IM-A-221 '85.12

Instrumentation Conditioner

WGA-200A

Operation Manual

KYOWA

CONTENTS

Thank you for purchasing the Kyowa instrumentation conditioner WGA-200.
There are a number of models due to different combinations of various functions incorporated. Please make sure that you have the right model you specified in your order by referring to the label on the side of the instrument. Before you start using instrument, please read this instruction manual carefully.

Handling precaution

Please read the following precautions without fail before you start using the instrument.

- Power supply

- There are two models, one to operate on AC 100V and the other, AC 200V. Before you connect your instrument to the power outlet, be sure that the power requirement described on the terminal board on the rear of the instrument is satisfied.

  AC 100V → 90 to 121V 50/60Hz
  AC 200V → 180 to 242V 50/60Hz [Never use power which exceeds these limits.]

- External noise

- Where there is a possible cause of noise such as a power line transformer, motor or transceiver, etc. adjacent to the input cable (connecting the instrument with transducers), please work out a countermeasure. (Refer to Connection, page 3.)

- Connection to the output terminal

- Connect an instrument providing a 5kΩ or higher unbalanced load to the voltage output terminal (Vo).
- Connect an instrument providing providing a 400Ω or lower load resistance to the current output terminal (Io).

- Comparator setter

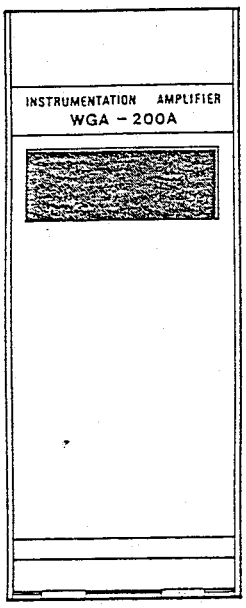
- It adopts the contact output type. Its capacity is rated at AC 250V 1A or DC 50V (resistance load).

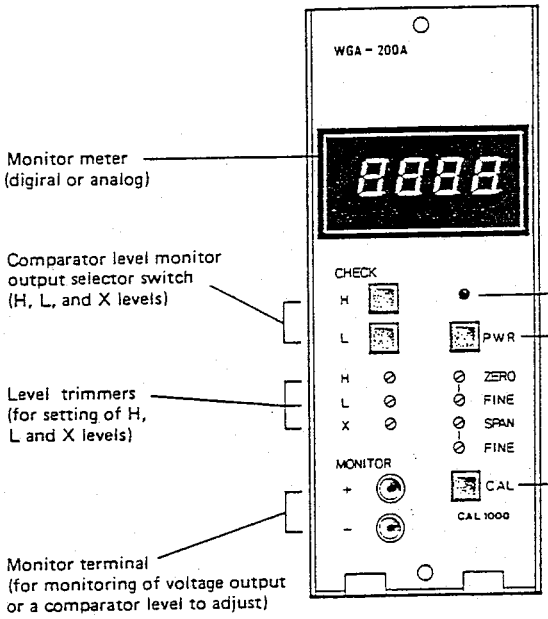
- Place of operation (installation)

- Operate the instrument in an atmospheric temperature range of −10 to +50°C and under 90%RH or lower humidity.
- The instrument adopts neither dustproof, waterproof nor vibration resisting construction. Therefore, be careful in the choice of a place of installation.

1. Parts identification

Front panel cover





Monitor meter
(digiral or analog)

Comparator level monitor
output selector switch
(H, L, and X levels)

Level trimmers
(for setting of H,
L and X levels)

Monitor terminal
(for monitoring of voltage output
or a comparator level to adjust)

Pilot lamp
(lights up in red when
the power switch is
put on)

Power switch

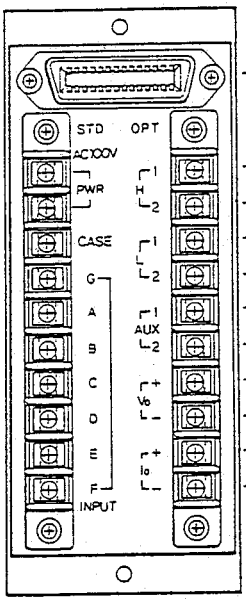
Zero trimmers
(ZERO: rough adjustment
FINE: fine adjustment)

Sensitivity trimmers
(SPAN: rough adjustment
FINE: fine adjustment)

Calibration switch

Digital I/O
(BCD output and external control)

Rear view



PWR: power input terminal
(AC)

CASE (insulated from all input/
output terminals in DC)

H: Output terminal
(comparator H level)

L: Output terminal
(comparator L level)

AUX: Output terminal
(comparator X level)

Vo: Output terminal
(voltage output)

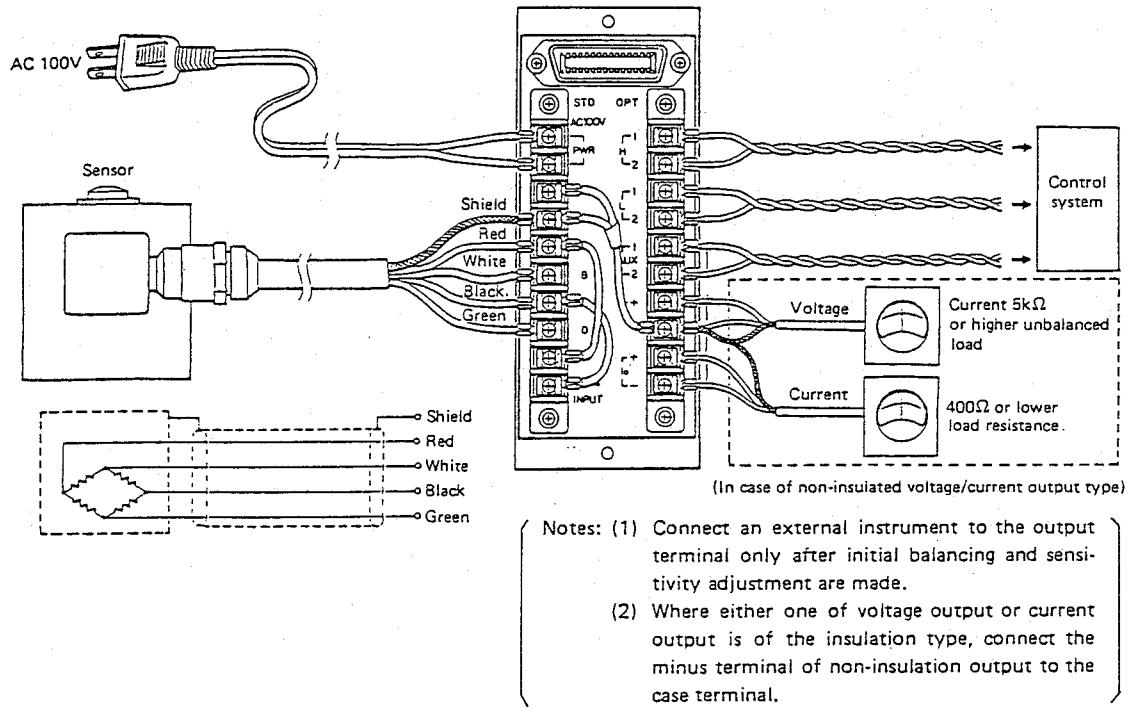
Io: Output terminal
(current output)

INPUT: input terminals to connect
with transducers)
G: Transducer's shield wire
A: " red lead wire (B.V. +)
B: " white lead wire (– output)
C: " black lead wire (B.V. –)
D: " green lead wire (+ output)
D: " yellow lead wire (remote for A)
E: " blue lead wire (remote for C)

2. Connection

- Connection by using a 4-conductor cable

(No cable is attached to the instrument because it is used mainly as a system unit for instrumentation.)

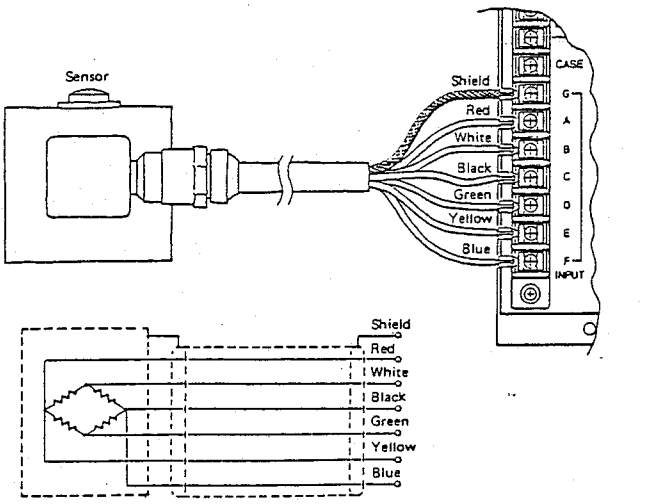


(In case of non-insulated voltage/current output type)

Notes: (1) Connect an external instrument to the output terminal only after initial balancing and sensitivity adjustment are made.

(2) Where either one of voltage output or current output is of the insulation type, connect the minus terminal of non-insulation output to the case terminal.

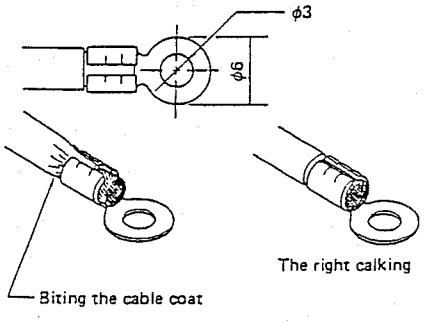
- Connection by using a 6-conductor shielded cable



CAUTION FOR CONNECTION

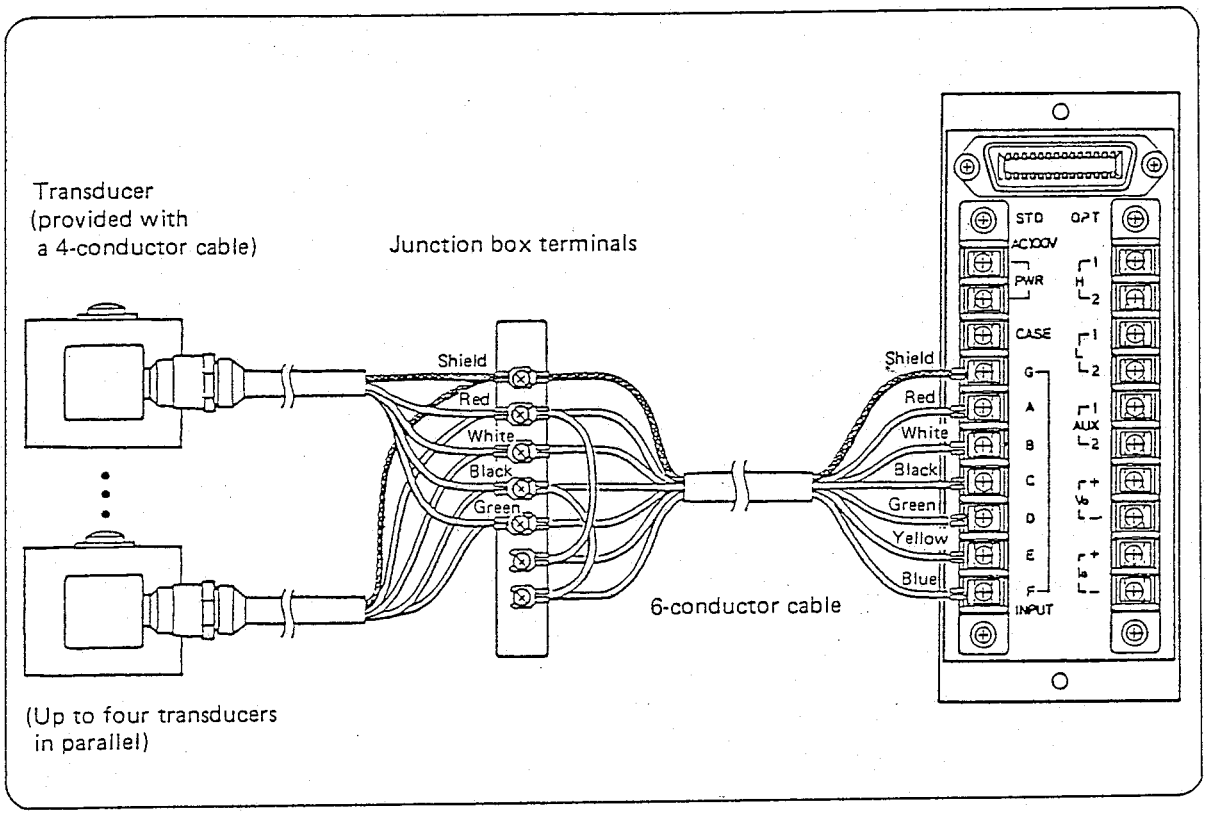
- Make power connection and power switching on only in the last.
- Make firm connection to the terminal board by using press fit terminals or arrowshape tips. Incomplete connection may cause not only irregular operation but also a trouble.

Press fit terminal

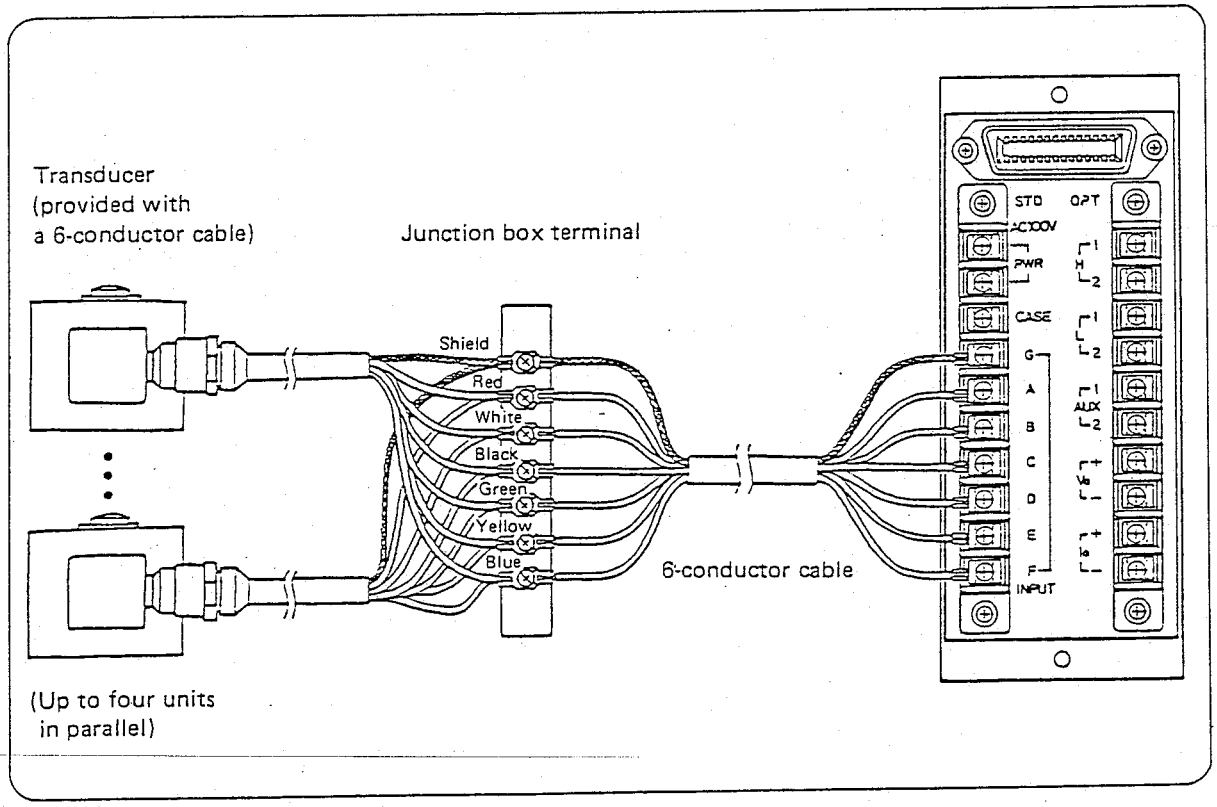


■ How to make connection by using a junction box

- How to connect a transducer provided with a four-conductor cable



- How to connect a transdueer provided with a six-conductor cable



- **Output available when transducers are connected in parallel**

This instrument is connectable to up to four strain gage type transducers in parallel having 350Ω bridge resistance, providing that these transducers are of the same model (providing the same capacity and sensitivity).
A load factor in parallel connection is expressed by [total load ÷ total capacity], and all the transducers connected can be treated as one transducer.

EXAMPLE

Suppose that three units of 10-ton capacity load cells (LC-10TE) supports a 25-ton load. What is voltage output?
The three units respectively provide 2mV/V rated voltage output.

Total capacity.....10 tons x 3 units = 30 tons

Load factor..... $\frac{25 \text{ tons}}{30 \text{ tons}} = \frac{5}{6}$

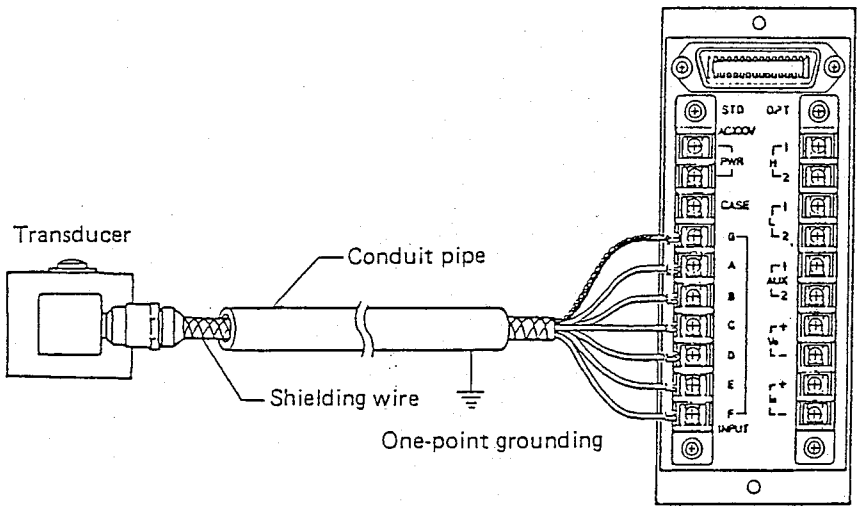
Voltage output can be calculated as:

$$2\text{mV/V} \times \frac{5}{6} \fallingdotseq 1.67\text{mV/V}$$

PRECAUTIONS — when connecting transducers

When using the instrument where there may be much external noise, particularly pay attention to the following.

- Use as much a short cable as possible, and use a shielded cable for it. Also, ground the shielding wire at one point without fail.
- In case the input cable is installed either crossing or in parallel with a power cable, cover the power cable by a conduit pipe or alike. If it cannot be done, cover the input cable by a conduit pipe or alike and ground the cable at one point.



3. How to operate

After having made sure that there is no erroneous connection, put the power switch (PWR) on (at which time the pilot lamp is lighted), and perform preheating for 10 to 15 minutes.

Bring the transducer's load or weight to measure to the initial condition. (In an ordinary case, a load or weight to measure is 0.)

Connect a digital voltmeter to the + and — terminals of the MONITOR. If there is a monitor meter having been built in, make use of the meter. Here, note that the monitor meter indicates a scaled physical quantity, but an output value from the monitor terminal is in voltage.

*Auto Zero starts

Initial balancing

Turn the ZERO and FINE trimmers so that monitor output or the monitor meter value becomes 0. By having turned the SPAN trimmer fully clockwise at this time, higher accuracy of zero point adjustment can be achieved.

Actual load calibration

Sensitivity adjustment (calibration)

Adjustment by using the built-in CAL

When there is a known usable load, apply it to the transducer, and adjust monitor voltage by using the sensitivity adjusting trimmers (SPAN and FINE).

When it is impossible to perform actual load calibration, make adjustment by using the built-in CAL. While depressing the calibration switch, turn the sensitivity adjusting trimmers (SPAN and FINE) to adjust monitor voltage.

*Comparator level setting

Measurement
(Measurement can be started upon a finish of the above adjustments.)

Note: Items with * are optional equipments.

4. Adjustment

- Putting the power switch on
- Only after making sure that there is no erroneous connection, put the power switch (PWR) on.
- The instrument is operable immediately after the power switch is put on. However, perform preheating for 10 to 15 minutes to secure performance stability.

- Initial (ZERO) balancing
- Connect a digital voltmeter to the monitor terminals (MONITOR) on the front panel.
- Make sure that no load is applied to the transducer.
- Preliminarily turn the sensitivity adjusting trimmer (SPAN) fully clockwise.
- Turn the zero point adjusting trimmers (ZERO and FINE) so that the digital voltmeter indicates 0.000V.

- Sensitivity (SPAN) adjustment

○ Adjustment by using an actual load

- Apply a known load (weight to measure) to the transducer, and turn the sensitivity adjusting trimmers (SPAN and FINE) so that a digital voltmeter reads a desired value.

EXAMPLE

When using one unit of transducer (load cell) and applying 100kgf load to it, 5V output is wanted. But, a usable weight is limited to 80kgf.
How to make adjustment in this case . . . . .

Where 5V output is obtained with a 100kgf load, output (xV) with a 80kgf load can be calculated by:

$$\frac{80}{100} = \frac{x}{5} \quad \text{Then,} \quad x = \frac{80 \times 5}{100} = 4$$

Accordingly, so adjust that 4.00V output is obtained when a 80kgf weight is applied.

Note however that unless a weight close to the maximum weight to measure is utilized, measuring accuracy deteriorates.

o Adjustment by using the built-in calibration value (CAL)

- Make sure that no load is applied the transducer.
- While depressing the calibration switch (CAL) on the front panel, turn the sensitivity adjusting trimmers (SPAN and FINE) so that desired monitor voltage is obtained.

NOTE: The calibration voltage value is of a value specified in your order, and it is described in code numbers on the name plate on the side of the instrument. (Refer to Page 17.)

EXAMPLE

By using 1.0mV/V calibration voltage and a load cell (LC-100kg) having rated capacity of 100kgf, 10.00V output is wanted when a 50kgf load is applied, provided that this load cell's rated voltage output sensitivity* is 1.998mV/V.

As this load cell's rated (i.e. with 100 kgf) voltage output sensitivity is 1.998mV/V, voltage output sensitivity with a 50kgf load can be calculated as:

$$1.998 \times \frac{50}{100} = 0.999 \text{ (mV/V)}$$

Because 10.00V output is wanted by using 0.999mV/V voltage output sensitivity, output voltage xV against 1.0mV/V calibration voltage can be calculated as:

$$0.999 : 10.00 = 1.0 : x$$

$$x = \frac{10.00}{0.999} = 10.01$$

Accordingly, adjust monitor output voltage to 10.01V by depressing the calibration switch.

*Rated voltage output sensitivity: A transducer's specific value which is described in its inspection certificate.

CAUTION

- This instrument's calibration value is put upon input when outputted by depressing the calibration switch (CAL).
- Finer accuracy can be achieved by repeating several times initial balancing and sensitivity adjustment in the alternative manner.

- Adjustment of current output

The same trimmer is used to adjust current and voltage output. It is therefore impossible to adjust both of current and voltage output to optional values, but it is wanted to give priority to either one of them.

For your information, current output is 4 to 20mA against voltage output of 0 to 10V in our standard specifications.

o Adjustment by giving priority to current output

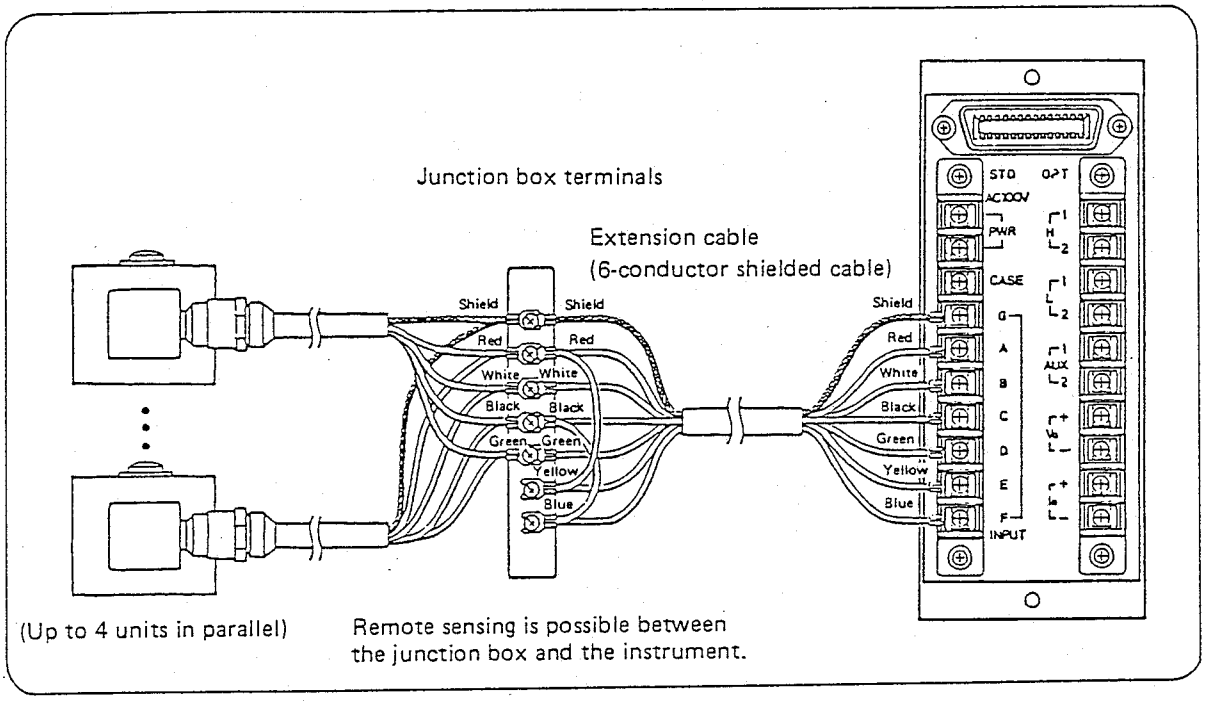
- Disconnect the digital voltmeter from the monitor terminal and connect an ammeter to the Io terminal on the rear terminal board.
- Make adjustment in the same manner as described in Initial (zero) balancing (Page 7) and Sensitivity (SPAN) adjustment (Page 7). Here, 0.00V corresponds to 4.00mA and 10.00V to 20.00mA.

5. Various functions

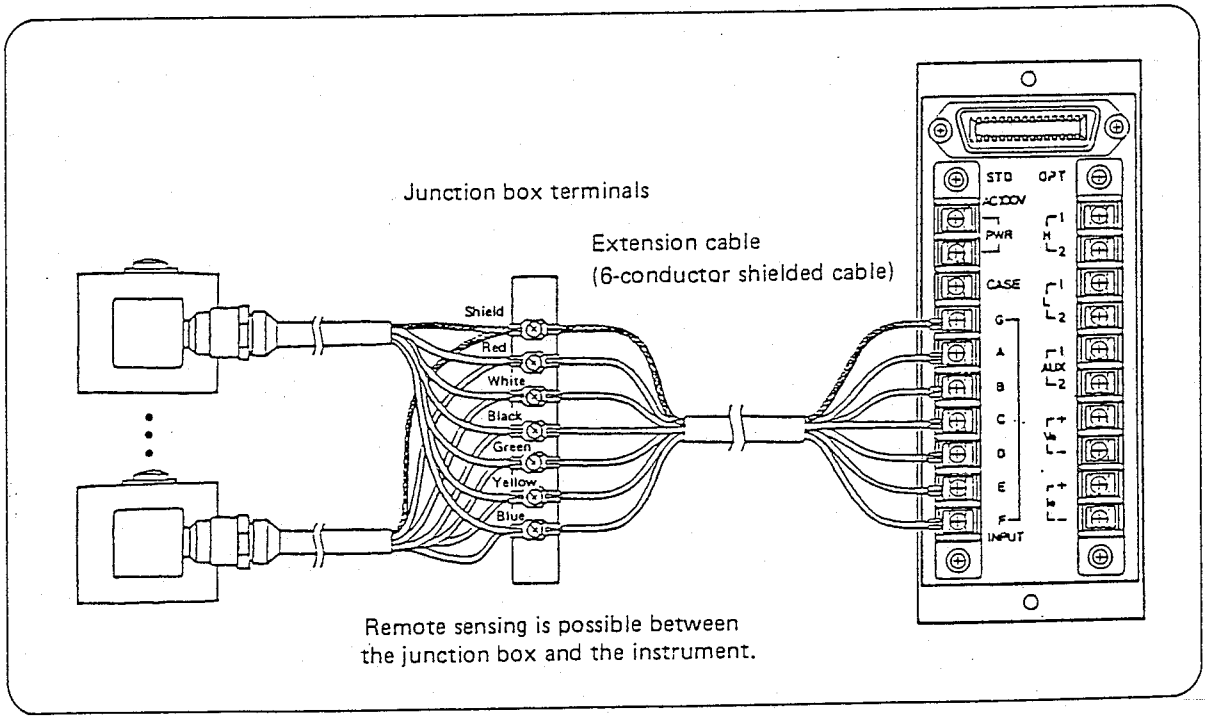
- Remote sensing

When a relay cable is used between the instrument and a transducer, cable resistance grows in proportion to a cable length, thereby causing a measurement error. It is so because bridge voltage applied to the transducer gets accordingly lesser. To prevent it, the remote sensing method is utilized.

- Transducers provided with a 4-conductor cable



- Transducers provided with a 6-conductor cable



CAUTION

When a cable length is extended so much so that cable resistance grows larger than values in the below table, remote sensing becomes impossible.
For remote sensing, cable resistance must be smaller than those contained in the below table.

Voltage applied to the bridge	Connectable transducers	Cable resistance (Max.)
DC 10V	350 4 units in parallel 350 1 unit 120 1 unit	12Ω 48Ω 16Ω
DC 4V	350 4 units in parallel 350 1 unit 120 1 unit	95Ω 200Ω 150Ω

- **Monitor meter (option)**

The monitor meter (analog or digital indication) is optionally available upon your order. Values the monitor meter indicates can be scaled to your specified physical quantity unit with monitor output (output from the MONITOR terminal) as a base.

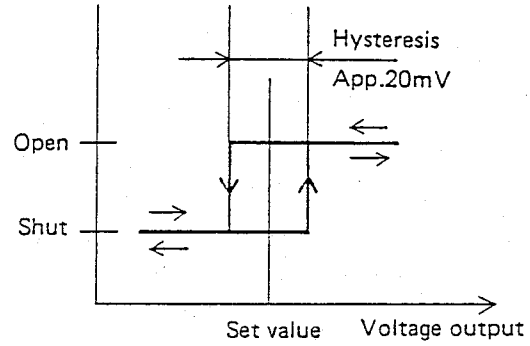
- **Comparator (option)**

From one- to three-stage comparator output is optionally available. The following B and M contact types are available for your selection.

	Power switch off	Power switch on	
		Voltage output Set value	Voltage output Set value
B type	Open	Shut	Open
N type	Open	Open	Shut

The B type is suitable for a fail-safe circuitry by which an overload condition is caused in case of power switch off, or damage to the relay contacts or to the coil or of disconnection of wiring.
The M type is suitable on the contrary for a circuitry by which an alarm is produced when a set value is exceeded.

Hysteresis is provided in order to prevent chattering of contact output inducible to noise.



○ How to set a comparator level

- Depress the CHECK switch H, and the H level value is outputted to the monitor output terminal and monitor display. Use the trimmer H and make adjustment.
- Depress the CHECK switch L, and the L level value is outputted to the monitor output terminal and monitor display. Use the trimmer L and make adjustment.
- Depress the CHECK switch H and L simultaneously, and the X level value is outputted to the monitor output terminal and monitor display. Use the trimmer X and make adjustment.

The monitor terminal output is in the voltage level and monitor display shows scaled physical quantity as precedingly stated.

EXAMPLE

It is wanted to get contact output respectively at 50%, 100% and 120% when weighing a maximum 8-ton load by using a load cell having 10-ton capacity, providing that the instrument's output voltage is 5V against a 8-ton load.

H level → 6V x 120% = 6V
Z level → 5V x 100% = 5V
L level → 5V x 50% = 2.5V

Caution: The maximum settable value is 10V for all the levels.

• BCD output (option)

The BCD output function is a function whereby a value of the digital indicator is outputted on the TTL level.

	Signal	Signal contents	Kind of signal
Input	$\overline{\text{HOLD}}$	Holds a indication value immediately before signal "0" enters, and holds data.	Negative logic signal from +5V to 0V, or contact signal (shorted with 0V)
Output	DATA (1 to 10000)	BCD (1-2-4-8) parallel output Positive logic	TTL level Fan-out LS1
	POL	Logic "1" with positive signal Logic "0" with negative signal	
	OVER	Logic "1" with overinput	
	Termination of measurement	When 1999 is indicated Negative logic pulse — width app. 10 sec When 10000 is indicated Positive logic pulse — width app. 2 msec	

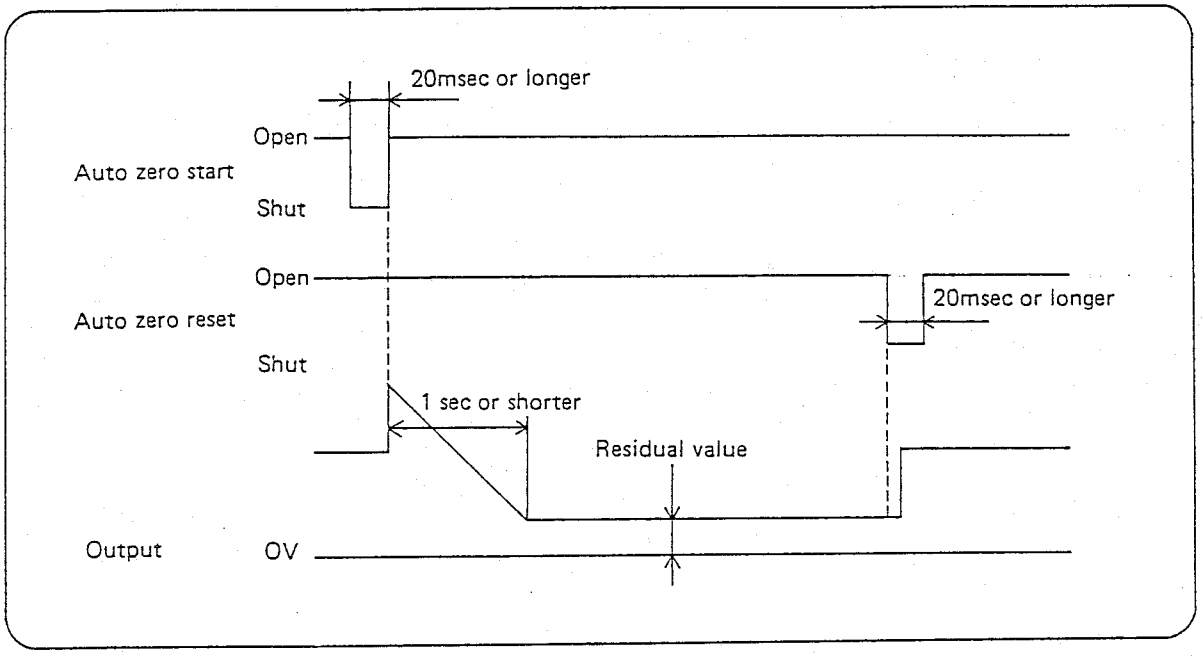
Termination of measurement

When 1999 is indicated: Renewal of data is performed within 1.5msec to follow outputting of a measurement termination signal.

When 10000 is indicated: A measurement termination signal is outputted immediately upon data renewal.

- Auto. zero (option)

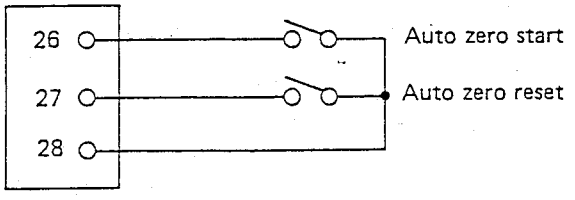
The auto. zero function is such a function whereby the automatic zero adjustment circuit functions to cause 0V output upon receiving an automatic zero start signal.
A standard of this function is that the automatic zero adjustment circuit functions when a zero start signal changes from SHUT to OPEN.



The automatic zero adjustment circuit is put off by an auto. zero reset signal. Perform initial adjustment at this reset condition. (The reset condition is always available when the power switch is put on for the first time.)
The instrument has a built-in power back-up. By putting the power switch on again within 30 minutes following power putting off, the automatic zero adjustment circuit maintains the status existed before the power switch was put off.

It functions through the 26, 27 and 28 pins in the digital I/O socket provided on the rear of the instrument.

Digital I/O connector pin numbers



+12V is applied to No. 26 and 27 pins.
Synchronous current of a SHUT signal is 0.5mA or lower.

CAUTION

- If an auto. zero start signal is put in when a transducer's load is fluctuating or there is electrical noise involved in input, there may be a large residual value. This residual value varies due to bridge exciting voltage. Take care not to cause a large residual value.

Bridge exciting voltage	Residual value
DC 10V	±1 V/V or less
DC 4V	±2 V/V or less
DC 2V	±4 V/V or less

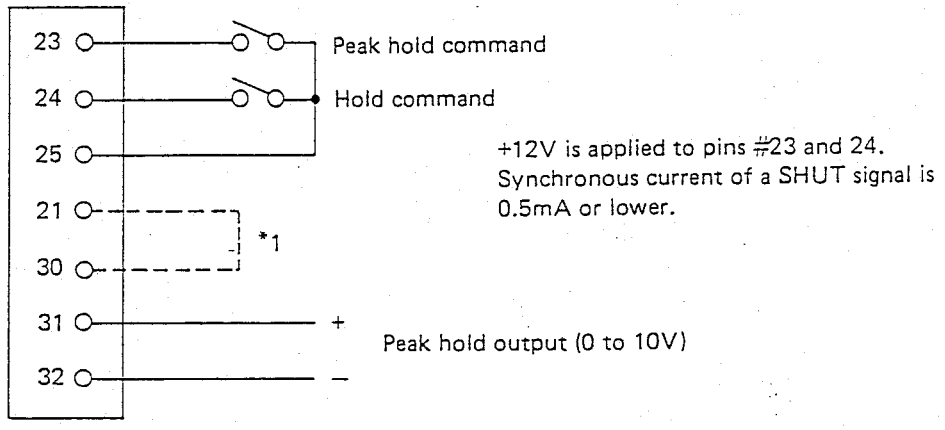
Note that there are such types of contact signal as causing chattering at a time of opening and shutting, which can be a cause of erroneous operation.

- Peak hold (option)

The peak hold function allows to measure the maximum value when a transducer's load is fluctuating.
For the models equipped with a comparator, it is standard that contact output is generated through comparison of peak hold output signals.
For those models equipped with an indicator (meter or digital indicator), it is standard that peak hold output signal is indicated.

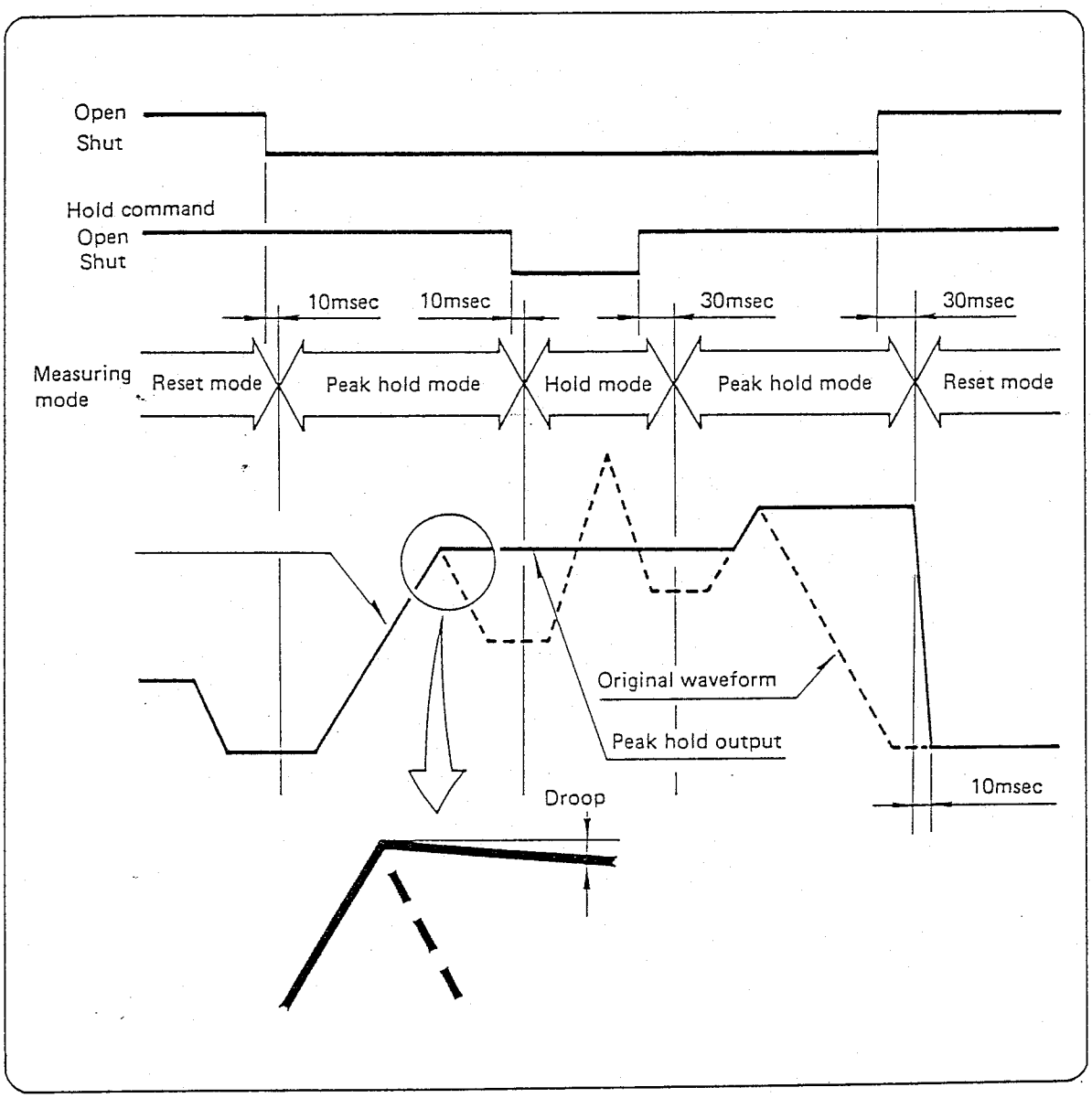
It functions through the below figured pins of the digital I/O connector provided on the rear of the instrument.

Digital I/O connector pin numbers



If a peak is held for a long time, a measured value comes to change. In order to prevent it, connect 21 and 30 in the above figure, thereby making it possible to hold a digital value — in the case of a model equipped with a digital indicator.
When it is wanted to monitor a comparator's set value, however, make 21-30 open or cause the reset mode.

Peak hold command



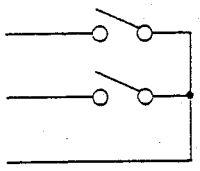
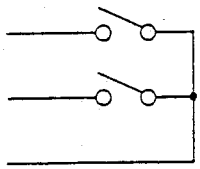
NOTE) With the original waveform in the above, voltage output and current output are respectively outputted from the Vo + — and Io + — terminals.
Sensitivity difference is adjusted to be below ±0.3% between peak hold output and original waveform.

- Digital I/O connector

For the model equipped with BCD output, auto. zero and peak hold functions, respective signals are inputted and outputted through the digital I/O connector.
As no connecting cable is attached, provide the below connector for wiring.

Connector usable: Hirose Male Connector P-1634BA
Top touch lock type plug case P-1634A-CA (20)

Digital I/O connector pin wiring table

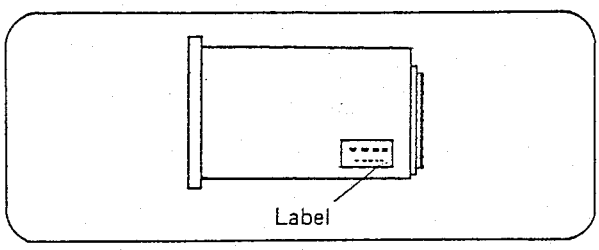
Pin No.	Signal	Function
1	DATA 1	Positive logic CMOS output
2	DATA 2	Positive logic CMOS output
3	DATA 4	Positive logic CMOS output
4	DATA 8	Positive logic CMOS output
5	DATA 10	Positive logic CMOS output
6	DATA 20	Positive logic CMOS output
7	DATA 40	Positive logic CMOS output
8	DATA 80	Positive logic CMOS output
9	DATA 100	Positive logic CMOS output
10	DATA 200	Positive logic CMOS output
11	DATA 400	Positive logic CMOS output
12	DATA 800	Positive logic CMOS output
13	DATA 1000	Positive logic CMOS output
14	DATA 2000	Positive logic CMOS output
15	DATA 4000	Positive logic CMOS output
16	DATA 8000	Positive logic CMOS output
17	DATA 10000	Positive logic CMOS output
18	POL	For positive input, Logic "1" For negative input, Logic "0" CMOS output
19	OVER	For overinput, Logic "1" CMOS output
20	MEASUREMENT TERMINATION	Approx. 2msec positive pulse is generated upon a finish of A-D conversion
21	$\overline{\text{HOLD}}$	When this terminal is put under Logic "0", data at that time is held.
23	PEAK HOLD COMMAND	 Peak hold at SW-ON (Drive enable by transistor. Synchronous current 0.5mA)
24	HOLD COMMAND	Holt at SW-ON (Drive enable by transistor. Synchronous current 0.5mA)
25	PH COMMON	
26	AUTO ZERO START	 Auto zeroing at the edge of SW-ON to OFF (Drive enable by transistor)
27	AUTO ZERO RESET	Reset at the edge of SW-ON (Drive enable by transistor)
28	AZ COMMON	
29		
30	DH COMMAND	By connection to $\overline{\text{HOLD}}$ terminal, displayed data is held in peak hold function.
31	+ ┐ PEAK HOLD OUTPUT	Peak-held voltage output
32	− ┘	Peak-held voltage output
33	+5V	Pull-up power
34	0V	

CAUTION

A model not provided with BCD output has no pins from No. 1 to 22, 33 and 34.
A model not provided with auto. zero function, has no such pins as from 26 to 28.
A model not provided with peak hold function has no such pins as from 23 to 25, and from 30 to 32.

6. Various built-in functions indicated by code numbers

Various functions are indicated by code numbers on the name plate on the side of the instrument.



WGA-200A-SCFVALMET

Contents / Code	S Supply voltage	C Calibration signal	F Frequency characteristic	V Output voltage	A Current output	L Comparator	M Monitor	E Bridge excitation voltage	T Additional function
0	———	0.25 mV/V	DC to 1Hz			No	No	DC 10V	No
1	AC 90 to 121V	0.5 mV/V	DC to 10Hz	Non-insulation type	Non-insulation type	1-step B type			Auto zero
2	———	1.0 mV/V	DC to 30Hz	Insulation type	Insulation type	2-step B type	Meter indication	DC 2V	Peak hold
3	AC 180 to 242V	1.5 mV/V	DC to 100Hz			3-step B type	Indicates 1999		
4		2.0 mV/V	DC to 200Hz			1-step M type	Indicates 1999 BCD output	DC 4V	Auto zero Peak hold
5			DC to 500Hz			2-step M type	Indicates 10000		
6						3-step M type	Indicates 10000 BCD output		

EXAMPLE

WGA-200A-120113302

- Peak hold
- B.V. DC 10V
- Monitor indicates 1999
- Comparator 3-stage B type
- Current output non-insulation type
- Current output non-insulation type
- Frequency characteristic DC to 1Hz
- Calibration value 1.0mV/V
- AC 100V power supply

7. Specifications

Signal Conditioner

Number of channels:	1
Applicable transducer:	350Ω strain gage transducer (up to 4 units can be connected parallelly.)
Bridge voltage (BV):	10V dc (with remote sensing), or 4V or 2V dc (as specified on order)
Input cable:	0.5mm² x 6-conductor shielded cable, 100m long max.
Input mode:	Balanced differential input
Input resistance:	1MΩ min.
Initial adjustment:	Zero: ZERO ±1.5mV/V 18-turn trimmer (also for tare weight correction) FINE ±0.1mV/V 18-turn trimmer Sensitivity: SPAN 1/1 to 1/100 18-turn trimmer FINE 1/1 to 9/10 18-turn trimmer Initial adjustment is performed by voltage output.
Adjusted value monitoring:	Through the monitor terminal on the front panel
Rated output:	Voltage: 10V (with 1mV/V and BV = 10V), or 4V (with 1mV/V and BV = 4V) or 2V (with 1mV/V and BV = 2V) (Unbalanced load of 5kΩ min.) Current: 4 to 20mA (to voltage output of 0 to 10V) (load resistance 400Ω max.)
Negative output:	−7V or 0mA
Output cable:	0.5mm² x 2-conductor shielded cable, 10m long max.
Non-linearity:	Within ±0.05% fs
Calibration value:	0.25, 0.5, 1, 1.5 or 2mV/V (0.5%) (as specified)
Noise:	SN ratio better than 60dB
Stability:	Zero: ±0.15μV/V/°C, ±0.25μV/V/day Sensitivity: ±0.01%/°C, ±0.01%/day
Frequency response:	DC to 1, 10, 30, 100, 200 or 500Hz (as specified)
Operating temperature range:	−10 to +50°C
Allowable temperature range:	−30 to +50°C
Operating humidity range:	10 to 90% R.H. (no dew condensing)
Allowable humidity range:	10 to 90% R.H. (no dew condensing)
Housing case:	Dust- and water-repellent. Isolated from common mode signal in DC-like situation) Withstand voltage 500V
Input/output plugs:	10P x 2, resin terminals; rated at 250V ac 10A; withstand voltage 500V dc/min.
Power requirements:	100V or 200V ac ±10% (as specified), 0.1A max.
Dimensions & weight:	60 x 150 x 250mm, approx. 1.5kg

Options

Isolated Voltage Output

Output:	Same as conditioner output
Output cable:	0.5mm² x 2-conductor shielded cable, 10m long max.
Non-linearity:	±0.1% fs
Withstand voltage:	500V dc for one minute
Noise:	Spike: 100mV (typical) Carrier: 0.1% fs (typical)

Isolated Current Output

Output:	Same as conditioner output (load resistance 300Ω max.)
Output cable:	0.5mm² x 2-conductor shielded cable, 10m long max.
Non-linearity:	±0.1% fs
Withstand voltage:	500V dc for one minute

Comparator

Signal type:	Analog
Comparison system:	Level type
Comparison level:	1, 2 or 3 steps (as specified)
Level setting:	18-turn trimmer for each step (setting range 0.1 to 10V)
Set value monitoring:	Possible by the monitor terminal and monitor value selector button on the front panel
Setting accuracy:	±0.3% fs
Hysteresis:	±0.2% fs
Contact output mode:	Excitation close → Non-excitation open (B mode), or Excitation open → Non-excitation close (M type) as specified (The above indicates the operation of contact at the time when a signal crosses the comparison level from the lower level to the higher.)
Contact capacity:	250V ac 1A, 50V dc (resistive load)
Response time:	Approx. 0.1 sec

Meter Indicator

Meter used:	Movable coil type, edge-wise meter
Accuracy:	Class 2.5
Scale:	0 to 100 in 25 divisions, developed length 34mm
Pointer:	Straight type, black
Indication area:	50 x 18cm
Pointer movement:	Transverse

Digital Indicator

Display:	Up to 1999 or 19999 and "—"; red 7-segment LEDs, character height 8.3mm
Display sensitivity:	1999/10V or 10000/10V (as specified)
Maximum value displayed:	1999 or 10000
Overrange indication:	By blanking of each digit
Decimal point & unit:	Position of decimal point can be specified when ordering. (Unit is indicated by carved marking or a label as specified.)
Display accuracy:	±(0.1% of indicated value + 1 digit) ±100ppm/°C
AC conversion system:	Double integral system
Sampling:	Approx. 4 times/sec

Digital Indicator & BCD Output

Display:	Refer to item "Digital Indicator."
External holding:	Negative logic signal of 0V to +5V or contact signal
Blanking:	Initiated by open collector input or contact signal "ON"
Measured data:	BCD (1-2-4-8) parallel output, TTL level (positive logic)
Polarity:	Binary code; logic "1" at positive polarity
Overinput:	Binary code; logic "1" at overinput
Termination of measurement:	By negative pulse of approx. 10μs width for "1999" display By positive pulse of approx. 2ms width for "100000" display
Output cable:	1m long max.

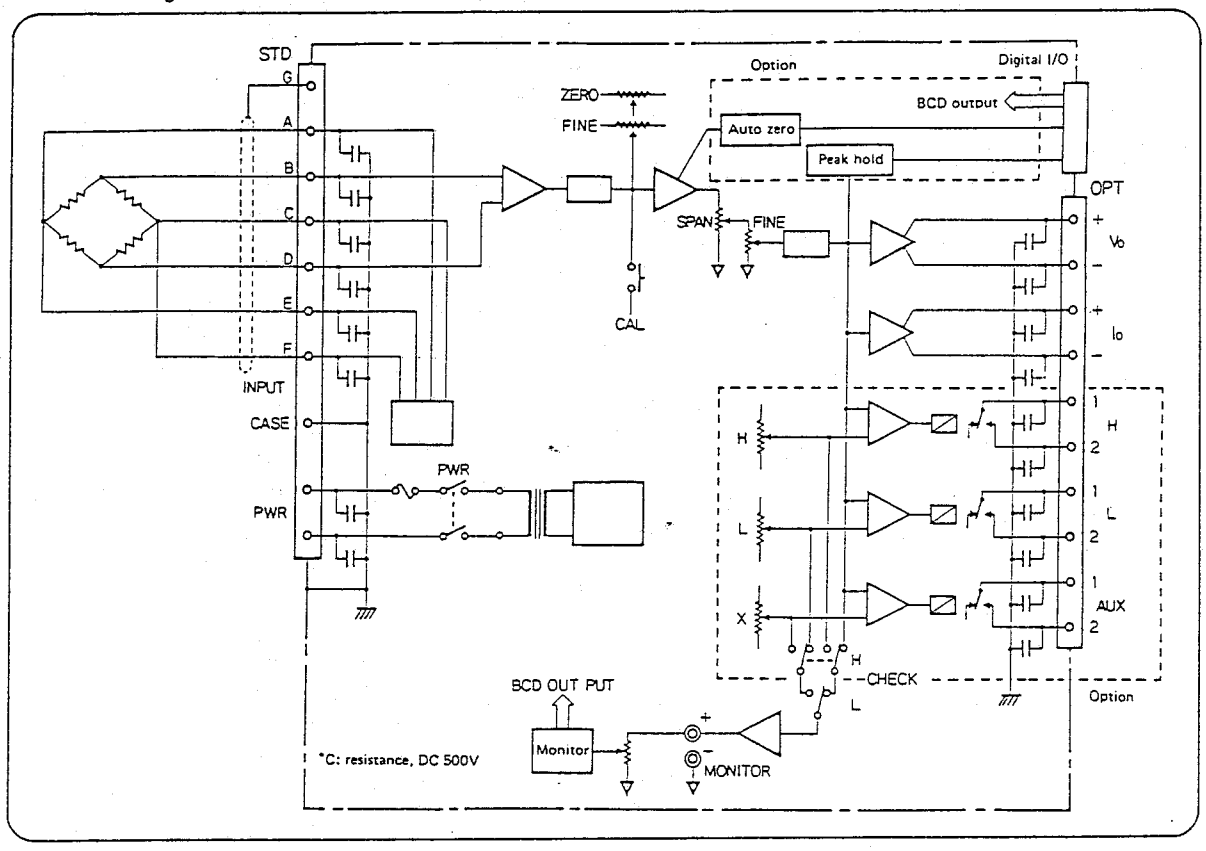
Automatic Zeroing Function

Balancing range:	Within ±0.5mV/V
Balancing time:	Within 1 sec
Residual:	1μV/V max.
Memory backup:	Approx. 30 minutes or as specified

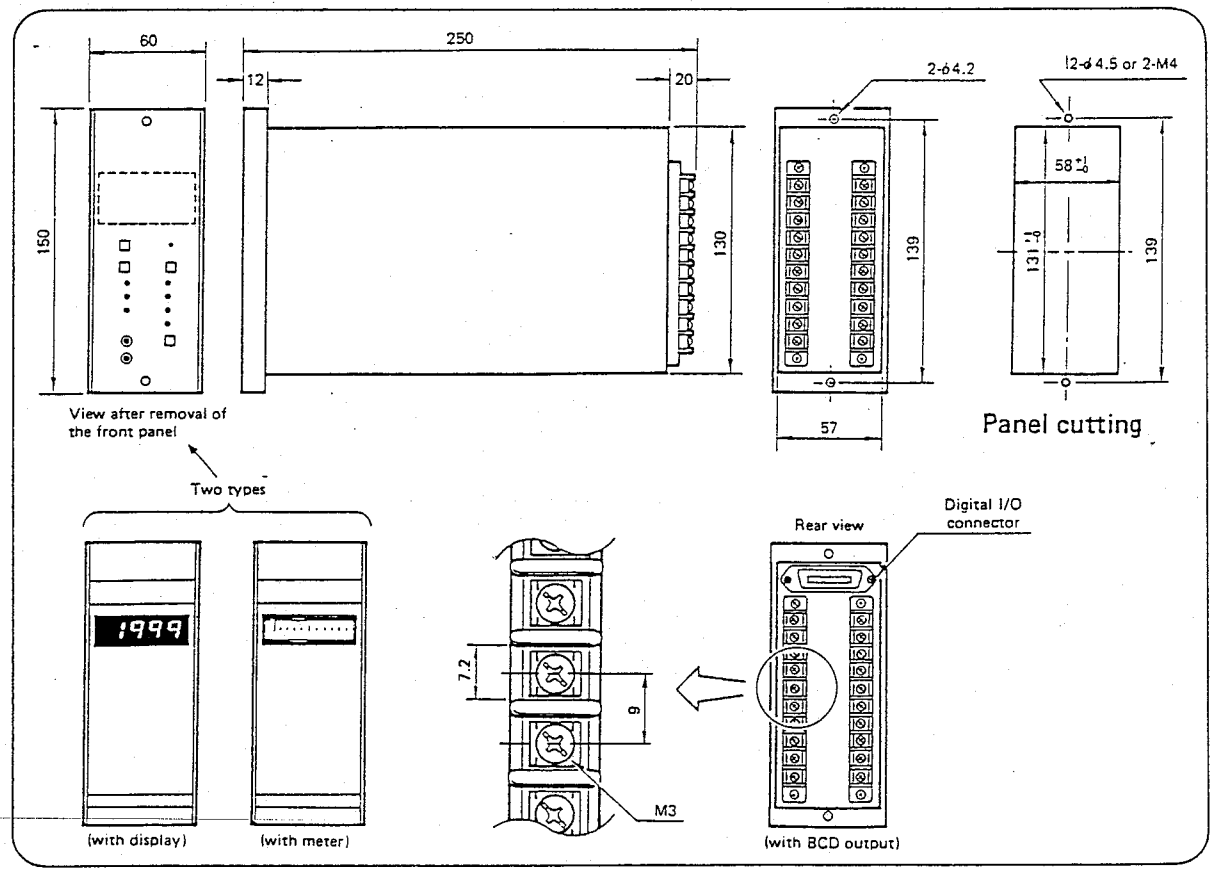
Peak Hold Function

Droop:	5mV/sec
Response speed:	10V/ms

■ Block diagram



■ External dimensions



8. Troubleshooting

Should a malfunction occur, do not immediately take it as a trouble, but please check the instrument by referring to the below table. If erroneous operation is the cause, please read this instruction manual carefully once more and operate the instrument in the correct manner.

	Trouble	Cause	Remedy	Refer to page
Power	No power supply	• The power cable is disconnected. • Inferior power cable connections.	• Plug the cable to the power outlet. • Inspect power cable connections.	3 3
Initial balancing	The ZERO trimmer does not function. (Or, the Auto ZERO trimmer does not function.)	• The SPAN adjusting trimmers is at its left turning end. • Inferior connection of a transducer. • Disconnection of a transducer. • Inferior wiring, and inferior auto ZERO on/off switch.	• Turn the SPAN adjusting trimmer clockwise. • Inspect the transducer's connecting terminal. • Replace the transducer. • Inspect wiring, and auto ZERO on/off switch.	7, 8 3, 4 3, 4 3, 4, 7
	Impossible initial balancing. (Or, impossible auto ZERO balancing.)	• The transducer's extensive initial unbalancing. • An excessively large load is applied to the transducer.	• Replace the transducer. • Remove such a load.	3, 4
	The zero point drifts with no load applied.	• Inferior insulation of the transducer. • External noise • Vibration affecting the load mount base.	• Replace the transducer. • Remove the cause of noise. • Remove the cause of vibration.	3, 4 1, 5
Measurement	No output (indication).	• The SPAN adjusting trimmer is at its left turning end. • Inferior contact of connecting terminals. • No load is sensed by the transducer.	• Adjust the SPAN adjusting trimmer in the correct manner. • Inspect the connecting terminals and fasten them. • Inspect the sensor of the transducer.	7, 8 3, 4
	Depressing the CAL switch causes no (or insufficient) output (indication).	• Inferior adjustment of the SPAN adjusting trimmer. • Inferior sensitivity adjustment. • Improper bridge voltage. • Lower power voltage. • A 220V model used on 100V.	• Do adjustment once again. • Do sensitivity adjustment once again. • Inspect voltage. • Confirm power voltage. • Meet the power requirement.	7, 8 7, 8 1 1
	Unstable output (indication).	• External noise. • Inferior insulation of the transducer. • Unstable measurement results. • Vibration affecting the load mount, etc.	• Remove such noise. • Replace the transducer. • Perform measurement after a load gets stable. • Remove the cause of vibration.	1, 5 3, 4

	Trouble	Cause	Remedy	Refer to page
	Output (indication) is not proportionate to a load.	• A horizontal force is affecting the load cell. • Inferior mechanism of the load sensing section. • Inferior transducer	• Amend the load cell installation method. • Amend the load sensing mechanism. • Replace the transducer.	3, 4
Comparator	Over 100% level setting is impossible.	• A level is set to exceed 10V.	• Set it to be lower than 10V (for example, at 5V).	
	Depressing CHECK·H, L causes display goes out.	• A level has been set to exceed the number of digits to display.	• The digital display goes out when the number of digits to display is exceeded by input. Readjust Trimmers, H, L and X.	11
	Does not function.	• An operation level is lower than a set level. • Erroneous wiring.	• Reset a level. • Inspect the wiring.	11
BCD output	BCD output cannot be taken in.	• Improper take-in load. • Inferior circuit wiring.	• It is TTL level output, therefore recondition the circuit. • Inspect the circuit wiring.	12
Peakhold	No peakhold is possible. Abnormal peakhold value.	• Inferior circuit wiring or inferior command switch. • External noise is held.	• Amend the circuit or replace the switch. • Remove external noise.	16

* Should the above remedies fail to put the instrument in order, immediately discontinue using the instrument and contact your nearest service station.

■ After purchase service

• Guarantee certificate

The certificate is necessary to receive after-purchase service. Examine the contents and keep it in your custody.

• Repair

If and when inspections and remedies performed according to the troubleshooting instructions fail to put the instrument in order, immediately discontinue using the instrument and contact your nearest service station for necessary repair.

• Repair during the guarantee period

Repair will be performed according to the terms of the guarantee certificate.

• Repair with the expired guarantee certificate

Repair will be performed upon request when it is deemed that such repair can put the instrument in order. (Chargeable)

• Repair parts for this instrument are stocked for 7 years, minimum, after discontinuity of the manufacturing.