Instruction Manual

Digital Panel Meter Model 482A

I-01706

1. Preface

- Please take care that this instruction manual is certainly delivered to the person in charge of operating this instrument.
- Unpack the product and confirm that the following items are included.
  (1) 482A main unit (2) Stickers of units
  (3) Instruction manual (4) A connector attached when the main unit is provided with an optional BCD output.

For safe use of this product, please observe the following warning and caution.
In order to help the users' safe use of the products, the following symbol marks are used in this manual.

⚠ WARNING This is the warning to avoid the danger when it is assumed that such danger as may cause fatal accident or severe injure to a user occurs in case that the product is mishandled.

⚠ CAUTION This is the caution to avoid the danger when it is assumed that such danger as may cause minor injure to a user or generate only physical obstacle occurs in case that the product is mishandled.

⚠ WARNING

● There is no power on-off switch on the model 482A. It immediately starts to operate after turning the power.
● Do not touch terminals when turning the power on.

⚠ CAUTION

Preserve followings for your safety.
● The rated data is, however, defines with more than 15 minutes warming-up times.
● When the product is installed in the cabinet, perform the appropriate heat radiation to keep less than 50 °C in it.
● Avoid the close-contacted mounting of the meter. The rise of internal temperature affects the life of product.
● Do not install under the following conditions.
●Where it is exposed to direct sunlight, dust, corrosive gases, rain, etc.
●Where ambient temperature or humidity is high.
●Where it is exposed to excessive noise or static electricity.
●Where there is constant vibration or shock
● Store the instrument within the specified temperature range for storage (-20~70°C).
● When the front panel or the case becomes dirty, wipe it with soft cloth.
For heavy dirt, wipe it lightly with the soft cloth wetted with the neutral cleaner thinned by water, and finish the cleaning with dry cloth. Do not use organic solvent like benzene or paint thinner as they may deform or discolor the case.

2. Standard Specifications

2.1 Model Designation

Model Name 482A -□-□-□-□-□

1 2 3 4 5

【1】Measuring Input

Model	Measuring Range	Input Resistance	Accuracy *	Overload
482A-01	±19.999mV	100MΩ	±(0.05 of rdg + 5digits)	DC±250V
482A-02	±199.99mV	100MΩ	±(0.05 of rdg + 3digits)	DC±250V
482A-03	±1.9999V	100MΩ	±(0.05 of rdg + 3digits)	DC±250V
482A-04	±19.999V	10MΩ	±(0.05 of rdg + 3digits)	DC±250V
482A-05	±199.99V	10MΩ	±(0.05 of rdg + 3digits)	DC±500V
482A-09	1~5V	1MΩ	±(0.05 of rdg + 5digits)	DC±250V
482A-V1	0~1V	1MΩ	±(0.1 of rdg + 3digits)	DC±250V
482A-V2	0~5V	1MΩ	±(0.1 of rdg + 3digits)	DC±250V
482A-V3	0~10V	1MΩ	±(0.1 of rdg + 3digits)	DC±250V
482A-11	±19.999μA	10kΩ	±(0.05 of rdg + 3digits)	DC±2mA
482A-12	±199.99μA	1kΩ	±(0.05 of rdg + 3digits)	DC±20mA
482A-13	±1.9999mA	100Ω	±(0.05 of rdg + 3digits)	DC±50mA
482A-14	±19.999mA	10Ω	±(0.05 of rdg + 3digits)	DC±150mA
482A-15	±199.99mA	1Ω	±(0.05 of rdg + 3digits)	DC±500mA
482A-19	4~20mA	12.5Ω	±(0.05 of rdg + 5digits)	DC±150mA
482A-A1	0~1mA	100Ω	±(0.1 of rdg + 3digits)	DC±50mA

* Accuracy: Defined at 23°C±5°C, 45~75%RH.
Temperature coefficient:
482A-01~03, -09, -19 ……. ±100ppm/°C
482A-04~05 ……. ±160ppm/°C
482A-11~15, A1, V1~V3 … ±150ppm/°C
Defined at 0~50°C

Internal range setting (setting by pin headers):
Volt meter: 03~05
Receiving meter: 09, 19

【2】Power Supply Voltage

Code	Power Source Voltage
3	AC100V (90~132V)
5	AC200V (180~250V)
9	DC24V±10%

【3】Data Output

Code	Specifications
Blank	No output
BP	BCD output (TTL level positive logic)
BN	BCD output (TTL level negative logic)
DP	BCD output (transistor output, source type)
DN	BCD output (transistor output, sink type)

【4】Decimal Point Control

Code	Description
Blank	Front setting
1	Remote control

【5】Display Color

Code	Description
Blank	Red LED
G	Green LED

2.2 General Specifications

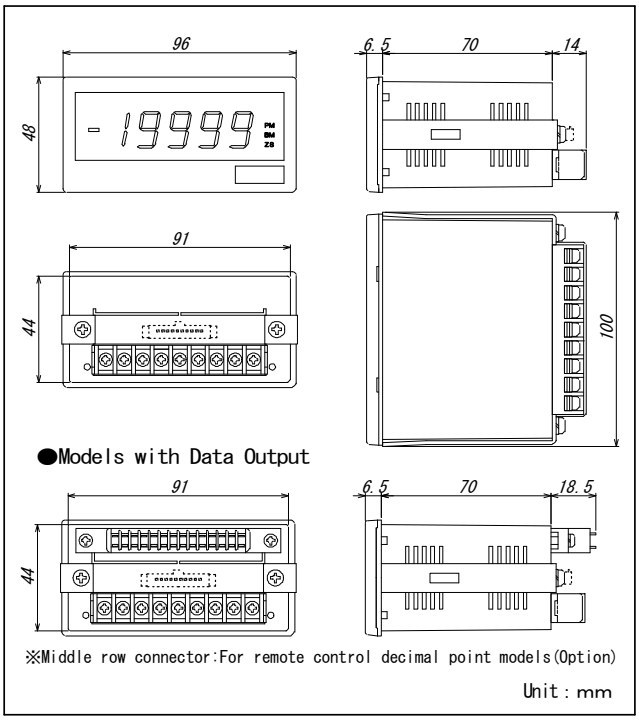
Display : 0~19999 red or green LED (character height 14.2mm) with zero-suppress function.
Scaling Function : Full scale display -19999~+19999 Offset display -19999~+19999
Zero-Set Function : Function to electrically set an initial input value to zero.
Offset Fixing Function : Function to fix a display reading of input less than offset value to the offset value.
Decimal Point : Arbitrary setting (front setting or remote control).
Over-range indication : Blinking with 130% display. When exceeded 19999, blinking with 00000.
Resolution : 1/20000
Sampling Rate : Approximately 7.5 times/sec.
Display Cycle : Function to select either cycle of 133ms, 400ms, 1s, 2s, 4s, or 5s is provided.
Input Selection : Function to change input is provided. 03~05 for volt meter, 09 or 19 for receiving meter.
Input Type : Single ended, floating input.
A/D Conversion : Δ-Σ conversion system.
Noise Rejection : Normal mode (NMR) - 50dB or more. Common mode (CMR) - 110dB or more.
Power source line penetrating noise : 1000V
Hold function : Measured data, peak/bottom memory value, amplitude and data output (option) are held. Not isolated from the input.
Peak/bottom memory, amplitude display : Display of max., min. or amplitude between them is possible. Selectable by front panel switch.
Averaging function : Average of display data, BCD data are calculated by display cycle (section).
Cut-off function : 0~19.9%.
Withstanding Voltage : Input terminals - Case : AC1500V each for 1 min.
Power supply terminals - Case : AC1500V each for 1 min.
Power supply terminals - Input terminals : AC1500V each for 1min.
Insulation Resistance : DC500V 100MΩ or more.
Power Source Voltage : AC90~132V or 180~250V 50/60Hz
DC24V±10%
Power Consumption : Approx. 3VA at 100/200VAC. Approx. 70mA at 24VDC.
Operating Temperature : 0~50°C
Storage Temperature : -20~70°C
Weight : Approx. 300g - AC power source models. Approx. 200g - DC power source models.
Mounting Method : Fastening from rear of the panel by metal brackets.

2.3 Unit Labels (attached)

Labels of different units are attached to the instruments.
Select and adhere the label of required unit:
V, mV, kV, W, A, mA, μA, kW, %, °C, m, mm, rpm, ppm, Pa, Torr, g, mN, kg, N, m/min, mmHg, J, m^3/h, kPa, MPa.

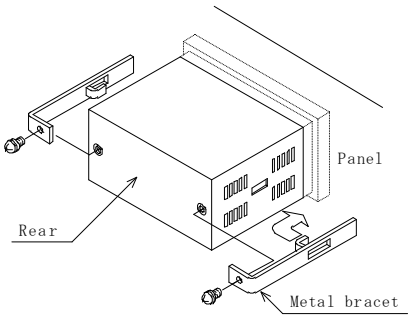
Note: Actual characters of the units printed on the stickers may be different from the above characters.

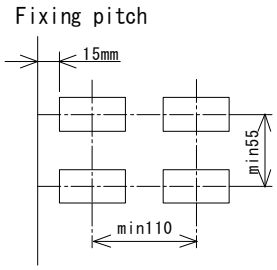
2.4 Dimensions



2.5 Installation

Remove the metal brackets at both sides,
Insert the instrument from the
front and fix it by the brackets.





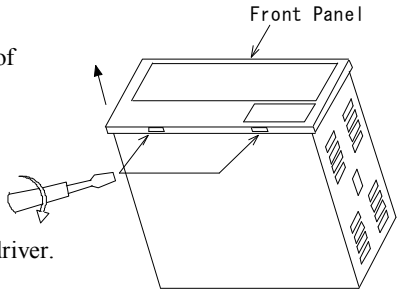
Panel cut-out dimension: $92^{+0.8}_{0}$ × $45^{+0.6}_{0}$ mm
Allowable panel thickness: 0.6~6mm
Note: Recommended thickness for the panel of aluminum is 1.5mm or more to avoid deformation of the panel.
Optimum torque of fixing screws: 0.25~0.39N･m

⚠ CAUTION

- **Do not overtighten the mounting bracket.**
- **When plural mounting, pay attention to ventilation to cool down in the panel.**

2.6 Removal of Front Panel

Insert (-) screwdriver into the dips at the low end of instrument and remove the front panel.



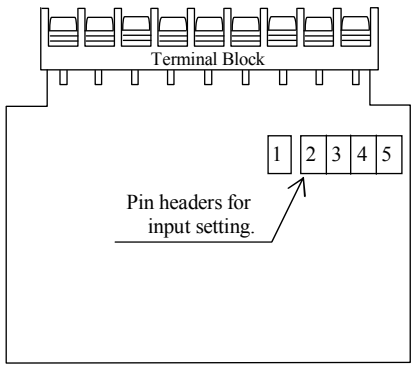
Wrench the panel open with (-) screwdriver.

2.7 Removal of Board

① Remove the screws on the rear terminal blocks (remove the connector if the instrument is data output type).
② Remove the front panel and take the board out, slightly and gently expanding the case up and downward.
③ When getting the board back into the case, insert it pressing softly the lower side of the display board. If the instrument is withremote decimal point control function, be careful that the connector lead wire does not coil around the rear terminal block.

2.8 Internal Setting of Range

A change of range between 482A-03, 04 and 05, or between 482A-09 and 19 is possible by changing the positions of pin headers for the input setting. When the range is changed, make sure to re-calibrate the instrument.



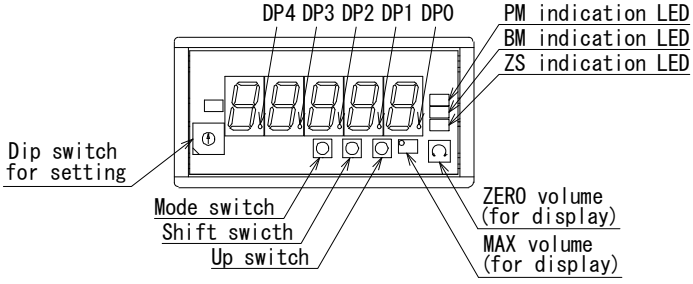
● **Pin Header Position** (Short-circuit the position marked ○)

	Rated Input	Pin Header Position				
		1	2	3	4	5
Volt Meter	-03 DC±1.9999V	○	○			
	-04 DC±19.999V	○		○		
	-05 DC±199.99V				○	○
Receiving Meter	-09 DC1~5V			○	○	
	-19 DC4~20mA	○	○			

Note: The range can not be exchanged between volt and receiving meters.

3. Setting of Each Function

● **Layout of Front Panel Inside**



● **Function of Each Switch**

Mode Switch [MODE] : Change of measurement and setting mode. (Change of display when FUNCTION 0)

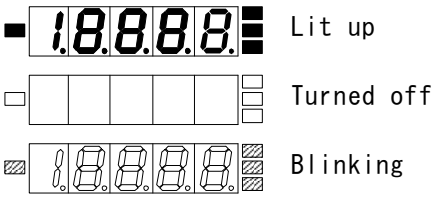
Shift Switch [SHIFT] : Change of set value of each function and change of function.

Up Switch [UP] : Change of set value of each function and change of function. When UP and SHIFT are simultaneously pressed for 3 seconds at FUNCTION 0, the memory is reset.

● **Function of Dip Switches for Setting**

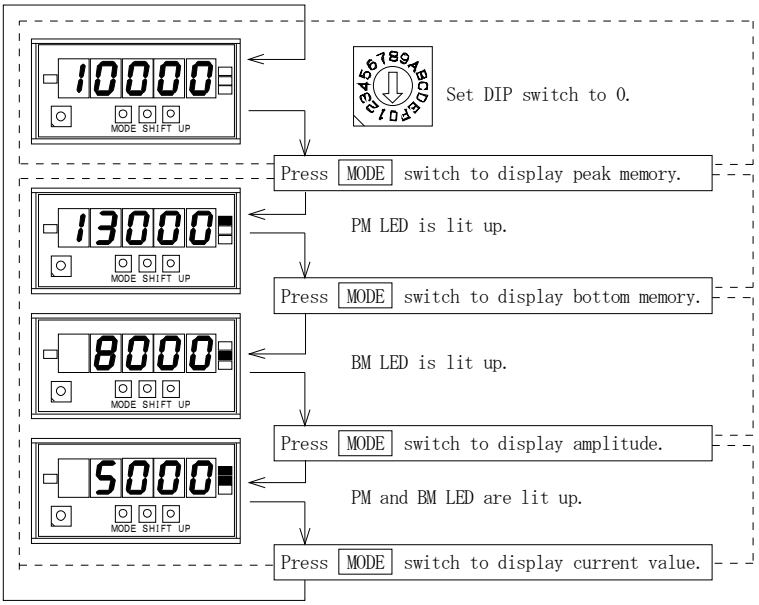
No.	Function
0	Change of display, memory reset
1	Scaling
2	Display cycle
3	Decimal point
4	----------
5	----------
6	Zero-set
7	Offset fixing
8	Fixation of 10^0 digit to 0
9	Averaging calculation
A	Cut-off
B	----------
C	Setting of BCD output cycle (option)
D	----------
E	----------
F	----------

● **Status of LED**



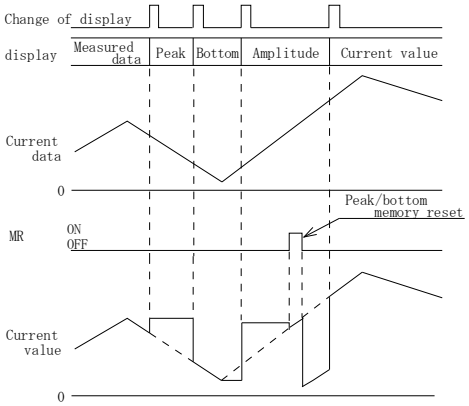
3.1 Change of Display, Memory Reset

● Change of display
A data to display can be selected.



● Peak/bottom memory, amplitude function
Max. (peak value) and min. (bottom value) can be memorized and displayed. An amplitude (max. value ~ min. value) can be displayed also. Memories are cleared by power OFF.

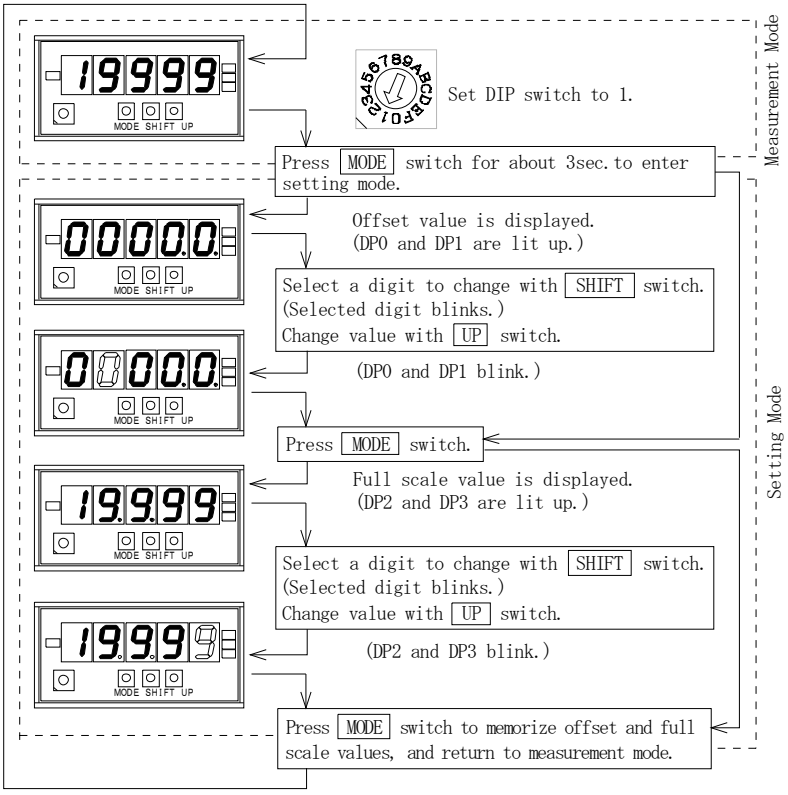
● Reset of peak/bottom memory
- Reset from the panel front.
  Press SHIFT and UP switches simultaneously for 3 sec. or more, then the display turns off once and the peak/bottom memories are reset.
- Reset from memory reset terminal (MR).
  Refer to the lower row terminals and the explanations.



When the MR input terminal is ON, the memory data are kept updated, so the real time value is displayed and output.

3.2 Scaling

Offset value and full scale display value can be set to an arbitrary value.
Adjustable range of full scale display value : -19999~19999
Adjustable range of offset value : -19999~19999

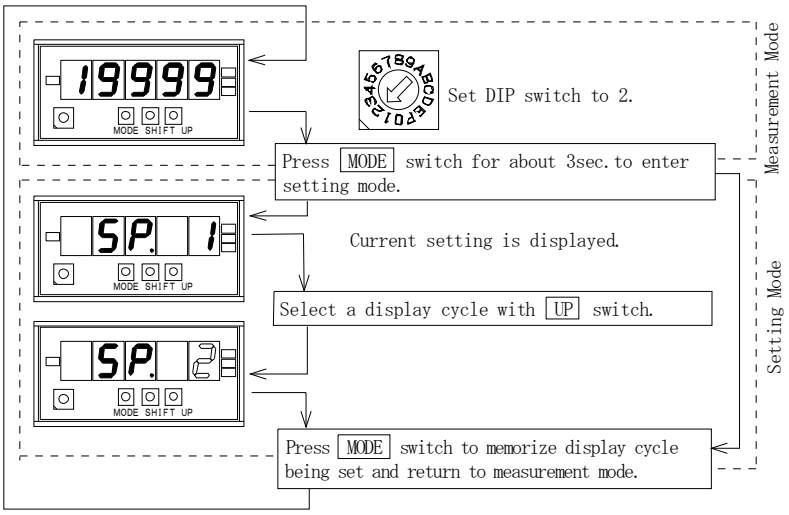


Adjustable range
Offset : -19999~19999
Full scale : -19999~19999

- When the scaling is changed, peak memory and bottom memory are set to real time values.
- If you want to reverse the polarity negative of the scaling data, change to the highest digit by the SHIFT switch, and then push the UP switch. The display will change in order of the 0, 1, -1, -0, and 0.

3.3 Display Cycle

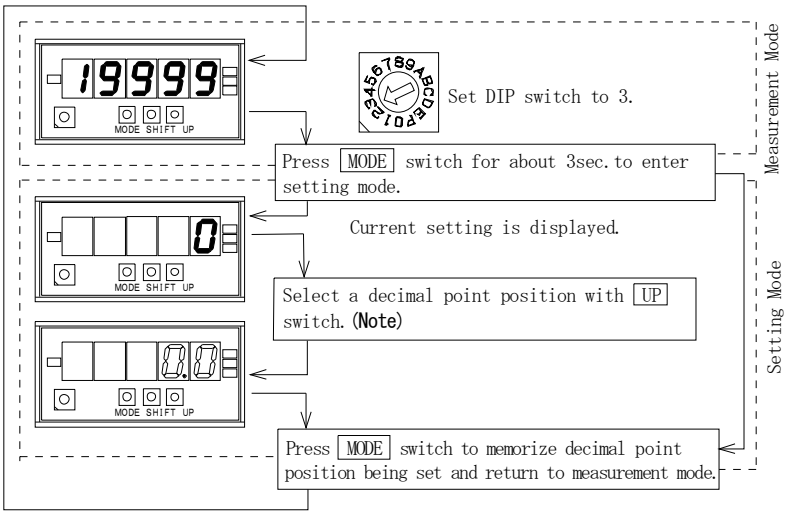
Display cycle of the data can be slowed. Sampling rate of measurement remain unchanged though the display cycle is slowed.



Display	Display Cycle
SP.1	133ms
SP.2	400ms
SP.3	1 sec.
SP.4	2 sec.
SP.5	4 sec.
SP.6	5 sec.

3.4 Decimal Point

Decimal point can be set to an arbitrary position.



Note:

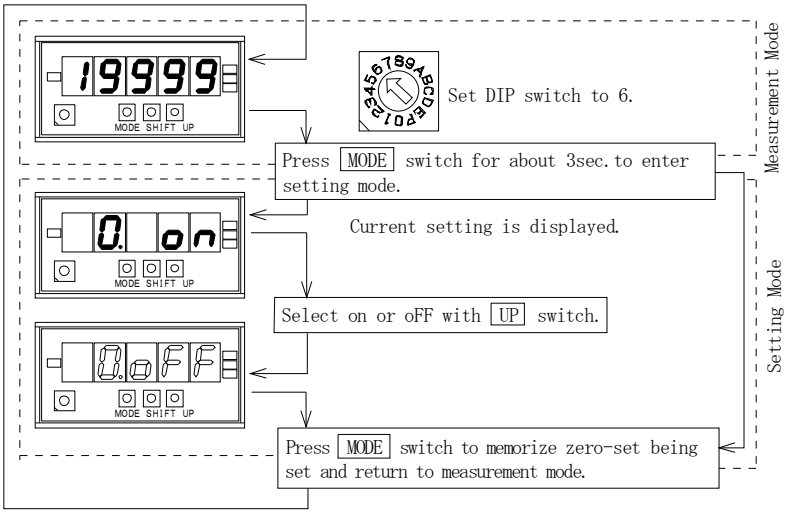
0 : Nil
0.0 : DP1
0.00 : DP2
0.000 : DP3
0.0000 : DP4
out : Remote control ※

※ Remote control is possible from the middle row connector when provided with this function.
When not provided, it is same as without decimal point.

UP switch: Setting changes in the order:
Nil→DP1→DP2→DP3→
DP4→Remote-control→Nil

3.5 Zero Set

Initial input value can be set to zero electrically.



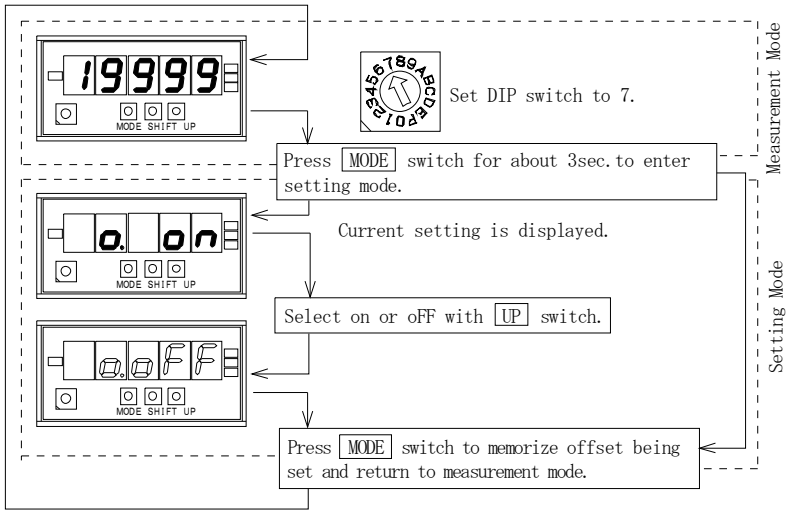
on : Zero-set functions
oFF : Zero-set does not function

When the setting is made to on, zero set LED is lit up.

In case that the offset value is set to the numeral other than 0 by scaling and, when the zero set function is effected and the ZS terminal is short-circuited to the COM, the display becomes the offset value.

3.6 Offset Fixing

Display can be fixed to the offset value when the input is the offset value or less.

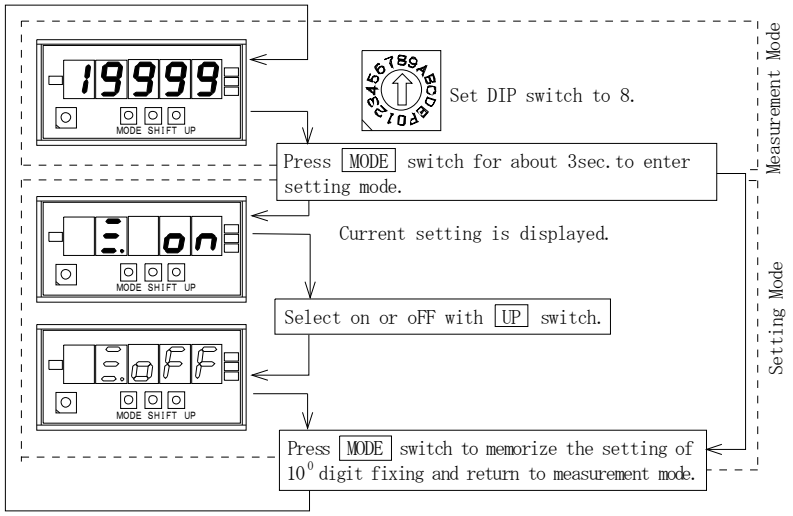


on : Offset fixing functions
oFF : Offset fixing does not function

When the offset fixing function is changed, peak memory and bottom memory are set to real time values.

3.7 Fixing of 10^0 Digit

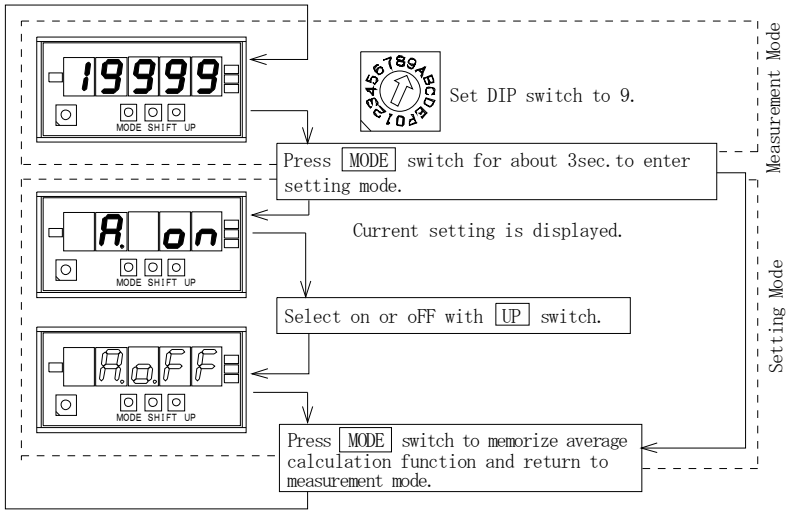
10^0 digit can be set to zero forcedly.



on : 10^0 digit fixing functions.
oFF : 10^0 digit fixing does not function.

3.8 Average Calculation

Average calculation of the display cycle section is made.



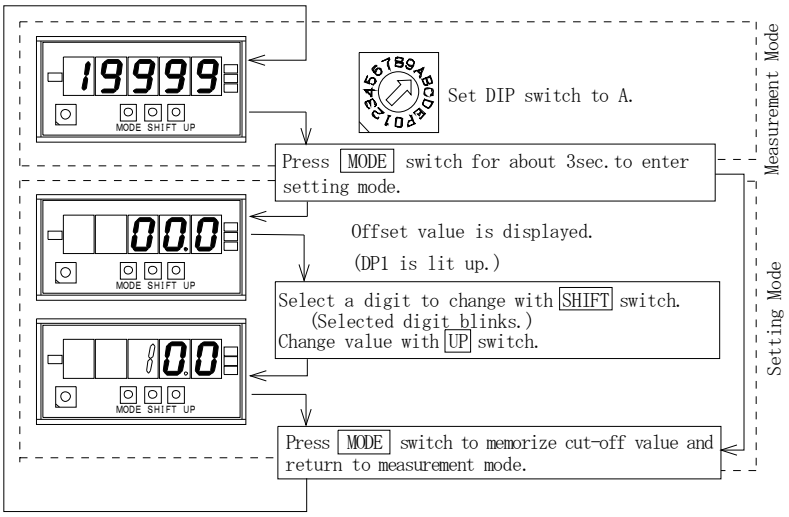
on : Average calculation functions.
oFF : Average calculation does not function.

Numbers of data for averaging:

Display cycle	Numbers of data
SP.1	1 data
SP.2	3 data
SP.3	7 data
SP.4	15 data
SP.5	30 data
SP.6	37 data

3.9 Cut-Off

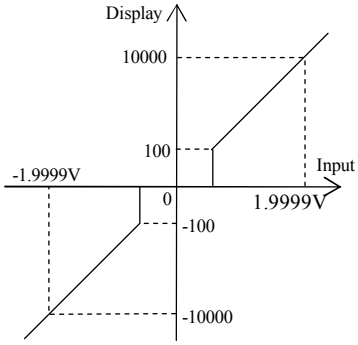
This is the function to cut an unstable zone around input of zero. The zone cut off becomes offset value. The value of zone to cut is set by % to the rated input.



Example:

When the rated input is ±1.9999V and the scaling is as follows:

Offset	0
Full scale	10000
Cut-off	01.0 (%)

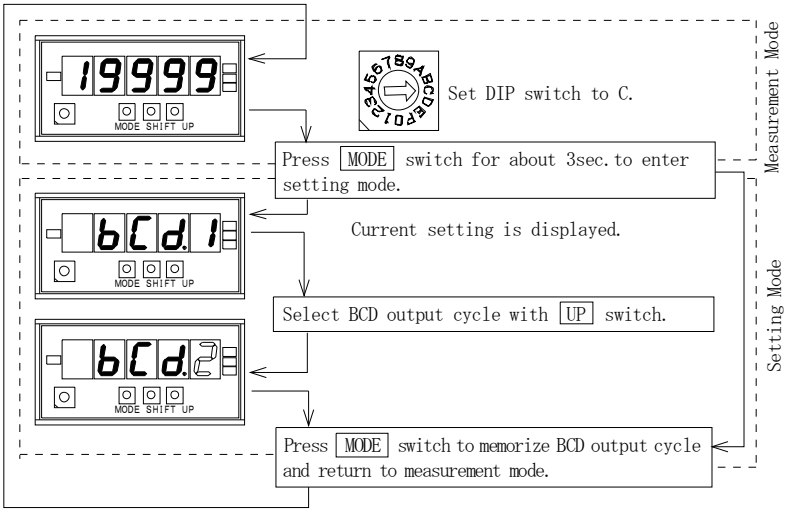


Adjustable range: 00.0~19.9%

When the 00.0 is set, the cut-off function is disabled.

3.10 BCD Output Cycle (When provided with BCD output)

It can be set whether the BCD data is output at display cycle or at sampling rate.



bCd.1:
BCD data is output at display cycle.
bCd.2:
BCD data is output at sampling rate.

In case that the BCD output is set to the sampling rate (bCd.2), the BCD data does not work in the following function:

- 10^0 digit fixing function
- Average calculation

Note: When the BCD data output is set to output at sampling rate, the timing of data renewal is differentiated, so the display and BCD data may not correspond with each other.

- **Cautions at Setting of Each Function**
  1. Dip switch operation is ineffective during the setting mode.
  2. Any function is allotted to 4, 5, B, D, E and F of the dip switch, so a mode switch operation is ineffective for them.
  3. When the BCD output is not provided, the dip switch C is not appropriated, so a pressing of mode switch is disregarded.
  4. The output (BCD) is held during the setting mode.

3.11 Initial Setting at Factory before Delivery

Dip switch for setting	Function		Setting	
1	Scaling	Offset	00000	
		Full scale	19999	
2	Display cycle		SP.1	
3	Decimal point		out	
6	Zero set		0.oFF	Note 1
7	Offset		o.oFF	
8	Zero fixing of 10^0 digit		Z.oFF	
9	Average calculation		A. on	
A	Cut-off		00.0	
C	BCD output rate		bCd.1	Note 2

Note 1: EEPROM writes 0 in.
Note 2: It can be set when provided with BCDoutput.

4. Terminal Arrangement and Explanation

⚠ WARNING

- **To avoid an electrical shock, turn the power off when wiring.**
- **Do not wire with moistened hands. Locate away from the wet place.**
- **Do not touch terminals when turning the power on.**

⚠ CAUTION

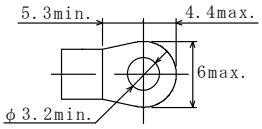
- **Power supply and load should be within the suitable range.**
- **Do not miswiring.**

4.1 Terminal & Connector Arrangement

● **Lower Row Terminals** **Note**: ( )=DC power source models.

Terminal Code	IN Hi	IN Lo	COM	HOLD	ZS	MR	GND(NC)	P2(+)	P1(-)
	1	2	3	4	5	6	7	8	9
Function	+	−	Common	Hold	Zero-Set	Memory Reset	Ground	Power Supply	
	Input								

Terminal screws: M3
Fastening torque: 0.46~0.62N・m
Crimp terminal: As shown on the right.



● **Middle Row Connector** (In case of remote control decimal point)

Connector Pin Code	DPCOM	DP1	DP2	DP3	DP4	NC	NC	NC	NC	NC
	1	2	3	4	5	6	7	8	9	10
Function	Common	10^1 dig.	10^2 dig.	10^3 dig.	10^4 dig.					
	Decimal Point									

● **Coloring of attached lead wire(lead wire length 1m)**

Brown : DPCOM Yellow : DP3
Red : DP1 Green : DP4
Orange : DP2

● **Upper Row Connector**

TYPE BP, BN, DP, DN

Function		Pin No.			Function
NC		1	2		MEMORY RESET
BOTTOM MEMORY		3	4		PEAK MEMORY
DATA COM		5	6		DATA COM
SYNC		7	8		LATCH
OVER		9	10		OUTPUT ENABLE
POL		11	12	1	$\times 10^4$
$\times 10^3$	8	13	14	8	$\times 10^2$
	4	15	16	4	
	2	17	18	2	
	1	19	20	1	
$\times 10^1$	8	21	22	8	$\times 10^0$
	4	23	24	4	
	2	25	26	2	
	1	27	28	1	

Connector : 1150N-028-009T

4.2 Explanation of Lower Row Terminals

● **Measurement Inputs (IN Hi, IN Lo)**

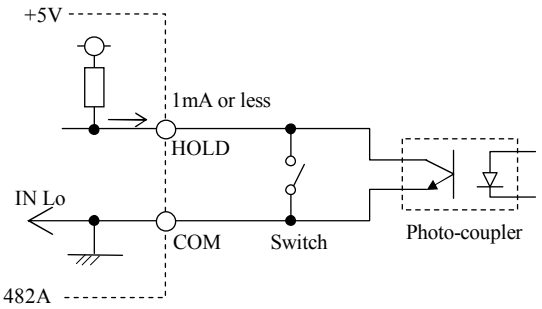
Make connections of measurement inputs with correct polarity. Connect the measurement input of higher electric potential to Hi. Make an independent wiring respectively for the input and power source line. If the wiring of input and power source line are made
in parallel, it may cause unstable reading.

● **Common (COM)**

Common terminal for hold, zero-set and memory reset.

● **Hold (HOLD)**

The measured data are held by making a short-circuit between
Active "L" I_{IL}≦1mA, "L"=0~0.8V, "H"=3.5~5V



● **Zero Set (ZS)**

Zero set function can be effected by making the zero-set ON with front switch operation. When the zero-set function is in operation, the ZS LED is lit up. The zero-set value is stored in the EEPROM (retaining term for about 10 years).
Active "L" I_{IL}≦1mA, "L"=0~0.8V, "H"=3.5~5V

1. Make zero-set ON by the switch inside the front panel.
2. Input a zero-set value and have the zero-set terminal short-circuited with the common terminal. The display value becomes 0 at this time (in case that the offset value is 0).
3. Open the zero-set terminal. Then, the zero-set value is stored in the memory and the zero-set functions starts.
   Display value = Input value - Zero-set value

○ Reset of Zero-set Function

1. The zero-set function can be reset by making the zero-set OFF the switch inside the front panel.
   The zero-set value is still stored in the memory.

● **Memory Reset Terminal (MR)**

○ By short-circuiting the memory reset terminal to the COM terminal, the peak memory value and bottom memory value are reset and a new memory is started.
○ During the short-circuiting of the memory reset terminal, the peak memory value and bottom memory value are real time values.
Active "L" I_{IL}≦1mA, "L"=0~0.8V, "H"=3.5~5V

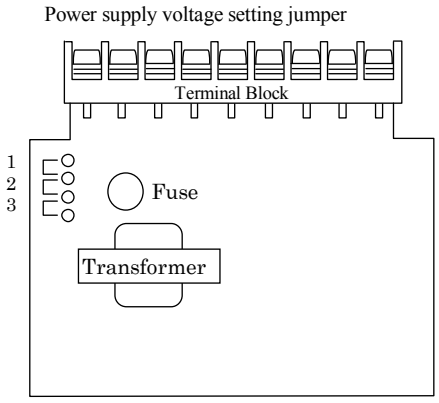
Note: COM, HOLD, ZS and MR terminals are not isolated from the input, so, in case of controlling the terminal of each function, it is recommended to use a photo-coupler, relay, switch and so on. Also, in case that the plural numbers of the instruments are controlled; make the control insulating each instrument individually.

● **Ground (GND)**

In case of fear that the noise is frequently generated on the power source line, it is effective to earth the ground terminal directly to the ground. If the instruments is not affected by environmental noise, the grounding can be omitted. In this case, take care for the ground terminal not to touch other input terminals, as it is charged with neutral electric potential of power source voltage.

● **Power Supply［P1(-), P2(+)］**

The power source voltage to be supplied to the instrument is specified on the terminal plate at delivery from factory.
○ AC100V ..... Use the instrument within the range AC90~132V
○ AC200V ..... Use the instrument within the range AC180~250V
For the AC power source models, the voltage AC90~132V or AC180~250V can be selected by changing a jumper connection provided on the internal board When the power source voltage is changed, do not forget to change an indication of voltage on the terminal plate accordingly.



Operating Voltage	Jumper Connections		
	1	2	3
AC90~132V	Short-circuited	Open	Short-circuited
AC180~250V	Open	Short-circuited	Open

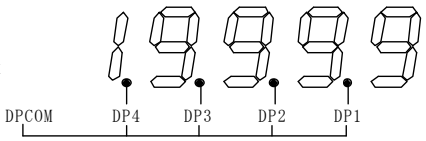
○ DC24V: Use the instrument with DC24C±10%.
Connect +24V to P2(+) and 0V to P1(-).

⚠ CAUTION

- **Do not use the product with the voltage out of the rated range as it may cause breakage of the products.**
- **Do not connect the DC power supply polarity in reverse. Otherwise, the DPM 482 will be broken.**

4.3 Explanation of Middle Row Connector

● Remote Control of Decimal Point (DP1~DP4, DPCOM)



Decimal point can be displayed at an arbitrary position by setting the decimal point setting switches inside the front panel to the remote control mode. Make a short-circuit between the decimal point 10^1~10^4 (DP1~DP4) and DPCOM. (Active "L")
Please do not set DP1 to DP4 more than once.

Note: The DP pins are not isolated from the measuring input, so make an insulation of it with use of photo-coupler, switch, etc. (When the input is used in floating, be sure to apply this solution. Also, in case that the plural numbers of the instruments are used, make the insulation of DP pins individually for each instrument.)

● NC

NC pins are open pins.

4.4 Explanation of Upper Row Connector

TTL Level Output

● Rated Input & Output

Signal	Code	TYPE-BP	TYPE-BN	Rate
Output	$\times 10^0$~$\times 10^4$	Positive logic	Negative logic	TTL level Fo=2 CMOS compatible
	POL	+="H", −="L"	+="L", −="H"	
	OVER	"H" at over	"L" at over	
	SYNC	"L" pulse of 10ms		
Input	LATCH	Held by short-circuit ("L")		IIL≦−1mA "L"=0~1.5V, "H"=3.5~5V
	ENABLE	Allowed by open ("H"), prohibited by short-circuit ("L")		
	MEMORY RESET	Reset by short-circuit ("L")		
	PEAK/BOTTOM MEMORY	Refer to each article.		

● Measured Data Output ($\times 10^0$～$\times 10^4$)

Parallel BCD (1-2-4-8) code, latch output. The output is Tri-state type, so a connection to the data bus is easy.

● Polarity Output (POL)

Polarity of measured data is output from the pin ⑪.

● Over-range Output (OVER)

When the display is over-range, the output is made at the pin ⑨. In case that the input exceeds 130%, the output of measured data is 130% display data and OVER data. When the display exceeds 19999, the data 0 and OVER data are output.

● Synchronization Signal Output (SYNC)

"L" pulse of 10ms synchronized with the display cycle is output at the pin ⑦. Read in the data at the rising point of this SYNC. In case of connection to the multiple data bus, the wired OR connection is possible.

● Data Enable Input (OUTPUT ENABLE)

When the pin ⑩ is opened, the data (including POL, OVER) and SYNC are output.
When it is short-circuited with the DATA COM (pin ⑤, ⑥), the data (including POL, OVER) becomes "high impedance" state. In this state, the output of SYNC is prohibited and the connection to data bus is easy.

● Latch (LATCH)

By short-circuiting the pins ⑧ and DATA COM (pin ⑤, ⑥), the data is held (the display is not held).

● Peak Memory (PEAK MEMORY), Bottom Memory (BOTTOM MEMORY)

By operating the pins ④, ③ and DATA COM (pin ⑤, ⑥), the output data can be changed to real time value, peak value, bottom value or amplitude.

Signal Name	Real Time Value	Peak Value	Bottom Value	Amplitude
Peak Memory (pin④)	Open "H"	Short-circuit "L"	Open "H"	Short-circuit "L"
Bottom Memory (pin③)	Open "H"	Open "H"	Short-circuit "L"	Short-circuit "L"

● Memory Reset (MEMORY RESET)

By short-circuiting the pins ② and DATA COM (pin ⑤, ⑥), the peak memory and bottom memory values are re-written to the real time values.

● Data Common (DATA COM)

Pin ⑤, ⑥ are common for the measured data, POL, OVER,SYNC, LATCH, OUTPUT ENABLE, PEAK MEMORY, BOTTOM MEMORY and MEMORY RESET.

● **NC**

NC pins are open pins but do not use them as relay terminal.

Note: Data output and control signals are unified to the TTL level, so ensure not to apply the voltage DC5V or higher. Arrange the wiring of data output and control input/output signal lines apart from the power source line, relays or magnet switches, etc. of big capacity, as well as the input line.

Transistor Output

In case that the BCD output of plural numbers of the instrument is connected to one PC, the wired OR connection is possible for the
measured data (including POL, OVER), SYNC.

● **Rated Input & Output**

Signal Code		Item	TYPE-DP	TYPE-DN
Output	$\times 10^0 \sim \times 10^4$ POL OVER SYNC	Output type	Source type	Sink type
		Output capacity	DC30V 30mA MAX, Saturated voltage 1.6V or less	
Input	LATCH ENABLE MEMORY RESET PEAK MEMORY BOTTO MEMORY	Signal level	Input power source = 1mA or less OFF (H)=3.5V~5V, ON(L)=0~1.5V	

● **Measurement Data Output ($\times 10^0 \sim \times 10^4$)**

Parallel BCD (1-2-4-8) code, latch output.
Transistor ON with the measured data "1". Transistor OFF with the measured data "0".

● **Polarity Output (POL)**

Polarity of measured data is output from the pin ⑪
Transistor ON when the display value is (+). Transistor OFF when the display value is (-).

● **Over-range Output (OVER)**

When the display is over-range, the output is made at the pin ⑨.
In case that the input exceeds 130%, the output of measured data is 130% display data and OVER data.
When the display exceeds 19999, the data 0 and OVER data are output.

● **Synchronization Signal Output (SYNC)**

"On" pulse of 10ms which is synchronized with the display cycle is output at the pin ⑦. Read in the data at the rising point (ON→OFF) of this SYNC.

● **Data Enable Input (OUTPUT ENABLE)**

When the pin ⑩ is opened, the data (including POL, OVER) and SYNC are output.
When it is short-circuited with the DATA COM (pin ⑤, ⑥) , the data (including POL, OVER) becomes "OFF" state.
In this state, the output of SYNC is prohibited, so the connection to data bus is easy.

● **Latch (LATCH)**

By short-circuiting the pins ⑧ and DATA COM (pin ⑤, ⑥), the data is held (the display is not held).

● **Peak Memory (PEAK MEMORY), Bottom Memory (BOTTOM MEMORY)**

By operating the pins ④, ③ and DATA COM (pin ⑤, ⑥), the output data can be changed to real time value, peak value, bottom value or amplitude.

Signal Name	Real Time Value	Peak Value	Bottom Value	Amplitude
Peak Memory (pin④)	Open	Short-circuit	Open	Short-circuit
Bottom Memory (pin③)	Open	Open	Short-circuit	Short-circuit

● **Memory Reset (MEMORY RESET)**

By short-circuiting the pins ② and DATA COM (pin ⑤, ⑥), the peak memory and bottom memory values are re-written to the real time values.

● **Data Common (DATA COM)**

Pin ⑤, ⑥ is common for the measured data, POL, OVER, SYNC, LATCH, OUTPUT ENABLE, PEAK MEMORY, BOTTOM MEMORY and MEMORY RESET.

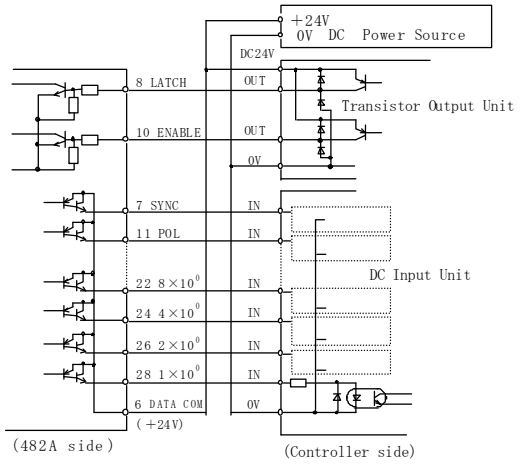
● **NC**

They are open pins but do not use them as relay terminal.

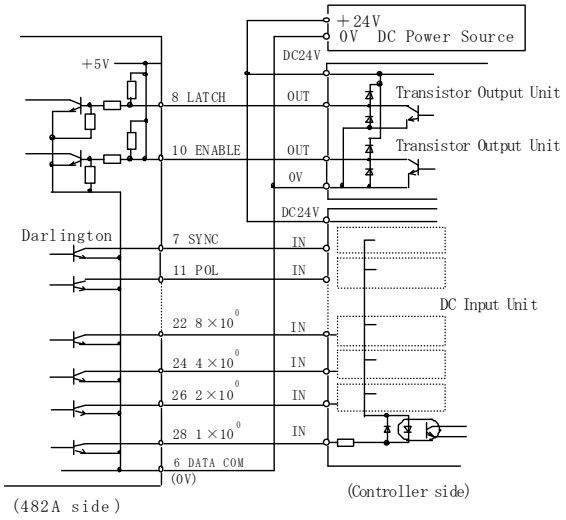
Note: Arrange the wiring of data output and control input/output signal lines apart from the power source line, relays or magnet switches, etc. of big capacity, as well as the input line.

4.5 Connections

Source Type

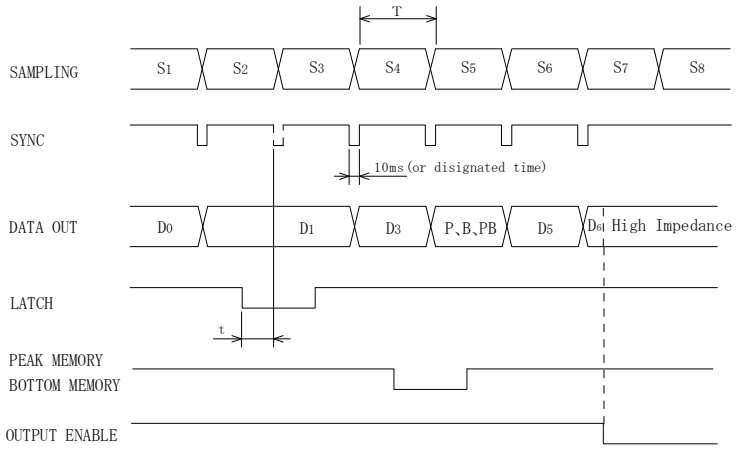


Sink Type

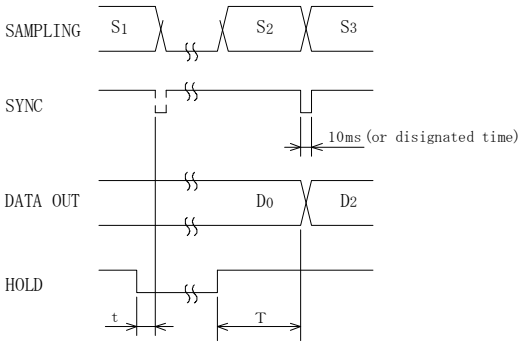


4.6 Timing Chart

● **BCD Data and LATCH**



● **BCD Data and HOLD**



P, B, PB : Peak memory value, bottom memory value or amplitude.
t : Internal transaction time approx. 15ms.
T : Display cycle or sampling rate (133ms).

t : Internal transaction time approx. 15ms.
T : Display cycle or sampling rate (133ms).

5. Calibration

In order to maintain long term accuracy, periodical calibration at an interval of about one year is recommended.
Make a calibration of the instrument with the ZERO and MAX volumes inside the front mask. Also, make a calibration in the ambient condition of 23°C±5°C, 75%RH or less.

Contact Information
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