

INST.NO. INE-824

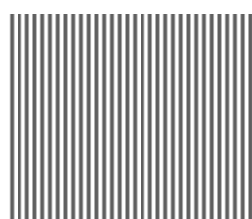
The logo for CHINO, consisting of the word "CHINO" in a bold, white, sans-serif font centered within a gray square.

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**Graphic  
Program Controller  
D P 1 0 0 0 G**

**[Communications Interface]**

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# **INSTRUCTIONS**



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# 1. Introduction

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Thank you for your purchasing Graphic Program Controller "DP1000G". DP1000G is a graphic type program controller that adopts a 5.6-inch TFT color liquid crystal display with a high level of visibility in search of operability such as advanced monitoring function and interactive setting.

It can store full universal inputs and up to 200 types of program patterns (up to 4000 steps), and operate the desirable execution patterns by calling them optionally.

It offers a high-speed, high-accuracy control period of 0.1 second in 5-digit display with the indicating accuracy of  $\pm 0.1\%$ , which is suitable for a wide range of application that requires accurate and complex pattern controlling.

The user is strongly recommended to read this manual carefully and gain comprehensive knowledge to avoid possible problems before using this product.

This document is intended for "Communications" instruction manual. For information other than communications, see also "General" instruction manual.

## Request

### - For persons doing instrumentation, installation, and sales -

Be sure to handover this instruction manual to the persons using this product.

### - For users of this product -

Keep this instruction manual carefully until you scrap this product.

## Product warranty period

This product is warranted for one year from the date of delivery. This product is guaranteed against mechanical failure and will be repaired with no charge within the warranty period, provided that it has been used normally with due attention and adherence to the cautions written in the instruction manual, product labels, etc. If this is the case, please contact the dealer you purchased this product or our nearest sales office.

However, repair orders can be accepted at your expense in the following cases even in the warranty period:

1. Mechanical failure or damage caused by improper use, connection, or repair
2. Mechanical failures or damages caused by fire, earthquake, wind or flood, thunderbolt, or other natural disasters, or pollution, salt water, harmful gas, abnormal voltage, or use of unspecified power
3. Replacement of parts or accessories that have reached the end of their life

## Notice

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2. The information contained in this document is subject to change without notice.
3. The information in this document is provided "as is". If you have any question or find any error or omission, please contact our nearest sales office.
4. Chino shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing or use of this product.

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## 2. For safe use of the product

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For safe use of this product, observe the following precautions carefully:

### 2 - 1. Prerequisites for use

This product is a general product of component type that is to be used indoor mounted in an instrumentation panel. Do not use it in any other condition.




To ensure safe use of this product, develop a fail-safe design of the final product and inspect it regularly, and use the product after confirming the safety of the system.

For wiring, adjustment, and operation of this product, contact knowledgeable personnels or companies familiar with instrumentation.

It is also necessary for users who actually use this product to read this instruction manual and have enough knowledge of various precautions and basic operations.

### 2 - 2. Symbol mark

The following symbol marks are used for the product body and in this instruction manual:  
Be sure to understand them properly.

Symbol mark	Meaning
 <b>Warning</b>	Used to draw the user's attention to the danger that can result in death or serious injury of the involved person. It also explains the way to avoid such an accident.
 <b>Precaution</b>	Used to draw the user's attention to the danger that can result in minor injuries of the involved person or damages of the peripheral instruments. It also explains the way to avoid such an accident.
	Indicates a ground terminal. Be sure to connect the ground terminal to protective grounding.

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## 3. Overview

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This product offers the RS-232C, RS-422A, and RS-485 communications interfaces used for communicating with personal computers (abbreviated hereafter to PC).

The PC can receive the measured data from this product, set each parameter, and command various operations. In the number that can be connected with this product, RS-232C is one, and RS-422A/RS-485 is 31 or less.

### **3 - 1. About RS-232C communications interface**

RS-232C is the data communications standard defined and issued by the U.S. Electronic Industries Alliance (EIA). The equivalent Japanese standard is JIS C 6361.

This standard is originally about the interface between modems and data terminals connected to the modems and defines only the electric and mechanical specification.

Currently, most of the RS-232C communications interfaces used in PCs or industrial devices such as the DP-G series may not be fully compliant with the above standard in the number of signal wires or in the connector specification.

There is no definition about the software portion, i.e., the "data transmission procedure" as well. So, devices with RS-232C interfaces do not always connect to each other without conditions. This requires designers to examine and check the devices for the specification and transmission procedures in advance. However, for connection destinations such as PCs that allow the specification to be arbitrary programmed, almost all devices can be combined by creating appropriate programs by designers.

The easiest way for those who need to examine the RS-232C standard is to refer to the JIS C 6361.

### **3 - 2. About RS-422A/485 communications interface**

With the RS-422A- or RS-485-compliant signals, the RS-422A/485 communications interface allows communications using multiple DP-G products (up to 31 units) connected in parallel.

There are less number of PCs with an RS-422A/485 communications interface. However, RS-422A/485 is serial communications, and thus the product can be easily connected by using an RS-232C to RS-422A/485 signal converter.

We also have the RS-232C to RS-422A/485 signal conversion line converter (model: SC8-10). Please contact us to place an order.

The difference between RS-422A and RS-485 is that the former uses four signal wires and the latter only two signal wires.

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## 4. Communications protocol

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This product has following two communications protocols that are switched using the front panel keys.

### **4 - 1. MODBUS protocol**

MODBUS is a registered trademark of Schneider Automation Inc.

The MODBUS protocol has the RTU mode and the ASCII mode, which are switched by setting using the front keys. It offers the measured data send, set, and operation functions.

### **4 - 2. PRIVATE protocol**

PRIVATE is Chino's conventional protocol.

You can switch to this protocol by setting the front keys. It offers the measured data send, set, and operation functions.

Our old products can be configured to be compatible. Note that MODBUS can set parameters that are not available in PRIVATE. If you are building a new communications environment, the use of the MODBUS protocol is recommended.

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## 5. Communications specification

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### 5 - 1. MODBUS

- . Communications method: Half-duplex asynchronous method (polling selecting method)
- . Protocol: MODBUS protocol
- . Transmission speed: Switched among 38400, 19200, 9600, 4800, and 2400 bps
- . Start bit: 1 bit
- . Data length: 7 bits (ASCII mode)  
8 bits (RTU/ASCII mode)
- . Parity bit: None (N) / Even (E) / Odd (O)
- . Stop bit: 1 bit/2 bits
- . Transmission code: ASCII (ASCII mode)  
Binary (RTU mode)
- . Error check: LRC (ASCII mode)  
(Error detection) CRC-16 (RTU mode)
- . Data transmission procedure: No procedure
- . Used signal name: Only for send/receive data (control signal not used)

### 5 - 2. PRIVATE

- . Communications method: Half-duplex asynchronous method (polling selecting method)
- . Protocol: PRIVATE protocol
- . Transmission speed: Switched among 38400, 19200, 9600, 4800, and 2400 bps
- . Start bit: 1 bit
- . Data length: Switched between 7 bits and 8 bits
- . Parity bit: None (N) / Even (E) / Odd (O)
- . Stop bit: 1 bit/2 bits
- . Transmission code: ASCII code
- . Error check: BCC (block check character) Checksum  
(Error detection)
- . Data transmission procedure: No procedure
- . Used signal name: Only for send/receive data (control signal not used)

Note: Among the character structures, the character structure of 7-bit data, no parity, and 1 stop bit (7N1) configuration is not settable.

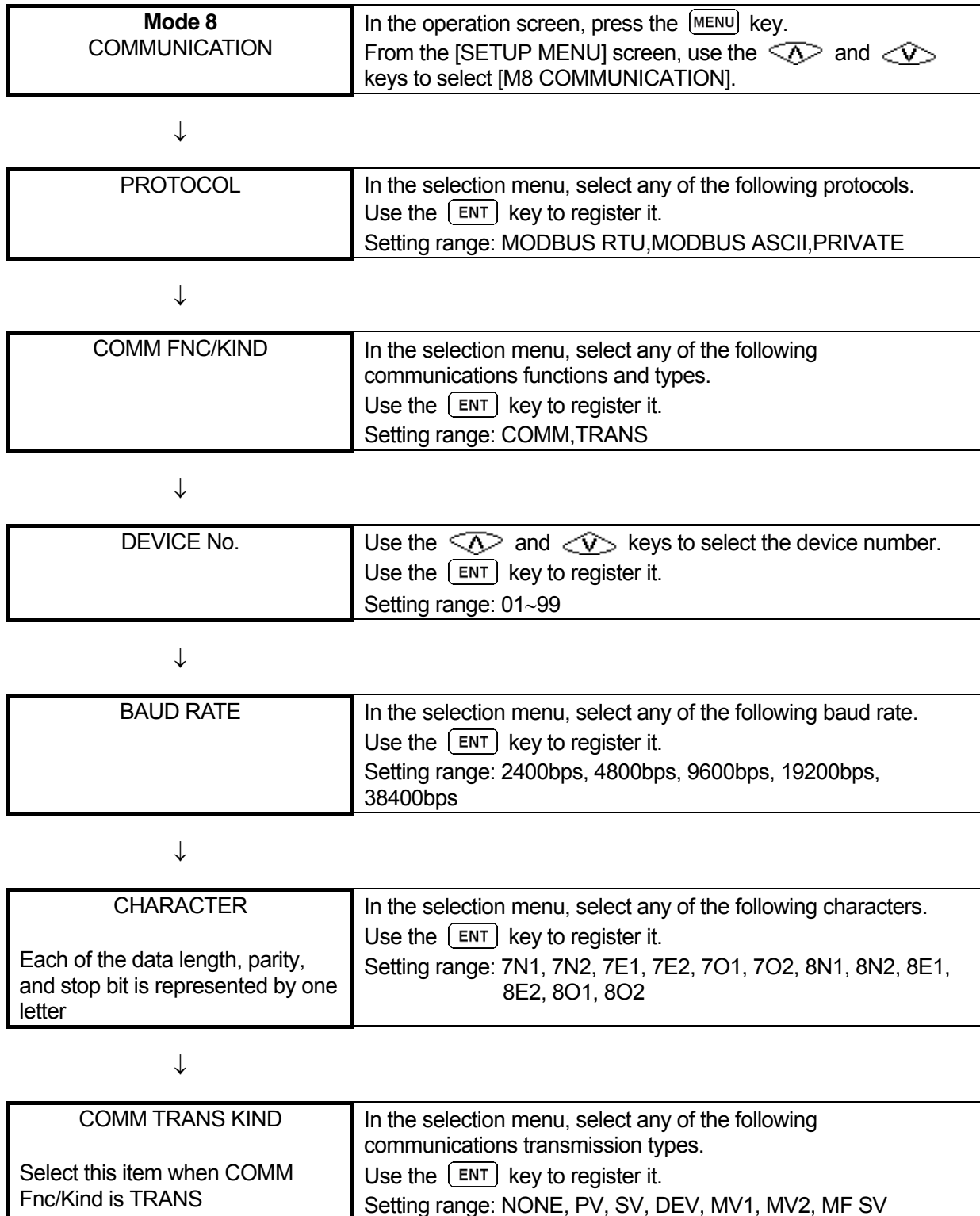


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## 6. Personal computer communications parameter setting

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In [M8 COMMUNICATION] (Mode 8), set the six items of "PROTOCOL", "COMM FNC/KIND", "DEVICE No.", "BAUD RATE", "CHARACTER", and "COMM TRANS KIND" according to the following flowchart:



## 6 - 1. Protocol setting

Set the protocol.

- (1) Select "M8 COMMUNICATION" - "PROTOCOL".
- (2) In the selection list, select the protocol, then press the **ENT** key.  
PROTOCOL: MODBUS RTU (initial value), MODBUS ASC, PRIVATE  
\* When the protocol is changed, the communications function is reset to the initial value.

## 6 - 2. Communications function and type settings

Select the communications function/type.



Use the same baud rate for this controller and the PC.

- (1) Select "M8 COMMUNICATION" - "COMM Fnc/Kind".
- (2) In the selection list, select the communications function and type, then press the **ENT** key.  
COMM: Used for communications (sending/receiving data and parameters). This option is for communications with computers.  
TRANS: Used for transmissions.  
This controller digitally outputs the transmission data (NONE/PV/SV/DEV/MV1/MV2/MFSV) from TRANS.  
\* See 6 - 6

## 6 - 3. Device number setting

Set the device number of this controller for RS-422A/485.

For the device(s) that communicate with the PC, set a device number different from the one for this controller.

- (1) Select "M8 COMMUNICATION" - "DEVICE No.".
- (2) Use the  and  keys to enter the device number (01~99).



### Precaution

Specify a unique device number to each device within the range from 1~99 (initial value: 1).

## 6 - 4. Baud rate setting

Set the baud rate.

- (1) Select "M8 COMMUNICATION" - "BAUD RATE".
- (2) In the selection list, select the baud rate, then press the **ENT** key.  
(Baud rate: 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps)

## 6 - 5. Character setting (data length, parity, and stop bit)

Set the character (data length, parity, and stop bit).

- (1) Select "M8 COMMUNICATION" - "DATA / PARITY / STOP BIT".
- (2) In the selection list, select the character, then press the **ENT** key.

Selection	Bit length	Parity	Stop bit	Initial value
7N1	7bit	None	1	8N1
7N2			2	
7E1		Even	1	
7E2			2	
7O1		Odd	1	
7O2			2	
8N1	8bit	None	1	
8N2			2	
8E1		Even	1	
8E2			2	
8O1		Odd	1	
8O2			2	

## 6 - 6. Setting communications transmission type

When "TRANS" is selected in "6 - 2. Communications function and type settings", the specified type of communications transmission can be performed.

- (1) Select "M8 COMMUNICATION" - "COMM TRANS KIND".
- (2) In the selection list, select the transmission type, then press the **ENT** key.  
Transmission type: NONE, PV, SV, DEV, MV1, MV2, MFSV

# 7. Wiring

## 7 - 1. Precautions for wiring

### 1. Communications terminal

The terminal layout varies depending on the communications interface you have specified.

For one communications port (COM1)

Terminal No.	RS-232C (COM1)	RS-422A (COM1)	RS-485 (COM1)
6E	RD	RDA	SA
6F	SD	RDB	SB
6G	SG	SDA	SG
6H		SDB	
6I			
6J			
5J		SG	

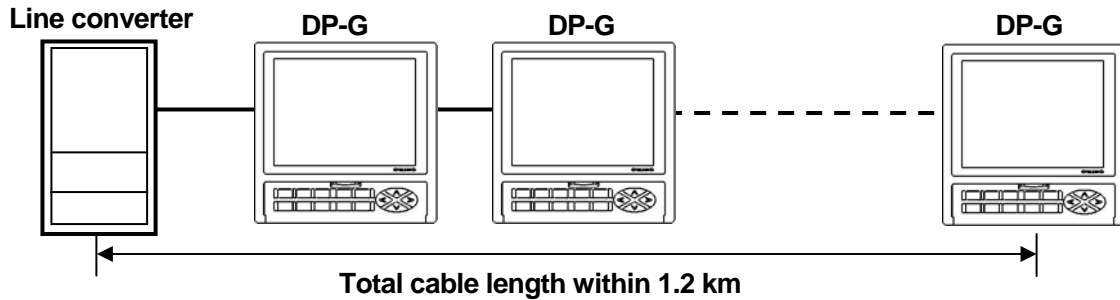
For two communications ports (COM1 and COM2)

Terminal No.	RS-232C (COM1) + RS-232C (COM2)		RS-422A (COM1) + RS-232C (COM2)		RS-485 (COM1) + RS-232C (COM2)		RS-232C (COM1) + RS-485 (COM2)		RS-422A (COM1) + RS-485 (COM2)		RS-485 (COM1) + RS-485 (COM2)	
	COM1		COM1		COM1		COM1		COM1		COM1	
6E		RD1		RDA1		SA1		RD1		RDA1		SA1
6F		SD1		RDB1		SB1		SD1		RDB1		SB1
6G		SG1		SDA1		SG1		SG1		SDA1		SG1
6H				SDB1						SDB1		
6I		RD2		RD2		RD2		SA2		SA2		SA2
6J		SD2		SD2		SD2		SB2		SB2		SB2
5J		SG2		SG2		SG2		SG2		SG2		SG2

Note: No insulation is placed between two communications ports.

## 2. Total RS-422A/485 communications cable length within 1.2 km

The wiring between each device is in any length as far as the total cable length is within 1.2 km.  
(line converter to DP-G at the termination)



## 3. Provide anti-noise contamination treatment.

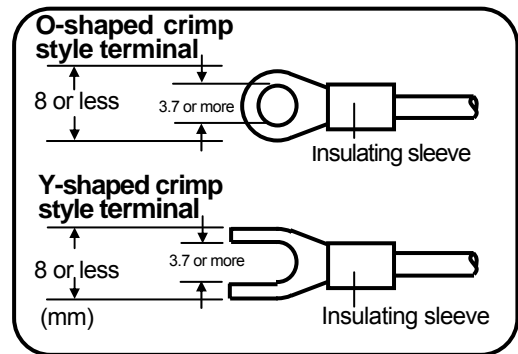
To avoid effect of noise, keep the communications cable away from the power cable or other communications cables at least 50 cm.

## 4. Be sure to treat with crimp style terminals.

One of the communications failure causes is wire drop-off.

Make sure the communications cable is terminated with an O- or Y-shaped crimp style terminal that has an insulating sleeve.

(The terminal screw is M3.5 mm for this controller and the line converter.)



## 5. Put a terminating resistor.

When using the RS-422A/485 communications, put a 100Ω resistor to the DP-G that is located at the termination. (For details, see 7 - 4)

(A general metal film resistor will do. We also have one. Please contact us to place an order.)

## 6. Number of DP-Gs Connected

For RS-232C: 1 unit

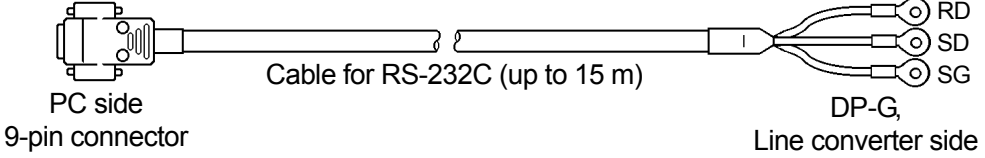
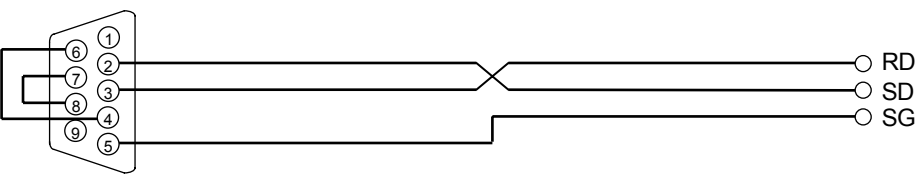
For RS-422A/485: Up to 31 units

## 7 - 2. Communications cable

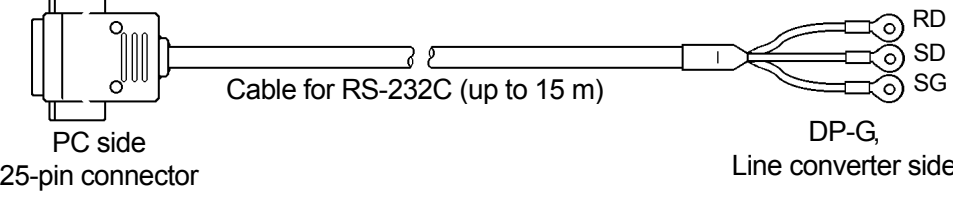
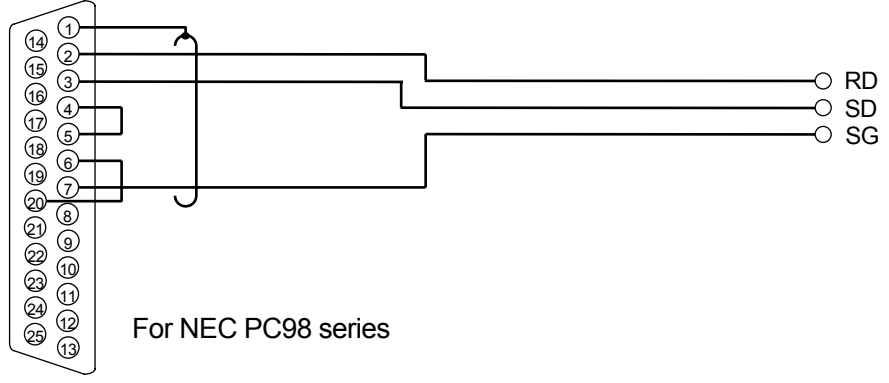
Before wiring, prepare the communications-dedicated cables. We also have the dedicated cables. Please contact us to place an order.

### 7 - 2 - 1. Communications cable for RS-232C (between PC and line converter)

(1) Connection between PC (9-pin) and this controller, between PC (9-pin) and line converter

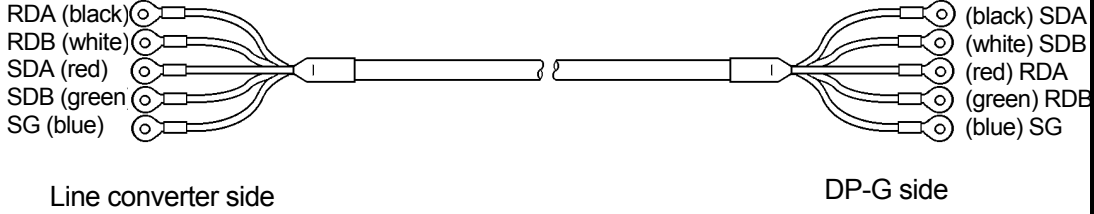
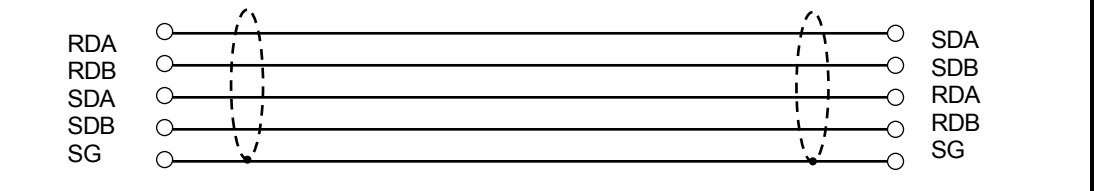
Cable	9-pin connector ↔ O-shaped crimp style terminal RS-232C cable
Shape	 <p>PC side 9-pin connector</p> <p>Cable for RS-232C (up to 15 m)</p> <p>DP-G, Line converter side</p>
Internal wiring	 <p>RD SD SG</p>
Model code	<p><b>RZ-CRS6</b>□□</p> <p>— Cable length: 01~15 m (specified)</p>

(2) Connection between PC (25-pin) and this controller, between PC (25-pin) and line converter

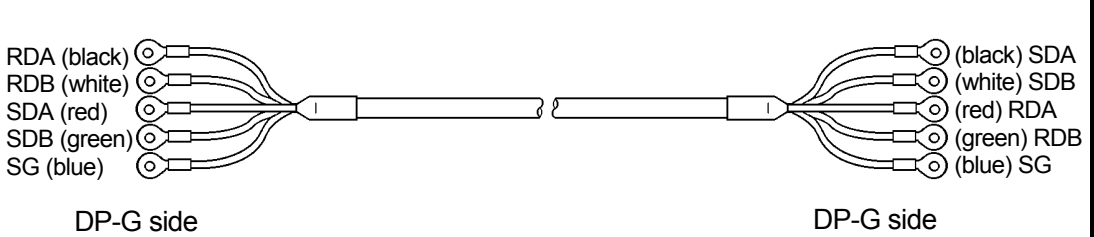
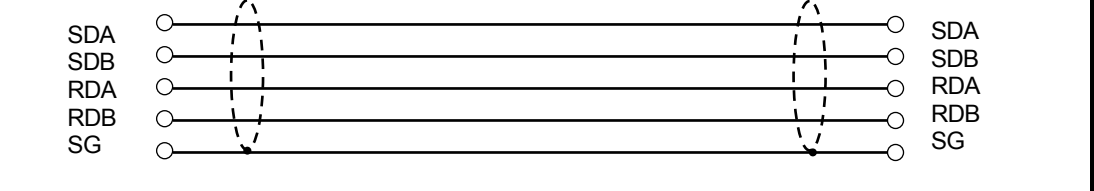
Cable	25-pin connector ↔ O-shaped crimp style terminal RS-232C cable
Shape	 <p>PC side 25-pin connector</p> <p>Cable for RS-232C (up to 15 m)</p> <p>DP-G, Line converter side</p>
Internal wiring	 <p>RD SD SG</p> <p>For NEC PC98 series</p>
Model code	<p><b>RZ-CRS2</b>□□</p> <p>— Cable length: 01~15 m (specified)</p>

## 7 - 2 - 2. Communications cable for RS-422A

(1) Connection between line converter and this controller

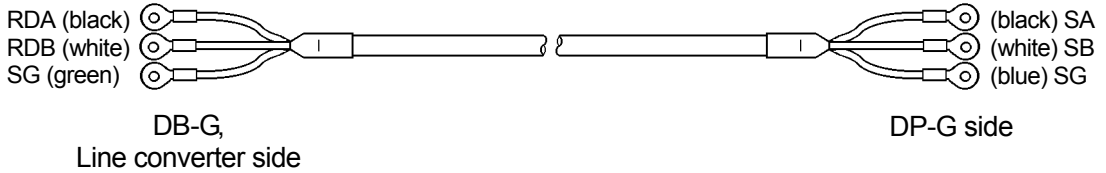
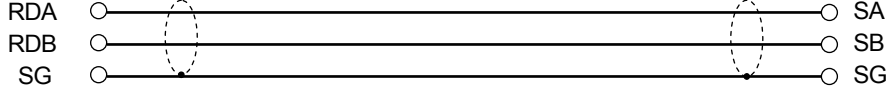
Cable	O-shaped crimp style terminal → O-shaped crimp style terminal, RS-422A cable (for line converter)
<p><b>Shape</b></p>	 <p>Line converter side</p> <p>DP-G side</p> <p>This 4-wire cable has two VCTF twist wires twisted. It has the signal ground (SG) wires on both ends. Cut the SG wire for use on the line converter side because the line converter has no SG terminal.</p>
<p><b>Internal wiring</b></p>	
<p><b>Model code</b></p>	<p><b>RZ-CRA2□□</b></p> <p>Cable length: 01~99 m (specified)</p>

(2) Connection between DP-Gs

Cable	O-shaped crimp style terminal → O-shaped crimp style terminal, RS-422A cable (for parallel)
<p><b>Shape</b></p>	 <p>DP-G side</p> <p>DP-G side</p> <p>This 4-wire cable has two VCTF twist wires twisted. It has the signal ground (SG) wires on both ends.</p>
<p><b>Internal wiring</b></p>	
<p><b>Model code</b></p>	<p><b>RZ-CRA1□□</b></p> <p>Cable length: 01~99 m (specified)</p>

### 7 - 2 - 3. Communications cable for RS-485

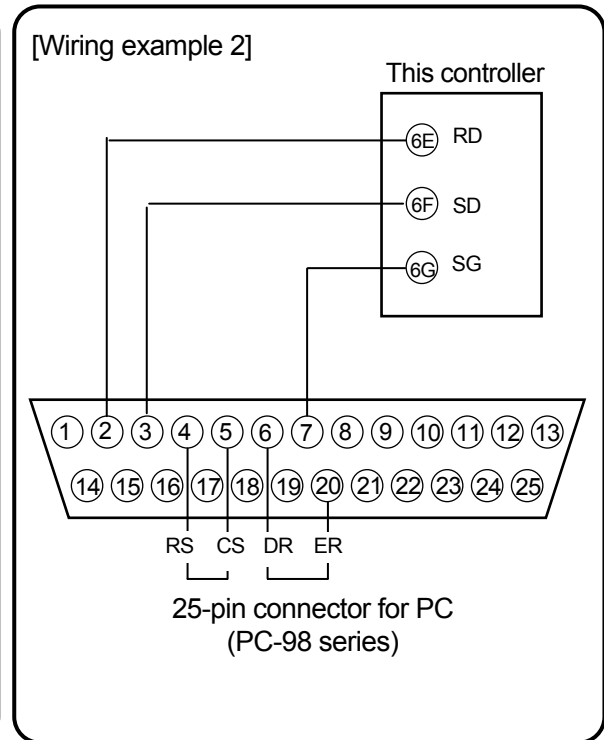
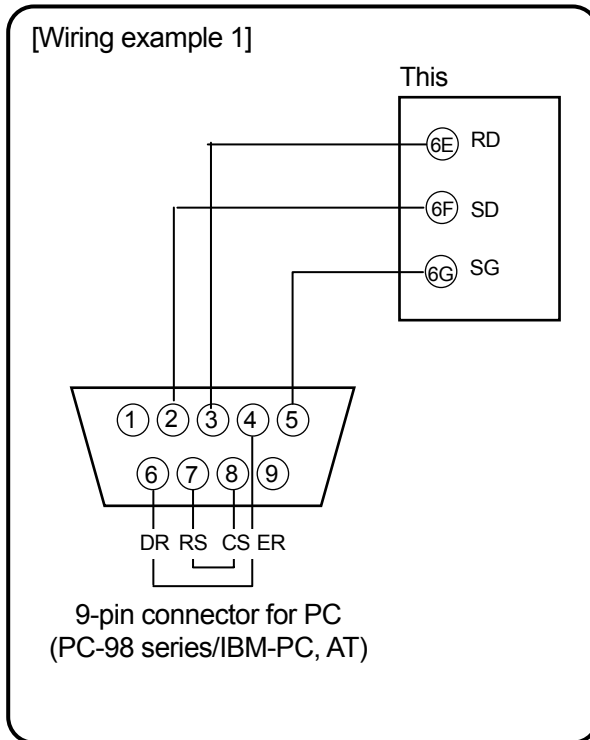
(1) Connection between line converter and this controller, between DP-Gs

Cable	O-shaped crimp style terminal ←→ O-shaped crimp style terminal RS-485 cable
<b>Shape</b>	 <p>This 2-wire cable has CVVS wires twisted. It has the signal ground (SG) wires on both ends. Cut the SG wire for use on the line converter side because the line converter has no SG terminal.</p>
<b>Internal wiring</b>	
<b>Model code</b>	<p><b>RZ-LEC□□□</b></p> <p>└─ Cable length: 001~200 m (specified)</p>



## 7 - 3. RS-232C wiring

This controller uses only the send (SD), receive (RD), and signal ground (SG). It uses no other control signals. A general PC is controlled by control signals. So, it does not work just by connecting the three signal wires. The wiring processing inside a connector varies depending on how the PC controls the control signals. Please see the instruction manual of your PC. The following diagram shows a typical wiring processing and wiring with this controller. On this controller, three terminals of RD, SD, and SG are used. The personal computer side shows the pin numbers of the connector for RS-232C.

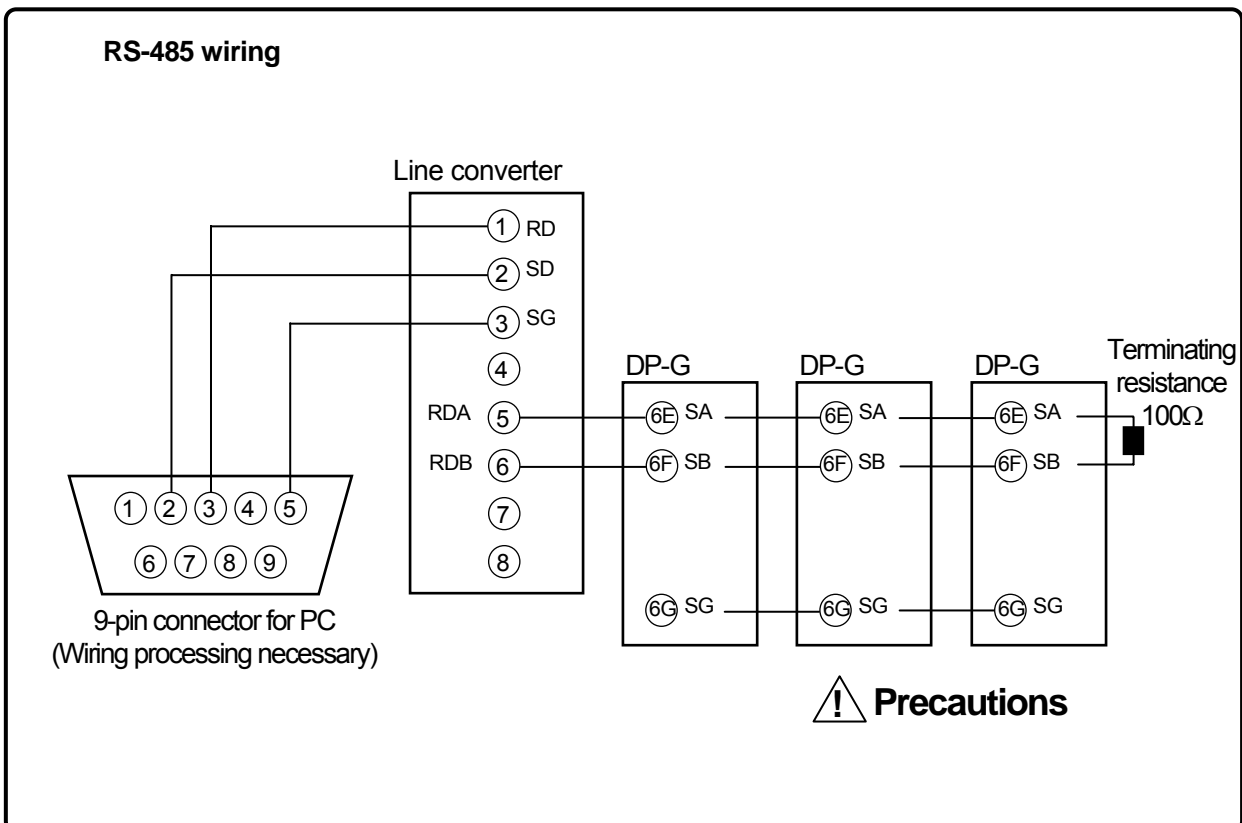
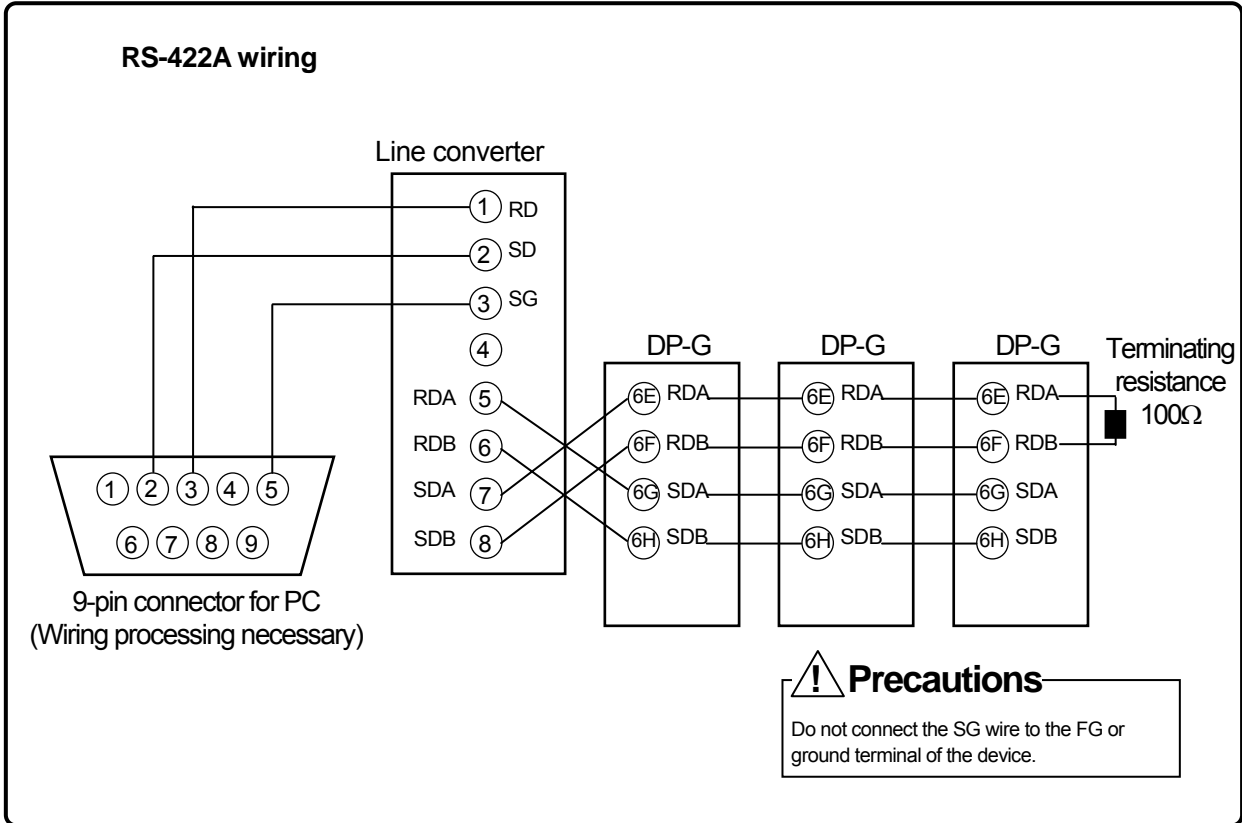


### Precautions

The RS-232C cable is 15 m long at the maximum. For wiring with a NEC PC98 series PC, follow the "wiring example 1" for the 9-pin connector and the "wiring example 2" for the 25-pin connector.

## 7 - 4. RS-422A/485 Wiring

Use the line converter (Model: SC8-10) to connect the RS-422A/485 communications interface with the PC. The line converter and PC use only three signals of send, receive, and signal ground and do not use other control signals. So, you need to process the wiring inside the connector as for the RS-232C wiring (see the line converter manual for details).



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## 8. MODBUS protocol

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### General procedures and precautions of the communications



#### Precautions

To avoid accidents, be sure to observe the instructions mentioned in this manual.

**1. The settings by key operations are restricted when setting parameters (write).**

This controller is always ready for the communications. It always responds to a data request from a PC and outputs it. When the device is operated, for example, when you set parameters from a PC, **ENT** key is temporary disabled while the setting screen is displayed. To enable **ENT** key again, switch the screen.

**2. Please be careful when you resend a command because the control signal line is not used.**

The serial interface in this controller does not use the control signal line for the communications. Therefore, the transmission error may occur depending on the controller condition, so please be careful when you resend a command.

**3. Be sure not to remove communications cables or the device, or not to turn on/off the controller during communications.**

If you remove the cables and devices consisting the serial interface, or if you turn on/off the controller during the communications, it may stop the operation or generate an error. In this case, reset all the devices consisting the serial interface and start the operation again.

**4. Send the next command after the communications drive is switched off.**

For RS-422A/485, multiple devices are connected to the same communications line and the line is activated by only one device whose number is specified by the PC. The activated communications line is off at some interval after the last one character is sent so that all characters are sent to the PC for sure. If a command is sent to the next device from the PC before the line is off, the signals conflict each other and the communications error occurs. Please pay attention on that point if you use a fast computer. The interval for sending commands safely is about 5 ms.

## 8 - 1. Message transmission mode

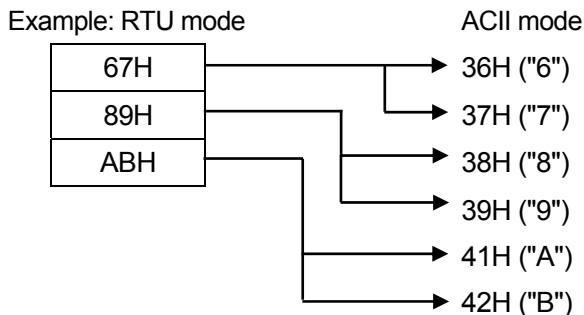
There are two types of mode, RTU (Remote Terminal Unit) and ASCII, which can be selected by setting the front panel keys.

Table 1. Comparison between RTU mode and ASCII mode

Item		RTU mode	ASCII mode
Interface		RS-232C, RS-422A, RS-485	
Communications method		Half duplex asynchronous method	
Baud rate		2400, 4800, 9600, 19200, 38400 bps	
Transmission code		Binary	ASCII
Error check (Error detection)	Vertical direction	Parity	
	Horizontal direction	CRC-16	LRC
Character structure	Start bit	1 bit	
	Data length	7 bits/8 bits	
	Parity bit	None/Even/Odd	
	Stop bit	1 bit/2 bits	
Message start code		None	:(colon)
Message exit code		None	CR, LF
Data time interval		28 bit time or less	1 second or less

### 8 - 1 - 1. Transmission data

In RTU mode, the transmission is run in binary mode. In ASCII mode, 8 bit binary of RTU is divided into the higher 4 bits and lower 4 bits and change them into characters (0~9, A~F).

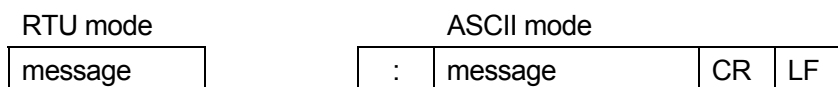


In RTU mode, a transmission is performed more efficiently than in ASCII mode because the message length in RTU mode is half of the one in ASCII mode.

### 8 - 1 - 2. Message frame structure

In RTU mode, a message frame consists of the message part only.

In ASCII mode, it consists of the starting characters ":(colon, 3AH)", message, and terminating characters "CR (carriage return, ODH) + LF (line feed, OAH)".



In ASCII mode, the message frame includes the starting characters of a message ":", so it has the advantage that it is easier to troubleshoot.

## 8 - 2. Data time interval

When in RTU mode: less than 9600 bps: 20 msec, 9600 bps or larger: 5msec

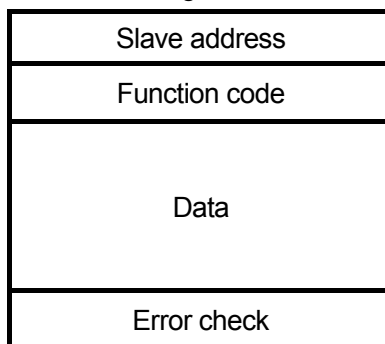
When in ASCII mode: 1 second or less

When sending messages, be sure not to set the data interval in a message longer than the interval above. If it is set longer than the interval above, the message is processed as an error because the receiving side (this controller) determines that the sending side finishes sending a message.

In RTU mode, message characters must be sent sequentially. On the other hand, in ASCII mode, the interval between characters is one second at a maximum, so it can be used in a slow master (PC).

## 8 - 3. Message structure

MODBUS messages in both RTU and ASCII mode is constructed as follows:



### 8 - 3 - 1. Slave address

Set the slave address (device number) from 1 to 99 in advance by setting the front panel keys. The master transmits to one slave, generally. A message from the master is sent to all the connected devices, but only the slave whose address matches the one in the direction message makes a response to the message.

The slave address "0" is used for a message to all slaves from the master (broadcast). In this case, no slaves return a response.

### 8 - 3 - 2. Function code

The function code is the one to be run by slaves and each data is classified nearly as follows: See the reference table for details.

- (1) Analog input data:           asured data, status, etc. Numeric value range: 16 bit data.  
(See the reference table for details.)
- (2) Parameter setting data:      Each configuration information. Numeric value range: 32 bit data.  
(See the reference table for details.)
- (3) Pattern setup value:         Pattern management information, step management information.  
Numeric value range: 32 bit data.  
(See the reference table for details.)
- (4) Operation setup value:       Time unit, pattern operation, and other operations  
(See the reference table for details.)
- (5) Real data:                    Measured data, status, etc. Numeric value range: 32 bit data.  
(See the reference table for details.)

Table 2. Function code table


Code	Function	Unit	MODBUS specific function (reference)
04	Analog input data reading	16-bit	Input register content reading
08	Loopback test (sends the received data)	16-bit	Loopback test
80	Parameter setting data reading	32-bit	Holding register content reading
81	Parameter setting data writing	32-bit	Writing to the single holding register
82	Multiple parameter setting data writing	32-bit	Writing to the multiple holding registers
83	Real data (Execution information) reading	32-bit	Input register content reading

### 8 - 3 - 3. Data section

The data structure varies depending on the function code. The data consists of the code number of the target data to be read or written (relative number which is calculated from the reference number described below), the number of data and so on when being requested from the master. The response from a slave consists of the data for the request and so on.

The MODBUS analog input data is a 16-bit integer (only device information is of character type) and whether the sign is included or not is determined per data. Therefore, it is represented by assigning the decimal point position to a different address and makes it an integer value, or by fixing the decimal point position and normalizing the value at the upper/lower limit of the scale. In this controller, the former method is applied.

The parameter setting data and the real data of MODBUS is either 32-bit bit field data, integer data, or decimal point data. The decimal point data is the IEEE compliant single-precision floating point (float type). It determines available number of places on the receiving side from the decimal point position assigned to the different address.

 <b>Precautions</b>	<p>In some data sections, specific numbers may be assigned as error data in the same way as input data. If such data is used, check whether it is identified as error or not before using it with decimal point data.</p> <p>If the error data is used with the decimal point data without checking, it is handled as normal data.</p>
--	--

### 8 - 3 - 4. Reference number

The data in this controller is assigned the number called "reference number," which is necessary to read or write this data. The data in the controller is classified into Analog Input Data, Parameter Setting Data, and Real Data based on its type. When the number is specified in a message, a relative number corresponding to each reference number is used (See "8 - 7. DP-G relative number table").

When you want to specify a MODBUS specific reference number by using a relative number, see "8-8. MODBUS protocol-compatible reference table".

Table 3. Reference number and relative number

Data type	Reference number	Relative number	MODBUS specific (reference)
Analog input data	30001 ~ 39999	Reference number minus 30001	Input register
Parameter setting values	70001 ~ 79999	Reference number minus 70001	Holding register
Real data	80001 ~ 89999	Reference number minus 80001	Input register

Example: The relative number of the measured value (PV) for "Reference number 80101" is "100".

Table 4. DP-G reference number quick reference

Data type	Parameters	Reference number	Relative number	Code	Reference table
Analog input data	Real data/parameter	30001~30153	0~152	04	8 - 7 - 1. section
Parameter setting values	Setup parameter 1	70001~70050	0~49	80 81 82	8 - 7 - 2. section
	Setup parameter 2	70051~70100	50~99		
	Run time parameter and specific parameter (CH1)	70101~70150	100~149		
	Run time parameter and specific parameter (CH2)	70151~70200	150~199		
	PID (CH1)	70201~70304	200~303		
	PID (CH2)	70321~70424	320~423		
	ALARM	70441~70550	440~549		
	AT setup (CH1)	70551~70600	550~599		
	AT setup (CH2)	70601~70650	600~649		
	OUTPUT (CH1)	70651~70800	650~799		
	OUTPUT (CH2)	70801~70950	800~949		
	Control setup setting	70951~71000	950~999		
	INPUT	71001~71050	1000~1049		
	Setting the time signal	71051~71150	1050~1149		
	Guarantee soak/wait time/MASS flow	71201~71250	1200~1249		
	DIO type setting	71251~71300	1250~1299		
linearize table (CH1)	71301~71350	1300~1349			
linearize table (CH2)	71351~71400	1350~1399			

Data type	Parameters	Reference number	Relative number	Code	Reference table
Pattern setup value	Pattern management/repeat	72001	2000	80 81 82	8 - 7 - 2. section
	Pattern management (No.1 - 200)	72002~74000	2001~3999		
	Step management information/pattern No.	75001	5000		
	Step management information/step information	75002~77800	5001~7799		
Operation setup value	Time unit	79048	9047	80	8 - 7 - 2. section
	Pattern operation	79051~79100	9050~9099	80 81	
	Other operations	79501~79550	9500~9549	82	
Real data (Execution Information)	Real data/parameter (CH1)	80001~80050	0~49	83	8 - 7 - 3. section
	Real data/parameter (CH2)	80051~80100	50~99		
	Real data/each status	80101~80150	100~149		
	Pattern information/total number of patterns	80151	150		
	Pattern information/total number of steps	80152	151		
	Pattern/the number of used steps	80201~80400	200~399		
	Hardware information	80401~80450	400~449		



### 8 - 3 - 5. Error check

The value used for the error check of transmission frames varies depending on the mode.

RTU mode: CRC-16

ASCII mode: LRC

#### (1) How to calculate CRC-16

In CRC method, the information to be sent is divided by the generating polynomial and is sent with its remainder added to the end of the information. The generating polynomial is as follows:

$$1 + X^2 + X^{15} + X^{16}$$

Use the following steps to calculate the value, ranging from the slave address to the end of the data:

- 1) Initialize the CRC-16 data. (X) (= FFFFH)
- 2) Exclusive OR of Data 1 and X. (EX-OR) → X
- 3) X is shifted one bit to the right. → X
- 4) If carry occurs, EX-OR is applied to X and A001H. If not occurs, proceed to 5. →X
- 5) Repeat 3 and 4 until X is shifted 8 times.
- 6) EX-OR is applied to the next data and X. →X
- 7) The same steps as 3~5.
- 8) Repeat the steps until the end of data.
- 9) Create messages for the calculated 16 bit data (X) in turn from the lower to the upper level.

Example: If the data is [02H] [07H], CRC-16 is calculated 1241H, so the data for the error check is [41H] [12H].

Here, "Data 1" in 2) is extended 16-bit to 0002H, and "the next data" in 6) is extended 16-bit to 0007H when being calculated.

## Reference: CRC-16 calculation program

```
/***** CRC-16 calculation program (C language) *****/
#include      <stdio.h>
#include      <conio.h>

void main(void)
{
    /** Internal variable declaration ***/
    unsigned int      iLoopCnt;          /* Loop counter          */
    unsigned short    usData;           /* Input data            */
    unsigned short    usCrcData;        /* CRC-16 data          */
    unsigned short    usErrChkData;     /* Error check data     */
    int               iDummy;          /* Dummy variable       */

    /* (1) Initialize the output result of CRC-16 data */
    usCrcData = 0xffff;

    printf("Enter the hexadecimal data. (end with [q]) >\n");
    while( scanf("%x",&usData) != 0 )
    {
        /* CRC output result and exclusion of input data is taken */
        usCrcData = usData ^ usCrcData;

        /** CRC is calculated ***/
        /* Repeat the steps until it is shifted 8 bits */
        for( iLoopCnt = 0 ; iLoopCnt < 8 ; iLoopCnt++ )
        {
            /*Check if the carry occurs or not */
            if( usCrcData & 0x0001 )
            {
                /* If the carry occurs */
                /* CRC output result is shifted one bit to the right */
                usCrcData = usCrcData >> 1;

                /* Exclusion of A001H is taken */
                usCrcData = usCrcData ^ 0xa001;
            }
            else
            {
                /* If the carry does not occur */
                /* CRC output result is shifted one bit to the right */
                usCrcData = usCrcData >> 1;
            }
        } /* for */
    } /* while */

    printf( "The CRC-16 data is %xH.\n", usCrcData );

    /* Error check data creation */
    usErrChkData = ( usCrcData >> 8 ) | ( usCrcData << 8 );
    printf( "The data for the error check is %xH.", usErrChkData );

    iDummy = getch();
}
```

## (2) How to calculate LRC

Use the following steps to calculate the value, ranging from the slave address to the end of the data:

- 1) The message is created in RTU mode.
- 2) Sum up from the beginning (slave address) to the end of the data. →X
- 3) The complement number of X (bit invert) is taken. →X
- 4) 1 is added. (X=X+1)
- 5) X is added as LRC to the end of the message.
- 6) The whole data is converted to the ASCII characters.

Example: If the data is [02H] [07H], LRC is calculated [F7H], so  
the binary message is        [02H]        [07H]        [F7H]  
and the ASCII message is [30H] [32H] [30H] [37H] [46H] [37H].

## Reference: LRC calculation program

```
/***** LRC calculation program (C language) *****/
#include <stdio.h>
#include <conio.h>

void main(void)
{
    /** Internal variable declaration ***/
    unsigned short    usData;                /* Input data          */
    unsigned short    usLrcData;            /* LRC data             */
    int               iDummy;              /* Dummy variable      */

    /* Initialize the output result of LRC data */
    usLrcData = 0;

    printf("Enter the hexadecimal data. (end with [q]) >\n");
    while( scanf("%x",&usData) != 0 )
    {
        /* Sum up from the beginning to the end of the data */
        usLrcData += usData;
        /* One byte from the upper level is discarded */
        usLrcData = usLrcData & 0xff;
    } /* while */

    /* Exclusion of FFH is taken */
    usLrcData = usLrcData ^ 0xff;

    /* 1 is added */
    usLrcData = usLrcData++;
    /* One byte from the upper level is discarded */
    usLrcData = usLrcData & 0xff;

    /* LRC error check */
    printf( "The LRC-16 data is %xH.\n", usLrcData );

    iDummy = getch();
}
```

## 8 - 3 - 6. Precautions in data processing

### 1) Handling decimal point data

- Analog Input Data (30001 - 39999): It is converted to an integer value when being transmitted. Check the number of digits after the decimal point on the receiving side and convert it to the decimal point data. The number of digits after the decimal point is shown in the Reference table.
- Parameter setting values (70001 - 79999): It is transmitted as it is (decimal point data), so set the number of digits after the decimal point to the enable value on the receiving side when displaying it. The number of digits after the decimal point is shown in the Reference table. The format of the decimal point data is the IEEE compliant single-precision floating point (float type).
- Real Data (80001 - 89999): Same as Parameter setting values (70001 - 79999).

- 2) Please be careful when the related data is set because each data can be accessed (changed). For example, when the measuring range is changed, the related data is initialized. See the Reference number quick reference for the details of processes.
- 3) Data must be read or written within the number range which is specified reference numbers. If the write operation is performed for the reference number which is not specified, an error might occur in actions of the device.
- 4) The write or read operation can be performed for multiple inconsecutive reference numbers. However, if the number which is not specified a reference number is set as the starting number, the error (Error 02H) occurs.
- 5) The data for the number which is not specified a reference number is "0" when reading multiple reference numbers.
- 6) If the error is detected when writing to multiple reference numbers, all settings are disabled.
- 7) See the error code table in "8-6-2. Error message response" for other errors.

## 8 - 4. How to create a message

A message consists of 1) slave address, 2) function code, 3) data section, and 4) error check code (See 8 - 3). The number of messages which can be read/written at a time is as follows:

Function code	The number of data	
	ASCII Mode	RTU Mode
04	32	64
80	16	32
82	16	32
83	16	32

Note: The number of data means the requested number from the upper level

The section below describes how to create a message using the following example.

Example: Reading the measured value of DP-G for "Slave address 02".

### 8 - 4 - 1. RTU mode message

(1) Slave address: 02 [02H]

(2) Function code: 04 [04H]

It is "Analog input data reading (input register content reading)". If the function code is "04," specify 2 bytes for the relative number of data which is read in the data section and 2 bytes for the number of data to be read (See 8 - 5. See 8 - 5 - 1 for details on "function code: 04".)

\* The number of bytes of data must be checked.

(3) Data section: The lead relative number 100 ([00H] [64H]), the number of data 2 ([00H] [02H])

The measured value (Analog input data) falls within the reference number "30032~30144". You can see the measured value (PV) falls within "30101" and PV status falls within "30102" from the Reference Table (See 8 - 7. For details on reading the measuring value, see 8 - 7 - 1). The relative number for the lead "reference number 30101" is 100 (30101-30001), which is [00H] [64H] when being presented in 2 bytes (See Table 3 in 8 - 3 - 4).

The number of data to be read is 2, the measured value and PV status, so they are [00H] [02H] when being presented in 2 bytes.

(4) Error check: Calculated by CRC-16 2730H ([30H] [27H])

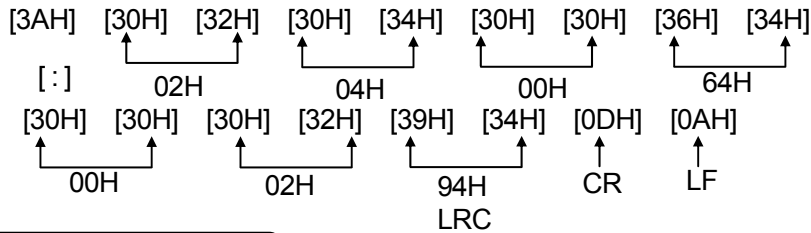
In RTU mode, the error check is calculated by CRC-16 (See (1) in 8 - 3 - 5). From (1) - (3), the data of the basic portion of the message is [02H] [04H] [00H] [64H] [00H] [02H] and CRC-16 is 2730H. Therefore, the error check data is [30H] [27H].

(5) Message: [02H][04H][00H][64H][00H][02H][30H][27H]

Create a message with the message structure (See 8 - 3).

## 8 - 4 - 2. ASCII mode message

Calculate the error check LRC from the basic portion of the message. LRC is calculated 94H (See (2) in 8 - 3 - 5). Convert each data in the basic portion to ASCII code. Also, convert LRC to ASCII code and add it to the basic portion. Add the starting character of the message ":", and add "CR" and "LF" at the end.



## 8 - 5. Function code

The response for each function code is shown below (See 8 - 3 - 2. <Table 2. Function code table>).

Note: For details on the response when error occurs, see 8 - 6

### 8 - 5 - 1. Analog input data reading (input register content reading)

[Function code: 04 (04H)]

The specified number of "consecutive analog input (2 bytes: 16 bits) data" is read from the specified number. The data is divided into higher 8 bits and lower 8 bits and sorted in order, which consists of data for the response message. Here is the example:

Example: Read the device information for slave 1.

(2 analog input reference numbers (30001 and 30002) for the slave 1 are read)

Reference number (Relative number)	30001 (0000H)	30002 (0001H)
Data	"DP" (4450H)	"1" (3100H)

<RTU mode>

Slave address	01H
Function code	04H
Starting number (H)	00H
Starting number (L)	00H
Number (H)	00H
Number (L)	02H
CRC(L)	71H
CRC(H)	CBH

Slave address	01H
Function code	04H
Number of data	04H
Device information 1(H)	44H
Device information 1(L)	50H
Device information 2(H)	31H
Device information 2(L)	00H
CRC(L)	FAH
CRC(H)	F5H

<Error check in ASCII mode> (\* The CRC(L)(H) portion above is the following LRC)

LRC	F9H
-----	-----

LRC	32H
-----	-----

Note: The starting number (relative number) is "Reference number minus 30001".

Note: The number of data means the number of bytes of data.

(It is different from the requested number. In this example, the requested number is 2 and the number of data is 4.)

Note: The number of data in a message which can be received (sent by this controller) at a time is restricted (See 8 - 4).

**8 - 5 - 2. Loopback test**

[Function code: 08 (08H)]

The transmission check is performed between the master and a slave. The response is sent according to the specified diagnostic code. In this controller, the return check is performed, in which the received data is sent as it is, and the diagnostic code is fixed to "0000H".

Example: Perform the loopback test for the slave 2

<RTU mode>

Master → Controller

Slave address		02H
Function code		08H
Diagnostic Code (H)	Fixed	00H
Diagnostic Code (L)		00H
Any Data		*
Any Data		*
CRC(L)		*
CRC(H)		*

Controller → Master (Normal)

Slave address		02H
Function code		08H
Diagnostic Code (H)	Fixed	00H
Diagnostic Code (L)		00H
Received Data		*
Received Data		*
CRC(L)		*
CRC(H)		*

### 8 - 5 - 3. Parameter setting data reading

[Function code: 80 (50H)]

The specified number of consecutive "parameter setting data" (4 bytes: 32 bits) is read from the specified number. The data is divided into top 8 bits, higher 8 bits, lower 8 bits, and bottom 8 bits and sorted in order to configure data for the response message.

Example: Read the SV value for the step being executed for the slave 1, P in PID being executed, and I in PID being executed.

(3 parameter setting data reference numbers (70101 - 70103) for the slave 1 are read.)

Reference number (Relative number)	70101 (0064H)	70102 (0065H)	70103 (0066H)
Data	100.0 (float) (42C80000H)	5.0 (float) (40A00000H)	60 (long) (0000003CH)

SV value for the step being executed = 100.0  
 P in PID being executed = 5.0  
 I in PID being executed = 60

<RTU mode>

Master → Controller		Controller → Master (Normal)	
Slave address	01H	Slave address	01H
Function code	50H	Function code	50H
Starting number (H)	00H	Number of data	0CH
Starting number (L)	64H	In progress SV(HH)	42H
Number (H)	00H	In progress SV(H)	C8H
Number (L)	03H	In progress SV(L)	00H
CRC(L)	C0H	In progress SV(LL)	00H
CRC(H)	18H	In progress P(HH)	40H
		In progress P(H)	A0H
		In progress P(L)	00H
		In progress P(LL)	00H
		In progress I(HH)	00H
		In progress I(H)	00H
		In progress I(L)	00H
		In progress I(LL)	3CH
		CRC(L)	4AH
		CRC(H)	93H

<Error check in ASCII mode> (\* The CRC(L)(H) portion above is the following LRC)

LRC	48H	LRC	7DH
-----	-----	-----	-----

Note: The starting number (relative number) is "Reference number minus 70001".

Note: The number of data means the number of bytes of data.

(It is different from the requested number. In this example, the requested number is 3 and the number of data is 12.)

Note: The number of data in a message which can be received (sent by this controller) at a time is restricted (See 8 - 4).



## 8 - 5 - 4. Parameter setting data writing

[Function code: 81 (51H)]

The parameter setting data whose number is specified is set to the specified value.

Example: Set the input type number for the slave 1 to 5 (K1).

<RTU mode>

Master → Controller		Controller → Master (Normal)	
Slave address	01H	Slave address	01H
Function code	51H	Function code	51H
Setting value number (H)	00H	Setting value number (H)	00H
Setting value number (L)	00H	Setting value number (L)	00H
Setting data (HH)	00H	Setting data (HH)	00H
Setting data (H )	00H	Setting data (H )	00H
Setting data (L )	00H	Setting data (L )	00H
Setting data (LL)	05H	Setting data (LL)	05H
CRC(L)	01H	CRC(L)	01H
CRC(H)	01H	CRC(H)	01H

<Error check in ASCII mode> (\* The CRC(L)(H) portion above is the following LRC)

LRC	A9H	LRC	A9H
-----	-----	-----	-----

Note: The starting number (relative number) is "Reference number minus 70001".

Note: The same response as the direction message is returned under normal conditions.

Note: All slaves run this command when setting the slave address to 0. However, no slave sends a respond.

## 8 - 5 - 5. Multiple parameter setting data writing

[Function code: 82 (52H)]

The specified number of the parameter setting data is set to the specified value from the specified number. The data is divided into top 8 bits, higher 8 bits, lower 8 bits, and bottom 8 bits and sorted in order before being sent.

Example: Set PID for the slave 1: Set P=5.0%, I=60 seconds, and D=30 seconds.

(3 parameter setting data reference numbers (70201 - 70203) for the slave 1 are set.)

Reference number (Relative number)	70201 (00C8H)	70202 (00C9H)	70203 (00CAH)
Data	5.0 (float) (40A00000H)	60 (long) (0000003CH)	30 (long) (0000001EH)

<RTU mode>

Master → Controller

Slave address	01H
Function code	52H
Starting number (H)	00H
Starting number (L)	C8H
Number (H)	00H
Number (L)	03H
Number of data	0CH
First data (HH)	40H
First data (H )	A0H
First data (L )	00H
First data (LL)	00H
Second data (HH)	00H
Second data (H )	00H
Second data (L )	00H
Second data (LL)	3CH
Third data (HH)	00H
Third data (H )	00H
Third data (L )	00H
Third data (LL)	1EH
CRC(L)	3FH
CRC(H)	18H

Controller → Master  
(Normal)

Slave address	01H
Function code	52H
Starting number (H)	00H
Starting number (L)	C8H
Number (H)	00H
Number (L)	03H
CRC(L)	F9H
CRC(H)	79H

<Error check in ASCII mode> (\* The CRC(L)(H) portion above is the following LRC)

LRC	9CH
-----	-----

LRC	E2H
-----	-----

Note: The starting number (relative number) is "Reference number minus 70001".

Note: All slaves run this command when setting the slave address to 0. However, no slave sends a respond.

Note: The number of data in a message which can be sent (received by this controller) at a time is restricted (See 8.4).

## 8 - 5 - 6. Real data (Execution information) reading

[Function code: 83 (53H)]

The specified number of "consecutive real data" (4 bytes: 32 bits) is read from the specified number. The data is divided into top 8 bits, higher 8 bits, lower 8 bits, and bottom 8 bits and sorted in order to configure data for the response message. The response example is the same as "Function code 50". However, the starting number (relative number) is "Reference number minus 80001".

## 8 - 6. Error handling

If an error is included in the message from the master, the following operation is performed.

### 8 - 6 - 1. No response

The message is ignored and no response is returned in the following cases:

- (1) When the transmission error (overrun, flaming, error in parity, CRC, or LRC) is detected in the message.
- (2) The slave address in the message is not own address.
- (3) When the data interval in the message is too long.

RTU mode: if less than 9600 bps : 20 msec or more

if 9600 bps or more: 5 msec or more

ASCII mode: 1 second or more

- (4) When the transmission parameters are different.
- (5) When the number of bytes of the received message exceeds the receivable number of bytes. If the number of received data exceeds the number shown in 8 - 4, no response may be returned.

Note: If the slave address is set to 0 in the write function, message is sent unless it includes an error, but no response is returned. Also, if the message includes one of the errors above, no response is returned. Therefore, if the slave address is set to 0, you can not determine if it is the normal operation or caused by an error only from the response from the controller.

## 8 - 6 - 2. Error message response

If an error below is detected in the message from the master and the message does not include an error shown in 8 - 6 - 1 section, the code which shows the error detail is returned as an error message.

The format of an error message is as follows:

Slave address	Function code	Function code +80H
Function code +80H	04	84H
Error code	08	88H
CRC(L)	80	D0H
CRC(H)	81	D1H
	82	D2H
	83	D3H

The error codes are described in the following table

Error code	Contents
01H	Function code failure The function code which is not specified is received
02H	Relative number (reference number) is invalid The received starting number or the set value number is out of the specified range
03H	The number of data is invalid <ul style="list-style-type: none"> <li>The number of data which is sent in response to the received message exceeds the specified number</li> <li>The requested number is 0</li> <li>The designated number of data received is different from the actual number of data</li> </ul>
11H	Out of the set value range The number which does not fall within the set value range specified in the reference table is set
12H	Invalid settings <ul style="list-style-type: none"> <li>A drive pattern number is set when the value other than COM is set for PATTERN SELECT.</li> <li>A drive pattern number is set when not in a RESET status.</li> <li>PROG DRIVE is selected when the value other than COM is set for PROG DRIVE.</li> <li>RUN, STOP, or ADV is set in END</li> <li>RUN, STOP, ADV, or RESET is set in CONST</li> <li>AT is started during AT</li> <li>AT1 or AT4 is performed in the program run during RESET</li> <li>AT2, AT3, AT5, or AT6 is performed except for the program run during RESET</li> <li>The FB tuning is performed during AT or FB tuning</li> <li>The FB tuning is performed during a program run</li> <li>Manual output is set when not in manual operation</li> <li>The SV for constant value operation is set when the program run is set for CONTROL MODE</li> <li>The step time becomes 0 sequentially by the write/add/delete operation of the step information</li> <li>The settings for Step SV and Step Rate are different from the PTN SETTING TYPE setting</li> <li>The user linearize table is set when the user linear range is not set for the input range</li> </ul>

## 8 - 7. DP-G relative number table

### 8 - 7 - 1. Analog input data (read-only) (16-bit unit)

\* 16-bit is used as an integer (short type). The device information of 30001 and 30002 is of character (char type)

#### 8 - 7 - 1 - 1. Real data, parameter information

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
30001 30002	04	R	INFORMATION	"DP1"=DP1000G      Reference number "DP2"=DP2000G      30001: "DP" in ASCII "DP3"=DP3000G      30002: "1" - "4" in ASCII "DP4"=DP4000G * Handled by 2 bytes (char type)
30101			measured value (PV)	Measured value (PV) (the decimal point position is [30153]PV decimal point position) If PV is + over range    32767(0x7FFF) If PV is - over range    -32768(0x8000) * Converted to integer type (short) when being transmitted
30102			PV status	0=Normal 1=+ over range 2=- over range * Integer type (short)
30103			SV value	SV value (the decimal point position is [30152]SV decimal point position) Range: -32768(0x8000) ~ 32767(0x7FFF)  The fixed value of each range in TC/Pt input See "8-9. Measuring range and decimal point position" See [30151] Input type number for measuring range * Converted to integer type (short) when being transmitted
30105			Control output value 1(MV1)	-50~1050=-5.0~105.0% * Converted to integer type (short) when being transmitted
30106			MV1 status	0=AUTO 1=MAN 2=AT 3=PRG.END OUT 4=PV ERR OUT 5=FB AT 6=RESET * Integer type (short)
30107			Control output value 2(MV2)	-50~1050=-5.0~105.0% * Converted to integer type (short) when being transmitted
30108			MV2 status	0=AUTO 1=MAN 2=AT 3=PRG.END OUT 4=PV ERR OUT 5=FB AT 6=RESET * Integer type (short)

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
30109	04	R	Execution SV	Actual SV value (the decimal point position is [30152]SV decimal point position) Range -32768(0x8000) ~ 32767(0x7FFF) * Converted to integer type (short) when being transmitted
30110 30111 30112 30113			Execution alarm value 1 Execution alarm value 2 Execution alarm value 3 Execution alarm value 4	Actual Alarm value (the decimal point position is [30153]PV decimal point position) Range -32768(0x8000) ~ 32767(0x7FFF) * Converted to integer type (short) when being transmitted
30114 30115 30116			Execution P Execution I Execution D	0 ~ 9999=0.0 ~ 999.9 0 ~ 9999 0 ~ 9999 * Integer type (short) or converted to integer type (short) when being transmitted
30117			Execution output limit lower limit	-50 ~ 1000=-5.0 ~ -100.0 * Converted to integer type (short) when being transmitted
30118			Execution output limit upper limit	0 ~ 1050=0.0 ~ 105.0 * Converted to integer type (short) when being transmitted
30119			Execution output variation limit: Down	-10000 ~ -1=-100.00 ~ -0.01 * Converted to integer type (short) when being transmitted
30120			Execution output variation limit: Up	1 ~ 10000=0.01 ~ 100.00 * Converted to integer type (short) when being transmitted
30121			Execution sensor bias	Execution sensor bias value (the decimal point position is [30152] SV decimal point position + 1 *** maximum=4 digits) Range -32768(0x8000) ~ 32767(0x7FFF) * Converted to integer type (short) when being transmitted
30122			A.R.W. lower limit value	-1000 ~ 0=-100.0 ~ 0.0 * Converted to integer type (short) when being transmitted
30123			A.R.W. upper limit value	0 ~ 1000=0.0 ~ 100.0 * Converted to integer type (short) when being transmitted
30126			Execution pattern number	1 ~ 200 * Integer type (short type)
30127			Execution step number	1 ~ 199 * Integer type (short type)
30128			Execution time: hour or minute	Elapsed/Remaining Time: hour or minute value * Integer type (short type)
30129			Execution time: minute or second	Elapsed/Remaining Time: minute or second value * Integer type (short type)
30130			Time display type	0=Step elapsed time 1=Pattern elapsed time 2=Step remaining time 3=Pattern remaining time * Integer type (short type)
30131			Display time unit	0=Hour : Minute 1=Minute : Second * Integer type (short type)
30151			Input type number	See [70001] Input type number for details * Integer type (short type)
30152			SV decimal point position	0 ~ 4 * Integer type (short type)
30153			PV decimal point position	0 ~ 4 * Integer type (short type)

## 8 - 7 - 2. Parameter setting data (32-bit unit)

\* Note that 32-bit data is used as integer type (long), single-precision floating point type (float), or bit field data (data contents varies depending on the bit division) depending on each reference number.

### 8 - 7 - 2 - 1. Setup parameter 1

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70001	80 81 82	R W W	Input type number	1/2/3/4/5/6/7/8/9/ 10/11/12/13/14/15/ 16/17/18/19/20/23/ 24/25/26/27/28/29/ 31/32/33/34/35/36/ 37/41/42/43/44/45/ 46/47/48/49/50/51/ 52/53/54/55/56/57/ 61/62/63/64/65/66/ 67/141/142/143/144/ 145/146/147/148/149/ 150/151/152/153/ 154/155/156/157	5 (K1)	1=B 2=R1 3=R2 4=S 5=K1 6=K2 7=K3 8=E1 9=E2 10=E3 11=E4 12=J1 13=J2 14=J3 15=J4 16=T1 17=T2 18=WRe5-26 19=WWRe0-26 20=Ni-NiMo 23=PR5-20 24=PR20-40 25=Platinel1 26=Platinel2 27=U 28=L 29=N 31=±10mV 32=±20mV 33=±50mV 34=±100mV 35=±5V 36=0-20mA 37=±10V 41=JPt100Ω1 (3 wire) 42=JPt100Ω2 (3 wire) 43=JPt100Ω3 (3 wire) 44=JPt100Ω4 (3 wire) 45=JPt100Ω5 (3 wire) 46=QPt100Ω1 (3 wire) 47=QPt100Ω2 (3 wire) 48=QPt100Ω3 (3 wire) 49=QPt100Ω4 (3 wire) 50=QPt100Ω5 (3 wire)

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70001	80 81 82	R W W	Input type number	1/2/3/4/5/6/7/8/9/ 10/11/12/13/14/15/ 16/17/18/19/20/23/ 24/25/26/27/28/29/ 31/32/33/34/35/36/ 37/41/42/43/44/45/ 46/47/48/49/50/51/ 52/53/54/55/56/57/ 61/62/63/64/65/66/ 67/141/142/143/144/ 145/146/147/148/149/ 150/151/152/153/ 154/155/156/157	5 (K1)	51=Pt50Ω (3 wire) 52=Pt-Co (3 wire) 53=Pt100Ω1 (3 wire) 54=Pt100Ω2 (3 wire) 55=Pt100Ω3 (3 wire) 56=Pt100Ω4 (3 wire) 57=Pt100Ω5 (3 wire) 61=WRe5-WRe26 62=W-WRe26 63=NiMo-Ni 64=Platinel II-1 65=Platinel II-2 66=CR-AuFe 67=PtRh20-PtRh40 141=JPt100Ω1 (4 wire) 142=JPt100Ω2 (4 wire) 143=JPt100Ω3 (4 wire) 144=JPt100Ω4 (4 wire) 145=JPt100Ω5 (4 wire) 146=QPt100Ω1 (4 wire) 147=QPt100Ω2 (4 wire) 148=QPt100Ω3 (4 wire) 149=QPt100Ω4 (4 wire) 150=QPt100Ω5 (4 wire) 151=Pt50Ω (4 wire) 152=Pt-Co (4 wire) 153=Pt100Ω1 (4 wire) 154=Pt100Ω2 (4 wire) 155=Pt100Ω3 (4 wire) 156=Pt100Ω4 (4 wire) 157=Pt100Ω5 (4 wire)  (See "Measurement Range List" in Section 8 - 9.)  * Integer type (long type)
70002	80 81 82	R W W	Unit number	0~7	0 (°C)	0=Centigrade temperature (°C) 2=Absolute temperature (K) 3=% 4=BLK 5=mV 6=V 7=mA If 66:CR-AuFe, 52:Pt-Co, or 152:Pt-Co is set for the input type, 0:°C can not be written. * Integer type (long type)
70003			RJ	0/1	0	0=RJ_INT (Internal) 1=RJ_EXT (External) * Integer type (long type)



Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70004	80 81 82	R W W	Linear range: ZERO	10mv: -10.00~9.99 20mv: -20.00~19.99 50mv: -50.00~49.99 100mv: -100.0~99.9 5V: -5.000~4.999 10V: -10.00~9.99 20mA: 0.00~19.99	Automatic Deployment	Be sure to set the value more than zero to the span. Write the range within the input range. (See "8 - 9. Measuring range and decimal point position")  * <b>Single-precision floating point type (float type)</b>
70005			Linear range: SPAN	10mv: -9.99~10.00 20mv: -19.99~20.00 50mv: -49.99~50.00 100mv: -99.9~100.0 5V: -4.999~5.000 10V: -9.99~10.00 20mA: 0.01~20.00		
70006 70007			Linear scale - MIN Linear scale - MAX	The range varies depending on the decimal point position. 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	Automatic Deployment	The input value for the range is assigned to the actual value for the scale.  Decimal point position: [70008] Linear scale decimal point  * <b>Single-precision floating point type (float type)</b>
70008			Linear scale decimal point Position (SV decimal point position)	0~4 digits	1	Linear scale decimal point setting. The fixed value of each range can be read in TC/Pt input. WRITE disabled. * <b>Integer type (long type)</b>
70011			PV decimal point position	0~4 digits	1	* <b>Integer type (long type)</b>
70012			Digital filter	0.0~99.9	0.1 second	0.0=OFF * <b>Single-precision floating point type (float type)</b>
70013			Burn out	0~2	0	0: UP 1: DOWN 2: NONE * <b>Burn out is not performed in linear range (2: NONE).</b> * <b>Integer type (long type)</b>
70014			Input operation	0~2	0	0: NONE 1: Square roots calculation 2: Log10 operation * <b>Integer type (long type)</b>

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70030	81 82	W W	Alarm reset	1	-	1=All alarm reset 2=Alarm 1~4 reset 3=Alarm 5~8 reset 4=Alarm 1 reset 5=Alarm 2 reset 6=Alarm 3 reset 7=Alarm 4 reset 8=Alarm 5 reset 9=Alarm 6 reset 10=Alarm 7 reset 11=Alarm 8 reset * Integer type (long type)

## 8 - 7 - 2 - 2. Setup parameter 2

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70051			Analog Transmission type 1	0/1/3/5/7/8/10	1 (PV)	0=NONE 1=PV 3=SV 5=DEV 7=MV1 8=MV2 10=MFSV <b>* Integer type (long type)</b>
70052 70053			Transmission scale 1: MIN Transmission scale 1: MAX	(1) NONE → Invalid settings (2) PV,SV,DEV → Measuring range See "Measuring range list" in section 8-9 Or scale range. (3) MV,MFSV → -5.0 ~ 105.0	Measuring range Or scale range, measuring limit	Decimal point position: PV, SV, DEV → [70008]Linear scale decimal point MV, MFB, MFSV → 1 digits <b>* Single-precision floating point type (float type)</b>
70061	80 81 82	R W W	Analog Transmission type 2	* Same as analog transmission kind		<b>* Integer type (long type)</b>
70062 70063			Transmission scale 2: MIN Transmission scale 2: MAX	* Transmission scale 1 similar		<b>* Single-precision floating point type (float type)</b>
70079			Communications Transmission type 1	0/1/3/5/7/8/10	1 (PV)	0=NONE 1=PV 3=SV 5=DEV 7=MV1 8=MV2 10=MFSV <b>* Integer type (long type)</b>
70080			Communications Transmission type 2	* Same as communications transmission type 1		<b>* Integer type (long type)</b>
70092			Actions when the power switch is turned on	0/1	0 (RESET)	0=operation reset (RESET) 1=operation continued (CONTINUE) <b>* Integer type (long type)</b>

8 - 7 - 2 - 3. Run time parameter, specific parameter (CH1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70101	80 81 82	R W W	Step being executed "SV value"	Within the range scale range	0	* Single-precision floating point type (float type)
70102			Running PID "P"	0: Two-position control 0.1~999.9	-	(CH1) * Single-precision floating point type (float type)
70103			Running PID "I"	0 ( $\infty$ ) 1~9999	-	(CH1)* Integer type (long type)
70104			Running PID "D"	0~9999	-	(CH1)* Integer type (long type)
70105			Running OUTPUT LIMIT "Lower limit"	-5.0~100.0	-	(CH1) For output limit, be sure to set the lower limit < the upper limit. * Single-precision floating point type (float type)
70106			Running OUTPUT LIMIT "Upper limit"	0.0~105.0	-	(CH1) For output limit, be sure to set the lower limit < the upper limit. * Single-precision floating point type (float type)
70107			Output variation limit during execution : Down	-100.00 ~ -0.01	-	(CH1) * Single-precision floating point type (float type)
70108			Output variation limit during execution: Up	0.01~100.00	-	(CH1) * Single-precision floating point type (float type)
70109			Running Sensor bias	The range varies depending on the decimal point position. 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	-	(CH1) Decimal point position: [70008] Linear scale decimal point + 1 * Single-precision floating point type (float type)
70110			Running A.R.W "Lower limit"	-100.0~0.0	-	(CH1) * Single-precision floating point type (float type)
70111			Running A.R.W "Upper limit"	0.0~100.0	-	(CH1) * Single-precision floating point type (float type)
70112			Running DEAD BAND/GAP	0.0~9.9	-	(CH1) * Single-precision floating point type (float type)
70113			Running PRESET	-100.0~100.0	-	(CH1) * Single-precision floating point type (float type)
70114			Output scale during execution "Lower limit"	-5.0~100.0	-	(CH1) * Single-precision floating point type (float type)
70115			Output scale during execution "Upper limit"	0.0~105.0	-	(CH1) * Single-precision floating point type (float type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70116			Running Step time	0~3599940 (seconds) (0~999h59m00s)	0	(CH1) When 000:00 presents "minute:second" 0~59999 (seconds) (999m59s) * Integer type (long type)
70117			SV bias during execution (Mode 0)	The range varies depending on the decimal point position. 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	-	(CH1) Decimal point position: input range scale digit + 1 * Single-precision floating point type (float type)
70118			SV type during execution (Mode 0)	0/1	-	(CH1) 0=ALL STEP 1=NOW STEP * Integer type (long type)
70119 ~ 70126	80 81 82	R W W	During execution: Alarm value 1 ~ During execution: Alarm value 8	The range varies depending on the decimal point position. 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	-	Decimal point position: Alarm mode=PV variation alarm high PV variation alarm low [70008]Linear scale decimal point + 1 Alarm mode=Other than above [70008]Linear scale decimal point * Single-precision floating point type (float type)

8 - 7 - 2 - 4. Run time parameter, specific parameter (CH2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70152	80 81 82	R W W	Running PID "P"	0: Two-position control 0.1~999.9	-	(CH2) * Single-precision floating point type (float type)
70153			Running PID "I"	0 ( $\infty$ ) 1~9999	-	(CH2)* Integer type (long type)
70154			Running PID "D"	0~9999	-	(CH2)* Integer type (long type)
70155			Output limit during execution "Lower value"	-5.0~100.0	-	(CH2) Be sure to set the lower limit < the upper limit. * Single-precision floating point type (float type)
70156			Output limit during execution "Upper value"	0.0~105.0	-	(CH2) Be sure to set the lower limit < the upper limit. * Single-precision floating point type (float type)
70157			Output variation limit during execution: Down	-100.00~-0.01	-	(CH2) * Single-precision floating point type (float type)
70158			Output variation limit during execution: Up	0.01~100.00	-	(CH2) * Single-precision floating point type (float type)
70159			Running Sensor bias	The range varies depending on the decimal point position. 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	-	(CH2) Decimal point position: [70008]Linear scale decimal point + 1 * Single-precision floating point type (float type)
70160			Running A.R.W "Lower limit"	-100.0~0.0	-	(CH2) * Single-precision floating point type (float type)
70161			Running A.R.W "Upper limit"	0.0~100.0	-	(CH2) * Single-precision floating point type (float type)
70162			Running DEAD BAND/GAP	0.0~9.9	-	(CH2) * Single-precision floating point type (float type)
70163			Output preset during execution	-100.0~100.0	-	(CH2) * Single-precision floating point type (float type)
70164			Output scale during execution "Lower limit"	-5.0~100.0	-	(CH2) * Single-precision floating point type (float type)
70165			Output scale during execution "Upper limit"	0.0~105.0	-	(CH2) * Single-precision floating point type (float type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70167			SV bias during execution (Mode 0)	The range varies depending on the decimal point position. 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	-	(CH2) Decimal point position: [70008]Linear scale decimal point + 1 * Single-precision floating point type (float type)
70168			SV type during execution (Mode 0)	0/1	-	(CH2) 0=ALL STEP 1=NOW STEP * Integer type (long type)

## 8 - 7 - 2 - 5. PID (CH1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70201	80 81 82	R W W	Step P(1)	0: Two-position control 0.1~999.9	5.0	(CH1) * Single-precision floating point type (float type)
70202			Step I(1)	0 ( $\infty$ ) 1~9999	60	(CH1)* Integer type (long type)
70203			Step D(1)	0~9999	30	(CH1)* Integer type (long type)
70204			Step A.R.W. L(1)	-100.0~0.0	-50.0	(CH1) * Single-precision floating point type (float type)
70205			Step A.R.W. H(1)	0.0~100.0	50.0	(CH1) * Single-precision floating point type (float type)
70206			Step PID DEAD BAND(1)	0.0~9.9	0.5	(CH1) * Single-precision floating point type (float type)
~			~	~	~	
70243			Step P(8)	0: Two-position control 0.1~999.9	5.0	(CH1) * Single-precision floating point type (float type)
70244			Step I(8)	0 ( $\infty$ ) 1~9999	60	(CH1)* Integer type (long type)
70245			Step D(8)	0~9999	30	(CH1)* Integer type (long type)
70246			Step A.R.W. L(8)	-100.0~0.0	-50.0	(CH1) * Single-precision floating point type (float type)
70247			Step A.R.W. H(8)	0.0~100.0	50.0	(CH1) * Single-precision floating point type (float type)
70248			Step PID DEAD BAND(8)	0.0~9.9	0.5	(CH1) * Single-precision floating point type (float type)
70250 ~ 70256			PID zone SV1 ~ PID zone SV7	Measuring range		(CH1) [Setting condition] SV1<=SV2=<SV3=<SV4 <=SV5<=SV6<=SV7 SV8 is calculated from SV7. * Single-precision floating point type (float type)
70257	Zone P(1)	0: Two-position control 0.1~999.9	5.0	(CH1) * Single-precision floating point type (float type)		
70258	Zone I(1)	0 ( $\infty$ ) 1~9999	60	(CH1)* Integer type (long type)		
70259	Zone D(1)	0~9999	30	(CH1)* Integer type (long type)		
70260	Zone A.R.W. L(1)	-100.0~0.0	-50.0	(CH1) * Single-precision floating point type (float type)		
70261	Zone A.R.W. H(1)	0.0~100.0	50.0	(CH1) * Single-precision floating point type (float type)		
70262	Zone PID DEAD BAND(1)	0.0~9.9	0.5	(CH1) * Single-precision floating point type (float type)		
~	~	~	~			
70299	Zone P(8)	0: Two-position control 0.1~999.9	5.0	(CH1) * Single-precision floating point type (float type)		
70300	Zone I(8)	0 ( $\infty$ ) 1~9999	60	(CH1)* Integer type (long type)		



FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70301			Zone D(8)	0~9999	30	(CH1)* Integer type (long type)
70302			Zone A.R.W. L(8)	-100.0~0.0	-50.0	(CH1) * Single-precision floating point type (float type)
70303			Zone A.R.W. H(8)	0.0~100.0	50.0	(CH1) * Single-precision floating point type (float type)
70304			Zone PID DEAD BAND(8)	0.0~9.9	0.5	(CH1) * Single-precision floating point type (float type)

## 8 - 7 - 2 - 6. PID (CH2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks	
70321	80 81 82	R W W	Step P(1)	0: Two-position control 0.1~999.9	5.0	(CH2) * Single-precision floating point type (float type)	
70322			Step I(1)	0 ( $\infty$ ) 1~9999	60	(CH2)* Integer type (long type)	
70323			Step D(1)	0~9999	30	(CH2)* Integer type (long type)	
70324			Step A.R.W. L(1)	-100.0~0.0	-50.0	(CH2) * Single-precision floating point type (float type)	
70325			Step A.R.W. H(1)	0.0~100.0	50.0	(CH2) * Single-precision floating point type (float type)	
70326			Step PID DEAD BAND(1)	0.0~9.9	0.5	(CH2) * Single-precision floating point type (float type)	
~			~	~			
70363			Step P(8)	0: Two-position control 0.1~999.9	5.0	(CH2) * Single-precision floating point type (float type)	
70364			Step I(8)	0 ( $\infty$ ) 1~9999	60	(CH2)* Integer type (long type)	
70365			Step D(8)	0~9999	30	(CH2)* Integer type (long type)	
70366			Step A.R.W. L(8)	-100.0~0.0	-50.0	(CH2) * Single-precision floating point type (float type)	
70367			Step A.R.W. H(8)	0.0~100.0	50.0	(CH2) * Single-precision floating point type (float type)	
70368			Step PID DEAD BAND(8)	0.0~9.9	0.5	(CH2) * Single-precision floating point type (float type)	
70370 ~ 70376			PID zone SV1 ~ PID zone SV7	Measuring range		(CH2) [Setting condition] SV1<=SV2<=SV3<=SV4 <=SV5<=SV6<=SV7 SV8 is calculated from SV7. * Single-precision floating point type (float type)	
70377			Zone P(1)	0: Two-position control 0.1~999.9	5.0	(CH2) * Single-precision floating point type (float type)	
70378			Zone I(1)	0 ( $\infty$ ) 1~9999	60	(CH2)* Integer type (long type)	
70379			Zone D(1)	0~9999	30	(CH2)* Integer type (long type)	
70380			Zone A.R.W. L(1)	-100.0~0.0	-50.0	(CH2) * Single-precision floating point type (float type)	
70381			Zone A.R.W. H(1)	0.0~100.0	50.0	(CH2) * Single-precision floating point type (float type)	
70382			Zone PID DEAD BAND(1)	0.0 ~9.9	0.5	(CH2) * Single-precision floating point type (float type)	
~			~	~			
70419			Zone P(8)	0: Two-position control 0.1~999.9	5.0	(CH2) * Single-precision floating point type (float type)	
70420			Zone I(8)	0 ( $\infty$ ) 1~9999	60	(CH2)* Integer type (long type)	
70421			Zone D(8)	0~9999	30	(CH2)* Integer type (long type)	
70422	Zone A.R.W. L(8)	-100.0~0.0	-50.0	(CH2) * Single-precision floating point type (float type)			
70423	Zone A.R.W. H(8)	0.0~100.0	50.0	(CH2) * Single-precision floating point type (float type)			
70424	Zone PID DEAD BAND(8)	0.0~9.9	0.5	(CH2) * Single-precision floating point type (float type)			

8 - 7 - 2 - 7. Alarm settings (basics)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70441 70442 70443 70444			Alarm judgment time(1) Alarm judgment time(2) Alarm judgment time(3) Alarm judgment time(4)	0~20000	0	(Basics) * Integer type (long type)
70451	80 81 82	R W W	Alarm mode(1)	[Alarm kind] 0 x 10: ABS HIGH 0 x 11: ABS LOW 0 x 20: DEVIATION HIGH 0 x 21: DEVIATION LOW 0x30: DEV BAND HIGH 0x31: DEV BAND LOW 0x40: PV variation high 0x41: PV variation low 0 x 50: SV LOW 0 x 51: SV HIGH 0 x 60: OUTPUT HIGH 0 x 61: OUTPUT LOW 0x70: Control loop error 0x80: FAIL 0x90: Waiting time alarm 0xA0 END SIGNAL  [Additional functions] 0x00: Wait = enable/Latch = disable/RE = OFF 0x01: Wait = disable/Latch = disable/RE = operation 0x04: Wait = enable/Latch = enable/RE = OFF 0x05: Wait = disable/Latch = enable/RE = operation 0x08: Wait = enable/Latch = disable/RE = OFF 0x09: Wait = enable/Latch = disable/RE = operation 0x0C: Wait = enable/Latch = enable/RE = disable 0x0D: Wait = enable/Latch =	[Type] 0x20 (DEVIATION HIGH)  [Additional] 0x00 (Wait = disable, Latch = disable, RE=OFF)	(Basics) [Data structure] b31 b16 <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto; text-align: center;">Unused</div> b15                      b8 b7                      b0 <div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%; height: 15px; margin: 5px auto;"> <span>Alarm Kind</span> <span>Additional functions</span> </div> [Additional functions] Wait : Disable/Enable Latch: disable/enable Action at READY: OFF / ACTION  * Bit field data

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
				enable/RE = operation		
70452			Alarm CH(1)	0:CH1	0	(Basics) Specify the CH which judges an alarm. * Integer type (long type)
70453	80 81 82	R W W	Alarm delay(1)	1~10	2	(Basics) Specify the number of times an alarm judge is performed (Check with the sampling period 0.1 second and generate an alarm if the alarm status is detected sequentially certain times.) * Integer type (long type)
70454			Alarm dead band (1)	The range varies depending on the decimal point position. 1: 0.0~9999.9 2: 0.00~999.99 3: 0.000~99.999 4: 0.0000~9.9999	2.00	(Basics) Decimal point position:  Alarm mode = PV variation alarm high PV variation alarm low [70008] Linear scale decimal point + 2  Alarm mode = Other than above [70008] Linear scale decimal point + 1  * Single-precision floating point type (float type)
~			~	~		
70463			Alarm mode(4)	* Same as Alarm mode (1)		(Basics) * Bit field data
70464			Alarm CH(4)	* Same as Alarm judge CH(1)		(Basics) * Integer type (long type)
70465			Alarm delay(4)	* Same as Alarm delay (1)		(Basics) * Integer type (long type)
70466			Alarm dead band (4)	* Same as Alarm dead band (1)		(Basics) * Single-precision floating point type (float type)
70467			Setting alarm value 1(1)	The range varies depending on the decimal point position. 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	400.0	(Basics) Decimal point position:  Alarm mode = V variation alarm high PV variation alarm low [70008] Linear scale decimal point + 1
70468			Setting alarm value 2(1)		-400.0	
70469			Setting alarm value 3(1)		400.0	
70470			Setting alarm value 4(1)		-400.0	
~			~		~	
70495			Setting alarm value 1(8)		400.0	
70496			Setting alarm value 2(8)	-400.0	Alarm mode = Other than above [70008] Linear scale decimal point	

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70497			Setting alarm value 3(8)		400.0	* Single-precision floating point type (float type)
70498			Setting alarm value 4(8)		-400.0	

8 - 7 - 2 - 8. Alarm settings (enhanced)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks	
70445 70446 70447 70448	80 81 82	R W W	Alarm judgment time(5) Alarm judgment time(6) Alarm judgment time(7) Alarm judgment time(8)	0~20000	0	(Enhanced) * Integer type (long type)	
70501			Alarm mode(5)	* Same as Alarm mode (1)		(Enhanced) * Bit field data	
70502			Alarm CH(5)	* Same as Alarm judge CH(1)		(Enhanced) * Integer type (long type)	
70503			Alarm delay(5)	* Same as Alarm delay (1)		(Enhanced) * Integer type (long type)	
70504			Alarm dead band (5)	* Same as Alarm dead band (1)		(Enhanced) * Single-precision floating point type (float type)	
~			~	~			
70513			Alarm mode(8)	* Same as Alarm mode (4)		(Enhanced) * Bit field data	
70514			Alarm CH(8)	* Same as Alarm judge CH(4)		(Enhanced) * Integer type (long type)	
70515			Alarm delay(8)	* Same as Alarm delay (4)		(Enhanced) * Integer type (long type)	
70516			Alarm dead band (8)	* Same as Alarm dead band (4)		(Enhanced) * Single-precision floating point type (float type)	
70517			Setting alarm value 5(1)	The range varies depending on the decimal point position. 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999		400.0	(Enhanced) Decimal point position: Alarm mode = PV variation alarm high PV variation alarm low [70008] Linear scale decimal point + 1
70518			Setting alarm value 6(1)			-400.0	
70519			Setting alarm value 7(1)			400.0	
70520			Setting alarm value 8(1)			-400.0	
~			~			~	
70545			Setting alarm value 5(8)			400.0	
70546			Setting alarm value 6(8)			-400.0	
70547			Setting alarm value 7(8)			400.0	
70548			Setting alarm value 8(8)			-400.0	

8 - 7 - 2 - 9. AT setup (CH1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks			
70551	80 81 82	R W W	AT2 start direction	0: UP 1: DOWN	0	(CH1) * Integer type (long type)			
70552			AT2: ON/OFF flag	0x00~0xFF	0x00	(CH1) [Data structure] b31 b16 <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td style="text-align: center;">Unused</td></tr></table> b15                      b8 b7                      b0 <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td style="text-align: center;">Unused</td><td style="text-align: center;">ON/OFF flag</td></tr></table> b0: ON/OFF No.1 b1: ON/OFF No.2 b2: ON/OFF No.3 b3: ON/OFF No.4 b4: ON/OFF No.5 b5: ON/OFF No.6 b6: ON/OFF No.7 b7: ON/OFF No.8 * Bit field data	Unused	Unused	ON/OFF flag
Unused									
Unused			ON/OFF flag						
70553 ~ 70560			AT2•SV1 ~ AT2•SV8	Measuring range		(CH1) * Single-precision floating point type (float type)			
70561			AT3 start direction	0: UP 1: DOWN	0	(CH1) * Integer type (long type)			
70562			AT3: ON/OFF flag	* Same as AT2: ON/OFF flag		(CH1) * Integer type (long type)			
70563 ~ 70570			AT3•SV1 ~ AT3•SV8	Measuring range		(CH1) [Setting condition] SV1<=SV2<=SV3<=SV4 <=SV5<=SV6<=SV7<=SV8 * Single-precision floating point type (float type)			

8 - 7 - 2 - 10. AT setup (CH2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70601	80 81 82	R W W	AT5 start direction	* Same as AT Setup (CH1) AT2		(CH2) * Integer type (long type)
70602			AT5: ON/OFF flag	* Same as AT Setup (CH1) AT2		(CH2) * Integer type (long type)
70603 ~ 70610			AT5•SV1 ~ AT5•SV8	* Same as AT Setup (CH1) AT2		(CH2) * Single-precision floating point type (float type)
70611			AT6 start direction	* Same as AT Setup (CH1) AT3		(CH2) * Integer type (long type)
70612			AT6: ON/OFF flag	* Same as AT Setup (CH1) AT3		(CH2) * Integer type (long type)
70613 ~ 70620			AT6•SV1 ~ AT6•SV8	* Same as AT Setup (CH1) AT3		(CH2) * Single-precision floating point type (float type)

## 8 - 7 - 2 - 11. Output setting (CH1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70651	80 81 82	R W W	Step output scale lower limit(1)	-5.0~100.0	0.0	(CH1) For the limit, be sure to set the lower limit < the upper limit and DOWN < UP. For the scale, the values are not checked if they are lower or higher. * Single-precision floating point type (float type)
70652			Step output scale upper limit(1)	0.0~105.0	100.0	
70653			Step output limit lower limit(1)	-5.0~100.0	0.0	
70654			Step output limit upper limit(1)	0.0~105.0	100.0	
70655			Step variation limit DOWN(1)	-100.00~-0.01	-100.00	
70656			Step variation limit UP(1)	0.01~100.00	100.00	
~			~	~	~	
70693			Step output scale lower limit(8)	-5.0~100.0	0.0	
70694			Step output scale upper limit(8)	0.0~105.0	100.0	
70695			Step output limit lower limit(8)	-5.0~100.0	0.0	
70696			Step output limit upper limit(8)	0.0~105.0	100.0	
70697			Step variation limit DOWN(8)	-100.00~-0.01	-100.00	
70698			Step variation limit UP(8)	0.01~100.00	100.00	
70702 ~ 70708					Zone SV(1) ~ Zone SV(7)	



FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks	
70710	80 81 82	R W W	Zone output scaling lower limit(1)	-5.0~100.0	0.0	(CH1) For the limit, be sure to set the lower limit < the upper limit and DOWN < UP. For the scale, the values are not checked if they are lower or higher. * Single-precision floating point type (float type)	
70711			Zone output scaling upper limit(1)	0.0~105.0	100.0		
70712			Zone output limit lower limit(1)	-5.0~100.0	0.0		
70713			Zone output limit upper limit(1)	0.0~105.0	100.0		
70714			Zone variation limit DOWN(1)	-100.00~-0.01	-100.00		
70715			Zone variation limit UP(1)	0.01~100.00	100.00		
~			~	~	~		~
70752			Zone output scaling lower limit(8)	-5.0~100.0	0.0		
70753			Zone output scaling upper limit (8)	0.0~105.0	100.0		
70754			Zone output limit lower limit(8)	-5.0~100.0	0.0		
70755			Zone output limit upper limit(8)	0.0~105.0	100.0		
70756			Zone variation limit DOWN(8)	-100.00~ -0.01	-100.00		
70757			Zone variation limit UP(8)	0.01~100.00	100.00		
70758 ~ 70765			Step PID PRESET(1) ~ Step PID PRESET(8)	-100.0~100.0	50.0		(CH1) * Single-precision floating point type (float type)
70766 ~ 70773			Zone PID PRESET(1) ~ Zone PID PRESET(8)	-100.0~100.0	50.0		(CH1) * Single-precision floating point type (float type)
70774			Manual output limit Function	0: YES 1: Invalid	0		(CH1) * Integer type (long type)

## 8 - 7 - 2 - 12. Output settings (CH2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks			
70801	80 81 82	R W W	Step output scale lower limit(1)	-5.0~100.0	0.0	(CH2) For the limit, be sure to set the lower limit < the upper limit and DOWN < UP. For the scale, the values are not checked if they are lower or higher. * Single-precision floating point type (float type)			
70802			Step output scale upper limit(1)	0.0~105.0	100.0				
70803			Step output limit lower limit(1)	-5.0~100.0	0.0				
70804			Step output limit upper limit(1)	0.0~105.0	100.0				
70805			Step variation limit DOWN(1)	-100.00~-0.01	-100.00				
70806			Step variation limit UP(1)	0.01~100.00	100.00				
~			~	~	~				
70843			Step output scale lower limit(8)	-5.0~100.0	0.0				
70844			Step output scale upper limit(8)	0.0~105.0	100.0				
70845			Step output limit lower limit(8)	-5.0~100.0	0.0				
70846			Step output limit upper limit(8)	0.0~105.0	100.0				
70847			Step variation limit DOWN(8)	-100.0~-0.01	-100.00				
70848			Step variation limit UP(8)	0.01~100.00	100.00				
70852 ~ 70858					Zone SV(1) ~ Zone SV(7)		Measuring range		(CH2) Set SV1 section central value ~ Set SV7 section central value SV8 is calculated from SV7 * Single-precision floating point type (float type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks	
70860	80 81 82	R W W	Zone output scaling lower limit (1)	-5.0~100.0	0.0	(CH2) For the limit, be sure to set the lower limit < the upper limit and DOWN < UP. For the scale, the values are not checked if they are lower or higher. * Single-precision floating point type (float type)	
70861			Zone output scaling upper limit (1)	0.0~105.0	100.0		
70862			Zone output limit lower limit(1)	-5.0~100.0	0.0		
70863			Zone output limit upper limit(1)	0.0~105.0	100.0		
70864			Zone variation limit DOWN(1)	-100.00~-0.01	-100.00		
70865			Zone variation limit UP(1)	0.01~100.00	100.00		
~			~	~			
70902			Zone output scaling lower limit (8)	-5.0~100.0	0.0		
70903			Zone output scaling upper limit (8)	0.0~105.0	100.0		
70904			Zone output limit lower limit(8)	-5.0~100.0	0.0		
70905			Zone output limit upper limit(8)	0.0~105.0	100.0		
70906			Zone variation limit DOWN(8)	-100.00~-0.01	-100.00		
70907			Zone variation limit UP(8)	0.01~100.00	100.00		
70908 ~ 70915			Step PID PRESET(1) ~ Step PID PRESET(8)	-100.0~100.0	50.0		(CH2) * Single-precision floating point type (float type)
70916 ~ 70923			Zone PID PRESET(1) ~ Zone PID PRESET(8)	-100.0~100.0	50.0		(CH2) * Single-precision floating point type (float type)
70924			Manual output limit Function	0: YES 1: Invalid	0		(CH2) * Integer type (long type)

## 8 - 7 - 2 - 13. Control setup setting

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
70951	80 81 82	R W W	Control algorism	0/1	0	(CH1) 0=Position type 1=Velocity type * Integer type (long type)
70952			CONTROL DIRECTION Direct/reverse	0/1	1 (REVERSE)	(CH1) 0=Direct (DIRECT: direct operation) 1=Reverse (REVERSE: reverse operation) * Integer type (long type)
70953			On-off pulse type	0/1	0	(CH1) 0=CONTROL INTERVAL 1=Pulse cycle * Integer type (long type)
70954			Control interval	0/1/2/3	0	(CH1) 0=100ms 1=200ms 2=300ms 3=500ms * Integer type (long type)
70955			On-off pulse interval	1~180	30	(CH1)* Integer type (long type)
70956			PV error output lower limit	-5.0~105.0	0.0	(CH1)* Single-precision floating point type (float type)
70957			PV error output upper limit	0.0~105.0	100.0	(CH1)* Single-precision floating point type (float type)
70958			Abnormal CPU output	-5.0~105.0	0.0	(CH1)* Single-precision floating point type (float type)
70959			Control algorism	0/1	0	(CH2) 0=Position type 1=Velocity type * Integer type (long type)
70960			CONTROL DIRECTION Direct/reverse	0/1	1 (REVERSE)	(CH2) 0=Direct (DIRECT: direct operation) 1=Reverse (REVERSE: reverse operation) * Integer type (long type)
70961			On-off pulse type	0/1	0	(CH2) 0=CONTROL INTERVAL 1=Pulse cycle * Integer type (long type)
70962			Control interval	0/1/2/3	0	(CH2) 0=100ms 1=200ms 2=300ms 3=500ms * Integer type (long type)
70963			On-off pulse interval	1~180	30	(CH2)* Integer type (long type)
70964			PV error output lower limit	-5.0~105.0	0.0	(CH2)* Single-precision floating point type (float type)
70965			PV error output upper limit	0.0~105.0	100.0	(CH2)* Single-precision floating point type (float type)

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks		
70966			Abnormal CPU output	-5.0~105.0	0.0	(CH2)* Single-precision floating point type (float type)		
70967	80 81 82	R W W	heating/cooling HEAT & COOL SEL	0/1/2	0	0=None 1=SPLIT (Matching box operation system) 2=COOP PROPORTION (Set the gap between Output 2 PID and Output 1 and Output 2.) * Integer type (long type)		
70968			heating/cooling H.C.DEAD BAND	-50.0~50.0	0.0	When the heating/cooling output type is COOL PROPORTION (COOL.P) with the control output 2 option specified. * Single-precision floating point type (float type)		
70969			heating/cooling COOL P	0.00~10.00	0.0	When the heating/cooling output type is COOP PROPORTION (COOL.P) with the control output 2 option specified. * Single-precision floating point type (float type)		
70970			SPLIT: Direct	0.0~60.0	0.0	When the heating/cooling output type is matching box (SPLIT) with the control output 2 option specified. * Single-precision floating point type (float type)		
70971			SPLIT: Reverse	40.0~100.0	100.0	When the heating/cooling output type is matching box (SPLIT) with the control output 2 option specified. * Single-precision floating point type (float type)		
70972			FB setup ON/OFF servo mode	0/1	0	0=Feedback enable 1=Open Loop * Integer type (long type)		
70973			FB: ZERO	0.0~99.9	0.0	Only when the control output 1 is ON/OFF servo WRITE enabled. * Single-precision floating point type (float type)		
70974			FB: SPAN	0.1~100.0	100.0			
70975			FB/Dead band (GAP)	0.5~5.0	1.0			
70983					Cascade primary controller out	0/1/2/3/4	0	0=OFF 1=Output 1 2=Output 2 3=Transmission 1 4=Transmission 2 * Integer type (long type)
70984					Cascade primary controller constant a	0.00~1.00	1.00	* Single-precision floating point type (float type)
70985					Cascade primary controller constant b	-100.0~100.0	0.0	* Single-precision floating point type (float type)
70986			Cascade primary controller constant c	0.00~1.00	0.00	* Single-precision floating point type (float type)		

## 8 - 7 - 2 - 14. INPUT

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71001			Burn out	0/1/2	0	0=UP 1=DOWN 2=NONE * Burn out is not performed in linear range (2: NONE) * Integer type (long type)
71002 ~ 71009	80 81 82	R W W	SENSOR BIAS VAL(1) ~ SENSOR BIAS VAL(8)	The range varies depending on the decimal point position. 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999	0.0	Decimal point position: [70008] Linear scale decimal point + 1 * Single-precision floating point type (float type)

8 - 7 - 2 - 15. Setting the time signal

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71051 ~ 71080	80 81 82	R W W	TS ON/time(1) ~ TS ON/time(30)	0~3599940 (seconds) (0~999h59m00s)	0	Time signal On time (seconds)  When 000:00 presents "minute:second" 0~59999 (seconds) (999m59s) * Integer type (long type)
71101 ~ 71130			TS OFF/time(1) ~ TS OFF/time(30)			0~3599940 (seconds) (0~999h59m00s)

8 - 7 - 2 - 16. Guarantee soak/wait time alarm/MASS flow

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71201 ~ 71208	80 81 82	R W W	Guarantee soak(1) ~ Guarantee soak(8)	The range varies depending on the decimal point position. 0: 0.1~99999.0 1: 0.1~9999.9 2: 0.01~999.99 3: 0.001~99.999 4: 0.0001~9.9999	2000.0	Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)
71209 ~ 71216			Waiting time alarm (1) ~ Waiting time alarm (8)	0~3599940 (seconds) (0~999h59m00s)		
71217			Mass flow SV(1)	-5.0~105.0	0.0	* Single-precision floating point type (float type)
71218			Mass flow SV(2)		10.0	
71219			Mass flow SV(3)		20.0	
71220			Mass flow SV(4)		30.0	
71221			Mass flow SV(5)		40.0	
71222			Mass flow SV(6)		50.0	
71223			Mass flow SV(7)		60.0	
71224			Mass flow SV(8)		70.0	

## 8 - 7 - 2 - 17. DIO type setting

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71251	80	R	DI function assignment(1)	1	1	<DP mode> RUN/STOP: fixed <DP-I> RUN(DPI): fixed * Integer type (long type)
71252			DI function assignment(2)	2	2	<DP mode> ADV: fixed <DP-I> STOP(DPI): fixed * Integer type (long type)
71253			DI function assignment(3)	3	3	<DP mode> RESET: fixed <DP-I> RESET(DPI): fixed * Integer type (long type)
71254			DI function assignment(4)	4	4	<DP mode> WAIT: fixed <DP-I> ADV(DPI): fixed * Integer type (long type)
71255			DI function assignment(5)	5	5	<DP mode> FAST: fixed <DP-I> Same as DI function assignment (6) * Integer type (long type)
71256	80 81 82	R W W	DI function assignment(6)	0/1/2/3/4/5/13/15/ 17/18/19/25/26/27/31/ 32/33/34/41/42/43/ 44/45/46/47/48/49/50		0=NONE 1=RUN/STOP 2=ADV 3=RESET 4=WAIT 5=FAST 13=CIRCL PULSE 15=PV HOLD 17=SV HOLD 18=MANUAL1 19=MANUAL2 25=AL ALL RESET 26=AL1-4 RESET 27=AL5-8 RESET 31=RUN(DPI) 32=STOP(DPI) 33=RESET (DPI) 34=ADV(DPI) 41=PTN SEL BCD 1 42=PTN SEL BCD 2 43=PTN SEL BCD 4 44=PTN SEL BCD 8 45=PTN SEL BCD 10 46=PTN SEL BCD 20 47=PTN SEL BCD 40 48=PTN SEL BCD 80 49=PTN SEL BCD 100 50=PTN SEL BCD 200 * Integer type (long type)
71257 ~ 71266			DI function assignment(7) ~ DI function assignment(16)	* Same as DI function assignment (6)		* Integer type (long type)



Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71267	80 81 82	R W W	DO function assignment(1)	0/1/2/3/4/5/6/7/8/ 9/10/15/17/18/19/ 25/26/31/32/33/34/ 35/36/37/41/42/43/ 44/45/46/47/48/49/ 50/51/52/53/54/55/ 56/57/58/59/62/63/ 64/65/66/67/68/69/ 70/71/72/73/74/75/ 76/77/78/79/80/81/ 82/83/84/85/86/87/ 88/89/92/93/94/95/ 96/97/98/99		0=NONE 1=RUN/STOP 2=ADV 3=RESET 4=WAIT 5=FAST 6=END 7=ALARM ALL RESET 8=ERROR 9=SV UP 10=SV DOWN 15=PV HOLD 17=SV HOLD 18=MANUAL1 19=MANUAL2 25=FAIL 26=HEALTH 31=RUN(DPI) 32=STOP(DPI) 33=CONST(DPI) 34=MANUAL(DPI) 35=BURN OUT(DPI) 36=END(DPI) 37=LOCK(DPI) 41=PTN No BCD 1 42=PTN No BCD 2 43=PTN No BCD 4 44=PTN No BCD 8 45=PTN No BCD 10 46=PTN No BCD 20 47=PTN No BCD 40 48=PTN No BCD 80 49=PTN No BCD 100 50=PTN No BCD 200 51=STP No BCD 1 52=STP No BCD 2 53=STP No BCD 4 54=STP No BCD 8 55=STP No BCD 10 56=STP No BCD 20 57=STP No BCD 40 58=STP No BCD 80 59=STP No BCD 100 62~89=TS1~TS28 92~99=AL1~AL8 * Integer type (long type)
71268 ~ 71294	80 81 82	R W W	DO function assignment(2) ~ DO function assignment(28)	* Same as DO function assignment (1)		* Integer type (long type)

8 - 7 - 2 - 18. Linearize table (CH 1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71301	80 81 82	R W W	Voltage mV(1)	The range of zero span for input linear range. The range varies depending on the decimal point position.		RW is enable only when the input range is the user linear range.  (CH1) Decimal point position: [10mV, 20mV, 50mV, 20mA, 10V] Decimal point=2 digits [100mV] Decimal point=1 digit [5V] Decimal point=3 digits * Single-precision floating point type (float type)
71302			Voltage mV(2)			
71303			Voltage mV(3)			
71304			Voltage mV(4)			
71305			Voltage mV(5)			
71306			Voltage mV(6)			
71307			Voltage mV(7)			
71308			Voltage mV(8)			
71309			Voltage mV(9)			
71310			Voltage mV(10)			
71311			Voltage mV(11)			
71312			Voltage mV(12)			
71313			Voltage mV(13)			
71314			Voltage mV(14)			
71315			Voltage mV(15)			
71316			Voltage mV(16)			
71317			Voltage mV(17)			
71318			Voltage mV(18)			
71319			Voltage mV(19)			
71320			Voltage mV(20)			
71321			VALUE(1)	The range of scale for input linear range. The range varies depending on the decimal point position.		RW is enabled only when the input range is the user linear range.  (CH1) Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)
71322			VALUE(2)			
71323			VALUE(3)			
71324			VALUE(4)			
71325			VALUE(5)			
71326			VALUE(6)			
71327			VALUE(7)			
71328			VALUE(8)			
71329			VALUE(9)			
71330			VALUE(10)			
71331			VALUE(11)			
71332			VALUE(12)			
71333			VALUE(13)			
71334			VALUE(14)			
71335			VALUE(15)			
71336			VALUE(16)			
71337			VALUE(17)			
71338			VALUE(18)			
71339			VALUE(19)			
71340			VALUE(20)			

## 8 - 7 - 2 - 19. Linearize table (CH 2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
71351 ~ 71370	80 81	R W	Voltage mV(1) ~ Voltage mV(20)	Same as Linearize table (CH1)		(CH2) * Single-precision floating point type (float type)
71371 ~ 71390	82	W	VALUE(1) ~ VALUE(20)	Same as Linearize table (CH1)		(CH2) * Single-precision floating point type (float type)

8 - 7 - 2 - 20. Pattern management

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks				
72001	80 81 82	R W W	Pattern repeat (Common)	0~9999	0	* Integer type (long type)				
72002	80	R	Used steps(1)	0=Unused 1~199	0	* Integer type (long type)				
72003			Patterns for operations , etc.(1)			[Data structure] b31      b24   b23      b16 <table border="1" style="width:100%;"><tr><td style="width:50%;"></td><td style="width:50%;"></td></tr></table> b15      b8   b7      b0 <table border="1" style="width:100%;"><tr><td style="width:50%; text-align:center;">(1)</td><td style="width:50%; text-align:center;">(2)</td></tr></table> * Bit field data			(1)	(2)
			(1)	(2)						
(1) Patterns for operations	0/1		0=Unused 1=Used							
(2) Start type selection	0/1		0=SV start 1=PV start							
72004	80 81 82	R W W	PTN SETTING TYPE , etc.(1)			[Data structure] b31      b24   b23      b16 <table border="1" style="width:100%;"><tr><td style="width:50%; text-align:center;">(1)</td><td style="width:50%; text-align:center;">(2)</td></tr></table> b15      b8   b7      b0 <table border="1" style="width:100%;"><tr><td style="width:50%; text-align:center;">(3)</td><td style="width:50%; text-align:center;">(4)</td></tr></table> * Bit field data	(1)	(2)	(3)	(4)
			(1)	(2)						
			(3)	(4)						
			(1) PTN SETTING TYPE	0/1	0	0=SV/TIME 1=RATE/TIME				
			(2) End mode 1	0/1	0	0=CONTROL 1=CONST				
(3) End mode 2	0/1	0	0=CONTROL 1=CONST							
(4) Pattern link	0=None 1~200	0	Pattern No.1~200							
72005										
72006			Start SV(1)	Measuring range	0.0	Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)				
72007			Output value1(1)	-5.0~105.0	0.0	* Single-precision floating point type (float type)				
72008			Output value2(1)	-5.0~105.0	0.0	* Single-precision floating point type (float type)				
72009			Reset SV(1)	Measuring range	0.0	Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)				
72010			END step SV(1)	Measuring range	0.0	Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)				

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks		
72011								
72012	80	R	Used steps (2)	* Same as Used steps (1)		* Integer type (long type)		
72013	80 81 82	R W W	Patterns for operations, etc. (2)	* Same as the Patterns for operations, etc. (1)		* Bit field data		
72014			PTN SETTING TYPE , etc.(2)	* PTN SETTING TYPE etc. (1)		* Bit field data		
72015								
72016			Start SV(2)	* Same as Start SV (1)		* Single-precision floating point type (float type)		
72017			Output value1(2)	* Same as Output value1 (1)		* Single-precision floating point type (float type)		
72018			Output value2(2)	* Same as Output value2 (1)		* Single-precision floating point type (float type)		
72019			Reset SV(2)	* Same as reset SV (1)		* Single-precision floating point type (float type)		
72020			END step SV(2)	* Same as END step SV (1)		* Single-precision floating point type (float type)		
-			-	-	-	-	-	
73991								
73992	80	R	Used steps (200)	* Same as Used steps (1)		* Integer type (long type)		
73993	80 81 82	R W W	Patterns for operations , etc. (200)	* Same as Patterns for operations etc. (1)		* Bit field data		
73994			PTN SETTING TYPE , etc.(200)	* Same as PTN SETTING TYPE etc. (1)		* Bit field data		
73995								
73996			Start SV(200)	* Same as Start SV (1)		* Single-precision floating point type (float type)		
73997			Output value1(200)	* Same as Output value1 (1)		* Single-precision floating point type (float type)		
73998			Output value2(200)	* Same as Output value2 (1)		* Single-precision floating point type (float type)		
73999			Reset SV(200)	* Same as reset SV (1)		* Single-precision floating point type (float type)		
74000			END step SV (200)	* Same as END step SV (1)		* Single-precision floating point type (float type)		

8 - 7 - 2 - 21. Step management information

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks								
75001	80 81 82	R W W	Pattern No.	1~200	1	Set the number of the pattern to be read/written * Integer type (long type)								
75002			Parameter No.1(1)			[Data structure] b31      b28   b27      b24 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(1)</td> <td style="width: 50%;">(2)</td> </tr> </table> b23      b20   b19      b16 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(3)</td> <td style="width: 50%;">(4)</td> </tr> </table> b15      b12   b11      b8 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(5)</td> <td style="width: 50%;">(6)</td> </tr> </table> b7              b4    b3      b0 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(7)</td> <td style="width: 50%;">(8)</td> </tr> </table> * Bit field data	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			(1)	(2)										
			(3)	(4)										
			(5)	(6)										
			(7)	(8)										
			(1) PIDNo.2	0: Same as the previous step 1~9: No.1~9	0	For Output 2								
			(2) PIDNo.1		For Output 1									
			(3) Output scale No.2		For Output 2									
			(4) Output scale No.1		For Output 1									
(5) OUTPUT LIMIT No.2	For Output 2													
(6) OUTPUT LIMIT No.1	For Output 1													
(7) Output variation limit No.2	For Output 2													
(8) Output variation limit No.1	For Output 1													
75003			Parameter No.2(1)				[Data structure] b31      b28   b27      b24 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(1)</td> <td style="width: 50%;">(2)</td> </tr> </table> b23      b20   b19      b16 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(3)</td> <td style="width: 50%;">(4)</td> </tr> </table> b15      b12   b11      b8 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">(5)</td> <td style="width: 50%;">(6)</td> </tr> </table> b7                              b0 <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 100%;">(7)</td> </tr> </table> * Bit field data	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(1)	(2)										
			(3)	(4)										
(5)	(6)													
(7)														
(1) Sensor bias No.2	0: Same as the previous step 1~8: No.1~8		For Input 2											
(2) Sensor bias No.1		For Input 1												

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks				
			(3) Guarantee soak No.	0: OFF 1~8: No.1~8						
			(4) Waiting time alarm No.	*(1) Same as sensor bias No.2						
			(5) Event No. (enhanced)	0: Same as the previous step		Alarm (enhanced)				
			(6) Event No. (basics)	1~8: No.1~8		Alarm (basics)				
			(7) MASS FLOW SV No.	*(1) Same as sensor bias No.2						
75004	80 81 82	R W W	TSNo.1~4(1)			[Data structure] b31      b24    b23      b16 <table border="1" style="margin-left: 40px;"> <tr> <td style="width: 40px; text-align: center;">(1)</td> <td style="width: 40px; text-align: center;">(2)</td> </tr> </table> b15            b8    b7            b0 <table border="1" style="margin-left: 40px;"> <tr> <td style="width: 40px; text-align: center;">(3)</td> <td style="width: 40px; text-align: center;">(4)</td> </tr> </table> * Bit field data	(1)	(2)	(3)	(4)
			(1)	(2)						
			(3)	(4)						
			(1) TSNo.4	b31: Repeat 0 = disable, 1 = enable b30: Phase 0 = direct, 1 = reverse b29~b24: Type 00H: Same as the previous step 01H~1EH: No.1-30 1FH:OFF 20H:ON	0	<Initial status> Repeat: disable Phase: direct Type: Same as the previous step				
			(2) TSNo.3	b23: Repeat 0 = disable, 1 = enable b22: Phase 0 = direct, 1 = reverse b21~b16: Type 00H: Same as the previous step 01H~1EH: No.1-30 1FH:OFF 20H:ON	0					
(3) TSNo.2	b15: Repeat 0 = disable, 1 = enable b14: Phase 0 = direct, 1 = reverse b13~b8: Type 00H: Same as the previous step 01H~1EH: No.1-30 1FH: OFF 20H: ON	0								
(4) TSNo.1	b7: Repeat 0 = disable, 1 = enable b6: Phase 0 = direct, 1 = reverse	0								

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
				b5~b0: Type 00H: Same as the previous step 01H~1EH: No.1-30 1FH: OFF 20H: ON		
75005			TSNo.5~8(1)	* Same as TS No.1~4 (1)		* Bit field data
75006			TSNo.9~12(1)	* Same as TS No.1~4 (1)		* Bit field data
75007			TSNo.13~16(1)	* Same as TS No.1~4 (1)		* Bit field data
75008			TSNo.17~20(1)	* Same as TS No.1~4 (1)		* Bit field data
75009			TSNo.21~24(1)	* Same as TS No.1~4 (1)		* Bit field data
75010			TSNo.25~28(1)	* Same as TS No.1~4 (1)		* Bit field data
75011	80 81 82	R W W	Step repeat(1)	0=Starting position 1~99=Repetition times 255=Steps to be repeated	0	255=Displayed as '-' on the screen * Integer type (long type)
75012			Step SV(1)	Measuring range		Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)
75013			Step time(1)	0 - 3599940 (seconds) (0~999h59m00s) 0xFFFFFFFF (CIRCLE: Circle step value enabled)	0	hour:minute → 0~3599940 (seconds) minute:second → 0~59999 (seconds) 0xFFFFFFFF:CIRCLE (Circle step value: enabled) * Integer type (long type)
75014			Step rate(1)	-99999.0~99999.0	0.0	* Single-precision floating point type (float type)
75015			Circle step value (1)	0.00~999.99		Enable when the step time is CIRCLE (CIRCLE=0xFFFFFFFF) * Single-precision floating point type (float type)
~			~	~		
77774			Parameter No.1(199)	* Same as Parameter No.1 (1)		Same as [75002] * Bit field data
77775			Parameter No.2(199)	* Same as Parameter No.2 (1)		Same as [75003] * Bit field data
77776			TSNo.1~4(199)	* Same as TS No.1~4 (1)		Same as [75004] * Bit field data
77777			TSNo.5~8(199)	* Same as TS No.5~8 (1)		Same as [75005] * Bit field data
77778			TSNo.9~12(199)	* Same as TS No.9~12 (1)		Same as [75006] * Bit field data
77779			TSNo.13~16 (199)	* Same as TS No.13~16 (1)		Same as [75007] * Bit field data
77780			TSNo.17~20 (199)	* Same as TS No.17~20 (1)		Same as [75008] * Bit field data
77781			TSNo.21~24 (199)	* Same as TS No.21~24 (1)		Same as [75009] * Bit field data
77782			TSNo.25~28 (199)	* Same as TS No.25~28 (1)		Same as [75010] * Bit field data
77783			Step repeat (199)	* Same as Step repeat (1)		Same as [75011] * Integer type (long type)



FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
77784			Step SV (199)	* Same as Step SV (1)		Same as [75012] * Single-precision floating point type (float type)
77785			Step time (199)	* Same as Step time (1)		Same as [75013] * Integer type (long type)
77786			Step rate (199)	* Same as Step rate (1)		Same as [75014] * Single-precision floating point type (float type)
77787			Circle step value (199)	* Same as Circle step value (1)		Same as [75015] * Single-precision floating point type (float type)

### 8 - 7 - 2 - 22. Time unit

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
79048	80 81 82	R W W	TIME SET TYPE	0=Hour: Minute 1=Minute: Second	0 (Hour:Minute)	* Integer type (long type)

### 8 - 7 - 2 - 23. Pattern operation

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
79066	80 81 82	R W W	Drive pattern No.	Pattern 1~200	1	WRITE is disabled when: <ul style="list-style-type: none"> <li>• OPERATION STATUS is set to other than RESET</li> <li>• PATTERN SELECT is set to other than COM if pattern select input options are used</li> </ul> Note: If the unsetting pattern No. is selected and RUN is performed, an error occurs * Integer type (long type)
79067	81 82	W W	Program drive	1/2/3/4	-	1= RUN 2= STOP 3= ADV 4= RESET  WRITE is disabled when: <ul style="list-style-type: none"> <li>• ADV or STOP is set when in RESET status</li> <li>• RUN, STOP, or ADV is set when in END status</li> <li>• RUN, STOP, ADV, or RESET is set in CONST status</li> <li>• PROGRAM DRIVE is set to other than COM if the external drive input is used</li> <li>• Set RUN on the pattern No. for which the pattern is not registered</li> </ul> Note: If the unsetting pattern No. is selected and RUN is

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks		
						performed, an error occurs * Integer type (long type)		
79070 ~ 79083			Step information	* Same as [75002]~[75015]		[79095]Write the step information which is used in STEP ADD		
79093	81 82	W W	Pattern copy trigger	Source pattern No.1~200 Destination pattern No.1~200	-	Upper 16 bits set the source pattern NO. for copying and lower 16 bits set the destination pattern No. for copying. Upper 16 bits      Lower 16 bits <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Source pattern No.</td> <td>Destination pattern No.</td> </tr> </table> <p>The copy operation is performed if the source pattern is not set or if the destination pattern is not cleared. * Bit field data</p>	Source pattern No.	Destination pattern No.
Source pattern No.	Destination pattern No.							
79094			Pattern clear trigger	0 = All patterns are cleared Pattern No.1~200	-	When the pattern for the specified set value is cleared and the set value 0 is set, all patterns are cleared. * Integer type (long type)		
79095			Step add trigger	Pattern No.=1~200 STEP No.=1~199	-	Upper 16 bits set the pattern No. and upper 16 bits set the step No. Upper 16 bits      Lower 16 bits <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Pattern No.</td> <td>STEP No.</td> </tr> </table> <p>* Bit field data</p>	Pattern No.	STEP No.
Pattern No.	STEP No.							
79096			Step delete trigger	Pattern No.=1~200 STEP No.=1~199	-	Upper 16 bits set the pattern No. and upper 16 bits set the step No. Upper 16 bits      Lower 16 bits <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Pattern No.</td> <td>STEP No.</td> </tr> </table> <p>* Bit field data</p>	Pattern No.	STEP No.
Pattern No.	STEP No.							

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks																																	
79501			Setting screen mode lock (corresponding to each bit)	0~0x00000FFF	-	<p>0=the setting screen is displayed normally 1=the setting screen is in locked status</p> <p>* Mode 0 - 11 is set in turn until bit 0 - 11 at lower 16 bits. (Higher 20 bits are fixed to 0 (Unused))</p> <p>Lower 8 - 11 bit</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: center;">Mode 11</td> <td colspan="3"></td> <td style="text-align: center;">Mode 8</td> </tr> </table> <p>Lower 0 - 7 bit</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 20px; height: 20px; text-align: center;">7</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> </tr> <tr> <td colspan="3"></td> <td style="text-align: center;">Mode 7</td> <td colspan="3"></td> <td style="text-align: center;">Mode 0</td> </tr> </table> <p>* Bit field data</p>					3	2	1	0					Mode 11				Mode 8	7	6	5	4	3	2	1	0				Mode 7				Mode 0
				3	2	1	0																																
				Mode 11				Mode 8																															
7	6	5	4	3	2	1	0																																
			Mode 7				Mode 0																																
79502	80 81 82	R W W	AT start/stop	0/1/2/3/4/5/6/7	0 (END)	<p>0=END 1=AT1 2=AT2 3=AT3 4=AT4 5=AT5 6=AT6 7=unable to use</p> <p>WRITE is disabled during auto tuning when AT1 - 6 is set. [For AT1] • WRITE is disabled in a program run during RESET. [For AT2], [For AT3] • WRITE is disabled except for a program run during RESET. [For AT4] • WRITE is disabled if Output 2 is not used. • WRITE is disabled in a program run during RESET. [For AT5], [For AT6] • WRITE is disabled if Output 2 is not used. • WRITE is disabled except for a program run during RESET.</p> <p>* Integer type (long type)</p>																																	
79503			Operation screen "A/M switching 1"	0/1	1	<p>(CH1) 0=AUTO 1=MANUAL</p> <p>* Integer type (long type)</p>																																	

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
79504			Operation screen "MANUAL output 1"	-5.0~105.0	0.0	(CH1) WRITE enabled only in manual operation * Single-precision floating point type (float type)
79505	80 81 82	R W W	Operation screen "A/M switching 2"	0/1	1	(CH2) 0=AUTO 1=MANUAL * Integer type (long type)
79506			Operation screen "MANUAL output 2"	-5.0~105.0	0.0	(CH2) WRITE enabled only in manual operation * Single-precision floating point type (float type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
79516	80 81 82	R W W	Program drive type	0/1/2/3	0 (KEY)	0=KEY 1=EXT 2=COM 3=SLAVE  WRITE enabled only when the external input is used * Integer type (long type)
79517			Pattern selection type	0/1/2	0 (KEY)	0=KEY 1=EXT 2=COM  WRITE enabled only when the external input is used * Integer type (long type)
79521			Control mode	0/1	0 (PROG)	0=PROG (Program run) 1=CONST (Constant value operation) * Integer type (long type)
79522			Operation screen "The SV for constant value operation"	Measuring range	0.0	WRITE disabled when program run is set for the control mode. Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)
79533			Operation key locked	0/1	0	0=Unlocked 1=Locked * Integer type (long type)
79534			Time display type	0/1/2/3	0 (Step elapsed time)	0=Step elapsed time 1=Pattern elapsed time 2=Step remaining time 3=Pattern remaining time * Integer type (long type)
79535			PV HOLD	0/1	0 (PV HOLD OFF)	0=PV HOLD OFF 1=PV HOLD ON * Integer type (long type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Setting range	Initial value	Remarks
79537			SV HOLD	0/1	0 (SV HOLD OFF)	0=SV HOLD OFF 1=SV HOLD ON * Integer type (long type)

### 8 - 7 - 3. Real Data (READ only) (32-bit unit)

#### 8 - 7 - 3 - 1. Real Data, parameters (CH 1)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80001	83	R	Measured value (PV Data)	(CH1) Decimal point position:[70011]PV decimal point If PV is + over range 2147483647(0x7FFFFFFF) If PV is - over range -2147483648(0x80000000) * Single-precision floating point type (float type)
80002			PV status	(CH1) * Multiple statuses can not be set. (0=Normal) b31 - b8 =Unused b7 =PV_HOLD b6 =RJ_ERR b5 =BOUT b4 =Data_H b3 =Data_L b2 =AD_ERR b1 =COM_ERR b0 =Input error * Integer type (long type)
80003			SV data	(CH1) Execution SV Decimal point position:[70008]Linear scale decimal point * Single-precision floating point type (float type)
80005			MV1 (Control output 1)	(CH1)-5.0~105.0% * Single-precision floating point type (float type)
80006			MV1 status	(CH1) b31 - b4 =Unused b3 =OFF flag b2 =ON flag b1 =FB_AD_ERR b0 =output error * On-off pulse /SSR : b2=ON, b3=OFF * Integer type (long type)
80007			MFB data (MASS flow output)	(CH1) 0.0~9999.9 * Single-precision floating point type (float type)
80008 80009 80010			Execution P Execution I Execution D	(CH1) Execution P set value (0.0 - 999.9%) * Single-precision floating point type (float type) Execution I set value (0 - 9999 seconds) * Integer type (long type) Execution D set value (0 - 9999 seconds) * Integer type (long type)
80011			During execution: Output limit lower limit	(CH1) -5.0~100.0 * Single-precision floating point type (float type)
80012			During execution: Output limit upper limit	(CH1) 0.0~105.0 * Single-precision floating point type (float type)
80013			During execution: Variation limit DOWN	(CH1) -100.00~0.00 * Single-precision floating point type (float type)
80014			During execution: Variation limit UP	(CH1) 0.00~100.00 * Single-precision floating point type (float type)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80015	83	R	During execution: ARW lower value	(CH1) -50.0~0.0 * Single-precision floating point type (float type)
80016			During execution: ARW upper value	(CH1) 0.0~50.0 * Single-precision floating point type (float type)
80017			During execution: Dead band/GAP	(CH1) 0.0~9.9 * Single-precision floating point type (float type)
80018			During execution: Output preset	(CH1) -100.0~100.0 * Single-precision floating point type (float type)
80019			During execution: Output scale lower limit	(CH1) -5.0~100.0 * Single-precision floating point type (float type)
80020			During execution: Output scale Upper limit	(CH1) 0.0~105.0 * Single-precision floating point type (float type)
80021			During execution: Sensor bias value	(CH1) 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999 Decimal point position: [70008]Linear scale decimal point + 1 * Single-precision floating point type (float type)
80022			During execution: Sensor bias SV	(CH1) 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999 Decimal point position: [70008]Linear scale decimal point * Single-precision floating point type (float type)

## 8 - 7 - 3 - 2. Real Data, parameters (CH 2)

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80055	83	R	MV2 (Control output 2)	(CH2)-5.0~105.0% * Single-precision floating point type (float type)
80056			MV2 status	(CH2) b31 - b4 =Unused b3 =OFF flag b2 =ON flag b1 =FB_AD_ERR b0 =output error  * On-off pulse /SSR: b2=ON, b3=OFF * Integer type (long type)
80058 80059 80060			Execution P Execution I Execution D	(CH2) Execution P set value (0.0~999.9%) * Single-precision floating point type (float type) Execution I set value (0~9999 seconds) * Integer type (long type) Execution D set value (0~9999 seconds) * Integer type (long type)
80061			During execution: Output limit lower limit	(CH2) -5.0~100.0 * Single-precision floating point type (float type)
80062			During execution: Output limit upper limit	(CH2) 0.0~105.0 * Single-precision floating point type (float type)
80063			During execution: Variation limit DOWN	(CH2) -100.00~0.00 * Single-precision floating point type (float type)
80064			During execution: Variation limit UP	(CH2) 0.00~100.00 * Single-precision floating point type (float type)
80065			During execution: ARW lower value	(CH2) -50.0~0.0 * Single-precision floating point type (float type)
80066			During execution: ARW upper value	(CH2) 0.0~50.0 * Single-precision floating point type (float type)
80067			During execution: Dead band/GAP	(CH2) 0.0~9.9 * Single-precision floating point type (float type)
80068			During execution: Output preset	(CH2) -100.0~100.0 * Single-precision floating point type (float type)
80069			During execution: Output scale lower limit	(CH2) -5.0~100.0 * Single-precision floating point type (float type)
80070			During execution: Output scale Upper limit	(CH2) 0.0~105.0 * Single-precision floating point type (float type)



8 - 7 - 3 - 3. Real data, each status

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80101	83	R	During execution: SV value	Measuring range (Decimal point position: [70008] Linear scale decimal point) * <b>Single-precision floating point type (float type)</b>
80102			Step elapsed/remaining time	0~3599940 (seconds) (0~999h59m00s) * <b>Integer type (long type)</b>
80103			Pattern elapsed/remaining time	0~3599940 (seconds) (0~999h59m00s) * <b>Integer type (long type)</b>
80104			REPEAT NUM	0~99 (times), 0xFFFFFFFF=Specify the repeat section * <b>Integer type (long type)</b>
80105			Control status	* 0=OFF, 1=ON b31 - b15=Unused b14 =SV_HOLD b13 =AUTO2 / MAN2 b12 =AUTO1 / MAN1 b11 =CONST b10 =SV_DN b9 =SV_UP b8 =ERR b7 =ALM_WAIT b6 =END b5 =FAST b4 =WAIT b3 =RESET b2 =ADV b1 =STOP b0 =RUN * <b>Bit field data</b>
80106			TIME SET TYPE	Time unit during operation 0=Hour: Minute 1=Minute: Second * <b>Integer type (long type)</b>
80107			Time display type	0=Step elapsed time 1=Pattern elapsed time 2=Step remaining time 3=Pattern remaining time * <b>Integer type (long type)</b>
80108			Alarm status	b31~b16=Unused b15~b8=Wait status of AL8~AL1 (0=OFF, 1=ON) b7~b0=Output status of AL8~AL1 (0=OFF, 1=ON) * <b>Bit field data</b>

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80109	83	R	External drive status	* 0=OFF, 1=ON b31 - b14=Unused b13 =STANDBY b12 =RANGE_L b11 =RANGE_H b10 =MAN2 b9 =MAN1 b8 =SV_HOLD b7 =PV2_HOLD b6 =PV1_HOLD b5 =FAST b4 =WAIT b3 =RESET b2 =ADV b1 =STOP b0 =RUN * Bit field data
80110			Pattern selection signal status	1 - 200, 0: None * Integer type (long type)
80111			Time signal status	* 0=OFF, 1=ON b31~b28=Unused b27~b0=TS_28~TS_1 * Bit field data
80112			DI input status	* 0=OFF, 1=ON b31~b16=Unused b15~b0=DI_16~DI_1 * Bit field data
80113			DO output status	* 0=OFF, 1=ON b31~b28=Unused b27~b0=DO_28~DO_1 * Bit field data
80114			execution pattern number	1~200 * Integer type (long type)
80115			Execution step number	0=Not executed yet, 1~199 * Integer type (long type)
80116			Step SV data	Measuring range (Decimal point position:[70008] Linear scale decimal point) SV in PATTERN SETUP of "M2 PARAMETER / SEQUENCE" * Single-precision floating point type (float type)
80117			Step time data	0~3599999 (seconds) (0~999h59m59s) Time in PATTERN SETUP of "M2 PARAMETER / SEQUENCE" * Integer type (long type)
80118			During execution: Alarm1 (Basics)	The range varies depending on the decimal point position. 0: -99999.0~99999.0
80119			During execution: Alarm2 (Basics)	1: -9999.9~9999.9 2: -999.99~999.99
80120			During execution: Alarm3 (Basics)	3: -99.999~99.999
80121			During execution: Alarm4 (Basics)	4: -9.9999~9.9999 (Decimal point position: [70011]PV decimal point)
80122			During execution: Alarm5 (Enhanced)	* Single-precision floating point type (float type)
80123			During execution: Alarm6 (Enhanced)	

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation	
80124			During execution: Alarm7 (Enhanced)		
80125			During execution: Alarm8 (Enhanced)		
80126			SV type during execution		0=ALL STEP 1=NOW STEP * Integer type (long type)
80127			Waiting time alarm		0~3599940 (seconds) (0~999h59m00s) * Integer type (long type)
80128	83	R	Guarantee soak	The range varies depending on the decimal point position. 0: -99999.0~99999.0 1: -9999.9~9999.9 2: -999.99~999.99 3: -99.999~99.999 4: -9.9999~9.9999 (Decimal point position: [70008] Linear scale decimal point) * Single-precision floating point type (float type)	
80129			MASS FLOW SV value	-5.0~105.0(%) * Single-precision floating point type (float type)	
80130			Lock status	* 0=the setting screen is displayed normally 1=the setting screen is in locked status b31~b12=Unused b11~b0=MODE11~MODE0 * Bit field data	

#### 8 - 7 - 3 - 4. Pattern information/all

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80151	83	R	Total number of patterns being used	0~200 (200 patterns at a maximum) * Integer type (long type)
80152			The number of steps being used	0~4000 (4000 steps at a maximum) * Integer type (long type)

#### 8 - 7 - 3 - 5. Pattern/the number of used steps

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80201	83	R	the number of steps which use pattern No.1	0~199 (199 steps at a maximum) * Integer type (long type)
~			~	~
80400			the number of steps which use pattern N.200	0~199 (199 steps at a maximum) * Integer type (long type)

8 - 7 - 3 - 6. Hardware information

FNC code: Applied function code, R/W: R: READ, W: WRITE

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80401 80402 80403 80404	83	R	Model code	<p>14 characters + NULL (15 bytes used)            DP10□■GO◇◆-△▲▽</p> <p>□: Control mode I (Output 1)            1: ON OFF pulse type PID            2: ON/OFF servo type PID            3: Current output type PID system (General accuracy DC4 - 20 mA)            5: SSR drive pulse type PID            6: Voltage output type PID system (General accuracy DC0 - 10 V)            8: on-off servo type PID (for small load)            A: Current output type PID (High accuracy DC4 - 20 mA)            B: Current output type PID (High accuracy DC1 - 5 mA)            C: Voltage output type PID (High accuracy DC0 - 10 V)</p> <p>■: Control mode II (Output 2)            0: None            1: ON OFF pulse type PID            3: Current output type PID system (General accuracy DC4 - 20 mA)            5: SSR drive pulse type PID            6: Voltage output type PID system (General accuracy DC0 - 10 V)            A: Current output type PID (High accuracy DC4 - 20 mA)            B: Current output type PID (High accuracy DC1 - 5 mA)            C: Voltage output type PID (High accuracy DC0 - 10 V)            (It can not be set when the Output 1 is the on-off servo type PID)</p> <p>O: Communications interface            0: None            R: RS-232C(COM1)            S: RS-485(COM1)            A: RS-422A(COM1)            B: RS-232C(COM1), RS-232C(COM2)            C: RS-485(COM1), RS-232C(COM2)            D: RS-422A(COM1), RS-232C(COM2)            E: RS-232C(COM1), RS-485(COM2)            F: RS-485(COM1), RS-485(COM2)            G: RS-422A(COM1), RS-485(COM2)</p> <p>◇: Transmission output I            0: None            1: 4-20mA            2: 0-1V            3: 0-10V            4: 1-5V</p> <p>◆: Transmission output II            0: None            1: 4-20mA            2: 0-1V            3: 0-10V</p> <p>△: Case color            G: Gray            B: Black</p>

Reference No.	FNC Code	R/W	Data name	Detailed Explanation
80401 80402 80403 80404	83	R	Model code	<p>▲:External input/output signal                      0: None                      1: Digital input/output                      2: Digital input/output (external power supply specification)</p> <p>▽:Transmitter power supply                      0: None                      1: With transmitter power supply</p> <p>* Handled by 4 bytes (char type)</p>
80405 80406 80407 80408			Serial No.	<p>15 characters + NULL (16 bytes used)</p> <p>* Handled by 4 bytes (char type)</p>
80409	83	R	HARDWARE STATUS	<p>&lt;Higher: operation mode, Lower: operation status&gt;                      0x0000FFFF : Initialize in progress                      0x00000000 : All stopped                      &lt;NORMAL MODE&gt;                      0x000001FF : In process/Operation error                      0x00000100 : Normal operation (compatible)                      0x00000101 : Normal operation (Enhanced) *** Default                      &lt;Test mode&gt;                      0x000002FF : In process/Operation error                      0x00000200 : Normal operation (compatible)                      0x00000201 : Normal operation (Enhanced) *** Default                      &lt;Maintenance mode&gt;                      0x000003FF : In process/Operation error                      0x00000300 : Normal operation (compatible)                      0x00000301 : Normal operation (Enhanced) *** Default                      &lt;Factory mode&gt;                      0x000004FF : In process/Operation error                      0x00000400 : Normal operation (compatible)                      0x00000401 : Normal operation (Enhanced) *** Default</p> <p>* Bit field data</p>
80410 80411 80412			Input/RJ-CPU1 information(1) Input/RJ-CPU1 information(2) Input/RJ-CPU1 information(3)	<p>Version information (12 characters)</p> <p>"VVVV.YYMMDD,"                      VVVV : Version information (V1.234 → 1234)                      YYMMDD : Date (12/1/2007 → 071201)</p> <p>* Integer type (long)</p>
80416 80417 80418			Control CPU information(1) Control CPU information(2) Control CPU information(3)	<p>Same as for input/RJ-CPU1</p> <p>* Integer type (long type)</p>
80419 80420 80421			Main CPU information(1) Main CPU information(2) Main CPU information(3)	<p>Same as for input/RJ-CPU1</p> <p>* Integer type (long type)</p>

## 8 - 8. MODBUS protocol-compatible reference table

Analog input data (30001 - 39999)							
Model information		Real data&parameter					
No.	Contents	No.	Contents	No.	Contents	No.	Contents
30001	INFORMATION(1)	30051		30101	PV data	30151	Input type number
30002	INFORMATION(2)	30052		30102	PV status	30152	SV decimal point position
30003		30053		30103	SV data	30153	PV decimal point position
30004		30054		30104		30154	
30005		30055		30105	MV1	30155	
30006		30056		30106	MV1 status	30156	
30007		30057		30107	MV2	30157	
30008		30058		30108	MV2 status	30158	
30009		30059		30109	Execution SV (Mode 0)	30159	
30010		30060		30110	Execution alarm 1 (Mode 0)	30160	
30011		30061		30111	Execution alarm 2 (Mode 0)	30161	
30012		30062		30112	Execution alarm 3 (Mode 0)	30162	
30013		30063		30113	Execution alarm 4 (Mode 0)	30163	
30014		30064		30114	Execution P (Mode 0)	30164	
30015		30065		30115	Execution I (Mode 0)	30165	
30016		30066		30116	Execution D (Mode 0)	30166	
30017		30067		30117	Execution output limit L	30167	
30018		30068		30118	Execution output limit H	30168	
30019		30069		30119	Execution output variation DW	30169	
30020		30070		30120	Execution output variation UP	30170	
30021		30071		30121	Execution sensor bias	30171	
30022		30072		30122	A.R.W. lower limit value	30172	
30023		30073		30123	A.R.W. upper limit value	30173	
30024		30074		30124		30174	
30025		30075		30125		30175	
30026		30076		30126	Execution pattern number	30176	
30027		30077		30127	Execution step number	30177	
30028		30078		30128	Execution time: hour or minute	30178	
30029		30079		30129	Execution time: minute or second	30179	
30030		30080		30130	Time display type	30180	
30031		30081		30131	Display time unit	30181	
30032		30082		30132		30182	
30033		30083		30133		30183	
30034		30084		30134		30184	
30035		30085		30135		30185	
30036		30086		30136		30186	
30037		30087		30137		30187	
30038		30088		30138		30188	
30039		30089		30139		30189	
30040		30090		30140		30190	
30041		30091		30141		30191	
30042		30092		30142		30192	
30043		30093		30143		30193	
30044		30094		30144		30194	
30045		30095		30145		30195	
30046		30096		30146		30196	
30047		30097		30147		30197	
30048		30098		30148		30198	
30049		30099		30149		30199	
30050		30100		30150		30200	

Parameter setting value (70001 - 70200)							
Setup parameter 1		Setup parameter 2		Run time parameter and specific parameter (CH1)		Run time parameter and specific parameter (CH2)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70001	Input type number	70051	Transmission (CH1): Analog transmission kind	70101	During execution: SV value	70151	
70002	Unit number	70052	Transmission (CH1) /scale MIN	70102	During execution: P (CH1)	70152	During execution: P (CH2)
70003	RJ	70053	Transmission (CH1) /scale MAX	70103	During execution: I (CH1)	70153	During execution: I (CH2)
70004	Linear range: ZERO	70054		70104	During execution: D (CH1)	70154	During execution: D (CH2)
70005	Linear range: SPAN	70055		70105	Execution output limit lower limit (CH1)	70155	Execution output limit lower limit (CH2)
70006	Linear scale - MIN	70056		70106	Execution output limit upper limit (CH1)	70156	Execution output limit upper limit (CH2)
70007	Linear scale - MAX	70057		70107	Execution variation L/Down (CH1)	70157	Execution variation L/Down (CH2)
70008	Linear scale decimal point	70058		70108	Execution variation L/Up (CH1)	70158	Execution variation L/Up (CH2)
70009		70059		70109	During execution: Sensor bias (CH1)	70159	During execution: Sensor bias (CH2)
70010		70060		70110	During execution: ARW lower value (CH1)	70160	During execution: ARW lower value (CH2)
70011	PV decimal point position	70061	Transmission (CH2): Analog transmission kind	70111	During execution: ARW upper value (CH1)	70161	During execution: ARW upper value (CH2)
70012	Digital filter	70062	Transmission (CH2) /scale MIN	70112	During execution: Dead band/GAP (CH1)	70162	During execution: Dead band/GAP (CH2)
70013	Burn out	70063	Transmission (CH2) /scale MAX	70113	During execution: Output preset (CH1)	70163	During execution: Output preset (CH2)
70014	Input operation	70064		70114	During execution: Under output scale (CH1)	70164	During execution: Under output scale (CH2)
70015		70065		70115	During execution: Above output scale (CH1)	70165	During execution: Above output scale (CH2)
70016		70066		70116	During execution: Step time (CH1)	70166	
70017		70067		70117	SV bias during execution (CH1)	70167	SV bias during execution (CH2)
70018		70068		70118	SV type during execution (CH1)	70168	SV type during execution (CH2)
70019		70069		70119	During execution: Alarm1	70169	
70020		70070		70120	During execution: Alarm2	70170	
70021		70071		70121	During execution: Alarm3	70171	
70022		70072		70122	During execution: Alarm4	70172	
70023		70073		70123	During execution: Alarm5	70173	
70024		70074		70124	During execution: Alarm6	70174	
70025		70075		70125	During execution: Alarm7	70175	
70026		70076		70126	During execution: Alarm8	70176	
70027		70077		70127		70177	
70028		70078		70128		70178	
70029		70079	Communications transmission type 1	70129		70179	
70030	Alarm reset	70080	Communications transmission type 2	70130		70180	
70031		70081		70131		70181	
70032		70082		70132		70182	
70033		70083		70133		70183	
70034		70084		70134		70184	
70035		70085		70135		70185	
70036		70086		70136		70186	
70037		70087		70137		70187	
70038		70088		70138		70188	
70039		70089		70139		70189	
70040		70090		70140		70190	
70041		70091		70141		70191	

Setup parameter 1		Setup parameter 2		Run time parameter and specific parameter (CH1)		Run time parameter and specific parameter (CH2)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70042		70092	Actions when the power switch is turned on	70142		70192	
70043		70093		70143		70193	
70044		70094		70144		70194	
70045		70095		70145		70195	
70046		70096		70146		70196	
70047		70097		70147		70197	
70048		70098		70148		70198	
70049		70099		70149		70199	
70050		70100		70150		70200	



**Parameter setting value (70201 - 70400)**

PID (CH1)		PID (CH1)		PID (CH1/CH2)		PID (CH2)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70201	Step P(1)	70251	PID zone SV2	70301	Zone D(8)	70351	Step P(6)
70202	Step I(1)	70252	PID zone SV3	70302	Zone A.R.W. L(8)	70352	Step I(6)
70203	Step D(1)	70253	PID zone SV4	70303	Zone A.R.W. H(8)	70353	Step D(6)
70204	Step A.R.W. L(1)	70254	PID zone SV5	70304	Zone PID dead band(8)	70354	Step A.R.W. L(6)
70205	Step A.R.W. H(1)	70255	PID zone SV6	70305		70355	Step A.R.W. H(6)
70206	Step PID dead band(1)	70256	PID zone SV7	70306		70356	Step PID dead band(6)
70207	Step P(2)	70257	Zone P(1)	70307		70357	Step P(7)
70208	Step I(2)	70258	Zone I(1)	70308		70358	Step I(7)
70209	Step D(2)	70259	Zone D(1)	70309		70359	Step D(7)
70210	Step A.R.W. L(2)	70260	Zone A.R.W. L(1)	70310		70360	Step A.R.W. L(7)
70211	Step A.R.W. H(2)	70261	Zone A.R.W. H(1)	70311		70361	Step A.R.W. H(7)
70212	Step PID dead band(2)	70262	Zone PID dead band(1)	70312		70362	Step PID dead band(7)
70213	Step P(3)	70263	Zone P(2)	70313		70363	Step P(8)
70214	Step I(3)	70264	Zone I(2)	70314		70364	Step I(8)
70215	Step D(3)	70265	Zone D(2)	70315		70365	Step D(8)
70216	Step A.R.W. L(3)	70266	Zone A.R.W. L(2)	70316		70366	Step A.R.W. L(8)
70217	Step A.R.W. H(3)	70267	Zone A.R.W. H(2)	70317		70367	Step A.R.W. H(8)
70218	Step PID dead band(3)	70268	Zone PID dead band(2)	70318		70368	Step PID dead band(8)
70219	Step P(4)	70269	Zone P(3)	70319		70369	
70220	Step I(4)	70270	Zone I(3)	70320		70370	PID zone SV1
70221	Step D(4)	70271	Zone D(3)	70321	Step P(1)	70371	PID zone SV2
70222	Step A.R.W. L(4)	70272	Zone A.R.W. L(3)	70322	Step I(1)	70372	PID zone SV3
70223	Step A.R.W. H(4)	70273	Zone A.R.W. H(3)	70323	Step D(1)	70373	PID zone SV4
70224	Step PID dead band(4)	70274	Zone PID dead band(3)	70324	Step A.R.W. L(1)	70374	PID zone SV5
70225	Step P(5)	70275	Zone P(4)	70325	Step A.R.W. H(1)	70375	PID zone SV6
70226	Step I(5)	70276	Zone I(4)	70326	Step PID dead band(1)	70376	PID zone SV7
70227	Step D(5)	70277	Zone D(4)	70327	Step P(2)	70377	Zone P(1)
70228	Step A.R.W. L(5)	70278	Zone A.R.W. L(4)	70328	Step I(2)	70378	Zone I(1)
70229	Step A.R.W. H(5)	70279	Zone A.R.W. H(4)	70329	Step D(2)	70379	Zone D(1)
70230	Step PID dead band(5)	70280	Zone PID dead band(4)	70330	Step A.R.W. L(2)	70380	Zone A.R.W. L(1)
70231	Step P(6)	70281	Zone P(5)	70331	Step A.R.W. H(2)	70381	Zone A.R.W. H(1)
70232	Step I(6)	70282	Zone I(5)	70332	Step PID dead band(2)	70382	Zone PID dead band(1)
70233	Step D(6)	70283	Zone D(5)	70333	Step P(3)	70383	Zone P(2)
70234	Step A.R.W. L(6)	70284	Zone A.R.W. L(5)	70334	Step I(3)	70384	Zone I(2)
70235	Step A.R.W. H(6)	70285	Zone A.R.W. H(5)	70335	Step D(3)	70385	Zone D(2)
70236	Step PID dead band(6)	70286	Zone PID dead band(5)	70336	Step A.R.W. L(3)	70386	Zone A.R.W. L(2)
70237	Step P(7)	70287	Zone P(6)	70337	Step A.R.W. H(3)	70387	Zone A.R.W. H(2)
70238	Step I(7)	70288	Zone I(6)	70338	Step PID dead band(3)	70388	Zone PID dead band(2)
70239	Step D(7)	70289	Zone D(6)	70339	Step P(4)	70389	Zone P(3)
70240	Step A.R.W. L(7)	70290	Zone A.R.W. L(6)	70340	Step I(4)	70390	Zone I(3)
70241	Step A.R.W. H(7)	70291	Zone A.R.W. H(6)	70341	Step D(4)	70391	Zone D(3)
70242	Step PID dead band(7)	70292	Zone PID dead band(6)	70342	Step A.R.W. L(4)	70392	Zone A.R.W. L(3)
70243	Step P(8)	70293	Zone P(7)	70343	Step A.R.W. H(4)	70393	Zone A.R.W. H(3)
70244	Step I(8)	70294	Zone I(7)	70344	Step PID dead band(4)	70394	Zone PID dead band(3)
70245	Step D(8)	70295	Zone D(7)	70345	Step P(5)	70395	Zone P(4)
70246	Step A.R.W. L(8)	70296	Zone A.R.W. L(7)	70346	Step I(5)	70396	Zone I(4)
70247	Step A.R.W. H(8)	70297	Zone A.R.W. H(7)	70347	Step D(5)	70397	Zone D(4)
70248	Step PID dead band(8)	70298	Zone PID dead band(7)	70348	Step A.R.W. L(5)	70398	Zone A.R.W. L(4)
70249		70299	Zone P(8)	70349	Step A.R.W. H(5)	70399	Zone A.R.W. H(4)
70250	PID zone SV1	70300	Zone I(8)	70350	Step PID dead band(5)	70400	Zone PID dead band(4)

### Parameter setting value (70401 - 70600)

PID (CH2)		Alarm settings (basics)		Alarm settings (enhanced)		AT setup (CH1)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70401	Zone P(5)	70451	Alarm mode(1)	70501	Alarm mode(5)	70551	AT2 start direction
70402	Zone I(5)	70452	Alarm CH(1)	70502	Alarm CH(5)	70552	AT2: ON/OFF flag
70403	Zone D(5)	70453	Alarm delay(1)	70503	Alarm delay(5)	70553	AT2/SV1
70404	Zone A.R.W. L(5)	70454	Alarm dead band(1)	70504	Alarm dead band(5)	70554	AT2/SV2
70405	Zone A.R.W. H(5)	70455	Alarm mode(2)	70505	Alarm mode(6)	70555	AT2/SV3
70406	Zone PID dead band(5)	70456	Alarm CH(2)	70506	Alarm CH(6)	70556	AT2/SV4
70407	Zone P(6)	70457	Alarm delay(2)	70507	Alarm delay(6)	70557	AT2/SV5
70408	Zone I(6)	70458	Alarm dead band(2)	70508	Alarm dead band(6)	70558	AT2/SV6
70409	Zone D(6)	70459	Alarm mode(3)	70509	Alarm mode(7)	70559	AT2/SV7
70410	Zone A.R.W. L(6)	70460	Alarm CH(3)	70510	Alarm CH(7)	70560	AT2/SV8
70411	Zone A.R.W. H(6)	70461	Alarm delay(3)	70511	Alarm delay(7)	70561	AT3 start direction
70412	Zone PID dead band(6)	70462	Alarm dead band(3)	70512	Alarm dead band(7)	70562	AT3: ON/OFF flag
70413	Zone P(7)	70463	Alarm mode(4)	70513	Alarm mode(8)	70563	AT3/SV1
70414	Zone I(7)	70464	Alarm CH(4)	70514	Alarm CH(8)	70564	AT3/SV2
70415	Zone D(7)	70465	Alarm delay(4)	70515	Alarm delay(8)	70565	AT3/SV3
70416	Zone A.R.W. L(7)	70466	Alarm dead band(4)	70516	Alarm dead band(8)	70566	AT3/SV4
70417	Zone A.R.W. H(7)	70467	Setting alarm value 1 (1)	70517	Setting alarm value 5 (1)	70567	AT3/SV5
70418	Zone PID dead band(7)	70468	Setting alarm value 2 (1)	70518	Setting alarm value 6 (1)	70568	AT3/SV6
70419	Zone P(8)	70469	Setting alarm value 3 (1)	70519	Setting alarm value 7 (1)	70569	AT3/SV7
70420	Zone I(8)	70470	Setting alarm value 4 (1)	70520	Setting alarm value 8 (1)	70570	AT3/SV8
70421	Zone D(8)	70471	Setting alarm value 1 (2)	70521	Setting alarm value 5 (2)	70571	
70422	Zone A.R.W. L(8)	70472	Setting alarm value 2 (2)	70522	Setting alarm value 6 (2)	70572	
70423	Zone A.R.W. H(8)	70473	Setting alarm value 3 (2)	70523	Setting alarm value 7 (2)	70573	
70424	Zone PID dead band(8)	70474	Setting alarm value 4 (2)	70524	Setting alarm value 8 (2)	70574	
70425		70475	Setting alarm value 1 (3)	70525	Setting alarm value 5 (3)	70575	
70426		70476	Setting alarm value 2 (3)	70526	Setting alarm value 6 (3)	70576	
70427		70477	Setting alarm value 3 (3)	70527	Setting alarm value 7 (3)	70577	
70428		70478	Setting alarm value 4 (3)	70528	Setting alarm value 8 (3)	70578	
70429		70479	Setting alarm value 1 (4)	70529	Setting alarm value 5 (4)	70579	
70430		70480	Setting alarm value 2 (4)	70530	Setting alarm value 6 (4)	70580	
70431		70481	Setting alarm value 3 (4)	70531	Setting alarm value 7 (4)	70581	
70432		70482	Setting alarm value 4 (4)	70532	Setting alarm value 8 (4)	70582	
70433		70483	Setting alarm value 1 (5)	70533	Setting alarm value 5 (5)	70583	
70434		70484	Setting alarm value 2 (5)	70534	Setting alarm value 6 (5)	70584	
70435		70485	Setting alarm value 3 (5)	70535	Setting alarm value 7 (5)	70585	
70436		70486	Setting alarm value 4 (5)	70536	Setting alarm value 8 (5)	70586	
70437		70487	Setting alarm value 1 (6)	70537	Setting alarm value 5 (6)	70587	
70438		70488	Setting alarm value 2 (6)	70538	Setting alarm value 6 (6)	70588	
70439		70489	Setting alarm value 3 (6)	70539	Setting alarm value 7 (6)	70589	
70440		70490	Setting alarm value 4 (6)	70540	Setting alarm value 8 (6)	70590	
70441	Alarm judgment time(1)	70491	Setting alarm value 1 (7)	70541	Setting alarm value 5 (7)	70591	
70442	Alarm judgment time(2)	70492	Setting alarm value 2 (7)	70542	Setting alarm value 6 (7)	70592	
70443	Alarm judgment time(3)	70493	Setting alarm value 3 (7)	70543	Setting alarm value 7 (7)	70593	
70444	Alarm judgment time(4)	70494	Setting alarm value 4 (7)	70544	Setting alarm value 8 (7)	70594	
70445	Alarm judgment time(5)	70495	Setting alarm value 1 (8)	70545	Setting alarm value 5 (8)	70595	
70446	Alarm judgment time(6)	70496	Setting alarm value 2 (8)	70546	Setting alarm value 6 (8)	70596	
70447	Alarm judgment time(7)	70497	Setting alarm value 3 (8)	70547	Setting alarm value 7 (8)	70597	
70448	Alarm judgment time(8)	70498	Setting alarm value 4 (8)	70548	Setting alarm value 8 (8)	70598	
70449		70499		70549		70599	
70450		70500		70550		70600	

Parameter setting value (70601 - 70800)							
AT setup (CH2)		OUTPUT (CH1)		OUTPUT (CH1)		OUTPUT (CH1)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70601	AT5 start direction	70651	Step output scale lower limit(1)	70701		70751	Zone variation limit: Up(7)
70602	AT5: ON/OFF flag	70652	Step output scale upper limit(1)	70702	Zone SV(1)	70752	Zone output scaling lower limit(8)
70603	AT5/SV1	70653	Step output limit lower limit(1)	70703	Zone SV(2)	70753	Zone output scaling upper limit(8)
70604	AT5/SV2	70654	Step output limit upper limit(1)	70704	Zone SV(3)	70754	Zone output limit lower limit(8)
70605	AT5/SV3	70655	Step variation limit DW(1)	70705	Zone SV(4)	70755	Zone output limit upper limit(8)
70606	AT5/SV4	70656	Step variation limit UP(1)	70706	Zone SV(5)	70756	Zone variation limit: Down(8)
70607	AT5/SV5	70657	Step output scale lower limit(2)	70707	Zone SV(6)	70757	Zone variation limit: Up(8)
70608	AT5/SV6	70658	Step output scale upper limit(2)	70708	Zone SV(7)	70758	Step PID output preset (1)
70609	AT5/SV7	70659	Step output limit lower limit(2)	70709		70759	Step PID output preset (2)
70610	AT5/SV8	70660	Step output limit upper limit(2)	70710	Zone output scaling lower limit(1)	70760	Step PID output preset (3)
70611	AT6 start direction	70661	Step variation limit DW(2)	70711	Zone output scaling upper limit(1)	70761	Step PID output preset (4)
70612	AT6: ON/OFF flag	70662	Step variation limit UP(2)	70712	Zone output limit lower limit(1)	70762	Step PID output preset (5)
70613	AT6/SV1	70663	Step output scale lower limit(3)	70713	Zone output limit upper limit(1)	70763	Step PID output preset (6)
70614	AT6/SV2	70664	Step output scale upper limit(3)	70714	Zone variation limit: Down(1)	70764	Step PID output preset (7)
70615	AT6/SV3	70665	Step output limit lower limit(3)	70715	Zone variation limit: Up(1)	70765	Step PID output preset (8)
70616	AT6/SV4	70666	Step output limit upper limit(3)	70716	Zone output scaling lower limit(2)	70766	Zone PID output preset(1)
70617	AT6/SV5	70667	Step variation limit DW(3)	70717	Zone output scaling upper limit(2)	70767	Zone PID output preset(2)
70618	AT6/SV6	70668	Step variation limit UP(3)	70718	Zone output limit lower limit(2)	70768	Zone PID output preset(3)
70619	AT6/SV7	70669	Step output scale lower limit(4)	70719	Zone output limit upper limit(2)	70769	Zone PID output preset(4)
70620	AT6/SV8	70670	Step output scale upper limit(4)	70720	Zone variation limit: Down(2)	70770	Zone PID output preset(5)
70621		70671	Step output limit lower limit(4)	70721	Zone variation limit: Up(2)	70771	Zone PID output preset(6)
70622		70672	Step output limit upper limit(4)	70722	Zone output scaling lower limit(3)	70772	Zone PID output preset(7)
70623		70673	Step variation limit DW(4)	70723	Zone output scaling upper limit(3)	70773	Zone PID output preset(8)
70624		70674	Step variation limit UP(4)	70724	Zone output limit lower limit(3)	70774	MANUAL OUTPUT LIMIT
70625		70675	Step output scale lower limit(5)	70725	Zone output limit upper limit(3)	70775	
70626		70676	Step output scale upper limit(5)	70726	Zone variation limit: Down (3)	70776	
70627		70677	Step output limit lower limit(5)	70727	Zone variation limit: Up(3)	70777	
70628		70678	Step output limit upper limit(5)	70728	Zone output scaling lower limit(4)	70778	
70629		70679	Step variation limit DW(5)	70729	Zone output scaling upper limit(4)	70779	
70630		70680	Step variation limit UP(5)	70730	Zone output limit lower limit(4)	70780	
70631		70681	Step output scale lower limit(6)	70731	Zone output limit upper limit(4)	70781	
70632		70682	Step output scale upper limit(6)	70732	Zone variation limit: Down(4)	70782	
70633		70683	Step output limit lower limit(6)	70733	Zone variation limit: Up(4)	70783	
70634		70684	Step output limit upper limit(6)	70734	Zone output scaling lower limit(5)	70784	
70635		70685	Step variation limit DW(6)	70735	Zone output scaling upper limit(5)	70785	
70636		70686	Step variation limit UP(6)	70736	Zone output limit lower limit (5)	70786	

AT setup (CH2)		OUTPUT (CH1)		OUTPUT (CH1)		OUTPUT (CH1)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70637		70687	Step output scale lower limit(7)	70737	Zone output limit upper limit(5)	70787	
70638		70688	Step output scale upper limit(7)	70738	Zone variation limit: Down(5)	70788	
70639		70689	Step output limit lower limit(7)	70739	Zone variation limit: Up(5)	70789	
70640		70690	Step output limit upper limit(7)	70740	Zone output scaling lower limit(6)	70790	
70641		70691	Step variation limit DW(7)	70741	Zone output scaling upper limit(6)	70791	
70642		70692	Step variation limit UP(7)	70742	Zone output limit lower limit(6)	70792	
70643		70693	Step output scale lower limit(8)	70743	Zone output limit upper limit(6)	70793	
70644		70694	Step output scale upper limit(8)	70744	Zone variation limit: Down(6)	70794	
70645		70695	Step output limit lower limit(8)	70745	Zone variation limit: Up(6)	70795	
70646		70696	Step output limit upper limit(8)	70746	Zone output scaling lower limit(7)	70796	
70647		70697	Step variation limit DW(8)	70747	Zone output scaling upper limit(7)	70797	
70648		70698	Step variation limit UP(8)	70748	Zone output limit lower limit(7)	70798	
70649		70699		70749	Zone output limit upper limit(7)	70799	
70650		70700		70750	Zone variation limit: Down(7)	70800	

Parameter setting value (70801 - 71000)							
OUTPUT (CH2)		OUTPUT (CH2)		OUTPUT (CH2)		Control setup setting	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70801	Step output scale lower limit(1)	70851		70901	Zone variation limit: Up(7)	70951	Control algorithm (CH1)
70802	Step output scale upper limit(1)	70852	Zone SV(1)	70902	Zone output scaling lower limit(8)	70952	Control direction direct/reverse (CH1)
70803	Step output limit lower limit(1)	70853	Zone SV(2)	70903	Zone output scaling upper limit(8)	70953	On-off pulse type (CH1)
70804	Step output limit upper limit(1)	70854	Zone SV(3)	70904	Zone output limit lower limit(8)	70954	Control interval (CH1)
70805	Step variation limit DW(1)	70855	Zone SV(4)	70905	Zone output limit upper limit(8)	70955	On-off pulse interval(CH1)
70806	Step variation limit UP(1)	70856	Zone SV(5)	70906	Zone variation limit: Down(8)	70956	PV error output lower limit (CH1)
70807	Step output scale lower limit(2)	70857	Zone SV(6)	70907	Zone variation limit: Up(8)	70957	PV error output upper limit (CH1)
70808	Step output scale upper limit(2)	70858	Zone SV(7)	70908	Step PID output preset (1)	70958	Abnormal CPU output (CH1)
70809	Step output limit lower limit(2)	70859		70909	Step PID output preset (2)	70959	Control algorithm (CH2)
70810	Step output limit upper limit(2)	70860	Zone output scaling lower limit(1)	70910	Step PID output preset (3)	70960	Control direction direct/reverse (CH2)
70811	Step variation limit DW(2)	70861	Zone output scaling upper limit(1)	70911	Step PID output preset (4)	70961	On-off pulse type (CH2)
70812	Step variation limit UP(2)	70862	Zone output limit lower limit(1)	70912	Step PID output preset (5)	70962	Control interval (CH2)
70813	Step output scale lower limit(3)	70863	Zone output limit upper limit(1)	70913	Step PID output preset (6)	70963	On-off pulse interval(CH2)
70814	Step output scale upper limit(3)	70864	Zone variation limit: Down(1)	70914	Step PID output preset (7)	70964	PV error output upper limit (CH2)
70815	Step output limit lower limit(3)	70865	Zone variation limit: Up(1)	70915	Step PID output preset (8)	70965	PV error output upper limit (CH2)
70816	Step output limit upper limit(3)	70866	Zone output scaling lower limit(2)	70916	Zone PID output preset (1)	70966	Abnormal CPU output (CH2)
70817	Step variation limit DW(3)	70867	Zone output scaling upper limit(2)	70917	Zone PID output preset (2)	70967	HEAT & COOL SEL
70818	Step variation limit UP(3)	70868	Zone output limit lower limit(2)	70918	Zone PID output preset (3)	70968	Heating/Cooling H.C. dead band
70819	Step output scale lower limit(4)	70869	Zone output limit upper limit(2)	70919	Zone PID output preset (4)	70969	Heating/Cooling Cool P coefficient
70820	Step output scale upper limit(4)	70870	Zone variation limit: Down(2)	70920	Zone PID output preset (5)	70970	SPLIT: Direct
70821	Step output limit lower limit(4)	70871	Zone variation limit: Up(2)	70921	Zone PID output preset (6)	70971	SPLIT: Reverse
70822	Step output limit upper limit(4)	70872	Zone output scaling lower limit(3)	70922	Zone PID output preset (7)	70972	FB setup ON/OFF servo mode
70823	Step variation limit DW(4)	70873	Zone output scaling upper limit(3)	70923	Zone PID output preset (8)	70973	FB: ZERO
70824	Step variation limit UP(4)	70874	Zone output limit lower limit(3)	70924	MANUAL OUTPUT LIMIT	70974	FB: SPAN
70825	Step output scale lower limit(5)	70875	Zone output limit upper limit(3)	70925		70975	FB/Dead band (gap)
70826	Step output scale upper limit(5)	70876	Zone variation limit: Down(3)	70926		70976	
70827	Step output limit lower limit(5)	70877	Zone variation limit: Up(3)	70927		70977	
70828	Step output limit upper limit(5)	70878	Zone output scaling lower limit(4)	70928		70978	
70829	Step variation limit DW(5)	70879	Zone output scaling upper limit(4)	70929		70979	
70830	Step variation limit UP(5)	70880	Zone output limit lower limit(4)	70930		70980	
70831	Step output scale lower limit(6)	70881	Zone output limit upper limit(4)	70931		70981	
70832	Step output scale upper limit(6)	70882	Zone variation limit: Down(4)	70932		70982	

OUTPUT (CH2)		OUTPUT (CH2)		OUTPUT (CH2)		Control setup setting	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
70833	Step output limit lower limit(6)	70883	Zone variation limit: Up(4)	70933		70983	Cascade primary controller output destination
70834	Step output limit upper limit(6)	70884	Zone output scaling lower limit(5)	70934		70984	primary controller constant a
70835	Step variation limit DW(6)	70885	Zone output scaling upper limit(5)	70935		70985	primary controller constant b
70836	Step variation limit UP(6)	70886	Zone output limit lower limit(5)	70936		70986	primary controller constant c
70837	Step output scale lower limit(7)	70887	Zone output limit upper limit(5)	70937		70987	
70838	Step output scale upper limit(7)	70888	Zone variation limit: Down(5)	70938		70988	
70839	Step output limit lower limit(7)	70889	Zone variation limit: Up(5)	70939		70989	
70840	Step output limit upper limit(7)	70890	Zone output scaling lower limit(6)	70940		70990	
70841	Step variation limit DW(7)	70891	Zone output scaling upper limit(6)	70941		70991	
70842	Step variation limit UP(7)	70892	Zone output limit lower limit(6)	70942		70992	
70843	Step output scale lower limit(8)	70893	Zone output limit upper limit(6)	70943		70993	
70844	Step output scale upper limit(8)	70894	Zone variation limit: Down(6)	70944		70994	
70845	Step output limit lower limit(8)	70895	Zone variation limit: Up(6)	70945		70995	
70846	Step output limit upper limit(8)	70896	Zone output scaling lower limit(7)	70946		70996	
70847	Step variation limit DW(8)	70897	Zone output scaling upper limit(7)	70947		70997	
70848	Step variation limit UP(8)	70898	Zone output limit lower limit(7)	70948		70998	
70849		70899	Zone output limit upper limit(7)	70949		70999	
70850		70900	Zone variation limit: Down(7)	70950		71000	

Parameter setting value (71001 - 71200)							
INPUT		Setting the time signal		Setting the time signal		Setting the time signal	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
71001	Burn out	71051	TS ON/time(1)	71101	TS OFF/time(1)	71151	
71002	SENSOR BIAS VAL(1)	71052	TS ON/time(2)	71102	TS OFF/time(2)	71152	
71003	SENSOR BIAS VAL(2)	71053	TS ON/time(3)	71103	TS OFF/time(3)	71153	
71004	SENSOR BIAS VAL(3)	71054	TS ON/time(4)	71104	TS OFF/time(4)	71154	
71005	SENSOR BIAS VAL(4)	71055	TS ON/time(5)	71105	TS OFF/time(5)	71155	
71006	SENSOR BIAS VAL(5)	71056	TS ON/time(6)	71106	TS OFF/time(6)	71156	
71007	SENSOR BIAS VAL(6)	71057	TS ON/time(7)	71107	TS OFF/time(7)	71157	
71008	SENSOR BIAS VAL(7)	71058	TS ON/time(8)	71108	TS OFF/time(8)	71158	
71009	SENSOR BIAS VAL(8)	71059	TS ON/time(9)	71109	TS OFF/time(9)	71159	
71010		71060	TS ON/time(10)	71110	TS OFF/time(10)	71160	
71011		71061	TS ON/time(11)	71111	TS OFF/time(11)	71161	
71012		71062	TS ON/time(12)	71112	TS OFF/time(12)	71162	
71013		71063	TS ON/time(13)	71113	TS OFF/time(13)	71163	
71014		71064	TS ON/time(14)	71114	TS OFF/time(14)	71164	
71015		71065	TS ON/time(15)	71115	TS OFF/time(15)	71165	
71016		71066	TS ON/time(16)	71116	TS OFF/time(16)	71166	
71017		71067	TS ON/time(17)	71117	TS OFF/time(17)	71167	
71018		71068	TS ON/time(18)	71118	TS OFF/time(18)	71168	
71019		71069	TS ON/time(19)	71119	TS OFF/time(19)	71169	
71020		71070	TS ON/time(20)	71120	TS OFF/time(20)	71170	
71021		71071	TS ON/time(21)	71121	TS OFF/time(21)	71171	
71022		71072	TS ON/time(22)	71122	TS OFF/time(22)	71172	
71023		71073	TS ON/time(23)	71123	TS OFF/time(23)	71173	
71024		71074	TS ON/time(24)	71124	TS OFF/time(24)	71174	
71025		71075	TS ON/time(25)	71125	TS OFF/time(25)	71175	
71026		71076	TS ON/time(26)	71126	TS OFF/time(26)	71176	
71027		71077	TS ON/time(27)	71127	TS OFF/time(27)	71177	
71028		71078	TS ON/time(28)	71128	TS OFF/time(28)	71178	
71029		71079	TS ON/time(29)	71129	TS OFF/time(29)	71179	
71030		71080	TS ON/time(30)	71130	TS OFF/time(30)	71180	
71031		71081		71131		71181	
71032		71082		71132		71182	
71033		71083		71133		71183	
71034		71084		71134		71184	
71035		71085		71135		71185	
71036		71086		71136		71186	
71037		71087		71137		71187	
71038		71088		71138		71188	
71039		71089		71139		71189	
71040		71090		71140		71190	
71041		71091		71141		71191	
71042		71092		71142		71192	
71043		71093		71143		71193	
71044		71094		71144		71194	
71045		71095		71145		71195	
71046		71096		71146		71196	
71047		71097		71147		71197	
71048		71098		71148		71198	
71049		71099		71149		71199	
71050		71100		71150		71200	

### Parameter setting value (71201 - 71400)

Guarantee soak/wait time/MASS flow		DIO type setting		linearize table (CH1)		linearize table (CH2)	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
71201	Guarantee soak(1)	71251	DI function assignment(1)	71301	Voltage mV(1)	71351	Voltage mV(1)
71202	Guarantee soak(2)	71252	DI function assignment(2)	71302	Voltage mV(2)	71352	Voltage mV(2)
71203	Guarantee soak(3)	71253	DI function assignment(3)	71303	Voltage mV(3)	71353	Voltage mV(3)
71204	Guarantee soak(4)	71254	DI function assignment(4)	71304	Voltage mV(4)	71354	Voltage mV(4)
71205	Guarantee soak(5)	71255	DI function assignment(5)	71305	Voltage mV(5)	71355	Voltage mV(5)
71206	Guarantee soak(6)	71256	DI function assignment(6)	71306	Voltage mV(6)	71356	Voltage mV(6)
71207	Guarantee soak(7)	71257	DI function assignment(7)	71307	Voltage mV(7)	71357	Voltage mV(7)
71208	Guarantee soak(8)	71258	DI function assignment(8)	71308	Voltage mV(8)	71358	Voltage mV(8)
71209	Waiting time alarm(1)	71259	DI function assignment(9)	71309	Voltage mV(9)	71359	Voltage mV(9)
71210	Waiting time alarm(2)	71260	DI function assignment(10)	71310	Voltage mV(10)	71360	Voltage mV(10)
71211	Waiting time alarm(3)	71261	DI function assignment(11)	71311	Voltage mV(11)	71361	Voltage mV(11)
71212	Waiting time alarm(4)	71262	DI function assignment(12)	71312	Voltage mV(12)	71362	Voltage mV(12)
71213	Waiting time alarm(5)	71263	DI function assignment(13)	71313	Voltage mV(13)	71363	Voltage mV(13)
71214	Waiting time alarm(6)	71264	DI function assignment(14)	71314	Voltage mV(14)	71364	Voltage mV(14)
71215	Waiting time alarm(7)	71265	DI function assignment(15)	71315	Voltage mV(15)	71365	Voltage mV(15)
71216	Waiting time alarm(8)	71266	DI function assignment(16)	71316	Voltage mV(16)	71366	Voltage mV(16)
71217	Mass flow SV(1)	71267	DO function assignment(1)	71317	Voltage mV(17)	71367	Voltage mV(17)
71218	Mass flow SV(2)	71268	DO function assignment(2)	71318	Voltage mV(18)	71368	Voltage mV(18)
71219	Mass flow SV(3)	71269	DO function assignment(3)	71319	Voltage mV(19)	71369	Voltage mV(19)
71220	Mass flow SV(4)	71270	DO function assignment(4)	71320	Voltage mV(20)	71370	Voltage mV(20)
71221	Mass flow SV(5)	71271	DO function assignment(5)	71321	VALUE(1)	71371	VALUE(1)
71222	Mass flow SV(6)	71272	DO function assignment(6)	71322	VALUE(2)	71372	VALUE(2)
71223	Mass flow SV(7)	71273	DO function assignment(7)	71323	VALUE(3)	71373	VALUE(3)
71224	Mass flow SV(8)	71274	DO function assignment(8)	71324	VALUE(4)	71374	VALUE(4)
71225		71275	DO function assignment(9)	71325	VALUE(5)	71375	VALUE(5)
71226		71276	DO function assignment(10)	71326	VALUE(6)	71376	VALUE(6)
71227		71277	DO function assignment(11)	71327	VALUE(7)	71377	VALUE(7)
71228		71278	DO function assignment(12)	71328	VALUE(8)	71378	VALUE(8)
71229		71279	DO function assignment(13)	71329	VALUE(9)	71379	VALUE(9)
71230		71280	DO function assignment(14)	71330	VALUE(10)	71380	VALUE(10)
71231		71281	DO function assignment(15)	71331	VALUE(11)	71381	VALUE(11)
71232		71282	DO function assignment(16)	71332	VALUE(12)	71382	VALUE(12)
71233		71283	DO function assignment(17)	71333	VALUE(13)	71383	VALUE(13)
71234		71284	DO function assignment(18)	71334	VALUE(14)	71384	VALUE(14)
71235		71285	DO function assignment(19)	71335	VALUE(15)	71385	VALUE(15)
71236		71286	DO function assignment(20)	71336	VALUE(16)	71386	VALUE(16)
71237		71287	DO function assignment(21)	71337	VALUE(17)	71387	VALUE(17)
71238		71288	DO function assignment(22)	71338	VALUE(18)	71388	VALUE(18)
71239		71289	DO function assignment(23)	71339	VALUE(19)	71389	VALUE(19)
71240		71290	DO function assignment(24)	71340	VALUE(20)	71390	VALUE(20)
71241		71291	DO function assignment(25)	71341		71391	
71242		71292	DO function assignment(26)	71342		71392	
71243		71293	DO function assignment(27)	71343		71393	
71244		71294	DO function assignment(28)	71344		71394	
71245		71295		71345		71395	
71246		71296		71346		71396	
71247		71297		71347		71397	
71248		71298		71348		71398	
71249		71299		71349		71399	
71250		71300		71350		71400	



**Pattern setup value (72001 - 72200)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72001	Pattern repeat	72051		72101		72151	
72002	Used steps(1)	72052	Used steps(6)	72102	Used steps(11)	72152	Used steps(16)
72003	Patterns for operations, etc.(1)	72053	Patterns for operations, etc.(6)	72103	Patterns for operations, etc.(11)	72153	Patterns for operations, etc.(16)
72004	PTN SETTING TYPE, etc.(1)	72054	PTN SETTING TYPE, etc.(6)	72104	PTN SETTING TYPE, etc.(11)	72154	PTN SETTING TYPE, etc.(16)
72005		72055		72105		72155	
72006	Start SV(1)	72056	Start SV(6)	72106	Start SV(11)	72156	Start SV(16)
72007	Output value1(1)	72057	Output value1(6)	72107	Output value1(11)	72157	Output value1(16)
72008	Output value2(1)	72058	Output value2(6)	72108	Output value2(11)	72158	Output value2(16)
72009	Reset SV(1)	72059	Reset SV(6)	72109	Reset SV(11)	72159	Reset SV(16)
72010	END step SV(1)	72060	END step SV(6)	72110	END step SV(11)	72160	END step SV(16)
72011		72061		72111		72161	
72012	Used steps(2)	72062	Used steps(7)	72112	Used steps(12)	72162	Used steps(17)
72013	Patterns for operations, etc.(2)	72063	Patterns for operations, etc.(7)	72113	Patterns for operations, etc.(12)	72163	Patterns for operations, etc.(17)
72014	PTN SETTING TYPE, etc.(2)	72064	PTN SETTING TYPE, etc.(7)	72114	PTN SETTING TYPE, etc.(12)	72164	PTN SETTING TYPE, etc.(17)
72015		72065		72115		72165	
72016	Start SV(2)	72066	Start SV(7)	72116	Start SV(12)	72166	Start SV(17)
72017	Output value1(2)	72067	Output value1(7)	72117	Output value1(12)	72167	Output value1(17)
72018	Output value2(2)	72068	Output value2(7)	72118	Output value2(12)	72168	Output value2(17)
72019	Reset SV(2)	72069	Reset SV(7)	72119	Reset SV(12)	72169	Reset SV(17)
72020	END step SV(2)	72070	END step SV(7)	72120	END step SV(12)	72170	END step SV(17)
72021		72071		72121		72171	
72022	Used steps(3)	72072	Used steps(8)	72122	Used steps(13)	72172	Used steps(18)
72023	Patterns for operations, etc.(3)	72073	Patterns for operations, etc.(8)	72123	Patterns for operations, etc.(13)	72173	Patterns for operations, etc.(18)
72024	PTN SETTING TYPE, etc.(3)	72074	PTN SETTING TYPE, etc.(8)	72124	PTN SETTING TYPE, etc.(13)	72174	PTN SETTING TYPE, etc.(18)
72025		72075		72125		72175	
72026	Start SV(3)	72076	Start SV(8)	72126	Start SV(13)	72176	Start SV(18)
72027	Output value1(3)	72077	Output value1(8)	72127	Output value1(13)	72177	Output value1(18)
72028	Output value2(3)	72078	Output value2(8)	72128	Output value2(13)	72178	Output value2(18)
72029	Reset SV(3)	72079	Reset SV(8)	72129	Reset SV(13)	72179	Reset SV(18)
72030	END step SV(3)	72080	END step SV(8)	72130	END step SV(13)	72180	END step SV(18)
72031		72081		72131		72181	
72032	Used steps(4)	72082	Used steps(9)	72132	Used steps(14)	72182	Used steps(19)
72033	Patterns for operations, etc.(4)	72083	Patterns for operations, etc.(9)	72133	Patterns for operations, etc.(14)	72183	Patterns for operations, etc.(19)
72034	PTN SETTING TYPE, etc.(4)	72084	PTN SETTING TYPE, etc.(9)	72134	PTN SETTING TYPE, etc.(14)	72184	PTN SETTING TYPE, etc.(19)
72035		72085		72135		72185	
72036	Start SV(4)	72086	Start SV(9)	72136	Start SV(14)	72186	Start SV(19)
72037	Output value1(4)	72087	Output value1(9)	72137	Output value1(14)	72187	Output value1(19)
72038	Output value2(4)	72088	Output value2(9)	72138	Output value2(14)	72188	Output value2(19)
72039	Reset SV(4)	72089	Reset SV(9)	72139	Reset SV(14)	72189	Reset SV(19)
72040	END step SV(4)	72090	END step SV(9)	72140	END step SV(14)	72190	END step SV(19)
72041		72091		72141		72191	
72042	Used steps(5)	72092	Used steps(10)	72142	Used steps(15)	72192	Used steps(20)
72043	Patterns for operations, etc.(5)	72093	Patterns for operations, etc.(10)	72143	Patterns for operations, etc.(15)	72193	Patterns for operations, etc.(20)
72044	PTN SETTING TYPE, etc.(5)	72094	PTN SETTING TYPE, etc.(10)	72144	PTN SETTING TYPE, etc.(15)	72194	PTN SETTING TYPE, etc.(20)
72045		72095		72145		72195	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72046	Start SV(5)	72096	Start SV(10)	72146	Start SV(15)	72196	Start SV(20)
72047	Output value1(5)	72097	Output value1(10)	72147	Output value1(15)	72197	Output value1(20)
72048	Output value2(5)	72098	Output value2(10)	72148	Output value2(15)	72198	Output value2(20)
72049	Reset SV(5)	72099	Reset SV(10)	72149	Reset SV(15)	72199	Reset SV(20)
72050	END step SV(5)	72100	END step SV(10)	72150	END step SV(15)	72200	END step SV(20)

**Pattern setup value (72201 - 72400)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72201		72251		72301		72351	
72202	Used steps(21)	72252	Used steps(26)	72302	Used steps(31)	72352	Used steps(36)
72203	Patterns for operations, etc.(21)	72253	Patterns for operations, etc.(26)	72303	Patterns for operations, etc.(31)	72353	Patterns for operations, etc.(36)
72204	PTN SETTING TYPE, etc.(21)	72254	PTN SETTING TYPE, etc.(26)	72304	PTN SETTING TYPE, etc.(31)	72354	PTN SETTING TYPE(36)
72205		72255		72305		72355	
72206	Start SV(21)	72256	Start SV(26)	72306	Start SV(31)	72356	Start SV(36)
72207	Output value1(21)	72257	Output value1(26)	72307	Output value1(31)	72357	Output value1(36)
72208	Output value2(21)	72258	Output value2(26)	72308	Output value2(31)	72358	Output value2(36)
72209	Reset SV(21)	72259	Reset SV(26)	72309	Reset SV(31)	72359	Reset SV(36)
72210	END step SV(21)	72260	END step SV(26)	72310	END step SV(31)	72360	END step SV(36)
72211		72261		72311		72361	
72212	Used steps(22)	72262	Used steps(27)	72312	Used steps(32)	72362	Used steps(37)
72213	Patterns for operations, etc.(22)	72263	Patterns for operations, etc.(27)	72313	Patterns for operations, etc.(32)	72363	Patterns for operations, etc.(37)
72214	PTN SETTING TYPE, etc.(22)	72264	PTN SETTING TYPE, etc.(27)	72314	PTN SETTING TYPE, etc.(32)	72364	PTN SETTING TYPE(37)
72215		72265		72315		72365	
72216	Start SV(22)	72266	Start SV(27)	72316	Start SV(32)	72366	Start SV(37)
72217	Output value1(22)	72267	Output value1(27)	72317	Output value1(32)	72367	Output value1(37)
72218	Output value2(22)	72268	Output value2(27)	72318	Output value2(32)	72368	Output value2(37)
72219	Reset SV(22)	72269	Reset SV(27)	72319	Reset SV(32)	72369	Reset SV(37)
72220	END step SV(22)	72270	END step SV(27)	72320	END step SV(32)	72370	END step SV(37)
72221		72271		72321		72371	
72222	Used steps(23)	72272	Used steps(28)	72322	Used steps(33)	72372	Used steps(38)
72223	Patterns for operations, etc.(23)	72273	Patterns for operations, etc.(28)	72323	Patterns for operations, etc.(33)	72373	Patterns for operations, etc.(38)
72224	PTN SETTING TYPE, etc.(23)	72274	PTN SETTING TYPE, etc.(28)	72324	PTN SETTING TYPE, etc.(33)	72374	PTN SETTING TYPE, etc.(38)
72225		72275		72325		72375	
72226	Start SV(23)	72276	Start SV(28)	72326	Start SV(33)	72376	Start SV(38)
72227	Output value1(23)	72277	Output value1(28)	72327	Output value1(33)	72377	Output value1(38)
72228	Output value2(23)	72278	Output value2(28)	72328	Output value2(33)	72378	Output value2(38)
72229	Reset SV(23)	72279	Reset SV(28)	72329	Reset SV(33)	72379	Reset SV(38)
72230	END step SV(23)	72280	END step SV(28)	72330	END step SV(33)	72380	END step SV(38)
72231		72281		72331		72381	
72232	Used steps(24)	72282	Used steps(29)	72332	Used steps(34)	72382	Used steps(39)
72233	Patterns for operations, etc.(24)	72283	Patterns for operations, etc.(29)	72333	Patterns for operations, etc.(34)	72383	Patterns for operations, etc.(39)
72234	PTN SETTING TYPE, etc.(24)	72284	PTN SETTING TYPE, etc.(29)	72334	PTN SETTING TYPE, etc.(34)	72384	PTN SETTING TYPE, etc.(39)
72235		72285		72335		72385	
72236	Start SV(24)	72286	Start SV(29)	72336	Start SV(34)	72386	Start SV(39)
72237	Output value1(24)	72287	Output value1(29)	72337	Output value1(34)	72387	Output value1(39)
72238	Output value2(24)	72288	Output value2(29)	72338	Output value2(34)	72388	Output value2(39)
72239	Reset SV(24)	72289	Reset SV(29)	72339	Reset SV(34)	72389	Reset SV(39)
72240	END step SV(24)	72290	END step SV(29)	72340	END step SV(34)	72390	END step SV(39)
72241		72291		72341		72391	
72242	Used steps(25)	72292	Used steps(30)	72342	Used steps(35)	72392	Used steps(40)
72243	Patterns for operations, etc.(25)	72293	Patterns for operations, etc.(30)	72343	Patterns for operations, etc.(35)	72393	Patterns for operations, etc.(40)
72244	PTN SETTING TYPE, etc.(25)	72294	PTN SETTING TYPE, etc.(30)	72344	PTN SETTING TYPE, etc.(35)	72394	PTN SETTING TYPE, etc.(40)
72245		72295		72345		72395	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72246	Start SV(25)	72296	Start SV(30)	72346	Start SV(35)	72396	Start SV(40)
72247	Output value1(25)	72297	Output value1(30)	72347	Output value1(35)	72397	Output value1(40)
72248	Output value2(25)	72298	Output value2(30)	72348	Output value2(35)	72398	Output value2(40)
72249	Reset SV(25)	72299	Reset SV(30)	72349	Reset SV(35)	72399	Reset SV(40)
72250	END step SV(25)	72300	END step SV(30)	72350	END step SV(35)	72400	END step SV(40)

**Pattern setup value (72401 - 72600)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72401		72451		72501		72551	
72402	Used steps(41)	72452	Used steps(46)	72502	Used steps(51)	72552	Used steps(56)
72403	Patterns for operations, etc.(41)	72453	Patterns for operations, etc.(46)	72503	Patterns for operations, etc.(51)	72553	Patterns for operations, etc.(56)
72404	PTN SETTING TYPE, etc.(41)	72454	PTN SETTING TYPE, etc.(46)	72504	PTN SETTING TYPE, etc.(51)	72554	PTN SETTING TYPE, etc.(56)
72405		72455		72505		72555	
72406	Start SV(41)	72456	Start SV(46)	72506	Start SV(51)	72556	Start SV(56)
72407	Output value1(41)	72457	Output value1(46)	72507	Output value1(51)	72557	Output value1(56)
72408	Output value2(41)	72458	Output value2(46)	72508	Output value2(51)	72558	Output value2(56)
72409	Reset SV(41)	72459	Reset SV(46)	72509	Reset SV(51)	72559	Reset SV(56)
72410	END step SV(41)	72460	END step SV(46)	72510	END step SV(51)	72560	END step SV(56)
72411		72461		72511		72561	
72412	Used steps(42)	72462	Used steps(47)	72512	Used steps(52)	72562	Used steps(57)
72413	Patterns for operations, etc.(42)	72463	Patterns for operations, etc.(47)	72513	Patterns for operations, etc.(52)	72563	Patterns for operations, etc.(57)
72414	PTN SETTING TYPE, etc.(42)	72464	PTN SETTING TYPE, etc.(47)	72514	PTN SETTING TYPE, etc.(52)	72564	PTN SETTING TYPE, etc.(57)
72415		72465		72515		72565	
72416	Start SV(42)	72466	Start SV(47)	72516	Start SV(52)	72566	Start SV(57)
72417	Output value1(42)	72467	Output value1(47)	72517	Output value1(52)	72567	Output value1(57)
72418	Output value2(42)	72468	Output value2(47)	72518	Output value2(52)	72568	Output value2(57)
72419	Reset SV(42)	72469	Reset SV(47)	72519	Reset SV(52)	72569	Reset SV(57)
72420	END step SV(42)	72470	END step SV(47)	72520	END step SV(52)	72570	END step SV(57)
72421		72471		72521		72571	
72422	Used steps(43)	72472	Used steps(48)	72522	Used steps(53)	72572	Used steps(58)
72423	Patterns for operations, etc.(43)	72473	Patterns for operations, etc.(48)	72523	Patterns for operations, etc.(53)	72573	Patterns for operations, etc.(58)
72424	PTN SETTING TYPE, etc.(43)	72474	PTN SETTING TYPE, etc.(48)	72524	PTN SETTING TYPE, etc.(53)	72574	PTN SETTING TYPE, etc.(58)
72425		72475		72525		72575	
72426	Start SV(43)	72476	Start SV(48)	72526	Start SV(53)	72576	Start SV(58)
72427	Output value1(43)	72477	Output value1(48)	72527	Output value1(53)	72577	Output value1(58)
72428	Output value2(43)	72478	Output value2(48)	72528	Output value2(53)	72578	Output value2(58)
72429	Reset SV(43)	72479	Reset SV(48)	72529	Reset SV(53)	72579	Reset SV(58)
72430	END step SV(43)	72480	END step SV(48)	72530	END step SV(53)	72580	END step SV(58)
72431		72481		72531		72581	
72432	Used steps(44)	72482	Used steps(49)	72532	Used steps(54)	72582	Used steps(59)
72433	Patterns for operations, etc.(44)	72483	Patterns for operations, etc.(49)	72533	Patterns for operations, etc.(54)	72583	Patterns for operations, etc.(59)
72434	PTN SETTING TYPE, etc.(44)	72484	PTN SETTING TYPE, etc.(49)	72534	PTN SETTING TYPE, etc.(54)	72584	PTN SETTING TYPE, etc.(59)
72435		72485		72535		72585	
72436	Start SV(44)	72486	Start SV(49)	72536	Start SV(54)	72586	Start SV(59)
72437	Output value1(44)	72487	Output value1(49)	72537	Output value1(54)	72587	Output value1(59)
72438	Output value2(44)	72488	Output value2(49)	72538	Output value2(54)	72588	Output value2(59)
72439	Reset SV(44)	72489	Reset SV(49)	72539	Reset SV(54)	72589	Reset SV(59)
72440	END step SV(44)	72490	END step SV(49)	72540	END step SV(54)	72590	END step SV(59)
72441		72491		72541		72591	
72442	Used steps(45)	72492	Used steps(50)	72542	Used steps(55)	72592	Used steps(60)
72443	Patterns for operations, etc.(45)	72493	Patterns for operations, etc.(50)	72543	Patterns for operations, etc.(55)	72593	Patterns for operations, etc.(60)
72444	PTN SETTING TYPE, etc.(45)	72494	PTN SETTING TYPE, etc.(50)	72544	PTN SETTING TYPE, etc.(55)	72594	PTN SETTING TYPE, etc.(60)
72445		72495		72545		72595	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72446	Start SV(45)	72496	Start SV(50)	72546	Start SV(55)	72596	Start SV(60)
72447	Output value1(45)	72497	Output value1(50)	72547	Output value1(55)	72597	Output value1(60)
72448	Output value2(45)	72498	Output value2(50)	72548	Output value2(55)	72598	Output value2(60)
72449	Reset SV(45)	72499	Reset SV(50)	72549	Reset SV(55)	72599	Reset SV(60)
72450	END step SV(45)	72500	END step SV(50)	72550	END step SV(55)	72600	END step SV(60)

**Pattern setup value (72601 - 72800)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72601		72651		72701		72751	
72602	Used steps(61)	72652	Used steps(66)	72702	Used steps(71)	72752	Used steps(76)
72603	Patterns for operations, etc.(61)	72653	Patterns for operations, etc.(66)	72703	Patterns for operations, etc.(71)	72753	Patterns for operations, etc.(76)
72604	PTN SETTING TYPE, etc.(61)	72654	PTN SETTING TYPE, etc.(66)	72704	PTN SETTING TYPE, etc.(71)	72754	PTN SETTING TYPE, etc.(76)
72605		72655		72705		72755	
72606	Start SV(61)	72656	Start SV(66)	72706	Start SV(71)	72756	Start SV(76)
72607	Output value1(61)	72657	Output value1(66)	72707	Output value1(71)	72757	Output value1(76)
72608	Output value2(61)	72658	Output value2(66)	72708	Output value2(71)	72758	Output value2(76)
72609	Reset SV(61)	72659	Reset SV(66)	72709	Reset SV(71)	72759	Reset SV(76)
72610	END step SV(61)	72660	END step SV(66)	72710	END step SV(71)	72760	END step SV(76)
72611		72661		72711		72761	
72612	Used steps(62)	72662	Used steps(67)	72712	Used steps(72)	72762	Used steps(77)
72613	Patterns for operations, etc.(62)	72663	Patterns for operations, etc.(67)	72713	Patterns for operations, etc.(72)	72763	Patterns for operations, etc.(77)
72614	PTN SETTING TYPE, etc.(62)	72664	PTN SETTING TYPE, etc.(67)	72714	PTN SETTING TYPE, etc.(72)	72764	PTN SETTING TYPE, etc.(77)
72615		72665		72715		72765	
72616	Start SV(62)	72666	Start SV(67)	72716	Start SV(72)	72766	Start SV(77)
72617	Output value1(62)	72667	Output value1(67)	72717	Output value1(72)	72767	Output value1(77)
72618	Output value2(62)	72668	Output value2(67)	72718	Output value2(72)	72768	Output value2(77)
72619	Reset SV(62)	72669	Reset SV(67)	72719	Reset SV(72)	72769	Reset SV(77)
72620	END step SV(62)	72670	END step SV(67)	72720	END step SV(72)	72770	END step SV(77)
72621		72671		72721		72771	
72622	Used steps(63)	72672	Used steps(68)	72722	Used steps(73)	72772	Used steps(78)
72623	Patterns for operations, etc.(63)	72673	Patterns for operations, etc.(68)	72723	Patterns for operations, etc.(73)	72773	Patterns for operations, etc.(78)
72624	PTN SETTING TYPE, etc.(63)	72674	PTN SETTING TYPE, etc.(68)	72724	PTN SETTING TYPE, etc.(73)	72774	PTN SETTING TYPE, etc.(78)
72625		72675		72725		72775	
72626	Start SV(63)	72676	Start SV(68)	72726	Start SV(73)	72776	Start SV(78)
72627	Output value1(63)	72677	Output value1(68)	72727	Output value1(73)	72777	Output value1(78)
72628	Output value2(63)	72678	Output value2(68)	72728	Output value2(73)	72778	Output value2(78)
72629	Reset SV(63)	72679	Reset SV(68)	72729	Reset SV(73)	72779	Reset SV(78)
72630	END step SV(63)	72680	END step SV(68)	72730	END step SV(73)	72780	END step SV(78)
72631		72681		72731		72781	
72632	Used steps(64)	72682	Used steps(69)	72732	Used steps(74)	72782	Used steps(79)
72633	Patterns for operations, etc.(64)	72683	Patterns for operations, etc.(69)	72733	Patterns for operations, etc.(74)	72783	Patterns for operations, etc.(79)
72634	PTN SETTING TYPE, etc.(64)	72684	PTN SETTING TYPE, etc.(69)	72734	PTN SETTING TYPE, etc.(74)	72784	PTN SETTING TYPE, etc.(79)
72635		72685		72735		72785	
72636	Start SV(64)	72686	Start SV(69)	72736	Start SV(74)	72786	Start SV(79)
72637	Output value1(64)	72687	Output value1(69)	72737	Output value1(74)	72787	Output value1(79)
72638	Output value2(64)	72688	Output value2(69)	72738	Output value2(74)	72788	Output value2(79)
72639	Reset SV(64)	72689	Reset SV(69)	72739	Reset SV(74)	72789	Reset SV(79)
72640	END step SV(64)	72690	END step SV(69)	72740	END step SV(74)	72790	END step SV(79)
72641		72691		72741		72791	
72642	Used steps(65)	72692	Used steps(70)	72742	Used steps(75)	72792	Used steps(80)
72643	Patterns for operations, etc.(65)	72693	Patterns for operations, etc.(70)	72743	Patterns for operations, etc.(75)	72793	Patterns for operations, etc.(80)
72644	PTN SETTING TYPE, etc.(65)	72694	PTN SETTING TYPE, etc.(70)	72744	PTN SETTING TYPE, etc.(75)	72794	PTN SETTING TYPE, etc.(80)
72645		72695		72745		72795	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72646	Start SV(65)	72696	Start SV(70)	72746	Start SV(75)	72796	Start SV(80)
72647	Output value1(65)	72697	Output value1(70)	72747	Output value1(75)	72797	Output value1(80)
72648	Output value2(65)	72698	Output value2(70)	72748	Output value2(75)	72798	Output value2(80)
72649	Reset SV(65)	72699	Reset SV(70)	72749	Reset SV(75)	72799	Reset SV(80)
72650	END step SV(65)	72700	END step SV(70)	72750	END step SV(75)	72800	END step SV(80)



**Pattern setup value (72801 - 73000)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72801		72851		72901		72951	
72802	Used steps(81)	72852	Used steps(86)	72902	Used steps(91)	72952	Used steps(96)
72803	Patterns for operations, etc. (81)	72853	Patterns for operations, etc.(86)	72903	Patterns for operations, etc.(91)	72953	Patterns for operations, etc.(96)
72804	PTN SETTING TYPE, etc. (81)	72854	PTN SETTING TYPE, etc.(86)	72904	PTN SETTING TYPE, etc.(91)	72954	PTN SETTING TYPE, etc.(96)
72805		72855		72905		72955	
72806	Start SV(81)	72856	Start SV(86)	72906	Start SV(91)	72956	Start SV(96)
72807	Output value1(81)	72857	Output value1(86)	72907	Output value1(91)	72957	Output value1(96)
72808	Output value2(81)	72858	Output value2(86)	72908	Output value2(91)	72958	Output value2(96)
72809	Reset SV(81)	72859	Reset SV(86)	72909	Reset SV(91)	72959	Reset SV(96)
72810	END step SV(81)	72860	END step SV(86)	72910	END step SV(91)	72960	END step SV(96)
72811		72861		72911		72961	
72812	Used steps(82)	72862	Used steps(87)	72912	Used steps(92)	72962	Used steps(97)
72813	Patterns for operations, etc. (82)	72863	Patterns for operations, etc.(87)	72913	Patterns for operations, etc.(92)	72963	Patterns for operations, etc.(97)
72814	PTN SETTING TYPE, etc. (82)	72864	PTN SETTING TYPE, etc.(87)	72914	PTN SETTING TYPE, etc.(92)	72964	PTN SETTING TYPE, etc.(97)
72815		72865		72915		72965	
72816	Start SV(82)	72866	Start SV(87)	72916	Start SV(92)	72966	Start SV(97)
72817	Output value1(82)	72867	Output value1(87)	72917	Output value1(92)	72967	Output value1(97)
72818	Output value2(82)	72868	Output value2(87)	72918	Output value2(92)	72968	Output value2(97)
72819	Reset SV(82)	72869	Reset SV(87)	72919	Reset SV(92)	72969	Reset SV(97)
72820	END step SV(82)	72870	END step SV(87)	72920	END step SV(92)	72970	END step SV(97)
72821		72871		72921		72971	
72822	Used steps(83)	72872	Used steps(88)	72922	Used steps(93)	72972	Used steps(98)
72823	Patterns for operations, etc. (83)	72873	Patterns for operations, etc.(88)	72923	Patterns for operations, etc.(93)	72973	Patterns for operations, etc.(98)
72824	PTN SETTING TYPE, etc. (83)	72874	PTN SETTING TYPE, etc.(88)	72924	PTN SETTING TYPE, etc.(93)	72974	PTN SETTING TYPE, etc.(98)
72825		72875		72925		72975	
72826	Start SV(83)	72876	Start SV(88)	72926	Start SV(93)	72976	Start SV(98)
72827	Output value1(83)	72877	Output value1(88)	72927	Output value1(93)	72977	Output value1(98)
72828	Output value2(83)	72878	Output value2(88)	72928	Output value2(93)	72978	Output value2(98)
72829	Reset SV(83)	72879	Reset SV(88)	72929	Reset SV(93)	72979	Reset SV(98)
72830	END step SV(83)	72880	END step SV(88)	72930	END step SV(93)	72980	END step SV(98)
72831		72881		72931		72981	
72832	Used steps(84)	72882	Used steps(89)	72932	Used steps(94)	72982	Used steps(99)
72833	Patterns for operations, etc. (84)	72883	Patterns for operations, etc.(89)	72933	Patterns for operations, etc.(94)	72983	Patterns for operations, etc.(99)
72834	PTN SETTING TYPE, etc. (84)	72884	PTN SETTING TYPE, etc.(89)	72934	PTN SETTING TYPE, etc.(94)	72984	PTN SETTING TYPE, etc.(99)
72835		72885		72935		72985	
72836	Start SV(84)	72886	Start SV(89)	72936	Start SV(94)	72986	Start SV(99)
72837	Output value1(84)	72887	Output value1(89)	72937	Output value1(94)	72987	Output value1(99)
72838	Output value2(84)	72888	Output value2(89)	72938	Output value2(94)	72988	Output value2(99)
72839	Reset SV(84)	72889	Reset SV(89)	72939	Reset SV(94)	72989	Reset SV(99)
72840	END step SV(84)	72890	END step SV(89)	72940	END step SV(94)	72990	END step SV(99)
72841		72891		72941		72991	
72842	Used steps(85)	72892	Used steps(90)	72942	Used steps(95)	72992	Used steps(100)
72843	Patterns for operations, etc. (85)	72893	Patterns for operations, etc.(90)	72943	Patterns for operations, etc.(95)	72993	Patterns for operations, etc.(100)
72844	PTN SETTING TYPE, etc. (85)	72894	PTN SETTING TYPE, etc. (90)	72944	PTN SETTING TYPE, etc. (95)	72994	PTN SETTING TYPE, etc. (100)
72845		72895		72945		72995	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
72846	Start SV(85)	72896	Start SV(90)	72946	Start SV(95)	72996	Start SV(100)
72847	Output value1(85)	72897	Output value1(90)	72947	Output value1(95)	72997	Output value1(100)
72848	Output value2(85)	72898	Output value2(90)	72948	Output value2(95)	72998	Output value2(100)
72849	Reset SV(85)	72899	Reset SV(90)	72949	Reset SV(95)	72999	Reset SV(100)
72850	END step SV(85)	72900	END step SV(90)	72950	END step SV(95)	73000	END step SV(100)

**Pattern setup value (73001 - 73200)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73001		73051		73101		73151	
73002	Used steps(101)	73052	Used steps(106)	73102	Used steps(111)	73152	Used steps(116)
73003	Patterns for operations, etc. (101)	73053	Patterns for operations, etc.(106)	73103	Patterns for operations, etc.(111)	73153	Patterns for operations, etc.(116)
73004	PTN SETTING TYPE, etc. (101)	73054	PTN SETTING TYPE, etc.(106)	73104	PTN SETTING TYPE, etc.(111)	73154	PTN SETTING TYPE, etc.(116)
73005		73055		73105		73155	
73006	Start SV(101)	73056	Start SV(106)	73106	Start SV(111)	73156	Start SV(116)
73007	Output value1(101)	73057	Output value1(106)	73107	Output value1(111)	73157	Output value1(116)
73008	Output value2(101)	73058	Output value2(106)	73108	Output value2(111)	73158	Output value2(116)
73009	Reset SV(101)	73059	Reset SV(106)	73109	Reset SV(111)	73159	Reset SV(116)
73010	END step SV(101)	73060	END step SV(106)	73110	END step SV(111)	73160	END step SV(116)
73011		73061		73111		73161	
73012	Used steps(102)	73062	Used steps(107)	73112	Used steps(112)	73162	Used steps(117)
73013	Patterns for operations, etc. (102)	73063	Patterns for operations, etc.(107)	73113	Patterns for operations, etc.(112)	73163	Patterns for operations, etc.(117)
73014	PTN SETTING TYPE, etc. (102)	73064	PTN SETTING TYPE(107)	73114	PTN SETTING TYPE (112)	73164	PTN SETTING TYPE, etc. (117)
73015		73065		73115		73165	
73016	Start SV(102)	73066	Start SV(107)	73116	Start SV(112)	73166	Start SV(117)
73017	Output value1(102)	73067	Output value1(107)	73117	Output value1(112)	73167	Output value1(117)
73018	Output value2(102)	73068	Output value2(107)	73118	Output value2(112)	73168	Output value2(117)
73019	Reset SV(102)	73069	Reset SV(107)	73119	Reset SV(112)	73169	Reset SV(117)
73020	END step SV(102)	73070	END step SV(107)	73120	END step SV(112)	73170	END step SV(117)
73021		73071		73121		73171	
73022	Used steps(103)	73072	Used steps(108)	73122	Used steps(113)	73172	Used steps(118)
73023	Patterns for operations, etc. (103)	73073	Patterns for operations, etc.(108)	73123	Patterns for operations, etc.(113)	73173	Patterns for operations, etc.(118)
73024	PTN SETTING TYPE, etc. (103)	73074	PTN SETTING TYPE, etc.(108)	73124	PTN SETTING TYPE, etc.(113)	73174	PTN SETTING TYPE, etc.(118)
73025		73075		73125		73175	
73026	Start SV(103)	73076	Start SV(108)	73126	Start SV(113)	73176	Start SV(118)
73027	Output value1(103)	73077	Output value1(108)	73127	Output value1(113)	73177	Output value1(118)
73028	Output value2(103)	73078	Output value2(108)	73128	Output value2(113)	73178	Output value2(118)
73029	Reset SV(103)	73079	Reset SV(108)	73129	Reset SV(113)	73179	Reset SV(118)
73030	END step SV(103)	73080	END step SV(108)	73130	END step SV(113)	73180	END step SV(118)
73031		73081		73131		73181	
73032	Used steps(104)	73082	Used steps(109)	73132	Used steps(114)	73182	Used steps(119)
73033	Patterns for operations, etc. (104)	73083	Patterns for operations, etc.(109)	73133	Patterns for operations, etc.(114)	73183	Patterns for operations, etc.(119)
73034	PTN SETTING TYPE, etc. (104)	73084	PTN SETTING TYPE, etc.(109)	73134	PTN SETTING TYPE (114)	73184	PTN SETTING TYPE, etc.(119)
73035		73085		73135		73185	
73036	Start SV(104)	73086	Start SV(109)	73136	Start SV(114)	73186	Start SV(119)
73037	Output value1(104)	73087	Output value1(109)	73137	Output value1(114)	73187	Output value1(119)
73038	Output value2(104)	73088	Output value2(109)	73138	Output value2(114)	73188	Output value2(119)
73039	Reset SV(104)	73089	Reset SV(109)	73139	Reset SV(114)	73189	Reset SV(119)
73040	END step SV(104)	73090	END step SV(109)	73140	END step SV(114)	73190	END step SV(119)
73041		73091		73141		73191	
73042	Used steps(105)	73092	Used steps(110)	73142	Used steps(115)	73192	Used steps(120)
73043	Patterns for operations, etc. (105)	73093	Patterns for operations, etc.(110)	73143	Patterns for operations, etc.(115)	73193	Patterns for operations, etc.(120)
73044	PTN SETTING TYPE, etc. (105)	73094	PTN SETTING TYPE, etc.(110)	73144	PTN SETTING TYPE, etc.(115)	73194	PTN SETTING TYPE, etc.(120)
73045		73095		73145		73195	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73046	Start SV(105)	73096	Start SV(110)	73146	Start SV(115)	73196	Start SV(120)
73047	Output value1(105)	73097	Output value1(110)	73147	Output value1(115)	73197	Output value1(120)
73048	Output value2(105)	73098	Output value2(110)	73148	Output value2(115)	73198	Output value2(120)
73049	Reset SV(105)	73099	Reset SV(110)	73149	Reset SV(115)	73199	Reset SV(120)
73050	END step SV(105)	73100	END step SV(110)	73150	END step SV(115)	73200	END step SV(120)

**Pattern setup value (73201 - 73400)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73201		73251		73301		73351	
73202	Used steps(121)	73252	Used steps(126)	73302	Used steps(131)	73352	Used steps(136)
73203	Patterns for operations, etc. (121)	73253	Patterns for operations, etc.(126)	73303	Patterns for operations, etc.(131)	73353	Patterns for operations, etc.(136)
73204	PTN SETTING TYPE, etc. (121)	73254	PTN SETTING TYPE, etc.(126)	73304	PTN SETTING TYPE, etc.(131)	73354	PTN SETTING TYPE, etc.(136)
73205		73255		73305		73355	
73206	Start SV(121)	73256	Start SV(126)	73306	Start SV(131)	73356	Start SV(136)
73207	Output value1(121)	73257	Output value1(126)	73307	Output value1(131)	73357	Output value1(136)
73208	Output value2(121)	73258	Output value2(126)	73308	Output value2(131)	73358	Output value2(136)
73209	Reset SV(121)	73259	Reset SV(126)	73309	Reset SV(131)	73359	Reset SV(136)
73210	END step SV(121)	73260	END step SV(126)	73310	END step SV(131)	73360	END step SV(136)
73211		73261		73311		73361	
73212	Used steps(122)	73262	Used steps(127)	73312	Used steps(132)	73362	Used steps(137)
73213	Patterns for operations, etc. (122)	73263	Patterns for operations, etc.(127)	73313	Patterns for operations, etc.(132)	73363	Patterns for operations, etc.(137)
73214	PTN SETTING TYPE, etc. (122)	73264	PTN SETTING TYPE, etc.(127)	73314	PTN SETTING TYPE, etc.(132)	73364	PTN SETTING TYPE, etc.(137)
73215		73265		73315		73365	
73216	Start SV(122)	73266	Start SV(127)	73316	Start SV(132)	73366	Start SV(137)
73217	Output value1(122)	73267	Output value1(127)	73317	Output value1(132)	73367	Output value1(137)
73218	Output value2(122)	73268	Output value2(127)	73318	Output value2(132)	73368	Output value2(137)
73219	Reset SV(122)	73269	Reset SV(127)	73319	Reset SV(132)	73369	Reset SV(137)
73220	END step SV(122)	73270	END step SV(127)	73320	END step SV(132)	73370	END step SV(137)
73221		73271		73321		73371	
73222	Used steps(123)	73272	Used steps(128)	73322	Used steps(133)	73372	Used steps(138)
73223	Patterns for operations, etc. (123)	73273	Patterns for operations, etc.(128)	73323	Patterns for operations, etc.(133)	73373	Patterns for operations, etc.(138)
73224	PTN SETTING TYPE, etc. (123)	73274	PTN SETTING TYPE, etc.(128)	73324	PTN SETTING TYPE, etc.(133)	73374	PTN SETTING TYPE, etc.(138)
73225		73275		73325		73375	
73226	Start SV(123)	73276	Start SV(128)	73326	Start SV(133)	73376	Start SV(138)
73227	Output value1(123)	73277	Output value1(128)	73327	Output value1(133)	73377	Output value1(138)
73228	Output value2(123)	73278	Output value2(128)	73328	Output value2(133)	73378	Output value2(138)
73229	Reset SV(123)	73279	Reset SV(128)	73329	Reset SV(133)	73379	Reset SV(138)
73230	END step SV(123)	73280	END step SV(128)	73330	END step SV(133)	73380	END step SV(138)
73231		73281		73331		73381	
73232	Used steps(124)	73282	Used steps(129)	73332	Used steps(134)	73382	Used steps(139)
73233	Patterns for operations, etc. (124)	73283	Patterns for operations, etc.(129)	73333	Patterns for operations, etc.(134)	73383	Patterns for operations, etc.(139)
73234	PTN SETTING TYPE, etc. (124)	73284	PTN SETTING TYPE, etc.(129)	73334	PTN SETTING TYPE, etc.(134)	73384	PTN SETTING TYPE, etc.(139)
73235		73285		73335		73385	
73236	Start SV(124)	73286	Start SV(129)	73336	Start SV(134)	73386	Start SV(139)
73237	Output value1(124)	73287	Output value1(129)	73337	Output value1(134)	73387	Output value1(139)
73238	Output value2(124)	73288	Output value2(129)	73338	Output value2(134)	73388	Output value2(139)
73239	Reset SV(124)	73289	Reset SV(129)	73339	Reset SV(134)	73389	Reset SV(139)
73240	END step SV(124)	73290	END step SV(129)	73340	END step SV(134)	73390	END step SV(139)
73241		73291		73341		73391	
73242	Used steps(125)	73292	Used steps(130)	73342	Used steps(135)	73392	Used steps(140)
73243	Patterns for operations, etc. (125)	73293	Patterns for operations, etc.(130)	73343	Patterns for operations, etc.(135)	73393	Patterns for operations, etc.(140)
73244	PTN SETTING TYPE, etc. (125)	73294	PTN SETTING TYPE, etc.(130)	73344	PTN SETTING TYPE, etc.(135)	73394	PTN SETTING TYPE, etc.(140)
73245		73295		73345		73395	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73246	Start SV(125)	73296	Start SV(130)	73346	Start SV(135)	73396	Start SV(140)
73247	Output value1(125)	73297	Output value1(130)	73347	Output value1(135)	73397	Output value1(140)
73248	Output value2(125)	73298	Output value2(130)	73348	Output value2(135)	73398	Output value2(140)
73249	Reset SV(125)	73299	Reset SV(130)	73349	Reset SV(135)	73399	Reset SV(140)
73250	END step SV(125)	73300	END step SV(130)	73350	END step SV(135)	73400	END step SV(140)

**Pattern setup value (73401 - 73600)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73401		73451		73501		73551	
73402	Used steps(141)	73452	Used steps(146)	73502	Used steps(151)	73552	Used steps(156)
73403	Patterns for operations, etc. (141)	73453	Patterns for operations, etc.(146)	73503	Patterns for operations, etc.(151)	73553	Patterns for operations, etc.(156)
73404	PTN SETTING TYPE, etc. (141)	73454	PTN SETTING TYPE, etc.(146)	73504	PTN SETTING TYPE, etc.(151)	73554	PTN SETTING TYPE, etc.(156)
73405		73455		73505		73555	
73406	Start SV(141)	73456	Start SV(146)	73506	Start SV(151)	73556	Start SV(156)
73407	Output value1(141)	73457	Output value1(146)	73507	Output value1(151)	73557	Output value1(156)
73408	Output value2(141)	73458	Output value2(146)	73508	Output value2(151)	73558	Output value2(156)
73409	Reset SV(141)	73459	Reset SV(146)	73509	Reset SV(151)	73559	Reset SV(156)
73410	END step SV(141)	73460	END step SV(146)	73510	END step SV(151)	73560	END step SV(156)
73411		73461		73511		73561	
73412	Used steps(142)	73462	Used steps(147)	73512	Used steps(152)	73562	Used steps(157)
73413	Patterns for operations, etc. (142)	73463	Patterns for operations, etc.(147)	73513	Patterns for operations, etc.(152)	73563	Patterns for operations, etc.(157)
73414	PTN SETTING TYPE, etc. (142)	73464	PTN SETTING TYPE, etc.(147)	73514	PTN SETTING TYPE, etc.(152)	73564	PTN SETTING TYPE, etc.(157)
73415		73465		73515		73565	
73416	Start SV(142)	73466	Start SV(147)	73516	Start SV(152)	73566	Start SV(157)
73417	Output value1(142)	73467	Output value1(147)	73517	Output value1(152)	73567	Output value1(157)
73418	Output value2(142)	73468	Output value2(147)	73518	Output value2(152)	73568	Output value2(157)
73419	Reset SV(142)	73469	Reset SV(147)	73519	Reset SV(152)	73569	Reset SV(157)
73420	END step SV(142)	73470	END step SV(147)	73520	END step SV(152)	73570	END step SV(157)
73421		73471		73521		73571	
73422	Used steps(143)	73472	Used steps(148)	73522	Used steps(153)	73572	Used steps(158)
73423	Patterns for operations, etc. (143)	73473	Patterns for operations, etc.(148)	73523	Patterns for operations, etc.(153)	73573	Patterns for operations, etc.(158)
73424	PTN SETTING TYPE, etc. (143)	73474	PTN SETTING TYPE, etc.(148)	73524	PTN SETTING TYPE, etc.(153)	73574	PTN SETTING TYPE, etc.(158)
73425		73475		73525		73575	
73426	Start SV(143)	73476	Start SV(148)	73526	Start SV(153)	73576	Start SV(158)
73427	Output value1(143)	73477	Output value1(148)	73527	Output value1(153)	73577	Output value1(158)
73428	Output value2(143)	73478	Output value2(148)	73528	Output value2(153)	73578	Output value2(158)
73429	Reset SV(143)	73479	Reset SV(148)	73529	Reset SV(153)	73579	Reset SV(158)
73430	END step SV(143)	73480	END step SV(148)	73530	END step SV(153)	73580	END step SV(158)
73431		73481		73531		73581	
73432	Used steps(144)	73482	Used steps(149)	73532	Used steps(154)	73582	Used steps(159)
73433	Patterns for operations, etc. (144)	73483	Patterns for operations, etc.(149)	73533	Patterns for operations, etc.(154)	73583	Patterns for operations, etc.(159)
73434	PTN SETTING TYPE, etc. (144)	73484	PTN SETTING TYPE, etc.(149)	73534	PTN SETTING TYPE, etc.(154)	73584	PTN SETTING TYPE, etc.(159)
73435		73485		73535		73585	
73436	Start SV(144)	73486	Start SV(149)	73536	Start SV(154)	73586	Start SV(159)
73437	Output value1(144)	73487	Output value1(149)	73537	Output value1(154)	73587	Output value1(159)
73438	Output value2(144)	73488	Output value2(149)	73538	Output value2(154)	73588	Output value2(159)
73439	Reset SV(144)	73489	Reset SV(149)	73539	Reset SV(154)	73589	Reset SV(159)
73440	END step SV(144)	73490	END step SV(149)	73540	END step SV(154)	73590	END step SV(159)
73441		73491		73541		73591	
73442	Used steps(145)	73492	Used steps(150)	73542	Used steps(155)	73592	Used steps(160)
73443	Patterns for operations, etc. (145)	73493	Patterns for operations, etc.(150)	73543	Patterns for operations, etc.(155)	73593	Patterns for operations, etc.(160)
73444	PTN SETTING TYPE, etc. (145)	73494	PTN SETTING TYPE, etc.(150)	73544	PTN SETTING TYPE, etc.(155)	73594	PTN SETTING TYPE, etc.(160)
73445		73495		73545		73595	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73446	Start SV(145)	73496	Start SV(150)	73546	Start SV(155)	73596	Start SV(160)
73447	Output value1(145)	73497	Output value1(150)	73547	Output value1(155)	73597	Output value1(160)
73448	Output value2(145)	73498	Output value2(150)	73548	Output value2(155)	73598	Output value2(160)
73449	Reset SV(145)	73499	Reset SV(150)	73549	Reset SV(155)	73599	Reset SV(160)
73450	END step SV(145)	73500	END step SV(150)	73550	END step SV(155)	73600	END step SV(160)



**Pattern setup value (73601 - 73800)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73601		73651		73701		73751	
73602	Used steps(161)	73652	Used steps(166)	73702	Used steps(171)	73752	Used steps(176)
73603	Patterns for operations, etc. (161)	73653	Patterns for operations, etc.(166)	73703	Patterns for operations, etc.(171)	73753	Patterns for operations, etc.(176)
73604	PTN SETTING TYPE, etc. (161)	73654	PTN SETTING TYPE, etc.(166)	73704	PTN SETTING TYPE, etc.(171)	73754	PTN SETTING TYPE, etc.(176)
73605		73655		73705		73755	
73606	Start SV(161)	73656	Start SV(166)	73706	Start SV(171)	73756	Start SV(176)
73607	Output value1(161)	73657	Output value1(166)	73707	Output value1(171)	73757	Output value1(176)
73608	Output value2(161)	73658	Output value2(166)	73708	Output value2(171)	73758	Output value2(176)
73609	Reset SV(161)	73659	Reset SV(166)	73709	Reset SV(171)	73759	Reset SV(176)
73610	END step SV(161)	73660	END step SV(166)	73710	END step SV(171)	73760	END step SV(176)
73611		73661		73711		73761	
73612	Used steps(162)	73662	Used steps(167)	73712	Used steps(172)	73762	Used steps(177)
73613	Patterns for operations, etc. (162)	73663	Patterns for operations, etc.(167)	73713	Patterns for operations, etc.(172)	73763	Patterns for operations, etc.(177)
73614	PTN SETTING TYPE, etc. (162)	73664	PTN SETTING TYPE, etc.(167)	73714	PTN SETTING TYPE, etc.(172)	73764	PTN SETTING TYPE, etc.(177)
73615		73665		73715		73765	
73616	Start SV(162)	73666	Start SV(167)	73716	Start SV(172)	73766	Start SV(177)
73617	Output value1(162)	73667	Output value1(167)	73717	Output value1(172)	73767	Output value1(177)
73618	Output value2(162)	73668	Output value2(167)	73718	Output value2(172)	73768	Output value2(177)
73619	Reset SV(162)	73669	Reset SV(167)	73719	Reset SV(172)	73769	Reset SV(177)
73620	END step SV(162)	73670	END step SV(167)	73720	END step SV(172)	73770	END step SV(177)
73621		73671		73721		73771	
73622	Used steps(163)	73672	Used steps(168)	73722	Used steps(173)	73772	Used steps(178)
73623	Patterns for operations, etc. (163)	73673	Patterns for operations, etc.(168)	73723	Patterns for operations, etc.(173)	73773	Patterns for operations, etc.(178)
73624	PTN SETTING TYPE, etc. (163)	73674	PTN SETTING TYPE, etc.(168)	73724	PTN SETTING TYPE, etc.(173)	73774	PTN SETTING TYPE, etc.(178)
73625		73675		73725		73775	
73626	Start SV(163)	73676	Start SV(168)	73726	Start SV(173)	73776	Start SV(178)
73627	Output value1(163)	73677	Output value1(168)	73727	Output value1(173)	73777	Output value1(178)
73628	Output value2(163)	73678	Output value2(168)	73728	Output value2(173)	73778	Output value2(178)
73629	Reset SV(163)	73679	Reset SV(168)	73729	Reset SV(173)	73779	Reset SV(178)
73630	END step SV(163)	73680	END step SV(168)	73730	END step SV(173)	73780	END step SV(178)
73631		73681		73731		73781	
73632	Used steps(164)	73682	Used steps(169)	73732	Used steps(174)	73782	Used steps(179)
73633	Patterns for operations, etc. (164)	73683	Patterns for operations, etc.(169)	73733	Patterns for operations, etc.(174)	73783	Patterns for operations, etc.(179)
73634	PTN SETTING TYPE, etc. (164)	73684	PTN SETTING TYPE, etc.(169)	73734	PTN SETTING TYPE, etc.(174)	73784	PTN SETTING TYPE, etc.(179)
73635		73685		73735		73785	
73636	Start SV(164)	73686	Start SV(169)	73736	Start SV(174)	73786	Start SV(179)
73637	Output value1(164)	73687	Output value1(169)	73737	Output value1(174)	73787	Output value1(179)
73638	Output value2(164)	73688	Output value2(169)	73738	Output value2(174)	73788	Output value2(179)
73639	Reset SV(164)	73689	Reset SV(169)	73739	Reset SV(174)	73789	Reset SV(179)
73640	END step SV(164)	73690	END step SV(169)	73740	END step SV(174)	73790	END step SV(179)
73641		73691		73741		73791	
73642	Used steps(165)	73692	Used steps(170)	73742	Used steps(175)	73792	Used steps(180)
73643	Patterns for operations, etc. (165)	73693	Patterns for operations, etc.(170)	73743	Patterns for operations, etc.(175)	73793	Patterns for operations, etc.(180)
73644	PTN SETTING TYPE, etc. (165)	73694	PTN SETTING TYPE, etc.(170)	73744	PTN SETTING TYPE, etc.(175)	73794	PTN SETTING TYPE, etc.(180)
73645		73695		73745		73795	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73646	Start SV(165)	73696	Start SV(170)	73746	Start SV(175)	73796	Start SV(180)
73647	Output value1(165)	73697	Output value1(170)	73747	Output value1(175)	73797	Output value1(180)
73648	Output value2(165)	73698	Output value2(170)	73748	Output value2(175)	73798	Output value2(180)
73649	Reset SV(165)	73699	Reset SV(170)	73749	Reset SV(175)	73799	Reset SV(180)
73650	END step SV(165)	73700	END step SV(170)	73750	END step SV(175)	73800	END step SV(180)

**Pattern setup value (73801 - 74000)**

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73801		73851		73901		73951	
73802	Used steps(181)	73852	Used steps(186)	73902	Used steps(191)	73952	Used steps(196)
73803	Patterns for operations, etc. (181)	73853	Patterns for operations, etc.(186)	73903	Patterns for operations, etc.(191)	73953	Patterns for operations, etc.(196)
73804	PTN SETTING TYPE, etc. (181)	73854	PTN SETTING TYPE, etc.(186)	73904	PTN SETTING TYPE, etc.(191)	73954	PTN SETTING TYPE, etc.(196)
73805		73855		73905		73955	
73806	Start SV(181)	73856	Start SV(186)	73906	Start SV(191)	73956	Start SV(196)
73807	Output value1(181)	73857	Output value1(186)	73907	Output value1(191)	73957	Output value1(196)
73808	Output value2(181)	73858	Output value2(186)	73908	Output value2(191)	73958	Output value2(196)
73809	Reset SV(181)	73859	Reset SV(186)	73909	Reset SV(191)	73959	Reset SV(196)
73810	END step SV(181)	73860	END step SV(186)	73910	END step SV(191)	73960	END step SV(196)
73811		73861		73911		73961	
73812	Used steps(182)	73862	Used steps(187)	73912	Used steps(192)	73962	Used steps(197)
73813	Patterns for operations, etc. (182)	73863	Patterns for operations, etc.(187)	73913	Patterns for operations, etc.(192)	73963	Patterns for operations, etc.(197)
73814	PTN SETTING TYPE, etc. (182)	73864	PTN SETTING TYPE, etc.(187)	73914	PTN SETTING TYPE, etc.(192)	73964	PTN SETTING TYPE, etc.(197)
73815		73865		73915		73965	
73816	Start SV(182)	73866	Start SV(187)	73916	Start SV(192)	73966	Start SV(197)
73817	Output value1(182)	73867	Output value1(187)	73917	Output value1(192)	73967	Output value1(197)
73818	Output value2(182)	73868	Output value2(187)	73918	Output value2(192)	73968	Output value2(197)
73819	Reset SV(182)	73869	Reset SV(187)	73919	Reset SV(192)	73969	Reset SV(197)
73820	END step SV(182)	73870	END step SV(187)	73920	END step SV(192)	73970	END step SV(197)
73821		73871		73921		73971	
73822	Used steps(183)	73872	Used steps(188)	73922	Used steps(193)	73972	Used steps(198)
73823	Patterns for operations, etc. (183)	73873	Patterns for operations, etc.(188)	73923	Patterns for operations, etc.(193)	73973	Patterns for operations, etc.(198)
73824	PTN SETTING TYPE, etc. (183)	73874	PTN SETTING TYPE, etc.(188)	73924	PTN SETTING TYPE, etc.(193)	73974	PTN SETTING TYPE, etc.(198)
73825		73875		73925		73975	
73826	Start SV(183)	73876	Start SV(188)	73926	Start SV(193)	73976	Start SV(198)
73827	Output value1(183)	73877	Output value1(188)	73927	Output value1(193)	73977	Output value1(198)
73828	Output value2(183)	73878	Output value2(188)	73928	Output value2(193)	73978	Output value2(198)
73829	Reset SV(183)	73879	Reset SV(188)	73929	Reset SV(193)	73979	Reset SV(198)
73830	END step SV(183)	73880	END step SV(188)	73930	END step SV(193)	73980	END step SV(198)
73831		73881		73931		73981	
73832	Used steps(184)	73882	Used steps(189)	73932	Used steps(194)	73982	Used steps(199)
73833	Patterns for operations, etc. (184)	73883	Patterns for operations, etc.(189)	73933	Patterns for operations, etc.(194)	73983	Patterns for operations, etc.(199)
73834	PTN SETTING TYPE, etc. (184)	73884	PTN SETTING TYPE, etc.(189)	73934	PTN SETTING TYPE, etc.(194)	73984	PTN SETTING TYPE, etc.(199)
73835		73885		73935		73985	
73836	Start SV(184)	73886	Start SV(189)	73936	Start SV(194)	73986	Start SV(199)
73837	Output value1(184)	73887	Output value1(189)	73937	Output value1(194)	73987	Output value1(199)
73838	Output value2(184)	73888	Output value2(189)	73938	Output value2(194)	73988	Output value2(199)
73839	Reset SV(184)	73889	Reset SV(189)	73939	Reset SV(194)	73989	Reset SV(199)
73840	END step SV(184)	73890	END step SV(189)	73940	END step SV(194)	73990	END step SV(199)
73841		73891		73941		73991	
73842	Used steps(185)	73892	Used steps(190)	73942	Used steps(195)	73992	Used steps(200)
73843	Patterns for operations, etc. (185)	73893	Patterns for operations, etc.(190)	73943	Patterns for operations, etc.(195)	73993	Patterns for operations, etc.(200)
73844	PTN SETTING TYPE, etc. (185)	73894	PTN SETTING TYPE, etc.(190)	73944	PTN SETTING TYPE, etc.(195)	73994	PTN SETTING TYPE, etc.(200)
73845		73895		73945		73995	

Pattern management		Pattern management		Pattern management		Pattern management	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
73846	Start SV(185)	73896	Start SV(190)	73946	Start SV(195)	73996	Start SV(200)
73847	Output value1(185)	73897	Output value1(190)	73947	Output value1(195)	73997	Output value1(200)
73848	Output value2(185)	73898	Output value2(190)	73948	Output value2(195)	73998	Output value2(200)
73849	Reset SV(185)	73899	Reset SV(190)	73949	Reset SV(195)	73999	Reset SV(200)
73850	END step SV(185)	73900	END step SV(190)	73950	END step SV(195)	74000	END step SV(200)

### Pattern setup value (75001 - 75200)

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
75001	Pattern No.	75051	TSNo.21~24(4)	75101	Parameter No.2(8)	75151	Step repeat(11)
75002	Parameter No.1(1)	75052	TSNo.25~28(4)	75102	TSNo.1~4(8)	75152	Step SV(11)
75003	Parameter No.2(1)	75053	Step repeat(4)	75103	TSNo.5~8(8)	75153	Step time(11)
75004	TSNo.1~4(1)	75054	Step SV(4)	75104	TSNo.9~12(8)	75154	Step rate(11)
75005	TSNo.5~8(1)	75055	Step time(4)	75105	TSNo.13~16(8)	75155	Circle step value(11)
75006	TSNo.9~12(1)	75056	Step rate(4)	75106	TSNo.17~20(8)	75156	Parameter No.1(12)
75007	TSNo.13~16(1)	75057	Circle step value(4)	75107	TSNo.21~24(8)	75157	Parameter No.2(12)
75008	TSNo.17~20(1)	75058	Parameter No.1(5)	75108	TSNo.25~28(8)	75158	TSNo.1~4(12)
75009	TSNo.21~24(1)	75059	Parameter No.2(5)	75109	Step repeat(8)	75159	TSNo.5~8(12)
75010	TSNo.25~28(1)	75060	TSNo.1~4(5)	75110	Step SV(8)	75160	TSNo.9~12(12)
75011	Step repeat(1)	75061	TSNo.5~8(5)	75111	Step time(8)	75161	TSNo.13~16(12)
75012	Step SV(1)	75062	TSNo.9~12(5)	75112	Step rate(8)	75162	TSNo.17~20(12)
75013	Step time(1)	75063	TSNo.13~16(5)	75113	Circle step value(8)	75163	TSNo.21~24(12)
75014	Step rate(1)	75064	TSNo.17~20(5)	75114	Parameter No.1(9)	75164	TSNo.25~28(12)
75015	Circle step value(1)	75065	TSNo.21~24(5)	75115	Parameter No.2(9)	75165	Step repeat(12)
75016	Parameter No.1(2)	75066	TSNo.25~28(5)	75116	TSNo.1~4(9)	75166	Step SV(12)
75017	Parameter No.2(2)	75067	Step repeat(5)	75117	TSNo.5~8(9)	75167	Step time(12)
75018	TSNo.1~4(2)	75068	Step SV(5)	75118	TSNo.9~12(9)	75168	Step rate(12)
75019	TSNo.5~8(2)	75069	Step time(5)	75119	TSNo.13~16(9)	75169	Circle step value(12)
75020	TSNo.9~12(2)	75070	Step rate(5)	75120	TSNo.17~20(9)	75170	Parameter No.1(13)
75021	TSNo.13~16(2)	75071	Circle step value(5)	75121	TSNo.21~24(9)	75171	Parameter No.2(13)
75022	TSNo.17~20(2)	75072	Parameter No.1(6)	75122	TSNo.25~28(9)	75172	TSNo.1~4(13)
75023	TSNo.21~24(2)	75073	Parameter No.2(6)	75123	Step repeat(9)	75173	TSNo.5~8(13)
75024	TSNo.25~28(2)	75074	TSNo.1~4(6)	75124	Step SV(9)	75174	TSNo.9~12(13)
75025	Step repeat(2)	75075	TSNo.5~8(6)	75125	Step time(9)	75175	TSNo.13~16(13)
75026	Step SV(2)	75076	TSNo.9~12(6)	75126	Step rate(9)	75176	TSNo.17~20(13)
75027	Step time(2)	75077	TSNo.13~16(6)	75127	Circle step value(9)	75177	TSNo.21~24(13)
75028	Step rate(2)	75078	TSNo.17~20(6)	75128	Parameter No.1(10)	75178	TSNo.25~28(13)
75029	Circle step value(2)	75079	TSNo.21~24(6)	75129	Parameter No.2(10)	75179	Step repeat(13)
75030	Parameter No.1(3)	75080	TSNo.25~28(6)	75130	TSNo.1~4(10)	75180	Step SV(13)
75031	Parameter No.2(3)	75081	Step repeat(6)	75131	TSNo.5~8(10)	75181	Step time(13)
75032	TSNo.1~4(3)	75082	Step SV(6)	75132	TSNo.9~12(10)	75182	Step rate(13)
75033	TSNo.5~8(3)	75083	Step time(6)	75133	TSNo.13~16(10)	75183	Circle step value(13)
75034	TSNo.9~12(3)	75084	Step rate(6)	75134	TSNo.17~20(10)	75184	Parameter No.1(14)
75035	TSNo.13~16(3)	75085	Circle step value(6)	75135	TSNo.21~24(10)	75185	Parameter No.2(14)
75036	TSNo.17~20(3)	75086	Parameter No.1(7)	75136	TSNo.25~28(10)	75186	TSNo.1~4(14)
75037	TSNo.21~24(3)	75087	Parameter No.2(7)	75137	Step repeat(10)	75187	TSNo.5~8(14)
75038	TSNo.25~28(3)	75088	TSNo.1~4(7)	75138	Step SV(10)	75188	TSNo.9~12(14)
75039	Step repeat(3)	75089	TSNo.5~8(7)	75139	Step time(10)	75189	TSNo.13~16(14)
75040	Step SV(3)	75090	TSNo.9~12(7)	75140	Step rate(10)	75190	TSNo.17~20(14)
75041	Step time(3)	75091	TSNo.13~16(7)	75141	Circle step value(10)	75191	TSNo.21~24(14)
75042	Step rate(3)	75092	TSNo.17~20(7)	75142	Parameter No.1(11)	75192	TSNo.25~28(14)
75043	Circle step value(3)	75093	TSNo.21~24(7)	75143	Parameter No.2(11)	75193	Step repeat(14)
75044	Parameter No.1(4)	75094	TSNo.25~28(7)	75144	TSNo.1~4(11)	75194	Step SV(14)
75045	Parameter No.2(4)	75095	Step repeat(7)	75145	TSNo.5~8(11)	75195	Step time(14)
75046	TSNo.1~4(4)	75096	Step SV(7)	75146	TSNo.9~12(11)	75196	Step rate(14)
75047	TSNo.5~8(4)	75097	Step time(7)	75147	TSNo.13~16(11)	75197	Circle step value(14)
75048	TSNo.9~12(4)	75098	Step rate(7)	75148	TSNo.17~20(11)	75198	Parameter No.1(15)
75049	TSNo.13~16(4)	75099	Circle step value(7)	75149	TSNo.21~24(11)	75199	Parameter No.2(15)
75050	TSNo.17~20(4)	75100	Parameter No.1(8)	75150	TSNo.25~28(11)	75200	TSNo.1~4(15)

**Pattern setup value (75201 - 75400)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
75201	TSNo.5~8(15)	75251	Step time(18)	75301	TSNo.13~16(22)	75351	Circle step value(25)
75202	TSNo.9~12(15)	75252	Step rate(18)	75302	TSNo.17~20(22)	75352	Parameter No.1(26)
75203	TSNo.13~16(15)	75253	Circle step value(18)	75303	TSNo.21~24(22)	75353	Parameter No.2(26)
75204	TSNo.17~20(15)	75254	Parameter No.1(19)	75304	TSNo.25~28(22)	75354	TSNo.1~4(26)
75205	TSNo.21~24(15)	75255	Parameter No.2(19)	75305	Step repeat(22)	75355	TSNo.5~8(26)
75206	TSNo.25~28(15)	75256	TSNo.1~4(19)	75306	Step SV(22)	75356	TSNo.9~12(26)
75207	Step repeat(15)	75257	TSNo.5~8(19)	75307	Step time(22)	75357	TSNo.13~16(26)
75208	Step SV(15)	75258	TSNo.9~12(19)	75308	Step rate(22)	75358	TSNo.17~20(26)
75209	Step time(15)	75259	TSNo.13~16(19)	75309	Circle step value(22)	75359	TSNo.21~24(26)
75210	Step rate(15)	75260	TSNo.17~20(19)	75310	Parameter No.1(23)	75360	TSNo.25~28(26)
75211	Circle step value(15)	75261	TSNo.21~24(19)	75311	Parameter No.2(23)	75361	Step repeat(26)
75212	Parameter No.1(16)	75262	TSNo.25~28(19)	75312	TSNo.1~4(23)	75362	Step SV(26)
75213	Parameter No.2(16)	75263	Step repeat(19)	75313	TSNo.5~8(23)	75363	Step time(26)
75214	TSNo.1~4(16)	75264	Step SV(19)	75314	TSNo.9~12(23)	75364	Step rate(26)
75215	TSNo.5~8(16)	75265	Step time(19)	75315	TSNo.13~16(23)	75365	Circle step value(26)
75216	TSNo.9~12(16)	75266	Step rate(19)	75316	TSNo.17~20(23)	75366	Parameter No.1(27)
75217	TSNo.13~16(16)	75267	Circle step value(19)	75317	TSNo.21~24(23)	75367	Parameter No.2(27)
75218	TSNo.17~20(16)	75268	Parameter No.1(20)	75318	TSNo.25~28(23)	75368	TSNo.1~4(27)
75219	TSNo.21~24(16)	75269	Parameter No.2(20)	75319	Step repeat(23)	75369	TSNo.5~8(27)
75220	TSNo.25~28(16)	75270	TSNo.1~4(20)	75320	Step SV(23)	75370	TSNo.9~12(27)
75221	Step repeat(16)	75271	TSNo.5~8(20)	75321	Step time(23)	75371	TSNo.13~16(27)
75222	Step SV(16)	75272	TSNo.9~12(20)	75322	Step rate(23)	75372	TSNo.17~20(27)
75223	Step time(16)	75273	TSNo.13~16(20)	75323	Circle step value(23)	75373	TSNo.21~24(27)
75224	Step rate(16)	75274	TSNo.17~20(20)	75324	Parameter No.1(24)	75374	TSNo.25~28(27)
75225	Circle step value(16)	75275	TSNo.21~24(20)	75325	Parameter No.2(24)	75375	Step repeat(27)
75226	Parameter No.1(17)	75276	TSNo.25~28(20)	75326	TSNo.1~4(24)	75376	Step SV(27)
75227	Parameter No.2(17)	75277	Step repeat(20)	75327	TSNo.5~8(24)	75377	Step time(27)
75228	TSNo.1~4(17)	75278	Step SV(20)	75328	TSNo.9~12(24)	75378	Step rate(27)
75229	TSNo.5~8(17)	75279	Step time(20)	75329	TSNo.13~16(24)	75379	Circle step value(27)
75230	TSNo.9~12(17)	75280	Step rate(20)	75330	TSNo.17~20(24)	75380	Parameter No.1(28)
75231	TSNo.13~16(17)	75281	Circle step value(20)	75331	TSNo.21~24(24)	75381	Parameter No.2(28)
75232	TSNo.17~20(17)	75282	Parameter No.1(21)	75332	TSNo.25~28(24)	75382	TSNo.1~4(28)
75233	TSNo.21~24(17)	75283	Parameter No.2(21)	75333	Step repeat(24)	75383	TSNo.5~8(28)
75234	TSNo.25~28(17)	75284	TSNo.1~4(21)	75334	Step SV(24)	75384	TSNo.9~12(28)
75235	Step repeat(17)	75285	TSNo.5~8(21)	75335	Step time(24)	75385	TSNo.13~16(28)
75236	Step SV(17)	75286	TSNo.9~12(21)	75336	Step rate(24)	75386	TSNo.17~20(28)
75237	Step time(17)	75287	TSNo.13~16(21)	75337	Circle step value(24)	75387	TSNo.21~24(28)
75238	Step rate(17)	75288	TSNo.17~20(21)	75338	Parameter No.1(25)	75388	TSNo.25~28(28)
75239	Circle step value(17)	75289	TSNo.21~24(21)	75339	Parameter No.2(25)	75389	Step repeat(28)
75240	Parameter No.1(18)	75290	TSNo.25~28(21)	75340	TSNo.1~4(25)	75390	Step SV(28)
75241	Parameter No.2(18)	75291	Step repeat(21)	75341	TSNo.5~8(25)	75391	Step time(28)
75242	TSNo.1~4(18)	75292	Step SV(21)	75342	TSNo.9~12(25)	75392	Step rate(28)
75243	TSNo.5~8(18)	75293	Step time(21)	75343	TSNo.13~16(25)	75393	Circle step value(28)
75244	TSNo.9~12(18)	75294	Step rate(21)	75344	TSNo.17~20(25)	75394	Parameter No.1(29)
75245	TSNo.13~16(18)	75295	Circle step value(21)	75345	TSNo.21~24(25)	75395	Parameter No.2(29)
75246	TSNo.17~20(18)	75296	Parameter No.1(22)	75346	TSNo.25~28(25)	75396	TSNo.1~4(29)
75247	TSNo.21~24(18)	75297	Parameter No.2(22)	75347	Step repeat(25)	75397	TSNo.5~8(29)
75248	TSNo.25~28(18)	75298	TSNo.1~4(22)	75348	Step SV(25)	75398	TSNo.9~12(29)
75249	Step repeat(18)	75299	TSNo.5~8(22)	75349	Step time(25)	75399	TSNo.13~16(29)
75250	Step SV(18)	75300	TSNo.9~12(22)	75350	Step rate(25)	75400	TSNo.17~20(29)

**Pattern setup value (75401 - 75600)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
75401	TSNo.21~24(29)	75451	Parameter No.2(33)	75501	Step repeat(36)	75551	TSNo.5~8(40)
75402	TSNo.25~28(29)	75452	TSNo.1~4(33)	75502	Step SV(36)	75552	TSNo.9~12(40)
75403	Step repeat(29)	75453	TSNo.5~8(33)	75503	Step time(36)	75553	TSNo.13~16(40)
75404	Step SV(29)	75454	TSNo.9~12(33)	75504	Step rate(36)	75554	TSNo.17~20(40)
75405	Step time(29)	75455	TSNo.13~16(33)	75505	Circle step value(36)	75555	TSNo.21~24(40)
75406	Step rate(29)	75456	TSNo.17~20(33)	75506	Parameter No.1(37)	75556	TSNo.25~28(40)
75407	Circle step value(29)	75457	TSNo.21~24(33)	75507	Parameter No.2(37)	75557	Step repeat(40)
75408	Parameter No.1(30)	75458	TSNo.25~28(33)	75508	TSNo.1~4(37)	75558	Step SV(40)
75409	Parameter No.2(30)	75459	Step repeat(33)	75509	TSNo.5~8(37)	75559	Step time(40)
75410	TSNo.1~4(30)	75460	Step SV(33)	75510	TSNo.9~12(37)	75560	Step rate(40)
75411	TSNo.5~8(30)	75461	Step time(33)	75511	TSNo.13~16(37)	75561	Circle step value(40)
75412	TSNo.9~12(30)	75462	Step rate(33)	75512	TSNo.17~20(37)	75562	Parameter No.1(41)
75413	TSNo.13~16(30)	75463	Circle step value(33)	75513	TSNo.21~24(37)	75563	Parameter No.2(41)
75414	TSNo.17~20(30)	75464	Parameter No.1(34)	75514	TSNo.25~28(37)	75564	TSNo.1~4(41)
75415	TSNo.21~24(30)	75465	Parameter No.2(34)	75515	Step repeat(37)	75565	TSNo.5~8(41)
75416	TSNo.25~28(30)	75466	TSNo.1~4(34)	75516	Step SV(37)	75566	TSNo.9~12(41)
75417	Step repeat(30)	75467	TSNo.5~8(34)	75517	Step time(37)	75567	TSNo.13~16(41)
75418	Step SV(30)	75468	TSNo.9~12(34)	75518	Step rate(37)	75568	TSNo.17~20(41)
75419	Step time(30)	75469	TSNo.13~16(34)	75519	Circle step value(37)	75569	TSNo.21~24(41)
75420	Step rate(30)	75470	TSNo.17~20(34)	75520	Parameter No.1(38)	75570	TSNo.25~28(41)
75421	Circle step value(30)	75471	TSNo.21~24(34)	75521	Parameter No.2(38)	75571	Step repeat(41)
75422	Parameter No.1(31)	75472	TSNo.25~28(34)	75522	TSNo.1~4(38)	75572	Step SV(41)
75423	Parameter No.2(31)	75473	Step repeat(34)	75523	TSNo.5~8(38)	75573	Step time(41)
75424	TSNo.1~4(31)	75474	Step SV(34)	75524	TSNo.9~12(38)	75574	Step rate(41)
75425	TSNo.5~8(31)	75475	Step time(34)	75525	TSNo.13~16(38)	75575	Circle step value(41)
75426	TSNo.9~12(31)	75476	Step rate(34)	75526	TSNo.17~20(38)	75576	Parameter No.1(42)
75427	TSNo.13~16(31)	75477	Circle step value(34)	75527	TSNo.21~24(38)	75577	Parameter No.2(42)
75428	TSNo.17~20(31)	75478	Parameter No.1(35)	75528	TSNo.25~28(38)	75578	TSNo.1~4(42)
75429	TSNo.21~24(31)	75479	Parameter No.2(35)	75529	Step repeat(38)	75579	TSNo.5~8(42)
75430	TSNo.25~28(31)	75480	TSNo.1~4(35)	75530	Step SV(38)	75580	TSNo.9~12(42)
75431	Step repeat(31)	75481	TSNo.5~8(35)	75531	Step time(38)	75581	TSNo.13~16(42)
75432	Step SV(31)	75482	TSNo.9~12(35)	75532	Step rate(38)	75582	TSNo.17~20(42)
75433	Step time(31)	75483	TSNo.13~16(35)	75533	Circle step value(38)	75583	TSNo.21~24(42)
75434	Step rate(31)	75484	TSNo.17~20(35)	75534	Parameter No.1(39)	75584	TSNo.25~28(42)
75435	Circle step value(31)	75485	TSNo.21~24(35)	75535	Parameter No.2(39)	75585	Step repeat(42)
75436	Parameter No.1(32)	75486	TSNo.25~28(35)	75536	TSNo.1~4(39)	75586	Step SV(42)
75437	Parameter No.2(32)	75487	Step repeat(35)	75537	TSNo.5~8(39)	75587	Step time(42)
75438	TSNo.1~4(32)	75488	Step SV(35)	75538	TSNo.9~12(39)	75588	Step rate(42)
75439	TSNo.5~8(32)	75489	Step time(35)	75539	TSNo.13~16(39)	75589	Circle step value(42)
75440	TSNo.9~12(32)	75490	Step rate(35)	75540	TSNo.17~20(39)	75590	Parameter No.1(43)
75441	TSNo.13~16(32)	75491	Circle step value(35)	75541	TSNo.21~24(39)	75591	Parameter No.2(43)
75442	TSNo.17~20(32)	75492	Parameter No.1(36)	75542	TSNo.25~28(39)	75592	TSNo.1~4(43)
75443	TSNo.21~24(32)	75493	Parameter No.2(36)	75543	Step repeat(39)	75593	TSNo.5~8(43)
75444	TSNo.25~28(32)	75494	TSNo.1~4(36)	75544	Step SV(39)	75594	TSNo.9~12(43)
75445	Step repeat(32)	75495	TSNo.5~8(36)	75545	Step time(39)	75595	TSNo.13~16(43)
75446	Step SV(32)	75496	TSNo.9~12(36)	75546	Step rate(39)	75596	TSNo.17~20(43)
75447	Step time(32)	75497	TSNo.13~16(36)	75547	Circle step value(39)	75597	TSNo.21~24(43)
75448	Step rate(32)	75498	TSNo.17~20(36)	75548	Parameter No.1(40)	75598	TSNo.25~28(43)
75449	Circle step value(32)	75499	TSNo.21~24(36)	75549	Parameter No.2(40)	75599	Step repeat(43)
75450	Parameter No.1(33)	75500	TSNo.25~28(36)	75550	TSNo.1~4(40)	75600	Step SV(43)

**Pattern setup value (75601 - 75800)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
75601	Step time(43)	75651	TSNo.13~16(47)	75701	Circle step value(50)	75751	TSNo.21~24(54)
75602	Step rate(43)	75652	TSNo.17~20(47)	75702	Parameter No.1(51)	75752	TSNo.25~28(54)
75603	Circle step value(43)	75653	TSNo.21~24(47)	75703	Parameter No.2(51)	75753	Step repeat(54)
75604	Parameter No.1(44)	75654	TSNo.25~28(47)	75704	TSNo.1~4(51)	75754	Step SV(54)
75605	Parameter No.2(44)	75655	Step repeat(47)	75705	TSNo.5~8(51)	75755	Step time(54)
75606	TSNo.1~4(44)	75656	Step SV(47)	75706	TSNo.9~12(51)	75756	Step rate(54)
75607	TSNo.5~8(44)	75657	Step time(47)	75707	TSNo.13~16(51)	75757	Circle step value(54)
75608	TSNo.9~12(44)	75658	Step rate(47)	75708	TSNo.17~20(51)	75758	Parameter No.1(55)
75609	TSNo.13~16(44)	75659	Circle step value(47)	75709	TSNo.21~24(51)	75759	Parameter No.2(55)
75610	TSNo.17~20(44)	75660	Parameter No.1(48)	75710	TSNo.25~28(51)	75760	TSNo.1~4(55)
75611	TSNo.21~24(44)	75661	Parameter No.2(48)	75711	Step repeat(51)	75761	TSNo.5~8(55)
75612	TSNo.25~28(44)	75662	TSNo.1~4(48)	75712	Step SV(51)	75762	TSNo.9~12(55)
75613	Step repeat(44)	75663	TSNo.5~8(48)	75713	Step time(51)	75763	TSNo.13~16(55)
75614	Step SV(44)	75664	TSNo.9~12(48)	75714	Step rate(51)	75764	TSNo.17~20(55)
75615	Step time(44)	75665	TSNo.13~16(48)	75715	Circle step value(51)	75765	TSNo.21~24(55)
75616	Step rate(44)	75666	TSNo.17~20(48)	75716	Parameter No.1(52)	75766	TSNo.25~28(55)
75617	Circle step value(44)	75667	TSNo.21~24(48)	75717	Parameter No.2(52)	75767	Step repeat(55)
75618	Parameter No.1(45)	75668	TSNo.25~28(48)	75718	TSNo.1~4(52)	75768	Step SV(55)
75619	Parameter No.2(45)	75669	Step repeat(48)	75719	TSNo.5~8(52)	75769	Step time(55)
75620	TSNo.1~4(45)	75670	Step SV(48)	75720	TSNo.9~12(52)	75770	Step rate(55)
75621	TSNo.5~8(45)	75671	Step time(48)	75721	TSNo.13~16(52)	75771	Circle step value(55)
75622	TSNo.9~12(45)	75672	Step rate(48)	75722	TSNo.17~20(52)	75772	Parameter No.1(56)
75623	TSNo.13~16(45)	75673	Circle step value(48)	75723	TSNo.21~24(52)	75773	Parameter No.2(56)
75624	TSNo.17~20(45)	75674	Parameter No.1(49)	75724	TSNo.25~28(52)	75774	TSNo.1~4(56)
75625	TSNo.21~24(45)	75675	Parameter No.2(49)	75725	Step repeat(52)	75775	TSNo.5~8(56)
75626	TSNo.25~28(45)	75676	TSNo.1~4(49)	75726	Step SV(52)	75776	TSNo.9~12(56)
75627	Step repeat(45)	75677	TSNo.5~8(49)	75727	Step time(52)	75777	TSNo.13~16(56)
75628	Step SV(45)	75678	TSNo.9~12(49)	75728	Step rate(52)	75778	TSNo.17~20(56)
75629	Step time(45)	75679	TSNo.13~16(49)	75729	Circle step value(52)	75779	TSNo.21~24(56)
75630	Step rate(45)	75680	TSNo.17~20(49)	75730	Parameter No.1(53)	75780	TSNo.25~28(56)
75631	Circle step value(45)	75681	TSNo.21~24(49)	75731	Parameter No.2(53)	75781	Step repeat(56)
75632	Parameter No.1(46)	75682	TSNo.25~28(49)	75732	TSNo.1~4(53)	75782	Step SV(56)
75633	Parameter No.2(46)	75683	Step repeat(49)	75733	TSNo.5~8(53)	75783	Step time(56)
75634	TSNo.1~4(46)	75684	Step SV(49)	75734	TSNo.9~12(53)	75784	Step rate(56)
75635	TSNo.5~8(46)	75685	Step time(49)	75735	TSNo.13~16(53)	75785	Circle step value(56)
75636	TSNo.9~12(46)	75686	Step rate(49)	75736	TSNo.17~20(53)	75786	Parameter No.1(57)
75637	TSNo.13~16(46)	75687	Circle step value(49)	75737	TSNo.21~24(53)	75787	Parameter No.2(57)
75638	TSNo.17~20(46)	75688	Parameter No.1(50)	75738	TSNo.25~28(53)	75788	TSNo.1~4(57)
75639	TSNo.21~24(46)	75689	Parameter No.2(50)	75739	Step repeat(53)	75789	TSNo.5~8(57)
75640	TSNo.25~28(46)	75690	TSNo.1~4(50)	75740	Step SV(53)	75790	TSNo.9~12(57)
75641	Step repeat(46)	75691	TSNo.5~8(50)	75741	Step time(53)	75791	TSNo.13~16(57)
75642	Step SV(46)	75692	TSNo.9~12(50)	75742	Step rate(53)	75792	TSNo.17~20(57)
75643	Step time(46)	75693	TSNo.13~16(50)	75743	Circle step value(53)	75793	TSNo.21~24(57)
75644	Step rate(46)	75694	TSNo.17~20(50)	75744	Parameter No.1(54)	75794	TSNo.25~28(57)
75645	Circle step value(46)	75695	TSNo.21~24(50)	75745	Parameter No.2(54)	75795	Step repeat(57)
75646	Parameter No.1(47)	75696	TSNo.25~28(50)	75746	TSNo.1~4(54)	75796	Step SV(57)
75647	Parameter No.2(47)	75697	Step repeat(50)	75747	TSNo.5~8(54)	75797	Step time(57)
75648	TSNo.1~4(47)	75698	Step SV(50)	75748	TSNo.9~12(54)	75798	Step rate(57)
75649	TSNo.5~8(47)	75699	Step time(50)	75749	TSNo.13~16(54)	75799	Circle step value(57)
75650	TSNo.9~12(47)	75700	Step rate(50)	75750	TSNo.17~20(54)	75800	Parameter No.1(58)



**Pattern setup value (75801 - 76000)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
75801	Parameter No.2(58)	75851	Step repeat(61)	75901	TSNo.5~8(65)	75951	Step time(68)
75802	TSNo.1~4(58)	75852	Step SV(61)	75902	TSNo.9~12(65)	75952	Step rate(68)
75803	TSNo.5~8(58)	75853	Step time(61)	75903	TSNo.13~16(65)	75953	Circle step value(68)
75804	TSNo.9~12(58)	75854	Step rate(61)	75904	TSNo.17~20(65)	75954	Parameter No.1(69)
75805	TSNo.13~16(58)	75855	Circle step value(61)	75905	TSNo.21~24(65)	75955	Parameter No.2(69)
75806	TSNo.17~20(58)	75856	Parameter No.1(62)	75906	TSNo.25~28(65)	75956	TSNo.1~4(69)
75807	TSNo.21~24(58)	75857	Parameter No.2(62)	75907	Step repeat(65)	75957	TSNo.5~8(69)
75808	TSNo.25~28(58)	75858	TSNo.1~4(62)	75908	Step SV(65)	75958	TSNo.9~12(69)
75809	Step repeat(58)	75859	TSNo.5~8(62)	75909	Step time(65)	75959	TSNo.13~16(69)
75810	Step SV(58)	75860	TSNo.9~12(62)	75910	Step rate(65)	75960	TSNo.17~20(69)
75811	Step time(58)	75861	TSNo.13~16(62)	75911	Circle step value(65)	75961	TSNo.21~24(69)
75812	Step rate(58)	75862	TSNo.17~20(62)	75912	Parameter No.1(66)	75962	TSNo.25~28(69)
75813	Circle step value(58)	75863	TSNo.21~24(62)	75913	Parameter No.2(66)	75963	Step repeat(69)
75814	Parameter No.1(59)	75864	TSNo.25~28(62)	75914	TSNo.1~4(66)	75964	Step SV(69)
75815	Parameter No.2(59)	75865	Step repeat(62)	75915	TSNo.5~8(66)	75965	Step time(69)
75816	TSNo.1~4(59)	75866	Step SV(62)	75916	TSNo.9~12(66)	75966	Step rate(69)
75817	TSNo.5~8(59)	75867	Step time(62)	75917	TSNo.13~16(66)	75967	Circle step value(69)
75818	TSNo.9~12(59)	75868	Step rate(62)	75918	TSNo.17~20(66)	75968	Parameter No.1(70)
75819	TSNo.13~16(59)	75869	Circle step value(62)	75919	TSNo.21~24(66)	75969	Parameter No.2(70)
75820	TSNo.17~20(59)	75870	Parameter No.1(63)	75920	TSNo.25~28(66)	75970	TSNo.1~4(70)
75821	TSNo.21~24(59)	75871	Parameter No.2(63)	75921	Step repeat(66)	75971	TSNo.5~8(70)
75822	TSNo.25~28(59)	75872	TSNo.1~4(63)	75922	Step SV(66)	75972	TSNo.9~12(70)
75823	Step repeat(59)	75873	TSNo.5~8(63)	75923	Step time(66)	75973	TSNo.13~16(70)
75824	Step SV(59)	75874	TSNo.9~12(63)	75924	Step rate(66)	75974	TSNo.17~20(70)
75825	Step time(59)	75875	TSNo.13~16(63)	75925	Circle step value(66)	75975	TSNo.21~24(70)
75826	Step rate(59)	75876	TSNo.17~20(63)	75926	Parameter No.1(67)	75976	TSNo.25~28(70)
75827	Circle step value(59)	75877	TSNo.21~24(63)	75927	Parameter No.2(67)	75977	Step repeat(70)
75828	Parameter No.1(60)	75878	TSNo.25~28(63)	75928	TSNo.1~4(67)	75978	Step SV(70)
75829	Parameter No.2(60)	75879	Step repeat(63)	75929	TSNo.5~8(67)	75979	Step time(70)
75830	TSNo.1~4(60)	75880	Step SV(63)	75930	TSNo.9~12(67)	75980	Step rate(70)
75831	TSNo.5~8(60)	75881	Step time(63)	75931	TSNo.13~16(67)	75981	Circle step value(70)
75832	TSNo.9~12(60)	75882	Step rate(63)	75932	TSNo.17~20(67)	75982	Parameter No.1(71)
75833	TSNo.13~16(60)	75883	Circle step value(63)	75933	TSNo.21~24(67)	75983	Parameter No.2(71)
75834	TSNo.17~20(60)	75884	Parameter No.1(64)	75934	TSNo.25~28(67)	75984	TSNo.1~4(71)
75835	TSNo.21~24(60)	75885	Parameter No.2(64)	75935	Step repeat(67)	75985	TSNo.5~8(71)
75836	TSNo.25~28(60)	75886	TSNo.1~4(64)	75936	Step SV(67)	75986	TSNo.9~12(71)
75837	Step repeat(60)	75887	TSNo.5~8(64)	75937	Step time(67)	75987	TSNo.13~16(71)
75838	Step SV(60)	75888	TSNo.9~12(64)	75938	Step rate(67)	75988	TSNo.17~20(71)
75839	Step time(60)	75889	TSNo.13~16(64)	75939	Circle step value(67)	75989	TSNo.21~24(71)
75840	Step rate(60)	75890	TSNo.17~20(64)	75940	Parameter No.1(68)	75990	TSNo.25~28(71)
75841	Circle step value(60)	75891	TSNo.21~24(64)	75941	Parameter No.2(68)	75991	Step repeat(71)
75842	Parameter No.1(61)	75892	TSNo.25~28(64)	75942	TSNo.1~4(68)	75992	Step SV(71)
75843	Parameter No.2(61)	75893	Step repeat(64)	75943	TSNo.5~8(68)	75993	Step time(71)
75844	TSNo.1~4(61)	75894	Step SV(64)	75944	TSNo.9~12(68)	75994	Step rate(71)
75845	TSNo.5~8(61)	75895	Step time(64)	75945	TSNo.13~16(68)	75995	Circle step value(71)
75846	TSNo.9~12(61)	75896	Step rate(64)	75946	TSNo.17~20(68)	75996	Parameter No.1(72)
75847	TSNo.13~16(61)	75897	Circle step value(64)	75947	TSNo.21~24(68)	75997	Parameter No.2(72)
75848	TSNo.17~20(61)	75898	Parameter No.1(65)	75948	TSNo.25~28(68)	75998	TSNo.1~4(72)
75849	TSNo.21~24(61)	75899	Parameter No.2(65)	75949	Step repeat(68)	75999	TSNo.5~8(72)
75850	TSNo.25~28(61)	75900	TSNo.1~4(65)	75950	Step SV(68)	76000	TSNo.9~12(72)

**Pattern setup value (76001 - 76200)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
76001	TSNo.13~16(72)	76051	Circle step value(75)	76101	TSNo.21~24(79)	76151	Parameter No.2(83)
76002	TSNo.17~20(72)	76052	Parameter No.1(76)	76102	TSNo.25~28(79)	76152	TSNo.1~4(83)
76003	TSNo.21~24(72)	76053	Parameter No.2(76)	76103	Step repeat(79)	76153	TSNo.5~8(83)
76004	TSNo.25~28(72)	76054	TSNo.1~4(76)	76104	Step SV(79)	76154	TSNo.9~12(83)
76005	Step repeat(72)	76055	TSNo.5~8(76)	76105	Step time(79)	76155	TSNo.13~16(83)
76006	Step SV(72)	76056	TSNo.9~12(76)	76106	Step rate(79)	76156	TSNo.17~20(83)
76007	Step time(72)	76057	TSNo.13~16(76)	76107	Circle step value(79)	76157	TSNo.21~24(83)
76008	Step rate(72)	76058	TSNo.17~20(76)	76108	Parameter No.1(80)	76158	TSNo.25~28(83)
76009	Circle step value(72)	76059	TSNo.21~24(76)	76109	Parameter No.2(80)	76159	Step repeat(83)
76010	Parameter No.1(73)	76060	TSNo.25~28(76)	76110	TSNo.1~4(80)	76160	Step SV(83)
76011	Parameter No.2(73)	76061	Step repeat(76)	76111	TSNo.5~8(80)	76161	Step time(83)
76012	TSNo.1~4(73)	76062	Step SV(76)	76112	TSNo.9~12(80)	76162	Step rate(83)
76013	TSNo.5~8(73)	76063	Step time(76)	75913	TSNo.13~16(80)	76163	Circle step value(83)
76014	TSNo.9~12(73)	76064	Step rate(76)	76114	TSNo.17~20(80)	76164	Parameter No.1(84)
76015	TSNo.13~16(73)	76065	Circle step value(76)	76115	TSNo.21~24(80)	76165	Parameter No.2(84)
76016	TSNo.17~20(73)	76066	Parameter No.1(77)	76116	TSNo.25~28(80)	76166	TSNo.1~4(84)
76017	TSNo.21~24(73)	76067	Parameter No.2(77)	76117	Step repeat(80)	76167	TSNo.5~8(84)
76018	TSNo.25~28(73)	76068	TSNo.1~4(77)	76118	Step SV(80)	76168	TSNo.9~12(84)
76019	Step repeat(73)	76069	TSNo.5~8(77)	76119	Step time(80)	76169	TSNo.13~16(84)
76020	Step SV(73)	76070	TSNo.9~12(77)	76120	Step rate(80)	76170	TSNo.17~20(84)
76021	Step time(73)	76071	TSNo.13~16(77)	76121	Circle step value(80)	76171	TSNo.21~24(84)
76022	Step rate(73)	76072	TSNo.17~20(77)	76122	Parameter No.1(81)	76172	TSNo.25~28(84)
76023	Circle step value(73)	76073	TSNo.21~24(77)	76123	Parameter No.2(81)	76173	Step repeat(84)
76024	Parameter No.1(74)	76074	TSNo.25~28(77)	76124	TSNo.1~4(81)	76174	Step SV(84)
76025	Parameter No.2(74)	76075	Step repeat(77)	76125	TSNo.5~8(81)	76175	Step time(84)
76026	TSNo.1~4(74)	76076	Step SV(77)	76126	TSNo.9~12(81)	76176	Step rate(84)
76027	TSNo.5~8(74)	76077	Step time(77)	76127	TSNo.13~16(81)	76177	Circle step value(84)
76028	TSNo.9~12(74)	76078	Step rate(77)	76128	TSNo.17~20(81)	76178	Parameter No.1(85)
76029	TSNo.13~16(74)	76079	Circle step value(77)	76129	TSNo.21~24(81)	76179	Parameter No.2(85)
76030	TSNo.17~20(74)	76080	Parameter No.1(78)	76130	TSNo.25~28(81)	76180	TSNo.1~4(85)
76031	TSNo.21~24(74)	76081	Parameter No.2(78)	76131	Step repeat(81)	76181	TSNo.5~8(85)
76032	TSNo.25~28(74)	76082	TSNo.1~4(78)	76132	Step SV(81)	76182	TSNo.9~12(85)
76033	Step repeat(74)	76083	TSNo.5~8(78)	76133	Step time(81)	76183	TSNo.13~16(85)
76034	Step SV(74)	76084	TSNo.9~12(78)	76134	Step rate(81)	76184	TSNo.17~20(85)
76035	Step time(74)	76085	TSNo.13~16(78)	76135	Circle step value(81)	76185	TSNo.21~24(85)
76036	Step rate(74)	76086	TSNo.17~20(78)	76136	Parameter No.1(82)	76186	TSNo.25~28(85)
76037	Circle step value(74)	76087	TSNo.21~24(78)	76137	Parameter No.2(82)	76187	Step repeat(85)
76038	Parameter No.1(75)	76088	TSNo.25~28(78)	76138	TSNo.1~4(82)	76188	Step SV(85)
76039	Parameter No.2(75)	76089	Step repeat(78)	76139	TSNo.5~8(82)	76189	Step time(85)
76040	TSNo.1~4(75)	76090	Step SV(78)	76140	TSNo.9~12(82)	76190	Step rate(85)
76041	TSNo.5~8(75)	76091	Step time(78)	76141	TSNo.13~16(82)	76191	Circle step value(85)
76042	TSNo.9~12(75)	76092	Step rate(78)	76142	TSNo.17~20(82)	76192	Parameter No.1(86)
76043	TSNo.13~16(75)	76093	Circle step value(78)	76143	TSNo.21~24(82)	76193	Parameter No.2(86)
76044	TSNo.17~20(75)	76094	Parameter No.1(79)	76144	TSNo.25~28(82)	76194	TSNo.1~4(86)
76045	TSNo.21~24(75)	76095	Parameter No.2(79)	76145	Step repeat(82)	76195	TSNo.5~8(86)
76046	TSNo.25~28(75)	76096	TSNo.1~4(79)	76146	Step SV(82)	76196	TSNo.9~12(86)
76047	Step repeat(75)	76097	TSNo.5~8(79)	76147	Step time(82)	76197	TSNo.13~16(86)
76048	Step SV(75)	76098	TSNo.9~12(79)	76148	Step rate(82)	76198	TSNo.17~20(86)
76049	Step time(75)	76099	TSNo.13~16(79)	76149	Circle step value(82)	76199	TSNo.21~24(86)
76050	Step rate(75)	76100	TSNo.17~20(79)	76150	Parameter No.1(83)	76200	TSNo.25~28(86)

**Pattern setup value (76201 - 76400)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
76201	Step repeat(86)	76251	TSNo.5-8(90)	76301	Step time(93)	76351	TSNo.13-16(97)
76202	Step SV(86)	76252	TSNo.9-12(90)	76302	Step rate(93)	76352	TSNo.17-20(97)
76203	Step time(86)	76253	TSNo.13-16(90)	76303	Circle step value(93)	76353	TSNo.21-24(97)
76204	Step rate(86)	76254	TSNo.17-20(90)	76304	Parameter No.1(94)	76354	TSNo.25-28(97)
76205	Circle step value(86)	76255	TSNo.21-24(90)	76305	Parameter No.2(94)	76355	Step repeat(97)
76206	Parameter No.1(87)	76256	TSNo.25-28(90)	76306	TSNo.1-4(94)	76356	Step SV(97)
76207	Parameter No.2(87)	76257	Step repeat(90)	76307	TSNo.5-8(94)	76357	Step time(97)
76208	TSNo.1-4(87)	76258	Step SV(90)	76308	TSNo.9-12(94)	76358	Step rate(97)
76209	TSNo.5-8(87)	76259	Step time(90)	76309	TSNo.13-16(94)	76359	Circle step value(97)
76210	TSNo.9-12(87)	76260	Step rate(90)	76310	TSNo.17-20(94)	76360	Parameter No.1(98)
76211	TSNo.13-16(87)	76261	Circle step value(90)	76311	TSNo.21-24(94)	76361	Parameter No.2(98)
76212	TSNo.17-20(87)	76262	Parameter No.1(91)	76312	TSNo.25-28(94)	76362	TSNo.1-4(98)
76213	TSNo.21-24(87)	76263	Parameter No.2(91)	76313	Step repeat(94)	76363	TSNo.5-8(98)
76214	TSNo.25-28(87)	76264	TSNo.1-4(91)	76314	Step SV(94)	76364	TSNo.9-12(98)
76215	Step repeat(87)	76265	TSNo.5-8(91)	76315	Step time(94)	76365	TSNo.13-16(98)
76216	Step SV(87)	76266	TSNo.9-12(91)	76316	Step rate(94)	76366	TSNo.17-20(98)
76217	Step time(87)	76267	TSNo.13-16(91)	76317	Circle step value(94)	76367	TSNo.21-24(98)
76218	Step rate(87)	76268	TSNo.17-20(91)	76318	Parameter No.1(95)	76368	TSNo.25-28(98)
76219	Circle step value(87)	76269	TSNo.21-24(91)	76319	Parameter No.2(95)	76369	Step repeat(98)
76220	Parameter No.1(88)	76270	TSNo.25-28(91)	76320	TSNo.1-4(95)	76370	Step SV(98)
76221	Parameter No.2(88)	76271	Step repeat(91)	76321	TSNo.5-8(95)	76371	Step time(98)
76222	TSNo.1-4(88)	76272	Step SV(91)	76322	TSNo.9-12(95)	76372	Step rate(98)
76223	TSNo.5-8(88)	76273	Step time(91)	76323	TSNo.13-16(95)	76373	Circle step value(98)
76224	TSNo.9-12(88)	76274	Step rate(91)	76324	TSNo.17-20(95)	76374	Parameter No.1(99)
76225	TSNo.13-16(88)	76275	Circle step value(91)	76325	TSNo.21-24(95)	76375	Parameter No.2(99)
76226	TSNo.17-20(88)	76276	Parameter No.1(92)	76326	TSNo.25-28(95)	76376	TSNo.1-4(99)
76227	TSNo.21-24(88)	76277	Parameter No.2(92)	76327	Step repeat(95)	76377	TSNo.5-8(99)
76228	TSNo.25-28(88)	76278	TSNo.1-4(92)	76328	Step SV(95)	76378	TSNo.9-12(99)
76229	Step repeat(88)	76279	TSNo.5-8(92)	76329	Step time(95)	76379	TSNo.13-16(99)
76230	Step SV(88)	76280	TSNo.9-12(92)	76330	Step rate(95)	76380	TSNo.17-20(99)
76231	Step time(88)	76281	TSNo.13-16(92)	76331	Circle step value(95)	76381	TSNo.21-24(99)
76232	Step rate(88)	76282	TSNo.17-20(92)	76332	Parameter No.1(96)	76382	TSNo.25-28(99)
76233	Circle step value(88)	76283	TSNo.21-24(92)	76333	Parameter No.2(96)	76383	Step repeat(99)
76234	Parameter No.1(89)	76284	TSNo.25-28(92)	76334	TSNo.1-4(96)	76384	Step SV(99)
76235	Parameter No.2(89)	76285	Step repeat(92)	76335	TSNo.5-8(96)	76385	Step time(99)
76236	TSNo.1-4(89)	76286	Step SV(92)	76336	TSNo.9-12(96)	76386	Step rate(99)
76237	TSNo.5-8(89)	76287	Step time(92)	76337	TSNo.13-16(96)	76387	Circle step value(99)
76238	TSNo.9-12(89)	76288	Step rate(92)	76338	TSNo.17-20(96)	76388	Parameter No.1(100)
76239	TSNo.13-16(89)	76289	Circle step value(92)	76339	TSNo.21-24(96)	76389	Parameter No.2(100)
76240	TSNo.17-20(89)	76290	Parameter No.1(93)	76340	TSNo.25-28(96)	76390	TSNo.1-4(100)
76241	TSNo.21-24(89)	76291	Parameter No.2(93)	76341	Step repeat(96)	76391	TSNo.5-8(100)
76242	TSNo.25-28(89)	76292	TSNo.1-4(93)	76342	Step SV(96)	76392	TSNo.9-12(100)
76243	Step repeat(89)	76293	TSNo.5-8(93)	76343	Step time(96)	76393	TSNo.13-16(100)
76244	Step SV(89)	76294	TSNo.9-12(93)	76344	Step rate(96)	76394	TSNo.17-20(100)
76245	Step time(89)	76295	TSNo.13-16(93)	76345	Circle step value(96)	76395	TSNo.21-24(100)
76246	Step rate(89)	76296	TSNo.17-20(93)	76346	Parameter No.1(97)	76396	TSNo.25-28(100)
76247	Circle step value(89)	76297	TSNo.21-24(93)	76347	Parameter No.2(97)	76397	Step repeat(100)
76248	Parameter No.1(90)	76298	TSNo.25-28(93)	76348	TSNo.1-4(97)	76398	Step SV(100)
76249	Parameter No.2(90)	76299	Step repeat(93)	76349	TSNo.5-8(97)	76399	Step time(100)
76250	TSNo.1-4(90)	76300	Step SV(93)	76350	TSNo.9-12(97)	76400	Step rate(100)

**Pattern setup value (76401 - 76600)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
76401	Circle step value(100)	76451	TSNo.21~24(104)	76501	Parameter No.2(108)	76551	Step repeat(111)
76402	Parameter No.1(101)	76452	TSNo.25~28(104)	76502	TSNo.1~4(108)	76552	Step SV(111)
76403	Parameter No.2(101)	76453	Step repeat(104)	76503	TSNo.5~8(108)	76553	Step time(111)
76404	TSNo.1~4(101)	76454	Step SV(104)	76504	TSNo.9~12(108)	76554	Step rate(111)
76405	TSNo.5~8(101)	76455	Step time(104)	76505	TSNo.13~16(108)	76555	Circle step value(111)
76406	TSNo.9~12(101)	76456	Step rate(104)	76506	TSNo.17~20(108)	76556	Parameter No.1(112)
76407	TSNo.13~16(101)	76457	Circle step value(104)	76507	TSNo.21~24(108)	76557	Parameter No.2(112)
76408	TSNo.17~20(101)	76458	Parameter No.1(105)	76508	TSNo.25~28(108)	76558	TSNo.1~4(112)
76409	TSNo.21~24(101)	76459	Parameter No.2(105)	76509	Step repeat(108)	76559	TSNo.5~8(112)
76410	TSNo.25~28(101)	76460	TSNo.1~4(105)	76510	Step SV(108)	76560	TSNo.9~12(112)
76411	Step repeat(101)	76461	TSNo.5~8(105)	76511	Step time(108)	76561	TSNo.13~16(112)
76412	Step SV(101)	76462	TSNo.9~12(105)	76512	Step rate(108)	76562	TSNo.17~20(112)
76413	Step time(101)	76463	TSNo.13~16(105)	76513	Circle step value(108)	76563	TSNo.21~24(112)
76414	Step rate(101)	76464	TSNo.17~20(105)	76514	Parameter No.1(109)	76564	TSNo.25~28(112)
76415	Circle step value(101)	76465	TSNo.21~24(105)	76515	Parameter No.2(109)	76565	Step repeat(112)
76416	Parameter No.1(102)	76466	TSNo.25~28(105)	76516	TSNo.1~4(109)	76566	Step SV(112)
76417	Parameter No.2(102)	76467	Step repeat(105)	76517	TSNo.5~8(109)	76567	Step time(112)
76418	TSNo.1~4(102)	76468	Step SV(105)	76518	TSNo.9~12(109)	76568	Step rate(112)
76419	TSNo.5~8(102)	76469	Step time(105)	76519	TSNo.13~16(109)	76569	Circle step value(112)
76420	TSNo.9~12(102)	76470	Step rate(105)	76520	TSNo.17~20(109)	76570	Parameter No.1(113)
76421	TSNo.13~16(102)	76471	Circle step value(105)	76521	TSNo.21~24(109)	76571	Parameter No.2(113)
76422	TSNo.17~20(102)	76472	Parameter No.1(106)	76522	TSNo.25~28(109)	76572	TSNo.1~4(113)
76423	TSNo.21~24(102)	76473	Parameter No.2(106)	76523	Step repeat(109)	76573	TSNo.5~8(113)
76424	TSNo.25~28(102)	76474	TSNo.1~4(106)	76524	Step SV(109)	76574	TSNo.9~12(113)
76425	Step repeat(102)	76475	TSNo.5~8(106)	76525	Step time(109)	76575	TSNo.13~16(113)
76426	Step SV(102)	76476	TSNo.9~12(106)	76526	Step rate(109)	76576	TSNo.17~20(113)
76427	Step time(102)	76477	TSNo.13~16(106)	76527	Circle step value(109)	76577	TSNo.21~24(113)
76428	Step rate(102)	76478	TSNo.17~20(106)	76528	Parameter No.1(110)	76578	TSNo.25~28(113)
76429	Circle step value(102)	76479	TSNo.21~24(106)	76529	Parameter No.2(110)	76579	Step repeat(113)
76430	Parameter No.1(103)	76480	TSNo.25~28(106)	76530	TSNo.1~4(110)	76580	Step SV(113)
76431	Parameter No.2(103)	76481	Step repeat(106)	76531	TSNo.5~8(110)	76581	Step time(113)
76432	TSNo.1~4(103)	76482	Step SV(106)	76532	TSNo.9~12(110)	76582	Step rate(113)
76433	TSNo.5~8(103)	76483	Step time(106)	76533	TSNo.13~16(110)	76583	Circle step value(113)
76434	TSNo.9~12(103)	76484	Step rate(106)	76534	TSNo.17~20(110)	76584	Parameter No.1(114)
76435	TSNo.13~16(103)	76485	Circle step value(106)	76535	TSNo.21~24(110)	76585	Parameter No.2(114)
76436	TSNo.17~20(103)	76486	Parameter No.1(107)	76536	TSNo.25~28(110)	76586	TSNo.1~4(114)
76437	TSNo.21~24(103)	76487	Parameter No.2(107)	76537	Step repeat(110)	76587	TSNo.5~8(114)
76438	TSNo.25~28(103)	76488	TSNo.1~4(107)	76538	Step SV(110)	76588	TSNo.9~12(114)
76439	Step repeat(103)	76489	TSNo.5~8(107)	76539	Step time(110)	76589	TSNo.13~16(114)
76440	Step SV(103)	76490	TSNo.9~12(107)	76540	Step rate(110)	76590	TSNo.17~20(114)
76441	Step time(103)	76491	TSNo.13~16(107)	76541	Circle step value(110)	76591	TSNo.21~24(114)
76442	Step rate(103)	76492	TSNo.17~20(107)	76542	Parameter No.1(111)	76592	TSNo.25~28(114)
76443	Circle step value(103)	76493	TSNo.21~24(107)	76543	Parameter No.2(111)	76593	Step repeat(114)
76444	Parameter No.1(104)	76494	TSNo.25~28(107)	76544	TSNo.1~4(111)	76594	Step SV(114)
76445	Parameter No.2(104)	76495	Step repeat(107)	76545	TSNo.5~8(111)	76595	Step time(114)
76446	TSNo.1~4(104)	76496	Step SV(107)	76546	TSNo.9~12(111)	76596	Step rate(114)
76447	TSNo.5~8(104)	76497	Step time(107)	76547	TSNo.13~16(111)	76597	Circle step value(114)
76448	TSNo.9~12(104)	76498	Step rate(107)	76548	TSNo.17~20(111)	76598	Parameter No.1(115)
76449	TSNo.13~16(104)	76499	Circle step value(107)	76549	TSNo.21~24(111)	76599	Parameter No.2(115)
76450	TSNo.17~20(104)	76500	Parameter No.1(108)	76550	TSNo.25~28(111)	76600	TSNo.1~4(115)

**Pattern setup value (76601 - 76800)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
76601	TSNo.5~8(115)	76651	Step time(118)	76701	TSNo.13~16(122)	76751	Circle step value(125)
76602	TSNo.9~12(115)	76652	Step rate(118)	76702	TSNo.17~20(122)	76752	Parameter No.1(126)
76603	TSNo.13~16(115)	76653	Circle step value(118)	76703	TSNo.21~24(122)	76753	Parameter No.2(126)
76604	TSNo.17~20(115)	76654	Parameter No.1(119)	76704	TSNo.25~28(122)	76754	TSNo.1~4(126)
76605	TSNo.21~24(115)	76655	Parameter No.2(119)	76705	Step repeat(122)	76755	TSNo.5~8(126)
76606	TSNo.25~28(115)	76656	TSNo.1~4(119)	76706	Step SV(122)	76756	TSNo.9~12(126)
76607	Step repeat(115)	76657	TSNo.5~8(119)	76707	Step time(122)	76757	TSNo.13~16(126)
76608	Step SV(115)	76658	TSNo.9~12(119)	76708	Step rate(122)	76758	TSNo.17~20(126)
76609	Step time(115)	76659	TSNo.13~16(119)	76709	Circle step value(122)	76759	TSNo.21~24(126)
76610	Step rate(115)	76660	TSNo.17~20(119)	76710	Parameter No.1(123)	76760	TSNo.25~28(126)
76611	Circle step value(115)	76661	TSNo.21~24(119)	76711	Parameter No.2(123)	76761	Step repeat(126)
76612	Parameter No.1(116)	76662	TSNo.25~28(119)	76712	TSNo.1~4(123)	76762	Step SV(126)
76613	Parameter No.2(116)	76663	Step repeat(119)	76713	TSNo.5~8(123)	76763	Step time(126)
76614	TSNo.1~4(116)	76664	Step SV(119)	76714	TSNo.9~12(123)	76764	Step rate(126)
76615	TSNo.5~8(116)	76665	Step time(119)	76715	TSNo.13~16(123)	76765	Circle step value(126)
76616	TSNo.9~12(116)	76666	Step rate(119)	76716	TSNo.17~20(123)	76766	Parameter No.1(127)
76617	TSNo.13~16(116)	76667	Circle step value(119)	76717	TSNo.21~24(123)	76767	Parameter No.2(127)
76618	TSNo.17~20(116)	76668	Parameter No.1(120)	76718	TSNo.25~28(123)	76768	TSNo.1~4(127)
76619	TSNo.21~24(116)	76669	Parameter No.2(120)	76719	Step repeat(123)	76769	TSNo.5~8(127)
76620	TSNo.25~28(116)	76670	TSNo.1~4(120)	76720	Step SV(123)	76770	TSNo.9~12(127)
76621	Step repeat(116)	76671	TSNo.5~8(120)	76721	Step time(123)	76771	TSNo.13~16(127)
76622	Step SV(116)	76672	TSNo.9~12(120)	76722	Step rate(123)	76772	TSNo.17~20(127)
76623	Step time(116)	76673	TSNo.13~16(120)	76723	Circle step value(123)	76773	TSNo.21~24(127)
76624	Step rate(116)	76674	TSNo.17~20(120)	76724	Parameter No.1(124)	76774	TSNo.25~28(127)
76625	Circle step value(116)	76675	TSNo.21~24(120)	76725	Parameter No.2(124)	76775	Step repeat(127)
76626	Parameter No.1(117)	76676	TSNo.25~28(120)	76726	TSNo.1~4(124)	76776	Step SV(127)
76627	Parameter No.2(117)	76677	Step repeat(120)	76727	TSNo.5~8(124)	76777	Step time(127)
76628	TSNo.1~4(117)	76678	Step SV(120)	76728	TSNo.9~12(124)	76778	Step rate(127)
76629	TSNo.5~8(117)	76679	Step time(120)	76729	TSNo.13~16(124)	76779	Circle step value(127)
76630	TSNo.9~12(117)	76680	Step rate(120)	76730	TSNo.17~20(124)	76780	Parameter No.1(128)
76631	TSNo.13~16(117)	76681	Circle step value(120)	76731	TSNo.21~24(124)	76781	Parameter No.2(128)
76632	TSNo.17~20(117)	76682	Parameter No.1(121)	76732	TSNo.25~28(124)	76782	TSNo.1~4(128)
76633	TSNo.21~24(117)	76683	Parameter No.2(121)	76733	Step repeat(124)	76783	TSNo.5~8(128)
76634	TSNo.25~28(117)	76684	TSNo.1~4(121)	76734	Step SV(124)	76784	TSNo.9~12(128)
76635	Step repeat(117)	76685	TSNo.5~8(121)	76735	Step time(124)	76785	TSNo.13~16(128)
76636	Step SV(117)	76686	TSNo.9~12(121)	76736	Step rate(124)	76786	TSNo.17~20(128)
76637	Step time(117)	76687	TSNo.13~16(121)	76737	Circle step value(124)	76787	TSNo.21~24(128)
76638	Step rate(117)	76688	TSNo.17~20(121)	76738	Parameter No.1(125)	76788	TSNo.25~28(128)
76639	Circle step value(117)	76689	TSNo.21~24(121)	76739	Parameter No.2(125)	76789	Step repeat(128)
76640	Parameter No.1(118)	76690	TSNo.25~28(121)	76740	TSNo.1~4(125)	76790	Step SV(128)
76641	Parameter No.2(118)	76691	Step repeat(121)	76741	TSNo.5~8(125)	76791	Step time(128)
76642	TSNo.1~4(118)	76692	Step SV(121)	76742	TSNo.9~12(125)	76792	Step rate(128)
76643	TSNo.5~8(118)	76693	Step time(121)	76743	TSNo.13~16(125)	76793	Circle step value(128)
76644	TSNo.9~12(118)	76694	Step rate(121)	76744	TSNo.17~20(125)	76794	Parameter No.1(129)
76645	TSNo.13~16(118)	76695	Circle step value(121)	76745	TSNo.21~24(125)	76795	Parameter No.2(129)
76646	TSNo.17~20(118)	76696	Parameter No.1(122)	76746	TSNo.25~28(125)	76796	TSNo.1~4(129)
76647	TSNo.21~24(118)	76697	Parameter No.2(122)	76747	Step repeat(125)	76797	TSNo.5~8(129)
76648	TSNo.25~28(118)	76698	TSNo.1~4(122)	76748	Step SV(125)	76798	TSNo.9~12(129)
76649	Step repeat(118)	76699	TSNo.5~8(122)	76749	Step time(125)	76799	TSNo.13~16(129)
76650	Step SV(118)	76700	TSNo.9~12(122)	76750	Step rate(125)	76800	TSNo.17~20(129)

**Pattern setup value (76801 - 77000)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
76801	TSNo.21~24(129)	76851	Parameter No.2(133)	76901	Step repeat(136)	76951	TSNo.5~8(140)
76802	TSNo.25~28(129)	76852	TSNo.1~4(133)	76902	Step SV(136)	76952	TSNo.9~12(140)
76803	Step repeat(129)	76853	TSNo.5~8(133)	76903	Step time(136)	76953	TSNo.13~16(140)
76804	Step SV(129)	76854	TSNo.9~12(133)	76904	Step rate(136)	76954	TSNo.17~20(140)
76805	Step time(129)	76855	TSNo.13~16(133)	76905	Circle step value(136)	76955	TSNo.21~24(140)
76806	Step rate(129)	76856	TSNo.17~20(133)	76906	Parameter No.1(137)	76956	TSNo.25~28(140)
76807	Circle step value(129)	76857	TSNo.21~24(133)	76907	Parameter No.2(137)	76957	Step repeat(140)
76808	Parameter No.1(130)	76858	TSNo.25~28(133)	76908	TSNo.1~4(137)	76958	Step SV(140)
76809	Parameter No.2(130)	76859	Step repeat(133)	76909	TSNo.5~8(137)	76959	Step time(140)
76810	TSNo.1~4(130)	76860	Step SV(133)	76910	TSNo.9~12(137)	76960	Step rate(140)
76811	TSNo.5~8(130)	76861	Step time(133)	76911	TSNo.13~16(137)	76961	Circle step value(140)
76812	TSNo.9~12(130)	76862	Step rate(133)	76912	TSNo.17~20(137)	76962	Parameter No.1(141)
76813	TSNo.13~16(130)	76863	Circle step value(133)	76913	TSNo.21~24(137)	76963	Parameter No.2(141)
76814	TSNo.17~20(130)	76864	Parameter No.1(134)	76914	TSNo.25~28(137)	76964	TSNo.1~4(141)
76815	TSNo.21~24(130)	76865	Parameter No.2(134)	76915	Step repeat(137)	76965	TSNo.5~8(141)
76816	TSNo.25~28(130)	76866	TSNo.1~4(134)	76916	Step SV(137)	76966	TSNo.9~12(141)
76817	Step repeat(130)	76867	TSNo.5~8(134)	76917	Step time(137)	76967	TSNo.13~16(141)
76818	Step SV(130)	76868	TSNo.9~12(134)	76918	Step rate(137)	76968	TSNo.17~20(141)
76819	Step time(130)	76869	TSNo.13~16(134)	76919	Circle step value(137)	76969	TSNo.21~24(141)
76820	Step rate(130)	76870	TSNo.17~20(134)	76920	Parameter No.1(138)	76970	TSNo.25~28(141)
76821	Circle step value(130)	76871	TSNo.21~24(134)	76921	Parameter No.2(138)	76971	Step repeat(141)
76822	Parameter No.1(131)	76872	TSNo.25~28(134)	76922	TSNo.1~4(138)	76972	Step SV(141)
76823	Parameter No.2(131)	76873	Step repeat(134)	76923	TSNo.5~8(138)	76973	Step time(141)
76824	TSNo.1~4(131)	76874	Step SV(134)	76924	TSNo.9~12(138)	76974	Step rate(141)
76825	TSNo.5~8(131)	76875	Step time(134)	76925	TSNo.13~16(138)	76975	Circle step value(141)
76826	TSNo.9~12(131)	76876	Step rate(134)	76926	TSNo.17~20(138)	76976	Parameter No.1(142)
76827	TSNo.13~16(131)	76877	Circle step value(134)	76927	TSNo.21~24(138)	76977	Parameter No.2(142)
76828	TSNo.17~20(131)	76878	Parameter No.1(135)	76928	TSNo.25~28(138)	76978	TSNo.1~4(142)
76829	TSNo.21~24(131)	76879	Parameter No.2(135)	76929	Step repeat(138)	76979	TSNo.5~8(142)
76830	TSNo.25~28(131)	76880	TSNo.1~4(135)	76930	Step SV(138)	76980	TSNo.9~12(142)
76831	Step repeat(131)	76881	TSNo.5~8(135)	76931	Step time(138)	76981	TSNo.13~16(142)
76832	Step SV(131)	76882	TSNo.9~12(135)	76932	Step rate(138)	76982	TSNo.17~20(142)
76833	Step time(131)	76883	TSNo.13~16(135)	76933	Circle step value(138)	76983	TSNo.21~24(142)
76834	Step rate(131)	76884	TSNo.17~20(135)	76934	Parameter No.1(139)	76984	TSNo.25~28(142)
76835	Circle step value(131)	76885	TSNo.21~24(135)	76935	Parameter No.2(139)	76985	Step repeat(142)
76836	Parameter No.1(132)	76886	TSNo.25~28(135)	76936	TSNo.1~4(139)	76986	Step SV(142)
76837	Parameter No.2(132)	76887	Step repeat(135)	76937	TSNo.5~8(139)	76987	Step time(142)
76838	TSNo.1~4(132)	76888	Step SV(135)	76938	TSNo.9~12(139)	76988	Step rate(142)
76839	TSNo.5~8(132)	76889	Step time(135)	76939	TSNo.13~16(139)	76989	Circle step value(142)
76840	TSNo.9~12(132)	76890	Step rate(135)	76940	TSNo.17~20(139)	76990	Parameter No.1(143)
76841	TSNo.13~16(132)	76891	Circle step value(135)	76941	TSNo.21~24(139)	76991	Parameter No.2(143)
76842	TSNo.17~20(132)	76892	Parameter No.1(136)	76942	TSNo.25~28(139)	76992	TSNo.1~4(143)
76843	TSNo.21~24(132)	76893	Parameter No.2(136)	76943	Step repeat(139)	76993	TSNo.5~8(143)
76844	TSNo.25~28(132)	76894	TSNo.1~4(136)	76944	Step SV(139)	76994	TSNo.9~12(143)
76845	Step repeat(132)	76895	TSNo.5~8(136)	76945	Step time(139)	76995	TSNo.13~16(143)
76846	Step SV(132)	76896	TSNo.9~12(136)	76946	Step rate(139)	76996	TSNo.17~20(143)
76847	Step time(132)	76897	TSNo.13~16(136)	76947	Circle step value(139)	76997	TSNo.21~24(143)
76848	Step rate(132)	76898	TSNo.17~20(136)	76948	Parameter No.1(140)	76998	TSNo.25~28(143)
76649	Circle step value(132)	76899	TSNo.21~24(136)	76949	Parameter No.2(140)	76999	Step repeat(143)
76850	Parameter No.1(133)	76900	TSNo.25~28(136)	76950	TSNo.1~4(140)	77000	Step SV(143)

**Pattern setup value (77001 - 77200)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
77001	Step time(143)	77051	TSNo.13~16(147)	77101	Circle step value(150)	77151	TSNo.21~24(154)
77002	Step rate(143)	77052	TSNo.17~20(147)	77102	Parameter No.1(151)	77152	TSNo.25~28(154)
77003	Circle step value(143)	77053	TSNo.21~24(147)	77103	Parameter No.2(151)	77153	Step repeat(154)
77004	Parameter No.1(144)	77054	TSNo.25~28(147)	77104	TSNo.1~4(151)	77154	Step SV(154)
77005	Parameter No.2(144)	77055	Step repeat(147)	77105	TSNo.5~8(151)	77155	Step time(154)
77006	TSNo.1~4(144)	77056	Step SV(147)	77106	TSNo.9~12(151)	77156	Step rate(154)
77007	TSNo.5~8(144)	77057	Step time(147)	77107	TSNo.13~16(151)	77157	Circle step value(154)
77008	TSNo.9~12(144)	77058	Step rate(147)	77108	TSNo.17~20(151)	77158	Parameter No.1(155)
77009	TSNo.13~16(144)	77059	Circle step value(147)	77109	TSNo.21~24(151)	77159	Parameter No.2(155)
77010	TSNo.17~20(144)	77060	Parameter No.1(148)	77110	TSNo.25~28(151)	77160	TSNo.1~4(155)
77011	TSNo.21~24(144)	77061	Parameter No.2(148)	77111	Step repeat(151)	77161	TSNo.5~8(155)
77012	TSNo.25~28(144)	77062	TSNo.1~4(148)	77112	Step SV(151)	77162	TSNo.9~12(155)
77013	Step repeat(144)	77063	TSNo.5~8(148)	77113	Step time(151)	77163	TSNo.13~16(155)
77014	Step SV(144)	77064	TSNo.9~12(148)	77114	Step rate(151)	77164	TSNo.17~20(155)
77015	Step time(144)	77065	TSNo.13~16(148)	77115	Circle step value(151)	77165	TSNo.21~24(155)
77016	Step rate(144)	77066	TSNo.17~20(148)	77116	Parameter No.1(152)	77166	TSNo.25~28(155)
77017	Circle step value(144)	77067	TSNo.21~24(148)	77117	Parameter No.2(152)	77167	Step repeat(155)
77018	Parameter No.1(145)	77068	TSNo.25~28(148)	77118	TSNo.1~4(152)	77168	Step SV(155)
77019	Parameter No.2(145)	77069	Step repeat(148)	77119	TSNo.5~8(152)	77169	Step time(155)
77020	TSNo.1~4(145)	77070	Step SV(148)	77120	TSNo.9~12(152)	77170	Step rate(155)
77021	TSNo.5~8(145)	77071	Step time(148)	77121	TSNo.13~16(152)	77171	Circle step value(155)
77022	TSNo.9~12(145)	77072	Step rate(148)	77122	TSNo.17~20(152)	77172	Parameter No.1(156)
77023	TSNo.13~16(145)	77073	Circle step value(148)	77123	TSNo.21~24(152)	77173	Parameter No.2(156)
77024	TSNo.17~20(145)	77074	Parameter No.1(149)	77124	TSNo.25~28(152)	77174	TSNo.1~4(156)
77025	TSNo.21~24(145)	77075	Parameter No.2(149)	77125	Step repeat(152)	77175	TSNo.5~8(156)
77026	TSNo.25~28(145)	77076	TSNo.1~4(149)	77126	Step SV(152)	77176	TSNo.9~12(156)
77027	Step repeat(145)	77077	TSNo.5~8(149)	77127	Step time(152)	77177	TSNo.13~16(156)
77028	Step SV(145)	77078	TSNo.9~12(149)	77128	Step rate(152)	77178	TSNo.17~20(156)
77029	Step time(145)	77079	TSNo.13~16(149)	77129	Circle step value(152)	77179	TSNo.21~24(156)
77030	Step rate(145)	77080	TSNo.17~20(149)	77130	Parameter No.1(153)	77180	TSNo.25~28(156)
77031	Circle step value(145)	77081	TSNo.21~24(149)	77131	Parameter No.2(153)	77181	Step repeat(156)
77032	Parameter No.1(146)	77082	TSNo.25~28(149)	77132	TSNo.1~4(153)	77182	Step SV(156)
77033	Parameter No.2(146)	77083	Step repeat(149)	77133	TSNo.5~8(153)	77183	Step time(156)
77034	TSNo.1~4(146)	77084	Step SV(149)	77134	TSNo.9~12(153)	77184	Step rate(156)
77035	TSNo.5~8(146)	77085	Step time(149)	77135	TSNo.13~16(153)	77185	Circle step value(156)
77036	TSNo.9~12(146)	77086	Step rate(149)	77136	TSNo.17~20(153)	77186	Parameter No.1(157)
77037	TSNo.13~16(146)	77087	Circle step value(149)	77137	TSNo.21~24(153)	77187	Parameter No.2(157)
77038	TSNo.17~20(146)	77088	Parameter No.1(150)	77138	TSNo.25~28(153)	77188	TSNo.1~4(157)
77039	TSNo.21~24(146)	77089	Parameter No.2(150)	77139	Step repeat(153)	77189	TSNo.5~8(157)
77040	TSNo.25~28(146)	77090	TSNo.1~4(150)	77140	Step SV(153)	77190	TSNo.9~12(157)
77041	Step repeat(146)	77091	TSNo.5~8(150)	77141	Step time(153)	77191	TSNo.13~16(157)
77042	Step SV(146)	77092	TSNo.9~12(150)	77142	Step rate(153)	77192	TSNo.17~20(157)
77043	Step time(146)	77093	TSNo.13~16(150)	77143	Circle step value(153)	77193	TSNo.21~24(157)
77044	Step rate(146)	77094	TSNo.17~20(150)	77144	Parameter No.1(154)	77194	TSNo.25~28(157)
77045	Circle step value(146)	77095	TSNo.21~24(150)	77145	Parameter No.2(154)	77195	Step repeat(157)
77046	Parameter No.1(147)	77096	TSNo.25~28(150)	77146	TSNo.1~4(154)	77196	Step SV(157)
77047	Parameter No.2(147)	77097	Step repeat(150)	77147	TSNo.5~8(154)	77197	Step time(157)
77048	TSNo.1~4(147)	77098	Step SV(150)	77148	TSNo.9~12(154)	77198	Step rate(157)
77049	TSNo.5~8(147)	77099	Step time(150)	77149	TSNo.13~16(154)	77199	Circle step value(157)
77050	TSNo.9~12(147)	77100	Step rate(150)	77150	TSNo.17~20(154)	77200	Parameter No.1(158)

**Pattern setup value (77201 - 77400)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
77201	Parameter No.2(158)	77251	Step repeat(161)	77301	TSNo.5~8(165)	77351	Step time(168)
77202	TSNo.1~4(158)	77252	Step SV(161)	77302	TSNo.9~12(165)	77352	Step rate(168)
77203	TSNo.5~8(158)	77253	Step time(161)	77303	TSNo.13~16(165)	77353	Circle step value(168)
77204	TSNo.9~12(158)	77254	Step rate(161)	77304	TSNo.17~20(165)	77354	Parameter No.1(169)
77205	TSNo.13~16(158)	77255	Circle step value(161)	77305	TSNo.21~24(165)	77355	Parameter No.2(169)
77206	TSNo.17~20(158)	77256	Parameter No.1(162)	77306	TSNo.25~28(165)	77356	TSNo.1~4(169)
77207	TSNo.21~24(158)	77257	Parameter No.2(162)	77307	Step repeat(165)	77357	TSNo.5~8(169)
77208	TSNo.25~28(158)	77258	TSNo.1~4(162)	77308	Step SV(165)	77358	TSNo.9~12(169)
77209	Step repeat(158)	77259	TSNo.5~8(162)	77309	Step time(165)	77359	TSNo.13~16(169)
77210	Step SV(158)	77260	TSNo.9~12(162)	77310	Step rate(165)	77360	TSNo.17~20(169)
77211	Step time(158)	77261	TSNo.13~16(162)	77311	Circle step value(165)	77361	TSNo.21~24(169)
77212	Step rate(158)	77262	TSNo.17~20(162)	77312	Parameter No.1(166)	77362	TSNo.25~28(169)
77213	Circle step value(158)	77263	TSNo.21~24(162)	77313	Parameter No.2(166)	77363	Step repeat(169)
77214	Parameter No.1(159)	77264	TSNo.25~28(162)	77314	TSNo.1~4(166)	77364	Step SV(169)
77215	Parameter No.2(159)	77265	Step repeat(162)	77315	TSNo.5~8(166)	77365	Step time(169)
77216	TSNo.1~4(159)	77266	Step SV(162)	77316	TSNo.9~12(166)	77366	Step rate(169)
77217	TSNo.5~8(159)	77267	Step time(162)	77317	TSNo.13~16(166)	77367	Circle step value(169)
77218	TSNo.9~12(159)	77268	Step rate(162)	77318	TSNo.17~20(166)	77368	Parameter No.1(170)
77219	TSNo.13~16(159)	77269	Circle step value(162)	77319	TSNo.21~24(166)	77369	Parameter No.2(170)
77220	TSNo.17~20(159)	77270	Parameter No.1(163)	77320	TSNo.25~28(166)	77370	TSNo.1~4(170)
77221	TSNo.21~24(159)	77271	Parameter No.2(163)	77321	Step repeat(166)	77371	TSNo.5~8(170)
77222	TSNo.25~28(159)	77272	TSNo.1~4(163)	77322	Step SV(166)	77372	TSNo.9~12(170)
77223	Step repeat(159)	77273	TSNo.5~8(163)	77323	Step time(166)	77373	TSNo.13~16(170)
77224	Step SV(159)	77274	TSNo.9~12(163)	77324	Step rate(166)	77374	TSNo.17~20(170)
77225	Step time(159)	77275	TSNo.13~16(163)	77325	Circle step value(166)	77375	TSNo.21~24(170)
77226	Step rate(159)	77276	TSNo.17~20(163)	77326	Parameter No.1(167)	77376	TSNo.25~28(170)
77227	Circle step value(159)	77277	TSNo.21~24(163)	77327	Parameter No.2(167)	77377	Step repeat(170)
77228	Parameter No.1(160)	77278	TSNo.25~28(163)	77328	TSNo.1~4(167)	77378	Step SV(170)
77229	Parameter No.2(160)	77279	Step repeat(163)	77329	TSNo.5~8(167)	77379	Step time(170)
77230	TSNo.1~4(160)	77280	Step SV(163)	77330	TSNo.9~12(167)	77380	Step rate(170)
77231	TSNo.5~8(160)	77281	Step time(163)	77331	TSNo.13~16(167)	77381	Circle step value(170)
77232	TSNo.9~12(160)	77282	Step rate(163)	77332	TSNo.17~20(167)	77382	Parameter No.1(171)
77233	TSNo.13~16(160)	77283	Circle step value(163)	77333	TSNo.21~24(167)	77383	Parameter No.2(171)
77234	TSNo.17~20(160)	77284	Parameter No.1(164)	77334	TSNo.25~28(167)	77384	TSNo.1~4(171)
77235	TSNo.21~24(160)	77285	Parameter No.2(164)	77335	Step repeat(167)	77385	TSNo.5~8(171)
77236	TSNo.25~28(160)	77286	TSNo.1~4(164)	77336	Step SV(167)	77386	TSNo.9~12(171)
77237	Step repeat(160)	77287	TSNo.5~8(164)	77337	Step time(167)	77387	TSNo.13~16(171)
77238	Step SV(160)	77288	TSNo.9~12(164)	77338	Step rate(167)	77388	TSNo.17~20(171)
77239	Step time(160)	77289	TSNo.13~16(164)	77339	Circle step value(167)	77389	TSNo.21~24(171)
77240	Step rate(160)	77290	TSNo.17~20(164)	77340	Parameter No.1(168)	77390	TSNo.25~28(171)
77241	Circle step value(160)	77291	TSNo.21~24(164)	77341	Parameter No.2(168)	77391	Step repeat(171)
77242	Parameter No.1(161)	77292	TSNo.25~28(164)	77342	TSNo.1~4(168)	77392	Step SV(171)
77243	Parameter No.2(161)	77293	Step repeat(164)	77343	TSNo.5~8(168)	77393	Step time(171)
77244	TSNo.1~4(161)	77294	Step SV(164)	77344	TSNo.9~12(168)	77394	Step rate(171)
77245	TSNo.5~8(161)	77295	Step time(164)	77345	TSNo.13~16(168)	77395	Circle step value(171)
77246	TSNo.9~12(161)	77296	Step rate(164)	77346	TSNo.17~20(168)	77396	Parameter No.1(172)
77247	TSNo.13~16(161)	77297	Circle step value(164)	77347	TSNo.21~24(168)	77397	Parameter No.2(172)
77248	TSNo.17~20(161)	77298	Parameter No.1(165)	77348	TSNo.25~28(168)	77398	TSNo.1~4(172)
77249	TSNo.21~24(161)	77299	Parameter No.2(165)	77349	Step repeat(168)	77399	TSNo.5~8(172)
77250	TSNo.25~28(161)	77300	TSNo.1~4(165)	77350	Step SV(168)	77400	TSNo.9~12(172)



**Pattern setup value (77401 - 77600)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
77401	TSNo.13~16(172)	77451	Circle step value(175)	77501	TSNo.21~24(179)	77551	Parameter No.2(183)
77402	TSNo.17~20(172)	77452	Parameter No.1(176)	77502	TSNo.25~28(179)	77552	TSNo.1~4(183)
77403	TSNo.21~24(172)	77453	Parameter No.2(176)	77503	Step repeat(179)	77553	TSNo.5~8(183)
77404	TSNo.25~28(172)	77454	TSNo.1~4(176)	77504	Step SV(179)	77554	TSNo.9~12(183)
77405	Step repeat(172)	77455	TSNo.5~8(176)	77505	Step time(179)	77555	TSNo.13~16(183)
77406	Step SV(172)	77456	TSNo.9~12(176)	77506	Step rate(179)	77556	TSNo.17~20(183)
77407	Step time(172)	77457	TSNo.13~16(176)	77507	Circle step value(179)	77557	TSNo.21~24(183)
77408	Step rate(172)	77458	TSNo.17~20(176)	77508	Parameter No.1(180)	77558	TSNo.25~28(183)
77409	Circle step value(172)	77459	TSNo.21~24(176)	77509	Parameter No.2(180)	77559	Step repeat(183)
77410	Parameter No.1(173)	77460	TSNo.25~28(176)	77510	TSNo.1~4(180)	77560	Step SV(183)
77411	Parameter No.2(173)	77461	Step repeat(176)	77511	TSNo.5~8(180)	77561	Step time(183)
77412	TSNo.1~4(173)	77462	Step SV(176)	77512	TSNo.9~12(180)	77562	Step rate(183)
77413	TSNo.5~8(173)	77463	Step time(176)	77513	TSNo.13~16(180)	77563	Circle step value(183)
77414	TSNo.9~12(173)	77464	Step rate(176)	77514	TSNo.17~20(180)	77564	Parameter No.1(184)
77415	TSNo.13~16(173)	77465	Circle step value(176)	77515	TSNo.21~24(180)	77565	Parameter No.2(184)
77416	TSNo.17~20(173)	77466	Parameter No.1(177)	77516	TSNo.25~28(180)	77566	TSNo.1~4(184)
77417	TSNo.21~24(173)	77467	Parameter No.2(177)	77517	Step repeat(180)	77567	TSNo.5~8(184)
77418	TSNo.25~28(173)	77468	TSNo.1~4(177)	77518	Step SV(180)	77568	TSNo.9~12(184)
77419	Step repeat(173)	77469	TSNo.5~8(177)	77519	Step time(180)	77569	TSNo.13~16(184)
77420	Step SV(173)	77470	TSNo.9~12(177)	77520	Step rate(180)	77570	TSNo.17~20(184)
77421	Step time(173)	77471	TSNo.13~16(177)	77521	Circle step value(180)	77571	TSNo.21~24(184)
77422	Step rate(173)	77472	TSNo.17~20(177)	77522	Parameter No.1(181)	77572	TSNo.25~28(184)
77423	Circle step value(173)	77473	TSNo.21~24(177)	77523	Parameter No.2(181)	77573	Step repeat(184)
77424	Parameter No.1(174)	77474	TSNo.25~28(177)	77524	TSNo.1~4(181)	77574	Step SV(184)
77425	Parameter No.2(174)	77475	Step repeat(177)	77525	TSNo.5~8(181)	77575	Step time(184)
77426	TSNo.1~4(174)	77476	Step SV(177)	77526	TSNo.9~12(181)	77576	Step rate(184)
77427	TSNo.5~8(174)	77477	Step time(177)	77527	TSNo.13~16(181)	77577	Circle step value(184)
77428	TSNo.9~12(174)	77478	Step rate(177)	77528	TSNo.17~20(181)	77578	Parameter No.1(185)
77429	TSNo.13~16(174)	77479	Circle step value(177)	77529	TSNo.21~24(181)	77579	Parameter No.2(185)
77430	TSNo.17~20(174)	77480	Parameter No.1(178)	77530	TSNo.25~28(181)	77580	TSNo.1~4(185)
77431	TSNo.21~24(174)	77481	Parameter No.2(178)	77531	Step repeat(181)	77581	TSNo.5~8(185)
77432	TSNo.25~28(174)	77482	TSNo.1~4(178)	77532	Step SV(181)	77582	TSNo.9~12(185)
77433	Step repeat(174)	77483	TSNo.5~8(178)	77533	Step time(181)	77583	TSNo.13~16(185)
77434	Step SV(174)	77484	TSNo.9~12(178)	77534	Step rate(181)	77584	TSNo.17~20(185)
77435	Step time(174)	77485	TSNo.13~16(178)	77535	Circle step value(181)	77585	TSNo.21~24(185)
77436	Step rate(174)	77486	TSNo.17~20(178)	77536	Parameter No.1(182)	77586	TSNo.25~28(185)
77437	Circle step value(174)	77487	TSNo.21~24(178)	77537	Parameter No.2(182)	77587	Step repeat(185)
77438	Parameter No.1(175)	77488	TSNo.25~28(178)	77538	TSNo.1~4(182)	77588	Step SV(185)
77439	Parameter No.2(175)	77489	Step repeat(178)	77539	TSNo.5~8(182)	77589	Step time(185)
77440	TSNo.1~4(175)	77490	Step SV(178)	77540	TSNo.9~12(182)	77590	Step rate(185)
77441	TSNo.5~8(175)	77491	Step time(178)	77541	TSNo.13~16(182)	77591	Circle step value(185)
77442	TSNo.9~12(175)	77492	Step rate(178)	77542	TSNo.17~20(182)	77592	Parameter No.1(186)
77443	TSNo.13~16(175)	77493	Circle step value(178)	77543	TSNo.21~24(182)	77593	Parameter No.2(186)
77444	TSNo.17~20(175)	77494	Parameter No.1(179)	77544	TSNo.25~28(182)	77594	TSNo.1~4(186)
77445	TSNo.21~24(175)	77495	Parameter No.2(179)	77545	Step repeat(182)	77595	TSNo.5~8(186)
77446	TSNo.25~28(175)	77496	TSNo.1~4(179)	77546	Step SV(182)	77596	TSNo.9~12(186)
77447	Step repeat(175)	77497	TSNo.5~8(179)	77547	Step time(182)	77597	TSNo.13~16(186)
77448	Step SV(175)	77498	TSNo.9~12(179)	77548	Step rate(182)	77598	TSNo.17~20(186)
77449	Step time(175)	77499	TSNo.13~16(179)	77549	Circle step value(182)	77599	TSNo.21~24(186)
77450	Step rate(175)	77500	TSNo.17~20(179)	77550	Parameter No.1(183)	77600	TSNo.25~28(186)

**Pattern setup value (77601 - 77800)**

Step management information		Step management information		Step management information		Step management information	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
77601	Step repeat(186)	77651	TSNo.5~8(190)	77701	Step time(193)	77751	TSNo.13~16(197)
77602	Step SV(186)	77652	TSNo.9~12(190)	77702	Step rate(193)	77752	TSNo.17~20(197)
77603	Step time(186)	77653	TSNo.13~16(190)	77703	Circle step value(193)	77753	TSNo.21~24(197)
77604	Step rate(186)	77654	TSNo.17~20(190)	77704	Parameter No.1(194)	77754	TSNo.25~28(197)
77605	Circle step value(186)	77655	TSNo.21~24(190)	77705	Parameter No.2(194)	77755	Step repeat(197)
77606	Parameter No.1(187)	77656	TSNo.25~28(190)	77706	TSNo.1~4(194)	77756	Step SV(197)
77607	Parameter No.2(187)	77657	Step repeat(190)	77707	TSNo.5~8(194)	77757	Step time(197)
77608	TSNo.1~4(187)	77658	Step SV(190)	77708	TSNo.9~12(194)	77758	Step rate(197)
77609	TSNo.5~8(187)	77659	Step time(190)	77709	TSNo.13~16(194)	77759	Circle step value(197)
77610	TSNo.9~12(187)	77660	Step rate(190)	77710	TSNo.17~20(194)	77760	Parameter No.1(198)
77611	TSNo.13~16(187)	77661	Circle step value(190)	77711	TSNo.21~24(194)	77761	Parameter No.2(198)
77612	TSNo.17~20(187)	77662	Parameter No.1(191)	77712	TSNo.25~28(194)	77762	TSNo.1~4(198)
77613	TSNo.21~24(187)	77663	Parameter No.2(191)	77713	Step repeat(194)	77763	TSNo.5~8(198)
77614	TSNo.25~28(187)	77664	TSNo.1~4(191)	77714	Step SV(194)	77764	TSNo.9~12(198)
77615	Step repeat(187)	77665	TSNo.5~8(191)	77715	Step time(194)	77765	TSNo.13~16(198)
77616	Step SV(187)	77666	TSNo.9~12(191)	77716	Step rate(194)	77766	TSNo.17~20(198)
77617	Step time(187)	77667	TSNo.13~16(191)	77717	Circle step value(194)	77767	TSNo.21~24(198)
77618	Step rate(187)	77668	TSNo.17~20(191)	77718	Parameter No.1(195)	77768	TSNo.25~28(198)
77619	Circle step value(187)	77669	TSNo.21~24(191)	77719	Parameter No.2(195)	77769	Step repeat(198)
77620	Parameter No.1(188)	77670	TSNo.25~28(191)	77720	TSNo.1~4(195)	77770	Step SV(198)
77621	Parameter No.2(188)	77671	Step repeat(191)	77721	TSNo.5~8(195)	77771	Step time(198)
77622	TSNo.1~4(188)	77672	Step SV(191)	77722	TSNo.9~12(195)	77772	Step rate(198)
77623	TSNo.5~8(188)	77673	Step time(191)	77723	TSNo.13~16(195)	77773	Circle step value(198)
77624	TSNo.9~12(188)	77674	Step rate(191)	77724	TSNo.17~20(195)	77774	Parameter No.1(199)
77625	TSNo.13~16(188)	77675	Circle step value(191)	77725	TSNo.21~24(195)	77775	Parameter No.2(199)
77626	TSNo.17~20(188)	77676	Parameter No.1(192)	77726	TSNo.25~28(195)	77776	TSNo.1~4(199)
77627	TSNo.21~24(188)	77677	Parameter No.2(192)	77727	Step repeat(195)	77777	TSNo.5~8(199)
77628	TSNo.25~28(188)	77678	TSNo.1~4(192)	77728	Step SV(195)	77778	TSNo.9~12(199)
77629	Step repeat(188)	77679	TSNo.5~8(192)	77729	Step time(195)	77779	TSNo.13~16(199)
77630	Step SV(188)	77680	TSNo.9~12(192)	77730	Step rate(195)	77780	TSNo.17~20(199)
77631	Step time(188)	77681	TSNo.13~16(192)	77731	Circle step value(195)	77781	TSNo.21~24(199)
77632	Step rate(188)	77682	TSNo.17~20(192)	77732	Parameter No.1(196)	77782	TSNo.25~28(199)
77633	Circle step value(188)	77683	TSNo.21~24(192)	77733	Parameter No.2(196)	77783	Step repeat(199)
77634	Parameter No.1(189)	77684	TSNo.25~28(192)	77734	TSNo.1~4(196)	77784	Step SV(199)
77635	Parameter No.2(189)	77685	Step repeat(192)	77735	TSNo.5~8(196)	77785	Step time(199)
77636	TSNo.1~4(189)	77686	Step SV(192)	77736	TSNo.9~12(196)	77786	Step rate(199)
77637	TSNo.5~8(189)	77687	Step time(192)	77737	TSNo.13~16(196)	77787	Circle step value(199)
77638	TSNo.9~12(189)	77688	Step rate(192)	77738	TSNo.17~20(196)	77788	
77639	TSNo.13~16(189)	77689	Circle step value(192)	77739	TSNo.21~24(196)	77789	
77640	TSNo.17~20(189)	77690	Parameter No.1(193)	77740	TSNo.25~28(196)	77790	
77641	TSNo.21~24(189)	77691	Parameter No.2(193)	77741	Step repeat(196)	77791	
77642	TSNo.25~28(189)	77692	TSNo.1~4(193)	77742	Step SV(196)	77792	
77643	Step repeat(189)	77693	TSNo.5~8(193)	77743	Step time(196)	77793	
77644	Step SV(189)	77694	TSNo.9~12(193)	77744	Step rate(196)	77794	
77645	Step time(189)	77695	TSNo.13~16(193)	77745	Circle step value(196)	77795	
77646	Step rate(189)	77696	TSNo.17~20(193)	77746	Parameter No.1(197)	77796	
77647	Circle step value(189)	77697	TSNo.21~24(193)	77747	Parameter No.2(197)	77797	
77648	Parameter No.1(190)	77698	TSNo.25~28(193)	77748	TSNo.1~4(197)	77798	
77649	Parameter No.2(190)	77699	Step repeat(193)	77749	TSNo.5~8(197)	77799	
77650	TSNo.1~4(190)	77700	Step SV(193)	77750	TSNo.9~12(197)	77800	

**Operation setup value (79001 - 79100, 79501 - 79600)**

Time unit		Pattern operation		Other operations			
No.	Contents	No.	Contents	No.	Contents	No.	Contents
79001		79051		79501	Mode lock (corresponding to each bit)	79551	
79002		79052		79502	AT start/stop	79552	
79003		79053		79503	A/M switching 1	79553	
79004		79054		79504	MAN output 1 value	79554	
79005		79055		79505	A/M switching 2	79555	
79006		79056		79506	MAN output 2 value	79556	
79007		79057		79507		79557	
79008		79058		79508		79558	
79009		79059		79509		79559	
79010		79060		79510		79560	
79011		79061		79511		79561	
79012		79062		79512		79562	
79013		79063		79513		79563	
79014		79064		79514		79564	
79015		79065		79515		79565	
79016		79066	Drive pattern No.	79516	Program drive type	79566	
79017		79067	Program drive	79517	Pattern selection type	79567	
79018		79068		79518		79568	
79019		79069		79519		79569	
79020		79070	Parameter No.1	79520		79570	
79021		79071	Parameter No.2	79521	CONST/PROG switching	79571	
79022		79072	TSNo.1~4	79522	CONST-SV value	79572	
79023		79073	TSNo.5~8	79523		79573	
79024		79074	TSNo.9~12	79524		79574	
79025		79075	TSNo.13~16	79525		79575	
79026		79076	TSNo.17~20	79526		79576	
79027		79077	TSNo.21~24	79527		79577	
79028		79078	TSNo.25~28	79528		79578	
79029		79079	Step repeat	79529		79579	
79030		79080	Step SV	79530		79580	
79031		79081	Step time	79531		79581	
79032		79082	Step rate	79532		79582	
79033		79083	Circle step value	79533	FNC key locked	79583	
79034		79084		79534	Time display type	79584	
79035		79085		79535	PV HOLD	79585	
79036		79086		79536		79586	
79037		79087		79537	SV HOLD	79587	
79038		79088		79538		79588	
79039		79089		79539		79589	
79040		79090		79540		79590	
79041		79091		79541		79591	
79042		79092		79542		79592	
79043		79093	Pattern copy trigger	79543		79593	
79044		79094	Pattern clear trigger	79544		79594	
79045		79095	Step add trigger	79545		79595	
79046		79096	Step delete trigger	79546		79596	
79047		79097		79547		79597	
79048	TIME SET TYPE	79098		79548		79598	
79049		79099		79549		79599	
79050		79100		79550		79600	

**Real data (80001 - 80200)**

Real data, parameter (CH1)		Real data, parameter (CH2)		Real data, each status		Pattern information/all	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
80001	PV data (CH1)	80051		80101	During execution: SV value	80151	Total number of patterns being used
80002	PV status (CH1)	80052		80102	Step elapsed/remaining time	80152	The number of steps being used
80003	SV data (CH1)	80053		80103	Pattern elapsed/remaining time	80153	
80004		80054		80104	REPEAT NUM	80154	
80005	MV1	80055	MV2	80105	Control status	80155	
80006	MV1 status	80056	MV2 status	80106	TIME SET TYPE	80156	
80007	MFB data	80057		80107	Time display type	80157	
80008	During execution: P (CH1)	80058	During execution: P (CH2)	80108	Alarm status	80158	
80009	During execution: I (CH1)	80059	During execution: I (CH2)	80109	External drive status	80159	
80010	During execution: D (CH1)	80060	During execution: D (CH2)	80110	Pattern selection signal status	80160	
80011	Execution output limit lower limit (CH1)	80061	Execution output limit lower limit (CH2)	80111	Time signal status	80161	
80012	Execution output limit upper limit (CH1)	80062	Execution output limit upper limit (CH2)	80112	DI input status	80162	
80013	Execution variation L/Down (CH1)	80063	Execution variation L/Down (CH2)	80113	DO output status	80163	
80014	Execution variation L/Up (CH1)	80064	Execution variation L/Up (CH2)	80114	execution pattern number	80164	
80015	During execution: ARW lower value (CH1)	80065	During execution: ARW lower value (CH2)	80115	Execution step number	80165	
80016	During execution: ARW upper value (CH1)	80066	During execution: ARW upper value (CH2)	80116	Step SV data	80166	
80017	During execution: Dead band/GAP (CH1)	80067	During execution: Dead band/GAP (CH2)	80117	Step time data	80167	
80018	During execution: Output preset (CH1)	80068	During execution: Output preset (CH2)	80118	During execution: Alarm1 (Basics)	80168	
80019	During execution: Under output scale (CH1)	80069	During execution: Under output scale (CH2)	80119	During execution: Alarm2 (Basics)	80169	
80020	During execution: Above output scale (CH1)	80070	During execution: Above output scale (CH2)	80120	During execution: Alarm3 (Basics)	80170	
80021	During execution: Sensor bias value (CH1)	80071		80121	During execution: Alarm4 (Basics)	80171	
80022	During execution: Sensor bias SV (CH1)	80072		80122	During execution: Alarm5 (Enhanced)	80172	
80023		80073		80123	During execution: Alarm6 (Enhanced)	80173	
80024		80074		80124	During execution: Alarm7 (Enhanced)	80174	
80025		80075		80125	During execution: Alarm8 (Enhanced)	80175	
80026		80076		80126	During execution: SV type	80176	
80027		80077		80127	Waiting time alarm	80177	
80028		80078		80128	Guarantee soak	80178	
80029		80079		80129	MASS FLOW SV value	80179	
80030		80080		80130	Lock status	80180	
80031		80081		80131		80181	
80032		80082		80132		80182	
80033		80083		80133		80183	
80034		80084		80134		80184	
80035		80085		80135		80185	
80036		80086		80136		80186	
80037		80087		80137		80187	
80038		80088		80138		80188	
80039		80089		80139		80189	
80040		80090		80140		80190	
80041		80091		80141		80191	

Real data, parameter (CH1)		Real data, parameter (CH2)		Real data, each status		Pattern information/all	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
80042		80092		80142		80192	
80043		80093		80143		80193	
80044		80094		80144		80194	
80045		80095		80145		80195	
80046		80096		80146		80196	
80047		80097		80147		80197	
80048		80098		80148		80198	
80049		80099		80149		80199	
80050		80100		80150		80200	

Real data (80201 - 80400)							
Pattern/the number of used steps		Pattern/the number of used steps		Pattern/the number of used steps		Pattern/the number of used steps	
No.	Contents	No.	Contents	No.	Contents	No.	Contents
80201	No.1•Used steps	80251	No.51•Used steps	80301	No.101•Used steps	80351	No.151•Used steps
80202	No.2•Used steps	80252	No.52•Used steps	80302	No.102•Used steps	80352	No.152•Used steps
80203	No.3•Used steps	80253	No.53•Used steps	80303	No.103•Used steps	80353	No.153•Used steps
80204	No.4•Used steps	80254	No.54•Used steps	80304	No.104•Used steps	80354	No.154•Used steps
80205	No.5•Used steps	80255	No.55•Used steps	80305	No.105•Used steps	80355	No.155•Used steps
80206	No.6•Used steps	80256	No.56•Used steps	80306	No.106•Used steps	80356	No.156•Used steps
80207	No.7•Used steps	80257	No.57•Used steps	80307	No.107•Used steps	80357	No.157•Used steps
80208	No.8•Used steps	80258	No.58•Used steps	80308	No.108•Used steps	80358	No.158•Used steps
80209	No.9•Used steps	80259	No.59•Used steps	80309	No.109•Used steps	80359	No.159•Used steps
80210	No.10•Used steps	80260	No.60•Used steps	80310	No.110•Used steps	80360	No.160•Used steps
80211	No.11•Used steps	80261	No.61•Used steps	80311	No.111•Used steps	80361	No.161•Used steps
80212	No.12•Used steps	80262	No.62•Used steps	80312	No.112•Used steps	80362	No.162•Used steps
80213	No.13•Used steps	80263	No.63•Used steps	80313	No.113•Used steps	80363	No.163•Used steps
80214	No.14•Used steps	80264	No.64•Used steps	80314	No.114•Used steps	80364	No.164•Used steps
80215	No.15•Used steps	80265	No.65•Used steps	80315	No.115•Used steps	80365	No.165•Used steps
80216	No.16•Used steps	80266	No.66•Used steps	80316	No.116•Used steps	80366	No.166•Used steps
80217	No.17•Used steps	80267	No.67•Used steps	80317	No.117•Used steps	80367	No.167•Used steps
80218	No.18•Used steps	80268	No.68•Used steps	80318	No.118•Used steps	80368	No.168•Used steps
80219	No.19•Used steps	80269	No.69•Used steps	80319	No.119•Used steps	80369	No.169•Used steps
80220	No.20•Used steps	80270	No.70•Used steps	80320	No.120•Used steps	80370	No.170•Used steps
80221	No.21•Used steps	80271	No.71•Used steps	80321	No.121•Used steps	80371	No.171•Used steps
80222	No.22•Used steps	80272	No.72•Used steps	80322	No.122•Used steps	80372	No.172•Used steps
80223	No.23•Used steps	80273	No.73•Used steps	80323	No.123•Used steps	80373	No.173•Used steps
80224	No.24•Used steps	80274	No.74•Used steps	80324	No.124•Used steps	80374	No.174•Used steps
80225	No.25•Used steps	80275	No.75•Used steps	80325	No.125•Used steps	80375	No.175•Used steps
80226	No.26•Used steps	80276	No.76•Used steps	80326	No.126•Used steps	80376	No.176•Used steps
80227	No.27•Used steps	80277	No.77•Used steps	80327	No.127•Used steps	80377	No.177•Used steps
80228	No.28•Used steps	80278	No.78•Used steps	80328	No.128•Used steps	80378	No.178•Used steps
80229	No.29•Used steps	80279	No.79•Used steps	80329	No.129•Used steps	80379	No.179•Used steps
80230	No.30•Used steps	80280	No.80•Used steps	80330	No.130•Used steps	80380	No.180•Used steps
80231	No.31•Used steps	80281	No.81•Used steps	80331	No.131•Used steps	80381	No.181•Used steps
80232	No.32•Used steps	80282	No.82•Used steps	80332	No.132•Used steps	80382	No.182•Used steps
80233	No.33•Used steps	80283	No.83•Used steps	80333	No.133•Used steps	80383	No.183•Used steps
80234	No.34•Used steps	80284	No.84•Used steps	80334	No.134•Used steps	80384	No.184•Used steps
80235	No.35•Used steps	80285	No.85•Used steps	80335	No.135•Used steps	80385	No.185•Used steps
80236	No.36•Used steps	80286	No.86•Used steps	80336	No.136•Used steps	80386	No.186•Used steps
80237	No.37•Used steps	80287	No.87•Used steps	80337	No.137•Used steps	80387	No.187•Used steps
80238	No.38•Used steps	80288	No.88•Used steps	80338	No.138•Used steps	80388	No.188•Used steps
80239	No.39•Used steps	80289	No.89•Used steps	80339	No.139•Used steps	80389	No.189•Used steps
80240	No.40•Used steps	80290	No.90•Used steps	80340	No.140•Used steps	80390	No.190•Used steps
80241	No.41•Used steps	80291	No.91•Used steps	80341	No.141•Used steps	80391	No.191•Used steps
80242	No.42•Used steps	80292	No.92•Used steps	80342	No.142•Used steps	80392	No.192•Used steps
80243	No.43•Used steps	80293	No.93•Used steps	80343	No.143•Used steps	80393	No.193•Used steps
80244	No.44•Used steps	80294	No.94•Used steps	80344	No.144•Used steps	80394	No.194•Used steps
80245	No.45•Used steps	80295	No.95•Used steps	80345	No.145•Used steps	80395	No.195•Used steps
80246	No.46•Used steps	80296	No.96•Used steps	80346	No.146•Used steps	80396	No.196•Used steps
80247	No.47•Used steps	80297	No.97•Used steps	80347	No.147•Used steps	80397	No.197•Used steps
80248	No.48•Used steps	80298	No.98•Used steps	80348	No.148•Used steps	80398	No.198•Used steps
80249	No.49•Used steps	80299	No.99•Used steps	80349	No.149•Used steps	80399	No.199•Used steps
80250	No.50•Used steps	80300	No.100•Used steps	80350	No.150•Used steps	80400	No.200•Used steps

**Real data (80401 - 80500)**

Hardware information		Operation information					
No.	Contents	No.	Contents	No.	Contents	No.	Contents
80401	Model code(1)	80451					
80402	Model code(2)	80452					
80403	Model code(3)	80453					
80404	Model code(4)	80454					
80405	Serial No.(1)	80455					
80406	Serial No.(2)	80456					
80407	Serial No.(3)	80457					
80408	Serial No.(4)	80458					
80409	HARDWARE STATUS	80459					
80410	Input/RJ-CPU1 information(1)	80460					
80411	Input/RJ-CPU1 information(2)	80461					
80412	Input/RJ-CPU1 information(3)	80462					
80413		80463					
80414		80464					
80415		80465					
80416	Control CPU information(1)	80466					
80417	Control CPU information(2)	80467					
80418	Control CPU information(3)	80468					
80419	Main CPU information(1)	80469					
80420	Main CPU information(2)	80470					
80421	Main CPU information(3)	80471					
80422		80472					
80423		80473					
80424		80474					
80425		80475					
80426		80476					
80427		80477					
80428		80478					
80429		80479					
80430		80480					
80431		80481					
80432		80482					
80433		80483					
80434		80484					
80435		80485					
80436		80486					
80437		80487					
80438		80488					
80439		80489					
80440		80490					
80441		80491					
80442		80492					
80443		80493					
80444		80494					
80445		80495					
80446		80496					
80447		80497					
80448		80498					
80449		80499					
80450		80500					

## 8 - 9. Measuring range and decimal point position

(Measuring range list)

	Input type	RANGE	Range decimal point
Thermocouple (TC)		SV (°C) Setting, display range	
	B	0.0 ~ 1820.0	1
	R1	0.0 ~ 1760.0	1
	R2	0.0 ~ 1200.0	1
	S	0.0 ~ 1760.0	1
	K1	-200.0 ~ 1370.0	1
	K2	0.0 ~ 600.0	1
	K3	-200.0 ~ 300.0	1
	E1	-270.0 ~ 1000.0	1
	E2	0.0 ~ 700.0	1
	E3	-270.0 ~ 300.0	1
	E4	-270.0 ~ 150.0	1
	J1	-200.0 ~ 1200.0	1
	J2	-200.0 ~ 900.0	1
	J3	-200.0 ~ 400.0	1
	J4	-100.0 ~ 200.0	1
	T1	-270.0 ~ 400.0	1
	T2	-200.0 ~ 200.0	1
	WRe5-WRe26	0.0 ~ 2310.0	1
	W-WRe26	0.0 ~ 2310.0	1
	NiMO-Ni	-50.0 ~ 1410.0	1
	Cr-AUFe	0.0 ~ 280.0 (K)	1
	PR5-20	0.0 ~ 1800.0	1
	PtRh40-PtRh20	0.0 ~ 1880.0	1
	Platinel II 1	0.0 ~ 1390.0	1
Platinel II 2	0.0 ~ 600.0	1	
U	-200.0 ~ 400.0	1	
L	-200.0 ~ 900.0	1	
N	0.0 ~ 1300.0	1	
DC voltage/current		Range setting (mV, V, mA)	
	10mV	-10.0 ~ 10.0	1
	20mV	-20.0 ~ 20.0	1
	50mV	-50.0 ~ 50.0	1
	100mV	-100.0 ~ 100.0	1
	5V	-5.0 ~ 5.0	1
	20mA	0.0 ~ 20.0	1
10V	-10.0 ~ 10.0	1	



Input type		RANGE		Range decimal point
Resistance thermometer		SV (°C) Setting, display range		
	JPt100Ω1	-200.0	~ 649.0	1
	JPt100Ω2	-200.0	~ 400.0	1
	JPt100Ω3	-200.0	~ 300.0	1
	JPt100Ω4	-200.0	~ 200.0	1
	JPt100Ω5	-100.0	~ 100.0	1
	QPt100Ω1	-200.0	~ 649.0	1
	QPt100Ω2	-200.0	~ 400.0	1
	QPt100Ω3	-200.0	~ 300.0	1
	QPt100Ω4	-200.0	~ 200.0	1
	QPt100Ω5	-100.0	~ 100.0	1
	Pt-Co	4.0	~ 374.0 (K)	1
	Pt50Ω	-200.0	~ 649.0	1
	Pt100Ω1	-200.0	~ 850.0	1
	Pt100Ω2	-200.0	~ 400.0	1
	Pt100Ω3	-200.0	~ 300.0	1
	Pt100Ω4	-200.0	~ 200.0	1
	Pt100Ω5	-100.0	~ 100.0	1
Thermocouple (DP MODE)		SV (°C) Setting, display range		
	WRe5-WRe26	0.0	~ 2320.0	1
	W-WRe26	0.0	~ 2320.0	1
	Ni-NiMO	0.0	~ 1310.0	1
	Platinel-1	-100.0	~ 1390.0	1
	Platinel-2	-100.0	~ 600.0	1
	PR20-40	0.0	~ 1880.0	1
DC voltage/current (User linear range)		Range setting		
	User linearize table	The range and the measuring range are determined from values set in LINEAR RANGE. The user table is used in scaling.		

---

## 9. PRIVATE protocol

---

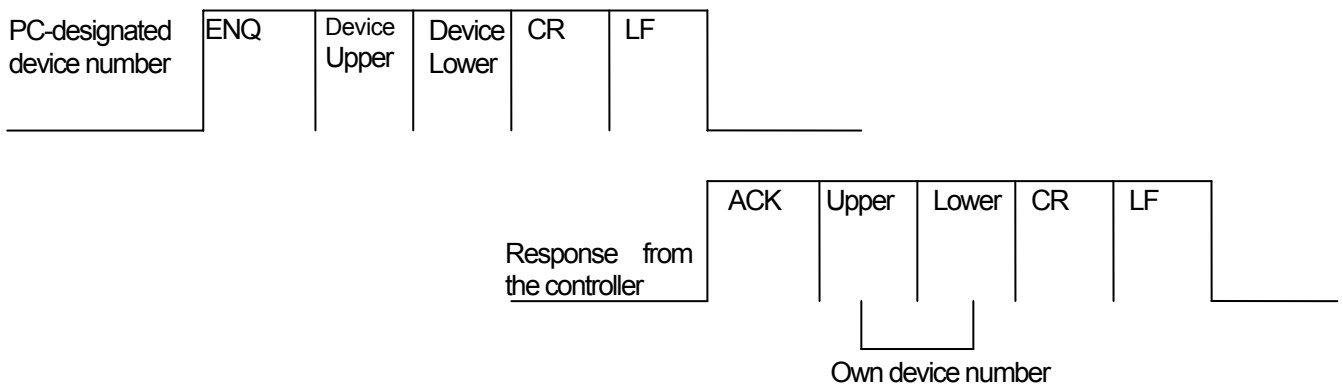
### 9 - 1. Difference between RS-232C and RS-422A/485

The only difference between RS-232C and RS-422A/485 is their electrical level and they use the same communications procedure. In RS-422A/485, a number of devices are connected in parallel. A PC sends a device number to one of those devices and establishes connection with it for communications.

This procedure is called establishment of data link. For this purpose, each device should be assigned a unique device number in advance to avoid possible duplication (See "6-3. Device number setting"). Once the data link is established, exactly the same communication procedure is used for RS-232C and RS-422A/485.

#### 9 - 1 - 1. Establishing data link (RS-422A/RS-485 only)

Using the following procedure from a PC to send a specific device number to a device enables to establish the data link with the device for communications. After the data link is established in this way, communication with that device is enabled according to the procedure described in the communications format.



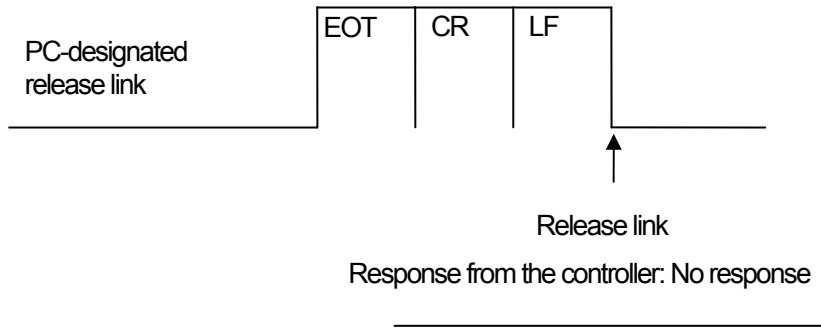
### Precautions

To avoid accidents, be sure to observe the instructions mentioned in this manual.

1. The device number is always sent in two digits from 01 to 99.
2. Do not use the device number 00.
3. Only the specified device responds within 1 second.
4. When the device of specified device number does not exist, no response is received.
5. If there is a device with an established data link, attempting to establish a new data link with another device will cancel the existing data link automatically.
6. In case of a power outage, a backup of the data link status before power outage is maintained.
7. ENQ and ACK represent control code and expressed in hexadecimal numbers as follows:  
ENQ: 05H  
ACK: 06H
8. When device number 01 is sent, the controller responds with the following code.  
ACK 30 31 CR LF  
When device number 99 is sent, the controller responds with the following code.  
ACK 39 39 CR LF

## 9 - 1 - 2. Releasing data link

To communicate with a device other than one currently communicating with, from a PC, use the following step to release the data link and then establish the data link again with the next device using the procedure described above.



### Precautions

1. This instruction urges all of the devices that have established connection to release their data link and go into the status waiting for the next data link to be established.
2. Since each device connected releases its data link within 10 msec after the instruction is received, the PC should wait at least 10 msec before resuming transmission.
3. EOT represents control code and expressed in hexadecimal numbers as follows:  
EOT: 04H

## 9 - 2. Basic communications procedure

### 9 - 2 - 1. Send/receive text format

STX	TEXT	ETX	BCC L	BCC H	CR	LF
-----	------	-----	-------	-------	----	----

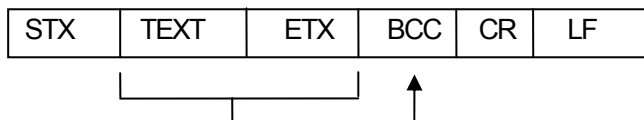
- (1) Characters received before STX are not received.
- (2) CR (0DH) and LF (0AH) should be always added as the termination code (common for both sending and receiving).

### 9 - 2 - 2. Checksum

This controller adds checksum data for BBC (Block Check Code).

In the checksum algorithm, each portion of text data is treated in the binary format and the total value of lowest eight bits are transmitted in two bytes of hexadecimal numbers.

- (1) Target range of BCC



- (2) BCC (Checksum)

Lower eight bits of the target range, treated as a net binary total sum, is split into two parts, higher four bits and lower four bits, and converted to the characters between 0 and F (30-39, 41-46H) and placed in the order of higher and than lower bytes (Two characters).

STX	TEXT	ETX	BCC L	BCC H	CR	LF
-----	------	-----	-------	-------	----	----

- (3) When adding parity bits to BCC, they are calculated from BCC itself.
- (4) BCC is not added to Acknowledgment or Negative acknowledgment.
- (5) It is not added to ENQ, ACK, or EOT.
- (6) BCC is added checked when data is sent or received.

Example:

STX	1	2	,	0	ETX	BCC L	BCC H	CR	LF
	31	32	2C	30	03	32	43		
						(2)	(C)		

The resultant data can be checked by the receiving side through calculation if it is altered due to some reasons such as transmission noise and occurrences of alteration can be detected.

### 9 - 2 - 3. Communication procedure

- (1) DP-G with the communications option is always ready for communications.
- (2) With RS-422A/485, data link is established first and then communications is performed with the controller according to the communications format. At last the data link is released and the system becomes ready for the next occurrence of communications.
- (3) With RS-232C, communications with the controller is ready according to the communications format from the begging.
- (4) When sending a command from an upper level PC or setting a pattern or a parameter, it is necessary to lock the FNC key or the relevant mode, otherwise the controller does not accept the request and return a negative acknowledgement.  
In this case, be sure to set the FNC key or the relevant mode to the lock status.
- (5) The controller returns data corresponding to a data request command from an upper lever PC regardless of the lock/unlock status (however, the pattern setting data is provided only when it is set to RESET).
- (6) When the controller receives a data request it sends data after checking to see that the request is valid.  
If it determines that the request is invalid or data transmission is not allowed, it sends a negative acknowledgement.
- (7) When the controller receives a request for parameter setting or a command, it processes the request or the command internally after verifying that it is valid.  
If it determines that the setting request or the command is invalid, or it can not receive them, it sends a negative acknowledgment.

### 9 - 2 - 4. Control code

The following code systems are used for communications.

STX (Start-of-text character):	02H
ETX (End-of-text character):	03H
ACK (Acknowledgment):	06H
NAK (Negative acknowledgment):	15H
[RS-422A/485]	
ENQ (Enquiry character):	05H
EOT (End of transmission character):	04H

## 9 - 3. Communications format

### 9- 3 - 1. Data request command (PC → DP-G)

Command name	Command format	Function
(1) Real data Request	STX Δ1, Δ1, ETX BCC CR LF (DF)	Current data request
(2) Execution parameter Request	STX Δ1, Δ2, ETX BCC CR LF (EF)	Mode 0 execution parameter request
(3) Setting program pattern data Request	STX Δ1, Δ3, □□, □□, ETX BCC CR LF <div style="margin-left: 100px;">           STEP No. [ 0~100 100==END Step ]            Pattern No.            Pattern repetition for 00            Data request         </div>	Program pattern data request Data request for each step
(4) Individual setting parameter Request	STX Δ1, Δ4, □□, □□, ETX BCC CR LF <div style="margin-left: 100px;">           1~8=Parameter No.            When parameter is type 8            91~98=When PID9            1=When parameter is type 1            Parameter type No.*1         </div> <p>* 1 parameter type No. is a number given to the setting parameter and described in 9-3-5.</p>	Requests data with one setting parameter specified
(5) Program Pattern setting status Request	STX Δ1, Δ5, □□, ETX BCC CR LF <div style="margin-left: 100px;">           Pattern No. (01~99)         </div>	pattern setting status request
(6) Device status Request	STX Δ1, Δ6, ETX BCC CR LF (20)	Request the configuration status of device
(7) Mode lock status Request	STX Δ1, Δ7, ETX BCC CR LF (30)	Each Mode lock status request
(8) STATUS 1 Request	STX Δ1, Δ8, ETX BCC CR LF (40)	Request the status of alarm, error, time signal
(9) STATUS 2 Request	STX Δ1, Δ9, ETX BCC CR LF (50)	Request of the status of program operation

Note: Δ=Space

### 9 - 3 - 2. DP-G response output to the data request command (DP-G → PC)

Function	Output format
<p>(1) Real data Output</p>	<p>STX <math>\Delta</math>1, <math>\square\square, \square\square, \square, \square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Pattern No. Step No. PV (Measurement value) SV (set value)  <b>All 9 digits in case of <math>\pm</math>OR</b>            PV status: 0=Normal, 1=+OR, 2=-OR, 4=Hardware error</p> <p><math>\square, \square, \square\square.\square\square, \square, \square\square\square\square\square\square, \square, \square\square\square\square\square\square,</math>            TIME (Time) MV1 (Output value) MV2 (Output 2)            Time unit 1=Minute 0=AUTO 1=MAN Only 2-output type. In the case of            2=Hour 2=AT (Auto tuning) 2=AT (Auto tuning) 1-output type, dummy data is            3=DAY 3=PROG.END OUT generated.            Time display type 0=AUTO            1=Step elapsed time 1=MAN            2=Pattern elapsed time 2=AT (Auto tuning)            3=Step remaining time 3=PRG.END OUT            4=Pattern remaining time 4=PV ERR OUT            5=FB AT            6=RESET</p> <p>ETX BCC CR LF</p>
<p>(2) Mode 0 Execution Parameter Output</p>	<p>STX <math>\Delta</math>2, <math>\square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Execution target SV Execution P Execution I  <math>\square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Execution D Execution AL1 Execution AL2  <math>\square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Execution AL3 Execution AL4 Execution OL  <math>\square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Execution OH Execution variation limit Execution sensor bias  <math>\square\square\square\square\square\square,</math>            SV bias value  <math>\square\square\square\square\square\square, \square\square\square\square\square\square, \square\square\square\square\square\square,</math>            Second P Second I Second D            Only 2-output type. In the case of 1-output type, dummy data is generated.            ETX BCC CR LF</p>
<p>(3) Setting program pattern data Output</p>	<p>(i) Step 0 output            STX <math>\Delta</math>3, <math>\Delta</math>1, <math>\square\square, \Delta</math>0, <math>\square\square\square\square\square\square, \square, \text{ETX BCC CR LF}</math>            Pattern No. Step No. Start SV 0=SV start            1=PV start</p> <p>(ii) Step n output            STX <math>\Delta</math>3, <math>\Delta</math>2, <math>\square\square, \square\square, \square\square\square\square\square\square, \square\square.\square\square, \square\square,</math>            Pattern No Step No. SV TIME.            REPEAT NUM  <math>\Delta</math>0=Repeat start step  <math>\Delta\Delta</math>=Un-set step</p> <p><math>\square, \square, \square, \square, \square, \square, \square, \square, \square, \square, \square, \square, \square,</math>            PID ALM OPL OSL TS1 TS2 TS3 TS4 TS5            No. No No. No. No. No. No. No. No. No. No. No. No.            Note: ALM: Alarm            Guarantee soak No. 0=ALL OFF            No.0=OFF 1=No.1            Sensor bias No. 2= No.1 repeat            99=ALL ON</p> <p>OPL: OUTPUT LIMIT            OSL: OUTPUT VARIATION LIMIT            TS: Time signal</p> <p><math>\square\square, \square\square, \square\square, \square\square, \square\square, \square\square, \text{ETX BCC CR LF}</math>            TS6 TS7 TS8 TS9 TS10</p>

Note:  $\Delta$ =Space







### 9 - 3 - 3. DP-G status transition command (PC → DP-G)

Command function	Command format
<p>(1) Program drive</p> <p>[FNC lock]</p>	<p>STX Δ2, Δ1, □, □□, ETX BCC CR LF</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           Pattern No.            1=RUN            2=STOP            3=ADV            4=RESET            5=Pattern select         </p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p>Only when RUN, Pattern is selected Otherwise, set to a space.</p> <p>Note: If the external drive input and pattern select input options are provided, the program drive type and the pattern selection type must be set to COM. (communications) in mode 1.</p> <p>Note: If RUN is performed in the unsetting pattern No., an error occurs.</p>
<p>(2) Execution parameter setting</p> <p>[Mode 0 lock]</p>	<p>STX Δ2, Δ2, □□□□□, □□□□□, □□□□□, □□□□□□□□,</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           P I D AL1         </p> <p>□□□□□□□□, □□□□□□□□, □□□□□□□□, □□□□□□,</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           AL2 AL3 AL4 OL         </p> <p style="margin-left: 100px;">           Output limit low limit         </p> <p>□□□□□□, □□□□□□, □□□□□□□□, □□□□□□□□,</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           OH OSL Sensor bias SV value bias         </p> <p>output limit higher limit Output variation</p> <p>ETX BCC CR LF</p>
<p>(3) AUTO/MAN switching</p>	<p>STX Δ2, Δ3, □, □□□, □, □□□, ETX BCC CR LF</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           MV1 MV2 When Output 2            Manually Set output value 0=MV2 AUTO, and then at this point set a space for MV2            1=MV2 MAN         </p> <p style="margin-left: 100px;">           0=MV1 AUTO, and then at this point set a space for MV1            1=MV1 MAN         </p>
<p>(4) Constant value control (CONST)</p> <p>[Mode 1 lock]</p>	<p>STX Δ2, Δ4, □, □□□□□□□□, ETX BCC CR LF</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           SV            0=PROG., and then at this point set a space for SV            1=CONST         </p>
<p>(5) Alarm Reset</p> <p>[Mode 1 lock]</p>	<p>STX Δ2, Δ5, ETX BCC CR LF</p> <p style="margin-left: 100px;">(20)</p>
<p>(6) Auto tuning start/stop</p>	<p>STX Δ2, Δ6, □, ETX BCC CR LF</p> <p style="margin-left: 100px;"> <span style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 0 5px;"> </span> </p> <p style="margin-left: 100px;">           0=AT stop            1=AT1 start            2=AT2 start            3=AT3 start            4=AT4 start (only for Output 2)         </p>

Note: Δ=Space

Command function	Command format
(7) Mode Lock/Unlock	STX Δ2, Δ7, □, □, □, □, □, □, □, □, □, □, □, □, <div style="margin-left: 100px;">             1 2 3 4 5 6 7 8 9              Mode 0              FNC key [ 0=Non-locked                        1=Locked           </div> ETX BCC CR LF
(8) Time display type  [Mode 1 lock]	STX Δ2, Δ8, □, ETX BCC CR LF <div style="margin-left: 100px;">             [ 1=Step elapsed time                2=Pattern elapsed time                3=Step remaining time                4=Pattern remaining time           </div>

Note: Δ=Space



Set field	Setup format
(5) Step Repeat	STX $\Delta$ 3, $\Delta$ 5, $\square\square$ , $\square\square$ , $\square\square$ , $\square\square$ , ETX BCC CR LF <div style="display: flex; justify-content: space-around; font-size: small;"> <div style="text-align: center;">             Pattern No.   Start step   End step   Always Starting &lt; End           </div> <div style="text-align: center;">             REPEAT NUM 1~99=Num 00=Cancel repeat           </div> </div> <p>Note: No duplication or nesting of repeat is allowed. For details, see mode 2 of instruction manual (General).</p>
(6) Pattern Repeat	STX $\Delta$ 3, $\Delta$ 6, $\square\square\square\square$ , ETX BCC CR LF REPEAT NUM
(7) Pattern COPY	STX $\Delta$ 3, $\Delta$ 7, $\square\square$ , $\square\square$ , ETX BCC CR LF <div style="display: flex; justify-content: center; margin-left: 40px;"> <div style="margin-right: 20px;"> </div> <div style="text-align: center;">             Copy destination pattern No. Copy source pattern No.           </div> </div>
(8) Pattern Clear	STX $\Delta$ 3, $\Delta$ 8, $\square\square$ , ETX BCC CR LF <div style="display: flex; justify-content: center; margin-left: 40px;"> <div style="margin-right: 20px;"> </div> <div style="text-align: center;">             00=ALL Clear 1~99=Each pattern is cleared           </div> </div>

Note:  $\Delta$ =Space

### 9 - 3 - 5. Individual parameter setting (PC → DP-G)

Parameter type	No.	Format
Alarm (1 - 8)  [Mode 3 lock]	12	STX 12, □, □□□□□□□□, □□□□□□□□, <div style="margin-left: 40px;"> <span style="margin-left: 100px;">AL1</span> <span style="margin-left: 100px;">AL2</span> </div> □□□□□□□□, □□□□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">AL3</span> <span style="margin-left: 100px;">AL4</span> </div> <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Alarm No</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div>
PID (1 - 8) (91 - 98)  [Mode 3 lock]	13	STX 13, □□, □□□□□□, □□□□□□, □□□□□□, <div style="margin-left: 40px;"> <span style="margin-left: 100px;">P</span> <span style="margin-left: 100px;">I</span> <span style="margin-left: 100px;">D</span> </div> Do not change the settings when all digits are spaces. <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=PIDNo</span>  <span style="margin-left: 100px;">91~98=PIDNo</span>  <span style="margin-left: 100px;">0=Copy to No.1~8, 90=Copy to No.91~98</span> </div> ETX BCC CR LF
Output variation limit (1 - 8)  [Mode 4 lock]	14	STX 14, □, □□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Parameter No.</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div>
Output high/low limit Limit (1 - 8)  [Mode 4 lock]	15	STX 15, □, □□□□□□, □□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">OL-L</span> <span style="margin-left: 100px;">OL-H</span> </div> Do not change the settings when all digits are spaces. <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Parameter No.</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div>
Sensor bias  [Mode 5 lock]	16	STX 16, □, □□□□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Parameter No.</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div>
Guarantee soak (1 - 8)  [Mode 6 lock]	17	STX 17, □, □□□□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Parameter No.</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div>
Waiting time alarm (1 - 8)  [Mode 6 lock]	18	STX 18, □, □□□□.□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <span style="margin-left: 100px;">1~8=Parameter No.</span>  <span style="margin-left: 100px;">0=Copy to No.1~8</span> </div> Note: A period is used for the delimiter of Time hours/minutes and minutes/seconds.

Note: △=Space

Parameter type	No.	Format
TIME SIGNAL (1 - 8)  [Mode 6 lock]	19	STX 19, □, □□□.□□, □□□.□□, ETX BCC CR LF <div style="margin-left: 40px;"> <p>ON Time      OFF Time</p> <p>Do not change the settings when 6 digits are spaces.</p> <p>1~8=Parameter No. 0=Copy to No.1~8</p> </div> <p>Note: A period is used for the delimiter of Time hours/minutes and minutes/seconds.</p>
Digital Filter [Mode 5 lock]	20	STX 20, □□□□, ETX BCC CR LF
Transmission type Transmission scale  [Mode 7 lock]	21	STX 21, □, □□□□□□, □□□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <p>Scale Min      Scale Max</p> <p>Do not change the settings when all digits are spaces.</p> <p>Transmission type</p> <ul style="list-style-type: none"> <li>0=SV</li> <li>1=PV</li> <li>2=MV1</li> <li>3=DEV</li> <li>4=MV2</li> </ul> </div>
OUTPUT 2 GAP [Mode 3 lock]	22	STX 22, □□□□□□, ETX BCC CR LF
Output 2 PID  [Mode 3 lock]	23	STX 23, □□□□□, □□□□, □□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <p>Second P      Second I      Second D</p> </div>
Secondary output variation limit [Mode 3 lock]	24	STX 24, □□□□□, ETX BCC CR LF
Output 2 High/low limit  [Mode 4 lock]	25	STX 25, □□□□□, □□□□□, ETX BCC CR LF <div style="margin-left: 40px;"> <p>Second OL      Second OH</p> <p>Do not change the settings when all digits are spaces.</p> </div>
Second position 2 dead band (output dead band) [Mode 3 lock]	26	STX 26, □□□, ETX BCC CR LF
Second Output at PV error [Mode 4 lock]	27	STX 27, □□□□□, ETX BCC CR LF
Second output Direct/reverse  [Mode 4 lock]	28	STX 28, □, ETX BCC CR LF <div style="margin-left: 40px;"> <p>0=DIRECT 1=REVERSE</p> </div>
Second pulse cycle [Mode 4 lock]	29	STX 29, □□□, ETX BCC CR LF

Note: △=Space





Parameter type	No.	Format
Linear scale [Mode 5 lock]	43	STX 43, <u>□□□□□□□□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> <span style="margin-right: 100px;">Min</span> <span>Max</span> </div> Do not change the settings when all digits are spaces.
ARW anti-reset windup [Mode 3 lock]	44	STX 44, <u>□□□□□□</u> , <u>□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> <span style="margin-right: 100px;">lower limit</span> <span>upper limit</span> </div> Do not change the settings when all digits are spaces.
AT2 SV (1 - 8) [Mode 3 lock]	45	STX 45, <u>□</u> , <u>□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> AT2SV  ├── 0=OFF  ├── 1=ON  └── 1~8=Parameter No.      0=No. Copy to 1~8 </div>
SV section (AT3) (1 - 7) [Mode 3 lock]	46	STX 46, <u>□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> DelimiterSV  └── 1~7=Parameter No. </div> Note: The setting range of the delimited SV is between the Min of the section and the scale max. For details, see mode 3 of instruction manual (General).
AT3 SV (1 - 8) [Mode 3 lock]	47	STX 47, <u>□</u> , <u>□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> AT3SV  ├── 0=OFF  ├── 1=ON  └── 1~8=Parameter No. </div>
Start direction for AT [Mode 3 lock]	48	STX 48, <u>□</u> , ETX BCC CR LF <div style="text-align: center;"> ├── 0=UP  └── 1=Down </div>
When reset SV [Mode 2 lock]	49	STX 49, <u>□□□□□□□□</u> , ETX BCC CR LF
SV scale [Mode 1 lock]	50	STX 50, <u>□□□□□□□□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> <span style="margin-right: 100px;">Min</span> <span>Max</span> </div> Do not change the settings when all digits are spaces.
Thermocouple type Unit [Mode 5 lock]	51	STX 51, <u>□□</u> , <u>□</u> , ETX BCC CR LF <div style="text-align: center;"> ├── Unit: 0=°C, 2=K, 3=%, 4=BLK  └── Thermocouple type No. </div> Note: For linear output, set the Thermocouple type to a space.
SV scaling [Mode 5 lock]	52	STX 52, <u>□□□□□□□□</u> , <u>□□□□□□□□</u> , ETX BCC CR LF <div style="text-align: center;"> <span style="margin-right: 100px;">Min</span> <span>Max</span> </div> Do not change the settings when all digits are spaces.

Note: △=Space

## 9 - 4. Acknowledgment and negative acknowledgment

### 9 - 4 - 1. Acknowledgment

ACK	CR	LF
-----	----	----

ACK=06H

### 9 - 4 - 2. Negative acknowledgment

NAK	Error	Code	CR	LF
-----	-------	------	----	----

NAK=15H

\* Do not apply STX, ETX, BCC to ACK/NAK.

### 9 - 4 - 3. Error code

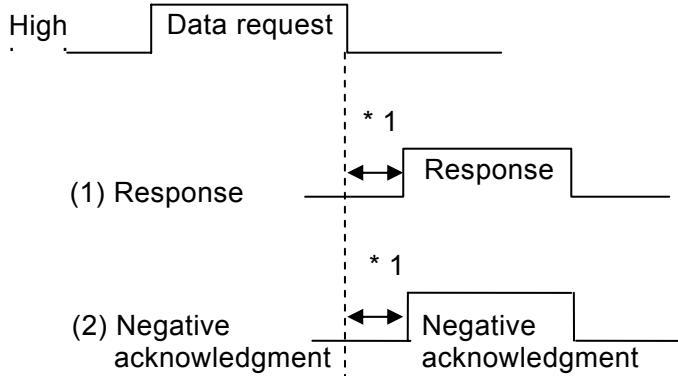
Code	Error type	Contents
△1	Framing	
△2	Overrun	
△3	Parity	
△4	Checksum	
△5	Lock/Non-lock	<ul style="list-style-type: none"> <li>When non-lock, the upper level is established and a command was sent from it.</li> </ul>
10	Format	<ul style="list-style-type: none"> <li>First communications code error</li> </ul>
11	"	<ul style="list-style-type: none"> <li>Second communications code error</li> </ul>
12	"	<ul style="list-style-type: none"> <li>Third communications code error</li> </ul>
14	"	<ul style="list-style-type: none"> <li>ETX error (No ETX)</li> </ul>
15	"	<ul style="list-style-type: none"> <li>Receiving buffer overflow</li> </ul>
16	Numeric value	<ul style="list-style-type: none"> <li>Can not be recognized as numeric digits.</li> </ul>
20	Data	<ul style="list-style-type: none"> <li>An undefined numeric value is received. (Numeric value is out of range.)</li> </ul>
21	"	<ul style="list-style-type: none"> <li>L/H Error (Relationship of magnitude is reversed)</li> </ul>
22	"	<ul style="list-style-type: none"> <li>SV RANG error (set out SV RANG)</li> </ul>
23	"	<ul style="list-style-type: none"> <li>SV scope error (out of AT3 SV section)</li> </ul>
24	"	<ul style="list-style-type: none"> <li>Z/S Error (Relationship of magnitude is reversed)</li> </ul>
25	"	<ul style="list-style-type: none"> <li>Linear range: error</li> </ul>
26	"	<ul style="list-style-type: none"> <li>Disp scale (SV scale) error</li> </ul>
30	Program drive	<ul style="list-style-type: none"> <li>STOP was performed during RESET.</li> </ul>
31	"	<ul style="list-style-type: none"> <li>A pattern is selected during STOP.</li> </ul>
32	"	<ul style="list-style-type: none"> <li>A pattern is selected during RUN.</li> </ul>
33	"	<ul style="list-style-type: none"> <li>A RUN, STOP, or ADV pattern is selected during END.</li> </ul>
34	"	<ul style="list-style-type: none"> <li>RUN, STOP, ADV, or RESET was performed during CONST.</li> </ul>
35	External drive OP	<ul style="list-style-type: none"> <li>Program drive performed RUN, STOP, ADV, or RESET during KEY or EXT.</li> </ul>

Note: △=Space

Code	Error type	Contents
36	Pattern select OP	<ul style="list-style-type: none"> <li>When pattern select is KEY or EXT, pattern select was used</li> </ul>
41	PATTERN SETUP	<ul style="list-style-type: none"> <li>Time = 0 is set for consecutive two steps.</li> </ul>
42	"	<ul style="list-style-type: none"> <li>Step n is set in the pattern during RUN.</li> </ul>
43	"	<ul style="list-style-type: none"> <li>Parameter No. was set in an unsetting step (END step).</li> </ul>
44	"	<ul style="list-style-type: none"> <li>A REPEAT setting was set to unsetting step.</li> </ul>
45	"	<ul style="list-style-type: none"> <li>Set behind an END step. (Addition)</li> </ul>
46	"	<ul style="list-style-type: none"> <li>An END was set behind an unsetting step.</li> </ul>
49	"	<ul style="list-style-type: none"> <li>Memory full (no remained step)</li> </ul>
51	Pattern copy	<ul style="list-style-type: none"> <li>The copy destination is not cleared.</li> </ul>
52	"	<ul style="list-style-type: none"> <li>The copy source pattern is not set.</li> </ul>
56	Pattern clear	<ul style="list-style-type: none"> <li>Tried to clear a pattern that is performing a RUN.</li> </ul>
55	Pattern read	<ul style="list-style-type: none"> <li>A read request is issued for an unset step.</li> </ul>
60	RUN; PTN No.	<ul style="list-style-type: none"> <li>A RUN is performed on an unset pattern. (Including unset link destinations.)</li> </ul>
61	RUN; Repeat step	<ul style="list-style-type: none"> <li>An error of repeat step settings for a pattern that was RUN.</li> </ul>
64	AT start is not allowed	<ul style="list-style-type: none"> <li>Already in AT</li> </ul>
65	AT start is not allowed	<ul style="list-style-type: none"> <li>Started AT1 during RESET,PROG.</li> </ul>
66	"	<ul style="list-style-type: none"> <li>Started AT2 other than RESET,PROG.</li> </ul>
67	"	<ul style="list-style-type: none"> <li>Started AT3 other than RESET,PROG.</li> </ul>
68	"	<ul style="list-style-type: none"> <li>Started AT4 during RESET,PROG.</li> </ul>
69	"	<ul style="list-style-type: none"> <li>Started AT5 other than RESET,PROG.</li> </ul>
70	"	<ul style="list-style-type: none"> <li>Started AT6 other than RESET,PROG.</li> </ul>
99	Miscellaneous	<ul style="list-style-type: none"> <li>When other errors are detected.</li> </ul>

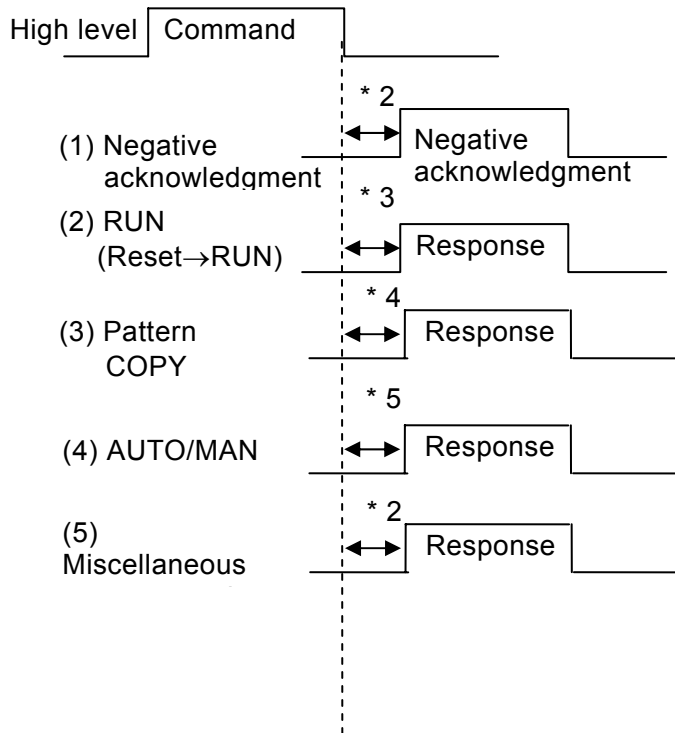
**9 - 5. Communications time chart**

**9 - 5 - 1. Response to data request**



\*1 Within 100 msec

**9 - 5 - 2. Response to command**



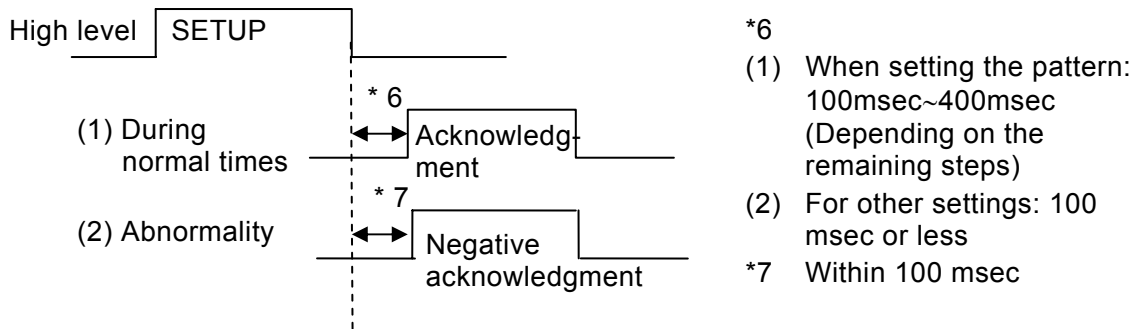
\*2 Within 100 msec

\*3 100 steps in a pattern:  
About 0.6 sec  
500 steps in a pattern:  
About 3.3 sec

\*4 Copies a pattern containing  
100 steps.  
1.9 sec - 12 sec  
(Varies depending on the  
remaining steps.)

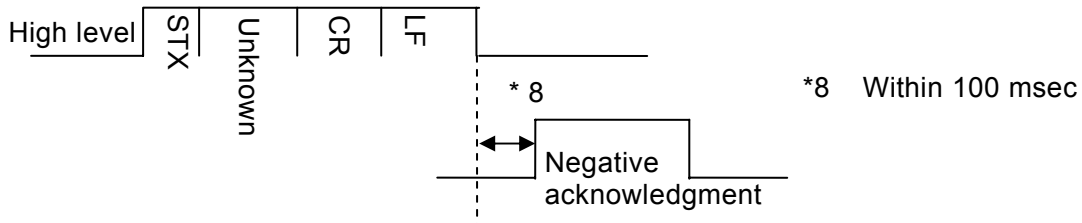
\*5 Within 200 msec

### 9 - 5 - 3. Response to pattern setting and parameter setting

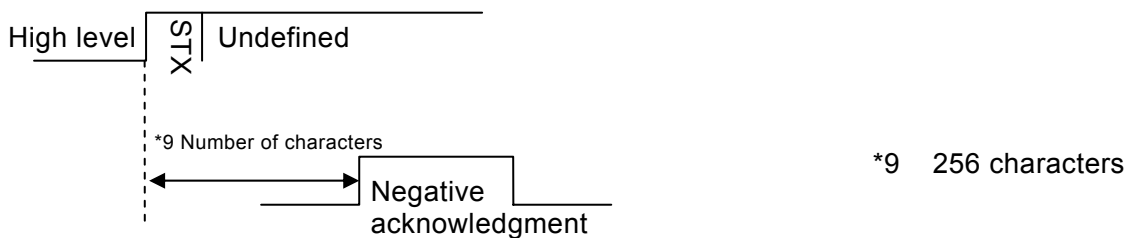


### 9 - 5 - 4. For other errors

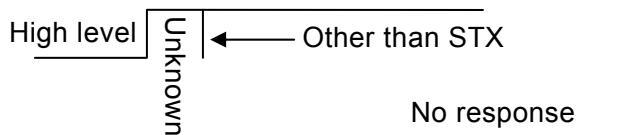
(1) Unknown contents



(2) Characters overflow (buffer overflow)



(3) When begins with STX



### 9 - 5 - 5. Handling on personal computer

The controller replies to a request or setting from a PC after a certain time period. In other words, if there is no response from the controller for a certain time period, the PC should send a request or settings again. For the timer time after which the request is sent again, see the time chart.



#### **Precautions**

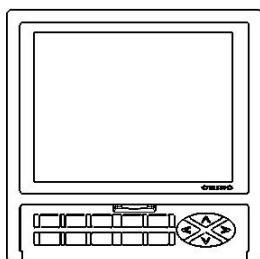
\* When trying to repeat the front key operations from 1 to 3, it may take several seconds.

# 10. Communications transmission (Digital)

## 10 - 1. Overview

This controller can be used not only for communications with a PC but also for digital communications with DB devices (between the controller and DB). They are called "Communications transmission" and "Communications remote", respectively.

When the controller is used in the environment in which multiple DBs are operated in the same condition, up to 31 slave SVs can be set up for communications, while the controller is set as the master device of transmission and the DBs are set as slave devices for remote communications. Depending on the key settings within the device itself, a device can be the controller (master device) that initiates transmission or a communications remote DB (slave device) that receives it.



If the communications function/type of Mode 8 communications settings is set to "TRANS", it becomes a communications transmitter (master device).

### (Communications function settings and transmission data contents)

Mode 8, communications function settings (Master device) → (Slave device)	Transmission data content
Protocol = PRIVATE (Transmission) → (Remote) [DP - G, DB]	<ul style="list-style-type: none"> <li>The master device transmits the remote SV data and a slave device receives it.</li> <li>PRIVATE protocol</li> <li>Transmits with a decimal point</li> </ul>
Protocol = MODBUS (Transmission) → (Remote) [DP - G, DB]	<ul style="list-style-type: none"> <li>The master device transmits RUN/STOP, execution No., and the remote SV data and a slave device receives it.</li> <li>MODBUS protocol</li> <li>Transmits without a decimal point</li> </ul>

\* To receive with a slave device, it must be switched to the remote mode.

\* The master device sends the following data.

- PRIVATE protocol  
Remote SV data = Data selected in communications transmission type

- MODBUS protocol

(1)RUN/STOP = RUN status

(2)Execution No. = SV No. during execution

(3)Remote SV data = Data selected in communications transmission type

## 10 - 2. Communications part specification

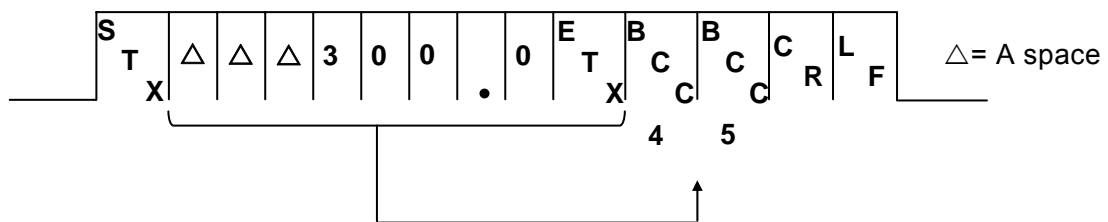
- Communications method : Asynchronous method
- Transmission Speed : Switched among 38400, 19200, 9600, 4800, and 2400 bps
- Start bit : 1 bit
- Data length : 7 bit (ASCII mode/PRIVATE mode) or 8 bit (RTU mode/ASCII mode) switched
- Parity bit : None (RTU mode/ASCII mode), Even (RTU mode/ASCII mode/PRIVATE mode), Odd(RTU mode/ASCII mode/PRIVATE mode)
- Stop bit : 1 bit (RTU mode/ASCII mode/PRIVATE mode), 2 bit (RTU mode/ASCII mode) switched
- Transmission code : ASCII (ASCII mode/PRIVATE mode) or Binary (RTU mode)
- Error check : Checksum \*1•• In PRIVATE mode  
: CRC-16 ••• In RTU mode  
: LRC ••• In ASCII mode
- Used signal name : Send data only. Control signal not used.

Note: Among the character structures, the character structure of 7-bit data, no parity, and 1 stop bit configuration is not settable.

\* 1 checksum (BCC)

In the checksum algorithm, the total value of characters between STX and ETX is calculated, the lower eight bits are split into two sets of four bits, each set of four bits are translated into a character between 0 - F, and then they are transmitted in the order from the upper four bits and then lower four bits.

Example:



Character	△	△	△	3	0	0	•	0	ETX	Total=BCC
ASCII code	20h	20h	20h	33h	30h	30h	2Eh	30h	03h	154h=45

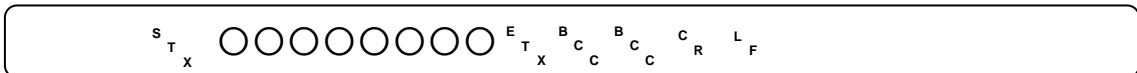


### 10 - 3. Communications transmission setting

Set the following parameters for DP-G of communications transmission.


- 1) Setting the protocol (See 6 - 1)
- 2) Setting the communications function/ type (See 6 - 2).
- 3) Setting the communications device number (See 6 - 3).
- 4) Setting the baud rate (See 6 - 4).
- 5) Setting the character (See 6 - 5).
- 6) Setting the communications transmission type (See 6 - 6).

**Reference** When the communications transmission mode is set to "PRIVATE", the controller generates output in the following format.



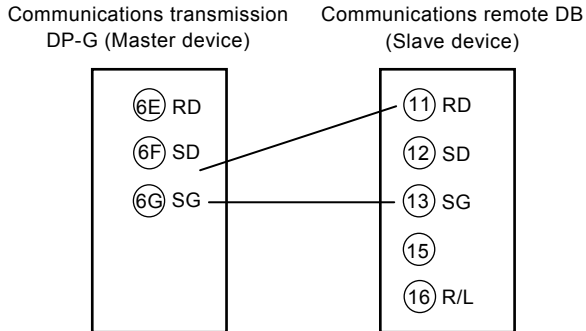
Data output: PV (measurement value), SV (Control setting value), MV1 (Output 1 value), MV2 (Output 2 value)

\* When the communications transmission mode is set to "RTU/ASCII mode", the MODBUS format described above is used to generate data at the slave address "0".

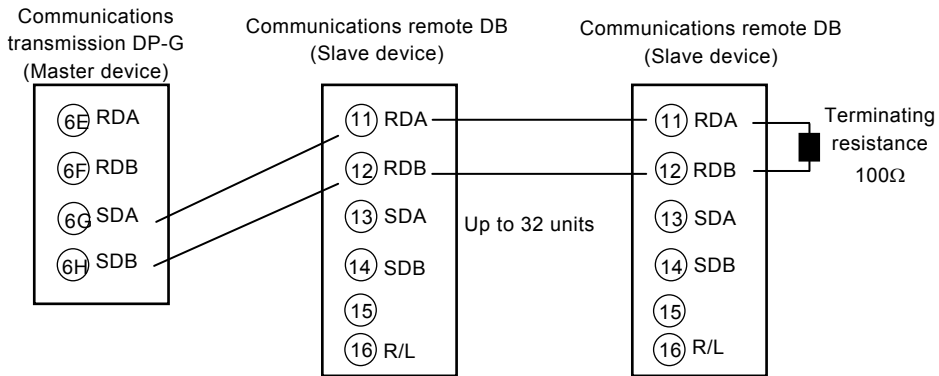
 <b>Precautions</b>	<ol style="list-style-type: none"> <li>(1) When connecting DP-G as the communications transmission and DB as a communications remote, use the same transmission speed and protocol for devices.</li> <li>(2) When analog remote and communications remote are used simultaneously, analog remote precedes communications remote.</li> <li>(3) The analog transmission type and the communications transmission type can be set separately.</li> <li>(4) When the analog transmission option and the communications transmission type is selected simultaneously, both of them generate transmission output.</li> </ol> <p>"Transmission scale lower limit", "transmission scale higher limit", "remote scale lower limit", and "remote scale higher limit" of the parameter are set for analog transmission/remote. Therefore, it is not necessary to set them when using communications transmission.</p>
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# 10 - 4. Wiring

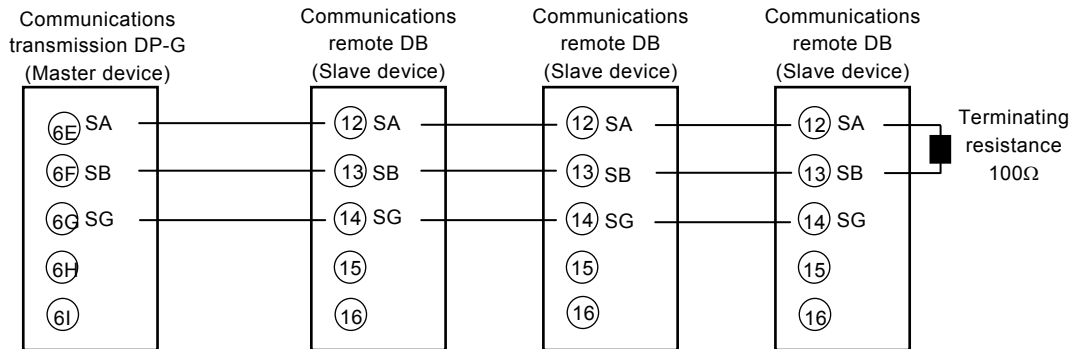
## 10 - 4 - 1. For RS-232C



## 10 - 4 - 2. For RS-422A



## 10 - 4 - 3. For RS-485

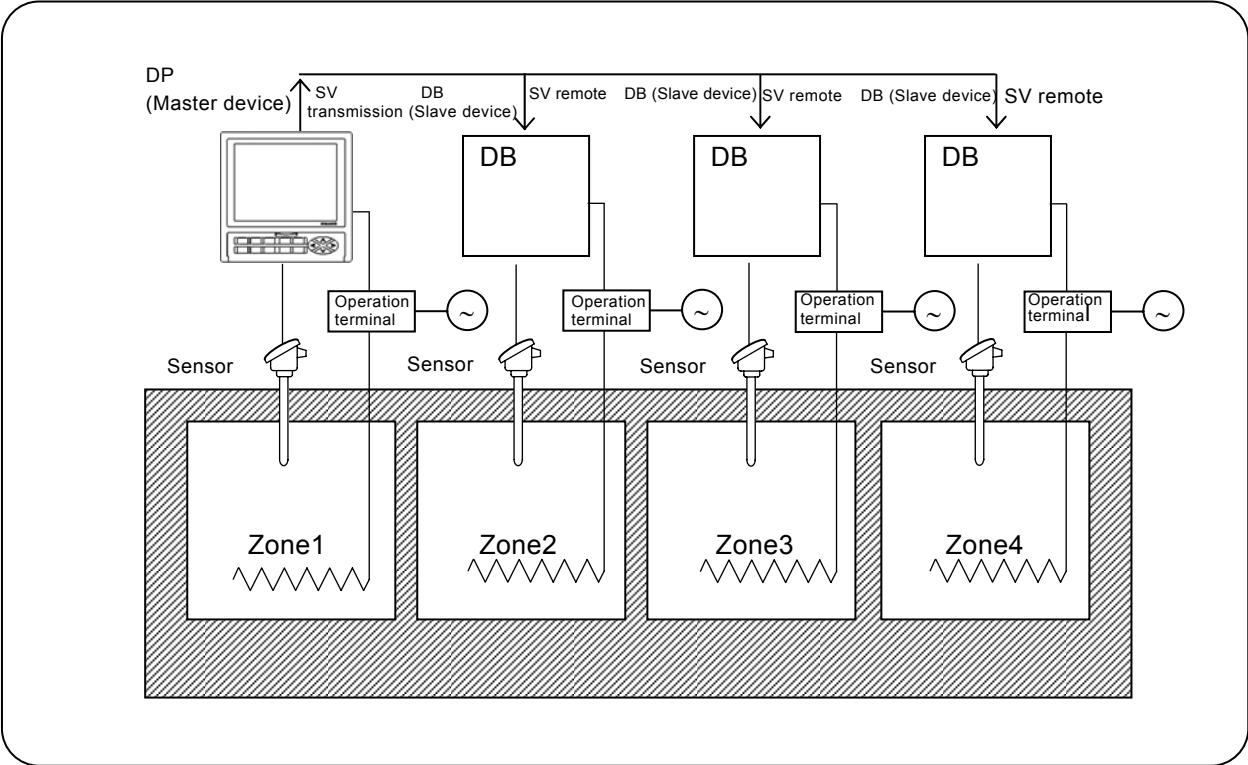


## 10 - 5. Combination example

### 10 - 5 - 1. Multi-zone temperature control

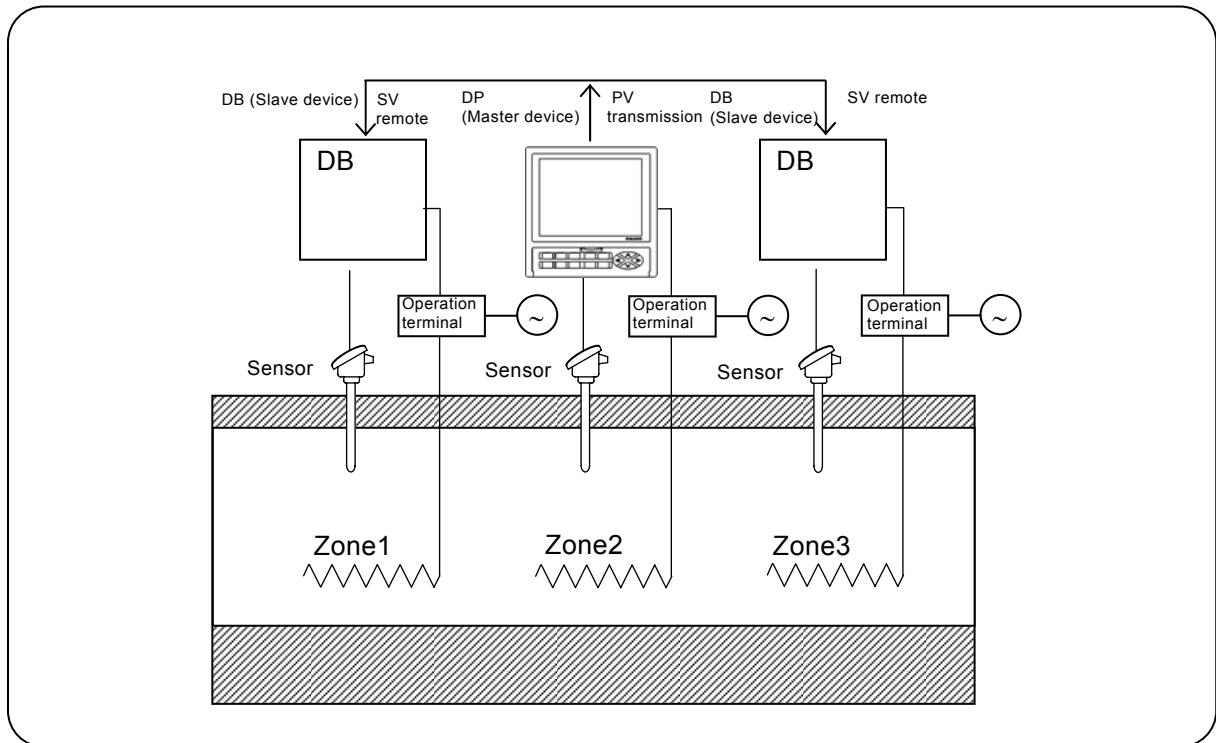
DP-G of the master device sends SV as communications transmission and DB of a slave device receives it as communications remote.

Since there is no error caused by analog transmission, remote control can be performed with high precision. In addition, using remote shift of DB allows to prepare a temperature rate for multi-zone.



## 10 - 5 - 2. Burning furnace zone control

PV is sent from the central master device and the slave devices located at the both ends receive remotely PV as SV, and then average thermal control is enabled.



# 11. Appendix

## 11 - 1. Communications format list

In the following tables, the symbols indicate as follows:  $\Delta$  = Space (20H), X=Numeric value data and code data at the time of setting,  $\circ$  = Numeric value data and code data at the time of DP transmission, SX = STX (02H), EX = ETX (03H), BCBC = BCC, CR = CR (0DH), LF = LF (0AH).

Communi- cations Item	Format																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Real Data Request	SX	$\Delta$	1	,	$\Delta$	1	,	EX	BC D	BC F	CR	LF																		
Response Output	SX	$\Delta$	1	,	$\circ$	$\circ$	,	$\circ$	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	$\circ$	,	$\circ$	,	$\circ$	$\circ$	$\circ$	,	$\circ$	$\circ$	,	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	,	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	$\circ$	$\circ$	,	EX	BC	BC	CR	LF																						
Execution Parameters Request	SX	$\Delta$	1	,	$\Delta$	2	,	EX	BC E	BC F	CR	LF																		
Response Output	SX	$\Delta$	2	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	
	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	,	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$	$\circ$
	BC	CR	LF																											

Communications Item	Format																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
SETUP Program	SX	△	1	,	△	3	,	x	x	,	x	x	x	,	EX	BC	BC	CR	LF												
Pattern Data request								PTN			STP																				
Step 0 Output	SX	△	3	,	△	1	,	○	○		△	0		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	SX	△	3	,	△	2	,	○	○		○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○	,	○
END step Output	○		PID		ALM		OPL		OSL		Sensor		G immediate		MAI		TS1		TS2		TS3		TS4		TS5						
	,	○	○	,	○	○	,	○	○	,	○	○	,	○	○	,	EX	BC	BC	CR	LF										
	TS6				TS7				TS8					TS9			TS10														
Pattern Repeat Output	SX	△	3	,	△	3	,	○	○		○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Individual setting Parameters Request	SX	△	1	,	△	4	,	x	x		x	x		EX	BC	BC	CR	LF													
Program Pattern Setting status Request	SX	△	1	,	△	5	,	x	x		EX	BC	BC	CR	LF																
Response output	SX	△	5	,	○	○		○	○		○	○	○	○		EX	BC	BC	CR	LF											
Device Status Request	SX	△	1	,	△	6	,	EX	BC	BC	CR	LF																			
Response output	SX	△	6	,	○		○		○		○		○		○		○		○		○		○		○		○		○		○
Mode lock Status Request	SX	△	1	,	△	7	,	EX	BC	BC	CR	LF																			
Response output	SX	△	7	,	○		○		○		○		○		○		○		○		○		○		○		○		○		○
Status 1 Request	SX	△	1	,	△	8	,	EX	BC	BC	CR	LF																			
Response output	SX	△	8	,	○	○		○	○		○	○		○	○		○		○		○		○		○		○		○		○
Status 2 Request	SX	△	1	,	△	9	,	EX	BC	BC	CR	LF																			
Response output	SX	△	9	,	○		○		○		○		○		○		○		○		○		○		○		○		○		○
	○	,	○	,	EX	BC	BC	CR	LF																						
	UP		DWN																												

Communications Item	Format																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
Program Drive	SX	△	2	,	△	1	,	x	,	x	x	,	EX	BC	BC	CR	LF																	
Execution Parameters SETUP	SX	△	2	,	△	2	,	x	x	x	x	x	,	x	x	x	x	,	x	x	x	x	,	x	x	x	x	x	x	x				
	,	x		x	x	x	x	,	x	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x				
	,	x		x	x	x	,	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
	BC	BC	CR	LF																										EX				
AUTO/MAN Switching	SX	△	2	,	△	3	,	x	,	x	x	x	,	x	,	x	x	x	,	EX	BC	BC	CR	LF										
Constant value control (CONST)	SX	△	2	,	△	4	,	x	,	x	x	x	x	x	x	x	,	EX	BC	BC	CR	LF												
Alarm Reset	SX	△	2	,	△	5	,	EX	BC	BC	CR	LF																						
Auto tuning	SX	△	2	,	△	6	,	x	,	EX	BC	BC	CR	LF																				
Mode Lock/lock CLEAR	SX	△	2	,	△	7	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	EX				
	BC	BC	CR	LF																														
Time display type	SX	△	2	,	△	8	,	x	,	EX	BC	BC	CR	LF																				
Step 0 SETUP	SX	△	3	,	△	1	,	x	x	,	0	0	,	x	x	x	x	x	x	x	x	x	x	,	EX	BC	BC	CR	LF					
Step n SETUP	SX	△	3	,	△	2	,	x	x	,	x	x	,	x	x	x	x	x	x	x	x	x	x	,	x	x	x	x	x	EX	BC			
	BC	CR	LF																															
END Step SETUP	SX	△	3	,	△	3	,	x	x	x	,	x	x	,	x	x	,	x	x	x	x	x	x	,	x	x	x	x	x	EX	BC	BC	CR	LF
Parameter No. SETUP	SX	△	3	,	△	4	,	x	x	,	x	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	,	x	x			
	x	x	,	x	x	,	x	x	,	x	x	,	x	x	,	x	x	,	x	x	,	x	x	,	x	x	,	x	x	EX	BC	BC		
	CR	LF																																
Step Repeat SETUP	SX	△	3	,	△	5	,	x	x	,	x	x	,	x	x	,	x	x	,	EX	BC	BC	CR	LF										
Pattern Repeat SETUP	SX	△	3	,	△	6	,	x	x	x	x	,	EX	BC	BC	CR	LF																	
Pattern COPY	SX	△	3	,	△	7	,	x	x	,	x	x	,	EX	BC	BC	CR	LF																
Pattern Clear	SX	△	3	,	△	8	,	x	x	,	EX	BC	BC	CR	LF																			

Communi- cations Item	Format																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Alarm	SX	1	2	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	
	SX	1	2	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
PID	SX	1	3	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	3	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
VARIATION LIMIT	SX	1	4	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	4	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
Output upper/lower limit	SX	1	5	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	5	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
Sensor BIAS	SX	1	6	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	6	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
Guarantee soak	SX	1	7	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	7	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O
Waiting time Alarm	SX	1	8	,	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	,	x	x	x	x	x	x	x	x	x	
	SX	1	8	,	O	,	O	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	,	O	O	O	O	O	O	O	O	O



Communications Item	Format																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Time signal	SX SX	1 1	9 9	,	x o	x o	,	x o	x o	x o	.	x o	x o	,	x o	x o	x o	.	x o	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF						
					No.					ON-Time																						
Digital Filter	SX SX	2 2	0 0	,	x o	x o	x o	x o	,	EX o	BC o	BC o	CR o	LF EX	BC o	BC o	CR o	LF o														
Transmission KIND	SX SX	2 2	1 1	,	x o	,	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	
Transmission Scale					Type						Scale MIN													Scale MAX								
Output 2 GAP	SX SX	2 2	2 2	,	x o	x o	x o	x o	x o	x o	,	EX o	BC o	BC EX	CR BC	LF BC	CR o	LF o														
Output 2 PID	SX SX	2 2	3 3	,	x o	x o	x o	x o	x o	,	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	x o	EX o	BC o	BC o	CR o	LF o						
										Second P																						
Output 2 VARIATION LIMIT	SX SX	2 2	4 4	,	x o	x o	x o	x o	x o	,	EX o	BC o	BC o	CR EX	LF BC	BC o	CR o	LF o														
Output 2 upper/lower limit	SX SX	2 2	5 5	,	x o	x o	x o	x o	x o	,	x o	x o	x o	x o	x o	x o	x o	x o	EX o	BC o	BC o	CR o	LF o									
										Second OL																						
Second 2-position Dead band	SX SX	2 2	6 6	,	x o	x o	x o	,	EX o	BC o	BC o	CR o	LF o	EX o	BC o	BC o	CR o	LF o														
Second PV abnormality output	SX SX	2 2	7 7	,	x o	x o	x o	x o	x o	,	EX o	BC o	BC o	CR EX	LF BC	BC o	CR o	LF o														
Output 2 Direct/reverse	SX SX	2 2	8 8	,	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																					
Second pulse cycle	SX SX	2 2	9 9	,	x o	x o	x o	,	EX o	BC o	BC o	CR o	LF o	EX o	BC o	BC o	CR o	LF o														
Measurement input unit	SX SX	3 3	0 0	,	x o	x o	,	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																		
					Input					Unit																						
RJ INT/EXT	SX SX	3 3	1 1	,	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																					
SV decimal point	SX SX	3 3	2 2	,	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																					
PV decimal point	SX SX	3 3	3 3	,	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																					
Alarm Filter	SX SX	3 3	4 4	,	x o	x o	,	EX EX	BC BC	BC BC	CR CR	LF LF																				

Communications Item	Format																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Alarm Mode Alarm DEAD BAND	SX SX	3 3	5 5	,	x O	,	x O	,	x O	x O	x O	x O	x O	.	EX O	BC O	BC ,	CR EX	LF BC	BC O	CR O	LF O									
2-position Dead band	SX SX	3 3	6 6	,	x O	x O	x O	,	EX O	BC O	BC O	CR O	LF ,	EX O	BC O	BC O	CR O	LF O													
Pulse cycle	SX SX	3 3	7 7	,	x O	x O	x O	,	EX O	BC O	BC O	CR O	LF ,	EX O	BC O	BC O	CR O	LF O													
ZERO SPAN Gain	SX SX	3 3	8 8	,	x O	x O	x O	x O	x O	.	x O	x O	x O	,	x O	x O	.	x O	x O	.	EX O	BC ,	BC O	CR O	LF O	O	O	O	O	O	
									ZERO											SPAN											
Output preset	SX SX	3 3	9 9	,	x O	x O	x O	x O	x O	x O	.	EX O	BC ,	BC EX	CR BC	LF BC	CR O	LF O													
PV error Output	SX SX	4 4	0 0	,	x O	x O	x O	x O	x O	.	EX O	BC O	BC ,	CR EX	LF BC	BC O	CR O	LF O													
Output Direct/reverse	SX SX	4 4	1 1	,	x O	,	EX EX	BC BC	BC BC	CR CR	LF LF																				
Linear range	SX SX	4 4	2 2	,	x O	x O	x O	x O	x O	x O	.	x O	x ,	x O	x O	x O	x O	.	EX O	BC O	BC O	CR ,	LF EX	BC O	BC O	CR O	LF O				
									ZERO											SPAN											
Linear scale	SX SX	4 4	3 3	,	x O	x O	x O	x O	x O	x O	.	x O	x ,	x O	x O	x O	x O	.	EX O	BC ,	BC EX	CR BC	LF BC	BC O	CR O	LF O	CR O	LF O			
									Scale MIN											Scale MAX											
ARW	SX SX	4 4	4 4	,	x O	x O	x O	x O	x O	.	x O	x O	x ,	x O	x O	.	EX O	BC O	BC O	CR O	LF O	,	EX O	BC O	BC O	CR O	LF O				
									lower limit											upper limit											
AT2 SV	SX SX	4 4	5 5	,	x O	,	x O	,	x O	x O	x O	x O	x O	x O	x O	.	EX O	BC EX	BC BC	CR BC	LF CR	LF O									
					No.				AT2 SV																						
SV section	SX SX	4 4	6 6	,	x O	,	x O	x O	x O	x O	x O	x O	x O	.	EX O	BC EX	BC BC	CR BC	LF CR	LF O											
					No.				Delimiter																						
AT3 SV	SX SX	4 4	7 7	,	x O	,	x O	,	x O	x O	x O	x O	x O	x O	x O	.	EX O	BC EX	BC BC	CR BC	LF CR	LF O									
					No.				AT3 SV																						
AT start Direction	SX SX	4 4	8 8	,	x O	,	EX EX	BC BC	BC BC	CR CR	LF LF																				

Communications Item	Format																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
When reset SV	SX SX	4 4	9 9	,	x O	x O	x O	x O	x O	x O	.	EX O	BC ,	BC EX	CR BC	LF BC	CR O	LF O												
Thermocouple KIND Unit	SX SX	5 5	1 1	,	x O	x O	,	x O	,	EX EX	BC BC	BC BC	CR CR	LF LF																
					KIND				Unit																					
SV Scale	SX SX	5 5	2 2	,	x O	x O	x O	x O	x O	x O	.	x O	x ,	x O	x O	x O	x O	.	EX O	BC O	BC O	CR ,	LF EX	BC O	BC O	CR O	LF O			
									Scale MIN											Scale MAX										

## 11 - 2. Input type No. -- Input type mapping table

### Thermocouple

No.	Input type	No.	Input type	No.	Input type	No.	Input type
1	B	8	E1	15	J4	23	PR5-20
2	R1	9	E2	16	T1	67	PtRh40-PtRh20
3	R2	10	E3	17	T2	64	Platinel2-1
4	S	11	E4	61	WRe5-WRe26	65	Platinel2-2
5	K1	12	J1	62	W-Wre26	27	U
6	K2	13	J2	63	NiMo-Ni	28	L
7	K3	14	J3	66	CR-AuFe	29	N

### Thermocouple (Previously DP)

No.	Thermocouple	No.	Thermocouple	No.	Thermocouple
18	WRe5-26	20	Ni-NiMo	25	Platinel1
19	WRe0-26	24	PR20-40	26	Platinel2

### DC voltage/current

No.	Input type	No.	Input type	No.	Input type
31	10mV	34	100mV	37	10V
32	20mV	35	5V	-	
33	50mV	36	20mA	-	

### Resistance (3 wire)

No.	Input type	No.	Input type	No.	Input type	No.	Input type
53	Pt100 1	41	JPt100 1	46	QPt100 1	51	Pt50
54	Pt100 2	42	JPt100 2	47	QPt100 2	52	Pt-Co
55	Pt100 3	43	JPt100 3	48	QPt100 3	-	
56	Pt100 4	44	JPt100 4	49	QPt100 4	-	
57	Pt100 5	45	JPt100 5	50	QPt100 5	-	

### Resistance (4 wire)

No.	Input type	No.	Input type	No.	Input type	No.	Input type
153	Pt100 1	141	JPt100 1	146	QPt100 1	151	Pt50
154	Pt100 2	142	JPt100 2	147	QPt100 2	152	Pt-Co
155	Pt100 3	143	JPt100 3	148	QPt100 3	-	
156	Pt100 4	144	JPt100 4	149	QPt100 4	-	
157	Pt100 5	145	JPt100 5	150	QPt100 5	-	

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# MEMO

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# CHINO

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