TD-271

OPERATION MANUAL

TEAC INSTRUMENTS CORPORATION

Rev.1.13
2004.APR

Cautions and Requests for Use

● Do not disassemble the main body for modifications or repair.

● Be sure to use crimp contacts for connection to terminal blocks, and do not to connect bare wires as they are.

● Be sure to perform Type III earth works when installing the main body.

- The main F.G. is indicated by ⏚ , it must be grounded with the protected earth.

● Be sure to disconnect the power cable when performing the following.

- Attachment/detachment of connectors of options.
- Wiring/connection of cables to terminal blocks.
- Connection of the ground line.

● Be sure to assort the machine which is supplied by AC power through the terminal in a panel with lock or screws.

● Carefully check wiring, etc. before applying power.

● Take an interval of more than 5 seconds when repeating ON/OFF.

● Take adequate shielding measures when using at the following locations.

- Near a power line.
- Where a strong electric field or magnetic field is formed.
- Where static electricity, relay noise or the like is generated.

● Do not install in the following environments.

- Place s exposed to direct sunlight.
- Where the temperature and/or humidity exceeds the range in the specifications.
- Place s containing corrosive gas or flammable gas.
- Place s with large quantities of dust, salt or iron powder.
- Where the product may be splashed with water, oil or chemicals.
- Where the main body is directly affected by vibration or shock.

Safety Precautions

● Indications for safe use and their meanings

In this manual, precautions for using the TD-271 digital indicator safely are indicated as follows. Be sure to follow the precautions given here because they are important descriptions relating to safety.

Indications and their meanings are as follows:

⚠WARNING	Misuse may cause the risk of death or serious injury to persons.

⚠ CAUTION	Misuse may cause the risk of injury to persons or damage to property.

● Explanation of pictographs

The △ means a caution (or warning).

A specific description is written in the △ .

The illustration on the left-hand side shows "Caution: May explode".

The △ means a caution (or warning).

A specific description is written in the △ .

The illustration on the left-hand side shows a general caution.

● About the built-in lithium battery

⚠ WARNING

Never disassemble, deform under pressure or throw the battery into fire.The battery may explode, catch fire or leak.

- Battery

Model: CR2477-1HF made by Matsushita Battery Industrial Co., Ltd.

Nominal voltage: 3V

Nominal electric capacity: 1000mAh

● About the signal I/O terminal block

⚠ CAUTION

For connection to the signal I/O terminal block, wire correctly after checking the signal names and terminal block numbers.

Also, turn off the power of the main body before connection/wiring to the signal I/O terminal block.

FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This device complies with Part 15 of the FCC Rules. Operation is subject to following two conditions :（1）this device may not cause harmful interference. and（2）this device must accept any interference received, including interference that may cause undesired operation.

NOTE : This equipment has been tested and found to comply with the limits for a Class A Digital Device, pursuant to part 15 of the FCC Rules.These limits are designed to provide reasonable Protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

－－ Reorient or relocate the receiving antenna.

－－ Increase the separation between the equipment and receiver.

－－ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

－－ Consult the dealer or an experienced radio ／ TV technician for help.

WARNING

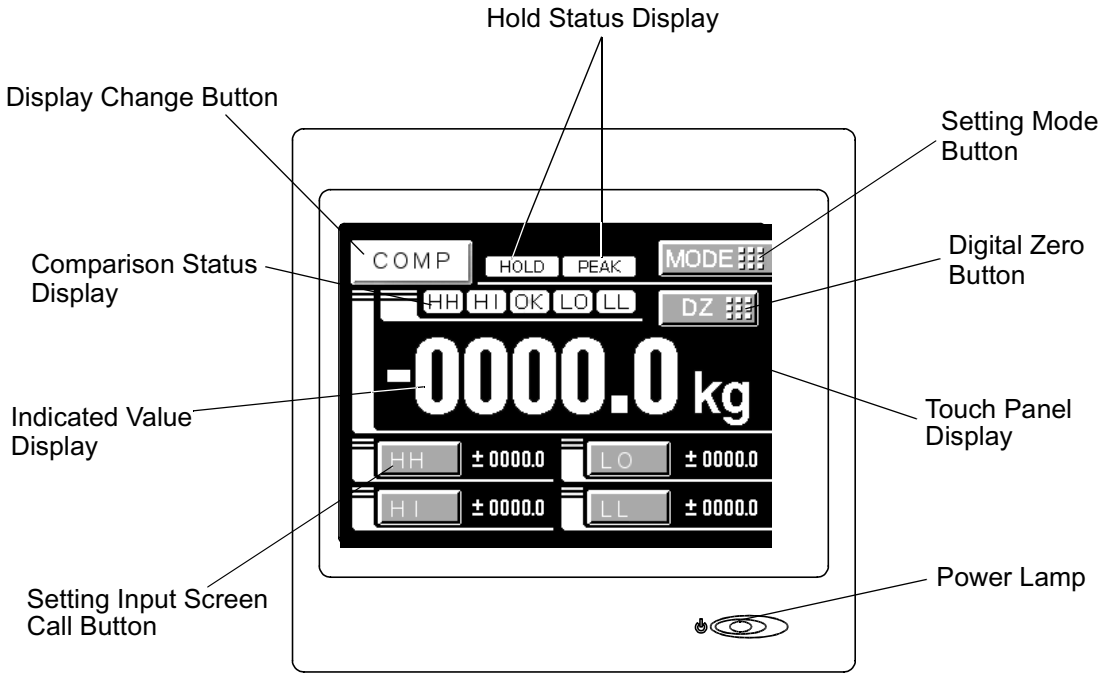
This equipment has been verified to comply with the limits for a Class A personal digital device, pursuant to subpart B of Part 15 of FCC Rules. Only peripherals（computer input ／ output devices, terminals, printers, etc.）certified or verified to comply with the Class A or B limits may be attached to this equipment. Operation with non － certified or non － verified personal computer and ／ or peripherals is likely to result in interference to radio and TV reception. The connection of a non － Shielded equipmentinterface cable to this equipment willinvalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

CONTENTS

1 APPEARANCE DESCRIPTION

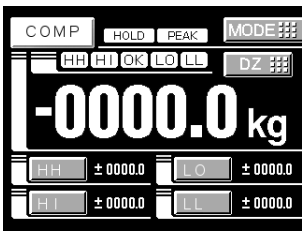
1-1. Front Panel



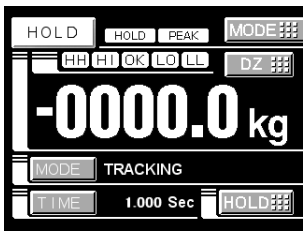
1-1-1. Touch Panel Display

This is the touch panel display for displaying an indicated value and graph set value and for setting various setting items of the TD-271. During measurement, a comparison display, hold display and graph display can be selected according to the function in use.

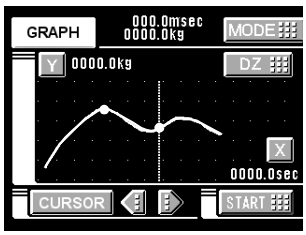
Comparison Display



Hold Display



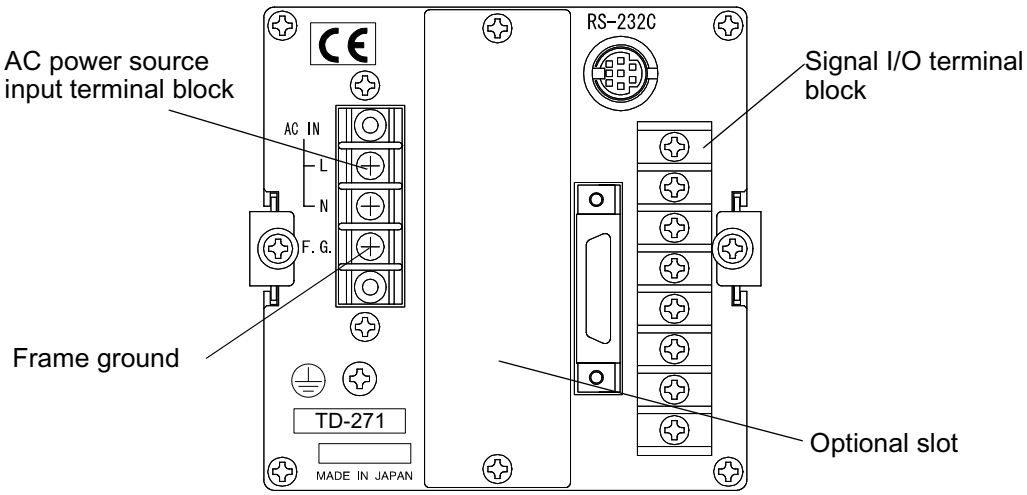
Graph Display



1-1-2. Power Lamp

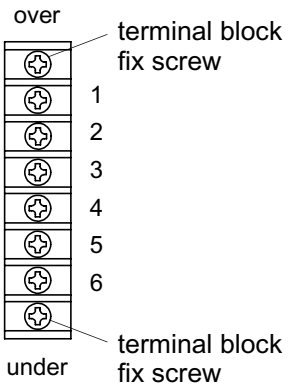
This lamp lights when the power to the TD-271 is on.

1-2. Rear Panel



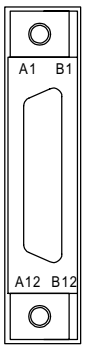
Terminal block

1	GND
2	VOL OUT
3	＋ SIG
4	－ EXC
5	－ SIG
6	＋ EXC



Signal input / output connect

A1	＊	COM1	B1	＊	COM2
A2	OUT	HH	B2	IN	CODE0
A3	OUT	HI	B3	IN	CODE1
A4	OUT	OK	B4	IN	CODE2
A5	OUT	LO	B5	IN	CODE3
A6	OUT	LL	B6	IN	T/H
A7	＊	COM1	B7	＊	COM2
A8	OUT	H/E	B8	IN	H/M
A9		NC	B9	IN	D/Z
A10		NC	B10	IN	ST/SP
A11	OUT	SI/F	B11	IN	CAL0
A12	OUT	SI/F	B12	IN	CAL1



＋ EXC － EXC ＋ SIG － SIG	The terminal for connecting to a strain-gage sensor.

See the section on Load Cell Connection page 10 for connection.

VOL OUT GND	The voltage output terminal. → page 77「VOLTAGE OUTPUT（VOL OUT）」

See the section on Voltage output Connection page 15 for connection.

COM1	The terminal common to output signals.
OK HI LO HH LL	Outputs the OK signal. Outputs the HI signal. Outputs the LO signal. Outputs the HH signal. Outputs the LL signal. → page 43 「COMPARISON FUNCTIONS」
H/E	Outputs the hold end signal. → page 49「HOLD FUNCTIONS」

See the section on External I/O Connection page 12 for connection.

COM2	The terminal common to input signals.
CODE0 CODE1 CODE2 CODE3	Selects the CH No. for the multi-hold function. Calibration value selection input → page 65「MULTI-HOLD FUNCTION」
T/H H/M	The input for controlling the hold signal. → page 49「HOLD FUNCTIONS」
D/Z	The input for digital zero (making the indicated value zero). → page 34「Digital Zero」
ST/SP	The graphic display start/stop signal. → page 69「Graph Plotting」
CAL0 CAL1	Selects the CAL No. for calibration value selection function. → page 31「External Selection of Calibration Value」

See the section on External I/O Connection page 12 for connection.

SI/F	The 2-wire serial interface for coupling a TEAC printer, external display, etc.

See the section on SI/F Connection page 11 for connection.

1-2-1. AC Power Source Input Terminal Block

Connect the AC power cord. The input voltage is 100V - 240V AC, and the frequency is 50/60Hz.

1-2-2. Frame Ground (Functional ground)

This is a ground terminal block. Be sure to ground the F.G. terminal to prevent electric shocks and failures due to static electricity.

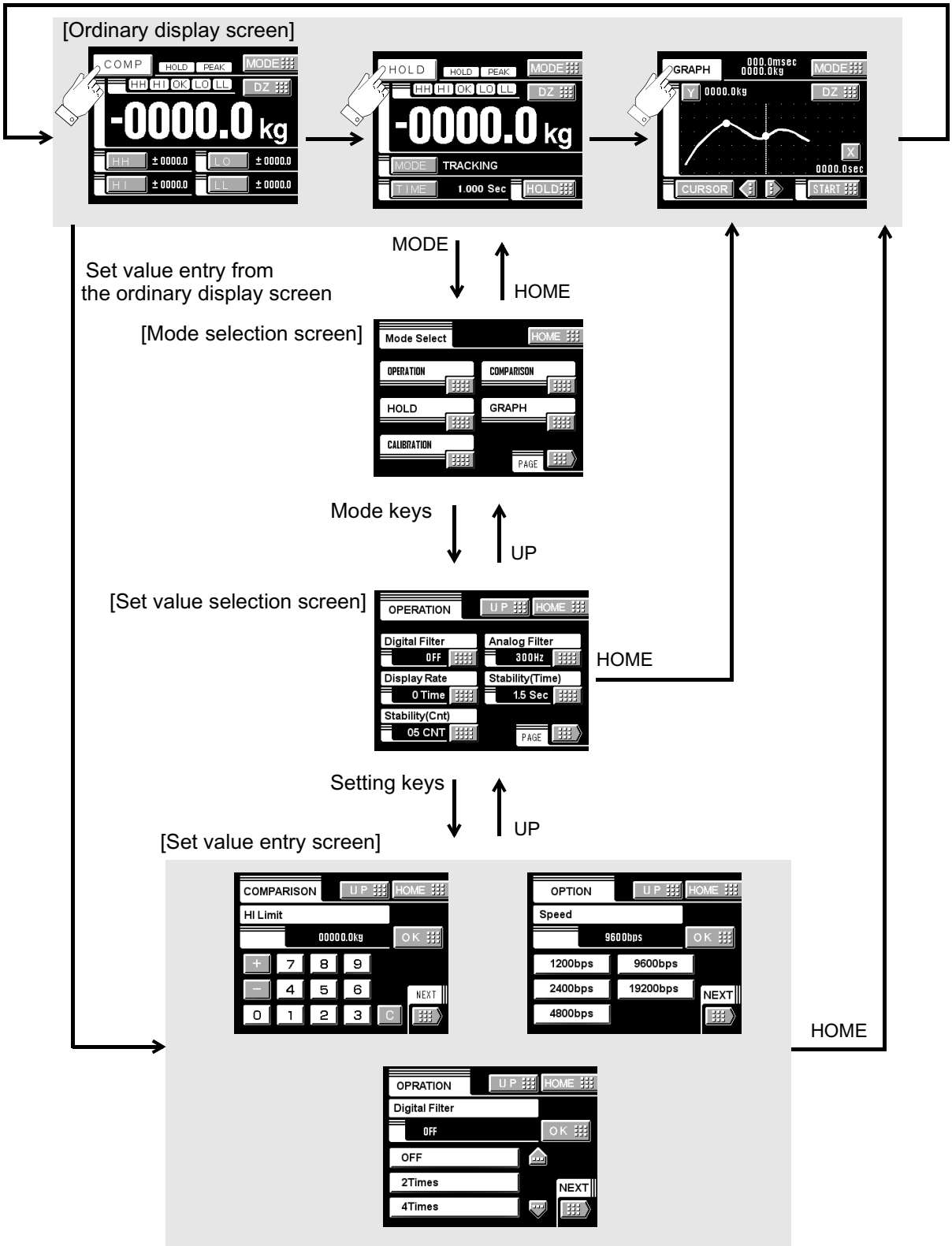
1-2-3. Optional Slot

Any one of the following optional boards can be mounted.

- TD-2703 BCD data output
- TD-2704 D/A converter
- TD-2710 RS-485

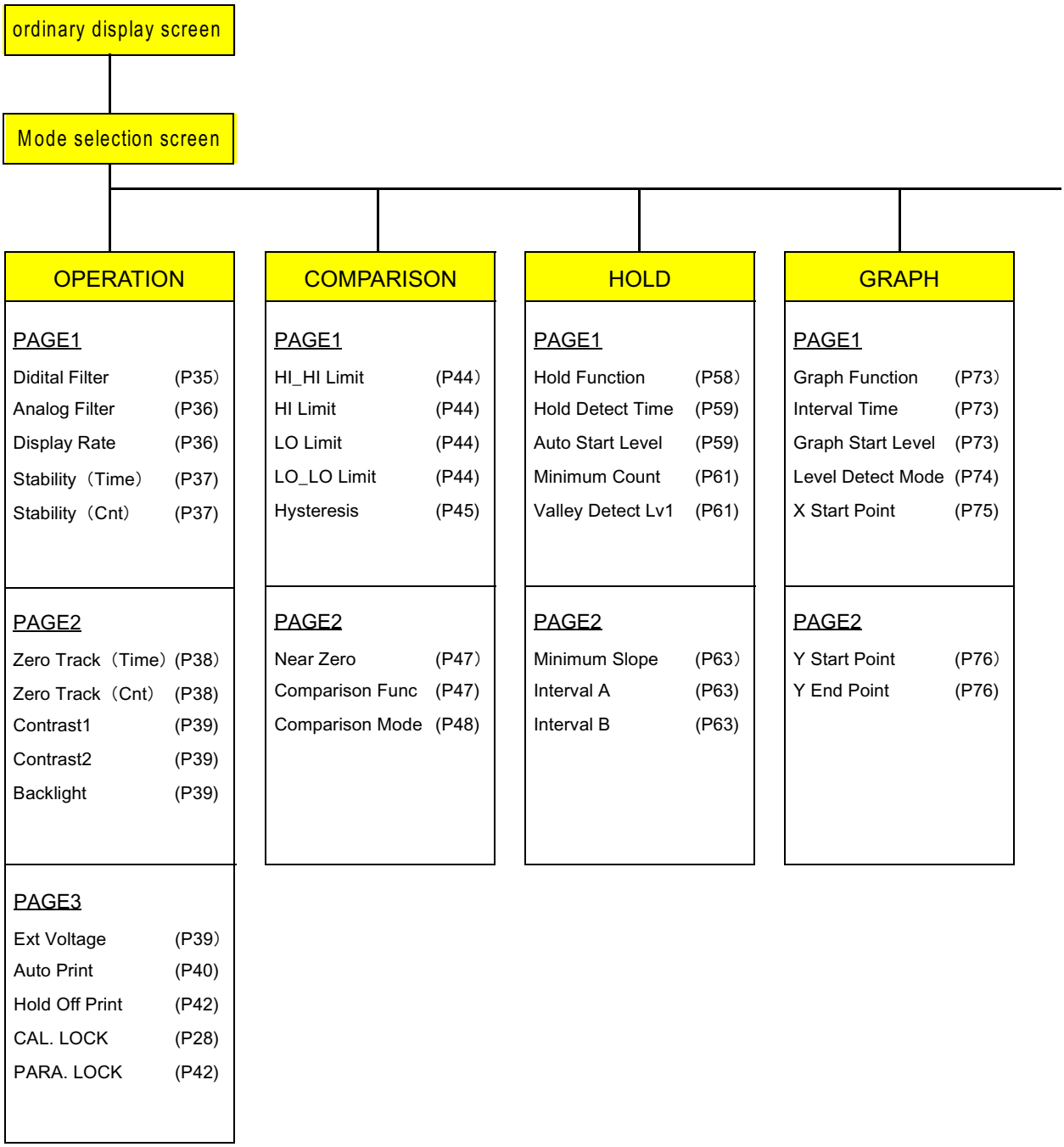
2. SETTING MODES

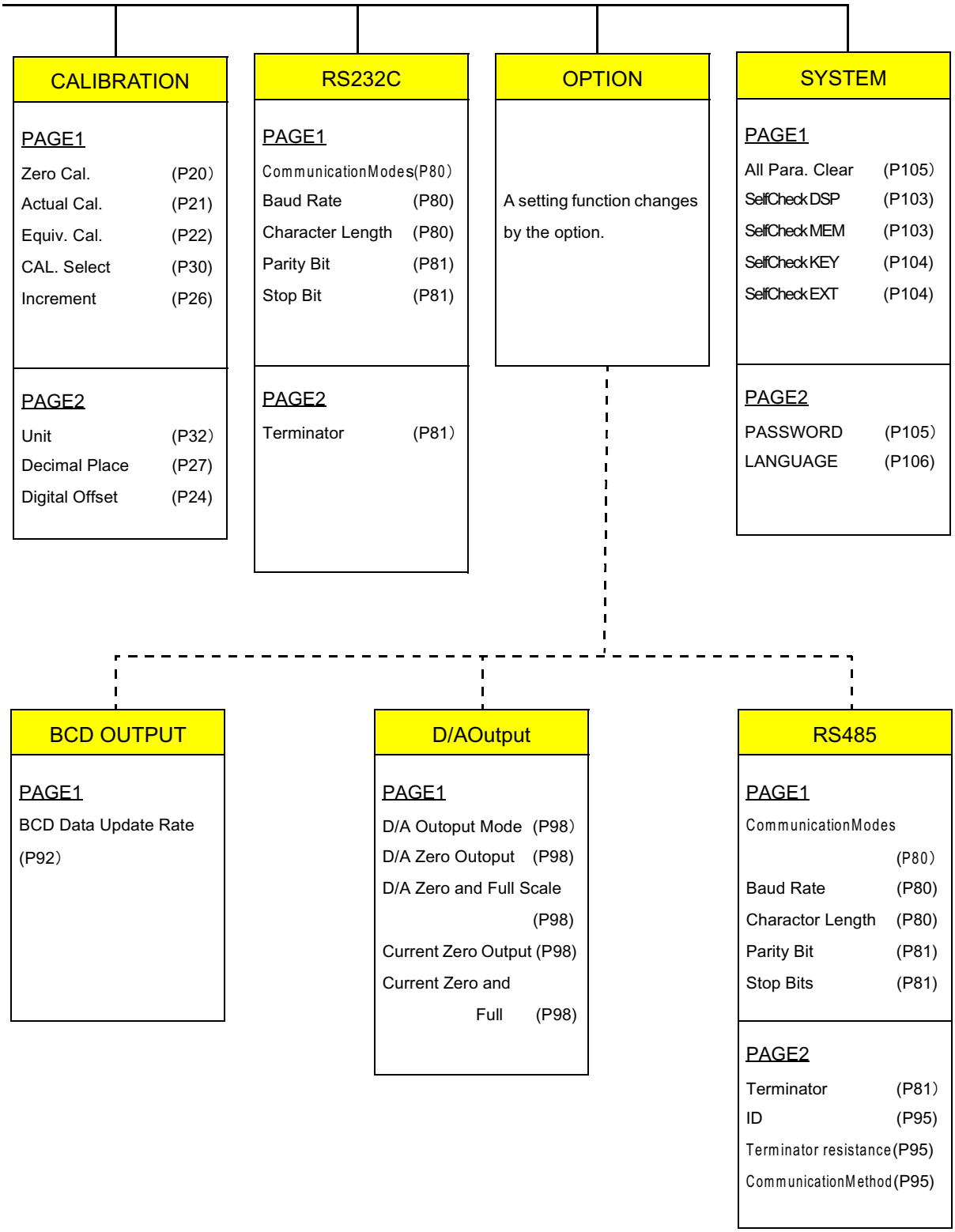
2-1. TD-271 Screen Configuration



With the NEXT key on the set value entry screen, the next set value entry screen appears.

2-2. Setting Modes Tree




CALIBRATION
PAGE1
Zero Cal. (P20)
Actual Cal. (P21)
Equiv. Cal. (P22)
CAL. Select (P30)
Increment (P26)
PAGE2
Unit (P32)
Decimal Place (P27)
Digital Offset (P24)
RS232C
PAGE1
CommunicationModes(P80)
Baud Rate (P80)
Character Length (P80)
Parity Bit (P81)
Stop Bit (P81)
PAGE2
Terminator (P81)
OPTION
A setting function changes by the option.
SYSTEM
PAGE1
All Para. Clear (P105)
SelfCheck DSP (P103)
SelfCheck MEM (P103)
SelfCheck KEY (P104)
SelfCheck EXT (P104)
PAGE2
PASSWORD (P105)
LANGUAGE (P106)
BCD OUTPUT
PAGE1
BCD Data Update Rate (P92)
D/AOutput
PAGE1
D/A Outoput Mode (P98)
D/A Zero Outoput (P98)
D/A Zero and Full Scale (P98)
Current Zero Output (P98)
Current Zero and Full (P98)
RS485
PAGE1
CommunicationModes (P80)
Baud Rate (P80)
Charactor Length (P80)
Parity Bit (P81)
Stop Bits (P81)
PAGE2
Terminator (P81)
ID (P95)
Terminator resistance (P95)
CommunicationMethod (P95)

2-3. About a Setting Call

In this manual, a setting function call is described as follows.

Calibration Protection

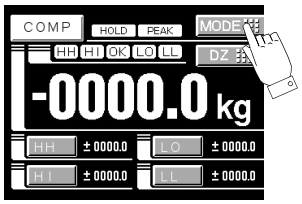
Setting call → Operation setting → Page 3

↑ Mode ↑ Page

This call can be made by the following procedure.

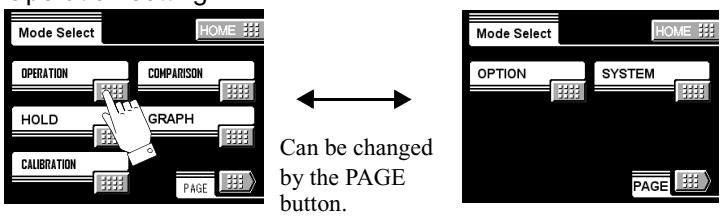
1) Press the MODE button on the ordinary display screen.

Setting call



2) The mode setting screen appears. Select the mode.

Operation setting

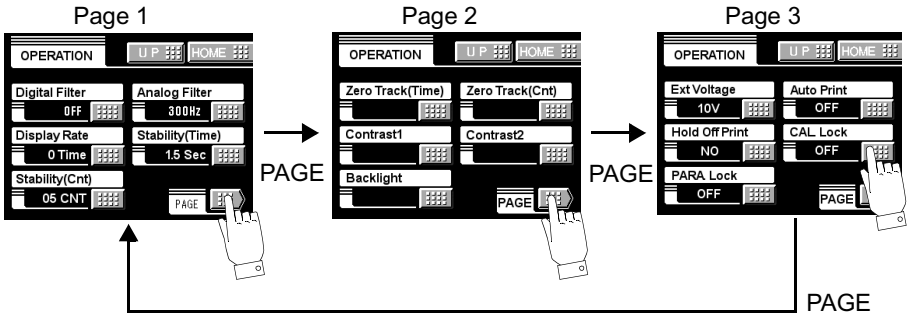


Can be changed by the PAGE button.

Modes are as follows:

- Operation setting
- Hold
- Calibration
- System
- Comparison setting
- Communication setting
- Graph setting
- Option

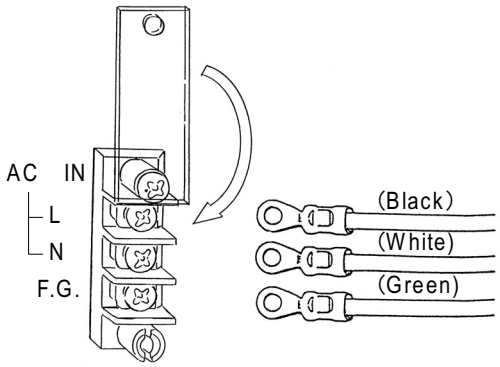
3) The setting function setting screen appears. Select the function.



3. CONNECTION

3-1. Power Input Connection

AC spec.

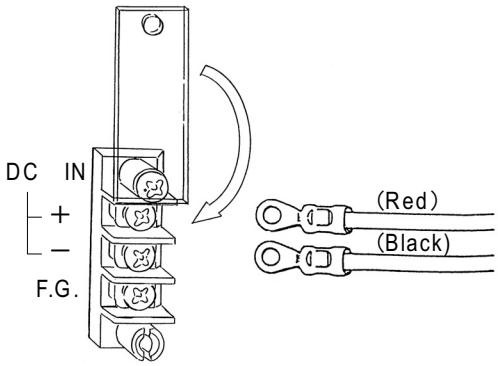


Connect AC power code. The input voltage is 100V-240V AC.
The frequency is 50/60Hz.

CAUTION

Pay close attention to the wring in case of power on.

DC spec.(Depending on the request at the time of order)



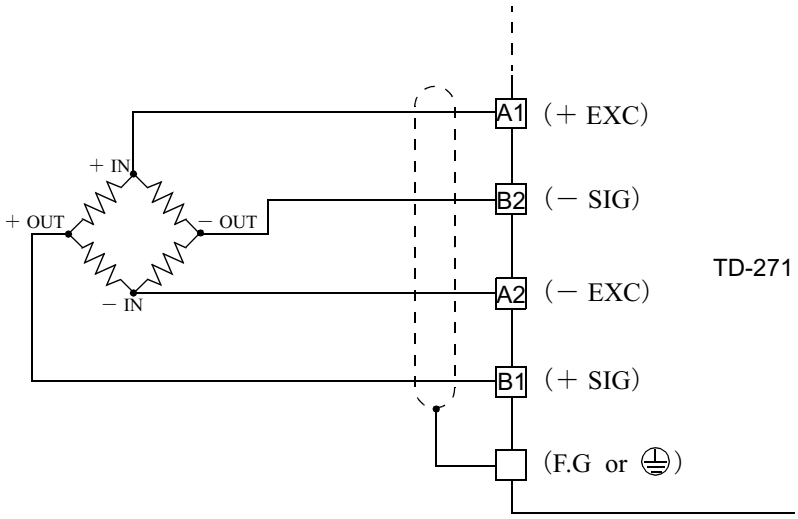
Connect the positive (+) side of the power source to the red screw side of the terminal block on the back of the TD-271, and its negative (-) side to the black screw side.The input voltage is 12V-24V DC.

CAUTION

Be aware that the voltage drops depending on the wire thickness and length.Also, never input an AC power source. Doing so will cause a failure.

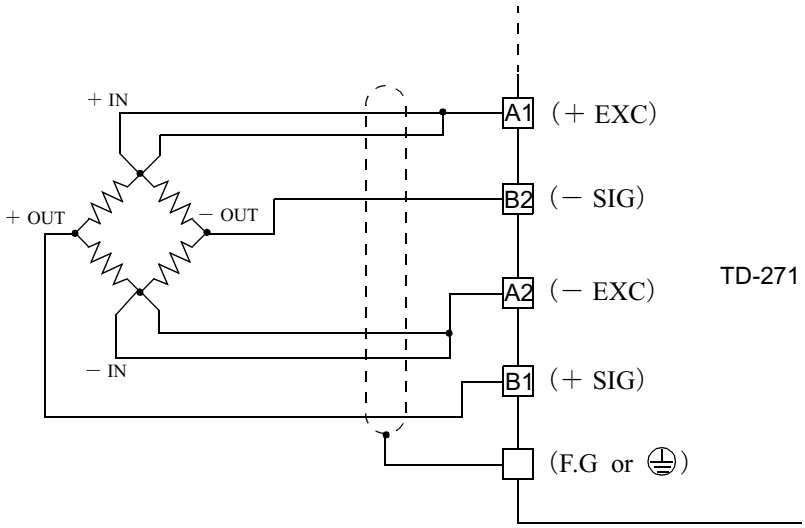
3-2. Load Cell Connection

▪ 4-wire sensor



▪ 6-wire sensor

Short-circuit +EXC with +S and -EXC with -S for connecting a 6-wire strain-gage sensor.

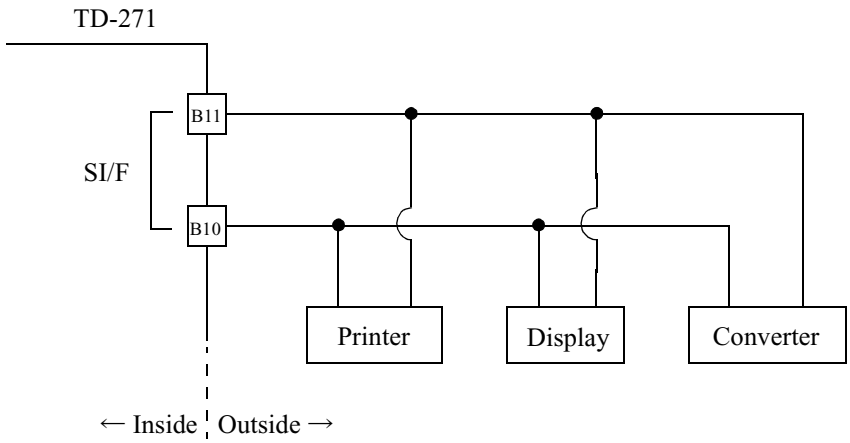


3-3. SI/F Connection

The 2-wire serial interface has connective ability for coupling a TEAC printer, external display, etc.

The interface is nonpolarized and up to three external instruments may be connected.

A two-core parallel cable or a cabtyre cable may be used for connection.

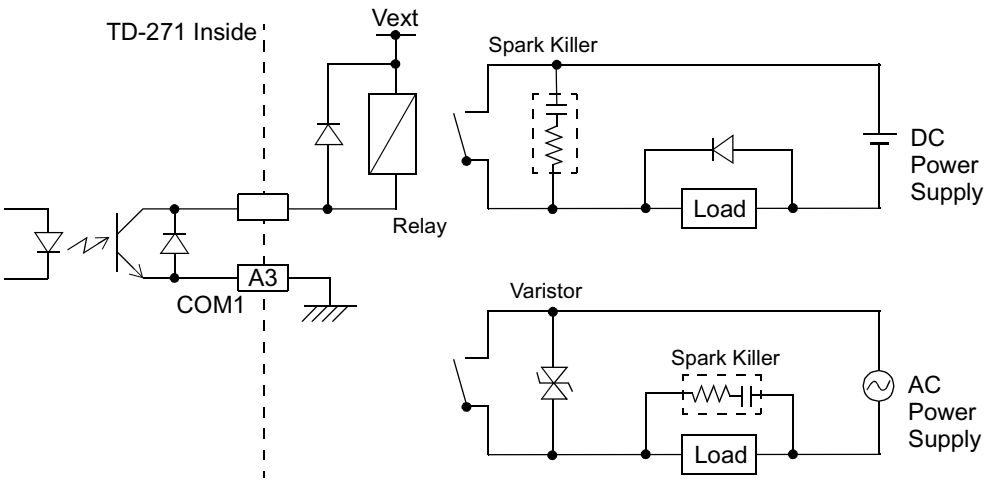


3-4. External I/O Connection

3-4-1. External Output Connection

The external output circuit is operated through an open collector. A3 COM1 is the common terminal. The open collector output capacity is 30mA and the withstand voltage is up to 30V.

▪ Equivalent circuit



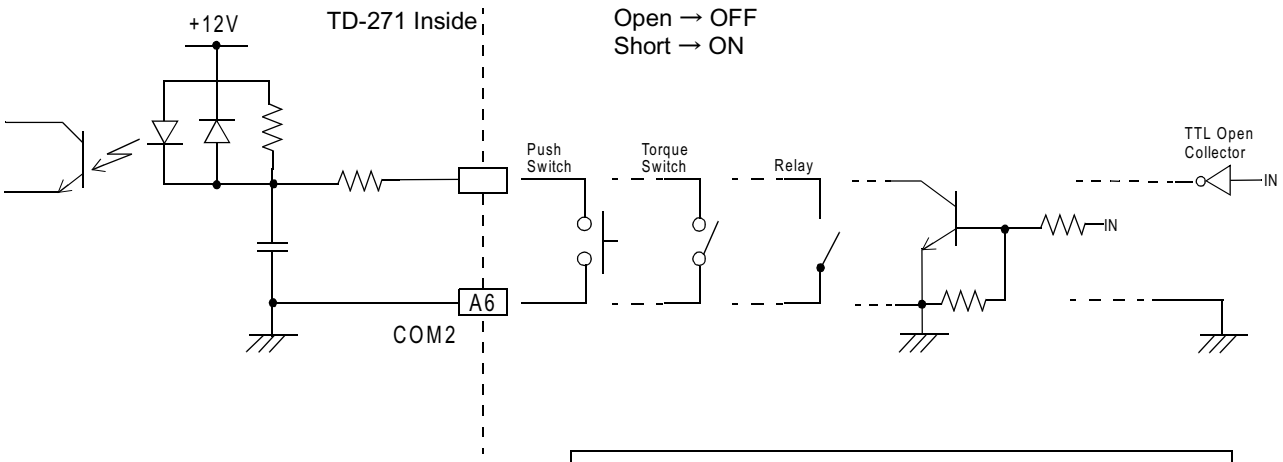
● Output Transistor Status

Output Data	Tr
0	OFF
1	ON

Supply an external power source for a relay drive power source (Vext).

3-4-2. External Input Connection

A signal is inputted to the signal input circuit by short-circuiting or opening the input terminal and the COM2 terminal. Short-circuiting is effected by means of a contact (such as a relay or a switch) or a noncontact (such as a transistor or an open-collector TTL).

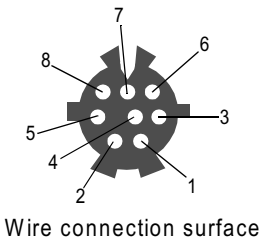


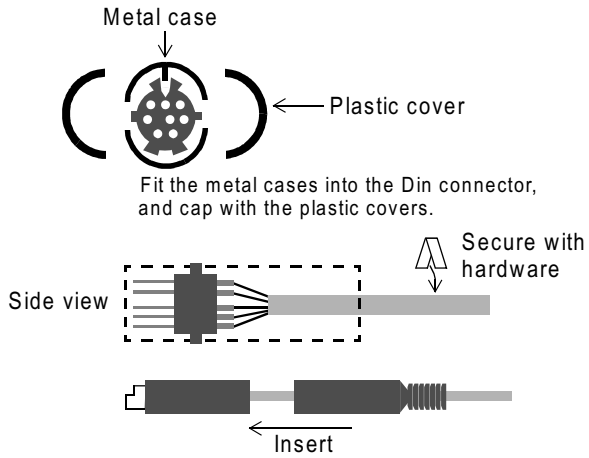
- The external element is required to withstand Ic=10mA.
- Leakage from the external element is required to be 100 μ A or below.

3-5. RS-232C Interface Connection

This connector connects the RS-232C.

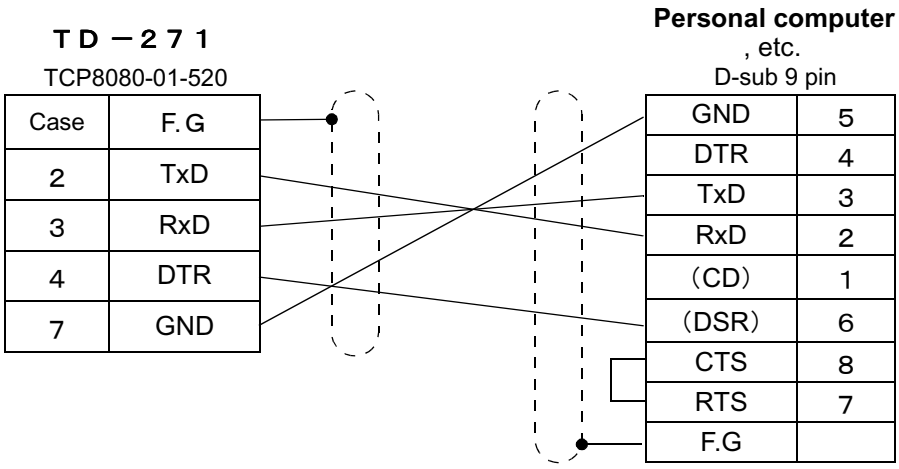
Pin No.	Signal name
1	
2	TxD
3	RxD
4	DTR
5	
6	
7	GND
8	
Case	F.G.





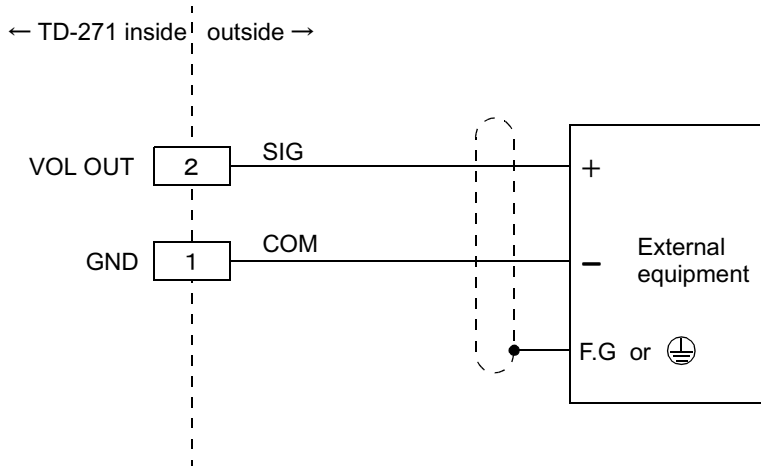
Example of cabling

The following shows an example of connection between DTE-DTE terminals. This will require modification depending on the equipment to be connected.For details, see the instruction manual of the equipment to be connected.



3-6. Voltage Output Connection

The voltage output terminal is an interface to extract analog voltage proportional to sensor signal inputs.



・Since the VOL OUT terminal is not insulated from the internal circuit, use a shielded cable for connection with the external equipment and wire within 2 ～ 3m.

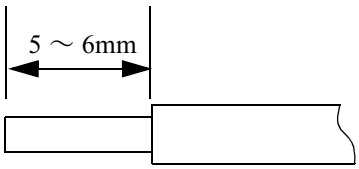
・Do not short-circuit. Doing so will cause a failure.

・Do not apply voltage from the outside. Doing so will cause breakage.

3-6-1. Connecting to Cage Clamp Terminal Block

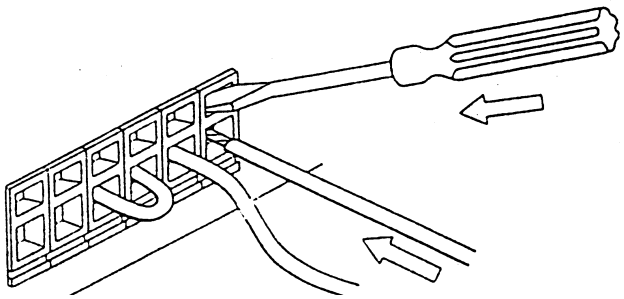
The output terminal D/A option and RS-485 option is using the cage clamp system terminal stand.Please connect in the following procedure.

1.Strip the casing 0.2in (6mm) on the cable to be connected.



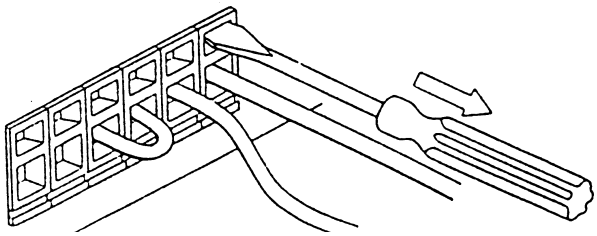
2.Twist the bare wire to fit the terminal hole.

3.Insert the supplied screwdriver into the upper hole and lift upward.



4.Insert the twisted wires into the lower hole.

5.Make sure cable is clamped securely and does not come out with a slight tug.



Notice

- Cable can be from 24 to 14AWG (0.2 to 2.5mm^2)
- It is not necessary to solder the cable wires or to fix a solderless terminal.
- If several cables to be inserted to the same hole, twist those cable wires together and insert.
- If you connect a cable (a load cell, SI/F, external input and output), please turn off and be sure to perform the power supply of a main part.

4. CALIBRATION

Calibration is performed for matching the TD-271 to a strain-gage sensor. The following two types of calibration are available for the TD-271.

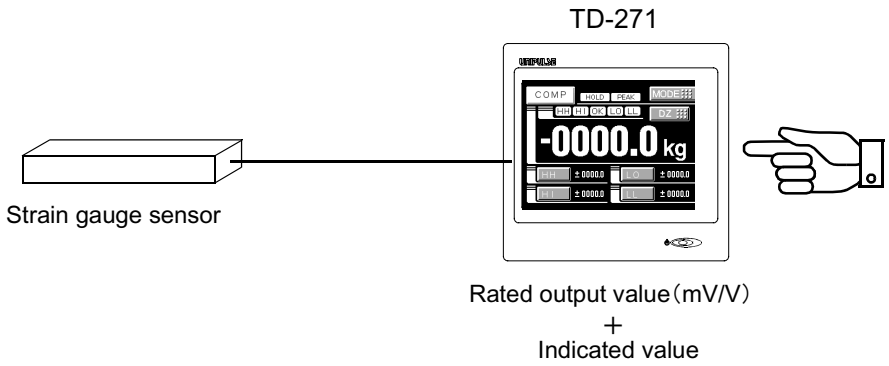
◇ Equivalent Input Calibration

Calibration is performed without an actual load by entering the rated output value (mV/V) and the capacity (to be indicated) of the strain-gage sensor by the keys. Calibration is easily performed when no actual load is available.

For example, the gain is automatically determined by entering:

2.001mV/V (rated output) - 100.0kg (capacity)

as indicated for a load.



A data sheet is attached to a strain-gage sensor at the time of purchase.

The data sheet provides data including:

capacity load (in kg, t, etc.)

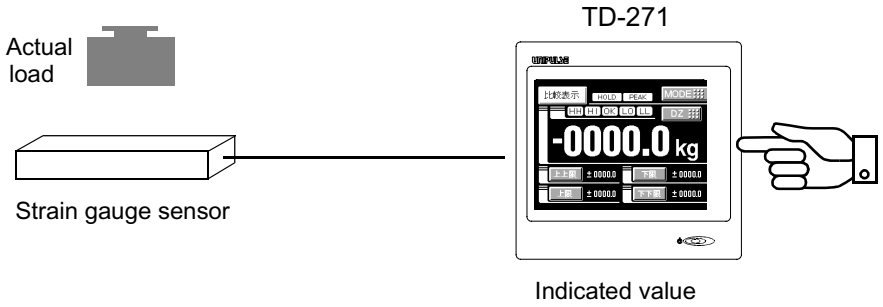
rated output. voltage (in mV/V)

non-linearity, hysteresis, input resistance, output resistance and zero balance.

Enter the capacity and the rated output value required for equivalent input calibration into the TD-271.

◇ Actual Load Calibration

Apply an actual load to the strain-gage sensor and enter the actual load value by the keys for calibration. Calibration is accurately performed with reductions in errors.



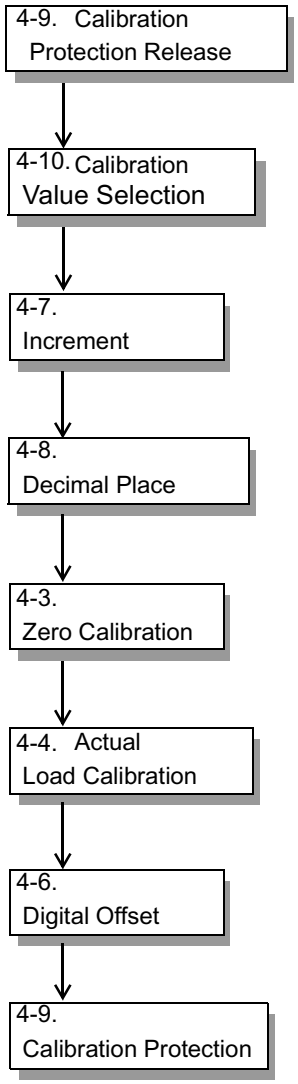
4-1. Equivalent Input Calibration Procedure

Follow the steps below to perform equivalent input calibration.

4-9. Calibration Protection Release	Release the calibration protection.
4-10. Calibration Value Selection	Set the calibration value No. (This step may be omitted for use with only one selection.)
4-7. Increment	Enter the minimum value of digital increments. (This step may be omitted if there is no change.)
4-8. Decimal Place	Determine the decimal point place of the indicated value. (This step may be omitted if there is no change.)
4-3. Zero Calibration	Set the zero point of the strain-gage sensor in no-load condition (with the sensor unloaded).
4-5. Equivalent Input Calibration	Enter the rated output value and reading of the strain-gage sensor.
4-6. Digital Offset	The calibrated value can be offset in advance. (This step may be omitted if there is no change.)
4-9. Calibration Protection	Turn on the calibration protection for preventing misoperation.

4-2. Actual Load Calibration Procedure

Follow the steps below to perform actual load calibration.



Release the calibration protection.

Set the calibration value No.
(This step may be omitted for use with only one selection.)

Enter the minimum value of digital increments.
(This step may be omitted if there is no change.)

Determine the decimal point place of the indicated value.
(This step may be omitted if there is no change.)

Enter the zero point of the strain-gage sensor with no load applied to the sensor.

Enter the span (gain) point of the strain-gage sensor with a load applied to the sensor.

The calibrated value can be offset in advance.
(This step may be omitted if there is no change.)

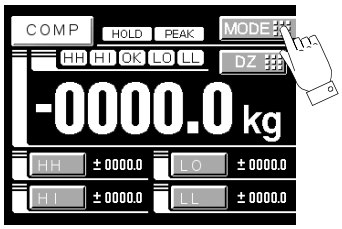
Turn on the calibration protection for preventing misoperation.

4-3. Zero Calibration

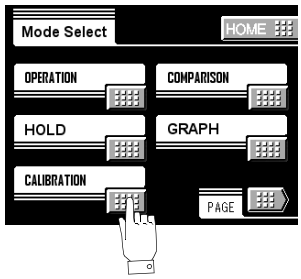
Set the zero point in no-load condition.

Setting call → Calibration → Page 1

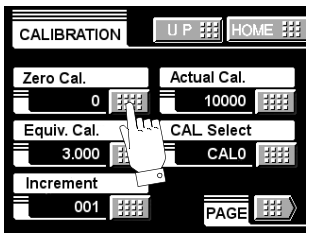
1） Press the MODE button.



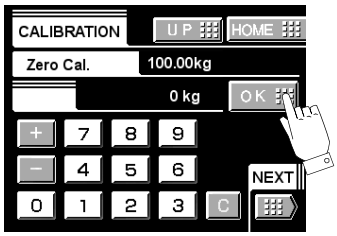
2） Press the CALIBRATION button.



3） Press the Zero Cal. button.



4） Press OK button after confirming no-load was applied to the sensor.

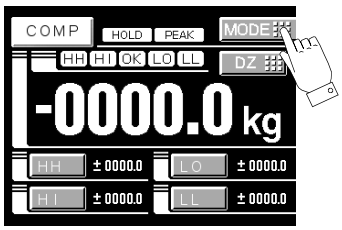


4-4. Actual Load Calibration

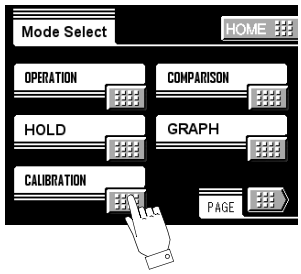
Set the actual load value under an actual load.

Setting call → Calibration → Page 1

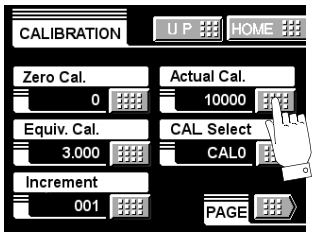
1） Press the MODE button.



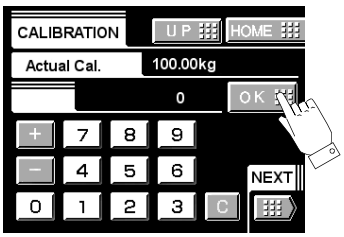
2） Press the CALIBRATION button.



3） Press the Actual Cal. button.



4） Apply an actual load to the sensor, enter the actual load value by the numerical keys and determine with the OK button.



4-5. Equivalent Input Calibration

Set the rated output value and reading of the sensor.

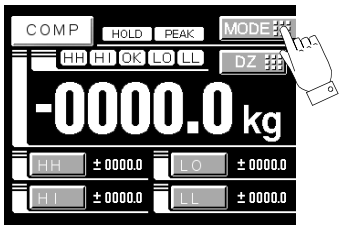
Rated output value: 0.000 - 3.000mV/V

Rated value: 00000 - 99999

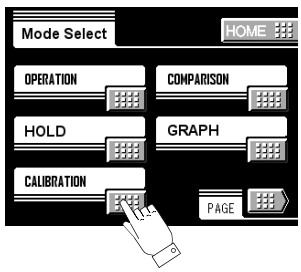
How to set

Setting call → Calibration → Page 1

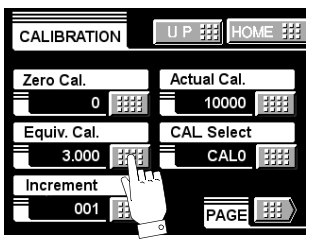
1） Press the MODE button.



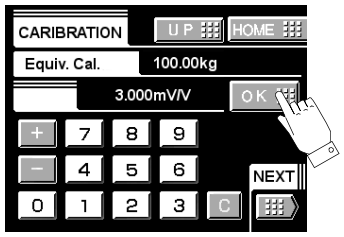
2） Press the CALIBRATION button.



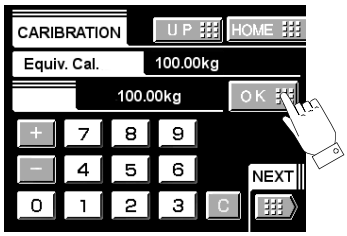
3） Press the Equiv. Cal. button.



4）Enter the rated output of the sensor by the numerical keys and determine with the OK button. The decimal point is fixed.



5） Enter the rated value by the numerical keys and determine with the OK button.



4-6. Digital Offset

By using the digital offset function, the value obtained by subtracting the set value from the indicated value is displayed.

This function is convenient when zero cannot be obtained with no load for some reason or for offsetting.

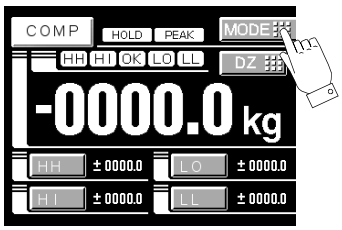
(displayed value)=(actual indicated value)-(offset value)

Setting range:
− 99999 - 99999

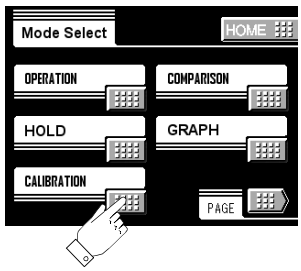
How to set

Setting call → Calibration → Page 2

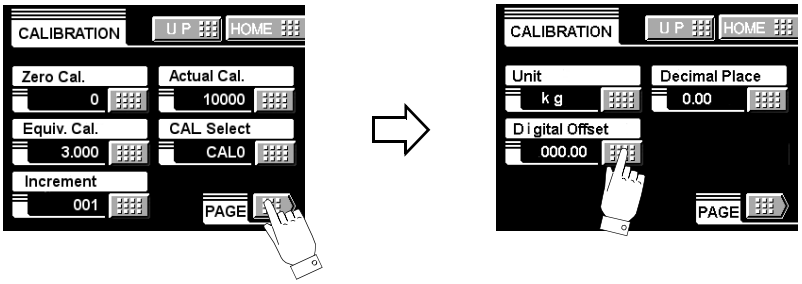
1) Press the MODE button.



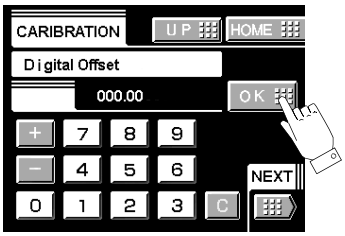
2) Press the CALIBRATION button.



3) Press the PAGE button to select the page and press the Digital Offset button.



4）Enter the digital offset value by the numerical keys and determine with the OK button.



4-7. Increment(This step may be omitted if there is no change.)

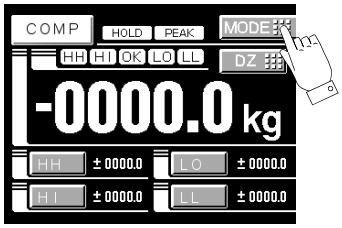
Set the increment of the indicated value.

Input range: 001 - 100

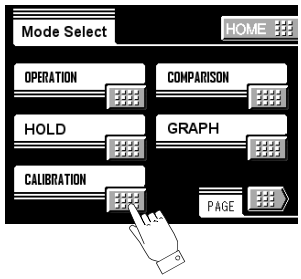
How to set

Setting call → Calibration → Page 1

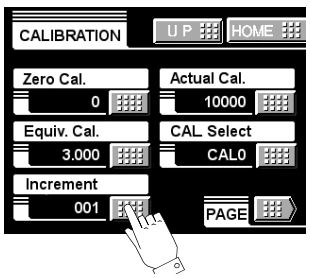
1） Press the MODE button.



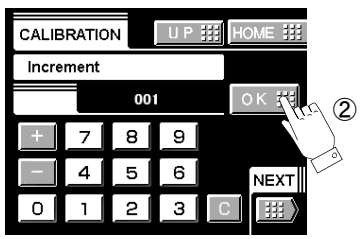
2） Press the CALIBRATION button.



3） Press the INCREMENT button.



4） Enter the increment by the numerical keys and determine with the OK button.



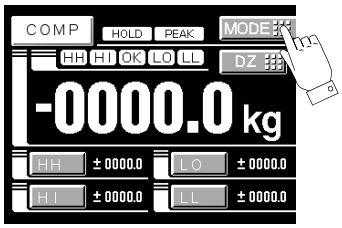
4-8. Decimal Place

Set the decimal point place of the indicated value. Selection can be made from the following.

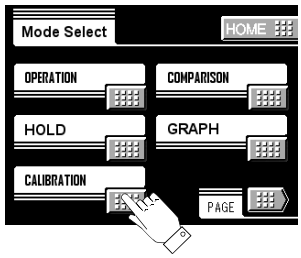
None, 0.0, 0.00, 0.000, 0.0000

Setting call → Calibration → Page 2

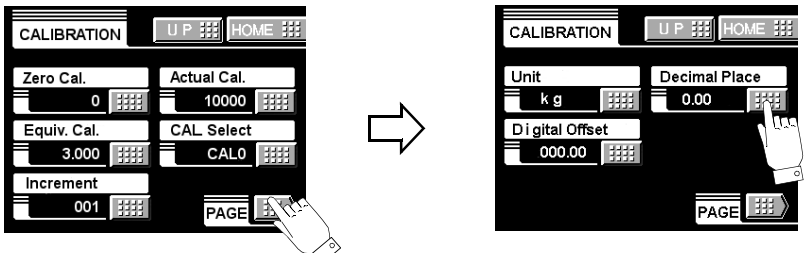
1) Press the MODE button.



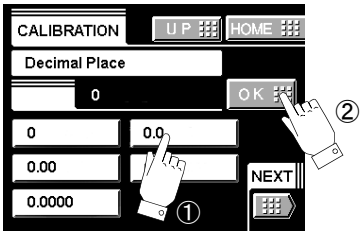
2) Press the CALIBRATION button.



3) Press the PAGE button to select the page and press the DECIMAL PLACE button.



4) Select the decimal place and determine with the OK button.



4-9. Calibration Protection

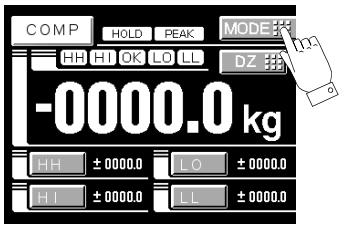
Calibration-related set values can be protected so that they will not be changed by misoperation. When Cal. Protect is ON, no change can be made while the alarm sounds.

ON: Protected

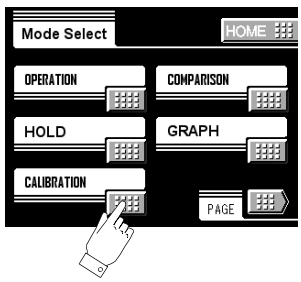
OFF: Unprotected

Setting call → Calibration → Page 3

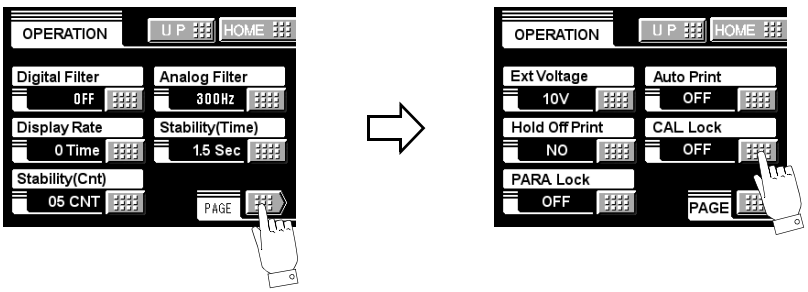
1） Press the MODE button.



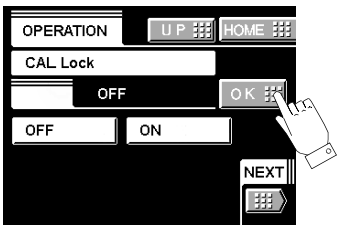
2） Press the CALIBRATION button.



3） Press the PAGE button to select the page twice and press the CAL Lock button.



4） Select the decimal place and determine with the OK button.



4-10. Calibration Value Selection

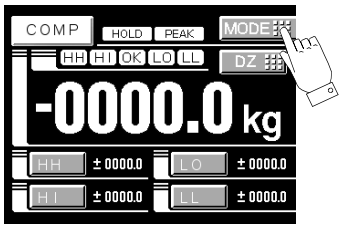
By storing up to four calibration values in the memory, the desired calibration value can be called to switch the indicated value. Setting values that can be switched are as follows:

Calibration Mode Setting	Operation Mode Setting
Zero Calibration	Excitation Voltage
Actual Load Calibration	
Equivalent Input Calibration	
Minimum Slope	
Unit	
Decimal Place	
Digital Offset	

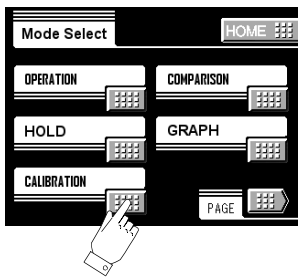
How to set

Setting call → Calibration → Page 1

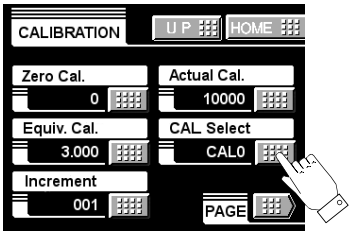
1） Press the MODE button.



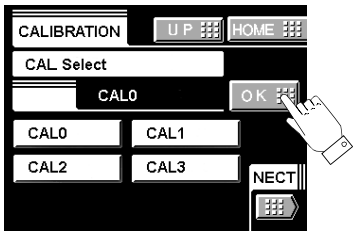
2） Press the CALIBRATION button.



3） Press the CAL. SELECT button.



4） Select the calibration value from 0 ～ 3 and determine with the OK button.



4-10-1. External Selection of Calibration Value

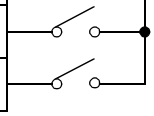
With this function, four types of calibration values can be selected with external selector signals CAL0 and CAL1 (when the calibration value selection setting is external).

Normally, when there is no input to CAL0 and CAL1 (the terminals are open), calibration value 0 is selected. When each terminal is in the following condition, each calibration value is selected.

CAL1	CAL0	Calibration value
Open	Open	alibration value 0
Open	Short-circuit	alibration value 1
Short-circuit	Open	alibration value 2
Short-circuit	Short-circuit	alibration value 3

I/O connector

B7	COM2
B11	CAL0
B12	CAL1



NOTE

It takes one second at maximum for the changed calibration value to become effective. During this time, the calibration value is indefinable. Also, the indicated value is accordingly indefinable.

4-11. Unit

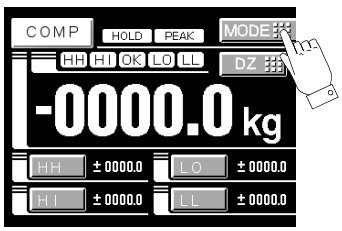
Set the unit of the load to be displayed. It can be selected from the following.

Category	Unit
Mass	kg, Mg, g, mg, μg, t, lb, dyne, kdyne, oz, TONNE, %
Force	N, kN, MN, mN, μN, Nm, kNm, MNm, mNm, μNm, ftlb, inlb, inoz, kgm, gcm
Pressure	Pa, kPa, MPa, GPa, hPa, mPa, μPa, bar, mbar, μbar, mmHg, N/m^2, ftH_2O, inH_2O, psia, psig, atm
Density	kg/m^3, g/cm^3, t/m^3, g/ml, g/l, kg/m, mg/m
Momentum	kgm/s, kgm^2/s, kgm^2
Viscosity	PaS, mPaS
Length	km, m, cm, mm, μm
Speed	m/s, km/h, m/s^2, rpm
Flow rate	kg/h, kg/min, kg/s, t/h, t/s, t/min, m^3/h, m^3/min, m^3/s, l/h, l/min, l/s

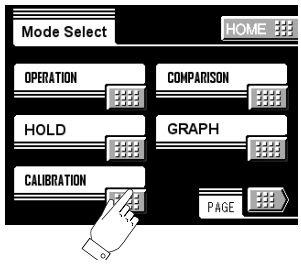
How to set

Setting call → Calibration → Page 2

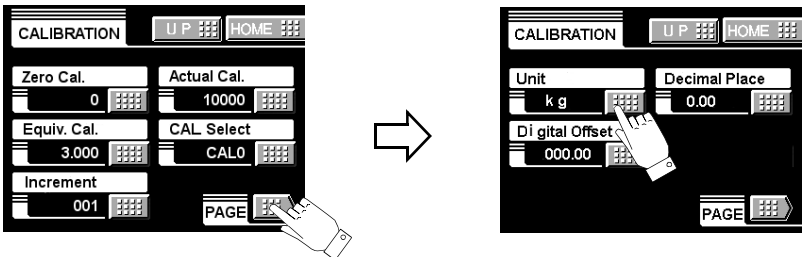
1） Press the MODE button.



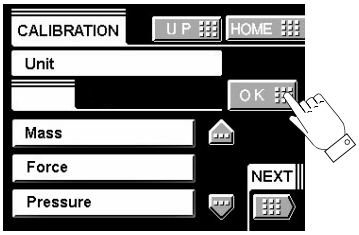
2） Press the CALIBRATION button.



3） Press the PAGE button to select the page and press the UNIT button.

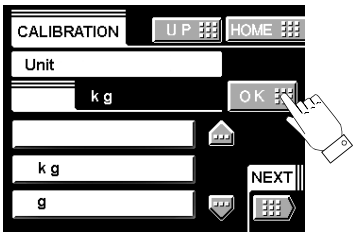


4） Select the category and determine with the OK button.



Scroll with the and buttons.

5） Select the unit and determine with the OK button.



Scroll with the and buttons.

* A change of unit does not affect the indicated value (calibration value).

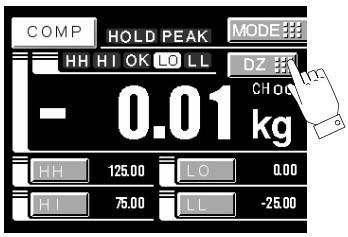
5. SETTING OF FUNCTIONS

5-1. Digital Zero

The indicated values is forcedly zeroed.

Digital Zero by means of Keys

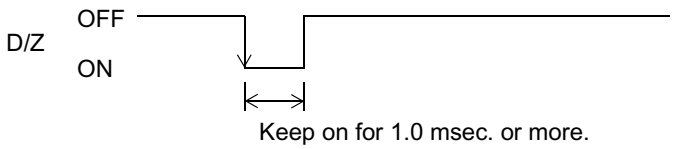
1) Press the DZ button.



2) Press 'OK' to perform the digital zero. Press 'Cancel' to cancel the digital zero..

Digital Zero by means of Keys

The digital zero may be performed by short circuiting the D/Z to the COM2 on the rear panel signal I/O terminal block.



NOTE

Digital zero is reseted in case of power failure. Please set digital zero again.

5-2. Digital Filter

The digital filter is a function for reducing drifts of the indicated value by means of a moving average of data converted from analog to digital. The number of the moving averages can be selected a range between 0 and 512.
With an increase in the number of filterings, the indicated value becomes more stable,but the response to inputs becomes slower.

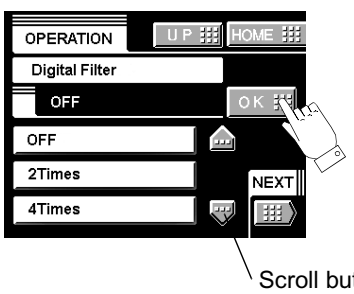
Number of settings:OFF, 2, 4, 8, 16, 32, 64, 128, 256, 512

How to set

Setting call → Operation Setting → Page 1

* See the section on About a Setting Call page 8.

The value of a digital filter is scrolled with a  button.



5-3. Analog Filter

A low-pass filter is provided for filtering input signals from the strain-gage sensor and canceling noise components.

The cut-off frequency can be selected in a range between 10Hz and 300Hz. With an increase in the cut-off frequency, the response becomes faster, but noise components may be indicated.

Cut-off frequency: 10Hz, 30Hz, 100Hz, 300Hz

How to set

Setting call → Operation Setting → Page 1

5-4. Display Rate

Enter the rate of rewriting the display.

The display rate can be selected in a range between 1 and 10 times/sec. The internal operation speed does not change.

How to set

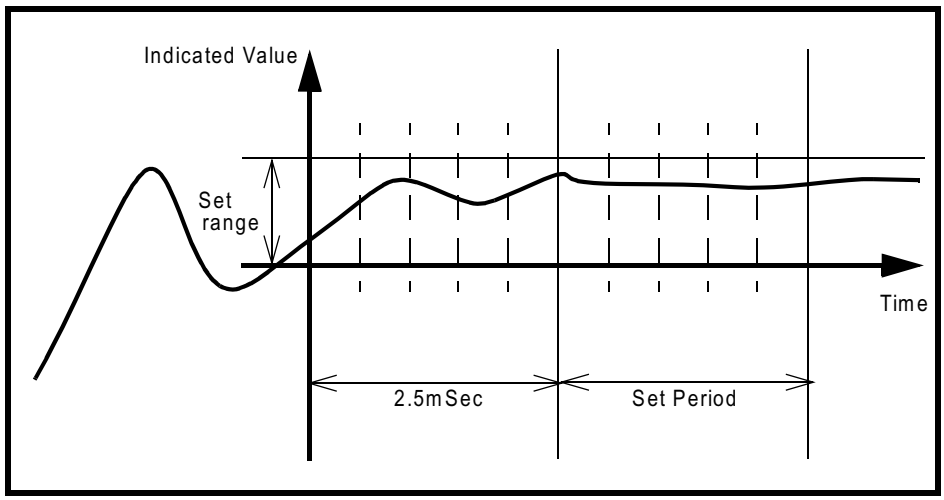
Setting call → Operation Setting → Page 1

5-5. Stability

Enter the parameters to detect stability.

If the difference between the current indicated value and the 2.5-msec-previously indicated value is less than the set count and the duration of the condition is more than the set time, the indicated value is regarded to be stable.

When stability is detected, a digital filter (fixed 32 times) to control instability in weight value is automatically inserted. This stable-time digital filter differs from the digital filter setting in the operation mode.



Setting range

- MD (time): 0.1 - 9.9 sec.

- MD (width): 01 - 99 markings

How to set

Setting call → Operation Setting → Page 1

CAUTION

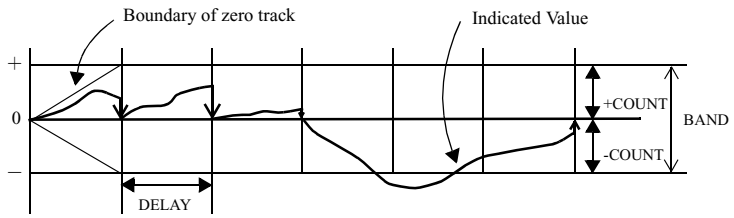
When the time is 0.0 sec. and the width is 00 markings, stability is not detected.

At this time, the stable-time digital filter is normally off.

5-6. Zero Track

Gradual changes in the zero point due to drifts etc., are automatically tracked for correction.。

- When displacement of the zero point is less than the set count, it is automatically made zero for each set time by the zero track function.
- The track delay time and the track band can be selected in the range between 0.1 and 9.9 sec and between 00 and 99, respectively. When the set value is 02, two graduations correspond to the indicated value. When the time is set at 0.0 sec and the band is at 00, the zero track function does not work.



Band=count × minimum value of digital changes (minimum graduation) × 2

Setting range

ZT (time): 0.1 - 9.9 sec.

ZT (width): 01 - 99 markings

Caution

Since the zero track function works from the calibrated zero point of the indicated value, it does not work if the indicated value is beyond the track band. In such a case, obtain the zero point again by zero calibration.

How to set

Setting call → Operation Setting → Page 1

5-7. Contrast Adjustment

Adjust the contrast of the touch panel display.

Brightness can be adjusted by CONTRAST1.

Screen flickering can be adjusted by CONTRAST2.

How to set

Setting call → Operation Setting → Page 2

5-8. Backlight

The backlight is turned off if no button operation is performed for the set time (minutes).

The backlight is turned on by touching the panel. Setting 00 disables this function.

Setting range: 00 - 99 min.

How to set

Setting call → Operation Setting → Page 2

5-9. Excitation Voltage

Select the bridge voltage to be supplied to the strain-gage sensor.

The bridge voltage is selectable from 10V, 5V and 2.5V.

Be sure to perform calibration after changing this setting.

How to set

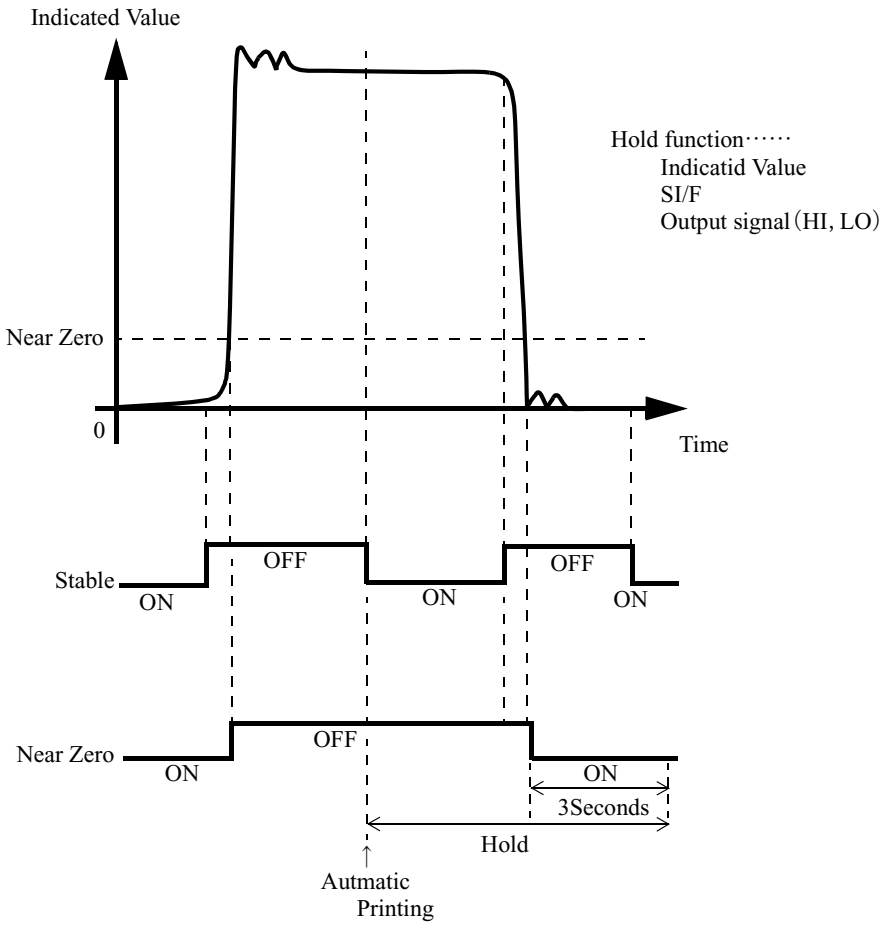
Setting call → Operation Setting → Page 3

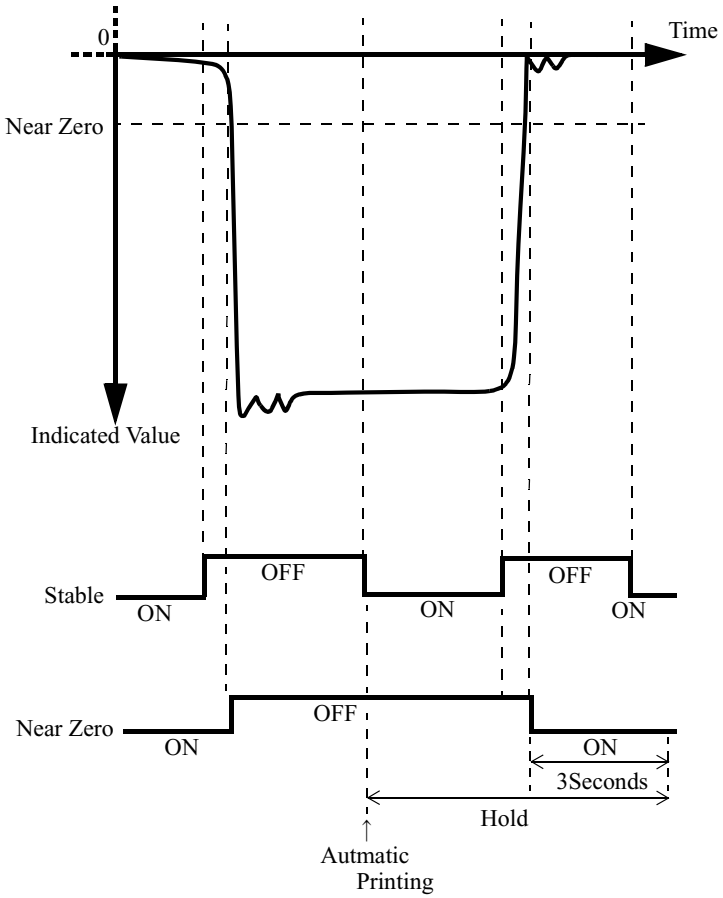
5-10. Auto Print

The indicated value is automatically printed to the TEAC printer coupled with the TD-271 through the SI/F. A print is made when the indicated value is stable. (Set the stability parameters by the stability operation.) The indicated value is held (for 3 seconds). (Indicated value hold function)

Setting call → Calibration → Page 3

- Operation of the indicated value hold function




0
Time
Near Zero
Indicated Value
Stable
ON
OFF
ON
OFF
ON
Near Zero
ON
OFF
ON
3Seconds
Hold
Autmatic
Printing

5-11. Hold Off Print

At hold-off time, the held value is automatically printed to the TEAC printer coupled with the TD-271 through the SI/F.
(The hold is released by the T/H signal off timing when the period setting is all interval in various hold modes by hold functions, and by the T/H signal of timing when other periods are set.)

Setting call → Calibration → Page 3

5-12. Parameter Protection

Parameters are protected from being changed by misoperation.

Setting call → Calibration → Page 3

For the parameters which are protected by parameter protection, see the list of parameters page 114 .

6. COMPARISON FUNCTIONS

By the comparison function, the HI limit and LO limit values are set, and when the indicated value exceeds the HI limit, the HI output is turned on, and when the indicated value falls below the LO limit, the LO output is turned on. Also, HI-HI limit and LO-LO limit values may be set outside the HI-LO limit comparison. When the indicated value exceeds the HI-HI limit, the HH output is turned on, and when the indicated value falls below the LO-LO limit, the LL output is turned on. When the HI, HH, LO and LL outputs are all off, the OK output is turned on.

<HI/LO output conditions>

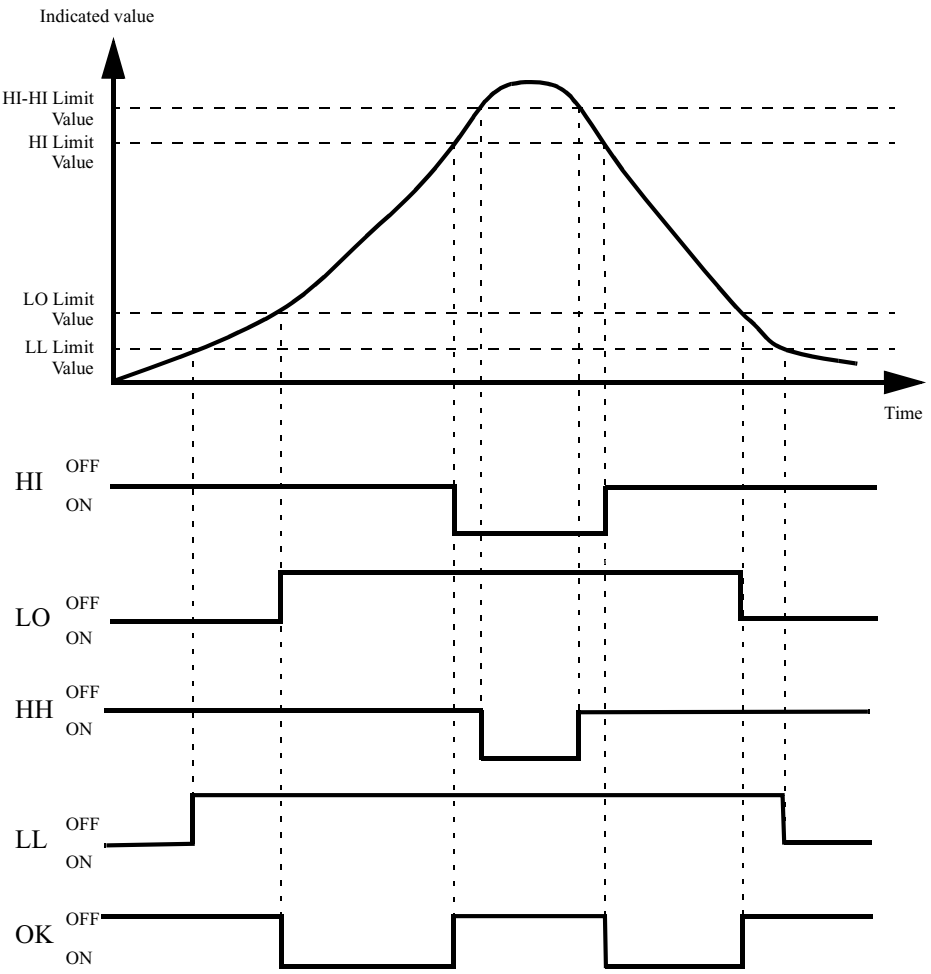
HI: indicated value > HI limit value
LO: indicated value < LO limit value

<HH/LL output conditions>

HH: indicated value > HI-HI limit value
LL: indicated value < LO-LO limit value

<OK output conditions>

OK: All conditions of HH, HI, LO and LL are off.



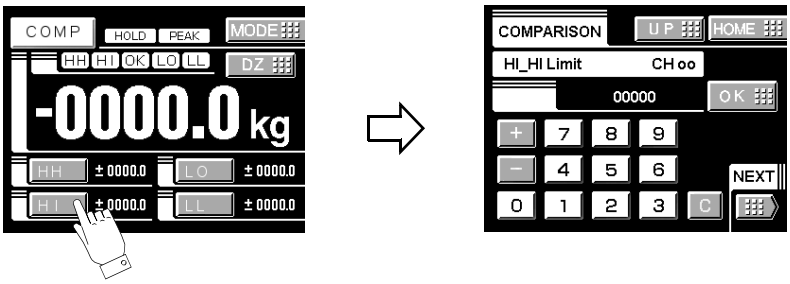
6-1. HI Limit/LO Limit/HI-HI Limit/LO-LO Limit

How to set

Setting call → Comparison setting → Page 1

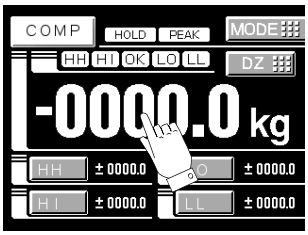
Simple setting call

Press any of the HI-HI, HI, LO and LO-LO buttons at the bottom of the indicated value display screen to go direct to the entry screen.



About the indicated value display color

The display color can be changed by pressing the indicated value display section. Every time it is pressed, State 1 and State 2 are changed.



・State 1

The indicated value display color is fixed (yellow).

・State 2

The indicated value display color changes following the comparison status.

OK: green

HI, LO: yellow

HH, LL: red

6-2. Hysteresis

The hysteresis value may be determined so as to allow a margin for timing the turning off of the HI-LO limit comparison. Normally, it is turned on when the indicated value exceeds the HI limit and is turned off when the indicated value falls below it. However, by setting the hysteresis, it is turned off when the indicated value falls below the HI limit further lowered by the hysteresis value.
This function is effective to prevent chattering in such a case where signals fluctuate (vibrate) subtly.

〈Comparison conditions〉

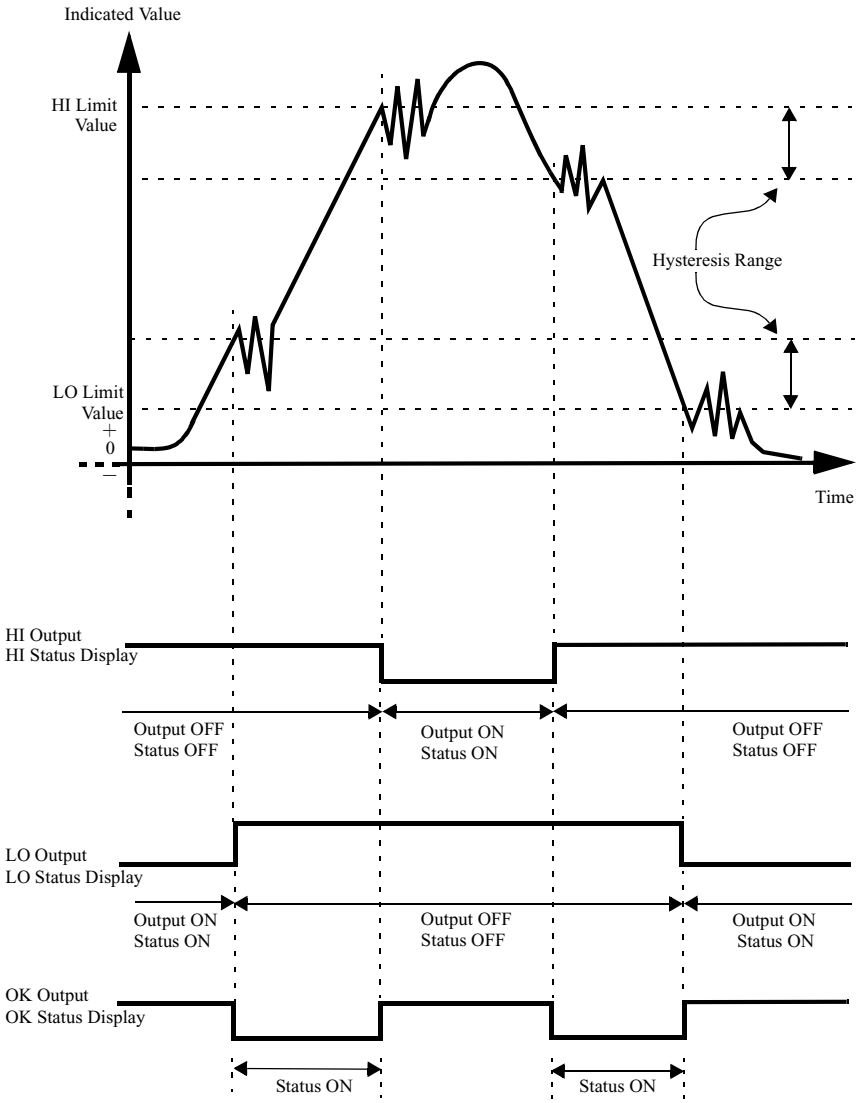
- HI limit
  ON condition: indicated value>HI limit value
  OFF condition: indicated value<(HI limit value)-(hysteresis value)

- LO limit
  ON condition: indicated value<LO limit value
  OFF condition: indicated value>(LO limit value)+(hysteresis value)

- HI-HI limit
  ON condition: indicated value>HI-HI limit value
  OFF condition: indicated value<(HI-HI limit value)-(hysteresis value)

- LO-LO limit
  ON condition: indicated value<LO-LO limit value
  OFF condition: indicated value>(LO-LO limit value)+(hysteresis value)

・Hysteresis operation



（Exsample：HI Output and LO Output）

How to set

Setting call → Comparison setting → Page 1

Hysteresis setting value is common to all HI limit value

6-3. Near Zero

By this function, it is detected that the indicated value is near zero.

Near-zero ON:| indicated value | <=near zero set value

Near-zero OFF:| indicated value | > near zero set value

Setting range: 00000 - 99999

Turning on/off the near zero function is closely related to the auto print function and HI-LO limit comparison.
For details, see the sections on HI-LO Limit Comparison Mode page 47 and Auto Print page 40 .

How to set

Setting call → Comparison setting → Page 2

6-4. HI-LO Limit Comparison Mode

Set the operating condition of HI-LO limit comparison. Select the condition from the following.

Continuous : HI-LO limit comparison is performed continuously.

MD : HI-LO limit comparison is performed when the indicated value is stable. Set the stability parameters by the stability operation.

NZ : HI-LO limit comparison is performed when the indicated value is not near zero.
Set the near zero parameters by the near zero operation.

MD+NZ : HI-LO limit comparison is performed when the indicated value is stable and not near zero.

How to set

Setting call → Comparison setting → Page 2

6-5. HI-LO Limit Output Mode

The number of HI-LO limits can be changed..

Mode	HI Limit Operation	LO Limit Operation
Mode 0	HI-HI Limit, HI Limit LO Limit, LO-LO Limit	None
Mode 1	HI-HI Limit, HI Limit、 LO Limit	LO-LO Limit
Mode 2	HI-HI Limit, HI Limit	LO Limit, LO-LO Limit
Mode 3	HI-HI Limit	HI Limit, LO Limit, LO-LO Limit
Mode 4	None	HI-HI Limit, HI Limit, LO Limit, LO-LO Limit

The HI limit output is turned on when the indicated value becomes larger than the set value.

The LO limit output is turned on when the indicated value becomes smaller than the set value.

Caution

Even if any mode other than MODE 2 is selected, the name of each setting does not change. Only the operation differs.

How to set

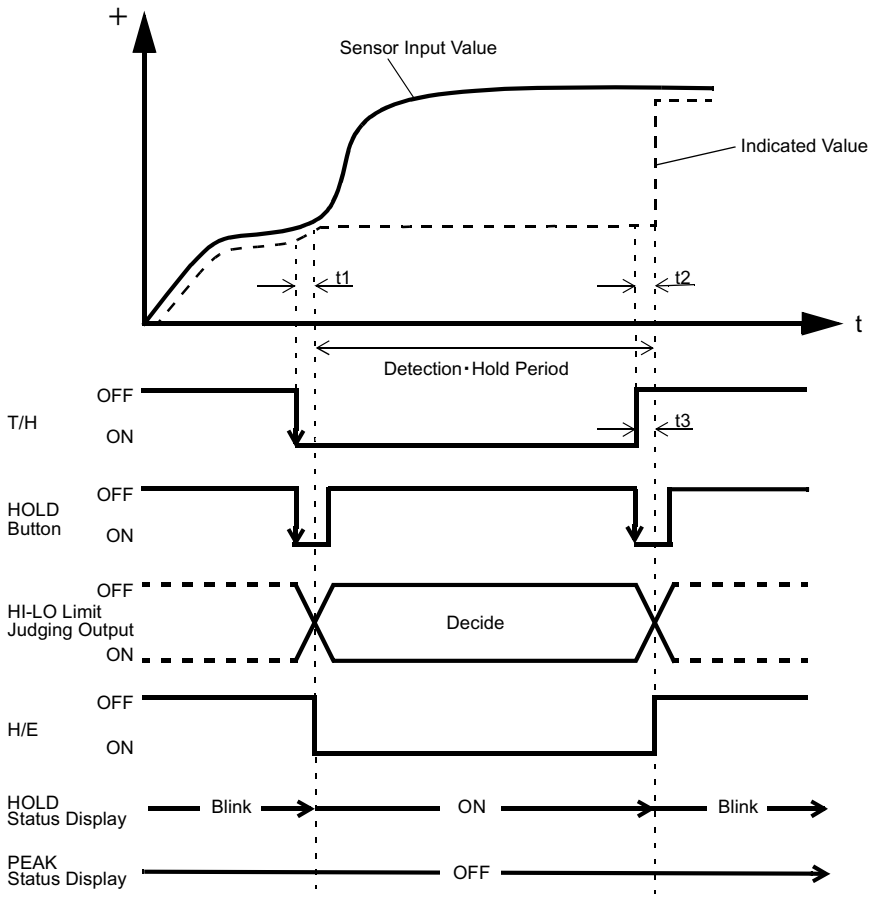
Setting call → Comparison setting → Page 2

7. HOLD FUNCTIONS

By the hold function including sample hold, peak hold, valley hold, peak-to-peak hold, relative maximum and minimum hold and inflection point hold, a specific point in a waveform is taken out for HI-LO limit comparison.
The operation of each hold will be described in detail.

7-1. Sample Hold

When the T/H signal is inputted, a desired point is held, and the H/E output is turned on. Hold of the value continues as long as the T/H signal is on.



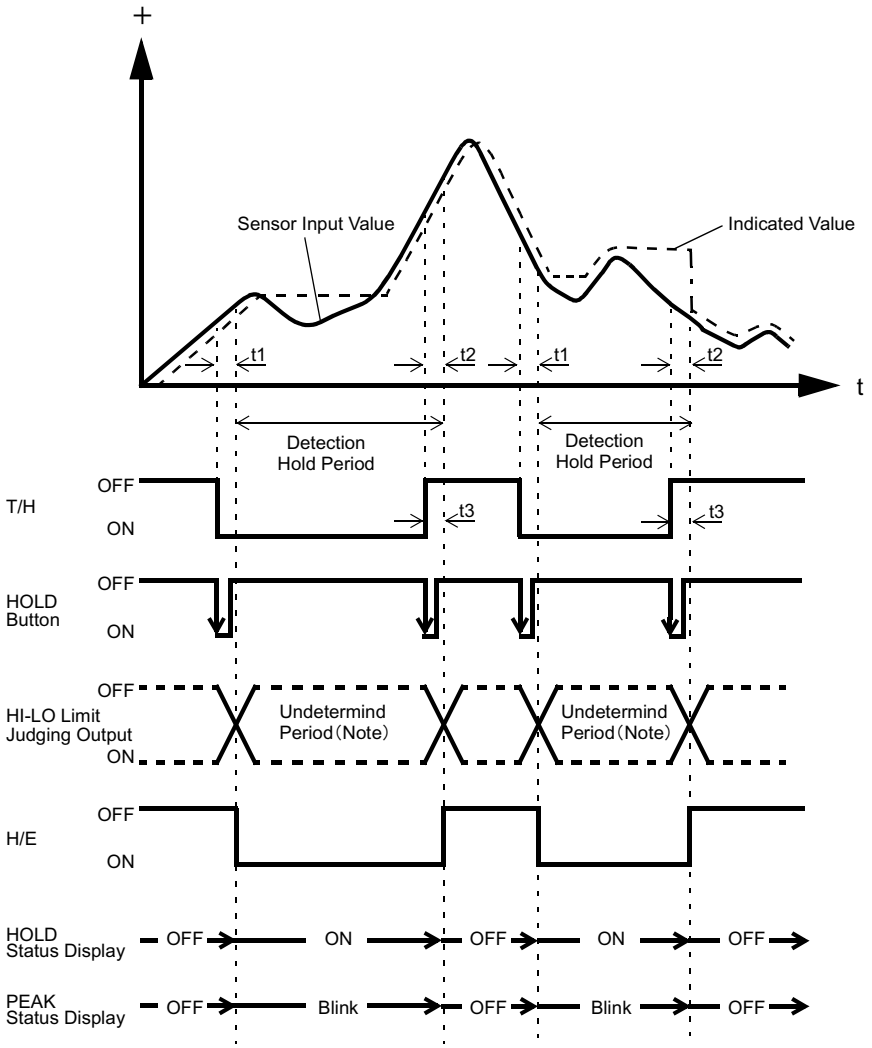
t1 : A delay time between the instant when the T/H signal is inputted and the instant when the indicated value is held
1.0ms (max.)

t2 : A delay time between the instant when the T/H signal is released and the instant when the indicated value returns to tracking
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-2. All Period Peak Hold

The maximum (peak) value in the positive direction is held as long as the T/H signal is on.



Note: During the undetermined period, the judging output varies with fluctuations in the input waveform. However, the H/E output remains on during the undetermined period. Read the judging result when the indicated value becomes stable (immediately before the T/H signal rises).

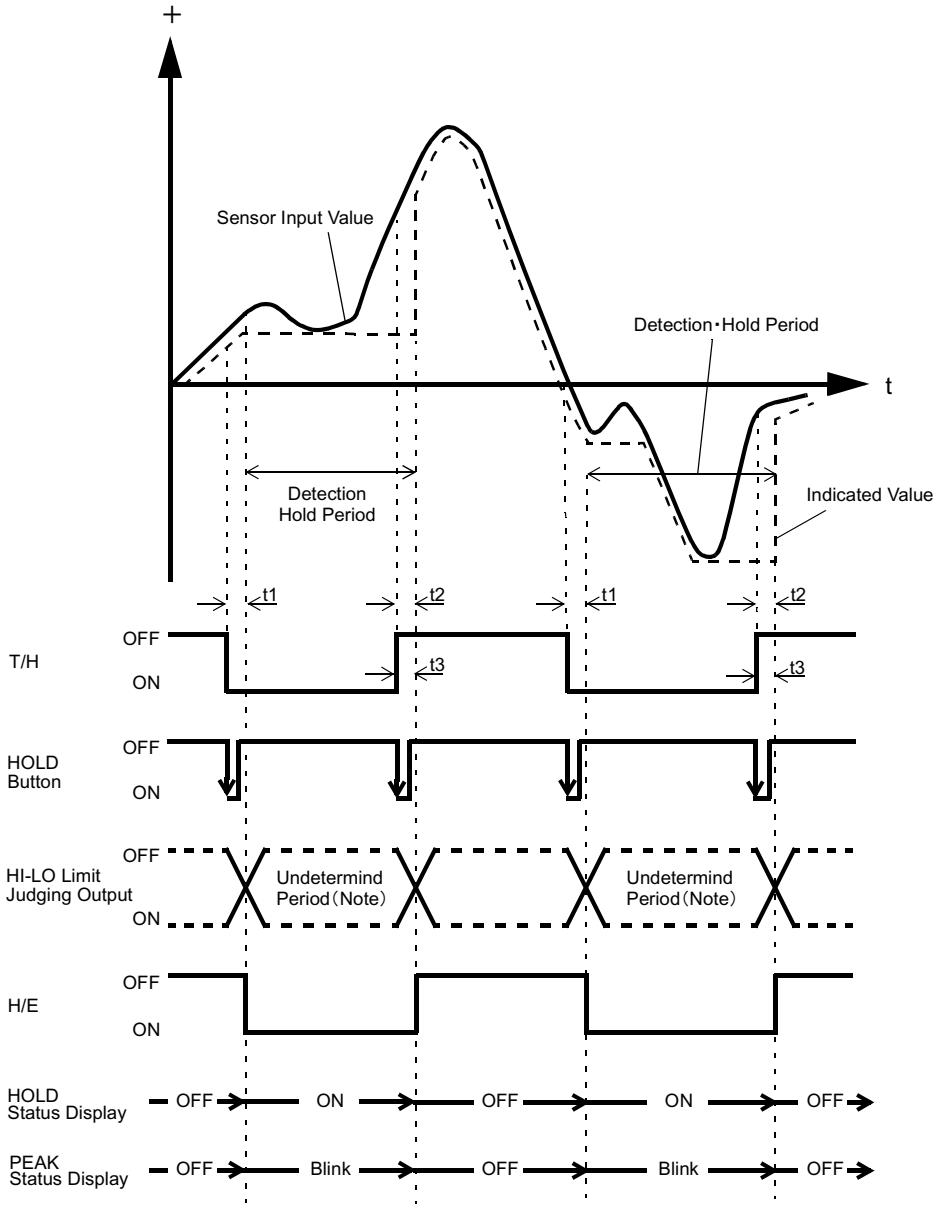
t1 : A delay time between the instant when the T/H signal is inputted and the instant when the indicated value is held
1.0ms (max.)

t2 : A delay time between the instant when the T/H signal is released and the instant when the indicated value returns to tracking
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-3. All Period Valley Hold

The maximum (valley) value in the negative direction is held.



Note: During the undetermined period, the judging output varies with fluctuations in the input waveform. However, the H/E output remains on during the undetermined period. Read the judging result when the indicated value becomes stable (immediately before the T/H signal rises).

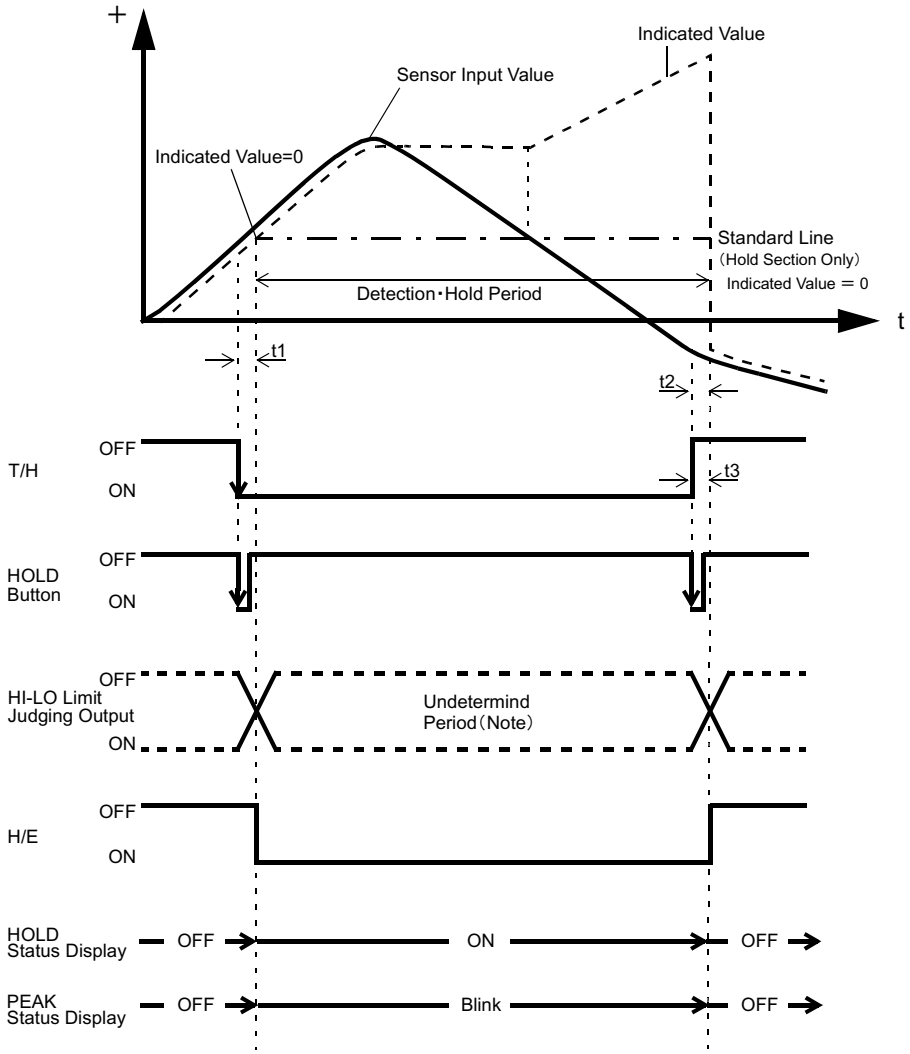
t1 : A delay time between the instant when the T/H signal is inputted and the instant when the indicated value is held
1.0ms (max.)

t2 : A delay time between the instant when the T/H signal is released and the instant when the indicated value returns to tracking
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-4. All Period Peak-to-Peak (P-P) Hold

The maximum difference from the point in time when the T/H signal is turned on is held.



Note: During the undetermined period, the judging output varies with fluctuations in the input waveform. However, the H/E output remains on during the undetermined period. Read the judging result when the indicated value becomes stable (immediately before the T/H signal rises).

t1 : A delay time between the instant when the T/H signal is inputted and the instant when the indicated value is held
1.0ms (max.)

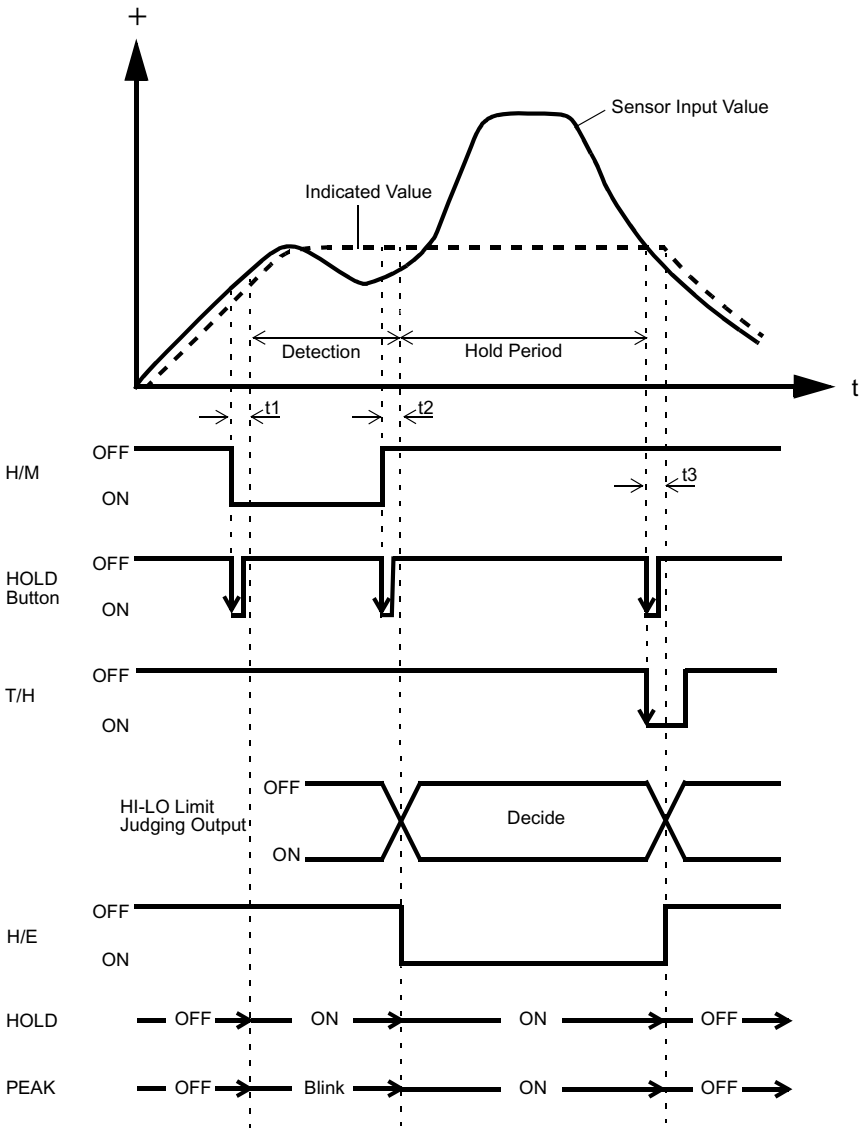
t2 : A delay time between the instant when the T/H signal is released and the instant when the indicated value returns to tracking
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-5. Externally Specified Period Hold (Peak, Valley and Peak-to-Peak)

The period during which hold is detected is defined externally by the H/M signal.
The hold is released by turning on the T/H signal as a reset signal.
The H/E output signal is on between the instant when the H/M signal is turned off and the instant when the T/H signal is turned on.

(Example) Period Specified Peak Hold



t1 : A delay time between the instant when the H/M signal is inputted and the instant when the value to be held is detected
1.0ms (max.)

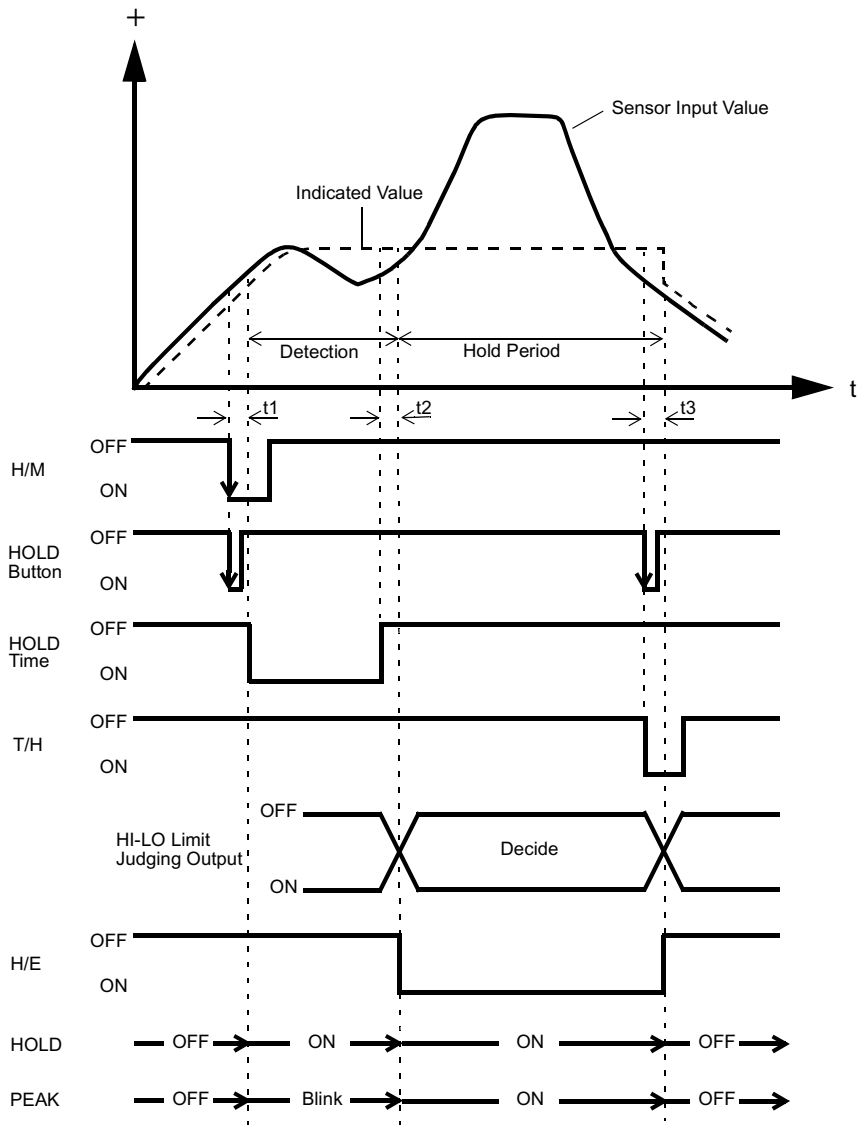
t2 : A delay time between the instant when the H/M signal is released and the instant when the value to be held is determined
1.08ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-6. Time Specified Period Hold (Peak, Valley and Peak-to-Peak)

Hold is detected during the predetermined time (hold detection time) from the point in time when the H/M signal is turned on. The hold is released by turning on the T/H signal as a reset signal.
The H/E output signal is on between the instant when the H/M signal is turned off and the instant when the T/H signal is turned on.

(Example) Time Specified Period Peak Hold



t1 : A delay time between the instant when the H/M signal is inputted and the instant when the value to be held is detected
1.0ms (max.)

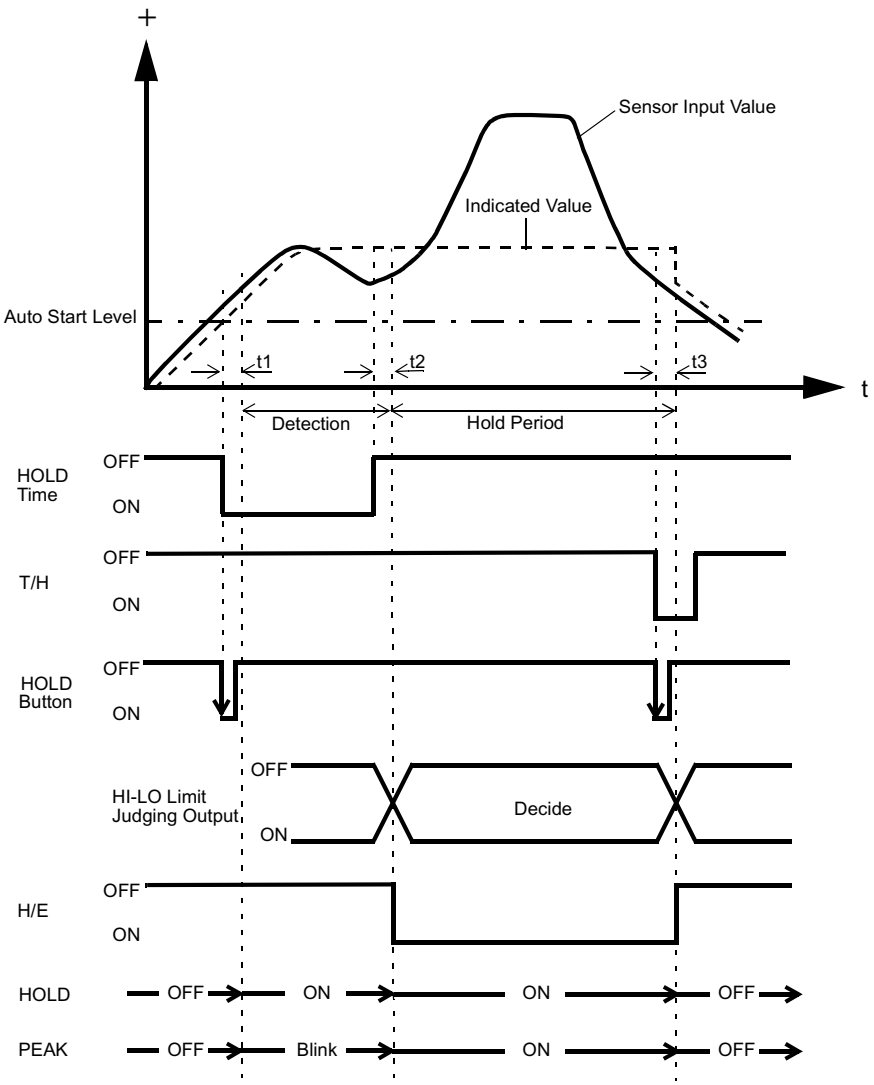
t2 : A delay time between the instant when the hold detection time is expired and the instant when the value to be held is determined
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-7. Time Specified Period Hold with Trigger (Peak, Valley and Peak-to-Peak)

Hold is detected during the predetermined time (hold detection time) from the point in time when the indicated value crosses the auto start level. The hold is released by turning on the T/H signal as a reset signal.
The H/E output signal is on between the instant when the hold detection time ends and the instant when the T/H signal is turned on.

(Example) Time Specified Period Peak Hold with Trigger



t1 : A delay time between the instant when the indicated value exceeds the auto start level and the instant when the value to be held is detected
0.5ms (max.)

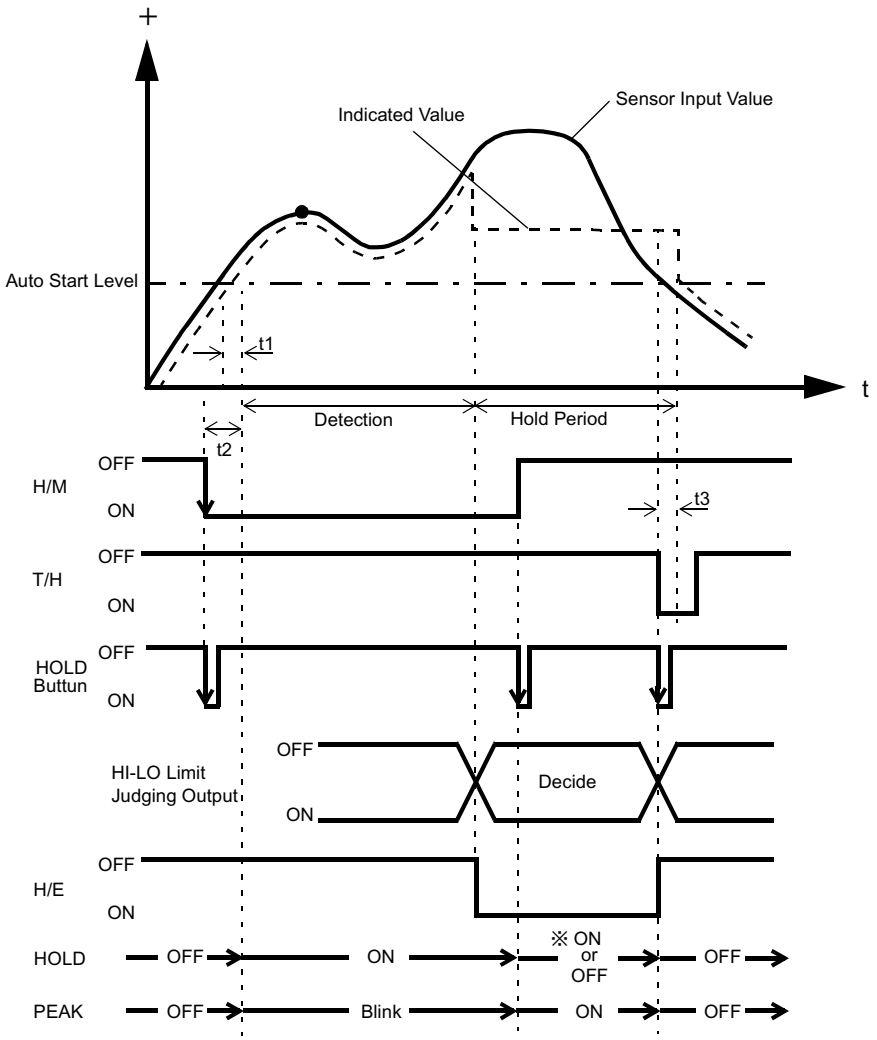
t2 : A delay time between the instant when the hold detection time is expired and the instant when the value to be held is determined
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

7-8. Relative Maximum, Relative Minimum and Inflection Point Hold

Detection starts when the indicated value crosses the auto start level with the H/M signal inputted. Detection is performed as long as the H/M signal is on.
The hold is released by turning on the T/H signal as a reset signal.
The H/E output signal is on between the instant when the hold starts and the instant when the T/H signal is turned on.

(Example) Relative Minimum Hold



※ Comes on if a value is held with conditions met in the detection period, and goes out if a value is not held.

t1 : A delay time between the instant when the indicated value exceeds the auto start level and the instant when the value to be held is detected
0.5ms (max.)

t2 : A delay time between the instant when the H/M signal is inputted and the instant when the value to be held is detected
1.0ms (max.)

t3 : A minimum reset signal width required for releasing the hold
1.0ms (min.)

The Hold Function in General

- The delay times of the judging signal and the H/E signal do not include a delay time of the analog circuit (low-pass filter). Also, the delay times are calculated without the digital filter. Since the judging signal and the H/E signal are generated for the value produced through the analog and digital filters, transmission of the signals becomes slower and the delay of each output signal increases with enhancement of the filters

- If the H/M signal is continuously input, the previously held value is reset by the on timing, and hold operation newly starts.

7-9. Hold Function Setting

7-9-1. Hold Mode

The TD-271 includes seven hold modes as shown in the table below.

In the peak, valley and peak-to-peak modes, period setting is required. Select all period, external signal, time, or time with trigger.

If you do not use any hold function, be sure to set the hold mode to tracking. (In tracking condition, hold operation is not performed but input values are always displayed.)

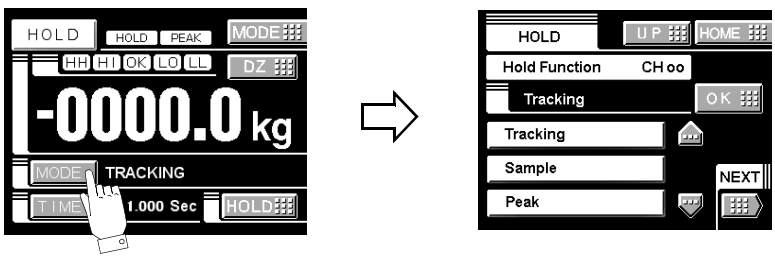
HOLD MODE	HOLD PERIOD SETTING
Tracking	None
Sample	None
Peak Valley P-P	There is a section setup. ・All Period ・External Signal ・Time ・Time with trigger
Relative maximum Relative minimumu Inflection Point	None

How to set

Setting call → Hold → Page 2

Simple setting call

Press the MODE button at the bottom of the indicated value display screen to go direct to the hold mode entry screen.



7-9-2. Hold Detection Time

If you set the hold period setting in the hold function setting to Time or Time with Trigger, set the time.

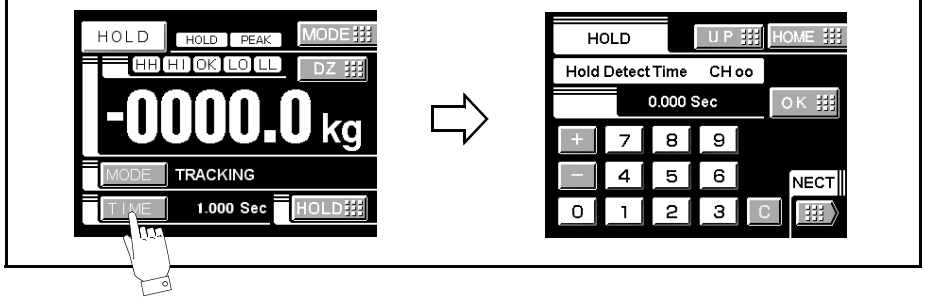
Setting range: 0.001 - 9.999 sec.

How to set

Setting call → Hold → Page 1

Simple setting call

Press the TIME button at the bottom of the indicated value display screen to go direct to the hold detection time entry screen.



7-9-3. Auto Start Level

If you select the time specified period mode with trigger, or relative maximum, relative minimum or inflection point hold in the hold mode setting, set the start level.

How to set

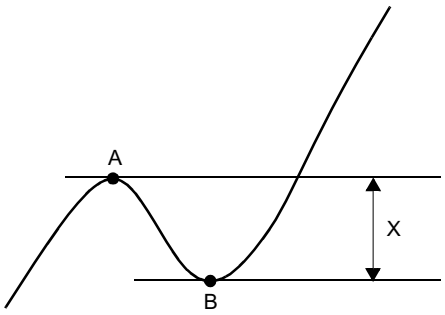
Setting call → Hold → Page 1

7-10. Relative Maximum and Relative Minimum Hold Setting

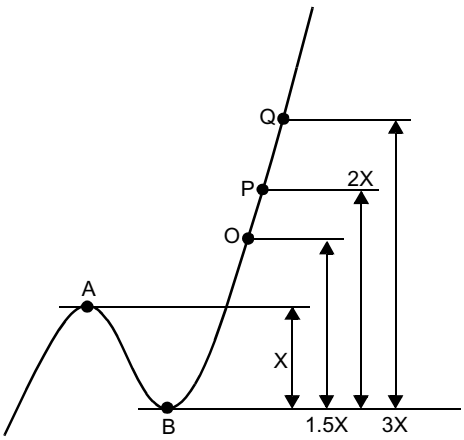
If you select the relative maximum and relative minimum hold in the hold function setting, set the relative maximum and relative minimum value detection parameters "minimum count" and "valley detection level".
Set referring to the principle of operation only when the value cannot be held successfully with the factory settings or when further adjustments are required.

Detection of the relative maximum value and relative minimum value

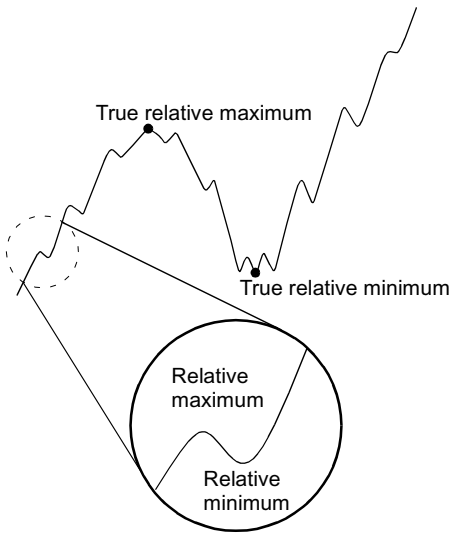
The logic of detecting the relative maximum value and relative minimum value is given below.



First, when difference X between point A and point B is larger than the minimum count, point A is judged to be the relative maximum value and point B is judged to be the relative minimum value.



When difference X between detected relative maximum value A and relative minimum value B exceeds the predetermined detection levels (1.5, 2, and 3 times), A is displayed in the relative maximum value hold mode at respective points O, P and Q and the value is held.



If the minimum count is too small, when the waveform includes noise as shown on the left-hand side, the noise is regarded as the relative maximum value or relative minimum value and a correct value may not be held. In such a case, set the minimum count somewhat large.

7-10-1. Minimum Count

Setting range: 0001 - 9999

How to set

Setting call → Hold → Page 1

7-10-2. Valley Detection Level

Level: 1/4, 1/2, 3/4, 1, 1.25, 1.5, 2, 3 times

How to set

Setting call → Hold → Page 1

7-11. Inflection Point Hold Setting

If you select the inflection point hold in the hold function setting, set the inflection point detection parameters "minimum slope", "interval A" and "interval B".
Set referring to the principle of operation only when the value cannot be held successfully with the factory settings or when further adjustments are required.

Detection of the inflection point

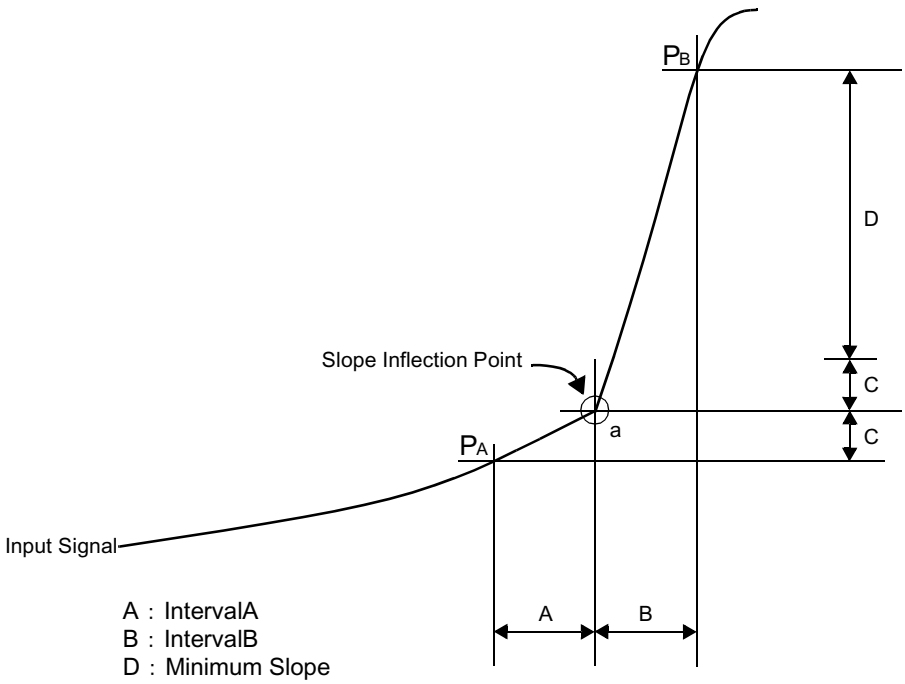
The logic of detecting the inflection point is given below.

Set the parameters of interval A and B and judgment value according to the input signal. In order to acquire a change point during an increase in the input signal, the change point at which $P_A \leqq a \leqq P_B$ is detected is as shown below.

Assuming that the remainder of subtracting change C of the indicated value in time A from the change of the indicated value in time B is D, when change D exceeds the minimum slope, point a is held as the inflection point.

If there are two or more inflection points in the hold period, the point having a larger change is held.

The inflection point is normally detected by A=B, but it may easily be detected with A<B where the slope is gradual.



7-11-1. Inflection Point Judging Value

Setting range: 00001 - 99999

How to set

Setting call → Hold → Page 2

7-11-2. Interval A and Interval B

Setting range:

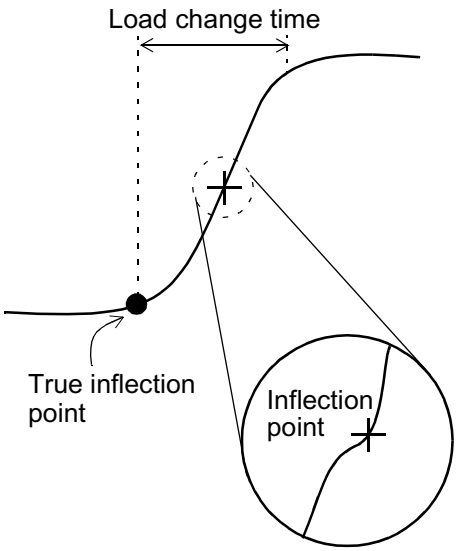
- Interval A+Interval B ≦ 500

- 5 ≦ Interval A(B) ≦ 495 （Unit msec）

How to set

Setting call → Hold → Page 2

Caution regarding inflection point hold

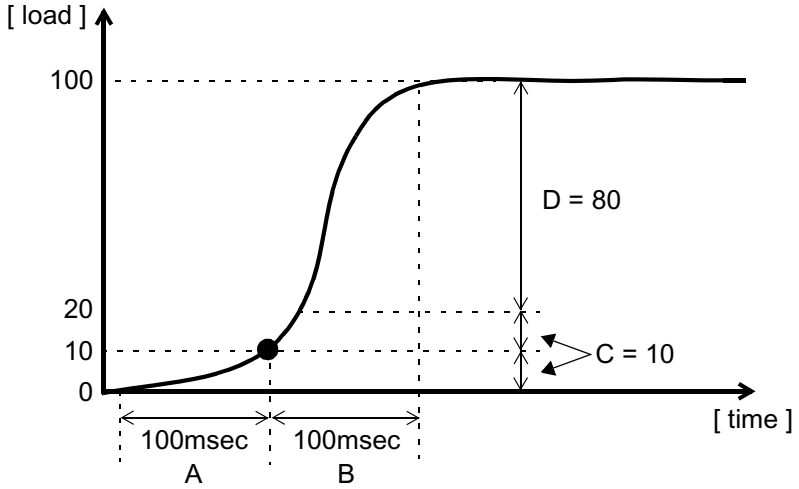


If the detection interval A and B are set too short, fine load changes may be detected as shown in the illustration on the left-hand side, so that a correct value cannot be held.

In this case, set the detection interval B large enough to bring it as close to the load change time as possible, and also set the inflection point judgment value large according to the amount of change at that time, so that the inflection point is held at a correct position.

Example of inflection point hold setting

● Example of ideal waveform setting

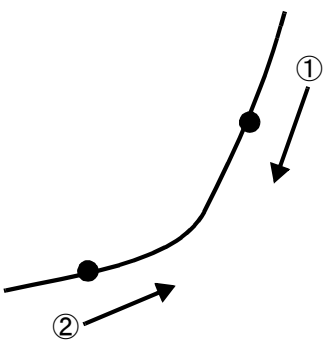


① Set the load change time (between the inflection point and when the change stops) to interval B.
In the example, set it to 100 msec.

② Set the same value as interval B to interval A.

③ Set load D obtained by subtracting load C changing with interval A from the load changing with interval B to the inflection point judgment value.
In the example, set load change D=80 obtained by subtracting load C=10 changing with A from load 90 changing with B to the inflection point judgment value.
However, since an inflection point is not judged until load change D exceeds the inflection point judgment value, actually set the inflection point judgment value a slightly smaller than D.

● If the inflection point cannot be located successfully



① When holding above the inflection point and moving downward

1） It is considered that the inflection point judgment value is small with respect to load change D. Set the inflection point judgment value larger.

2） If lowering is insufficient in 1), increase interval A.

② When holding below the inflection point and moving upward Interval B is too long and the inflection point judgment value is too large.
Shorten interval B and decrease the inflection point judgment value.

8. MULTI-HOLD FUNCTION

By this function, up to 16 types of hold, graph and comparison set values can be stored and selected with external switching signals of CODE0 - CODE3.

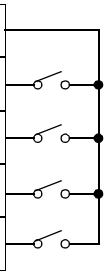
Normally, if there is no entry for CODE0 - CODE3, the set value of CH0 is selected, but when CODE0 - CODE3 are in the following conditions, the set value of each setting CH is selected.

CODE3	CODE2	CODE1	CODE0	SettingCH
0	0	0	0	SettingCH00
0	0	0	1	SettingCH01
0	0	1	0	SettingCH02
0	0	1	1	SettingCH03
0	1	0	0	SettingCH04
0	1	0	1	SettingCH05
0	1	1	0	SettingCH06
0	1	1	1	SettingCH07
1	0	0	0	SettingCH08
1	0	0	1	SettingCH09
1	0	1	0	SettingCH10
1	0	1	1	SettingCH11
1	1	0	0	SettingCH12
1	1	0	1	SettingCH13
1	1	1	0	SettingCH14
1	1	1	1	SettingCH15

(0: open, 1: short)

I/O terminal block

A6	COM2
A7	CODE0
B7	CODE1
A8	CODE2
B8	CODE3



Caution

It takes 15msec at the maximum for the changed CH to become effective. During this period, which CH is used for comparison is undefined.

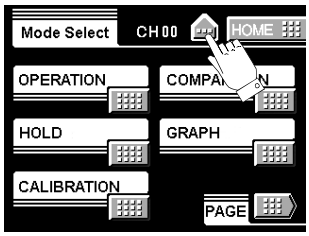
Also, when the CH is switched, the hold and graph functions are reset to wait for starting with the after-switching CH conditions irrespective of the previous operation.

8-1. About Changing of the Setting CH

When changing the hold or comparison set value of each CH, set the CH No. with the CH change key on the mode selection screen, and change the set value.

How to set

1） Select the setting CH on the mode setting screen.



2） Then, enter each set value in a likewise manner.

For making the settings of all CHs equal, set the CH No. to CH16. The value set with CH16 is set for all CH00 ～ CH15.

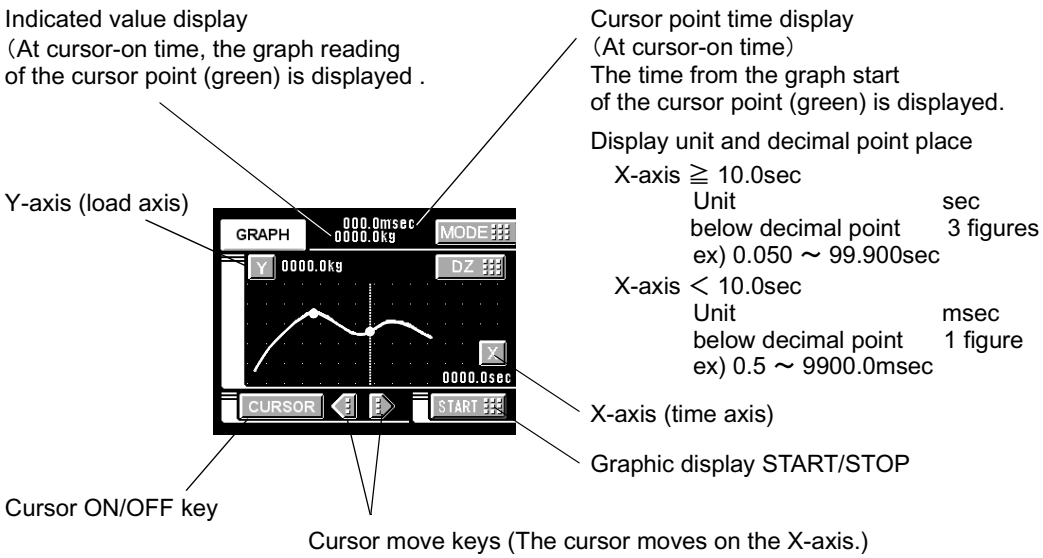
NOTE

No control CH can be designated with the CH change key. Designate control CH(s) with external selector signals CODE0 ～ CODE3.

9. WAVEFORM DISPLAY

9-1. Graphic Display Screen

Graph is updated while usually operating on the display screen (a comparison, a hold, graph)



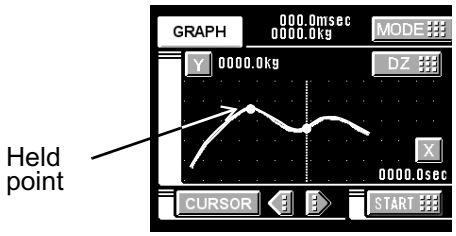
Caution

When the cursor display is on and when the setting screen is open, the graph is not upgraded.

9-1-1. Hold Point Plotting

By using the hold function and the graph plotting function together, the held point (red) can be plotted.

Example) Relative maximum hold



9-1-2. X-axis and Y-axis on the Graph Plotting Screen

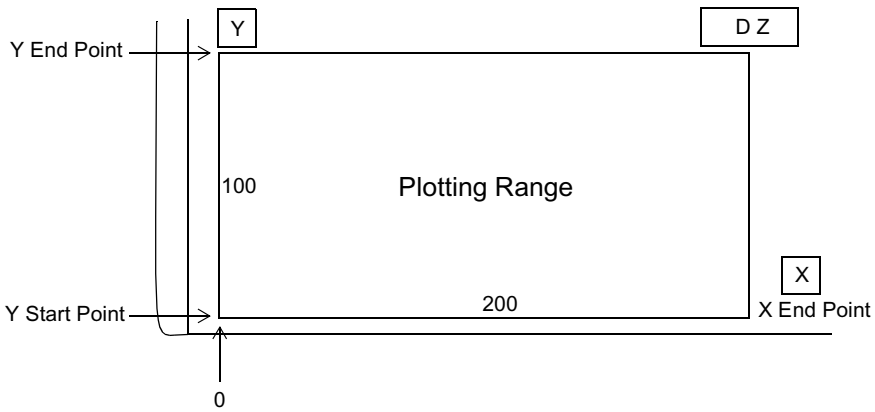
X-axis

The X-axis is a time setting axis. One graph screen is plotted between the start signal input point and the X start point.

There are 200 plotting points, and typical values for the predetermined time divided by this number of plotting points are plotted

Y-axis

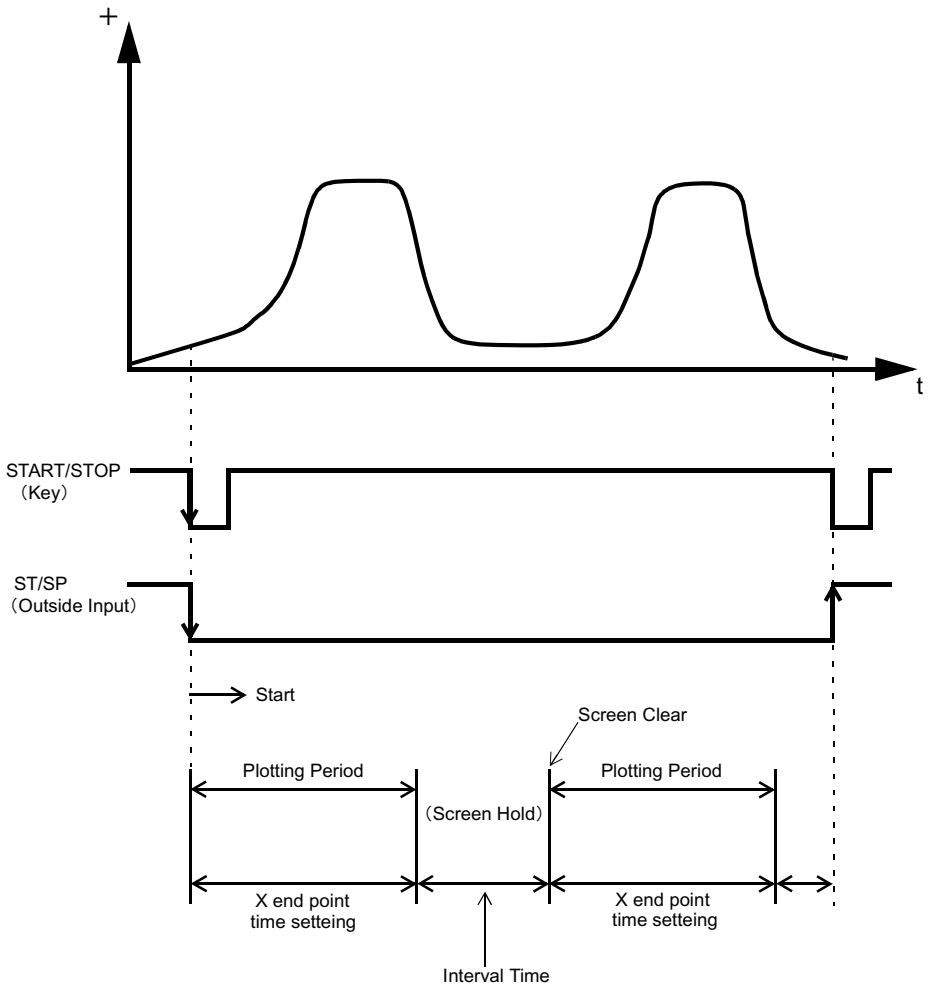
The Y-axis is a load setting value. A graph is plotted between the Y start point and the Y end point. (There are 100 plotting points.)



9-2. Graph Plotting

9-2-1. Continuous

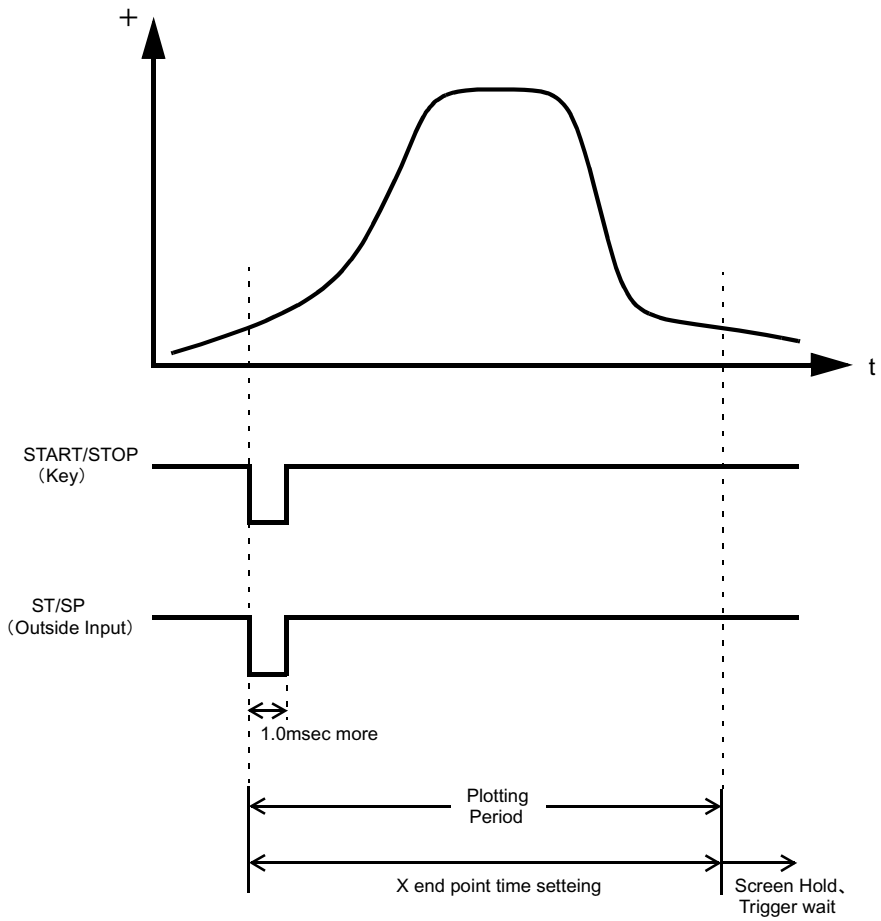
Graph plotting is started by turning on the START/STOP key or turning on the ST/SP external input. When it ends on one screen, the screen is cleared after expiration of the interval time and graph plotting restarts on the next screen. It is ended by turning off the START/STOP key or turning off the ST/SP external input.



9-2-2. Trigger 1 (External Input)

Plotting is started by turning on the START/STOP key or turning on the ST/SP external input.

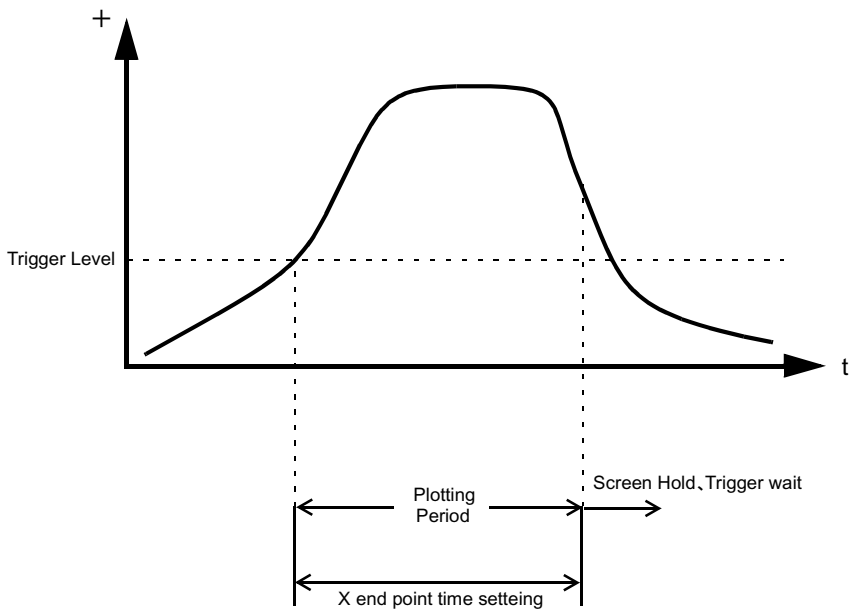
Plotting ends on one screen at the predetermined time of the X end point.



9-2-3. Trigger 2 (Level Detection)

Plotting is started when the conditions of the detection mode are met in comparison of the trigger level set value and indicated value.

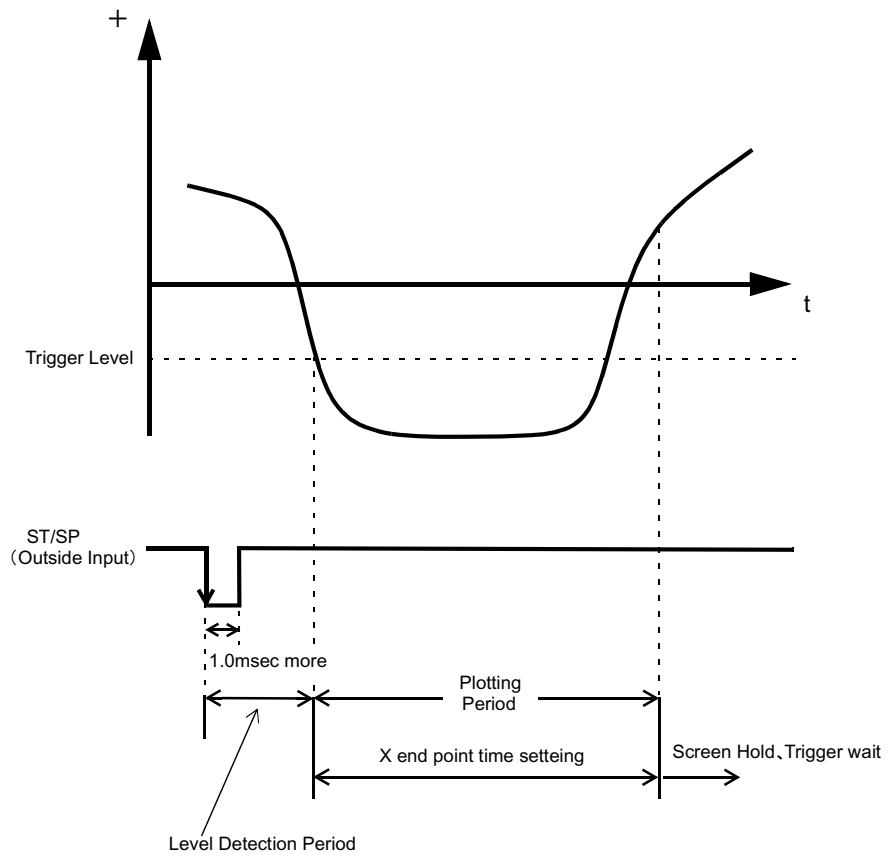
Plotting ends on one screen at the predetermined time of the X end point.



9-2-4. Trigger 3 (External Input + Level Detection)

Plotting is started according to the conditions of the level detection mode in comparison of the trigger level and indicated value after the ST/SP external input is turned on. Plotting ends on one screen at the predetermined time of the X end point.

(Example) Level Detection Mode → Passing under.



9-3. Graph Function

Set the graph plotting mode.

Modes

Continuous, trigger 1 (external input), trigger 2 (level detection), trigger 3 (external input + level detection)

Setting call → Graph → Page 1

9-4. Interval Time

If you select "continuous" in the graph function setting, set the graph plotting operation interrupting time from clearing the screen until moving to the next graph plotting operation. During this time, the graph screen is held.

Setting range: 00.0 - 99.9 sec.

How to set

Setting call → Graph → Page 1

9-5. Graph Start Level

If you select Trigger 2 or Trigger 3 in the graph function setting, set the graph plotting start level.

Setting range: -99999 - 99999

How to set

Setting call → Graph → Page 1

9-6. Level Detection Mode

If you select Trigger 2 or Trigger 3 in the graph function setting, set the graph plotting start level comparison conditions.

Conditions: passing, passing over, passing under, large, small

How to set

Setting call → Graph → Page 1

- Passing

  Graph plotting starts when the indicated value crosses the level set value.

- Passing over

  Graph plotting starts when the indicated value crosses the level set value upward.

- Passing under

  Graph plotting starts when the indicated value crosses the level set value downward.

- Large

  Graph plotting starts when the indicated value is larger than the level set value.

- Small

  Graph plotting starts when the indicated value is smaller than the level set value.

9-7. X Start Point

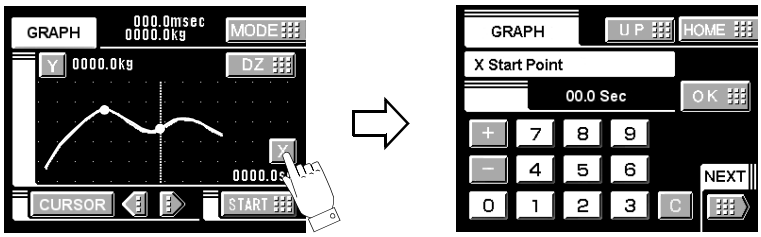
Set the time to display by one screen in the range between 0.1 sec. and 99.9 sec.

How to set

Setting call → Graph → Page 1

Simple setting call

Press the X button on the graph display to go direct to the X end point entry screen.



9-8. Y (Load) Start Point and Y (Load) End Point

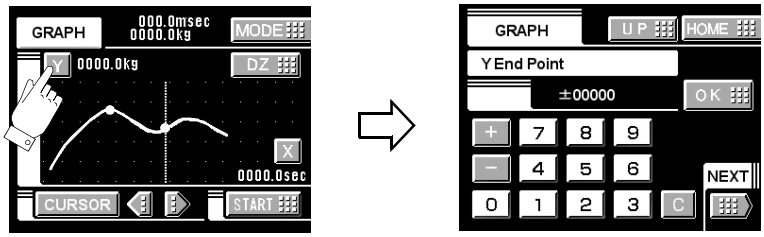
Setting range: -99999 - 99999 (where Y start point < Y end point)

How to set

Setting call → Graph → Page 2

Simple setting call

Press the Y button on the graph display to go direct to the Y end point entry screen.

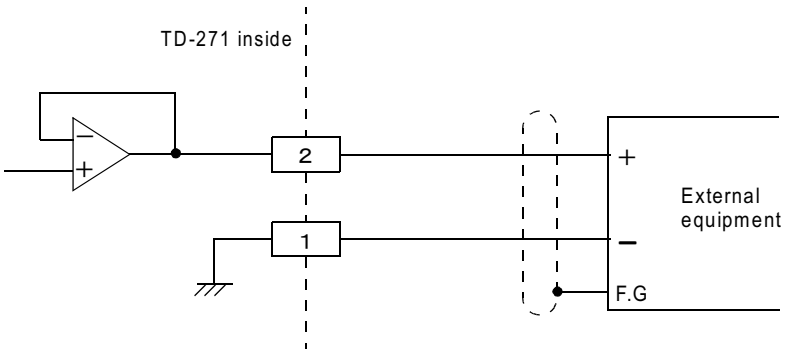


10. VOLTAGE OUTPUT（VOL OUT）

This interface extracts analog voltage proportional to sensor input signals. This interface is convenient for observation and recording of waveforms with a recorder, etc., connected.

The output level is approx. 2V per 1mV/V of sensor input.

・Example of output equivalent circuit and external equipment connection

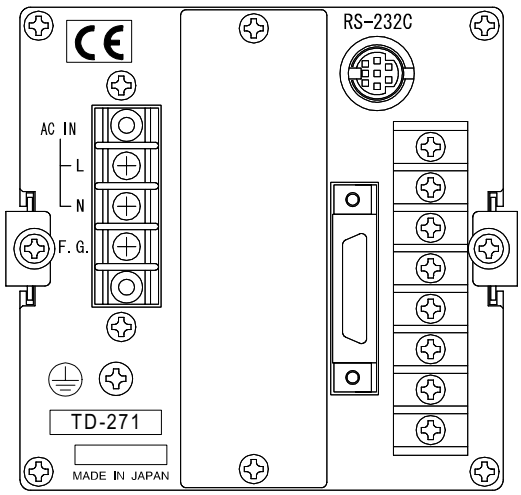


Output signals are not the indicated values themselves because they are extracted before sensor input signals are A/D-converted.

Therefore, output signals do not coincide with the digitally processed indicated values, such as the digital zero and digital filter.

11. RS-232C INTERFACE

The RS-232C is an interface to read the indicated value and status of the TD-271 and to write parameters into the TD-271.
This interface is convenient to process controls, totals, records, etc., by connecting the TD-271 to a computer, process controller, sequencer or the like.



11-1. Communication Specifications

11-1-1. Specifications

Signal level	: Based on RS-232C	
Transmitting distance	: Approx.15m	
Transmitting method	: Asynchronous, Full duplex	
Transmitting speed	: 1200, 2400, 4800, 9600 or 19200bps Selectable	
Bit configuration	: Start bit	1
	Character length	7 or 8 bit Selectable
	Stop bit	1 or 2 bit Selectable
	Parity	Parity none, odd or even Selectable
	Terminator	CR, CR+LF Selectable
Code	: ASCII	

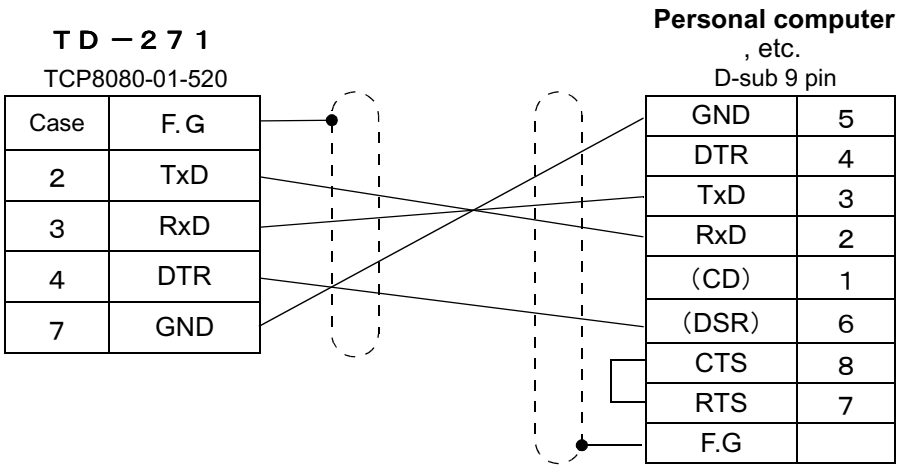
11-1-2. Connector Pin Assignment

This connector connects the RS-232C.

Pin No.	Signal name
1	
2	TxD
3	RxD
4	DTR
5	
6	
7	GND
8	
Case	F.G.

11-1-3. Cable

The following shows an example of connection between DTE-DTE terminals. This will require modification depending on the equipment to be connected. For details, see the instruction manual of the equipment to be connected.



* This connection diagram shows an example of connecting a DTE (data terminal equipment) personal computer.
  Use a straight cable for connecting a DCE (data circuit terminating equipment) such as a modem.

* Before preparing a cable, check the connector shape and pin assignment of the equipment to be connected again.

11-2. RS-232C Interface Setting

Set the RS-232C communication conditions of the TD-271.

11-2-1. Communication Mode

Communication mode 0, communication mode 1, communication mode 2

How to set

Setting call → Option → Page 1

11-2-2. Baud Rate

1200, 2400, 4800, 9600, 19200bps

How to set

Setting call → Option → Page 1

11-2-3. Character Length

7bit, 8bit

How to set

Setting call → Option → Page 1

11-2-4. Parity Bit

None, odd, even

How to set

Setting call → Option → Page 1

11-2-5. Stop Bit

1 bit, 2 bit

How to set

Setting call → Option → Page 1

11-2-6. Terminator

CR, CR + LF

How to set

Setting call → Option → Page 2

11-3. Communication Modes

1.Communication Mode 0

Communications are carried out by commands from the host computer.

The indicated value, status and parameters can be read, and parameters can be written.

2. Communication Mode 1

The indicated value and status are continuously transmitted.

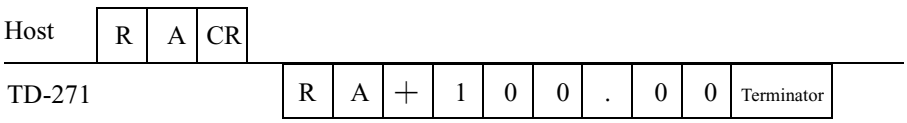
3. Communication Mode 2

The indicated value is transmitted upon printing.

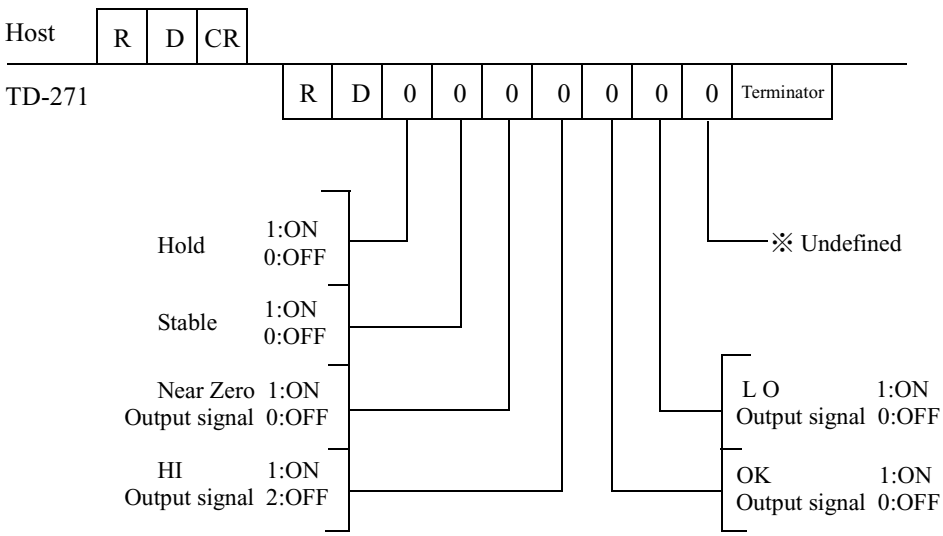
11-4. Communication Format

1. Communication Mode 0

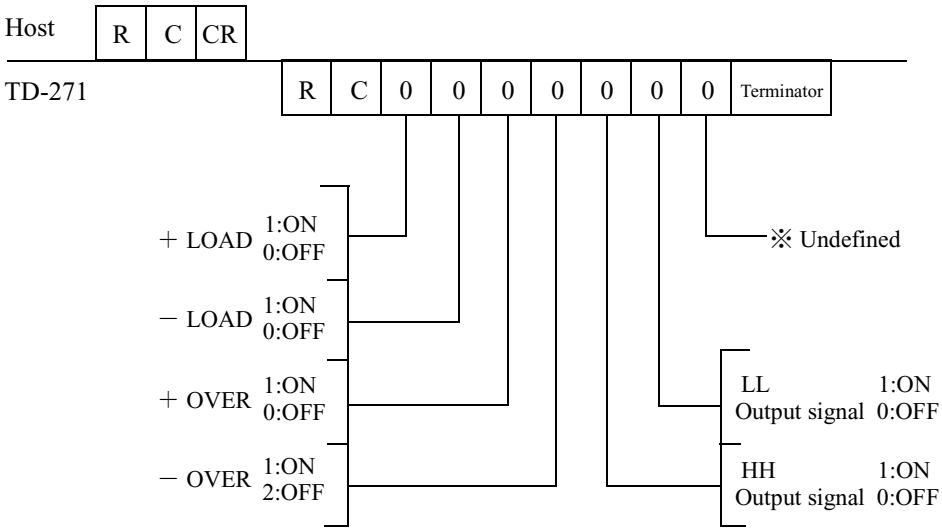
- Reading the indicated value (sign, 5-digit indicated value, decimal point)



- Reading the status (7-digit)



※ The hold bit is operated at the same timing as the H/E signal.



- Writing parameters

HI-HI Limit	W	1	1	±						CR	LF	(Set Value Lock)
HI limit	W	1	2	±						CR	LF	(Set Value Lock)
LO limit	W	1	3	±						CR	LF	(Set Value Lock)
LO-LO Limit	W	1	4	±						CR	LF	(Set Value Lock)
Hysteresis	W	1	5	0	0					CR	LF	(Set Value Lock)
Calibration Value Selection	W	4	4	0	0	0	0	0	⑥	CR	LF	(Calibrationt Value Lock)
Digital Offset Setting	W	4	8	±						CR	LF	(Calibrationt Value Lock)
Near Zero	W	1	6	0						CR	LF	(Set Value Lock)

Hold mode	W	2	1	0	0	0	0	0	①	CR	LF	(Set Value Lock)
Hold Section Setup	W	7	1	0	0	0	0	0	②	CR	LF	
Hold Detect Time	W	2	2	0	0					CR	LF	(Set Value Lock)
Auto Start Level	W	2	3	±						CR	LF	(Set Value Lock)
Minimum Count	W	2	4	0	0	0				CR	LF	1 ～ 999
valley Detect Level	W	2	5	0	0	0	0	0	③	CR	LF	0 ～ 3
Minimum Slope	W	2	6	0						CR	LF	
IntervalA	W	2	7	0	0	0				CR	LF	010 ～ 120
IntervalB	W	2	8	0	0	0				CR	LF	010 ～ 120
Graph Function	W	3	1	0	0	0	0	0	④	CR	LF	
Interval Time	W	3	2	0	0	0				CR	LF	
Graph Start Level	W	3	3	±						CR	LF	(Set Value Lock)
Level Detect Mode	W	3	4	0	0	0	0	0	⑤	CR	LF	(Set Value Lock)
CH	W	1	F	0	0	0	0			CR	LF	

Set value correspondence table

① Hold mode

0 :	tracking	4 :	peak-to-peak
1 :	sample	5 :	relative maximum
2 :	peak	6 :	relative minimum
3 :	valley	7 :	inflection point

② Hold period setting

0 : all period
1 : external signal
2 : time
3 : time with trigger

③ Valley detection level

0 :	1/4 times	4 :	1.25 times
1 :	1/2 times	5 :	1.5 times
2 :	3/4 times	6 :	2 times
3 :	1 time	7 :	3 times

④ Graph mode

0 : continuous
1 : trigger 1
2 : trigger 2
3 : trigger 3

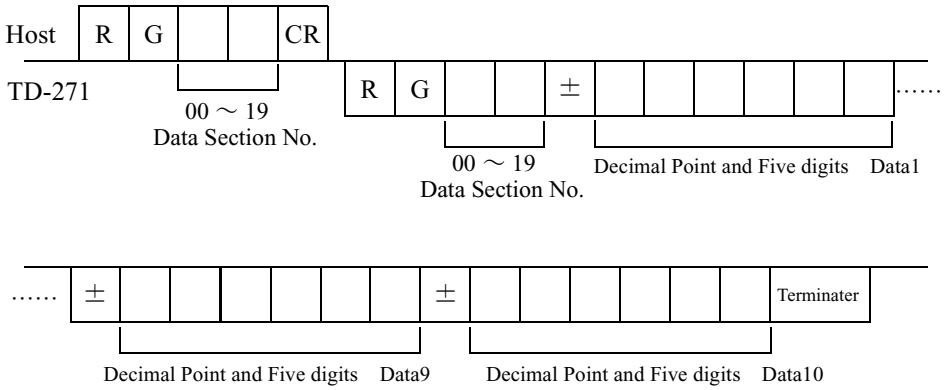
⑤ Level detection mode

0 : passing
1 : passing over
2 : passing under
3 : large
4 : small

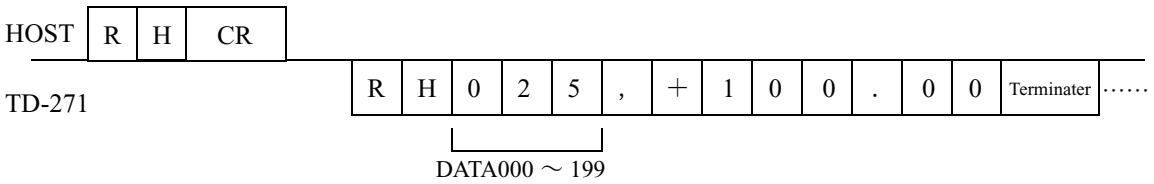
⑥ Calibration Value Selection

0 : calibration value 0
1 : calibration value 1
2 : calibration value 2
3 : calibration value 3

- Reading waveform data

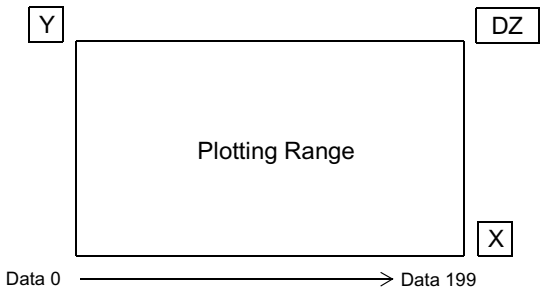


・Wave form hold point data read-out(data No, a mark, a decimal point,5 figures of directions value)



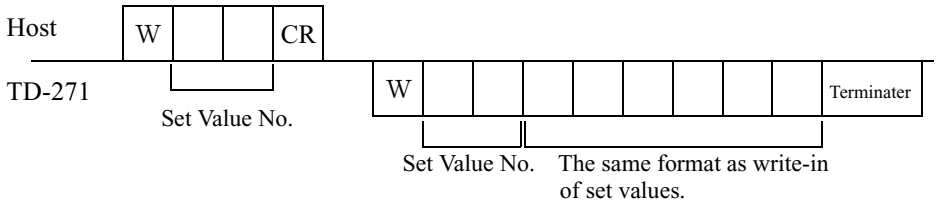
Data Section No.

One graph plotting screen includes 200 pieces of data. In reading waveform data, data can be read by being divided into 20 sections (by 10 pieces).



Section 00 Data 0 ～ Data 9
Section 01 Data 10 ～ Data 19
≀
Section 19 Data 190 ～ Data 199

- Reading parameters

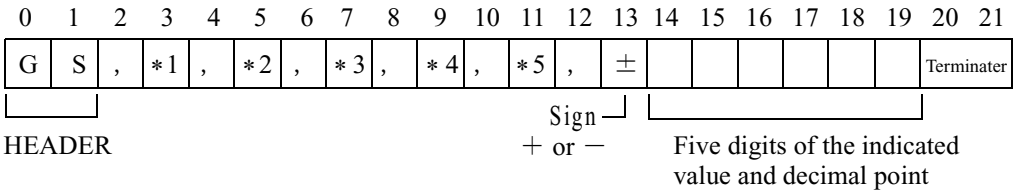


- Commands (Host → TD-271)

Digital Zero	C G CR	(This is effctive only when the set value LOCK is "1.")
Digital Zero reset	C F CR	(This is effctive only when the set value LOCK is "1.")
Print instruction	C I CR	(This will issue print a command onto SIF.)

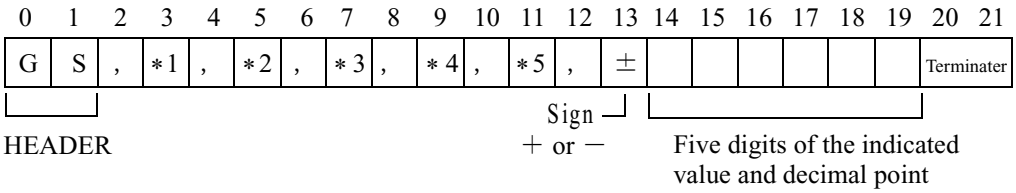
2. Communication mode 1

The indicated value is continuously transmitted.



3. Communication mode 2

The indicated value is transmitted upon printing.



＊1

O.....Over Load（LOAD，OFL）
S .....Stable
M.....Not Stable
H.....Hold

＊1Priority　H＞O＞（S or M）

＊2

A.....Zero Tracking OFF
T .....Zero Tracking ON

＊3

H.....High Limit ON
L .....Low Limit ON
G.....High Limit and Low Limit OFF
N.....High Limit and Low Limit ON
F .....Compare OFF

＊3Priority　　N＞（H or L） F＞G

＊4

H.....High High Limit ON
L .....Low Low Limit ON
G.....High High Limit and Low Low Limit OFF
N.....High High Limit and Low Low Limit ON
F .....Compare OFF

＊Priority　N＞（H or L）F＞G

＊5

N.....Near Zero OFF
Z .....Near Zero ON

12. BCD DATA OUTPUT(TD-2703)

The BCD data output is an interface to extract the indicated value of the TD-271 as BCD data. This interface is convenient to process controls, totals, records, etc., by connecting the TD-271 to a computer, process controller, sequencer or the like.

The I/O and internal circuits are electrically insulated by photocoupler.

The data output rate can be selected from once/sec., 10 times/sec., 100 times/sec., and 1000 times/sec.

12-1. Connector Pin Assignment

Anphenol Connector（36-Pin）

No.		Signal	No.		Signal
1	⁎	COM	19	⁎	COM
2	Out	1	20	Out	20000
3	Out	2	21	Out	40000
4	Out	4	22	Out	80000
5	Out	8	23	Out	Minus(Palarity)
6	Out	10	24	Out	OVER
7	Out	20	25	Out	P.C（Stable）
8	Out	40	26	Out	STROBE
9	Out	80	27	In	BCD Data Hold
10	Out	100	28	In	Logic Switching
11	Out	200	29		
12	Out	400	30		
13	Out	800	31		
14	Out	1000	32		
15	Out	2000	33		
16	Out	4000	34		
17	Out	8000	35		
18	Out	10000	36		

Compatible connector is DDK57-30360 or equivalent.

12-2. Logic Change

Select the logic of output signals with pin No. 28.

When COM and pin No. 28 are open: negative logic

When they are short-circuited: positive logic

12-3. BCD Data Hold

The BCD data output signal is held. Switching is carried out by pin No. 27.

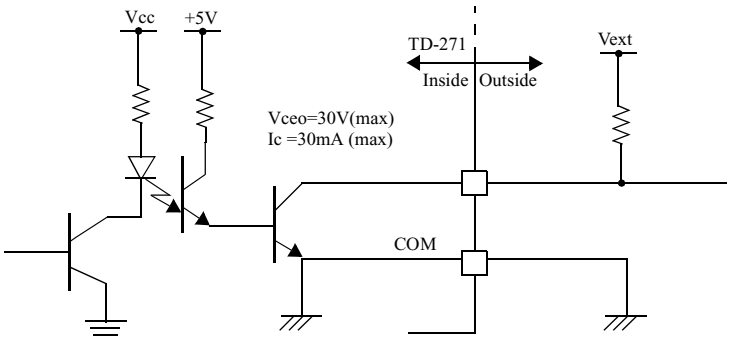
When COM and pin No. 27 are open: hold cancel

When they are short-circuited: hold on

12-4. Equivalent Circuit

• Output

The signal output circuit is operated through a TTL open collector.



● Internal transistor status

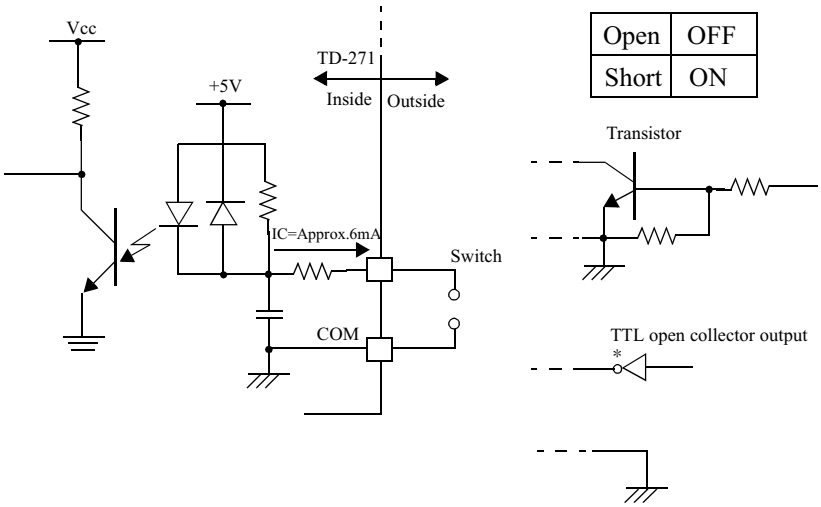
Output data	Negative	Positive
0	OFF	ON
1	ON	OFF

● Output pin level

Output data	Negative	Positive
0	H	L
1	L	H

Through logic switching (pin28)

▪ Input



Open	OFF
Short	ON

NOTE

- Do not apply external voltage to the signal input circuit.
- The external element is required to withstand Ic=10mA.
- Leakage from the external element is required to be 30 μA or below.

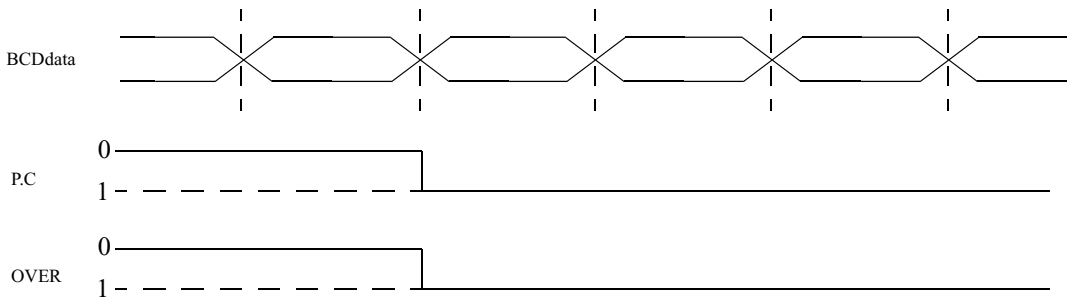
12-5. Signal Timing

▪ PC

This signal turns on at the same time as BCD data when stable.

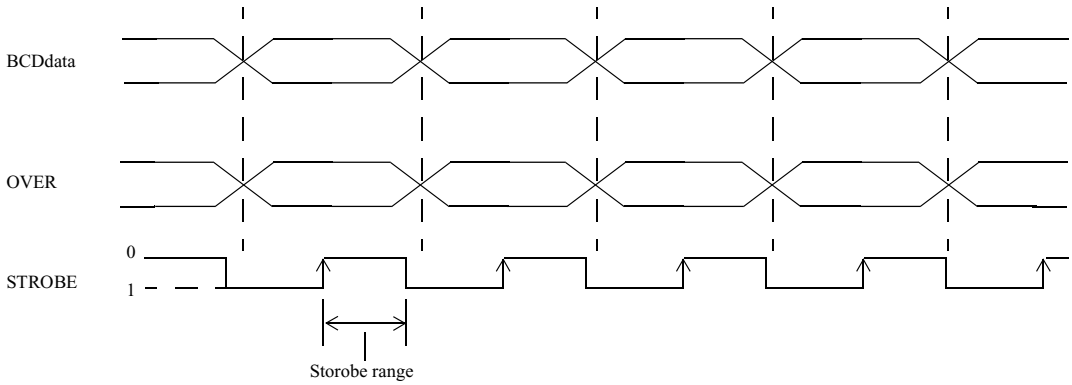
▪ OVER

– This signal is outputted at the time of -ADC OVER, +ADC OVER, +overflow or -overflow.



· STROBE

Strobe pulses are outputted in synchronization with BCD data. Read data using the rising edges of the pulses. The BCD data update rate setting can be changed.



12-6. BCD Data Update Rate Selection

Output rate: 1, 10, 100, 1000 times

How to set

Setting call → Option → Page 1

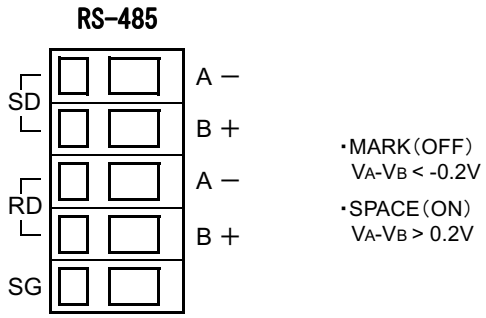
13. RS-485 COMMUNICATION INTERFACE(TD-2710)

13-1. Communication Specifications

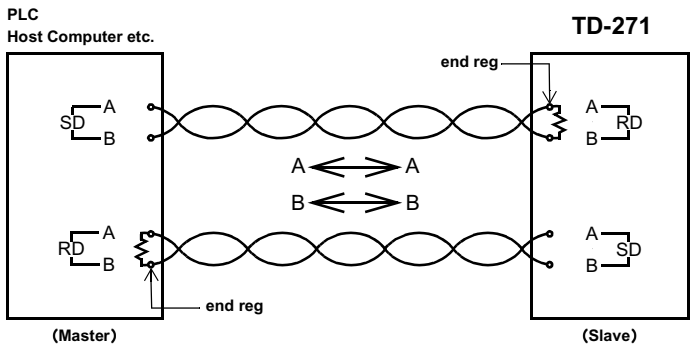
- Specifications

Signal level	Based on RS-485	
Transmitting distance	Approx 1km	
Transmitting method	Asynchronous, Full duplex	
Transmitting speed	1200, 2400, 4800, 9600 or 19200bps Selectable	
Bit configuration	Start	1bit
	Character length	7 or 8bits Selectable
	Stop	1 or 2bits Selectable
	Parity	None,Odd or Even Selectable
Terminator	CR+LF/CR Selectable	
Code	ASCII	

- Connector Pin Assignment



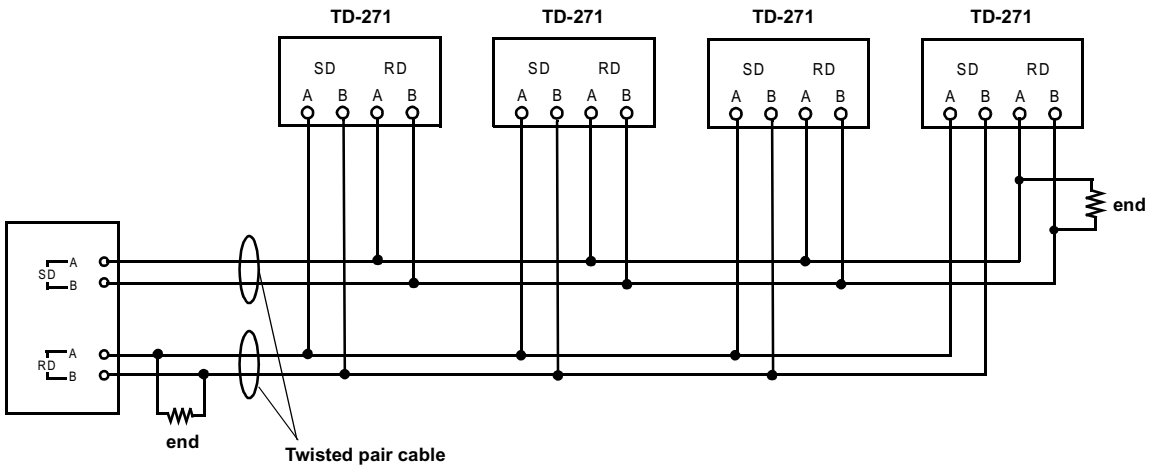
- One-to-One Connection



Use a twisted pair cable for connection. (The noise margin will increase.) However, a twin cable is sufficient for short-distance connection. Couple a terminal resistor of 100～200Ω to the receiving end.

(The terminus resistance by the side of TD-271 can be switched by setup.120 ohms is conncted when terminus resistance is set as ON.)

- One-to-more Connection



13-2. Communication Method

1. For connecting more than one TD-271, assign an ID number to each TD-271.

2. Send the start command including the ID number from the host, whereby communications are allowed with one TD-271, enabling reading of indicated value, reading and changing of set values (parameters), sending of commands and so on.

Communication Format

HOST	I	D	0	0	0	1	R	A	CR							
TD-271	I	D	0	0	0	1	R	A	+	1	0	0	.	0	0	terminater

13-3. RS-485 Interface Setting

13-3-1. ID

Setting range: 0000 - 9999

How to set

Setting call → Option → Page 2

13-3-2. Terminater Resistance

Without terminater resistance / with terminater resistance

How to set

Setting call → Option → Page 2

13-3-3. Communication Method

2-wire / 4-wire

How to set

Setting call → Option → Page 2

Caution

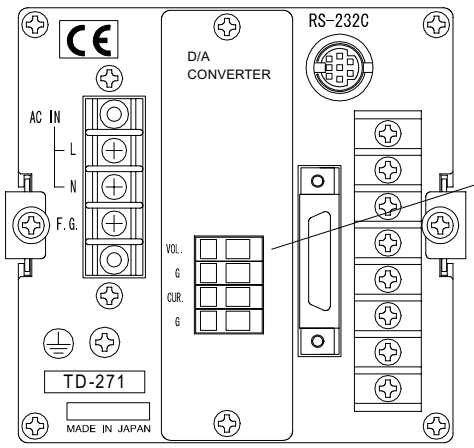
For other settings, see the section of RS-232C Option. However, the communication mode setting is fixed at 0.

14. D/A CONVERTER(TD-2707)

A D/A converter is provided for obtaining analog output synchronized with the indicated value of the TD-271.

The analog output ranges are 0 ～ +10V output and 4 ～ 20mA constant-current output. By using the D/A zero setting and D/A full scale setting functions, analog output can be obtained between zero (0V, 4mA) and full scale (+10V, 20mA) with respect to the predetermined digital value.

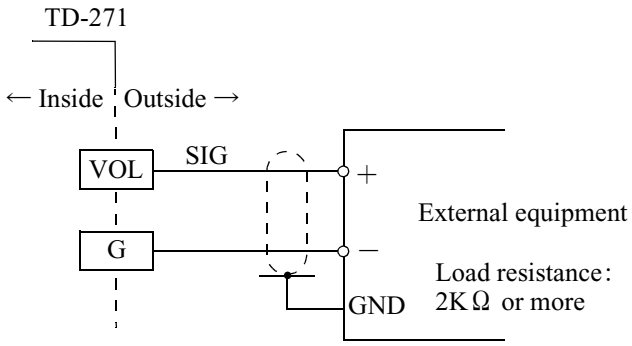
The output circuit and the main unit circuit are isolated. The resolution is 1/10000 to 0 ～ +10V, and the conversion rate is 2000 times/sec. The output has an overrange of approx. ± 10%FS.



Voltage/current output terminals:
Terminals to extract voltage or current signals.
VOL and CUR indicate signals and G indicates ground.
0 ～ +10V and 4 ～ 20mA can be obtained between VOL and G and between CUR and G, respectively.

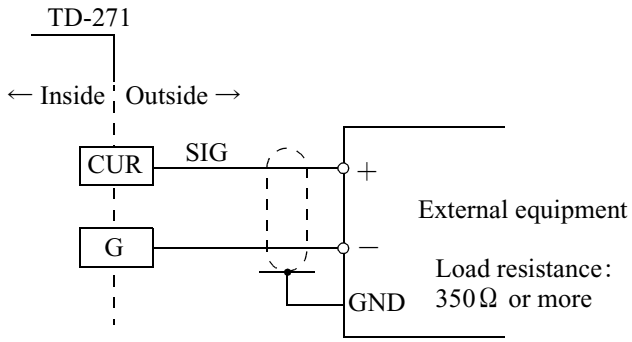
- Taking voltage output signals

Connect external equipment (2K Ω or more load resistance) to VOL and G of the TD-271.



- Taking current output signals

Connect external equipment (350Ω or less load resistance) to CUR and G of the TD-271.



- Resolution

The D/A converter has a resolution of 1/10000 to 0 ～ 10V (4 ～ 20mA).

NOTE

* The D/A converter is optional.
* Do not apply external voltage because it will break.
* Do not short-circuit the voltage output because a failure will occur.
  Also, connecting a capacitive load may cause oscillation.

14-1. D/A Zero and Full Scale

Setting range: -99999 - 99999 (zero setting value < full scale setting value)

Voltage zero output	: Set the value indicated when 0V is output.
Voltage full scale	: Set the value indicated when 10V is output.
Current zero output	: Set the value indicated when 4mA is output.
Current full scale	: Set the value indicated when 20mA is output.

How to set

Setting call → Option → Page 1

14-2. D/A Output Mode

In synchronization with the indicated value / Fixed at 0V /
Fixed at 10V / Fixed at 4mA / Fixed at 20mA

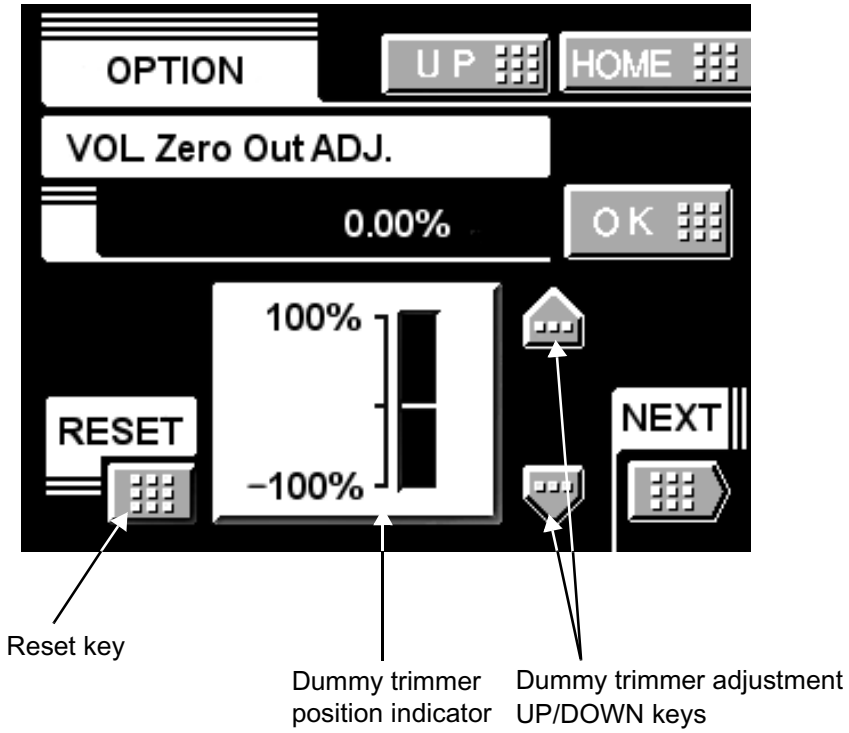
In synchronization with the indicated value	Outputs in synchronization with the indicated value.
Fixed at 0V	: The voltage output is fixed at zero output (0V).
Fixed at 10V	: The voltage output is fixed at full scale (10V).
Fixed at 4mA	: The current output is fixed at zero output (4mA).
Fixed at 20mA	: The current output is fixed at full scale (20mA).

How to set

Setting call → Option → Page 1

How to adjust

Adjust the output with the dummy trimmer that appears on the adjustment screen after selecting each fixed output in the D/A output mode setting and pressing the [OK] key. While monitoring the output value, finely adjust the output with the dummy trimmer UP/ DOWN keys, and press the [OK] key to confirm, so that the trimmer position is entered.



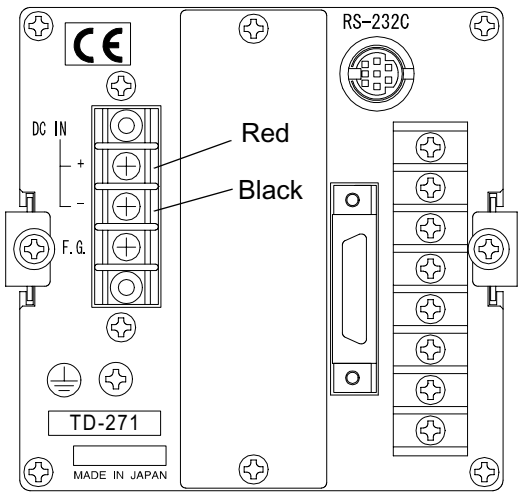
*Pressing the dummy trimmer UP/DOWN keys continuously performs continuous operation.

*The trimmer adjusting ranges are as follows: voltage; ± 1.0V, and current; ± 1.6mA.

*The reset key resets the dummy trimmer position to the trimmer center point (0%).

15. DC POWER SOURCE

The TD-271 can be used on a DC power source by specification at delivery time.



Connect the positive (+) side of the power source to the red screw side of the terminal block on the back of the TD-271, and its negative (-) side to the black screw side.

Input voltage range (voltage between terminals of the TD-271)

12 - 24V DC (± 15%)

Caution

Be aware that the voltage drops depending on the wire thickness and length. Also, never input an AC power source. Doing so will cause a failure.

Power consumption

20W max

Caution

Use a source power (or battery) of 3A DC or more.

16. ERROR MESSAGES

ADC+OVER or ADC-OVER

This message indicates that the inputted electric signal exceeds the input voltage range of the element (ADC) which converts the inputted electric signal to a digital value whereby the signal cannot be converted to a correct digital value.
ADC+OVER and ADC-OVER indicate that the inputted electric signal exceeds the input range in the positive direction and negative direction, respectively.
This message may also be displayed when an excessive load is applied to the sensor or the input terminals are opened due to a break in the cable.

+OVER+ or -OVER-

This message indicates that the value to be displayed except the decimal point and sign exceeds five digits. The message and a value of as much as five digits appear alternately.
+OVER+ and -OVER- indicate that the value to be displayed exceeds five digits in the positive direction and negative direction, respectively.
This message is displayed in such a case wherein a load larger than expected is applied or calibration is performed below the measuring range. Check calibration and the measuring object.

Zero calibration error

This message indicates that calibration cannot be performed because the inputted electric signal exceeds the input voltage range.
Check the cables for breaks or miswiring.

Span calibration error

The span calibration error occurs under the following conditions.

1) An actual load set value of zero is inputted.
2) An electric signal in the negative direction is inputted.
3) An electric signal of 0.05mV/V or less in the positive direction is inputted.

In the case of 1), check the set value, and perform calibration again.
In the case of 2) or 3), check that the actual load is properly applied and check the cables for miswiring. Where the condition in 3) applies with too light a load, the load needs to be increased.

Although the TD-271 will not break down immediately even if the above messages are displayed, ADC+OVER or ADC-OVER indicates that an excessive voltage may be applied to the input circuit of the TD-271. It is therefore required to remove the cause immediately.

(Although the input is provided with a protection circuit, a long-time excessive voltage or an instantaneous but extremely high voltage may break the TD-271.)

17. SELF-CHECK AND INITIALIZATION

17-1. Self-Check

The self-check function includes a memory check to check the memory automatically for detecting problems, a visual check to check the display visually, a touch panel key input check and an external I/O check.

17-1-1. Self-Check DSP

The display is checked.

White → Black → Red → Green → Blue → "H" (half size) →“H“ (full size)

How to set

Setting call → System → Page 1

17-1-2. Self-Check MEM

The memory is checked.

ROM check judgment checksum
ROM vwesion

SRAM check judgment
NOVRAM check judgment

Judgment: OK or NG

How to set

Setting call → System → Page 1

17-1-3. Self-Check KEY

The touch panel keys are checked.

Black-bordered pseudo keys appear on the blue screen. These keys should change to white when pressed.
When all keys are pressed, the original screen is restored. If the color does not change with no reaction due to a problem, it is NG.
In the case of NG, the original screen is restored in 30 seconds after the last key operation.

How to set

Setting call → System → Page 1

17-1-4. Self-Check EXT

The external I/O is checked.

Pseudo LEDs for the input terminals and pseudo ON/OFF keys for the output terminals appear.
When each input terminal is shorted (turned on), the pseudo LED lights.
When each output terminal key is pressed, the output is turned on.
The original screen is restored by the ESC key.

How to set

Setting call → System → Page 1

17-2. Initialization(All setting value clearances)

The contents of the memory are rewritten to factory defaults.
In this operation, calibration values (zero calibration and span calibration) do not change but all other parameters are rewritten to factory defaults.
See the section on List of Setting Items page 114 for factory defaults.

How to set

Setting call → System → Page 1

17-3. Password

This setting is for maintenance and inspection. Do not operate.

18. ABOUT JAPANESE/ENGLISH DISPLAY SELECTION

The display language of the TD-271 is selectable between Japanese and English.

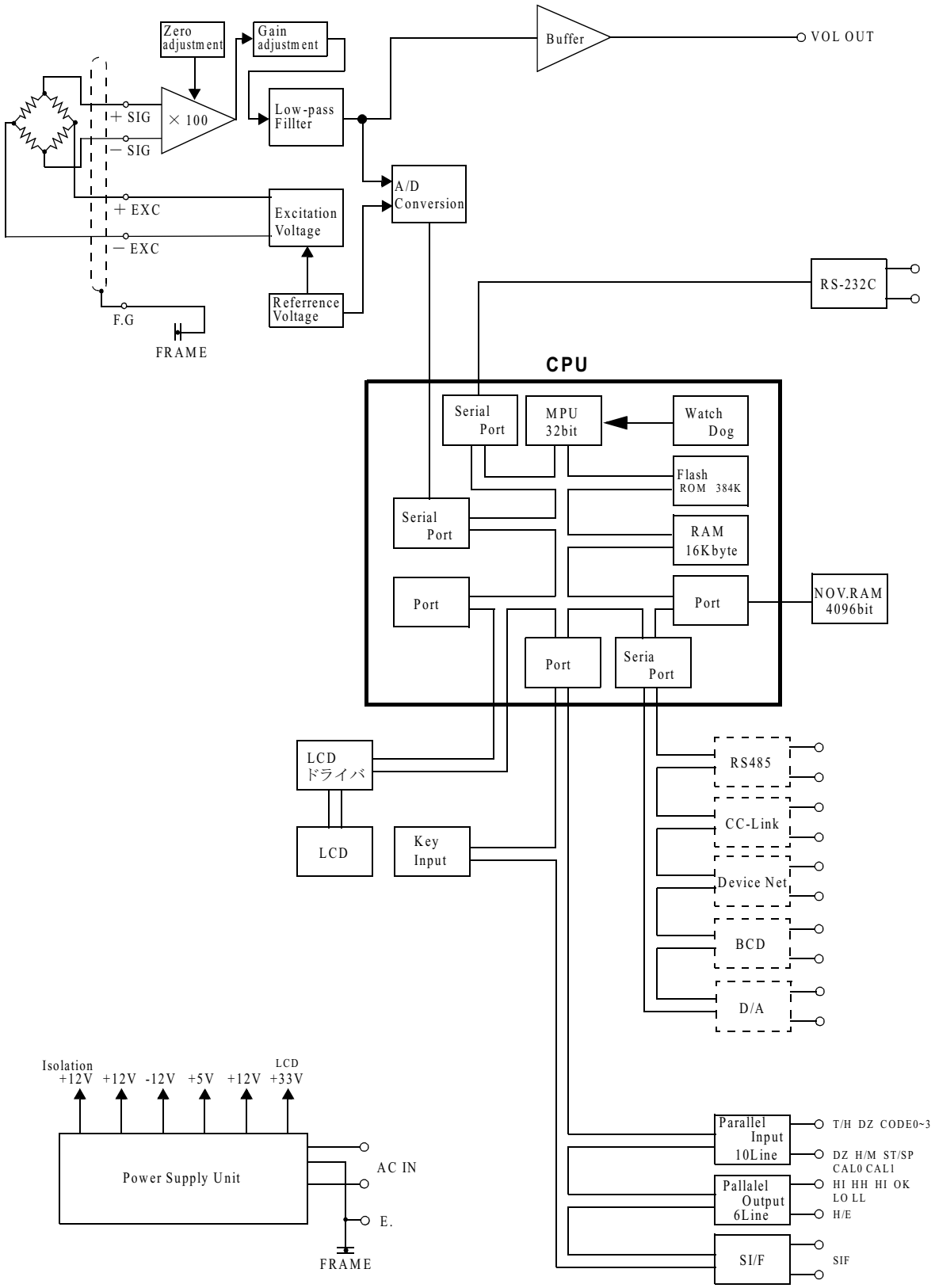
How to set

Setting call → System → Page 2

JPN: Japanese

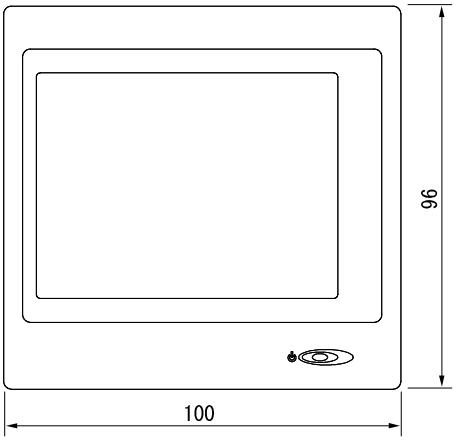
ENG: English

19. BLOCK DIAGRAM

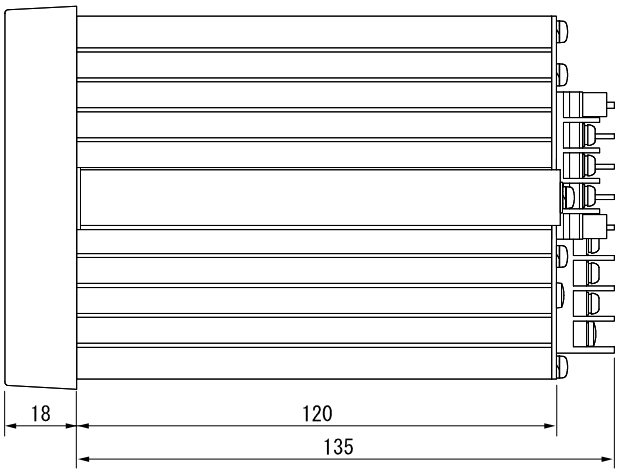


20. DIMENSIONS

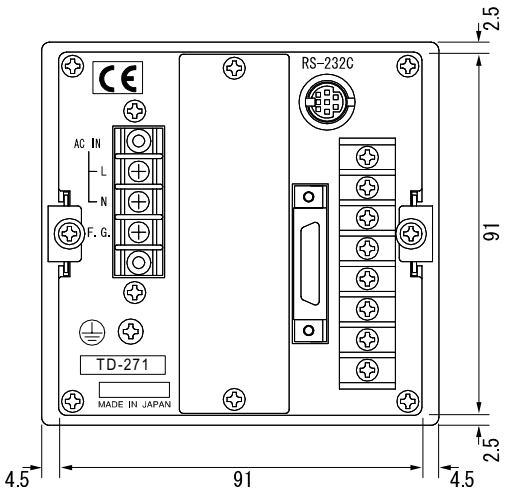
Unit : mm



[Front]



[Side]

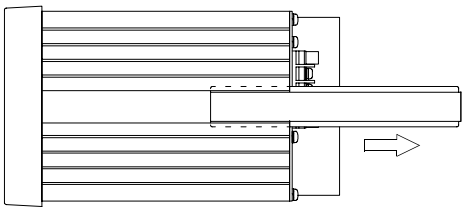


[Rear]

21. INSTALLATION IN A PANEL

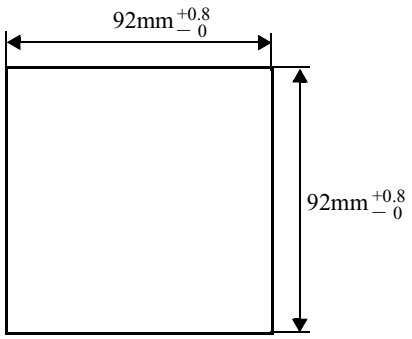
Follow the steps below to install the TD-271 in a panel.

1) Remove both side rails.

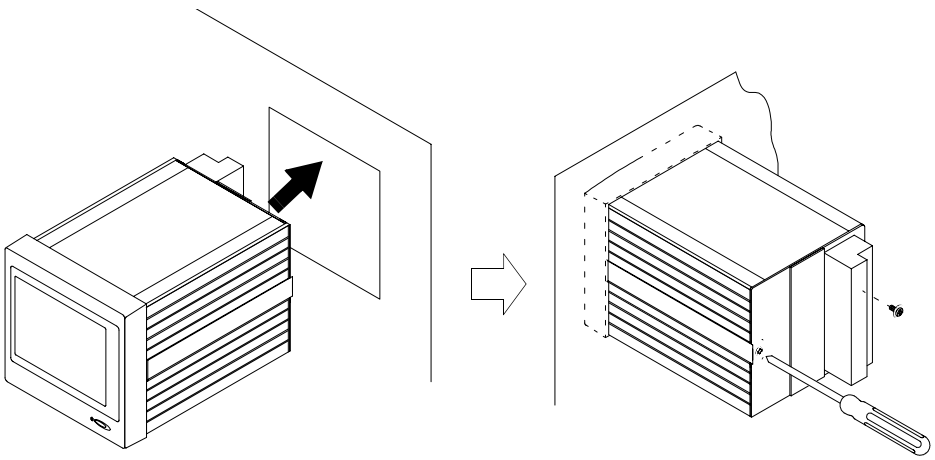


2) Make a hole in the panel in accordance with the panel cutout size.

Panel Cutout Size
92W × 92H (mm)



3) Install the TD-271 and attach it with side rails.



22. SPECIFICATIONS

22-1. Analog Section

Sensor excitation	10V, 5V, 2.5V DC (digital adjustment) Output current: Within 120mA 4-wire (Up to four 350Ω load cells can be connected.)	
Signal input range	-3.0 ～ +3.0mV/V	
Zero and gain adjustment	Performed by digital computation	
Accuracy	Non-linearity	: Within 0.02%FS ± 1 digit (at a 3.0mV/V input)
	Zero drift	: Within 0.5 μ V/ ℃ RTI
	Gain drift	: Within 0.01%/ ℃
A/D converter	Rate	: 2000 times/sec.
	Resolution	: 16 bits (binary)
Analog filter	10Hz, 30Hz, 100Hz, 300Hz (digital adjustment)	
Analog voltage output	Output level	: Approx. 2V per 1mV/V of input Load
	resistance	: 2KΩ or more

22-2. Digital Section

Display	STN color LCD module (display area: 75mm × 56mm) 320 × 240 dots Indicated value: ± 99999 (5-digit)
Equivalent input calibration	Range: 0.5 ～ 3.0mV/V Error: Within 0.03%FS
Hold functions	1) Sample hold 2) Peak hold 3) Valley hold 4) Peak-to-peak hold 5) Relative maximum hold 6) Relative minimum hold 7) Inflection point hold Period setting (all period, external signal, time, time with

trigger) is available for 2) ～ 4).
Combinations allow selection from 16 hold types.

Comparison functions

	External output
HI-HI limit	HH
LO-LO limit	LL
	OK
HI limit	HI
LO limit	LO

Calibration value selection　Four calibration values can be stored in memory and switched.

22-3. Communication

RS-232C communication interface

Start/stop system
Baud rate: 1200bps ～ 19200bps

22-4. Options

BCD data output (TD-2703)
Open-collector output
Output rate
Can be selected from 1 time/sec., 10 times/sec., 100 times/sec. and 1000 times/sec.

RS-485 communication interface (TD-2710)
Communication conditions are the same as RS232C.

D/A converter (TD-2707)

Voltage output	0 ～ 10V	RL>2KΩ
Current output	4 ～ 20mA	RL<350Ω

Zero output and full scale output can be digitally adjusted.

Zero adjusting range	: ± 10%FS
Gain adjusting range	: ± 10%FS
Non-linearity	: 0.05%FS
Response	: Dependent on the A/D conversion speed (2000 times/sec.) of the main unit

22-5. External Input and Output

Output

Output common - COM1

HI-LO limit comparison output (open-collector outputs)

- HH
- HI
- GO
- LO
- LL

Hold end output

- H/E

Serial data output SI/F start/stop system 600bps

Input

Input common - COM2

Parameter selection input

- CODE0
- CODE1
- CODE2
- CODE3

Hold control input

- T/H
- H/M

Digital zero input

- DZ

Graphic display start/stop input

- ST/SP

Calibration value selection input

-CAL0

-CAL1

22-6. General

Required power source	- AC spec: 100V to 240V AC (＋ 10% － 15%) [free power source 50/60Hz] - DC spec: 12V to 24V DC (± 15%) (Depending on the request at the time of order)
Power consumption	- AC spec: 15W (30VA) max. - DC spec: 20W max.
Rush current (Typ)	15A, 5 msec.: 100V AC mean load state (ordinary temperature, at cold-start time) 30A, 5 msec.: 200V AC mean load state (ordinary temperature, at cold-start time)
Operating conditions	Temperature：－ 10 ℃ to ＋ 40 ℃ Humidity：80%RH or below (non-condensing)
Warmup time	20 minutes
Dimensions	100W × 96H × 135D（mm）(excluding projected parts)
Weight	About 1kg

22-7. Accessories

- Operation Manual - 1
- Acceptance proof- 1
- The sticking-by-pressure terminal for external I/O terminal stand - - - 10
  （TMEV1.25-3S）
- AC cable - 1
- Connector 1 (FCN-361J024-AU for external I/O connector) - - - - - - - - 1
- Connector 2 (TCP8080-01-520 for standard RC-232C) - - - - - - - - - - - 1
- Connector 3 (57-30360, when the BCD option is added) - - - - - - - - - - 1
- Mini screwdriver (D/A, when the RS-485 option is added) - - - - - - - - - 1

23. SETTING ITEM CHART

Setting of OPERATION

N : NOVRAM S : SRAM

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Digital Filter	OFF		◎	○	
2		Analog Filter	300Hz		◎	○	
3		Display Rate	10Times		◎	○	
4		Stability（Time）	1.5Sec		◎	○	
5		Stability（Cnt）	05CNT		◎	○	
6	2	Zero Track（Time）	0.0Sec		◎	○	
7		Zero Track（Cnt）	00CNT		◎	○	
8		Contrast1				○	
9		Contrast2	70			○	
10		Backlight	10Min.			○	
11	3	Excitation Voltage	10V		◎	○	
12		Auto Printo	No		◎	○	
13		Hold Off Print	No		◎	○	
14		Cal.Protect	OFF				
15		Para.Protect	OFF				

Setting of COMPARISON(CH00 ～ CH15)

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Hi-Hi Limit	12500*		◎		○
2		HI Limit	07500*		◎		○
3		LO Limit	00000*		◎		○
4		LO-LO Limit	-02500*		◎		○
5		Hysteresis	00000*		◎		○
6	2	Near Zero	00100*		◎		○
7		Comparison Mode	ALL		◎		○
8		Comparison Select	MODE2		◎		○

* The display position of a decimal point changes by the decimal point position setup in the proofreading mode.

Setting of HOLD MODE（CH00 ～ CH15）

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Hold Function	Tracking		◎		○
2		Hold Detect Time	1.000Sec		◎		○
3		Auto Start Level	00100*		◎		○
4		Minimum Count	010		◎		○
5		Valley Detect Level	1.0Times		◎		○
6	2	Minimum Slope	00030*		◎		○
7		Interval A	100msec		◎		○
8		Interval B	100msec		◎		○

Setting of GRAPH（CH00 ～ CH15）

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Graph Function	CONTINUDE		◎		○
2		Interval Time	01.0Sec		◎		○
3		Graph Start Level	00100*		◎		○
4		Level Detet Mode	Passed High		◎		○
5		X Start Point	10.0Sec		◎		○
6	2	Y Start Point	00000*		◎		○
7		Y End Point	10000*		◎		○

* The display position of a decimal point changes by the decimal point position setup in the proofreading mode.

Setting of Calibration

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Zero Calibration	0	◎		○	
2		Actual Load Cal	10000*	◎		○	
3		Egv.Input Cal	3.000	◎		○	
4		Cal. Select	CAL.0	◎		○	
5		Incurement	001	◎		○	
6	2	Unit	kg	◎		○	
7		Decimal Place	0.00	◎		○	
8		Digital Offset	00000*	◎		○	

* The display position of a decimal point changes by the decimal point position setup in the proofreading mode.

Communications

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Comm.Mode	MODE0		◎	○	
2		Speed	9600bps		◎	○	
3		Character Length	8bit		◎	○	
4		Stop	1bit		◎	○	
5		Parity	No		◎	○	
6	2	Terminator	CR		◎	○	

Setting of Option

In case of used BCDOUT

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Output Rate	100Times		◎	○	

Setting of Option

In case of used Output Mode

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Output Mode	Input Value		◎	○	
2		Voltage Zero Output	00000		◎	○	
3		Voltage Full Scale	10000		◎	○	
4		Current Zero Output	00000		◎	○	
5		Current Full Scale	10000		◎	○	

Setting of Option

In case of used RS-485

	page	Item	Default	Calibration LOCK	Set Value LOCK	N	S
1	1	Comm.Mode	MODE0		◎	○	
2		Speed	9600bps		◎	○	
3		Character Length	8bit		◎	○	
4		Stop	1bit		◎	○	
5		Parity	No		◎	○	
6	2	Terminator	CR		◎	○	
7		ID	0000		◎	○	
8		end.reg	No		◎	○	
9		wire-sel	4wire		◎	○	

Setting of SYSTEM

	page	Item	Default	Calibration LOCK	Set Value LOCK	CH	Note
1	1	All Para.Clear					
2		Self Check DSP					
3		Self Check MEM					
4		Self Check KEY					
5		Self Check EXT					
6	2	PASSWORD	* * * *				
7		LANGUAGE	ENG				

24. CONFORMITY TO EC DIRECTIVES

The TD-271 digital indicator conforms to EC directives (based on the EC council of ministers), carrying a CE mark.

- Low voltage directive: EN61010-1
- EMC directive: EN61326-1

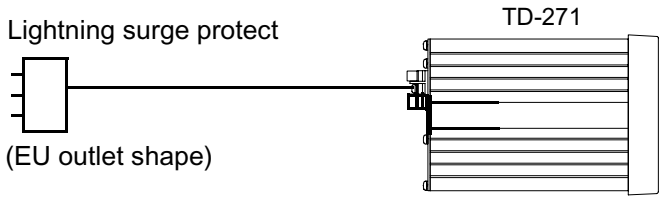
(EN55011, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-3-2, EN61000-3-3)

When installing, attention should be given to the following.

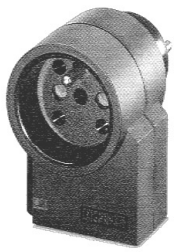
1. Since the TD-271 is defined as an open type (built-in equipment), be sure to install the TD-271 and fix to a panel or the like for use.

2. Use the attached power cable.

3. Use shielded cables for others (load cell, external I/O, option).



● Lightning surge protect (MAINTRAB MNT-1D) made by PHOENIX CONTACT (Germany))

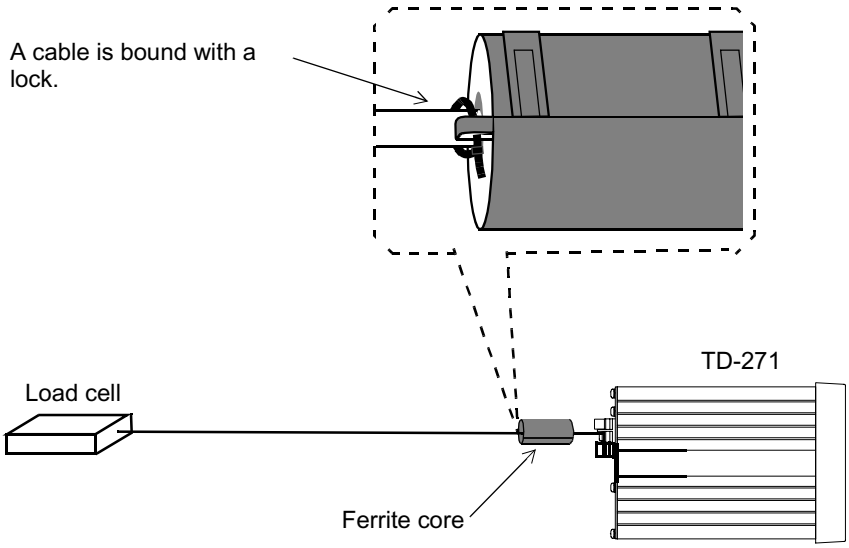


*MAINTRAB MNT-1D is a trademark of PHOENIX CONTACT.

This lightning surge protect (MAINTRAB MNT-1D) is not a standard accessory (optionally available).

Purchase it from PHOENIX CONTACT or us as necessary.

Also, it is necessary to attach a ferrite core to a sensor cable for a load cell or the like.



CAUTION

- The TD-271 main body conforms to EMC directive EN61000-4-5 (lightning surge immunity) in combination with the lightning surge protect.

- The TD-271 does not conform to EC directives with the CC-Link option or Device Net option, and on a DC power source.

TEAC

TEAC INSTRUMENTS CORPORATION

83 IMAIKAMIMACHI, NAKAHARA-KU, KAWASAKI JAPAN
Phone : (044)-711-5221 Fax : (044)-711-5240