DESCRIPTION

The MS5305HA is a plug-in, high-accuracy digital alarm setter that compares the levels of DC current or voltage signals with two or four set-points and outputs two or four independent isolated relay contact closure signals.

ORDERING CODE

MS5305HA- ☐ - ☐ ☐

Model

Power Supply
A: 100 to 240V AC (50 to 60Hz)
D: 24V DC **P**: 110V DC

Input

A: 4 to 20mA DC	**3**: 0 to 1V DC
B: 2 to 10mA DC	**4**: 0 to 10V DC
C: 1 to 5mA DC	**5**: 0 to 5V DC
D: 0 to 20mA DC	**6**: 1 to 5V DC
E: 4 to 20mA DC *1	**4W**: ±10V DC
H: 10 to 50mA DC	**5W**: ±5V DC
Z: Other DC current signal	**0**: Other DC voltage signal

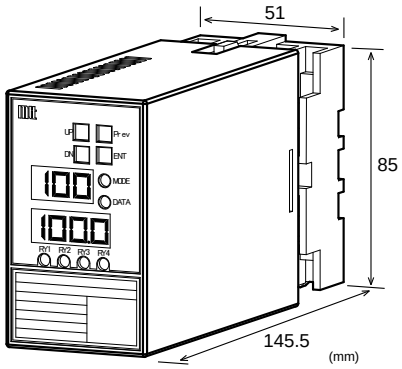
*1: Shunt resistor 50Ω

Output
A: 4 x form A contacts
B: 4 x form B contacts
C: 2 x form C contacts

Options
No code: None
/S: Screw terminal with spring washer
/D: Relay contact with max. allowable voltage 125V DC
/X: Others (Special order)
* For non-standard options, ask MTT for availability.

ORDERING INFORMATION

To place an order, please use the ordering code format as shown above.
(e.g.) MS5305HA-A-AA



SPECIFICATIONS

●POWER SECTION

Power Requirements	100 to 240V AC: 85 to 264V AC (47 to 63Hz) 24V DC: 24V DC±10% 110V DC: 90 to 121V DC
Power Sensitivity	Better than ±0.1% of span for each power supply range.
Power Line Fuse	160mA fuse

Maximum Power Consumption

Power	100-240V AC	24V DC	110V DC
	Approx. 7.5VA	Approx. 2.5W	Approx. 5.5W

●INPUT SECTION

Input Resistance

Voltage Input Model	1MΩ min. with or without power.	
Current Input Model	4 to 20mA	250Ω (std.)
	2 to 10mA	250Ω
	1 to 5 mA	100Ω
	0 to 20mA	250Ω
	10 to 20mA	10Ω

Allowable Input Voltage

Voltage Input Model	30V DC max., continuous. (Standard for a span up to 10V)
Current Input Model	40mA DC max., continuous. (Standard for 4 to 20mA)

Ranges Available

	Current Signal	Voltage Signal
Input Range (DC)	-100 to 100mA	-300 to 300V
Input Span (DC)	100μA to 200mA	200mV to 600V
Input Bias	-100 to 100%	-100 to 100%

Input Spec. Ex. 1: For 3 to 8V input, the input span is 5V and the bias +60%.
Input Spec. Ex. 2: For -5 to 0V input, the input span is 5V and the bias -100%.

OUTPUT SECTION

Trip Points	Separately adjustable for each output channel by front accessible switches. Range: 0.0 to 105.0% of span (in 0.1% steps) * In the engineering unit mode, trip points can be set within the range displayed in engineering units. * Available alarm range is from -10 to 110%. Accuracy: Better than ±(0.1% of span + resolution)
Hysteresis	Separately adjustable for each output channel by front accessible switches. Range: 0.5 to 10.0% of span (in 0.1% steps) Accuracy: Better than ±(0.1% of span + resolution)
Relay Status Indicator LED	A red LED turns on when the relay is activated.
Output without Power	4 x form A contacts: All four contacts are open. 4 x form B contacts: All four contacts are closed. 2 x from C contacts: COM and NC are closed; COM and NO are open.
Start-up Delay	Separately adjustable for each output channel by front accessible switches. Range: 1 to 99s (in 1s steps)
Activation Delay	Separately adjustable for each output channel by front accessible switches. Range: 0 to 99s (in 1s steps) Accuracy: ±0.2s max. (excluding response time)
Deactivation Delay	Separately adjustable for each output channel by front accessible switches. Range: 0 to 99s (in 1s steps) Accuracy: ±0.2s max. (excluding response time)

PERFORMANCE

Temperature Effect	Better than ±0.15% of span per 10°C change in ambient.
Response Time	500ms max. (0 to 90%) with a step input at 100%.
Resolution	1/3000
Indications	Mode indication: 7-segment red LED display, 8mm character height, 3 digits. 1 red/green LED indicator. Data indication: 7-segment red LED display, 8mm character height, 4 digits. 1 red/green LED indicator. Relay status indication: 4 red LED indicators. (2 red LED indicators for the form C contact version) Data display range: Approx. -20 to 110% of input If input in engineering units is out of the following range, the figures -999 or 9999 blinks at 1 second intervals (0.5s on/0.5s off). Decimal point position 0: -999 to 9999 Decimal point position 1: -99.9 to 999.9 Decimal point position 2: -9.99 to 99.99 Decimal point position 3: -999 to 9.999 If non-data-display mode is enabled, "----" appears on the display when there is a signal input below a set value. Data display accuracy: Better than ±(0.1% of span + resolution) Display cycle: Approx. 0.5s
Isolation	4-way isolation between input, output, power, and ground.
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	-10 to 60°C
Insulation Resistance	100MΩ min. (@ 500V DC) 4 x form A contacts: Input / [OUT1, OUT2] / [OUT3, OUT4] / Power / Ground 4 x form B contacts: Input / [OUT1, OUT2] / [OUT3, OUT4] / Power / Ground 2 x form C contacts: Input / OUT1 / OUT2 / Power / Ground
Dielectric Strength	2000V AC for 1 minute (Cutoff current: 0.5mA) 4 x form A contacts: Input / [OUT1, OUT2] / [OUT3, OUT4] / Power / Ground 4 x form B contacts: Input / [OUT1, OUT2] / [OUT3, OUT4] / [Power, Ground] 2 x form C contacts: Input / OUT1 / OUT2 / [Power, Ground] 2000V AC for 1 minute between Power and Ground (Cutoff current: 5.0mA)
Relay Contacts (Standard)	
Rated Load	3A, 250V AC (Resistive load) 3A, 30V DC (Resistive load)
Max. Allowable Voltage	250V AC, 30V DC
Max. Allowable Current	3A (Resistive load)
Electrical Life	NO: 50,000 cycles NC: 30,000 cycles (Rated load by resistive load; frequency 360 cycles/h)
Mechanical Life	5 million cycles (Frequency 10, 000 cycles/h)
Relay Contacts (Optional)	
Rated Load	3A, 250V AC (Resistive load) 3A, 30V DC (Resistive load)
Max. Allowable Voltage	250V AC, 125V DC* * Load current 0.4mA max. (resistive load) for 125V DC
Max. Allowable Current	3A (Resistive load)
Electrical Life	AC: 100,000 cycles DC: 50,000 cycles (Rated load by resistive load; frequency 1800 cycles/h)
Mechanical Life	10 million cycles (Frequency 18, 000 cycles/h)

●PHYSICAL

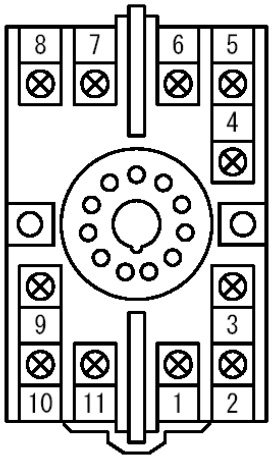
Installation	Wall/DIN rail mounting
Mounting Orientation	Vertical
Screwing Torque (Recommended)	Standard: 0.78 to 1.18 [Nm] With spring washer: 0.78 to 0.98 [Nm]
Wiring	M3.5 screw terminal connection
External Dimensions	W51 × H85 × D145.5mm (including the socket)
Weight	Main unit: 250g max. Socket: Approx. 75g

●MATERIALS

Housing	ABS resin (UL 94V-0)
Socket	ABS resin (UL 94V-0)
Screw Terminal	Galvanized steel with trivalent chromate finish
Printed Circuit Board	Glass fabric epoxy resin (FR-4: UL 94V-0)
Conformal Coating	HumiSeal® 1A27NSLU (Polyurethane)

* HumiSeal® is a registered trademark of Chase Corporation.

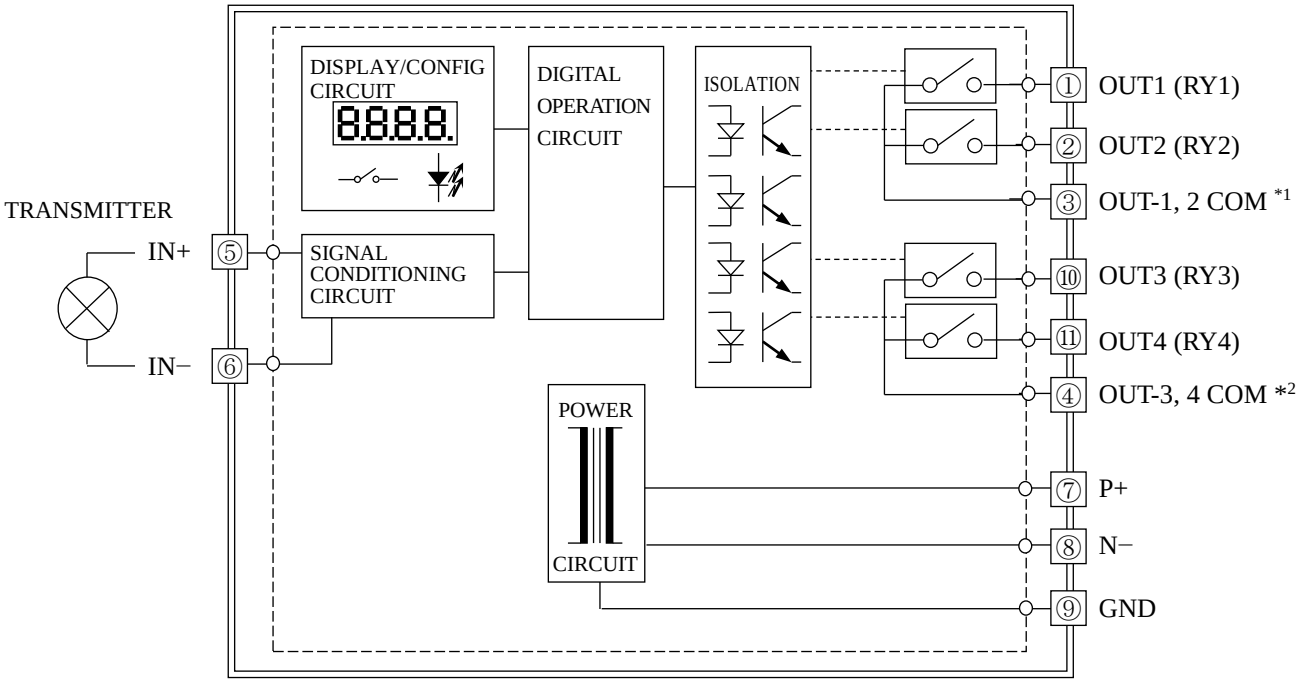
TERMINAL ASSIGNMENT



Terminal	4 x form A contacts	4 x form B contacts	2 x form C contacts
1	OUT1 (NO)	OUT1 (NC)	OUT1 (NC)
2	OUT2 (NO)	OUT2 (NC)	OUT1 (NO)
3	OUT1,OUT2 COM	OUT1,OUT2 COM	OUT1 COM
4	OUT3,OUT4 COM	OUT3,OUT4 COM	OUT2 COM
5	IN+	IN+	IN+
6	IN−	IN−	IN−
7	P+ (POWER)	P+ (POWER)	P+ (POWER)
8	N− (POWER)	N− (POWER)	N− (POWER)
9	GND	GND	GND
10	OUT3 (NO)	OUT3 (NC)	OUT2 (NC)
11	OUT4 (NO)	OUT4 (NC)	OUT2 (NO)

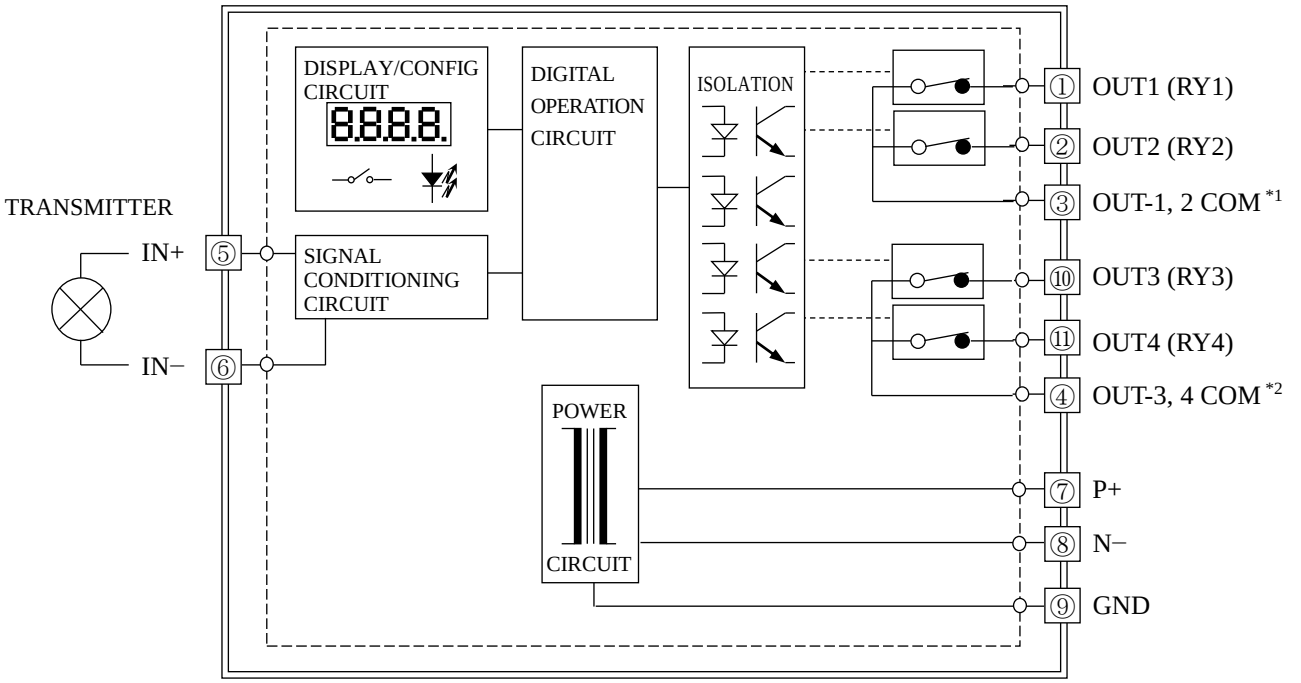
BLOCK DIAGRAM

4 x Form A Contacts:



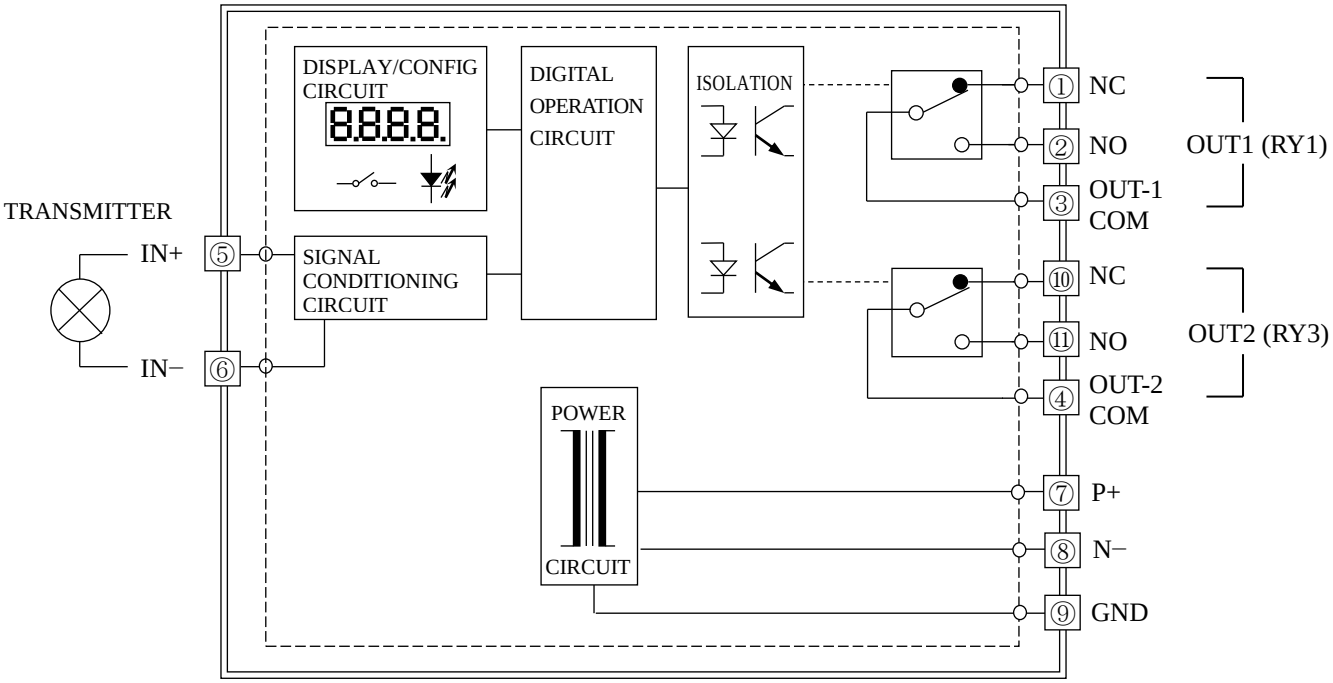
*1: The sum of the load currents on RY1 and RY2 must not exceed 3A.
*2: The sum of the load currents on RY3 and RY4 must not exceed 3A.

4 x Form B Contacts:

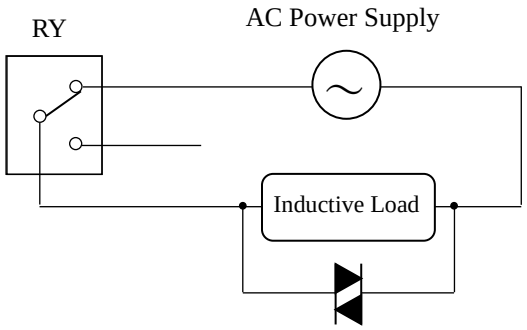


*1: The sum of the load currents on RY1 and RY2 must not exceed 3A.
*2: The sum of the load currents on RY3 and RY4 must not exceed 3A.

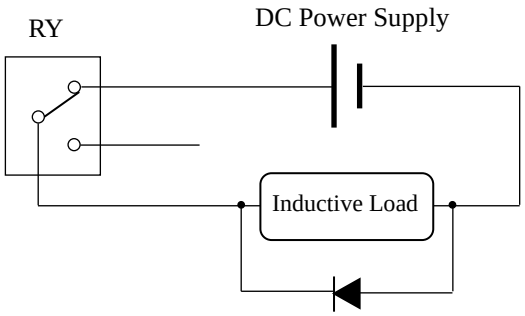
2 x Form C Contacts:



When an inductive load, such as an electric motor, is connected to the output, a relay contact protection circuit must be connected across the load as shown below.

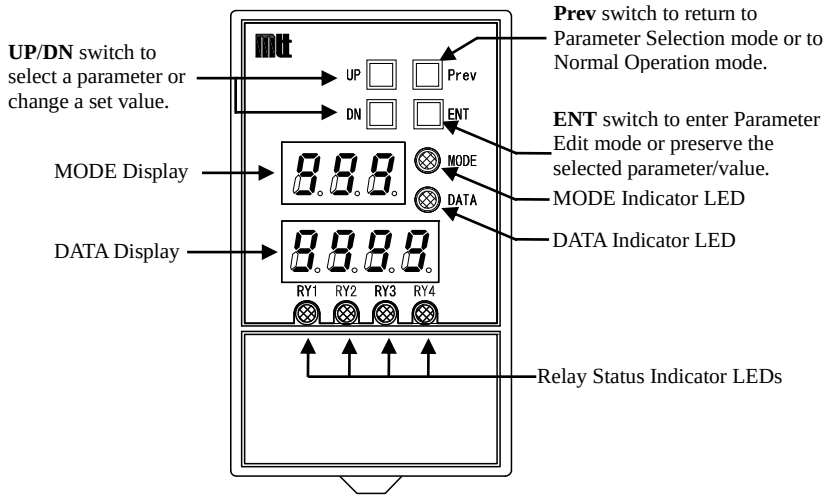


Protection Circuit
(Varistor, CR circuit, etc.)

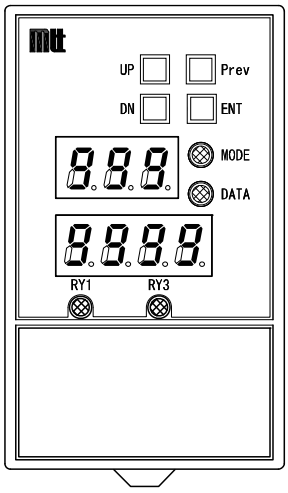


Protection Circuit
(Diode, varistor, CR circuit, etc.)

FRONT VIEW



Output: Form A or B contacts



Output: Form C contacts

MODE Section: Consists of a MODE display and a red/green MODE indicator LED.

Normal operation mode	The display is off and the indicator LED lights green.
Error status	The display shows an error code (comprising a letter E and a two-digit number), and the indicator LED lights red.
Parameter Selection mode	The display shows a parameter code (comprising a letter P and a two-digit number), and the indicator LED blinks green.

DATA Section: Consists of a DATA display and a red/green DATA indicator LED.

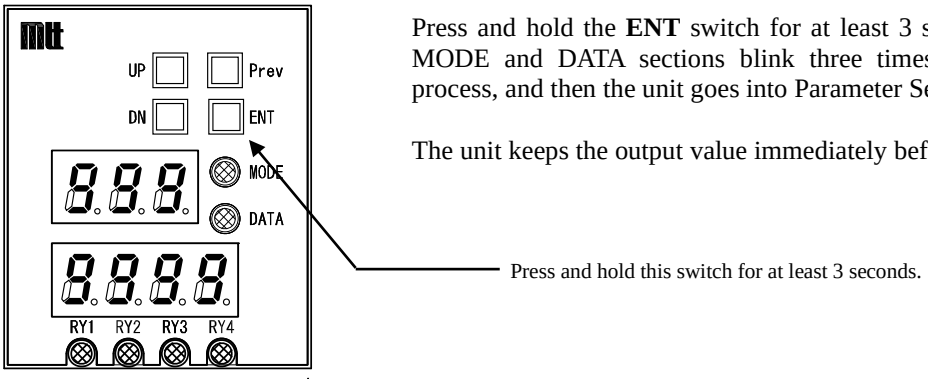
Normal operation mode	The display shows an input value in engineering units or in percentage (0 to 100%). Red LED indicates that the value is positive; green LED indicates that it is negative.
Errors status	The display and indicator LED are both off.
Parameter Selection mode	The display shows a set value corresponding to the parameter code selected. The indicator LED lights red when the value is positive and green when negative.

RY1 - RY4: Relay status indicator LED (red LED turns on when the corresponding relay is activated)
For the form C contact output, RY2 and RY4 have no function.
RY1: OUT1
RY2: OUT2 (not applicable for the form C contact output)
RY3: OUT3
RY4: OUT4 (not applicable for the form C contact output)

PARAMETER SETTING

Configuring Parameters

1. Switching from Normal Operation Mode to Parameter Selection Mode



Press and hold the **ENT** switch for at least 3 seconds. All the LEDs in the MODE and DATA sections blink three times, indicating self-diagnostics process, and then the unit goes into Parameter Selection mode.

The unit keeps the output value immediately before the switching.

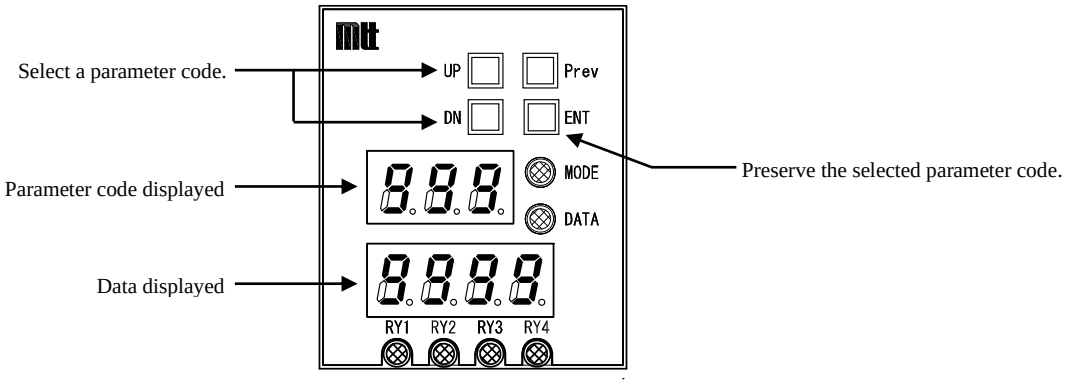
2. Selecting a Parameter

Once the module enters Parameter Selection mode, the MODE display shows a letter P, followed by a two-digit number, and the MODE indicator LED blinks green.

Press the **UP** or **DN** switch until the parameter code you want appears on the MODE display. (For a complete list of parameter codes, refer to the "Parameter Code List" on page 10.) The DATA display shows the current value corresponding to the parameter code being displayed.
The DATA indicator LED lights red when the value is positive and green when negative.

3. Switching from Parameter Selection Mode to Parameter Edit Mode

In Parameter Selection mode, press the **ENT** switch to go into Parameter Edit mode, where the value indicated in the DATA display can be modified.



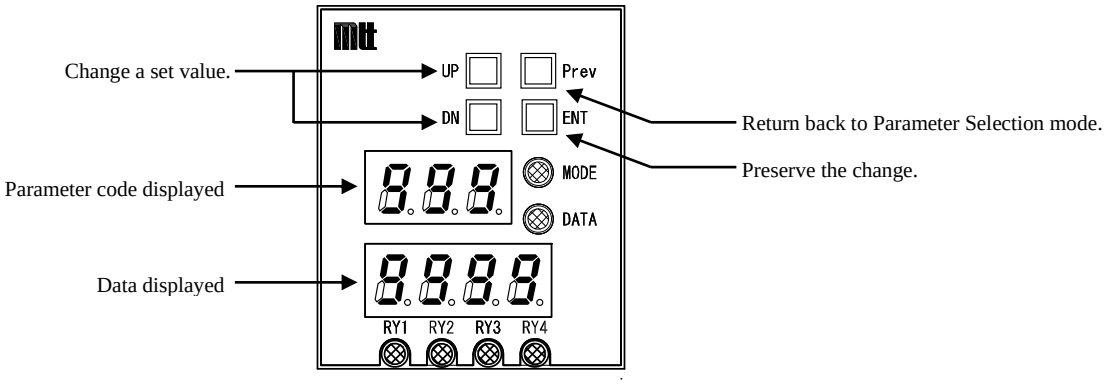
4. Changing Parameter Values

Once the module enters Parameter Edit mode, the MODE indicator LED lights green and the DATA indicator LED blinks red or green. A blinking red LED indicates that the value displayed is positive; a blinking green LED indicates that it is negative.

Press the **UP** or **DN** switch until the value you want appears on the DATA display. Pressing and holding the switch increases the speed at which the value changes.

Press and hold the **ENT** switch for at least 3 seconds to save the value indicated on the DATA display into the module. At this point, the DATA display turns off for about 0.5 second.

Press the **Prev** switch to return to Parameter Selection mode.



5. Changing Multiple Parameter Values

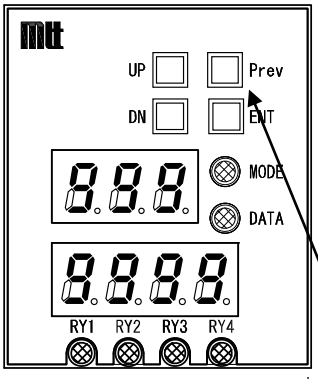
If you want to change more than one parameter, just repeat steps 2 to 4.

6. Exiting Parameter Selection Mode and Returning to Normal Operation Mode

While in Parameter Selection mode as mentioned in step 2, press and hold the **Prev** switch for at least 3 seconds. All the LEDs in the MODE and DATA sections blink three times, and the unit returns to Normal Operation mode. If no switch is operated for one minute, the module automatically returns to Normal Operation mode.

Confirming Set Values

1. Switching from Normal Operation Mode to Confirmation Mode
   Note: The Confirmation mode does not allow users to make any changes to the settings.



Press and hold the **Prev** switch for at least 3 seconds. All the LEDs in the MODE and DATA sections blink three times, indicating self-diagnostics process, and then the unit goes into Confirmation mode.

The unit keeps the output status for normal operation.

When the module moves from any error status (error code E10 or E90) to Confirmation mode, all the relays remain deactivated. In the case of E90, however, relay behavior and status indication may be undefined.

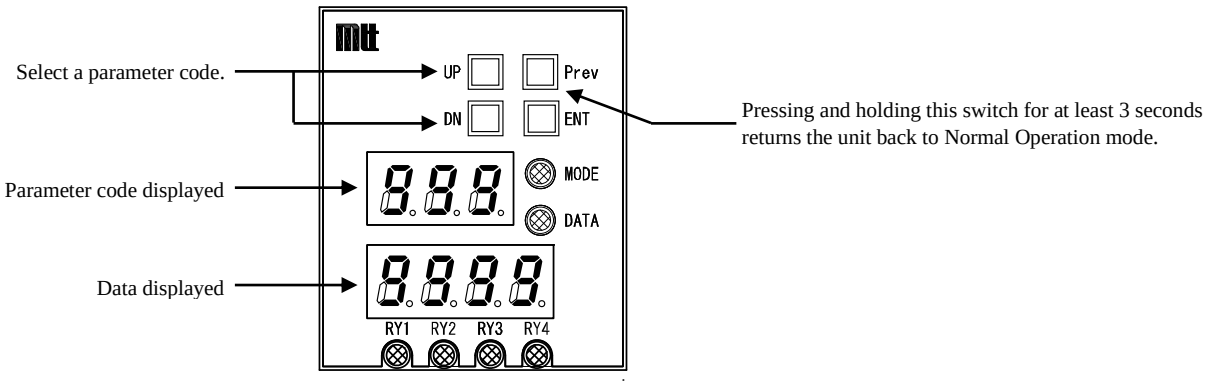
2. Selecting a Parameter

Once the module enters Confirmation mode, the MODE display shows a parameter code (a letter P, followed by a two-digit number), and the MODE indicator LED blinks green.

Press the **UP** or **DN** switch until the parameter code you want appears on the MODE display. The DATA display shows the value corresponding to the parameter code being displayed. (For a complete list of parameter codes, refer to the "Parameter Code List" on page 10.)
The DATA indicator LED lights red when the value is positive and green when negative.

3. Exiting Confirmation mode and Returning to Normal Operation mode

While in the Confirmation mode, press and hold the **Prev** switch for at least 3 seconds. All the LEDs in the MODE and DATA sections blink three times, and the unit returns to Normal Operation mode.
If no switch is operated for one minute, the module automatically returns to Normal Operation mode.



Parameters

Parameter Code List

Parameter Code			Range	Description	Factory Default
Hi	Mid	Lo			
P	1	1	0.0 to 105.0	Trip point (%)	0.0
		2			0.0 *
		3			100.0
		4			100.0 *
	2	1	0.5 to 10.0	Hysteresis (%)	1.0
		2			1.0 *
		3			1.0
		4			1.0 *
	3	1	H, L, 0	Relay activation mode H: Activated when input is above set point L: Activated when input is below set point 0: Constantly deactivated	H
		2			H *
		3			L
		4			L *
	4	1	1 to 99	Start-up delay (sec)	1
		2			1 *
		3			1
		4			1 *
	5	1	0 to 99	Activation delay (sec)	0
		2			0 *
		3			0
		4			0 *
	6	1	0 to 99	Deactivation delay (sec)	0
		2			0 *
		3			0
		4			0 *
	9	0	0 to 30	Display turn-on time (min) 0: Constantly on 1 to 30: Turn-on time	0
		1	0, 1	Input display mode 0: Percentage (0-100%) 1: Engineering units	0
		2	-999 to 9999	0% input in engineering units	0
		3	-999 to 9999	100% input in engineering units	1000
		4	0 to 3	Decimal point position for input in engineering units 0: XXXX 1: XXX.X 2: XX.XX 3: X.XXX	1
	9	5	0, 1	Non-data-display mode 0: Disabled 1: Enabled	1
	9	6	-15.0 to 0.0	Set value for non-data-display mode (%)	-5.0

Note: For parameter codes P1x - P6x, the least significant digit corresponds to the output number (relay number).
For 2 form C contact outputs, the parameters marked with an asterisk can be configured but do not work.

Trip Point

Input Display mode “0” (where input is displayed in 0-100%):
A trip point is adjustable from 0.0 to 105.0% in steps of 0.1%. It can be configured separately for each relay output. Each trip point is displayed in percentage values.

Input Display mode “1” (where input is displayed in engineering units):
A trip point is adjustable from 0.0 to 100.0% in steps of 0.1%. It can be configured separately for each relay output. Each trip point is displayed in engineering units.

The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P11	RY1	RY1	RY1
P12	RY2	RY2	N/A *
P13	RY3	RY3	RY3
P14	RY4	RY4	N/A *

* It can be configured, but does not function.

Notes:
1) When the trip point set to 105% in percentage mode is displayed in engineering units, its value will be equivalent to 105%. Pressing the **UP** or **DN** switch once here will make the value equal to 100%. Engineering unit mode does not allow setting of any value over 100%. If the 100%-equivalent value is not saved, the set value will remain at 105%.
2) With the engineering unit setting that does not allow 0.1% readings, the display may not change even if the **UP** or **DN** switch is pressed once. In this case, a simple solution is to change the decimal point position to an appropriate (0.1% viewable) setting to recognize any display changes. Another alternative is to just press and hold down the switch for faster value changes. It is therefore recommended that in engineering unit mode, the display should be configured for 1/1000 of span.

Hysteresis

This parameter is used to define hysteresis. It is adjustable from 0.5% to 10.0% in steps of 0.1%, and can be configured separately for each relay output.

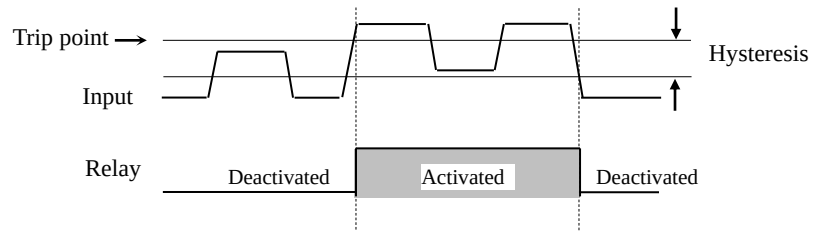
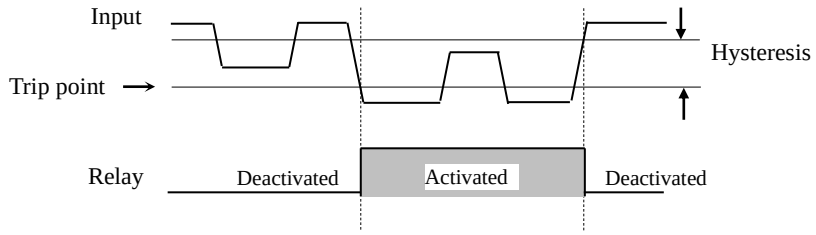
The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P21	RY1	RY1	RY1
P22	RY2	RY2	N/A *
P23	RY3	RY3	RY3
P24	RY4	RY4	N/A *

* It can be configured, but does not function.

Relay Activation Mode

This parameter is used to set relay operation in response to input. It can be configured separately for each relay output.

<table>
<tr><th>Mode of Operation</th><th>Relay Operation</th></tr>
<tr><td rowspan="3">H</td><td>Input > Trip point: Activated</td></tr>
<tr><td>Input < (Trip point − Hysteresis): Deactivated</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="3">L</td><td>Input > (Trip point + Hysteresis): Deactivated</td></tr>
<tr><td>Input < Trip point: Activated</td></tr>
<tr><td> 
</td></tr>
<tr><td>0</td><td>Deactivated regardless of input level.</td></tr>
</table>

The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P31	RY1	RY1	RY1
P32	RY2	RY2	N/A *
P33	RY3	RY3	RY3
P34	RY4	RY4	N/A *

* It can be configured, but does not function.

Start-up Delay

This parameter is used to set a period of time taken for the relay to get ready after module power on. It is adjustable from 1 to 99 seconds in steps of one second, and can be configured separately for each relay output.

The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P41	RY1	RY1	RY1
P42	RY2	RY2	N/A *
P43	RY3	RY3	RY3
P44	RY4	RY4	N/A *

* It can be configured, but does not function.

Relay Activation Delay

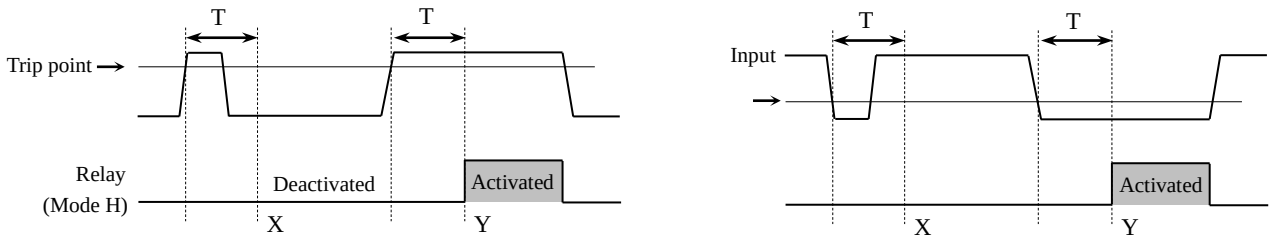
This parameter is used to set the duration of input that allows the relay to be activated. It is adjustable from 0 to 99 seconds in steps of 1 second, and can be configured separately for each relay output.

The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P51	RY1	RY1	RY1
P52	RY2	RY2	N/A *
P53	RY3	RY3	RY3
P54	RY4	RY4	N/A *

* It can be configured, but does not function.

Example: When the delay time is defined as T,
X shows that the relay is kept deactivated because the input is within the delay time (T), and
Y shows that the relay is activated because the input is past the delay time (T).



Relay Deactivation Delay

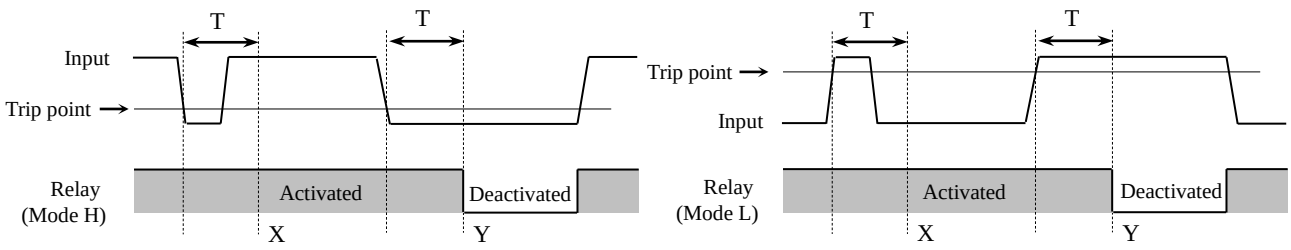
This parameter is used to set the duration of input that allows the relay to be deactivated. It is adjustable from 0 to 99 seconds in steps of 1 second, and can be configured separately for each relay output.

The correspondence of Parameter Codes to the name of outputs is as listed below.

Parameter Code	Outputs		
	4 x form A contacts	4 x form B contacts	2 x form C contacts
P61	RY1	RY1	RY1
P62	RY2	RY2	N/A *
P63	RY3	RY3	RY3
P64	RY4	RY4	N/A *

* It can be configured, but does not function.

Example: When the delay time is defined as T,
X shows that the relay is kept activated because the input is within the delay time (T), and
Y shows that the relay is deactivated because the input is past the delay time (T).



Input Display Mode

This parameter is used to specify the method for displaying an input value on the DATA display during normal operation or trip point setting.

Parameter Code	Set Value	Description
P91	0	Displayed in percentage (%) Displays an input value or set trip point with an input span defined as 100%.
	1	Displayed in engineering units Displays an input value or trip point set for parameter code P92 or P93.

Display Turn-on Time

This parameter is used to set the turn-on time for the DATA display in the Normal Operation mode. It can be set to "constant on" or is adjustable from 1 to 30 minutes in steps of 1 minute. When it is set to 0, the DATA display does not turn off. When it is set to any of the values from 1 to 30, the DATA display turns off automatically if no operations are made for the set period of time. Pressing any of the **UP**, **DN**, **Prev**, and **ENT** switches turns on the DATA display, following three blinks of all LEDs representing self-diagnostics.

Parameter Code	Set Value	Description
P90	0	Constant ON
	1 to 30	Turn-on time

0% Input in Engineering Units

This parameter is used to define a value for 0% input when display in engineering units is selected for the Input Display Mode (parameter code P91). It is adjustable from -999 to 9999 in steps of 1 without a decimal point.

Parameter Code	Set Value	Description
P92	-999 to 9999	0% input value in engineering units

100% Input in Engineering Units

This parameter is used to define a value for 100% input when display in engineering units is selected for the Input Display Mode (parameter code P91). It is adjustable from -999 to 9999 in steps of 1 without a decimal point.

Parameter Code	Set Value	Description
P93	-999 to 9999	100% input value in engineering units

Decimal Point Position for Input in Engineering Units

This parameter is used to define a decimal point position for input in engineering units (parameter codes P92 & P93).

Parameter Code	Set Value	Decimal Point Position
P94	0	XXXX
	1	XXX.X
	2	XX.XX
	3	X.XXX

Examples:

0% input in engineering units (P92)	100% input in engineering units (P93)	Decimal point position for input in engineering units (P94)	Display range for 0 to 100% input
0	100	0	0 to 100
0	1000	1	0.0 to 100.0
-100	1000	2	-1.00 to 10.00
-100	1000	3	-0.100 to 1.000
-999	9999	3	-.999 to 9.999 *

Note: If input is out of the range from -999 to 9999, it can no longer be shown on the display screen, and the DATA display and the DATA indicator LED will blink.

Non-Data-Display Mode

This parameter is used to define whether an input value is displayed or not when it falls below the set value defined for non-data-display mode (parameter P96) in Normal Operation mode.

Parameter Code	Set Value	Description
P95	0	Displays an input value.
	1	Displays “----”.

Set Value for Non-Data-Display Mode

This parameter is used to define a value to set the non-data-display mode (P95) to 1 and show “----” on the DATA display when an input falls below the set value. It can be set from -15% to 0.0% in steps of 0.1%.

Parameter Code	Set Value	Description
P96	-15.0 to 0.0	Set value for non-data-display mode

Error Indication

If an error is detected in the module, the MODE display shows a corresponding error code (a letter E, followed by a two-digit number), and the MODE indicator LED lights red.

Error Code List

Error Code	Event	Relay Behavior	Recovery Operation	Remarks
E10	Parameter data error	All relays deactivated	Reconfiguration	
E90	System error	All relays deactivated	None	Relay behavior and status indication may be undefined.
Other than above	Undefined error	All relays deactivated	None	Relay behavior and status indication may be undefined.

Panel Indication

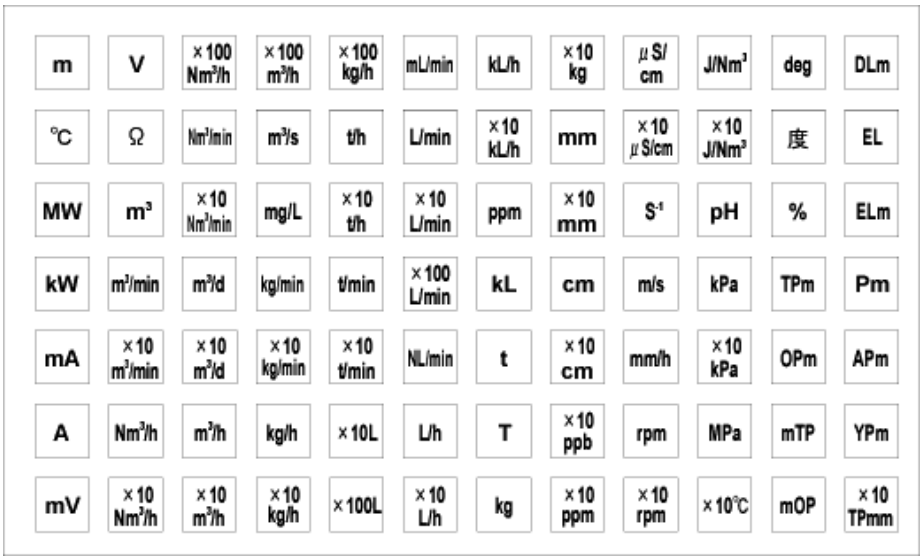
No.	Event	MODE Section		DATA Section	
		MODE Indicator LED	MODE Display	DATA Indicator LED	DATA Display
1	Power-on, mode switching, or switch operation during display "off" time	Green LED turns ON for 1s, then red LED turns ON for 0.5s. This cycle is repeated 3 times.	All LEDs turn ON for 1s, then turn OFF for 0.5s. This cycle is repeated three times.	Green LED turns ON for 1s, then red LED turns on for 0.5s. This cycle is repeated 3 times.	All LEDs turn ON for 1s, then turn OFF for 0.5s. This cycle is repeated three times.
2	Input (Normal)	Green LED is ON.	OFF	Red LED is ON if the value is positive. Green LED is ON if the value is negative.	Input value
3	Input (Non-data-display mode: enabled when below set value)	Green LED is ON.	OFF	Red LED blinks at 1s intervals if the value is positive. Green LED blinks at 1s intervals if the value is negative.	"----" is displayed.
4	Input (Overflow) *	Green LED is ON.	OFF	Red LED blinks at 1s intervals if the value is positive. Green LED blinks at 1s intervals if the value is negative.	-999 or 9999 blinks at 1 second intervals.
5	Display turn-off	Green LED is ON.	OFF	OFF	OFF
6	Selection of the parameter to be configured or confirmed	Green LED blinks at 1 second intervals.	Parameter code	Red LED is ON if the value is positive. Green LED is ON if the value is negative.	Set value
7	Parameter constant setting	Green LED is ON.	Parameter code	Red LED blinks at 1s intervals if the value is positive. Green LED blinks at 1s intervals if the value is negative.	Set value
8	Parameter data error	Red LED is ON.	Error code	OFF	OFF
9	System error	Red LED is ON.	OFF	OFF	OFF

* No. 4: The DATA indicator LED and DATA display blink only if an input reading in engineering unit mode is out of the range from -999 to 9999.

* No. 8 & 9: Indication may be undefined.

ACCESSORIES

Engineering unit sticker label: 1 sheet



FACTORY SETTINGS

If you specify a set value for each of the parameters when ordering, your product will be preconfigured to your specification and shipped. To specify, use the table below. Otherwise, the product will be configured to our factory default settings.

Parameter	Range	Customer specified	Example	Factory Default
RY1 trip point (%)	0.0 to 105.0		75.0	0.0
RY2 trip point (%)			50.0	0.0
RY3 trip point (%)			25.0	100.0
RY4 trip point (%)			0.0	100.0
RY1 hysteresis (%)	0.5 to 10.0		2.0	1.0
RY2 hysteresis (%)			2.0	1.0
RY3 hysteresis (%)			2.0	1.0
RY4 hysteresis (%)			2.0	1.0
RY1 mode of operation	H, L, 0		L	H
RY2 mode of operation			L	H
RY3 mode of operation			0	L
RY4 mode of operation			H	L
RY1 start-up delay (s)	1 to 99		5	1
RY2 start-up delay (s)			10	1
RY3 start-up delay (s)			15	1
RY4 start-up delay (s)			20	1
RY1 activation delay (s)	0 to 99		10	0
RY2 activation delay (s)			20	0
RY3 activation delay (s)			30	0
RY4 activation delay (s)			40	0
RY1 deactivation delay (s)	0 to 99		20	0
RY2 deactivation delay (s)			20	0
RY3 deactivation delay (s)			30	0
RY4 deactivation delay (s)			30	0
Display turn-on time (m)	0 to 30		2	0
Input display mode 0: Percentage 1: Engineering units	0, 1		0	0
0% input in engineering units	-999 to 9999		0	0
100% input in engineering units	-999 to 9999		2000	1000
Decimal point position for input in engineering units 0: XXXX 1: XXX.X 2: XX.XX 3: X.XXX	0 to 3		0	1
Non-data-display mode 0: Disabled 1: Enabled	0, 1		0	1
Set value for non-data-display mode	-15.0 to 0.0		-10.0	-5.0