17000	00000 to 30000
	T	-200 to 0400	-300 to 0700	-2000 to 04000	-3000 to 07000
	E	0000 to 0600	0000 to 1100	00000 to 06000	00000 to 11000
	B	0100 to 1800	0300 to 3000	01000 to 18000	03000 to 30000
	N	0000 to 1300	0000 to 2300	00000 to 13000	00000 to 23000
	L	-100 to 0850	-100 to 1500	-1000 to 08500	-1000 to 15000
	U	-200 to 0400	-300 to 0700	-2000 to 04000	-3000 to 07000
	W/Re5-26	0000 to 2300	0032 to 4100	00000 to 23000	00320 to 41000
	PL-II	0000 to 1300	0000 to 2300	00000 to 13000	00000 to 23000
	Pt100	-100 to 0500	-100 to 0900	-1000 to 05000	-1000 to 09000
	JPt100	-100 to 0500	-100 to 0900	-1000 to 05000	-1000 to 09000

#### Command

When Setting Unit is 1

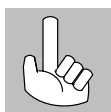
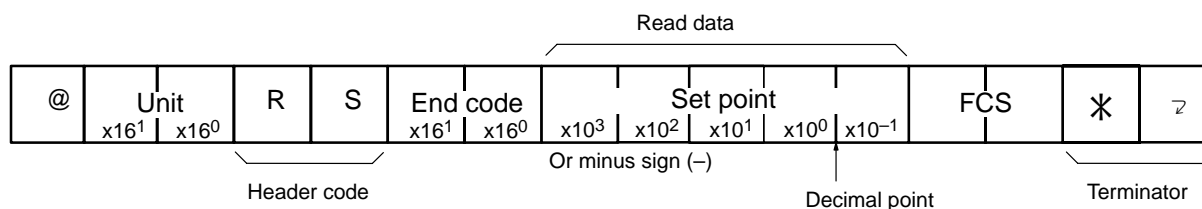


When Setting Unit is 0.1





## When Setting Unit is 0.1



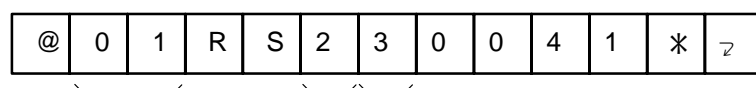
1. The response block for Set Point Read (RS) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

## Communications Example

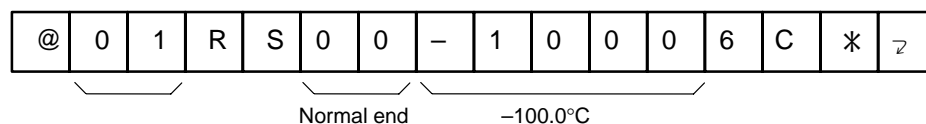
In this example, the E5ZE is operated with Set Point Read (RS) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Setting Unit: 0.1  
 Set Point: -100.0°C

## Command



## Response

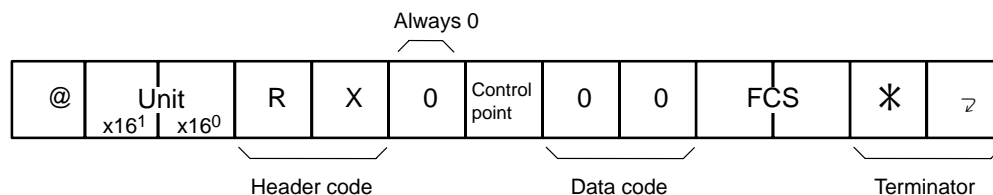


## 3-3 Process Value Read: RX

## Function

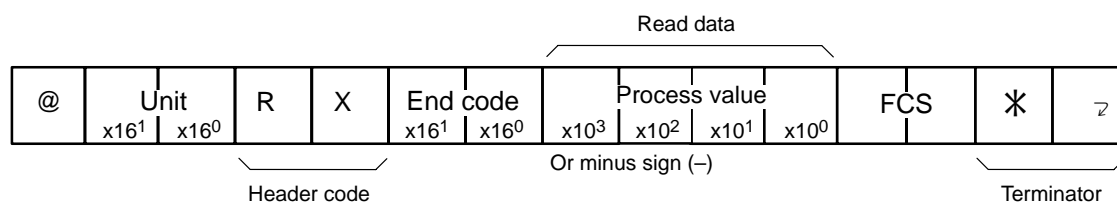
This command is used to read the temperature being measured at a control point.

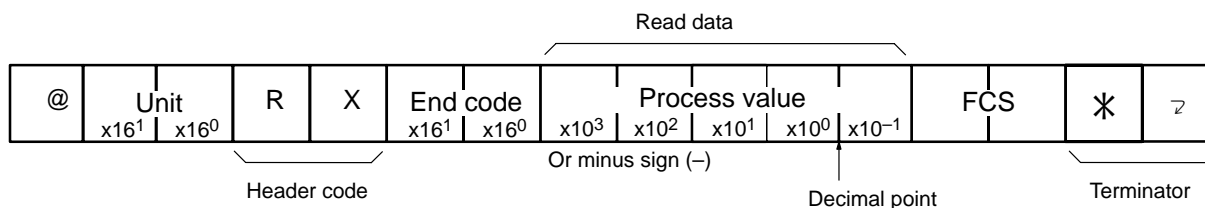
## Command



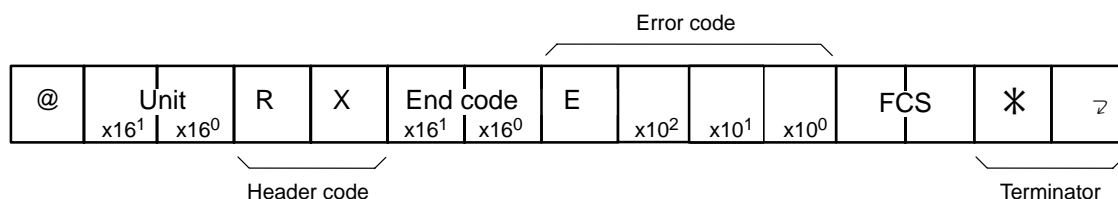
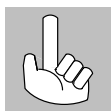
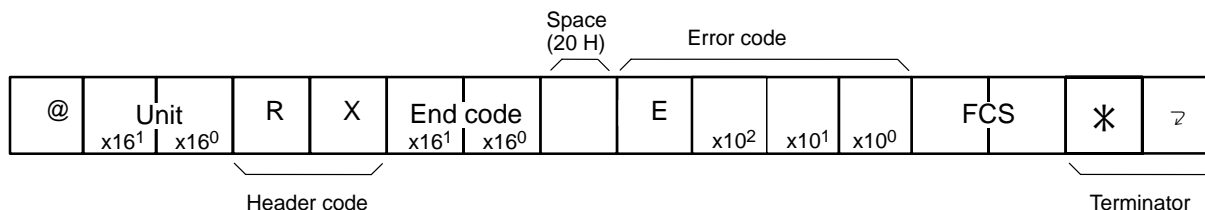
## Response

## When Process Value Unit is 1



**When Process Value Unit Set is 0.1****Response Block with Error Detected**

The response block for Process Value Read (RS) will include an error code if an error is detected by the E5ZE while the E5ZE is processing the command.

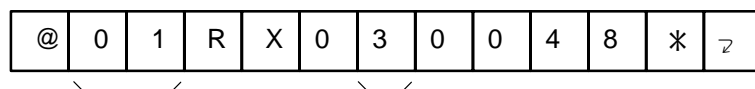
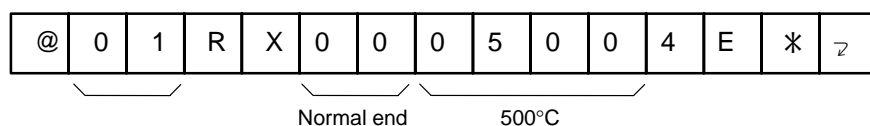
**When Process Value Unit is 1****When Process Value Unit Set is 0.1**

1. The response block for Process Value Read (RX) does not include read data or an error code if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.
3. Refer to 1-5 Error Codes.

**Communications Example**

In this example, the E5ZE is operated with Process Value Read (RX) under the following conditions.

Unit no.: 1  
Control Point: 3  
Process Value Unit: 1  
Process Value: 500°C

**Command****Response**

## 3-4 Output Value Read: RO

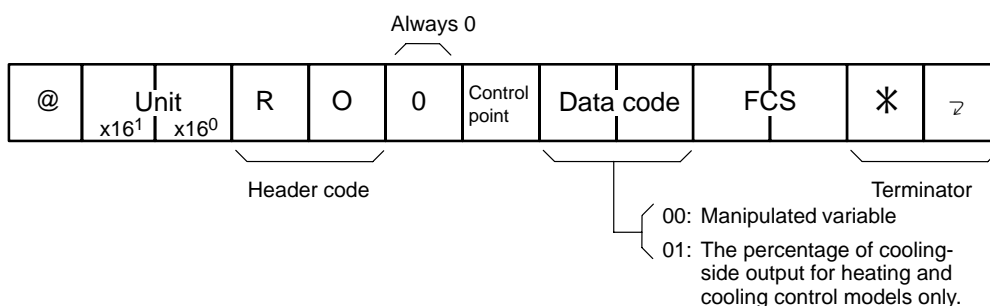
### Function

This command is used to read the percentage of manipulated variable that has been set at a control point.

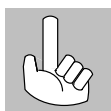
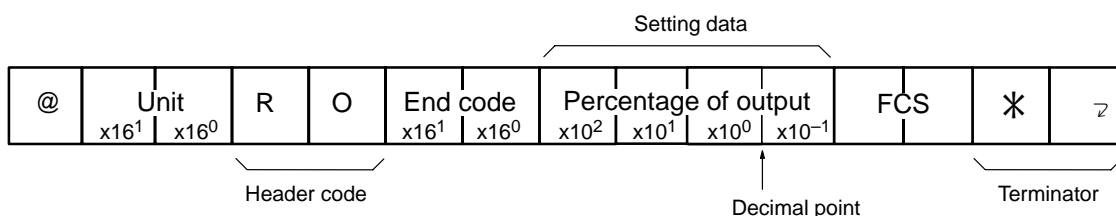


The percentage of the cooling-side output that has been set at a control point can be read provided that the E5ZE is a heating and cooling control model.

### Command



### Response



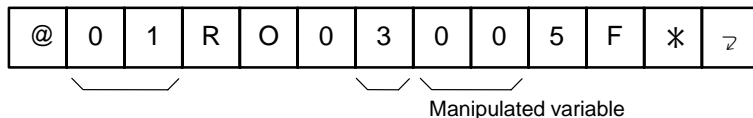
1. The response block for Output Value Read (RO) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

### Communications Example

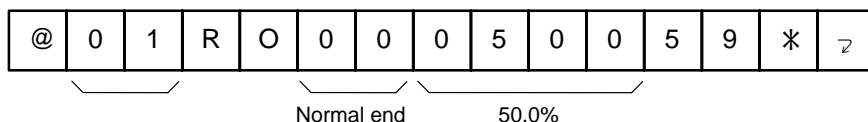
In this example, the E5ZE is operated with MV Read (RO) under the following conditions.

Unit no.: 1  
Control point: 3  
Manipulated variable: 50.0%

#### Command



#### Response



## 3-5 Proportional Band Write: WB

### Function

This command is used to write proportional bands to a control point.



Proportional Band Write (WB) cannot be used at a control point being auto-tuned.

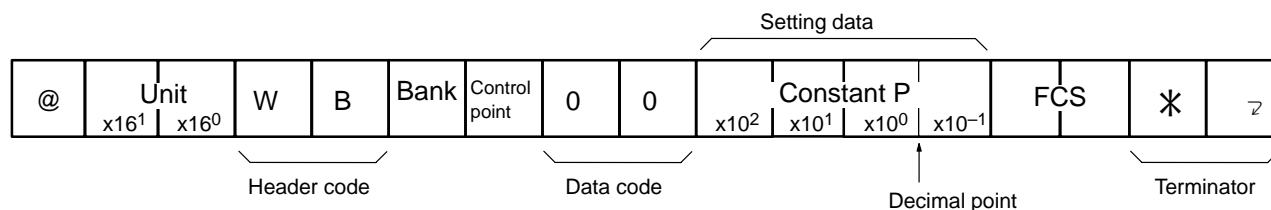
### Setting Data Range

Setting unit	0.1	
°C or °F	°C	°F
Default	0000	
Setting data	0000 to 9999	

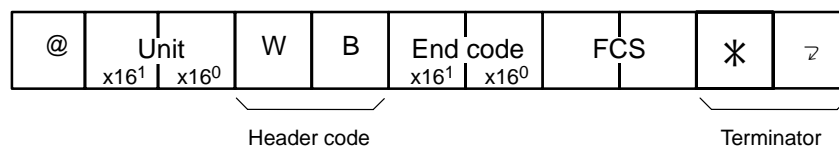


If the constant P of a control point set to 0000 is used for temperature control with the E5ZE, the E5ZE will be in ON/OFF control operation at the control point.

### Command



### Response

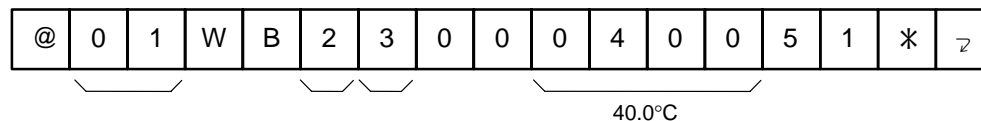


### Communications Example

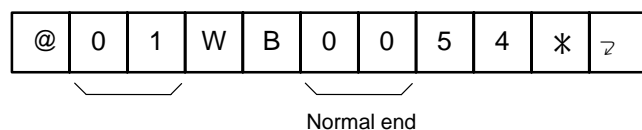
In this example, the E5ZE is operated with Proportional Band Write (WB) under the following conditions.

Unit no.: 1  
Memory Bank no.: 2  
Control Point: 3  
Proportional Band: 40.0°C

#### Command



#### Response

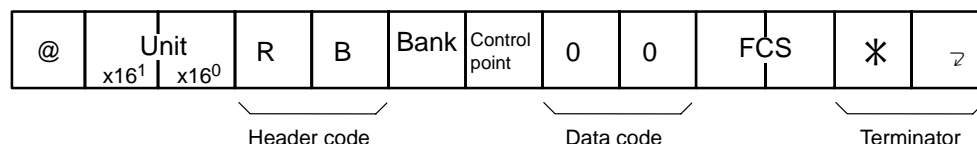


## 3-6 Proportional Band Read: RB

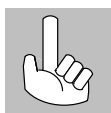
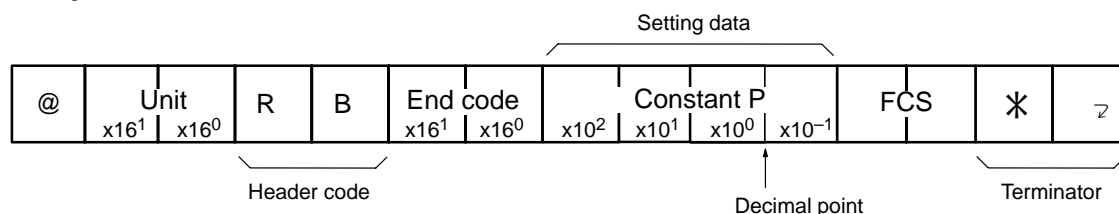
### Function

This command is used to read the proportional bands that have been set at a control point.

### Command



### Response



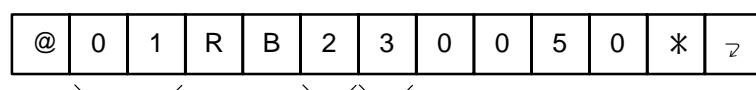
1. The response block for Proportional Band Read (RB) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

### Communications Example

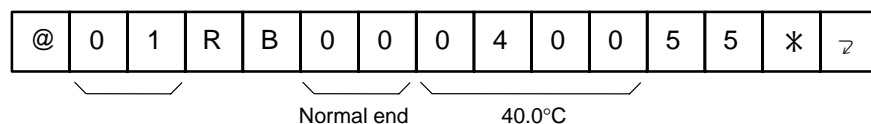
In this example, the E5ZE is operated with Proportional Band Read (RB) under the following conditions.

Unit no.: 1  
Memory Bank no.: 2  
Control Point: 3  
Proportional Band: 40.0°C

### Command



### Response



## 3-7 Integral Time Write: WN

### Function

This command is used to write the integral time to a control point.

Integral Time Write (WN) cannot be used at a control point being auto-tuned.



### Setting Data Range

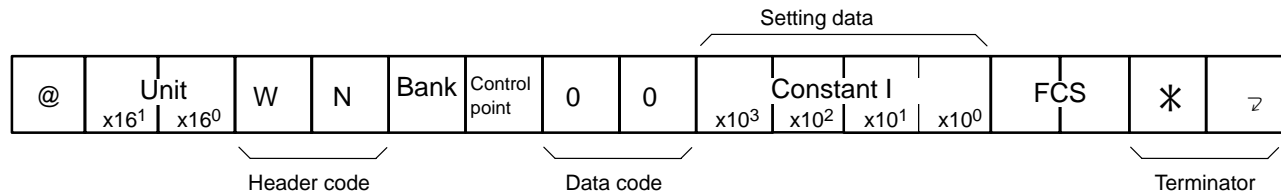
Setting unit	1
Setting time unit	s
Default	0000
Setting data	0000 to 3999



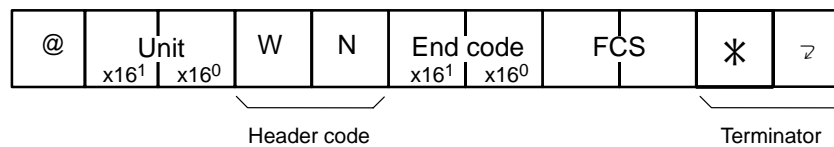


If the constant I of a control point set to 0000 is used for temperature control with the E5ZE, the E5ZE will not be in integral operation at the control point.

### Command



### Response

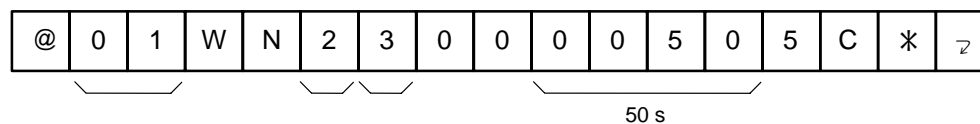


### Communications Example

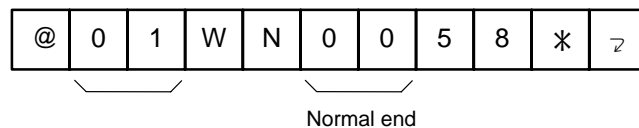
In this example, the E5ZE is operated with Integral Time Write (WN) under the following conditions.

Unit no.: 1  
Memory Bank no.: 2  
Control Point: 3  
Integral Time: 50 s

#### Command



#### Response

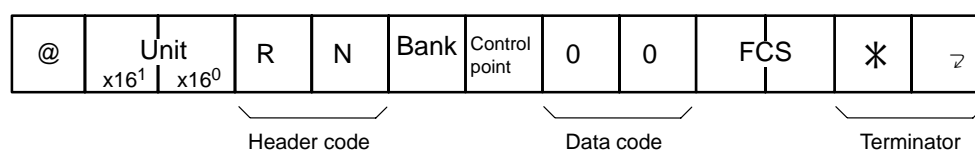


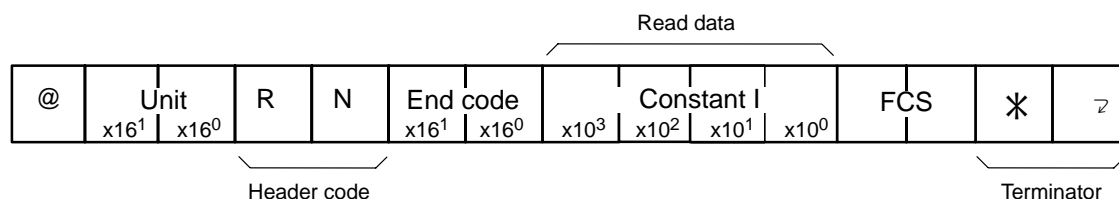
## 3-8 Integral Time Read: RN

### Function

This command is used to read the integral time that have been set at a control point.

### Command



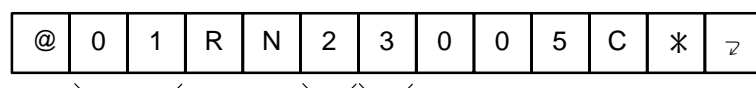
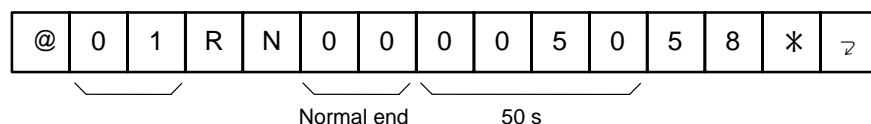
**Response**

1. The response block for Integral Time Read (RN) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

**Communications Example**

In this example, the E5ZE is operated with Integral Time Read (RN) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Integral Time: 50 s

**Command****Response****3-9 Derivative Time Write: WV****Function**

This command is used to write the derivative time to a control point.

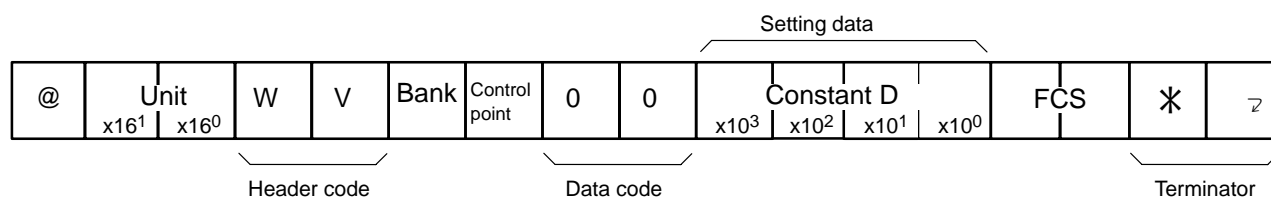
Derivative Time Write (WV) cannot be used at a control point being auto-tuned.

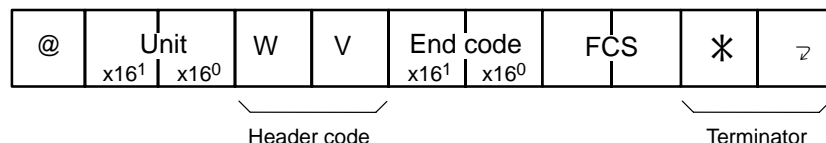
**Setting Data Range**

Setting unit	1
Setting time unit	s
Default	0000
Setting data	0000 to 3999



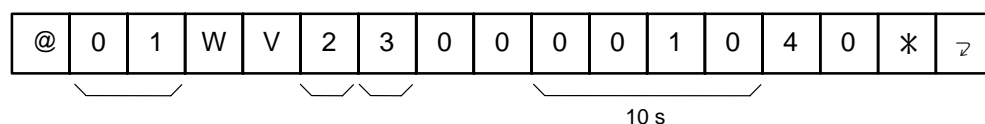
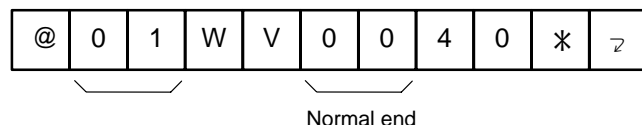
If the constant D of a control point set to 0000 is used for temperature control with the E5ZE, the E5ZE will not be in derivative operation at the control point.

**Command**

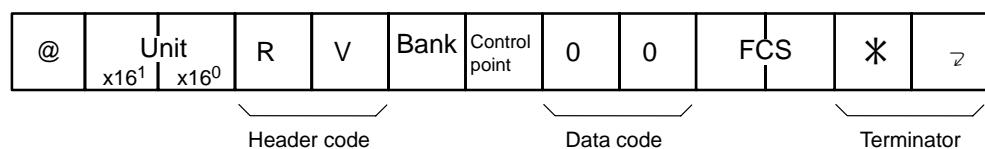
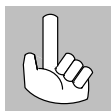
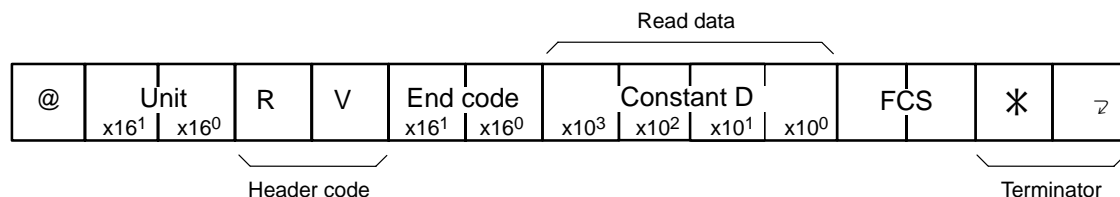
**Response****Communications Example**

In this example, the E5ZE is operated with Derivative Time Write (WV) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Derivative Time: 10 s

**Command****Response****3-10 Derivative Time Read: RV****Function**

This command is used to read the derivative time that have been set at a control point.

**Command****Response**

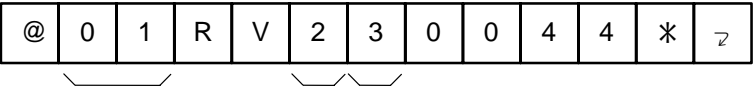
1. The response block for Derivative Time Read (RV) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

Communications Example

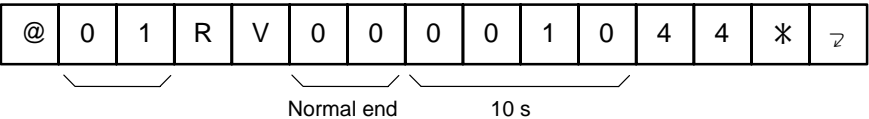
In this example, the E5ZE is operated with Derivative Time Read (RV) under the following conditions.

Unit no.: 1  
Memory Bank no.: 2  
Control Point: 3  
Derivative Time: 10 s

Command



Response



3-11 Control Period Write: WT

Function

This command is used to write the control period to a control point.

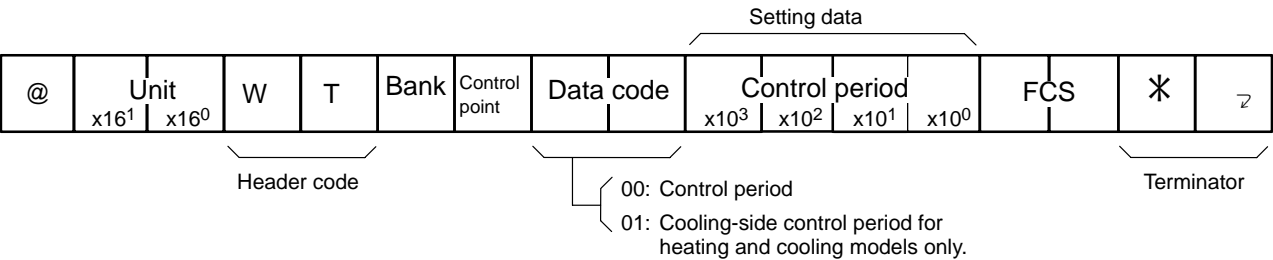


The Control Period Write (WT) cannot be used at a control point being auto-tuned.  
Cooling-side control period can be written to a control point provided that the E5ZE is a heating and cooling control model.

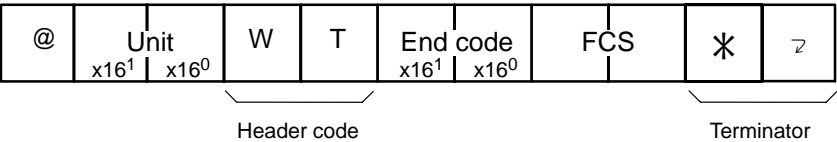
Setting Data Range

Setting unit	1
Setting time unit	s
Default	0002
Setting data	0001 to 0099

Command



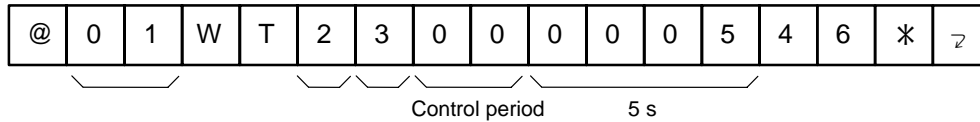
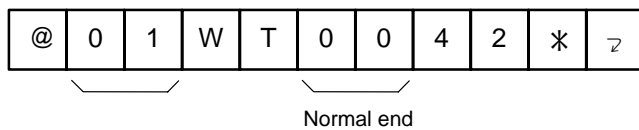
Response



**Communications Example**

In this example, the E5ZE is operated with Control Period Write (WT) under the following conditions.

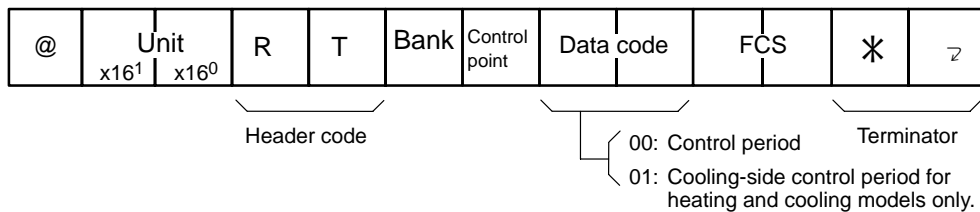
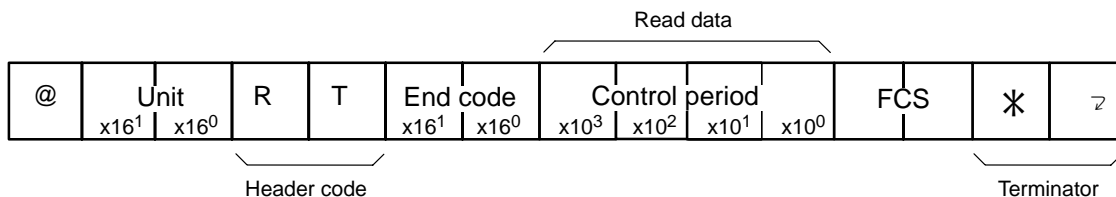
Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Control Period: 5 s

**Command****Response****3-12 Control Period Read: RT****Function**

This command is used to read the control period that have been set at a control point.



The cooling-side control period that have been set at a control point can be read provided that the E5ZE is a heating and cooling control model.

**Command****Response**

1. The response block for Control Period Read (RT) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

**Communications Example**

In this example, the E5ZE is operated with Control Period Read (RT) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Control Period: 5 s

**Command**

@	0	1	R	T	2	3	0	0	4	6	*	↻
					Control period							

**Response**

@	0	1	R	T	0	0	0	0	0	5	4	2	*	↻
					Normal end		5 s							

**3-13 Output Operation (Normal/Reverse) Write: WU****Function**

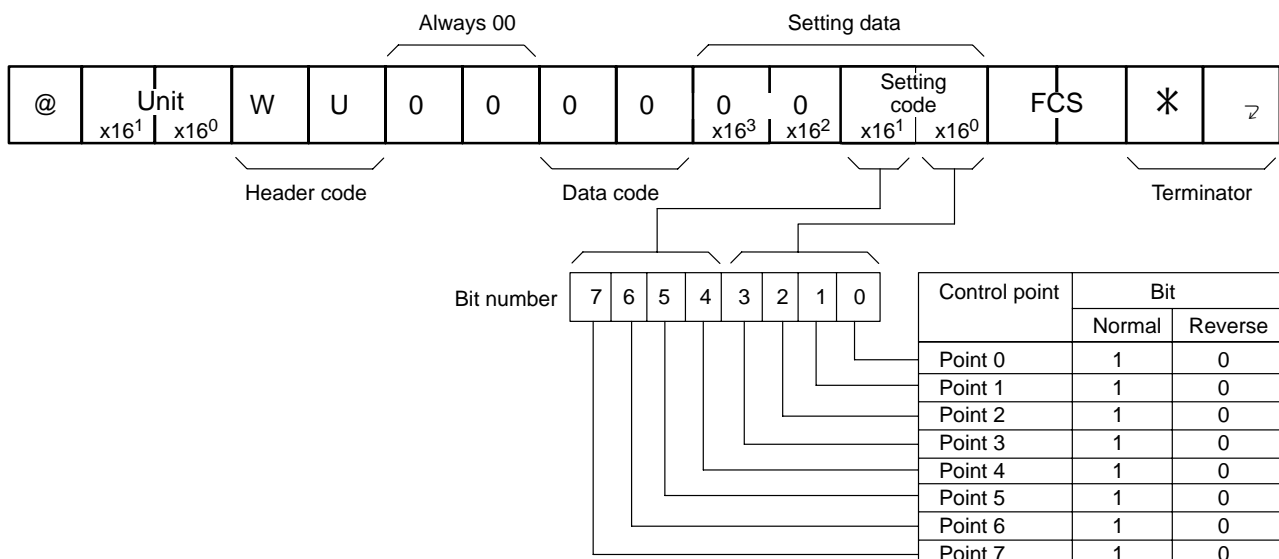
This command is used to designate the normal or reverse operation of a control point.



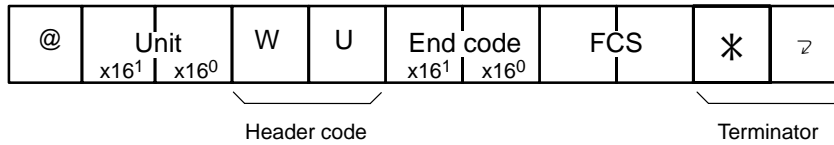
1. Output Operation Write (WU) enables the E5ZE in heating and cooling control operation to change its heating-side control to cooling-side control and vice versa at a control point simultaneously.
2. Output Operation Write (WU) cannot be used at a control point in manual operation, control operation or auto-tuning operation.

**Setting Data Range**

<b>Default</b>	0000 (All control points in reverse operation)
<b>Setting code</b>	00 to FF

**Command**

## Response

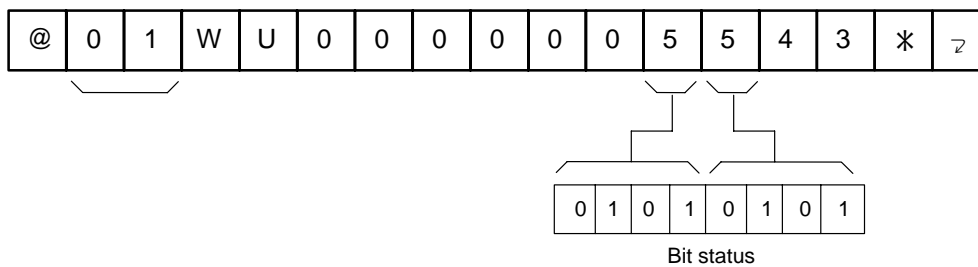


## Communications Example

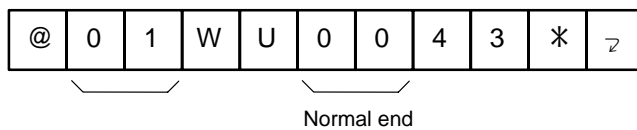
In this example, the E5ZE is operated with Output Operation Write (WU) under the following conditions.

Unit no.: 1  
Control Points 0, 2, 4, and 6: Direct operation  
Control Points 1, 3, 5, and 7: Reverse operation

## Command



## Response

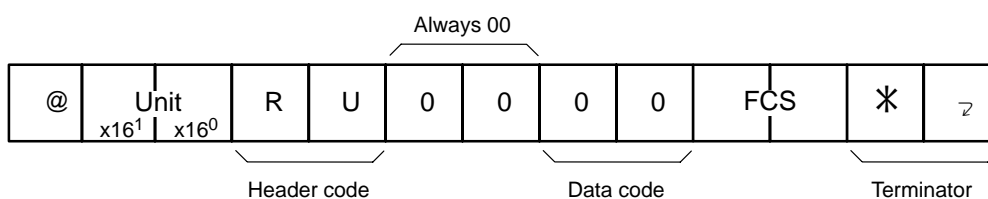


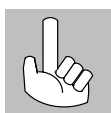
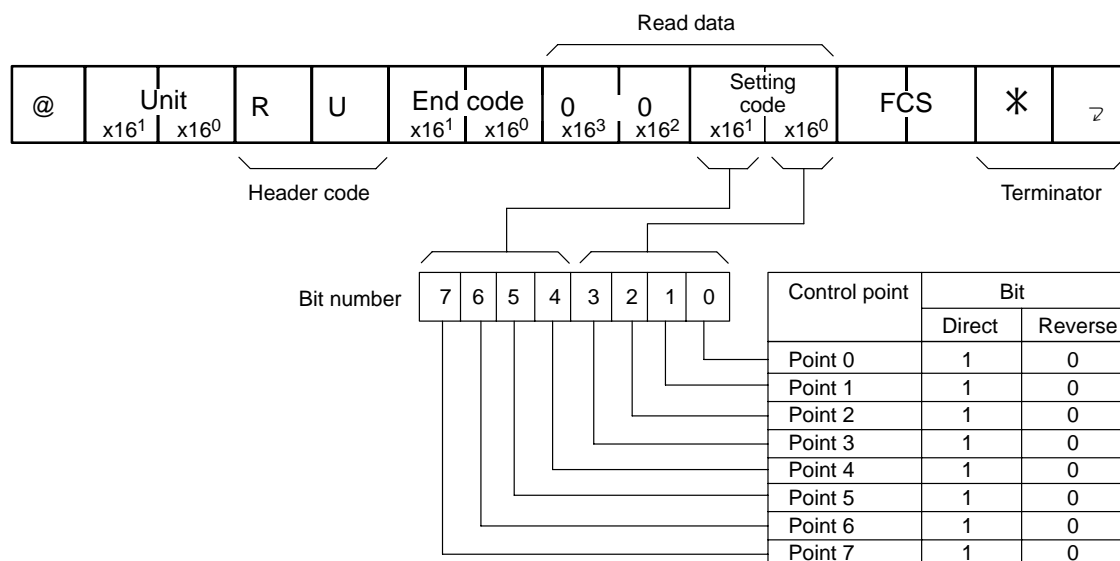
### 3-14 Output Operation (Direct/Reverse) Read: RU

## Function

This command is used to read the output operation that has been set at a control point.

### Command



**Response**

1. The response block for Output Operation Read (RU) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

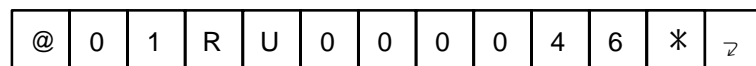
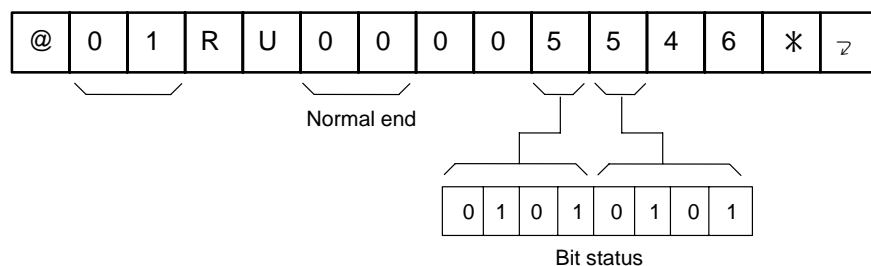
**Communications Example**

In this example, the E5ZE is operated with Output Operation Read (RU) under the following conditions

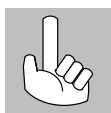
Unit no.: 1

Control Points 0, 2, 4, and 6: Direct operation

Control Points 1, 3, 5, and 7: Reverse operation.

**Command****Response****3-15 Alarm Mode Write: W#****Function**

This command is used to designate the alarm mode of alarm 1 or 2 of a control point.

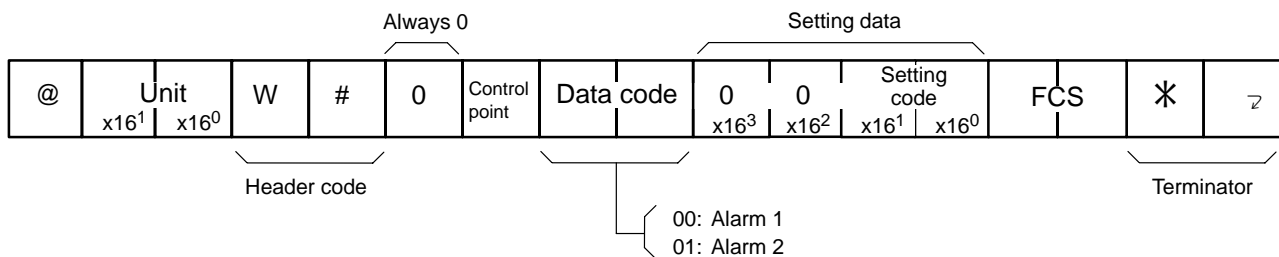
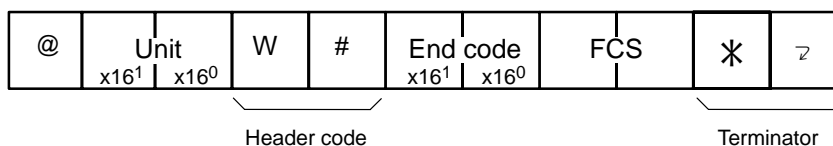


1. Alarm Mode Write (W#) cannot be used at a control point in manual operation, control operation or auto-tuning operation.
2. If the temperature control or manual operation at a control point is interrupted, all the alarm output of the control point will be OFF.



**Setting Data Range**

Alarm		Alarm 1	Alarm 2
Default		00	
Setting code	Alarm OFF	00	
	Upper- and lower-limit alarm	01	
	Upper-limit alarm	02	
	Lower-limit alarm	03	
	Upper- and lower-limit range alarm	04	
	Upper- and lower-limit alarm with standby sequence	05	
	Upper-limit alarm with standby sequence	06	
	Lower-limit alarm with standby sequence	07	
	Absolute-value upper-limit alarm	08	
	Absolute-value lower-limit alarm	09	
	Absolute-value upper-limit alarm with standby sequence	0A	
	Absolute-value lower-limit alarm with standby sequence	0B	
	HB and HS alarm	0C	

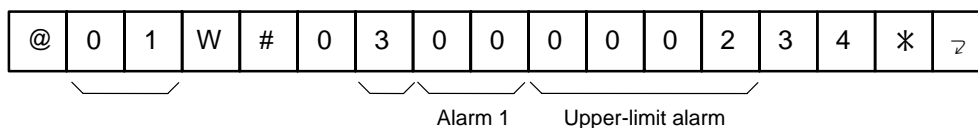
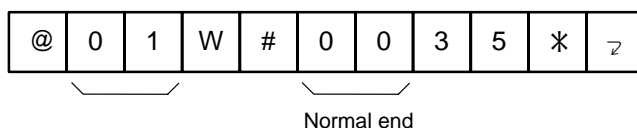
**Command****Response****Communications Example**

In this example, the E5ZE is operated with Alarm Mode Write (W#) under the following conditions.

Unit no.: 1

Control Point: 3

Alarm 1 Mode: Upper-limit alarm

**Command****Response**



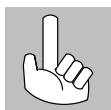
## 3-17 Alarm Temperature Write: W%

### Function

This command is used to set the alarm temperatures for alarm 1 or 2 of a control point.

### Setting Data Range

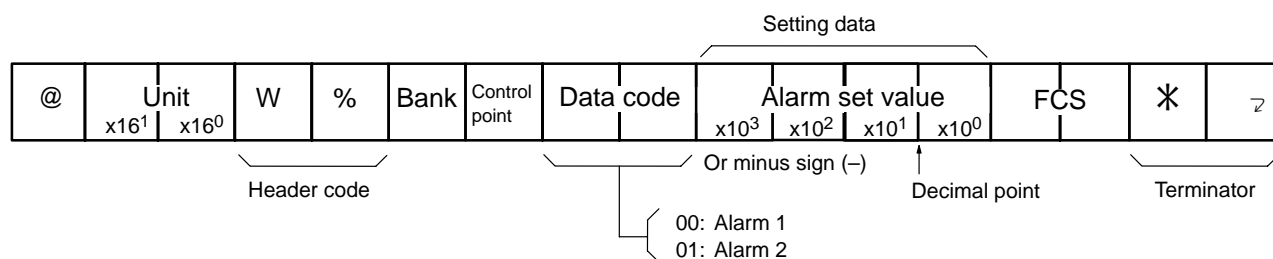
Setting unit		1		0.1	
°C or °F		°C	°F	°C	°F
Default		0000		00000	
Parameters	Alarm OFF	-999 to 9999		-9999 to 99999	
	Upper- and lower-limit alarm	0000 to 9999		00000 to 99999	
	Upper-limit alarm	-999 to 9999		-9999 to 99999	
	Lower-limit alarm	-999 to 9999		-9999 to 99999	
	Upper- and lower-limit range alarm	0000 to 9999		00000 to 99999	
	Upper- and lower-limit alarm with standby sequence	0000 to 9999		00000 to 99999	
	Upper-limit alarm with standby sequence	-999 to 9999		-9999 to 99999	
	Lower-limit alarm with standby sequence	-999 to 9999		-9999 to 99999	
	Absolute-value upper-limit alarm	-999 to 9999		-9999 to 99999	
	Absolute-value lower-limit alarm	-999 to 9999		-9999 to 99999	
	Absolute-value upper-limit alarm with standby sequence	-999 to 9999		-9999 to 99999	
	Absolute-value lower-limit alarm with standby sequence	-999 to 9999		-9999 to 99999	
	HB and HS alarm	---		---	



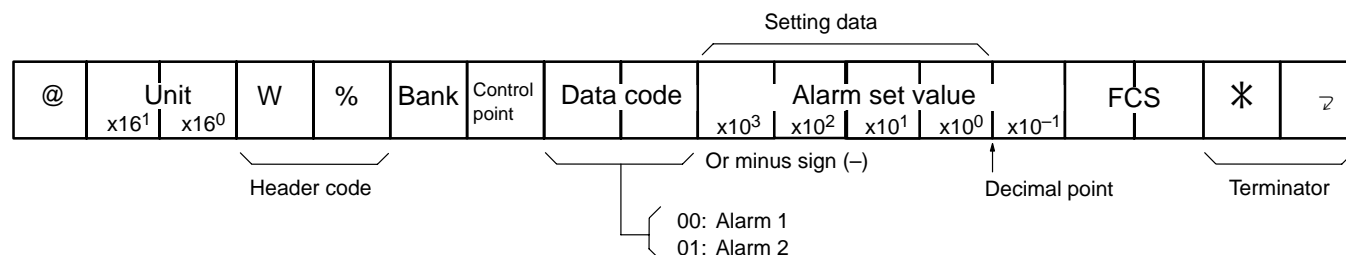
1. Setting Unit Write (Wt) must be used to set the temperature setting unit of a control point to 1 or 0.1.
2. It is unnecessary to set an alarm temperature if HB and HS alarm data is used as the parameters for Alarm Temperature Write (W%).

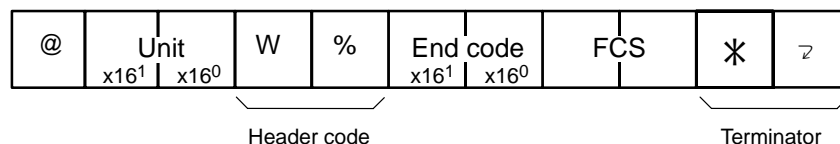
### Command

#### When Setting Unit is 1



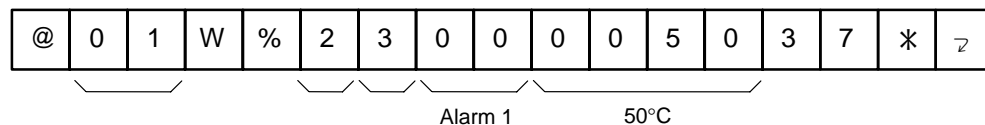
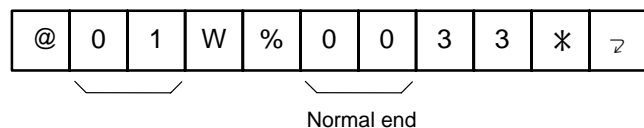
#### When Setting Unit is 0.1



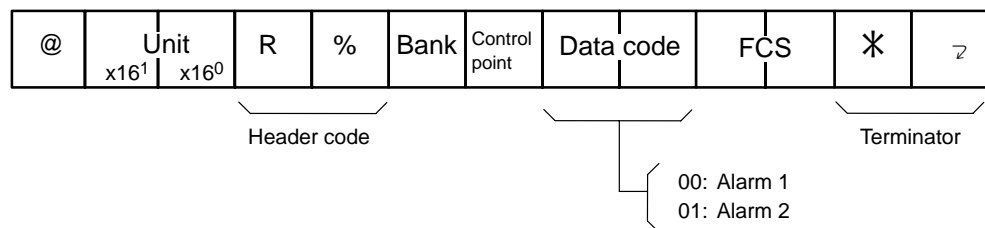
**Response****Communications Example**

In this example, the E5ZE is operated with Alarm Temperature Write (W%) under the following conditions.

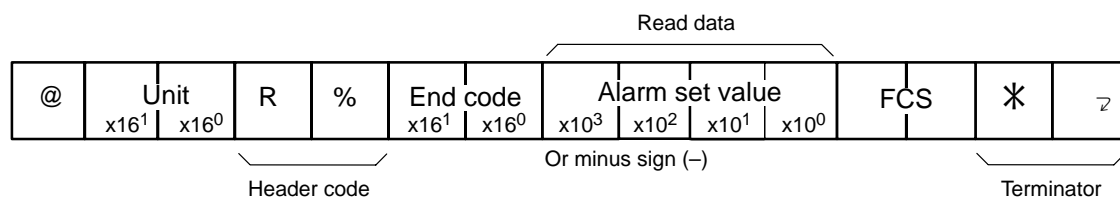
Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Setting Unit: 1  
 Alarm 1 Temperature: 50°C

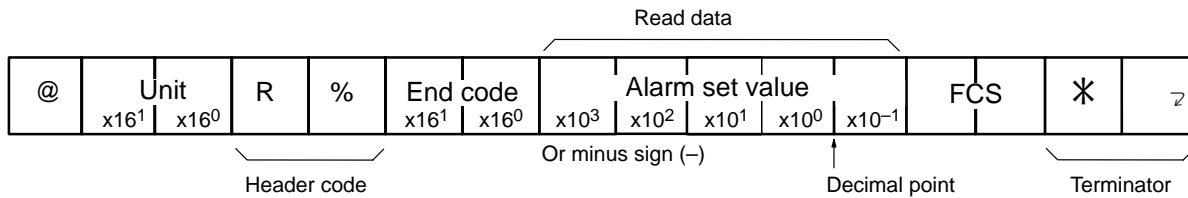
**Command****Response****3-18 Alarm Temperature Read: R%****Function**

This command is used to read the alarm temperatures that have been set at a control point.

**Command****Response**

When Setting Unit is 1



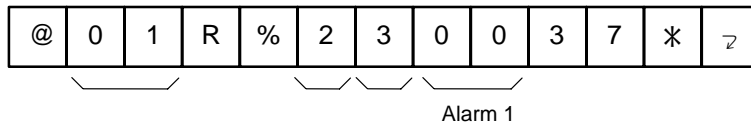
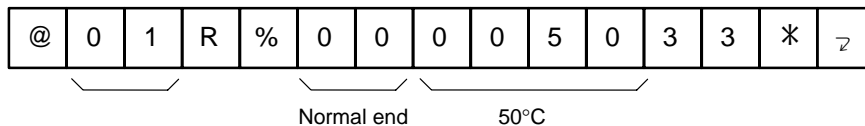
**When Setting Unit is 0.1**

1. The response block for Alarm Temperature Read (R%) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

**Communications Example**

In this example, the E5ZE is operated with Alarm Temperature Read (R%) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Setting Unit: 1  
 Alarm 1 Temperature: 50°C

**Command****Response****3-19 Memory Bank Designation Write: WM****Function**

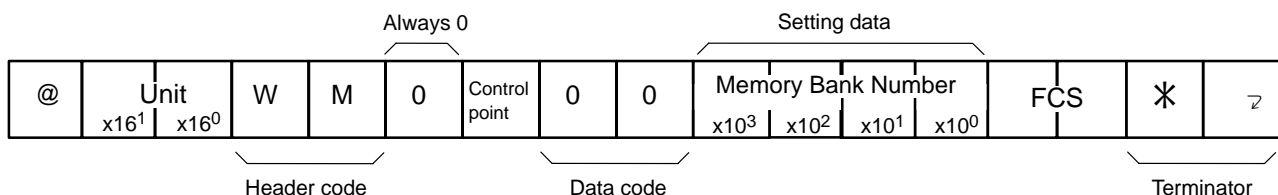
This command is used to designate the memory banks at a control point that are used for temperature control.

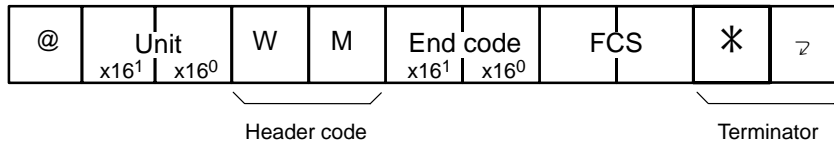


1. Memory Bank Designation Write (WM) cannot be used if the memory bank designation method is set to contact input designation.
2. Memory Bank Designation Write (WM) cannot be used at a control point being auto-tuned.
3. When the E5ZE is turned ON, the memory bank numbers previously selected through communications will be effective.

**Setting Data Range**

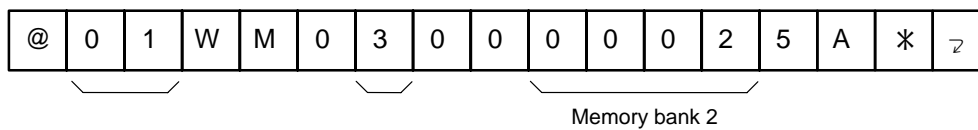
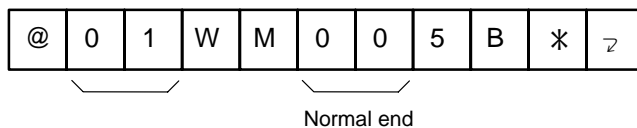
<b>Default</b>	0000 for all control points
<b>Setting data</b>	0000 to 0007

**Command**

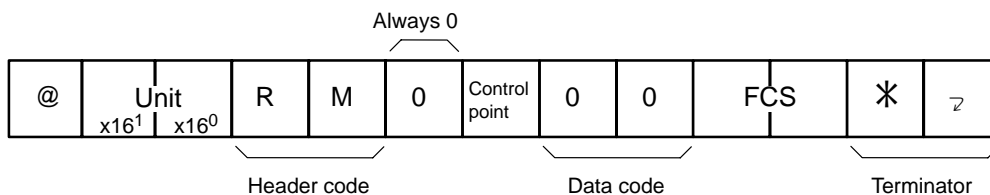
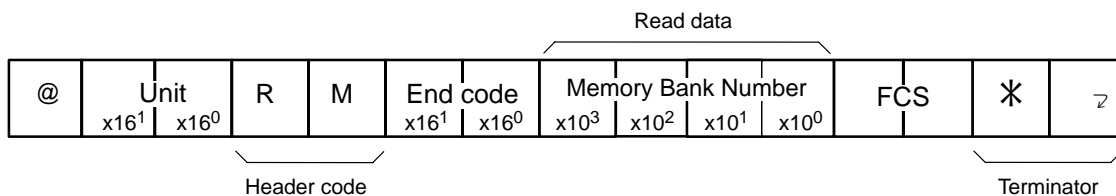
**Response****Communications Example**

In this example, the E5ZE is operated with Memory Bank Designation Write (WM) under the following conditions.

Unit no.: 1  
Control Point: 3  
Memory Bank no.: 2

**Command****Response****3-20 Memory Bank Designation Read: RM****Function**

This command is used to read the memory banks that have been set at a control point.

**Command****Response**

1. The response block for Memory Bank Designation Read (RM) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

**Communications Example**

In this example, the E5ZE is operated with Memory Bank Designation Read (RM) under the following conditions.

Unit no.: 1  
Control Point: 3  
Memory Bank no.: 2

**Command**

@	0	1	R	M	0	3	0	0	5	D	*	↵
---	---	---	---	---	---	---	---	---	---	---	---	---

**Response**

@	0	1	R	M	0	0	0	0	0	2	5	C	*	↵
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Normal end      Memory bank 2

**3-21 Hysteresis Write: WH****Function**

This command is used to set the hysteresis of control outputs of a control point in ON/OFF operation.



1. Hysteresis Write (WH) cannot be used at a control point being auto-tuned.
2. Hysteresis Write (WH) is invalid if it is used for the E5ZE for 2-PID control.
3. The hysteresis of the cooling-side control outputs can be set provided that the E5ZE is a heating and cooling control model.

**Setting Data Range**

<b>Setting unit</b>	0.1	
<b>°C or °F</b>	°C	°F
<b>Default</b>	0008	0015
<b>Setting data</b>	0000 to 0999	

**Command**

Setting data														
@	Unit		W	H	Bank	Control point	Data code	Hysteresis				FCS	*	↺
	x16 <sup>1</sup>	x16 <sup>0</sup>						x10 <sup>2</sup>	x10 <sup>1</sup>	x10 <sup>0</sup>	x10 <sup>-1</sup>			
Header code								Or minus sign (-)			Decimal point	Terminator		
00: Hysteresis														
01: Hysteresis of cooling-side output for heating and cooling models only														

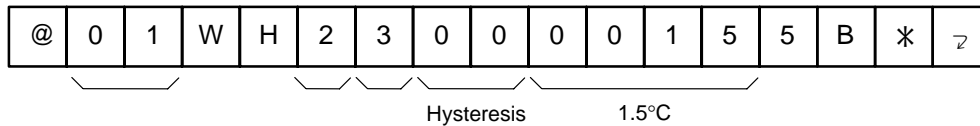
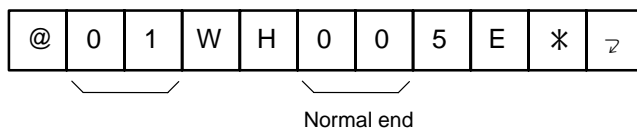
**Response**

@	Unit		W	H	End code		FCS	*	↵
	x16 <sup>1</sup>	x16 <sup>0</sup>			x16 <sup>1</sup>	x16 <sup>0</sup>			
Header code					Terminator				

**Communications Example**

In this example, the E5ZE is operated with Hysteresis Write (WH) under the following conditions.

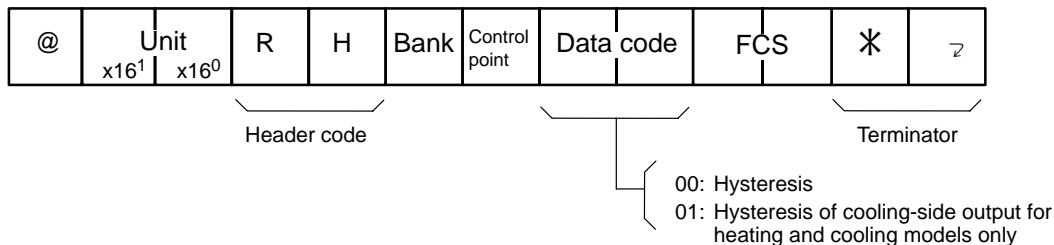
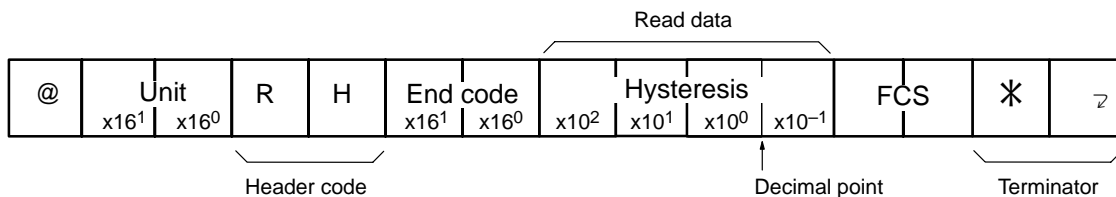
Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Hysteresis: 1.5°C

**Command****Response****3-22 Hysteresis Read: RH****Function**

This command is used to read the hysteresis of control outputs that have been set at a control point.



The hysteresis of the cooling-side control outputs can be read provided that the E5ZE is a heating and cooling control model.

**Command****Response**

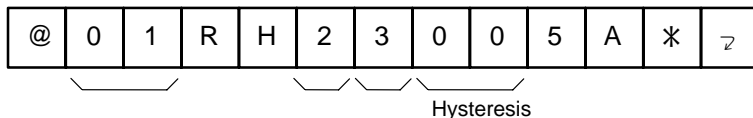
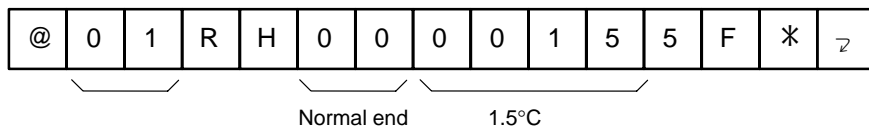
1. The response block for Hysteresis Read (RH) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.



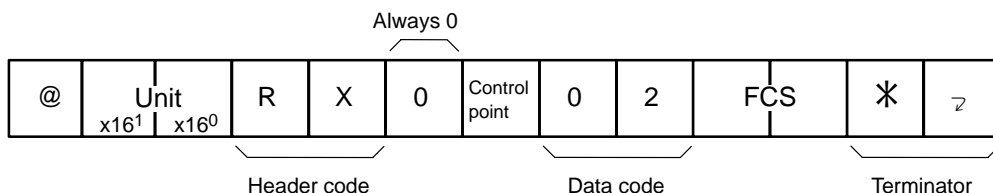
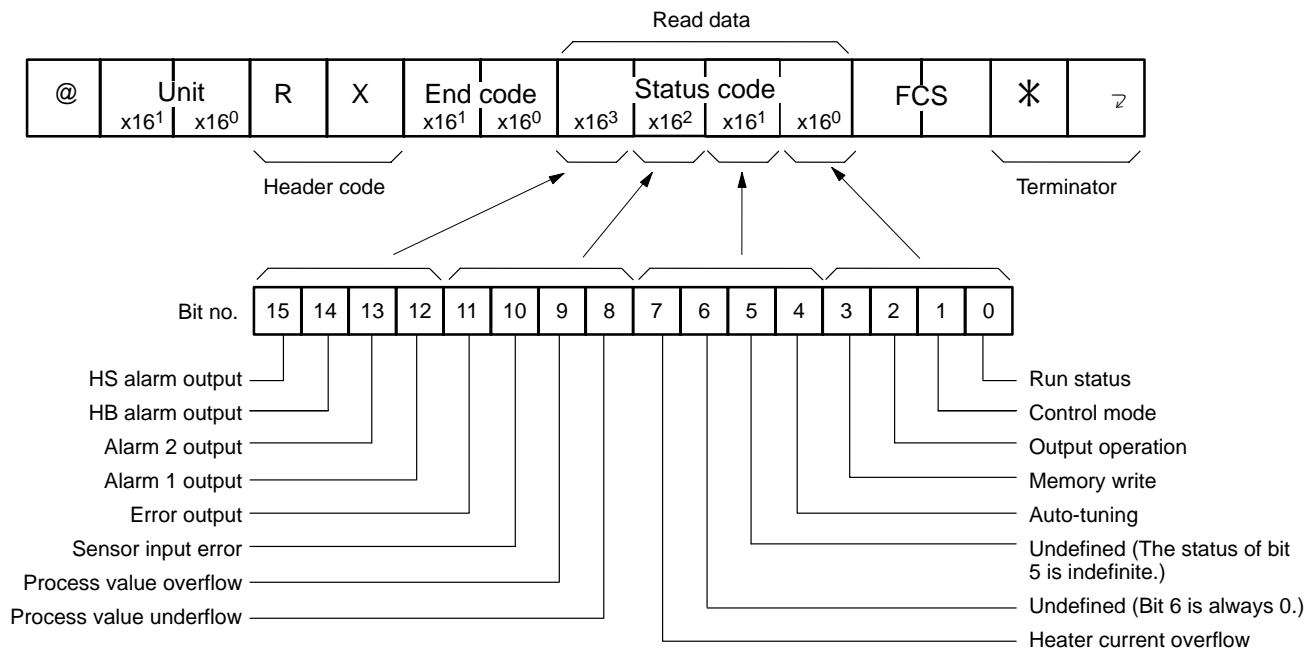
**Communications Example**

In this example, the E5ZE is operated with Hysteresis Read (RH) under the following conditions.

Unit no.: 1  
 Memory Bank no.: 2  
 Control Point: 3  
 Hysteresis: 1.5°C

**Command****Response****3-23 Status Read: RX****Function**

This command is used to read the operating status.

**Command****Response**

Bit no.	Function	Bit status		Bit no.	Function	Bit status	
		1	0			1	0
0	RUN Status	E5ZE is operating.	E5ZE is OFF.	8	Process Value Underflow	Process value is too low.	Process value is OK.
1	Control Mode	PID	Manual	9	Process Value Overflow	Process value is too high.	Process value is OK.
2	Output Operation	Direct operation	Reverse operation	10	Sensor Input Error	Sensor error.	Sensor is OK.
3	Memory Write	Not written	Written	11	Error Output	ON	OFF
4	Auto-tuning	Auto-tuning.	Not auto-tuning.	12	Alarm 1 Output	ON	OFF
5	Undefined (The status of bit 5 is indefinite.)	---	---	13	Alarm 2 Output	ON	OFF
6	Undefined (Bit 6 is always 0.)	---	0	14	HB Alarm Output	ON	OFF
7	Heater Current Overflow	Current is too large.	Current is normal.	15	HS Alarm Output	ON	OFF



1. The response block for Status Read (RX) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.
3. The contents of temperature controller errors detected with Status Read (RX) can be checked with Error Read (RU). Refer to 3-24 Error Read: RU.

### Communications Example

In this example, the E5ZE is operated with Status Read (RX) under the following conditions.

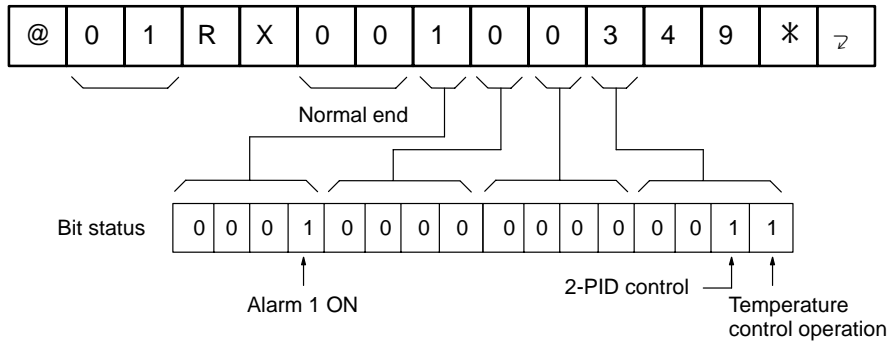
Unit no.: 1  
Control Point: 3

RUN Status:	ON (E5ZE is operating)
Control Mode:	2-PID control
Output Operation:	Reverse operation
Parameters:	Written to memory
Auto-tuning:	Not auto-tuning
Heater Current Overflow:	Normal current
Process Value:	OK
Sensor Input Error:	Sensor is OK
Error Output:	OFF
Alarm 1 Output:	ON
Alarm 2 Output:	OFF
HB Alarm Output:	OFF
HS Alarm Output:	OFF

### Command

@	0	1	R	X	0	3	0	2	4	A	*	2
---	---	---	---	---	---	---	---	---	---	---	---	---

## Response

**Bit Meanings in Detail**

Meanings of other bits have been described previously.

**Bit 0: RUN Status**

Indicates the following operation control status of the E5ZE.

- Temperature control or manual operation
- OFF

**Bit 1: Control Mode**

Indicates the control mode of the E5ZE.

- 2-PID control mode (with ON/OFF control)
- Manual operation mode

**Bit 2: Output Operation**

Indicates the control output operation of the E5ZE.

- Direct operation
- Reverse operation

**Bit 3: Memory Write**

Indicates the existence or nonexistence of the setting data of the E5ZE.

- Not written
- Written

**Bit 4: Auto-tuning**

Indicates the auto-tuning status of the E5ZE.

- Auto-tuning
- Not auto-tuning.

**Bit 7: Heater Current Overflow**

This flag turns ON to indicate that the measured heater current has exceeded 55.0 A. The E5ZE continues temperature control even when this flag turns ON.

**Bit 8: Process Value Underflow**

This flag turns ON to indicate that the process value at a control point has dropped below the set point range by 20°C or 40°F or more. The E5ZE continues temperature control even when this flag turns ON.

**Bit 9: Process Value Overflow**

This flag turns ON to indicate that the process value at a control point has exceeded the set point range by 20°C or 40°F. The E5ZE continues temperature control even when this flag turns ON.

**Bit 10: Sensor Input Error**

This flag turns ON to indicate that the sensor connected to a control point has been incorrectly wired, that the sensor circuit is burnout, or that a temperature input from the sensor has exceeded the set point range. Although the E5ZE continues temperature control even when this flag turns ON, the control output of the control point will be OFF until this flag turns OFF.

## 3-24 Error Read: RU

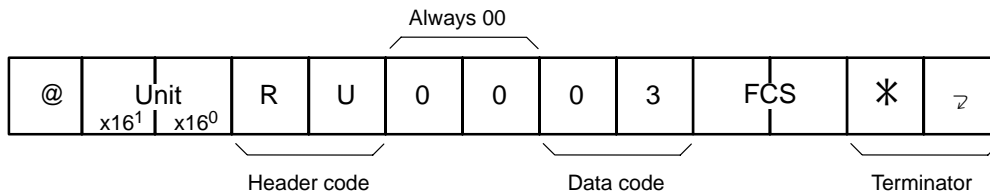
### Function

This command is used to obtain information on errors that exist in the E5ZE.

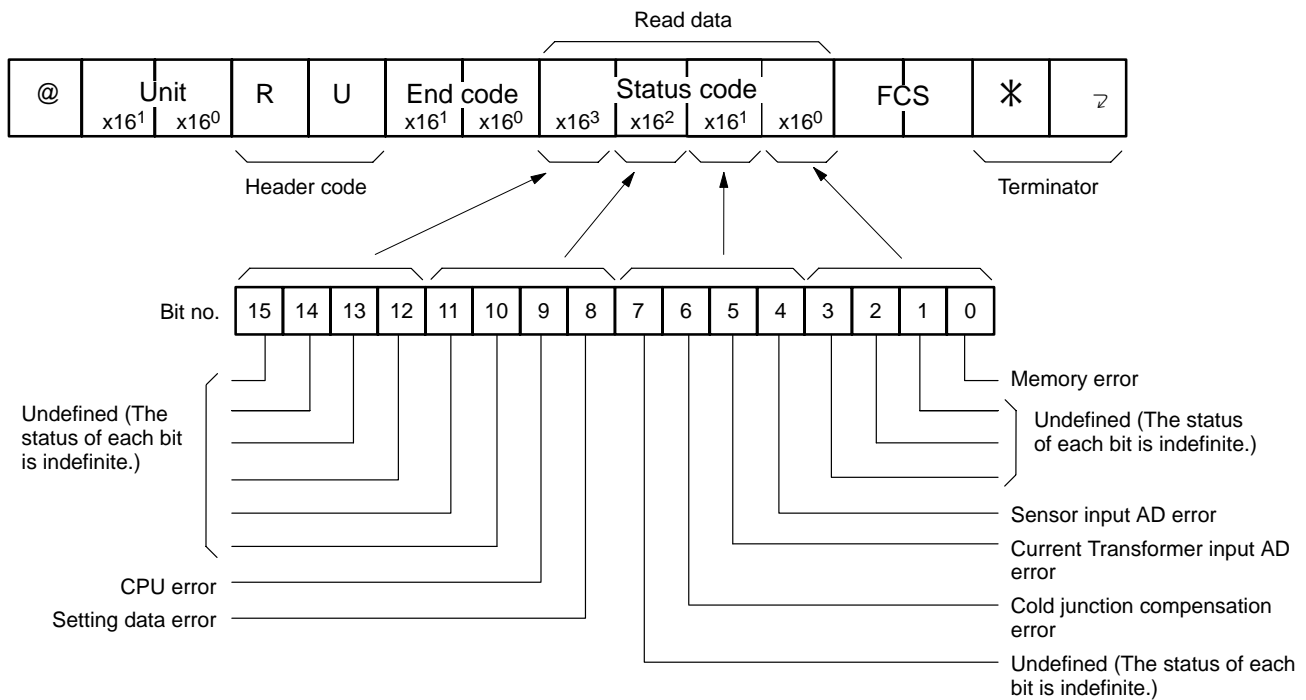


If an error exists in the E5ZE, the control output of a control point will be OFF and the E5ZE will turn an error output ON until the error is eliminated.

### Command



### Response



Bit No.	Contents	Bit status	
		1	0
0	Memory error	Error	Normal
1	Undefined (The status of each bit is indefinite.)	---	---
2		---	---
3		---	---
4	Sensor input AD error	Error	Normal
5	Current Transformer input AD error	Error	Normal
6	Cold junction compensation error	Error	Normal
7	Undefined (The status of each bit is indefinite.)	---	--
8	Setting data error	Error	Normal
9	CPU error	Error	Normal
10	Undefined (The status of each bit is indefinite.)	---	---
11		---	---
12		---	---
13		---	---
14		---	---
15		---	---



1. The response block for Error Read (RU) does not include read data if the end code of the response block is other than 00.
2. Refer to 1-4 End Codes.

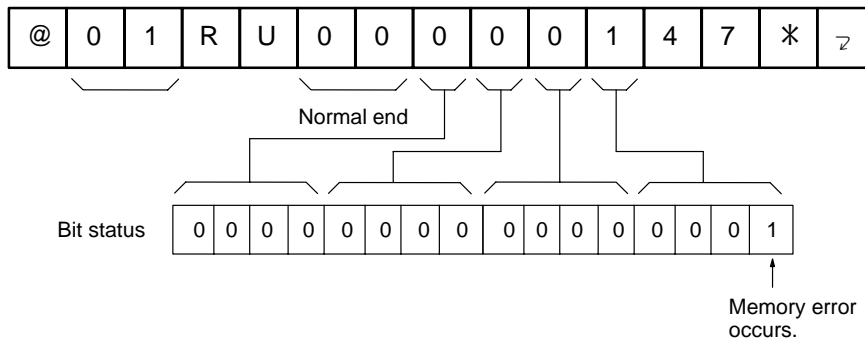
### Communications Example

In this example, the memory error occurs, the unit number of which has been set to 1, is read by the Error Read (RU).

#### Command

@	0	1	R	U	0	0	0	3	4	5	*	↻
---	---	---	---	---	---	---	---	---	---	---	---	---

#### Response



### Readable Errors

Refer to the following for the kinds of errors and their meanings.

#### Memory Error

This error occurs in the following cases.

- The contents of the Memory are destroyed.
- The E5ZE is turned OFF before the E5ZE returns a response to Memory Write (WE) to the host computer.
- The CPU goes out of control.

The calibration data may be destroyed in the following case.

- A memory error occurs after the setting data are set to the factory-set default parameters with Initialize Setting Data (MC) and these parameters are written to the Memory with Memory Write (WE). In such cases, turn the E5ZE OFF and ON. If a memory error occurs again, the E5ZE needs calibration.

#### Sensor Input AD Error

This error occurs if the IC that converts sensor input values to the E5ZE to digital values fails or a peripheral circuit of the IC fails.

#### Current Transformer Input AD Error

This error occurs if the IC that converts CT input values to the E5ZE to digital values fails or a peripheral circuit of the IC fails.

#### Cold Junction Compensation Error

This error occurs in the following cases if the E5ZE is a thermocouple input model.

- The Cold Junction Compensator is not connected to the terminal block correctly.
- The terminals screws of the Cold Junction Compensator is loosened.
- The Cold Junction Compensator is broken.
- The ambient temperature drops below  $-15^{\circ}\text{C}$  or exceeds  $60^{\circ}\text{C}$ .

#### Setting Data Error

This error occurs in the following cases. If a setting data error occurs, initialize the parameters with Initialize Setting Data (MC) within the permissible parameter setting ranges of the E5ZE.

- Setting data in the memory are destroyed.
- A set point of a control point is not within the allowable set point range.

#### CPU Error

This error occurs if the CPU or its peripheral circuitry is broken.



Reset the set point in the following cases.

- $^{\circ}\text{C}$  is changed to  $^{\circ}\text{F}$  or vice versa with the FUNCTION switch.
- The input type connected to a control point is changed with the INPUT selector.