Instruction Manual for A5000 Series of Unit Meters

8.1.15 Frequency Measuring Unit (open collector, logic, and magnet)

Range	Measu	rement	Indication		Highest	Input		Accuracy
	rai	nge			resolution	impedance	В	
11	0.1 to	200Hz			0.1Hz	1 ~ 10s		
12	1 to 2000Hz		Prescale: 0.001 to 5		1Hz	1s		±(0.2% of FS)
13	0.01 to	20kHz	Frequency division: 1 to 100		10Hz	100ms	±(0.2 % 01 F	
14	0.1 to 200kHz			100Hz	100ms			
Input	Input type Input voltage		Input voltage level	М	aximum perr	missible input		
Open collector LO:1'		LO:1	V or less (5 V: 2.2 kΩ pull up)		30	V		
Lo			1 V or less, HI: 2.5 to 15 V		15	V		

8.1.16 Frequency Measuring Unit (500 Vrms)

Range	Measurement range	Indication	Highest resolution	Indication updating- time interval	Accuracy
11	0.1 to 200Hz		0.1Hz	1 to 10s	
12	1 to 2000Hz	Prescale: 0.001 to 5	1Hz	1s	±(0.2% of FS)
13	0.01 to 20kHz	Frequency division: 1 to 100	10Hz	100ms	±(0.2 % 01 F 3)
14	0.1 to 200kHz		100Hz	100ms	

8.1.17 Strain Gage Unit

	Sensor power	Zero adjusting range	Span adjusting ran			Accuracy
	5V	-0.3 to +2mV/V	1 to 3mV/V		0.5µV/digit	±(0.1% of FS + 2digit)
	10V	-0.5 to +2111V/V	I to Sillv/v		1µV/digit	±(0.1% 01 F3 + 2digit)
Input circuit : Single ended type				cable	sensor: 350Ω	
Operating system ΔΣ conversion				or po		in 15 mA)or 10 V ± 5%
	Maximum sam	nling rate : 12.5 times	ner second		(within 30 mA)	

8.1.18 Process Signal Measuring Unit

Range	Measurement	Indication	Input	Maximum	Accuracy
	range		impedance	permissible input	
1V	1 to 5V	Offset: ±9999	About 1 M Ω	±100V	±(0.2% of FS)
2A	4 to 20mA	Full scale : 0 to ±9999	About 10 Ω	±100mA	1(0.270 011 0)
Input ci	ircuit : Single en	ded type	Maximum sam	pling rate : 12.5 ti	mes per second

Operating system ΔΣ conversion

Noise rejection ratio: NMR 50 dB or more (50 Hz or 60 Hz)

8.2 Common Specifications

Display: 7-segment LED display (character height: 14.2 mm on main display and 8 mm on sub-display)

Polarity indication: Automatically indicated when the calculated result is negative.

Indication range : -9999 to 9999

Over-range alarm : OL or -OL for input signals outside the indication range

Decimal point : Can be set at an arbitrary digit Zero indication: Leading zero suppression

External control : HOLD, PH, DZ (reset for frequency measuring unit)

Operating temperature and humidity range: 0 to 50°C, 35 to 83% RH (non-condensing)

Storage temperature and humidity range : -10 to 70°C, 60% RH or less Power supply: 100 to 240 V AC ±10% for AC power supply unit

9 to 50 V DC for DC power supply unit

Power consumption : Approx. 5 W

External dimensions: 96 mm (W) x 48 mm (H) x 146.5 mm (D)

Note: Depth (D) denotes the maximur Weight : Approx. 450 g

Withstand voltage : 2000 V AC for 1 min. between power terminals and input terminal, and between power terminals and each output terminal (AC power supply)

Withstand voltage : 500 V DC for 1 min. between power terminals and input terminal, and between power terminals and each output terminal (DC power supply)

Withstand voltage : 500 V DC for 1 min. between input terminal and each output terminal, and between analog output

2000 V AC for 1 min. between case and each terminal (common to both AC and DC supply) Insulation resistance : $100~\text{M}\Omega$ between the above terminals when 500 V DC is applied

8.3 Output Specifications

8.3.1 Output for Comparison

Conditions for comparison	Judgment result
Indicated value > Upper limit judgment value	н
Low er limit judgment value ≤ hdicated value ≤ Upper limit judgment	GO
Low er limit judgment value > hdicated value	10

Control system : Micro computer operating system

Judgment value setup range: -9999 to 9999

Hysteresis: Can be set in the range of 1 to 999 digits for each judgment value

Operating speed: Depends on the sampling rate.

Output method : Relay contact output (Make and break contacts for HI and LO and make contacts for GO)

Output rating :240 V AC. 8 A (resistive load) and 30 V DC. 8 A (resistive load)

8.3.2 Analog Output

Output type	Load resistance	Accuracy	Ripple
0 to 1V	10 k Ω or more		
0 to 10V	10 k Ω or more	±(0.5% of FS)	±50mVpp
1 to 5V	10 k Ω or more	1(0.5% 0110)	
4 to 20mA	550 O or less		+25mVpp

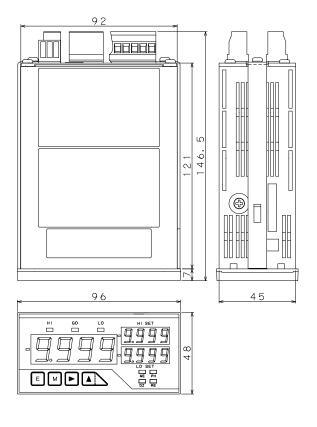
Note: The ripple ratings for the 4-20 mA output are when the load resistance of 250 Ω and the output current of 20 mA are applied. Conversion system: PWM conversion

Resolution: Equivalent to 13 bits Response speed: About 0.5 second

8.3.3 Communicating Function

	RS-232C	RS-485		
Synchronization system		Start and stop synchronization		
Communication system	Full duplex	Two-wire half duplex (polling selecting system)		
Communication rate	36400	bps/19200bps/9600bps/4800bps/2400bps		
Start bit		1bit		
Data length		7 bits/8 bits		
Error detection	Even parity/odd parity/non-parity			
		BCC (block check character) check sum		
Stop bit		1 bit/2 bits		
Character code		ASCII code		
Communication control procedure		No procedure		
Signal name used	TXD,RXD,SG	Non-inversion (+) and inversion (-)		
Number of connectable units	1	1 Up to 31 meters		
Line length	15m	Up to 500 m (total)		
Delimiter		CR4LF/CR		

8.4 External Dimensions



9. Warranty and After-service

9.1 Warranty

The warranty period shall be one year from the date of delivery. Any failure that arises during this period and the cause thereof is judged to be obviously attributable to Asahi Keiki Co., Ltd. shall be remedied at no cost.

9.2 After-service

This product is manufactured, tested, inspected, and then shipped under stringent quality control. Should the product fail, however, contact (or send the product to) your vendor or Asahi Keiki directly. (It is advisable that you send a memo describing the failure in as much detail as possible along with the product returned.)

For details on the handling of A5000 meters, either purchase the optional "A5000 User's Manual" or download it from Asahi Keiki's Web site.



Instruction Manual for A5000 Series of Unit Meters

A5000 Series of Unit Meters (UU-33330)

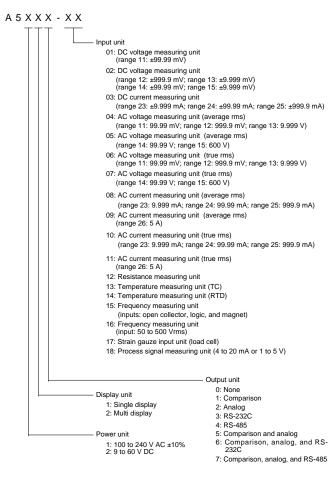
- (1) Do not apply a voltage or current exceeding the maximum allowable value; otherwise, it may damage the equipment.
- (2) Use a power voltage within the operation range; otherwise, it may result in a fire, electrical shock, or malfunction.
- (3) The contents of this manual are subject to change without notice
- (4) Although the contents of this manual have been prepared with extra care, if you have any questions, or find errors or missing information, contact the sales agent from which you purchased the product or Asahi Keiki Co.,
- (5) After reading this manual thoroughly, keep it in a convenient place for future reference.

1. Before Using the Product

Thank you for purchasing the A5000 series. This manual should be passed on to the person who operates the product. Examine the product for damage caused by transportation or any other defects. If you find any damage or defects, contact the sales agent from which you purchased the product or Asahi Keiki Co., Ltd.

1.1 Model Codes

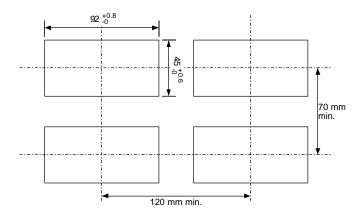
The model lineup of the A5000 series is shown below. Check that the model code and specifications of your product match those you specified when ordering.



2. Mounting the Product

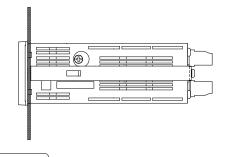
2.1 Dimensions for Cutting Panel

Cut the panel for mounting according to the following dimensions.



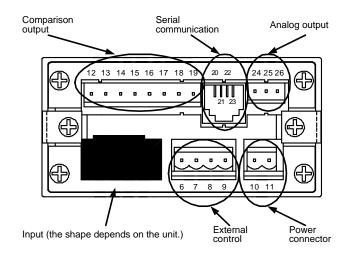
2.2 Mounting the Product to the Panel

To mount the A5000 to the panel, remove its fittings and insert it through the hole in the front of the panel. From the back of the panel, fix the product to the panel with the fittings.



- (1) Mount the product to a panel that is strong enough to hold the product. If the panel is not strong enough or the product is not fixed tightly, it may fall down and cause injury.
- (2) The A5000 does not have a power switch, and will thus be immediately ready for pperation upon connecting it to a power supply.
- (3) If the product is installed inside other equipment, provide sufficient heat dissipation to ensure that the temperature inside the equipment does not exceed 50°C.

3. Terminal Arrangement



UU-33330 2002.04

Asahi Keiki Co., Ltd

3.1 Power



Terminal No.	Name	Description
10	POWER	Power terminal without polarity for both DC and AC
11	POWER	Power terminal without polarity for both DC and AC

3.2 External Controls



Terminal No.	Name	Description
6	HOLD	Control for hold function. Enabled when short-circuited or at the same potential as COM.
7	DZ	Control for digital zero function. Enabled when short- circuited or at the same potential as COM.
8	PH	Control for peak hold function. Enabled when short- circuited or at the same potential as COM.
9	COM	Common for all external control terminals.

3.3 Input Signals

3.3.1 DC Voltage Measuring Unit (Range 11)



Terminal No.	Name	Description
1	Н	Positive input terminal
2	NC	Do not connect this terminal.
3	LO	Negative input terminal

3.3.2 DC Voltage Measuring Unit (Range 12)



	Terminal No.	Name	Description
4	1	12	Positive input terminal for range 12 (±999.9 mV)
	2	13	Positive input terminal for range 13 (±9.999 V)
4	3	14	Positive input terminal for range 14 (±99.99 V)
=	4	15	Positive input terminal for range 15 (±600 V)
	5	LO	Negative input terminal

3.3.3 DC Current Measuring Unit



Terminal	Name	Description
No.		
1	23	Positive input terminal for range 23 (±9.999 mA)
2	24	Positive input terminal for range 24 (±99.99 mA)
3	25	Positive input terminal for range 25 (±999.9 mA)
4	LO	Negative input terminal
5	10	Negative input terminal

3.3.4 AC Voltage Measuring Unit (Ranges 11 to 13)



Terminal No.	Name	Description
1	11-12	Positive input terminal for ranges 11 (99.99 mV) and 12 (999.9 mV)
2	13	Positive input terminal for range 13 (9.999 V)
3	0	Common input terminal

3.3.5 AC Voltage Measuring Unit (Ranges 14 and 15)



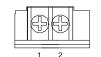
7	Terminal No.	Name	Description
	1	14	Positive input terminal for range 14 (99.99 V)
	2	15	Positive input terminal for range 15 (600 V)
	3	LO	Common input terminal

3.3.6 AC Current Measuring Unit (Ranges 23 to 25)



	Terminal	Name	Description
_	No.		·
٦l	1	23	Positive input terminal for range 23 (±9.999 mA)
	2	24	Positive input terminal for range 24 (±99.99 mA)
4	3	25	Positive input terminal for range 25 (±999.9 mA)
	4	LO	Negative input terminal
j	5	LO	Negative input terminal

3.3.7 AC Current Measuring Unit (Range 26)



	Н	Input terminal
	LO	Input terminal
Α	pplicable	solderless terminals

3.3.8 Resistance Measuring Unit



Terminal No.	Name	Description	
1	HI	Input terminal for all ranges	
2	LO	Input terminal for all ranges	
3	+S	Constant current for four-wire resistance measurement (positive)	
4	-S	Constant current for four-wire resistance measurement (negative)	
6	COM	Common terminal (grounding terminal for input circuit)	

3.3.9 Temperature Measuring Unit (TC)

	Terminal No.	Name	Description
	1	+	Positive terminal for thermocouple
	2	NC	Do not connect this terminal.
	3		Negative terminal for thermocouple
1 2 3			

3.3.10 Temperature Measuring Unit (RTD)

	Terminal No.	Name	Description
	1	Α	Resistance sensor wire
	2	В	Resistance sensor wire
	3	С	Elimination of wire resistance
1 2 3	C	Connectic	on of three-wire sensor

3.3.11 Frequency Measuring Unit (Open collector, logic, and magnet)



	No.	Ivaille	Description
	1	Ī	Positive input terminal
	2	LO	Negative input terminal
	3	+15 V	Power output for sensor (positive)
ſ	4	0 V	Power output for sensor (negative)
	5	COM	Common terminal (grounding terminal for input circuit)

3.3.12 Frequency Measuring Unit (500 Vrms)



Terminal	Name	Description
No.		•
1	Н	Input terminal
2	NC	Do not connect this terminal.
3	LO	Input terminal

3.3.13 Strain Gauge Input Unit (Load cell)



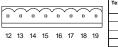
Terminal	Name	Description
No.		'
1	+SIG	Positive input terminal
2	-SIG	Negative input terminal
3	+EXC	Power output for sensor (positive)
4	-EXC	Power output for sensor (negative)
5	COM	Common terminal (grounding terminal for input circuit)

3.3.14 Process Signal Measuring Unit



minal No.	Name	Description
1	V-IN	Positive input terminal for 1 to 5 V range
2	A-IN	Positive input terminal for 4 to 20 mA range
3	LO	Negative input terminal

3.4 Comparison Output



Terminal	Name	Description		
No.				
12	LO-b	LO output terminal (b contact)		
13	LO-c	Common terminal for LO output		
14	LO-a	LO output terminal (a contact)		
15	GO-c	Common terminal for GO output		
16	GO-a	GO output terminal (a contact)		
17	Hŀb	HI output terminal (b contact)		
18	HI-c	Common terminal for HI output		
19	H⊦a	HI output terminal (a contact)		
	No. 12 13 14 15 16 17	No. 12 LO-b 13 LO-c 14 LO-a 15 GO-c 16 GO-a 17 HI-b 18 HI-c		

3.5 Analog Output



Terminal No.	Name	Description				
24	COM	Common terminal for analog output				
25	A-OUT	Current output terminal (4 to 20 mA)				
26	V-OUT	Voltage output terminal (1 to 5 V, 0 to 1 V, and 0 to 10 V)				

3.6 Serial Communication



Terminal	Name	Description
No.		·
20	RXD(+)	RS-232C: transmission; RS-485: Non-reverse output
21	TXD(-)	RS-232C: reception; RS-485: Reverse output
22	NC	Do not connect this terminal.
23	SG	Common terminal for communications

-	Æ	Caution

- (1) Use 12 to 28 AWG wire for the power, input (except for range 26), external control, and
- (2) Tighten the screws for the power, input (except for range 26), external control, and comparison output connectors to a torque of 0.5 to 0.6 Nm.
- (3) Use 16 to 28 AWG wire for the analog output connector
- (4) Tighten the screws of analog output connector to a torque of 0.22 to 0.25 Nm.

7. Output Function

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7.1 Comparison Output Function

The A5000 series of unit meters is designed so that the two judgment values HI and LO can be set for the measured (indicated) value to provide the results of judgment as relay contact output. (This function is effective when the meter is equipped with a comparison output unit.) For details on the contact ratings and other specifications, refer to the section "Output Specifications."

7.2 Analog Output Function

The A5000 series of unit meters can output an analog signal for an indicated value (when the meter is equipped with an analog output unit). There are four output ranges, 0 to 1 V/0 to 10 V/1 to 5 V/4 to 20 mA, from which a selection can be made using the condition data. In addition, the analog output of the A5000 series allows for arbitrary output scaling. This scaling can be achieved by setting the indication value for an output of the maximum scale value (20 mA for 4-20 mA output range) in the AOHI parameter of the scaling data.

7.3 RS-485 Interface Function

The A5000 series can be equipped with an RS-485 interface (when the meter is provided with an RS-485 unit). For details on the RS-485 function, see the separate manual on communication functions.

7.4 RS-232C Interface Function

The A5000 series can be equipped with an RS-232C interface (when the meter is provided with an RS-232C unit). For details on the RS-232C function, see the separate manual on communication functions.

8. Specifications and External Dimensions

8.1 Input Specifications

8.1.1 DC Voltage Measuring Unit (range 11)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
11	±99.99mV	Offset: ±9999 Full scale: 0 to ±9999	10μV	About 100 ${\rm M}_{\Omega}$	±100V	±(0.1% of FS)
Input circuit : Single ended type Maximum sampling rate : 12.5 times per second						

Operating system ΔΣ conversion

8.1.2 DC Voltage Measuring Unit (ranges 12 to 15)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy	
	range		resolution	impedance	permissible input		
12	±999.9mV		100µV	About 100 Ω	±100V		
13	±9.999V	Offs et: ±9999	1mV	About 1 MΩ	±250V	±(0.1% of FS)	
14	±9.999V	Full scale: 0 to ±9999	10mV	About 10 M Ω	±250V		
15	±600V		100mV	About 10 M Ω	±600V	±(0.15% of FS)	
Input circuit: Single ended type Maximum sampling rate : 12.5 times per second							
Operati	ng system :ΔΣ	conversion N	loise reject	on ratio: NMF	350 dB or more (50 or 60 Hz)	

8.1.3 DC Current Measuring Unit

		_				
Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
23	±9.999mA	Offset: +9999	1μA	About 10 Ω	±100mA	±(0.2% of FS)
24	±99.99mA	Full scale : 0 to +9999	10µA	About 1 Ω	±500mA	±(0.2 % 01 F3)
25	±999.9mA	1 dii 3caie . 0 to 13333	11µA	Αβουπ 0.1.Ω	±3A	±(0.3% of FS)

Maximum sampling rate : 12.5 times per second Input circuit: Single ended type

8.1.4 AC Voltage Measuring Unit (average value detection: ranges 11 to 13)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
11	99.99mV	Offset: ±9999	10μV	1 MΩ or more	100V	
12	999.9mV	Full scale : 0 to ±9999	100µV	1 MΩ or more	100V	±(0.2% of rdg + 10digit)
13	9.999V	ruii 5cale . 0 to ±9999	1mV	1 ΜΩ ορ μορε	250V	

Frequency range: 40 Hz to 1 kHz Maximum sampling rate: 12.5 times per second Dead zone: 0 to 99 digits

8.1.5 AC Voltage Measuring Unit (average value detection: ranges 14 and 15)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy		
	range		res olution	impedance	permissible input			
14	99.99V	Offset: ±9999	10mV	1 MΩ or more	250V	±(0.2% of rdg + 10digit)		
15	600V	Full scale: 0 to ±9999	100mV	1 MΩ or more	600V	±(0.3% of rdg + 10digit)		
Input ci	nput circuit : Single ended type Frequency range: 40 Hz to 1 kHz							
Operating system ΔΣ conversion			Resp	Response speed : About 1 second				
Maximum sampling rate : 12.5 times per second				zone : 0 to 99	digits			

8.1.6 AC Voltage Measuring Unit (true rms value: ranges 11 to 13)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
11	99.99mV	Offset: +9999	10µV	1 MΩ or more	100V	
12	999.9mV	Full scale : 0 to +9999	100µV	1 MΩ or more	100V	±(0.2% of rdg + 20digit)
13	9.999V	ruii Scale . U t0 ±9999	1mV	1 MΩ or more	250V	

Operating system $\Delta\Sigma$ conversion Crest factor: 4:1 at full scale Maximum sampling rate: 12.5 times per second Dead zone: 0 to 99 digits Frequency range: 40 Hz to 1 kHz

range 14 99.99V Offset: ±9999 10mV 1 MΩ or more 15 600V Full scale: 0 to ±9999

$$\label{eq:local_problem} \begin{split} & \text{Input circuit: Single ended type} & \text{Response speed: About 1 secon} \\ & \text{Operating system} \Delta \Sigma \text{ conversion} & \text{Crest factor: 4:1 at full scale} \\ & \text{Maximum sampling rate: 1:2.5 times per second Dead zone: 0 to 99 digits} \end{split}$$

Frequency range: 40 Hz to 1 kHz

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
23	9.999mA	Offset: ±9999	1µA	About 10 Ω	100mA	
24	99.99mA		10µA	About 1 Ω	500mA	±(0.5% of rdg + 10digit)
0.6	0000	Full scale: 0 to ±9999	400 4		0.4	

8.1.7 AC Voltage Measuring Unit (true rms value: ranges 14 and 15)

Input circuit : Single ended type Frequency range : 40 Hz to 1 kHz Response speed : About 1 second Maximum sampling rate : 12.5 times per second Dead zone : 0 to 99 digits

8.1.8 AC Current Measuring Unit (average value detection: ranges 23 to 25)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
26	5A	Offset: ±9999	1mA	(CT)	8A	±(0.5% of rdg + 10digit)

Input circuit : CT isolation type Frequency range : 50 Hz or 60 Hz Response speed : About 1 second Operating system ΔΣ conversion Maximum sampling rate: 12.5 times per second Dead zone: 0 to 99 digits

8.1.9 AC Current Measuring Unit (average value detection: range 26)

Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
	range		resolution	impedance	permissible input	
23	9.999mA	Offset: +9999	1µA	About 10 Ω	100mA	
24	99.99mA	Offset: ±9999 Full scale : 0 to ±9999	10µA	About 1 Ω	500mA	±(0.5% of rdg + 20digit)
25	999.9mA	Full Scale: 0 to ±9999	100uA	About 0.1.0.	3A	

Input circuit : Single ended type Response speed : About 1 second Operating system ΔΣ conversio Crest factor: 4:1 at full scale Maximum sampling rate: 12.5 times per second Frequency range: 40 Hz to 1 kHz Dead zone : 0 to 99 digits

8.1.10 AC Current Measuring Unit (true rms value: ranges 23 to 25)

Offcet: +9999	Range	Measurement	Indication	Highest	Input	Maximum	Accuracy
26 5A +(0.5% of rdg + 20		range		resolution	impedance	permissible input	
	26	5A		1mA	(CT)	8A	±(0.5% of rdg + 20dig

Input circuit : CT isolation type Operating system : DS conversion Maximum sampling rate: 12.5 times per second Dead zone: 50 Hz or 60 Hz

8.1.11 AC Current Measuring Unit (true rms value: range 26)

Range	Measurement	Indication	Highest	Maximum	Accuracy
	range		resolution	permissible input	
11	99.99Ω		10mΩ	About 5 mA	
12	999.9Ω	Offset: ±9999	0.1Ω	About 0.5 mA	±(0.2% of FS)
13	9.999kΩ	Full scale : 0 to ±9999	1Ω	About 50 µA	±(0.2 % 01 F 3)
14	99.99k		10Ω	About 5 µA	

Input circuit : Single ended type Measuring system : Two-wire system or four-wire system

Operating system $2\Delta\Sigma$ conversion (internal sock Maximum sampling rate : 12.5 times per second Open-circuit voltage : About 5 V

8.1.12 Resistance Measuring Unit

Range	Input sensor	Indication	Highest resolution	Accuracy
KA	К	-50.0 to 199.9°C (-58.0 to 391.8°F)	0.1°C (0.1°F)	±(0.5% of FS)
KB	К	-50 to 1200°C	(0.1 F)	
KB	ĸ	(-58 to 2192°F)		±(0.2% of FS)
J	J	-50 to 1000°C		1(0.270 01 1 0)
		(-58 to 1832°F) -50 to 400°C		
Т	Т	(-58 to 752°F)	1°C	±(0.6% of FS)
S	S	0 to 1700°C	(1°F)	
		(32 to 3092°F)		
R	R	-10 to 1700°C		±(0.4% of FS)
		(14 to 3092°F)	ļ	
В	В	100 to 1800°C (212 to 3272°F)		

Note : The accuracy of range B is applicable to temperatures of 500°C or more.

Input circuit : Single ended type Operating system ΔΣ conversion Linearizer: Digital linearize

Maximum sampling rate: 12.5 times per second Burnout alarm: N/A Cold junction compensation error : ±1°C(at 10 through 40°C)

8.1.13 Temperature Measuring Unit (TC)

Range	Input sensor	Indication	Highest resolution	Accuracy
PA	PT100 Ω	-100.0 to 199.9°C	0.1℃	±(0.15% of FS)
JPA	JPt100 Ω	(-148.0 to 391.8°F)	(0.1°F)	±(0.13 % 01 F 3)
PB	PT100 Ω	-100.0 to 600°C	1°C	±(0.3% of FS)
IDD	ID1400 0	(4 40 0 to 204 00F)	(405)	±(0.3 /0 UI F 3)

External resistance : 10Ω or less per wire Input circui t: Single ended type Operating system ΔΣ conve Linearizer : Digital linea

Maximum sampling rate :12.5 times per second Burnout alarm : N/A

Current through RTD : About 1 mA

8.1.14 Temperature Measuring Unit (RTD)

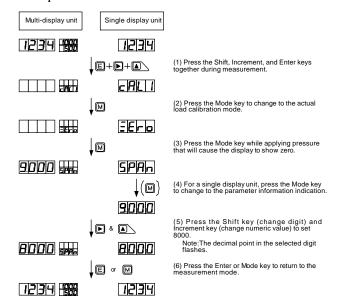
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5.4.4 Method of Setting Calibration Data

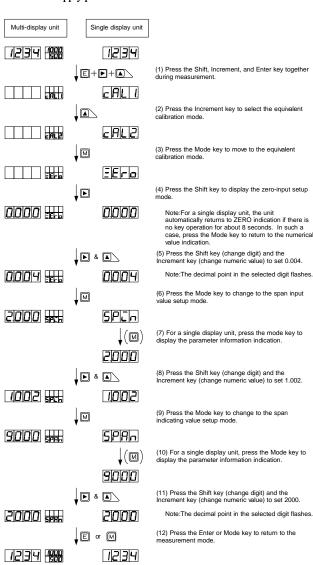
5.4.4.1 Actual Load Calibration

Actual load calibration means that calibration is carried out by applying actually measured pressure to a sensor such as a load cell connected to the meter.



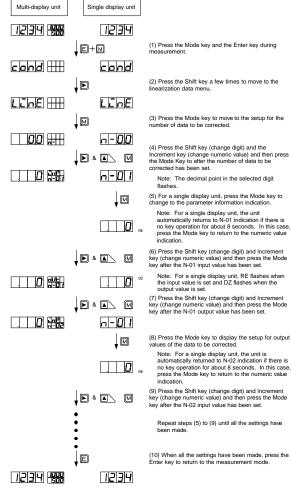
5.4.4.2 Equivalent Calibration

Equivalent calibration means that calibration is carried out according to the ratings (specifications) of such a sensor as a load cell. It is not necessary to connect the sensor or to apply pressure to the sensor



5.4.5 Method of Setting Linearization Data

The linearization function means a function that changes the slope of straight lines in the relationship between the input and indication by correcting the relations at arbitrary points. Linearization data are set using the input value (indicated value before correction) and the output value (indicated value after correction) at each arbitrary point.



The setup conditions are $N-1 < N-2 \dots N-15 < N-16$.

6. Control Functions

6.1 Hold Function

The Hold function temporarily retains the indication. The hold function is enabled by shortcircuiting the HOLD and COM terminals or setting both terminals to the same voltage level. As a result the display unit retains the indication given at that moment.

6.2 Digital Zero Function

The Digital Zero function zeros the indication given at an arbitrary timing. Thereafter, the function shows the amount of change from the point of zeroing. However, this function serves as an indication resetting function for a frequency measuring unit. Thus, the Digital Zero function can be used to reset the indication when there is no input signal at all.

Note that, the on/off control of the Digital Zero function can be achieved by means of terminal control or front panel keys. In the case of terminal control, the Digital Zero function is turned on by shortcircuiting the DZ and COM terminals or setting both terminals to the same voltage level. The indication at that moment is zeroed. In the case of control with the front panel keys, hold down the Mode key and press the Increment key for about 1 second to zero the indication at that moment.

Note: Operation with the control terminals takes priority over operation with the front panel keys. The Digital Zero function is disabled if the control terminals are made to go through the off-on-off sequence with the function enabled by means of the front panel keys.

6.3 Peak Hold Function

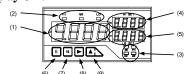
The Peak Hold function retains one of the maximum (peak hold)/minimum (valley hold)/maximum - minimum (peak-valley hold) values and provides output for that value. Selection from these values is made using the condition data. The peak hold function is enabled by shortcircuiting the PH and COM terminals or setting both terminals to the same voltage level.

Instruction Manual for A5000 Series of Unit Meters

The front panel design of the A5000 series of unit meters differs depending on the display unit selected. The names and functions of each unit are as shown below.

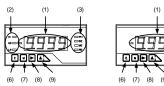
4.1 Multi-display Unit

4. Components and their Functions



No.	Name		Main Functions	
INO.	ivanie		During measurement	During parameter setup
(1)	Main display		Indicates the measured value.	IIndicates information on the paramet
` '				to be set.
(2)	Judgment	HI	Indicates the result of judgment and turns on if the measured	
	indicators		value > HI judgment value.	
		GO	Indicates the result of judgment and turns on if LO judgment	
			value ≤ the measured value ≤ HI judgment value.	
		LO	Indicates the result of judgment and turns on if the measured	
			value < LO judgment value.	
(3)	Function		Turns on if "digital zero backup" is on.	
	indicators		Turns on if "peak hold/valley hold/peak - valley hold" is on.	
			Turns on if "digital zero" is on.	
		RE	Turns on if remote control is being performed through RS-232C	
(4)	0.1. F		or RS-485 interface. Indicates the HI side judgment value.	
(4)	Sub-display 1		Indicates the Hi side judgment value. Indicates the item in the maximum/minimum/(maximum-	
(5)	Sub-display 2		minimum)/input value monitoring mode. Indicates the LO side judgment value.	Indicates the item to be set.
(5)	Sub-display 2		Indicates infe EO side judgment value. Indicates information on the item in the	indicates the item to be set.
			maximum/minimum/(maximum-minimum)/input value monitoring	
			mode.	
(6)	Enter key		Pressing the Enter and Mode keys together changes to the	Returns to the measurement mode.
			parameter setting mode.	
			Pressing the Enter and Increment keys together changes to the	
			maximum/minimum/(maximum-minimum)/input value monitoring	
			mode.	
			Switches from the maximum/minimum/(maximum-	
			minimum)/input value monitoring mode to the comparative	
			judgment reading mode.	
(7)	Mode key		Pressing the Mode and Enter keys together changes to the	Selects the item to be set.
			parameter setting mode.	
			Pressing the Mode and Shift keys together changes to the shift	
			function setup mode.	
			Pressing the Mode and Incremental keys together turns on/off	
(0)	01:61		the "Digital zero" indicator.	01
(8)	Shift key		Pressing the Shift and Enter keys together changes to the parameter checking mode. (Comparator data can be set.)	Changes the digit to be set.
			Pressing the Shift and Mode keys together changes to the shift	
			function setup mode.	
			Selects from items in the maximum/minimum/(maximum-	
			minimum)/input value monitoring mode. (Hold down the key for	
			about one second.)	
(9)	Increment key		Pressing the Increment and Mode keys together turns on/off the	Changes the value or content of a
(3)	increment key		"Digital zero" indicator.	selected digit. (Increments the value)
			Pressing the Increment and Enter keys changes to the	ociocica aigit. (moromente trio valad)
			maximum/minimum/(maximum-minimum)/input value monitoring	
			mode.	
			Resets the maximum/minimum/(maximum-minimum)/input value	
			monitoring mode. (Hold down the key for about one second.)	

4.2 Single Display Unit

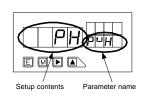


Name Main display		During measurement Indicates the measured value.	During parameter setup
Main display			
		indicates the measured value.	Indicates information on the parameter
		İ	to be set.
		Indicates information on the item in the	
		maximum/minimum/(maximum-minimum)/input value monitoring	
		mode.	
Judgment	Н	Indicates the result of judgment and turns on if the measured	
ndicators		value > HI judgment value.	
	GO	Indicates the result of judgment and turns on if LO judgment	
		value ≤ the measured value ≤ HI judgment value.	
	LO	Indicates the result of judgment and turns on if the measured	
		value < LO judgment value.	
unction	PH	Turns on if "peak hold/valley hold/peak - valley hold" is on.	
ndicators	DZ	Turns on if "digital zero" is on.	
		Flashes when linearization data output values are set.	
	ME	Turns on if "peak hold/valley hold/peak - valley hold" is on.	
	RE	Turns on if remote control is being performed through RS-232C	
		or RS-485 interface.	
		Flashes when linearization data input values are set.	
Enter key		Pressing the Mode and Enter keys together changes to the	Returns to the measurement mode.
		parameter setting mode.	
		Pressing the Increment and Enter keys together changes to the	
		maximum/minimum/(maximum-minimum)/input value monitoring	
		mode.	
		Switches from the maximum/minimum/(maximum-	
		minimum)/input value monitoring mode to the comparative	
Mode key			Selects the item to be set.
		parameter setting mode.	
		"Digital zero" indicator.	
Shift key			Changes the digit to be set.
ncrement key			Changes the value or content of a
			selected digit. (Increments the value)
		monitoring mode. (Hold down the key for about one second.)	<u> </u>
r = r	unction dicators	dicators GO LO unction DZ ME RE nter key	value > HI judgment value. GO Indicates the result of judgment and turns on if LO judgment value. Set indicates the result of judgment and turns on if LO judgment value. LO Indicates the result of judgment and turns on if the measured value < LO Indicates the result of judgment and turns on if the measured value < LO Judgment value. Unction PH Turns on if 'peak hot/valley hot/gibeak - valley hotd' is on. Flashes when linearization data output values are set. Flashes when linearization data output values are set. Furns on if remote control is being performed through RS-232C or RS-485 interface. Flashes when linearization data input values are set. Pressing the Mode and Enter keys together changes to the parameter setting mode. Pressing the Mode and Enter keys together changes to the maximum/minimum/(maximum-minimum)/input value monitoring mode to the comparative judgment reading mode. Floode key Pressing the Mode and Enter keys together changes to the parameter setting mode and Enter keys together changes to the parameter setting mode. Pressing the Shift and Mode keys together changes to the parameter setting mode. Pressing the Increment and Mode keys together changes to the parameter setting mode. Pressing the Shift and Mode keys together changes to the shift function setup mode. Pressing the Shift and Enter keys together changes to the parameter specking mode. (Comparator data can be set.) Pressing the Shift and Enter keys together changes to the bift function setup mode. Holding down the Shift key for about one second moves to the Hi Judgment value indicator. Selects from times in the maximum/minimum/(maximum-minimum/)/input value monitoring mode. (Hold down the key for about one second).

5. Parameter Setup

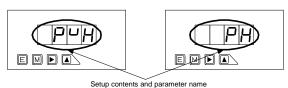
5.1 Differences between Display Units

5.1.1 Multi-display Unit



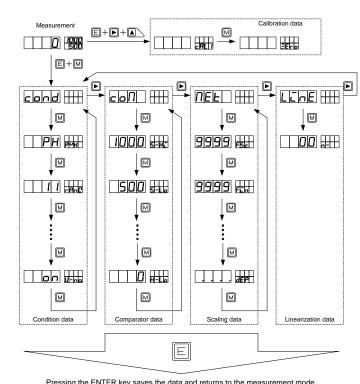
Note: Pressing the Mode key displays the next parameter.

5.1.2 Single Display Unit



- Note 1: Pressing the mode key with the parameter name shown changes the display to the parameter information indication. If there is no key operation for about one second when the parameter name is shown, the display automatically changes to the parameter information indication (however, this change does not automatically occur for parameters PH/S-HI/ FSC, etc., right after COND/COM/MET is indicated).
- Note 2: Pressing the Mode key when the parameter information indication is shown results in the next parameter being displayed.
- Note 3: If there is no key operation for about 8 seconds with the parameter information indication shown, the display returns to the parameter name indi-

5.2 Moving to the Parameter Setup Mode



(Data are backed up with EEPROM even when the power is turned off.)

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5.3 Data Lists and Default Settings

ndication	Name	Default	Equipped							Output unit number																		
idication	i Name	value	as	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	0	1	2	3	4 5	5 F	6
Condition	data																											
PVH	Peak hold setup	PH	0																							\Box	T	Т
RANG	Measurement range setup	*1		X 11	X 15	O 25	O 13	O 15	O 13	O 15	O 25	X 26	O 25	X 26	O 14	ОВ	O JPB	0	0	×	O 2A			П	П			T
AVG	Number of averaging	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	х	×	0	0				\Box	士		1
MAV	Number of moving average operations setup	OFF	0																					H				
S.UD	Step width setup	1	0																				П		\neg		Т	T
BLNK	Indication blank setup	OFF	0													П				Ħ		\vdash	П	П	\neg		\top	┪
UNIT	Unit setup	С														0	0						П	П	\neg		\neg	П
BAUD	Baud rate setup	9600																				×	×	×	0	0 >	X C	5
DATA	Data length setup	7														П				t		×	×	×	0			0
P.BIT	Parity bit setup	Ē																		t		×	×	×				5
S.BIT	Stop bit setup	2														\vdash				+		×	×	×	Ō			5
T-	Delimiter setup	CR.LF														\vdash				+		x				0 3		
ADR	Equipment ID setup	00		-										 		\vdash				-		ŵ			×			×
A.OUT		OFF		-										-		\vdash				+		â		ô				<u> </u>
	Analog output setup	OFF	0	1												\vdash				-		┝┷┦	⊦≏⊦	\vdash	-	<u> </u>	4	4
B.UP	Digital zero backup setup	CLR	0													\vdash				\vdash		\vdash	\vdash	\vdash	$\boldsymbol{ o}$	+	+	+
LINE	Linearization setup		0	-	-								- ·	-				_	-	-		\vdash	\vdash	\vdash	$\boldsymbol{ o}$	+	+	+
I.SEL	Input selection	OC	_	×	×	×	×	×	×	×	×	×	×	×	×	×	×	0	×	×	X	ш	$\boldsymbol{\vdash}$	\vdash	\rightarrow	$-\!\!\!+$	+	4
TR T	Tracking zeroing time setup	00	0	1														Х	×	-		ш	ш	\vdash	\dashv	$-\!\!+$	+	4
TR V	Tracking zeroing width setup*2	01	0															X	×	ш		ш	ш	ш	_		Щ.	_
SNSR	Sensor power setup	10		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	0	×		ш	ш				
PON	Power-on delay time setup	OFF	0																				ш	ш				
PRO	Protect setup	OFF	0																			ш	ш	ш				
U-NO.	Unit number indication setup	ON	0																				ш	ш				
compara	tor data																											
S-HI	HI side judgment value setup	1000																				Х	0	×	X	X	O (0
S-LO	LO side judgment value setup	500																				×	0	×	×	X (0	0
H-HI	HI side hysteresis setup	0																				×	0	×	×	X (0	5
H-LO	LO side hysteresis setup	0																		t		×		×				5
caling d								1				_										Ë	ت	۳	<u></u> -	<u> </u>		
		*1		0	0	0	0	0	0	0	0	0	0	0	0	×	×	×	×	×	0	\vdash	$\overline{}$	$\overline{}$	\neg	$\overline{}$	一	\neg
FSC	Full scale indication value setup			9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999						9999		Ш	Ш				
FIN	Full scale input value setup	*1		0	0	0	0	0	0	0	0	0	0	0	0	×	×	×	×	×	0		1 !	1				
	r an coale input value cotup			9999	9999			9999	9999	9999	9999	9999	9999	9999	9999						*3	ш	ш	ш	\dashv	\dashv	+	4
OFS	Offset indication value setup	*1		0	0	0	0	0	0	0	0	0	0	0	0	×	×	×	×	×	0	!	1 1	1				
	Chock maleation value cotap			0	0	0	0	0	0	0	0	0	0	0	0					1	0	ш	ш	ш	_	_	_	_
OIN	Offset input value setup	*1		0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	00	0 0	0 0	0 0	×	×	×	×	×	○ *4			Ш				
PS	Pre-scaling value setup	1		×	×	×	×	×	×	×	×	×	×	×	×	×	×	0	0	×	×		П	П	\neg			Т
PPR	Frequency division setup	1		×	×	×	×	×	×	×	×	×	×	×	×	×	×	0	0	×	×	\Box	П	\Box	\neg	丁	丁	┪
DLHI	Digital limiter HI value setup	9999	0				X	×	×	×	X	×	×	×		П				Πİ		\Box	П	\Box	\neg	\neg	\top	寸
DLLO	Digital limiter LO value setup	-9999	Ō				X	×	×	×	X	×	×	×		П				t		\vdash	П	П	\dashv	\dashv	\top	┪
AOHI	Analog output HI indication setup	9999					<u> </u>			<u> </u>	<u> </u>			<u> </u>		П				Ħ		×	×	0	×	X (0 0	5
AOLO	Analog output LO indication setup	0											—	 		\vdash				+		x			x			5
DEP	Decimal point position setup	None	0										-			\vdash				H		⊢≏	⊢Ĥ	┌┷┤	^ +	~+`	~	4
	tion data	*5	0									 	 	 		\vdash				+ +		\vdash	\vdash	\vdash	$\boldsymbol{ o}$	+	+	+
		5	0	\vdash		<u> </u>	<u> </u>	<u> </u>			<u> </u>				<u> </u>	ш						\vdash	ш	ш		_	ㅗ	_
Calibratio				L.,																		╙					—	_
ZERO	Zero input value*6	0		X	X	X	X	X	X	X	X	X	×	×	×	×	×	×	×	0	×	╙	ш	ш	_	\dashv	4	4
SPIN	Span input value*6	2000 9000		×	×	×	X	X	×	×	×	×	×	×	×	×	×	×	×	0	×	igspace	ш	ш			_	4
SPAN	Span indication			×	×	×	×	×	×		×	×	l ×	l ×	×					0	×							

- Each value in the lower part of a cell in the columns on the right is the default value.
- 2 Tracking zero width setup parameter is not indicated if the tracking time is set to OFF(0).
- 13 5000 for 1 V range and 2000 for 2 A range 14 1000 for 1 V range and 400 for 2 A range
- *4 1000 for 1 V range and 400 for 2 A range
 *5 Linearization data are not set up for the default values.
- Linearization data are not set up for the default values.
 This value is not indicated if calibration is done using an actual load.
- The shaded parts show the parameters that must be set for each unit.

5.4 Information on Each Parameter

Indication	Name	Setup options						
Condition of	data							
PVH	Peak hold setup	PH (peak hold)/VH (valley hold)/PVH (peak-valley hold)	PH					
RANG	Measurement range setup	*1	*1					
AVG	Number of averaging operations setup	1/2/4/8/10/20/40/80	1					
MAV	Number of moving average operations setup	OFF/2/4/8/16/32	OFF					
S.UD	Step width setup	1(1digit)/2(2digit)/5(5digit)/0(10digit)	1					
BLNK	Indication blank setup	OFF/B-3/B-2/B-1/ON	OFF					
UNIT	Unit setup	C/F	С					
BAUD	Baud rate setup	9600/4800/2400/384(38400)/192(19200)	9600					
DATA	Data length setup	7(7bit)/8(8bit)	7bit					
P.BIT	Parity bit setup	E (even number), O (odd number), N (none)	E					
S.BIT	Stop bit setup	2(2bit)/1(1bit)	2					
T-	Delimiter setup	CR.LF(CR+LF)/CR	CRLF					
ADR	Equipment ID setup	01 to 99	00					
A.OUT	Analog output setup	OFF/0-1(0 to 1V)/0-10(0 to 10V)/1-5(1 to 5V)/4-20(4 to 20mA)	OFF					
B.UP	Digital zero backup setup	OFF/ON	OFF					
LINE	Linearization setup	OFF/ON	CLR					
I.SEL	Input selection	OC (open collector)/LGC (logic)/MAG (magnet)	0.0					
TR T	Tracking zeroing time setup	00 to 99	00					
TR V	Tracking zeroing width setup *2	00 to 99	01					
SNSR	Sensor power setup	10(10V)/05(5V)	10					
PON	Power-on delay time setup	OFF/ON	OFF					
PRO	Protect setup	OFF/1 to 30	OFF					
U-NO.	Unit number indication setup	OFF/ON	ON					
omparato		OFF/ON	ON					
S-HI	HI side judgment value setup	-9999 to 9999	1000					
S-LO	LO side judgment value setup	-9999 to 9999	500					
H-HI	HI side hysteresis setup	-9999 to 9999	0					
H-LO	LO side hysteresis setup	-9999 to 9999	0					
caling da		I-aaaa to aaaa	0					
		L 0000 1- 0000	1 *1					
FSC	Full scale indication value setup	-9999 to 9999 -9999 to 9999	*1					
OFS	Full scale input value setup	-9999 to 9999 -9999 to 9999	*1					
	Offset indication value setup		*1					
OIN	Offset input value setup	-9999 to 9999						
PS	Pre-scaling value setup	0.001 to 5.000	1.000					
PPR	Frequency division setup	1 to 100	1					
DLHI	Digital limiter HI value setup	-9999 to 9999	9999					
DLLO	Digital limiter LO value setup	-9999 to 9999	-999					
AOHI	Analog output HI indication setup	-9999 to 9999	9999					
AOLO	Analog output LO indication setup	-9999 to 9999	0					
DEP	Decimal point indication position setup	None/place of 10 ⁰ /place of 10 ¹ /place of 10 ² /place of 10 ³	None					
inearizatio	on data	*2	*2					
alibration	data							
ZERO	Zero input value	-0.300 to 2.000	0.000					
SPIN	Span input value	1.000 to 3.000	2.000					
SPAN	Span indication	0 to 9999	9000					

5.4.1Method of Setting Condition Data

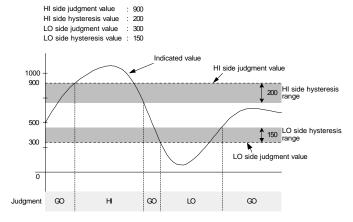
This section shows a typical example of setting the peak hold parameter. The same method applies to other parameters.

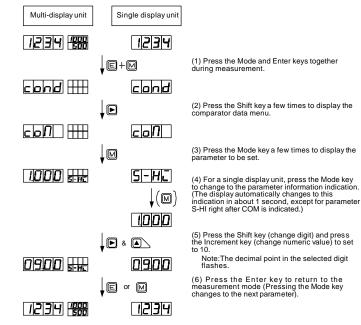
Multi-display unit	Single display unit	
1234 (500	1234	
	F=HM	(1) Press the Mode and Enter keys together during measurement.
cond ##	cond	
	↓ M	(2) Press the Mode key to change to the peak hold setup mode.
PH DU		(3) For a single display unit, press the Mode key to change to the parameter information indication. (The display automatically changes to this indication in about 1 second, except right after COND is indicated.)
		(4) Press the Increment key a few times to set to Valley Hold.
UH PUH	UH	
	▼E or M	(5) Press the Enter key to return to measurement mode. (Pressing the Mode key changes to the next parameter).
1234 E00	1234	. ,

Instruction Manual for A5000 Series of Unit Meters

5.4.2 Method of Setting Comparator Data

This section explains comparator data and shows a typical example of setting the HI side judgment value. The same method applies to all other parameters.

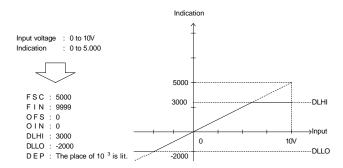




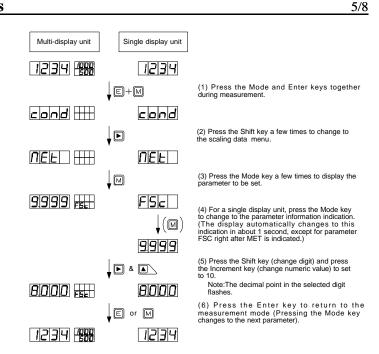
Note: The setup conditions are HI side judgment value > LO side judgment value, HI side judgment value ≥ LO side judgment value + LO side hysteresis, and LO side judgment value ≤ HI side judgment value-HI side hysteresis. If these conditions are not satisfied, an error indication appears and the display returns to the HI side judgment value setup.

5.4.3 Method of Setting Scaling Data

This section explains comparator data and shows a typical example of setting the full scale indication parameter. The same method applies to all other parameters.



Note: For the Digital limiter, values larger than the DLHI setpoint are not indicated even if signals greater that the value set in the DLHI parameter are input (for DLLO parameter, values smaller than the DLLO setpoint are not indicated).



Note: For the process signal measuring unit, set the full scale input value to 5.000 for the 1 V range and to 20.00 for the 2 A range, and set the offset input value to 1.000 for the 1 V range and to 4.00 for the 2 A range.

The following explains the frequency measuring unit. (The same method applies to the full scale indication parameter.)

The figure below shows an example where the revolution rises to a maximum speed of about 100 rpm.

Determining the revolution speed (rpm) using the rotary encoder set to 30 pulses per minute

(1)Determine the measurement range by calculating the maximum frequency.

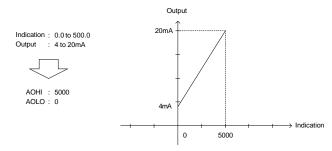


(2)Since the number of pulses determined in (1) is 50 per second (50 Hz), set the range to range 11 (for how to set the range, see the section on setting condition data)

)The display unit shows 500 if 50 Hz pulse input is measured under range 11 (when PS=1 and PPR=1 by default). Therefore, the parameters should be set as PS=2 and PPR=1 so that the decimal point is positioned in the 10 di

Note: For the frequency measuring unit, set the relationship between the input and indication using the PS and PPR parameters (parameters of FSC, FIN, OFS, and OIN are not indicated).

The following explains the scaling of analog output (The same method applies to the full scale indication parameter.)



te: For analog output scaling, set the indication value for an output current of 20 mA in the AOHI parameter and set the indication value for an output current of 4 mA in the AOLO parameter (for 4-20 mA output).