

Specifications

Digital Indicator

CSD-815B

Spec. No. EN382815B-L

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1. General

The instrument is a digital indicator designed for the strain gage applied transducers with the panel size of 96 mm×96 mm.

2. Specifications

2-1. Specifications for analog section

- Bridge power supply DC5 V±0.25 V within 60 mA (Changeable to DC2.5 V)
- Applicable transducers Up to 4 pieces of strain gage applied transducers (350Ω) are connectable.
- Input range F.S. setting is available at the input range from ±0.4 mV/V to ±3.1 mV/V. (When bridge power supply is DC5 V)
- Output range DC±10 V Load resistance is 5 k-ohm or more (F.S. setting is available in Function.)
- Output times Changeable to 4 times/s, 20 times/s, 50 times/s or 100 times/s (Synchronous with display rate.)
- Output resolution Approx. 1/12 000
- Zero adjustment range ±2.4 mV/V
- Non-linearity
 - Display 0.01 %F.S.
 - Output 0.05 %F.S.
- Temperature coefficient
 - Zero point ±0.5 μV/°C
(Input conversion,
When F.S. is set at the input from ±0.5 mV/V to ±3.1 mV/V)
- Sensitivity ±0.01 %F.S./°C
(Input conversion,
When F.S. is set at the input from ±0.5 mV/V to ±3.1 mV/V)
- Input noise ±0.6 μVp-p or less
(With the default setting of digital filter and stabilized filter)
- Input filter 2 Hz (Changeable to 10 Hz, 100 Hz, 2 kHz)
- A/D sampling 100 times/s
- CHECK Approx. 0.3 mV/V
(Setting with the interval of about 0.1 mV/V is available in the range from approx. 0.1 mV/V to 1.5 mV/V)
* The extension cable is applied to Minebea's standard cable CAB-502(4 cores) within the length of 30 m.
* Not applicable when the zener is used.
- Analog peak hold Response speed : Corresponds to the characteristics of input filter
Accuracy : 0.1 %F.S. or less

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2-2. Specifications for digital section

- Load display
 - Display range -99 999 to 99 999
 - Display increment 1 (Changeable to 2, 5 or 10)
 - Display 7 segment red LED, with 17 mm character's height
 - Over display “-OL” displays at the time of minus(-) over, and “OL” displays at the time of plus (+) over.
- Status display SEL.1, SEL.2, ◎, HOLD, CHECK, PEAK, BOTTOM, A/Z
- Judgement display S0, S1, S2
- Display rate 4 times/s (Changeable to 20 times/s, 50 times/s or 100 times/s.)
- Decimal point display Changeable to non, 10¹, 10², 10³ or 10⁴ changeable.

2-3. Front panel sheet key function

- FUNC. Change of Function mode
- ZERO Zero set
- S1 / ◀ / S0 S1 set value display / Carry on set value / S0 set value display by pressing with the shift key together at the same time.
- S2 / ▲ S2 set value display / Increment of set value
- PEAK/TRACK / ◎A/Z Change of Track and Peak hold, or Bottom hold and Peak bottom hold / Status display, Tare weight cancellation clear is executed when ◎ lights on (It Can be changed by the function.)
- RESET / ◎A/Z OFF Reset of peak value During ON, the display is fixed to zero(0). / Status display, Tare weight cancellation clear is executed when ◎ lights on (It can be changed by the function.)
- CHECK ON/OFF for check value
- ENTER / SHIFT Enter key / Shift key

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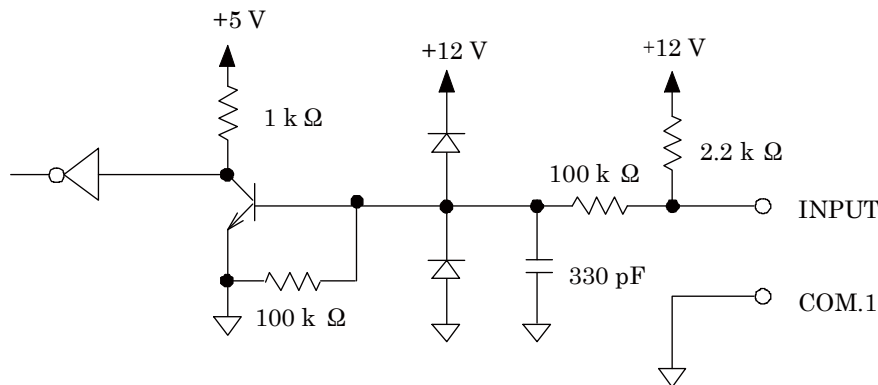
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2-4. External control function

- ZERO Same as ZERO key
*Above is a pulse input. It is effective once after a input of a pulse width for 50 ms or more. (Pulse width is changeable to 5 ms, 10 ms or 20 ms.)
- PEAK/TRACK / A/Z Change of Track and or Peak hold, or Bottom hold and Peak bottom hold / Tare weight cancellation is executed when a status indicator of ☉ lights on. (It is changed by the function.)
Open : Track
Short : Peak hold, Bottom hold, Peak bottom hold
- HOLD Hold of Display, Comparative output, BCD output, Analog output, CC-Link load output, RS-232C load output and RS-422/485 load output.
- RESET / A/Z OFF Same as RESET key, reset condition is made by short.
/ Tare weight cancellation is executed when a status indicator of ☉ lights on. (It is changed by the function.)
- SEL.1、 SEL.2 4 kinds of “Calibration data” is changed by the combination of SEL.1 and SEL.2.
*Above is level input. It become effective while a input of shortening over 50 ms or more. Only the function of A/Z and A/Z OFF is a pulse input. These are effective once by a pulse width of 50 ms or more. (Level and pulse width is changeable to 5 ms, 10 ms or 20 ms.)
- Equivalent circuit of external control input



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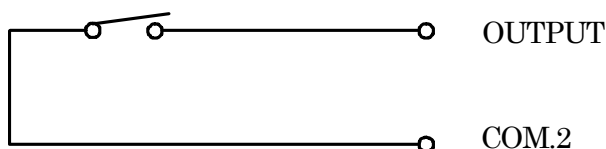
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2-5. Comparator function

- Set value -99 999 to 99 999
- Numbers of setting 3 points of S0, S1 and S2.
* "S0" is set by function command.
- Set value for hysteresis data 0 to 99 digits
- Setting hysteresis time width 0 to 9.9 s
- Hysteresis direction Selectable from "On delay" or "Off delay"
- Conversion times for comparator Changeable to 4 times/s, 20 times/s, 50 times/s or 100 times/s.
(Synchronous with display rate.)
*During the display of set value, both of the setting process and comparison process are interrupted.

2-6. Contact output signal

- S1, S2 The contact operates when reached under/over the comparator set value.
- S0 The contact operates with either condition in below by function setting.
 - FULL condition (100 % of rated load).
 - When the both of S1 and S2 are OFF condition.
 - Operates when reached under/over the S0 set value.
(Same as the comparative operation of S1 and S2.)
 - At the time of A/Z ON.
 - At the time of HOLD ON.
 - At the time of PEAK
- Contact specifications 1a contact
AC125 V 0.1 A (Resistance load)
DC30 V 0.5 A (Resistance load)
- Equivalent circuit of contact output section



2-7. Various kinds of functions

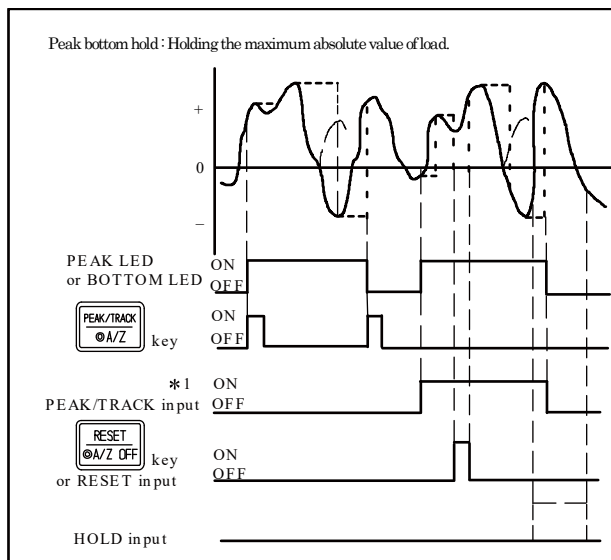
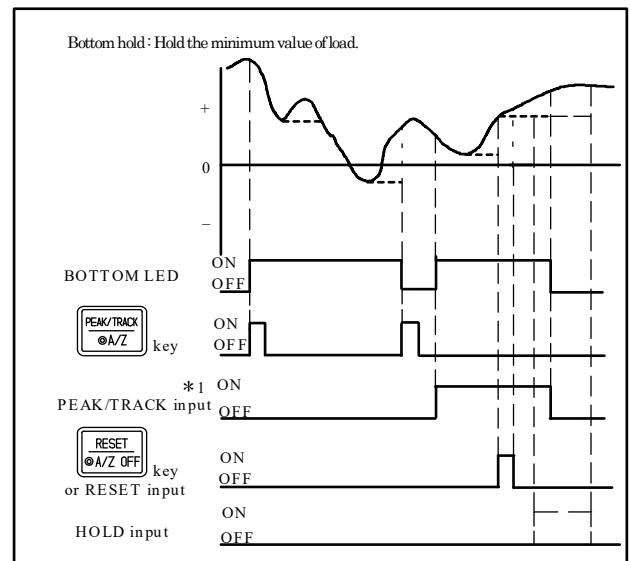
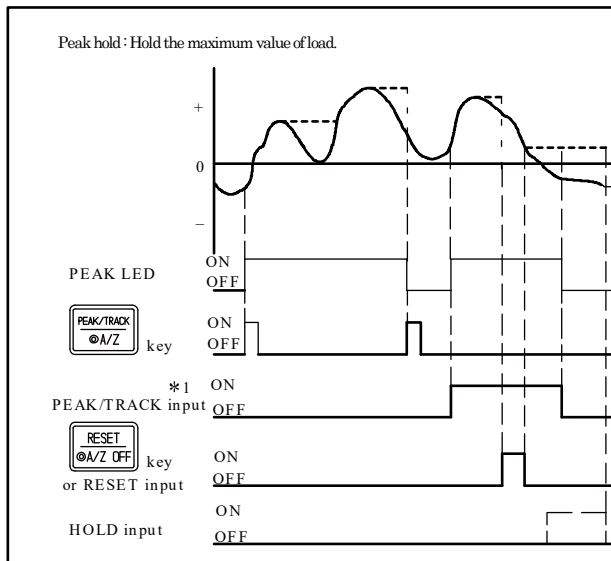
- Zero tracking Stabilizes the variation of zero point within the fixed condition.
- Digital filter Stabilizes the data by the computing process through CPU.
- Stabilized filter Only when the load variation width is within the fixed value, this strengthens/stabilizes the digital filter.
- Change of target of HOLD With the combination of "Display", "Comparative output", "Analog output" and either of optional load output by BCD interface, CC-Link interface, RS-232C interface or RS-422/485 interface, target of HOLD can be made.
- Sheet key lock Prohibition of operation of optional key.
- Selection of Peak mode 3 modes of Peak hold, Bottom hold and Peak bottom hold
Besides, the Peak hold can be selected from the two of "Digital peak hold" and "Analog peak hold".
- Change of target of analog output The target of analog output can be changed either "TRACK value/Gross weight" and "PEAK value/Net weight".

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*1 During ON of the input for PEAK/TRACK, peak hold status will not change even if "PEAK/TRACK / ©A/Z" key turns on.

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3. General specifications

- Operating temperature/humidity range
 - Temperature -10 °C to 50 °C
 - Humidity Less than 85 %RH (Non condensing.)
- Used elevation Under 2 000 m
- Pollution degree Under 2
- Overvoltage category Category II
- Power supply
 - Power supply voltage AC100 V to AC240 V (Allowable variable range : AC85 V to AC264 V)
 - Power supply frequency 50/60 Hz
 - Power consumption Approx. 9 VA (Without option, at AC100 V)
Approx. 17 VA at max.
(With option, in the range from AC100 V to AC240 V)
- Outline dimensions (W×H×D) 96 mm×96 mm×129.5 mm (Excludes protruding parts.)
- Dustproof waterproof specification
 - During the panel mount is installed, the front panel section becomes IP 65 or equivalent. (When the attached panel mounting gasket is installed.)
- Weight Approx. 500 g (Without any options.)

4. Standard specifications at the shipment

- Bridge power supply DC5 V
- Span adjustment $\pm 2\ 000$ display at the input of ± 0.5 mV/V.
- The minimum scale 1
- Analog output 0 V to ± 10.000 V at 0 to $\pm 2\ 000$ display

5. Accessories

- Instruction manual 1 piece
- Time lug fuse 1 piece (1A)
- Unit seal 1 piece
- Panel mounting attachment 2 pieces
- Panel mounting gasket 1 piece
- BCD output plug 1 piece (Attached only when optional BCD output is installed.)
- CC-LINK plug 1 piece (Attached only when optional CC-LINK output is installed.)
- CC-LINK Instruction manual 1 piece (Attached only when optional CC-LINK output is installed.)

6. Options

6-1. Current output

- P/N CSD815B-P07
- Specifications
 - Output DC4 mA to 20 mA Load resistance at 260 Ω or less
 - Non-linearity 0.05 %F.S.
 - Resolution Approx. 1/12 000
 - Over range “-OL” display at approx. DC2.4 mA and “OL” display at approx. DC21.6 mA.
*Voltage output is not available when this option is installed.

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6-2. BCD output

• P/N CSD815B-P15

• Specifications
Output

BCD 5 digits Parallel output, with polarity (POL.) applied
(Output ON with minus, and output OFF with plus.)

P.C.(Print command)

ON for a fixed time after conversion of BCD output is completed.

ERROR ON at the time of various errors are occurred.

OVR(over) ON at the time when data becomes over.

Above are open collector outputs. $V_{CE}=DC30\text{ V}$, $I_C=DC20\text{ mA MAX}$

*Renewal of output cannot be made in other than the Measurement mode.

Input ZERO Same as the ZERO key.

*Above pulse input and pulse width is 50 ms or more is effective once.
(Pulse width is changeable to 5 ms, 10 ms and 20 ms.)

PEAK/TRACK / A/Z Same as the PEAK/TRACK / \odot A/Z key

RESET / A/Z OFF Same as the RESET / \odot A/Z OFF key

HOLD Hold of display and BCD output

BCD-ENABLE Compulsive OFF for the related output of BCD
(Hi impedance)

*Above are level inputs, and effective by shortening 50 ms or more during inputting. Beside, only the functions of A/Z and A/Z OFF are pulse input and effective once after the input with pulse width at 50 ms or more.

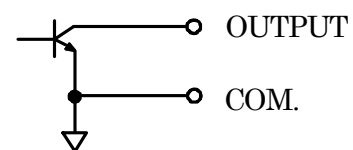
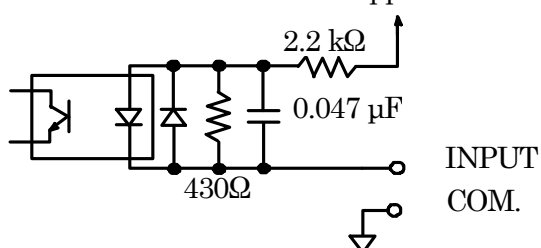
(Level and pulse width : 5 ms, 10 ms or 20 ms changeable.)

• Connector pin configuration for BCD output Suitable plug : 57-30360 (Made by DDK.)

1	COM.	13	8×10^2	25	ERROR
2	1×10^0	14	1×10^3	26	P.C.
3	2×10^0	15	2×10^3	27	HOLD
4	4×10^0	16	4×10^3	28	N.C.
5	8×10^0	17	8×10^3	29	SEL.1
6	1×10^1	18	1×10^4	30	SEL.2
7	2×10^1	19	COM.	31	ZERO
8	4×10^1	20	2×10^4	32	PEAK/TRACK / A/Z
9	8×10^1	21	4×10^4	33	RESET / A/Z OFF
10	1×10^2	22	8×10^4	34	N.C.
11	2×10^2	23	POL.	35	BCD-ENABLE
12	4×10^2	24	OVR.	36	N.C.

*Never connect with N.C. pin.

• Equivalent circuit for input/output sections
Approx 12 V



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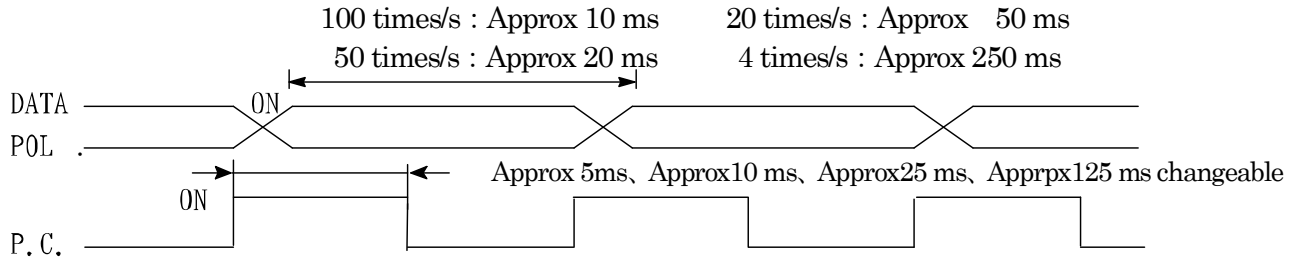
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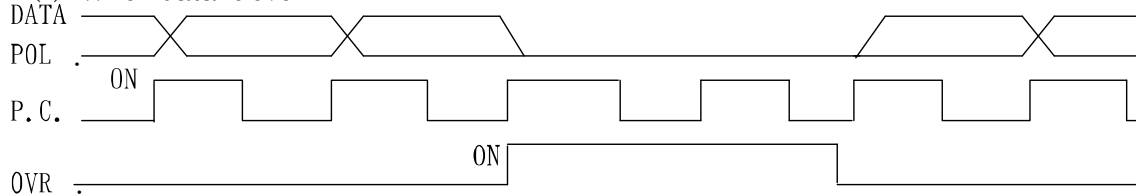
• Timing chart

(1) Normal



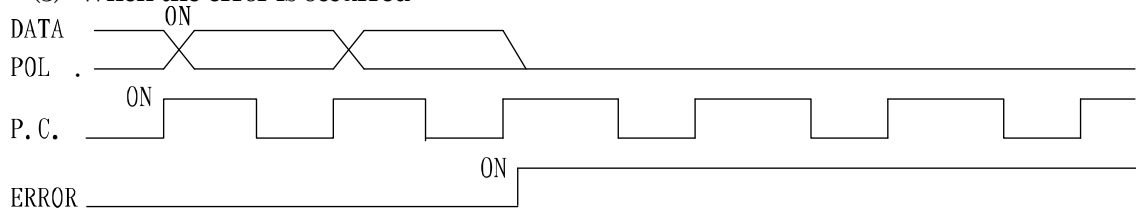
*Output transistor will be ON (Negative logic in electrical theory) when all of the P.C., DATA and POL output the data.

(2) When data is over



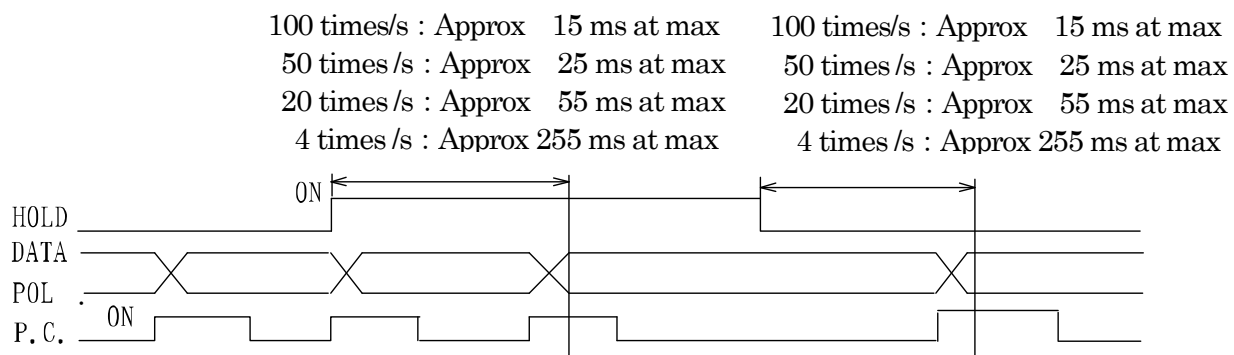
*Output transistor of OVR signal will become ON (Negative logic in electrical theory) during the output of OVR. Moreover, output transistor of all of the DATA, P.C. and POL will become OFF (Positive logic in electrical theory) during the output of OVR.

(3) When the error is occurred



*Output transistor of ERROR signal will become ON (Negative logic in electrical theory) during the output of ERROR. Moreover, output transistor of all the P.C., DATA and POL will become OFF (Positive logic in electrical theory) during the output of ERROR. (However, as for P.C., it will become OFF after one shot of operation is over.)

(4) At the time of input of HOLD signal



*Output transistor of P.C. becomes OFF (Positive logic in electrical theory) during the input of HOLD

*After the HOLD signal is input, the following response times will be required until the DATA or POL is frozen or released. (In case of choosing P.C. width 5ms)

100 times/s : Approx 15 ms at max
50 times/s : Approx 25 ms at max
20 times/s : Approx 55 ms at max
4 times/s : Approx 255 ms at max

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6-3. CC-LINK Interface

- P/N : CSD815B-P73
- CC-LINK version : Ver.1.10
- Occupied stations No. : Selectable from 1,2 or 4 stations.
- Specifications
 - Baud rate : Select from 156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps or 10 Mbps
 - Communication method : Polling method
 - Synchronous method : Bit synchronization method
 - Transmission path form : RS-485 bus
 - Transmission format : HDLC conforming
 - Remote station number : In the case of 1 station occupied, No's 01 to 64 can be selectable.
In the case of 2 stations occupied, No's 01 to 63 can be selectable.
In the case of 4 stations occupied, No's 01 to 61 can be selectable.
- Cable length : Baud rate (bps) Total extension distance (m)

156 k	1 200
625 k	600
2.5 M	200
5 M	150
10 M	100
- Number of connection : In the case of 1 station occupied, 64 units at maximum
In the case of 2 stations occupied, 32 units at maximum
In the case of 4 stations occupied, 16 units at maximum
- Connected cable : Use the exclusive use of "CC-LINK" with the shield addition twisted-pair cable
- Termination : Resistance of communication is expressed with four LED, RUN, SD, RD or ERR
- Connector pin configuration for CC-LINK Suitable plug : 721-105/037-000 (Made by WAGO)

DA	Signal conductor DA side
DB	Signal conductor DB side
DG	Signal conductor ground
SLD	Shield
FG	Frame ground

* "SLD" and "FG" are connected in this unit

- Function
 - (1) Reading out the load
 - (2) Reading out the condition (every ON/OFF of HOLD and A/Z)
 - (3) Change the condition (ON/OFF of A/Z and ZERO)
 - (4) Reading out the comparator set value (S0, S1 and S2)
 - (5) Change the comparator set value (S0, S1 and S2)
 - (6) Reading out the comparator judgement.
 - (7) Error code

*CC-LINK is abbreviation of Control & Communication Link.

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6-4. RS-232C Interface

- P/N : CSD815B-P74
- Specifications
 - Baud rate : Select from 1 200, 2 400, 4 800, 9 600, 19 200 or 38 400 bps
 - Data bit length : Select from 7 bits or 8 bits.
 - Parity bit : Select from Non, Even or Odd.
 - Stop bit : Select from 1 bit or 2 bits.
 - Terminator : Select from CR+LF or CR.
 - Communication method : Half-duplex
 - Synchronous method : Start-stop synchronous method
 - Communication data : ASCII code
- RS-232C connector pin configuration Suitable plug : DE-9S-NR by JAE or equivalent.

Pin NO.	Signal name
1	CD
2	TXD
3	RXD
4	N.C.
5	S.G.
6	N.C.
7	RTS
8	CTS
9	N.C.

*The connector plug is not attached.

*The screw for the engaging fixation base is inch type screw.

*Never connect with the N.C. pins.

- Function
 - (1) Reading out the load
 - (2) Reading out the status
(ON/OFF for each of SEL.1, SEL.2, ◎, HOLD, CHECK, PEAK, BOTTOM or A/Z)
 - (3) Change of status (ON/OFF of PEAK, ON/OFF of A/Z or ZERO)
 - (4) Reading out the comparative set value (S0, S1 and S2)
 - (5) Change of comparative set value (S0, S1 and S2)
 - (6) Reading out the comparative judgement.
 - (7) Communication error code (Error code related with communication.)

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6-5. RS-422/485 Interface

- P/N : CSD815B-P76
- Specifications
 - Baud rate : Select from 1 200, 2 400, 4 800, 9 600, 19 200
 - Data bit length : Select from 7 bits and 8 bits.
 - Parity bit : Select from Non, Even or Odd.
 - Stop bit : Select from 1 bit or 2 bits.
 - Terminator : Select from CR+LF and CR.
 - Communication method : Half-duplex
 - Synchronous method : Start-stop synchronous method
 - Address : Select one among 0 to 31.
 - Communication data : ASCII code
 - Cable length : Approx. 1 km
 - No. of connections : 32 sets at max.(RS-422 : 10 sets)
 - Termination : Built-in (Yes/No can be selected by the connection with terminal board.)
with input/output monitor LED.
 - Change of RS422/485 : Can be set in Function.

• Layout of terminal board for RS422/485

SDA	Differential output
SDB	Differential output
RDA	Differential output
RDB	Differential output
TRM.	Termination
S.G.	Signal ground

- Function
 - (1) Reading out the load
 - (2) Reading out the status
(ON/OFF for each of SEL.1, SEL.2, ◎, HOLD, CHECK, PEAK, BOTTOM or A/Z)
 - (3) Change of status (ON/OFF of PEAK, ON/OFF of A/Z or ZERO)
 - (4) Reading out the comparative set value (S0, S1 and S2)
 - (5) Change of comparative set value (S0, S1 and S2)
 - (6) Reading out the comparative judgement
 - (7) Communication error code (Error code related with communication.)

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6-6. Optional combinations

	P07	P15	P73	P74	P76
P07	—	○	○	○	○
P15	○	—	×	×	×
P73	○	×	—	×	×
P74	○	×	×	—	×
P76	○	×	×	×	—

○: Possible, ×: Impossible

P07 : Current output (DC 4 mA to 20 mA)

P15 : BCD output

P73 : CC-LINK interface (serial communication)

P74 : RS-232C interface (serial communication)

P76 : RS-422/485 interface (serial communication)

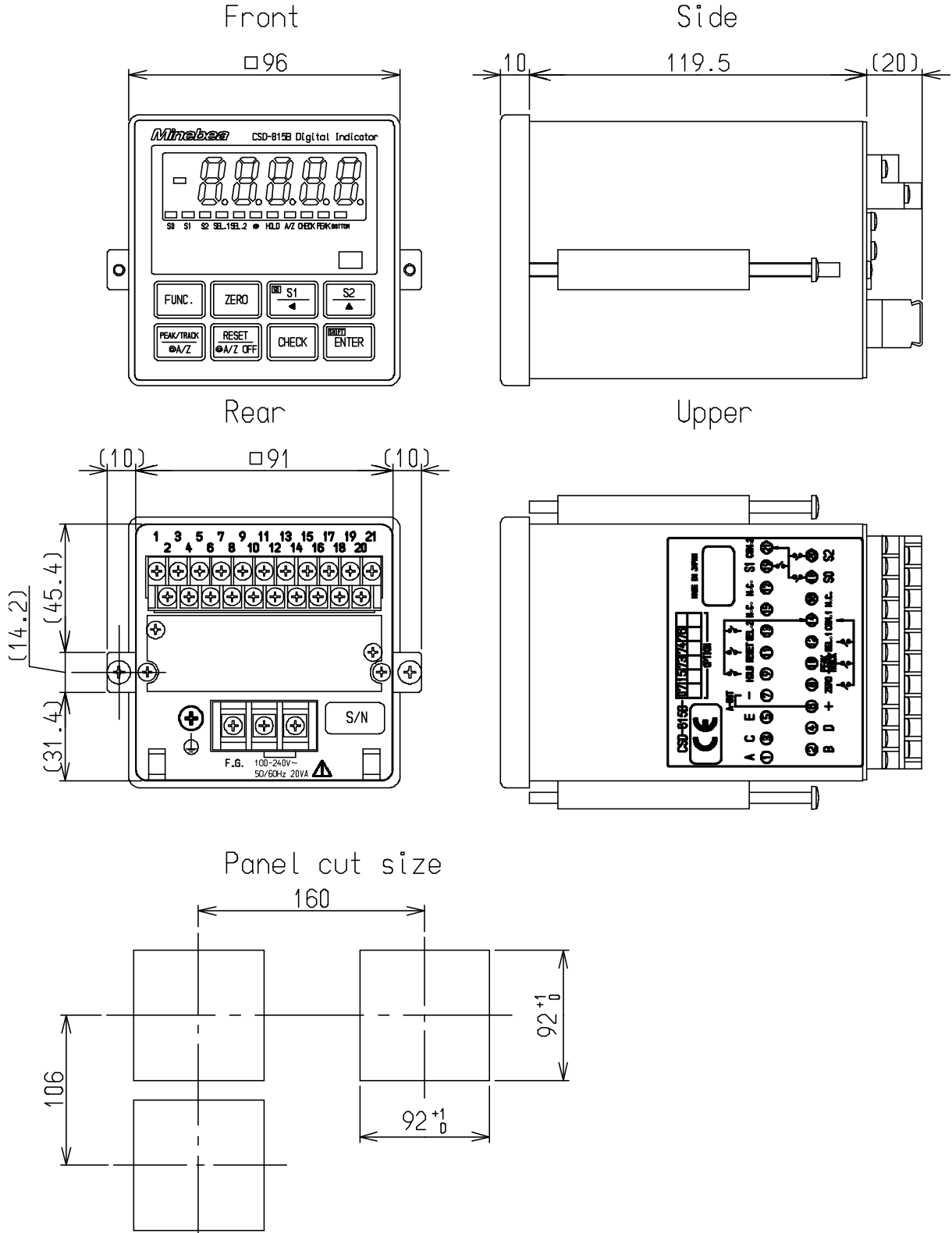
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7. Outline dimensions



Unit : mm

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8. CE conformity standard

- This instrument has suited the following standard.

EN61326-1 : 2013

“Electrical equipment for measurement, control and laboratory use— EMC requirements”
“Immunity test requirements for equipment intended for use in industrial locations”

EN61010-1 : 2010+A1:2019

“Safety requirement for electrical equipment for measurement, control and laboratory use—
Part 1 : General requirement”

RoHS compliant

*CE conformity standard is not effective in case of using optional CC-LINK interface
The using condition to suit this standard is as follows.

8-1. Wiring

(1) About cable

- Use the shielded cable for all connections except a power cable.

(2) Shield processing

- Connect the shielded cable of load cell, external control input, contact output, voltage output, current output and RS-422/485 interface with F.G. terminal. (Terminal block-2, terminal No. 3)
- Please use the connector for BCD output and RS-232C interface with a metallic shell, and make sure to come in contact the shield with a metallic shell of a connector directly.

(3) Grounding

- The ground of this instrument shall apply the individual ground by using the protective ground terminal.

*Specifications and outline dimensions and so on which have printed may subject to change for the purpose of improvement.