Minebea

SPECIFICATIONS

Digital Indicato

1. General

The instrument is a built−in control panel type digital indicator for strain gage applied transducers.

2. Specifications

2-1. Specifications for analog section

- Bridge power supply — DC10 V± 0.25 V within 120 mA (changeable to DC5 V or 2.5 V) with remote sensing applied

- Applicable transducers — Up to 4 pieces of strain gage applied transducers (350 Ω) are connectable

- Input range — F.S. setting is available at the input of 0.2 mV/V to 3.1 mV/V (when bridge power supply is DC10 V.)

- Zero point adjustment range
  −2.5 mV/V to 2.5 mV/V

- Non−linearity — 0.01 %F.S.

- Temperature efficient
  - Zero point — ± 0.2 μV/℃ — (Input conversion, in F.S. setting at the input of ± 0.3 mV/V to 3.1 mV/V)
  - Sensitivity — $\pm 0.001\ 5$ %F.S./℃ (Input conversion, in F.S. setting at the input of ± 0.3 mV/V to 3.1 mV/V)

- Input noise — ± 0.3 μVp−p or less (at the default setting of input filter digital filter and stabilization filter)

- Input filter — 4 Hz (Changeable to 2 Hz, 6 Hz, 8 Hz, 10 Hz)

- A/D sampling — 200 times/s (changeable to 100 times/s, 50 times/s, 20 times/s or 10 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 2.4 mV/V)
  ※ The extension cable is applied within 100 m of the Minebea's standard cable CAB−501 (6 wires)
  ※ It is not applied when zener barrier is in use.

2-2. Specifications for digital section

- Load display
  - Display range — −9 999 to 99 999
  - Display increment — 1 (changeable to 2, 5 or 10)
  - Display unit — 7 segment red LED with 8 mm character height
  - Over display — "−OL" display at the time of minus(−) over, and "OL" display at the time of plus (＋) over

- Condition display — RUN, A/Z, LOCK, HOLD and CHECK

- Judgement display — S0, S1, S2, S3 or S4

- Display rate — 20 times/s (changeable to 4 times/s, 50 times/s or 100 times/s)

- Decimal display — Changeable to no display, 10^1, 10^2, 10^3 or 10^4.

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2-3. Function of front panel sheet key switch

FUNC. ／CHECK	Changeover of function mode, or ON/OFF of CHECK value by pressing this key and shift key at the same time.
S※／◀	Display S※ setting value, or carry on the set value
ZERO／▲	ZERO set, and inclement the set value
A/Z	Tare weight cancellation
A/Z OFF	Tare weight cancellation clear
ENTER／SHIFT	Enter key or Shift key

2-4. External control function

- ZERO   Same as the ZERO key
- A/Z   Tare weight cancellation
- A/Z OFF   Tare weight cancellation clear

  ※ Above is pulse input, effective once at the pulse width 50 ms or more
  (The pulse width is changeable to 2 ms, 5 ms, 10 ms or 20 ms.)

- HOLD   Holding the display, the comparative output, the analog output and the BCD output, CC−Link load output, RS−232C load output and RS−422/485 load output.

- LOCK   Prohibiting the key operation

  ※ Above is level input, and effective during short of 50 ms or more.
  (The level is changeable to 2 ms, 5 ms, 10 ms or 20 ms.)

- Equivalent circuit of external control input section
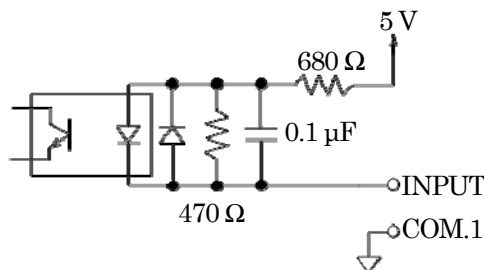
2-5. Comparator function

- Set value   −99 999 to 99 999
- Numbers of setting   S0, S1, S2, S3 and S4 5 points

  ※ "S0" is set by function.

- Setting hysteresis data width
  0 to 99 digits
- Setting hysteresis time width
  0 to 9.99 s
- Direction of hysteresis   Can be selected whichever "On delay" or "Off delay".
- Comparator conversion rate

  Changeable to 10 times/s, 20 times/s, 50 times/s, 100 times/s or 200 times/s (Synchronous with A/D sampling rate.)

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2-6. Open collector output signal

- S1, S2, S3 and S4 — The open collector is ON when reached under/over the comparator set value.

- S0 — The open collector is ON with either condition in below by function setting.
  - ·FULL condition (100 % of rated load).
  - ·When the selecting pairs of S1, S2, S3 or S4 are OFF condition.
  - ·Operates when reached under/over the S0 set value.
    (Same as the comparative operation of S1, S2, S3 and S4.)
  - ·Turned ON for synchronous with HOLD LED of condition display.
  - ·Turned ON for synchronous with PEAK LED of condition display.
  - ·Turned ON for synchronous with MEAS. LED of condition display.
  - ·Turned ON for synchronous with Stability detection.

- RUN — ON during the measurement mode.

- ERROR — ON when the various kinds of errors are occurred.

- Specification of open collector — V_{CE}=DC30 V,I_C=30 mA MAX

- Equivalent circuit of open collector output
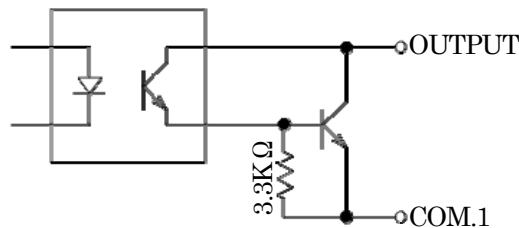
2-7. Various functions

- Zero tracking — Stabilizes the zero point fluctuation in a constant condition

- Digital filter — Stabilizes the data by the computing process through CPU.

- Stabilization filter — Reinforces and stabilizes the digital filter only when the change width of the load is constant.

- 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.

- Change target of analog output

  The target of analog output can be changed either "Gross weight" or "Net weight".

- Stability detection — Can be detected at the load is stable only when the change width of the load is constant.

SPECIFICATIONS

3. General Specifications

- operating temperature/humidity range
  Temperature   −10 ℃to 50 ℃
  Humidity   85 %RH or less (Non condensing)
- 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.16 VA (without options at AC100 V)
                         Approx.19 VA at maximum (with options at AC100 V to AC240 V)
- Outline dimensions(W × H × D)
                         67 mm × 208 mm × 140.7 mm (excluding protrusion.)
- Weight   Approx.1.2 kg (without any option)

4. Standard specifications at the shipment

- Bridge power supply   DC10 V
- Span adjustment   2000 display at the input of 0.3 mV/V
- Minimum scale   1

5. Accessory

- Instruction manual   1 piece
- Midget fuse   1 piece (5 A)
- Short bar for A−F and C−G
                         2 pieces
- BCD output plug   1 piece (Attached when optional BCD output is installed.)

6. Options

6-1. Analog output

6-1-1. Current output

- Parts No.   CSD891B-P07

- Specifications
  Output   DC4 mA to 20 mA Load resistance 510 Ω or less
  Non−linearity   0.05 %F.S.
  Resolution   Approx.1/12 000
  Over range   Approx.DC2.4 mA at "−OL" display, and approx.DC21.6 mA at "OL" display.
  Output times   10 times/s, 20 times/s, 50 times/s, 100 times/s or 200 times/s (Synchronous with A/D sampling rate.)

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6-1-2. Voltage output

- Parts No.   CSD891B-P25
- Specifications

Output	DC0 V to 10 V Load resistance 5 kΩ or more
Non-linearity	0.05 %F.S.
Resolution	Approx.1/12 000
Over range	Approx.DC−1 V at "−OL" display, and approx.DC11 V at "OL" display.
Output times	10 times/s, 20 times/s, 50 times/s, 100 times/s or 200 times/s (Synchronous with A/D sampling rate.)

6-2. BCD output

- Parts No.   CSD891B−P15
- Specifications

Output   BCD 5 digits, parallel output with polarity applied
       (Output ON with minus, and output OFF with plus.),
       P.C. (Print command)
        Turning on during fixed time after conversion of BCD output is
        completed
       ERROR ON when the various error occurs.
       OVR (Over)
       ※Above are open collector outputs. V_{CE}=30 V , I_C=30 mA

Input   ZERO same as ZERO key
       A/Z   same as A/Z key
       A/Z OFF same as A/Z OFF key
       ※Above is pulse input, effective once with the pulse width 50 ms or more.
        (Pulse width is changeable to 2 ms, 5 ms, 10 ms or 20 ms.)
       HOLD Holding of display and BCD output
       LOCK Prohibiting the key operation
       SEL.1,SEL.2
          The output target of the BCD output is switched
          as follows by the combination of two input status.
          Both SEL.1 and SEL.2 are open   :Gross weight
          Only SEL.1 is short   :part of A/Z cancel
          Only SEL.2 is short   :Display interlock
          Both SEL.1 and SEL.2 are shor   :Gross weight
       BCD−ENABLE
          Compulsion OFF of BCD relation output (High−impedance)
       ※Above is level input, effective during the input with short more than 50
        ms.(Level width is changeable to 2 ms, 5 ms, 10 ms or 20 ms.)

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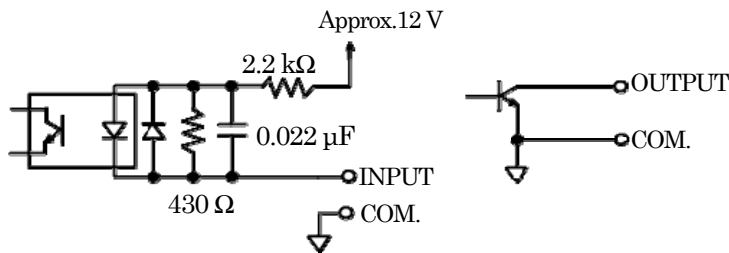
SPECIFICATIONS

• Connector pin configuration of BCD output   Suitable plug：57−30360 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	LOCK
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	A/Z
9	8×10^1	21	4×10^4	33	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.

※Don't connect with N.C. pin.

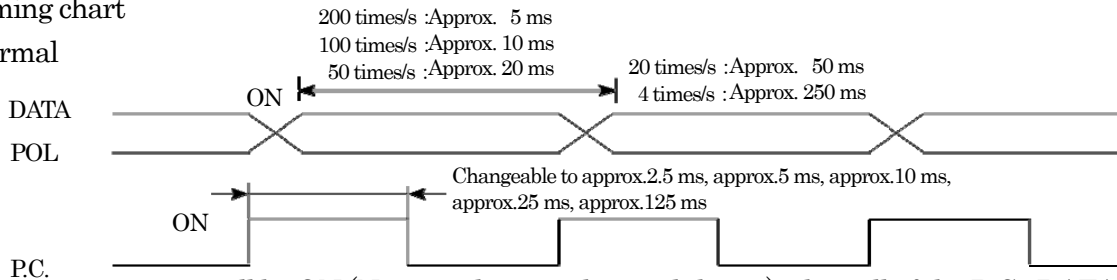※An internal circuit and photocoupler are insulated.

• Equivalent circuit of input/output section.

Approx.12 V
2.2 kΩ
0.022 μF
430 Ω
INPUT
COM.
OUTPUT
COM.

• Timing chart

①Normal

200 times/s :Approx. 5 ms
100 times/s :Approx. 10 ms
50 times/s :Approx. 20 ms
20 times/s :Approx. 50 ms
4 times/s :Approx. 250 ms

DATA

POL

Changeable to approx.2.5 ms, approx.5 ms, approx.10 ms, approx.25 ms, approx.125 ms

P.C.
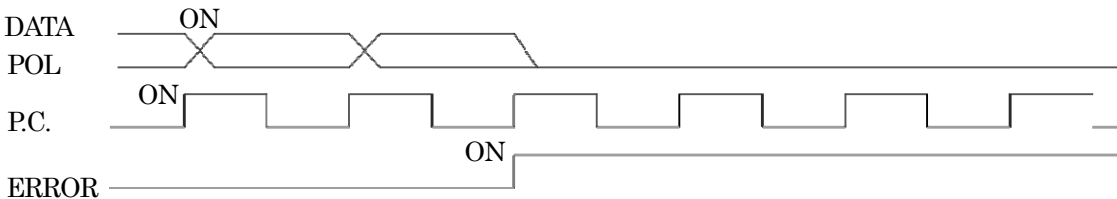
※Output transistor will be ON (Negative logic in electrical theory) when all of the P.C., DATA and POL output the data.
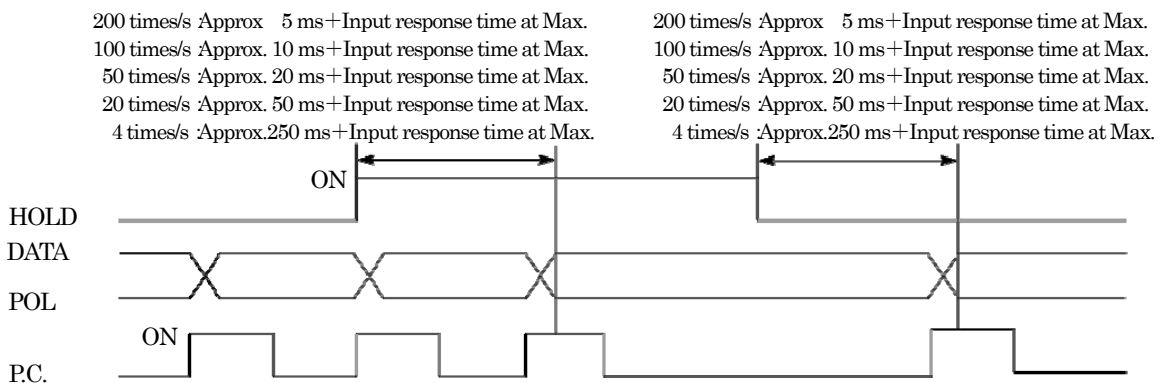
②When data is over.
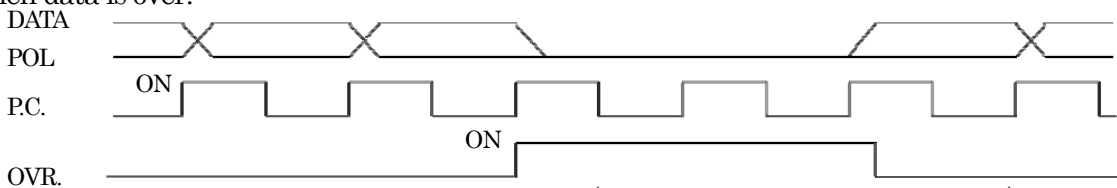
DATA
POL
P.C.
OVR.

※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.

③When the error is occurred.

DATA
POL
P.C.
ERROR

※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.

④When the HOLD signal is input.

200 times/s :Approx   5 ms+Input response time at Max.
100 times/s :Approx. 10 ms+Input response time at Max.
50 times/s :Approx. 20 ms+Input response time at Max.
20 times/s :Approx. 50 ms+Input response time at Max.
4 times/s :Approx.250 ms+Input response time at Max.

200 times/s :Approx   5 ms+Input response time at Max.
100 times/s :Approx. 10 ms+Input response time at Max.
50 times/s :Approx. 20 ms+Input response time at Max.
20 times/s :Approx. 50 ms+Input response time at Max.
4 times/s :Approx.250 ms+Input response time at Max.

HOLD
DATA
POL
P.C.

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

※It will take as follows response time by the time of HOLD or release of DATA and POL after the HOLD signal is input. (When the input response time for 2.5 ms is selected.)

200 times/s :Approx   5 ms+Input response time at Max.
100 times/s :Approx. 10 ms+Input response time at Max.
50 times/s :Approx. 20 ms+Input response time at Max.
20 times/s :Approx. 50 ms+Input response time at Max.
4 times/s :Approx.250 ms+Input response time at Max.

6-3. CC-LINK interface

- Parts No.   CSD891B-P73
- Version of CC-LINK   Ver.1.10

Occupied stations No.	:Selectable from 1,2 or 4 stations.

- Specifications

Baud rate	:Selectable 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)	156K	625K	2.5M	5M	10M
Total extension distance(m)	1 200	600	200	150	100

Numbers 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 cabel	:Use the exclusive use of "CC-LINK" with the shield addition twisted-pair cable.
Termination	:Resistance externally attached
Status LED	:The status 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
  - ①Reading out the load
  - ②Reading out the condition (every ON/OFF of HOLD and A/Z)
  - ③Changing the condition (ON/OFF of A/Z and ZERO)
  - ④Reading out the comparator set value (S0, S1, S2, S3 and S4)
  - ⑤Changing the comparator set value (S0, S1, S2, S3 and S4)
  - ⑥Reading out the comparator judgement
  - ⑦Error code

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

6-4. RS—232C Interface

- Parts No.   CSD891B—P74

- Specifications   Baud rate   : Selectable from 1 200, 2 400, 4 800, 9 600, 19200 or 38 400 bps

Data bit length   : Selectable from 7 bit or 8 bit

Parity bit   : Selectable from None, Even or Odd.

Stop bit   : Selectable from 1 bit or 2 bit

Terminator   : Selectable from CR＋LF or CR

Communication method   : Half duplex

Synchronous method   : Start—stop synchronous method

Communication data   : ASCII code

Cable length   : within 15 m

Input/output monitor with LED

- Connector pin configuration of RS—232C   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.

※Connector plug is not attached.

※The engagement fixation stand screw is inch screw.

※Don't connect with N.C. pin.

※An internal circuit is insulated by photocoupler.

- Function   ①Reading out the load.

②Change of load calibration.

③Reading out the condition (every ON/OFF of HOLD, CHECK and A/Z)

④Changing the condition (input of CHECK, ON/OFF of A/Z, ZERO)

⑤Reading out the comparator set value (S0, S1, S2, S3 and S4)

⑥Changing the comparator set value (S0, S1, S2, S3 and S4)

⑦Reading out the comparator judgement.

⑧Reading out the function data

⑨Changing the function data

⑩Communication error code (error code as to the communication)

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6-5. RS－422/485 interface

- Parts No.   CSD891B－P76

      Specifications

Baud rate	：Selectable from 1 200, 2 400, 4 800, 9 600,19 200 or 38 400 bps
Data bit length	：Selectable from 7 bit or 8 bit
Parity bit	：Selectable from None, Even or Odd.
Stop bit	：Selectable from 1 bit or 2 bit
Terminator	：Selectable from CR＋LF or CR
Communication method	：Half duplex
Synchronous method	：Start－stop synchronous method
Address	：Select one from 0 to 31
Communication data	：ASCII code
Cable length	：Approx.1 km
Connectable unit	：32 units at maximum (RS－422：10 units)
Termination	：Internal (Selects the presence by the terminal block connection.)

    Input/output monitor with LED

    Changeover the RS－422/485   ：Set by function.

- Terminal configuration of RS－422/485

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

    ※An internal circuit is insulated by photocoupler.

- Function

    ①Reading out the load.

    ②Change of load calibration.

    ③Reading out the condition(every ON/OFF of HOLD, CHECK and A/Z)

    ④Changing the condition(input of CHECK, ON/OFF of A/Z, ZERO)

    ⑤Reading out the comparator set value(S0, S1, S2, S3 and S4)

    ⑥Changing the comparator set value(S0, S1, S2, S3 and S4)

    ⑦Reading out the comparator judgement.

    ⑧Reading out the function data

    ⑨Changing the function data

    ⑩Communication error code (error code as to the communication)

6-6. Optional combinations

	P07	P15	P25	P73	P74	P76
P07	—	○	×	○	○	○
P15	○	—	○	×	×	×
P25	×	○	—	○	○	○
P73	○	×	○	—	×	×
P74	○	×	○	×	—	×
P76	○	×	○	×	×	—

○：Possible, ×：Impossible

P07：Current output

P15：BCD output

P25：Voltage output

P73：CC−LINK interface
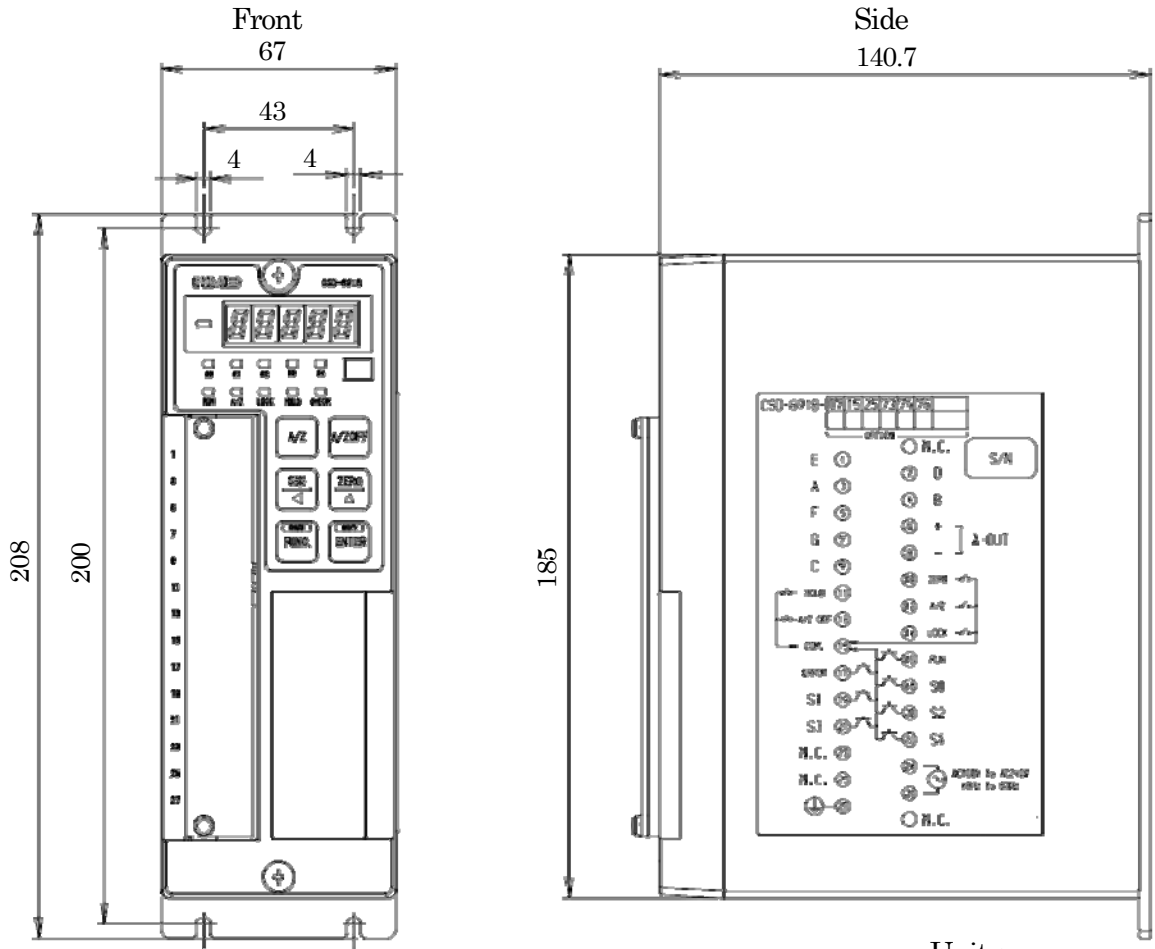
P74：RS−232C interface

P76：RS−422/485 interface

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7. Outline dimensions

Front
67

Side
140.7

Unit : mm

※ Specifications and outline dimensions and so on which have printed may subject to change for the purpose of improvement without notice.