Minebea

CSD-814B

SPECIFICATIONS

Spec. No.EN382814B-I

Digital Indicator

1. General

The instrument is a digital indicator for the purpose of instrumentation, and suitable for the application in hopper, tank scale, and so on.

2. Specifications

2-1. Specifications for analog

- Bridge power supply: DC10 V ± 0.3 V within 120 mA (DC2.5 V or 5 V changeable)
  Remote sensing applied.
- Applicable transducers: Up to 4 pieces of strain gage applied transducers (350 Ω) can be connectable.
- Input range: F.S setting can be made with the input range of 0.3 mV/V to 3 mV/V.
  (At the time of bridge power supply is DC10 V.)
  ± F.S. setting can be available
  with the input range of ± 0.6 mV/V to ± 3 mV/V
  (At the time of selection of +/− Display mode at Function setting.)
  (At the time of bridge power supply is DC10 V.)
- Zero adjustment range: ± 2.4 mV/V
- Non−Linearity: 0.01 %F.S.
- Temperature coefficient
  - Zero point: ± 0.2 μV/℃ (Input conversion)
  - Sensitivity: ± 0.001 5 %F.S./℃
- A/D Sampling rate: 100 times/s
- CHECK: Approx. 0.3 mV/V 1 point
  ※Suitable extension cable is Minebea's standard cable
  CAB−501 (6−cores) within 100 m.
  ※Not applicable when Zener barrier is used.

2-2. Specifications for digital

- Load display
  - Display range: −1 000 to 11 000 (×2, ×5 and ×10, changeable)
    −11 000 to 11 000 (×2, ×5 and ×10, changeable
    When +/− display mode is set with Function setting.)
  - Display: 7 segment green colored fluorescence display tube with 22 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(Auto Zero), LOCK, HOLD, CHECK
- Setting display: 7 segment fluorescence display tube and
  each 7 digits of S1, S2, S3 and S4 with 4.5 mm character height.
- Judgement display: S0, S1, S2, S3 and S4
- Bar meter display: Displays the percentage of present load against rated capacity (100 %) by 11 dots bar meter display.
- Display times: 4 times/s (20 times/s can be available depending on the setting.)
- Decimal point display: None, 10^1, 10^2, 10^3 and 10^4 (changeable).

2-3. Function of Sheet key on front panel

SHIFT	Shift key
S1	Key for Set value digit carry/S1 setting display/Tare weight cancellation
S2	Key for Set value digit down/S2 setting display/Tare weight clear
S3	Key for Set value increment/S3 setting display/Zero compensation
S4	Key for Set value decrement/S4 setting display
FUNC	Key for Changeover of Function mode/Changeover of ZERO & SPAN adjustment
CHECK	Key for ON/OFF of check value
ENTER	Enter key

2-4. External control function

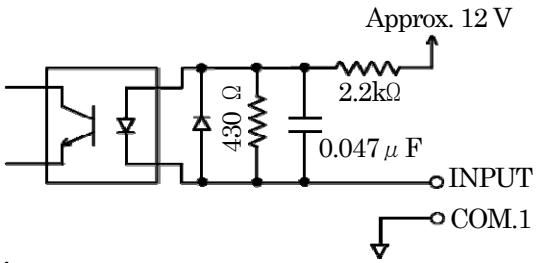
- ZERO — As same as ZERO key ＋ SHIFT key
- A/Z — As same as A/Z key ＋ SHIFT key
- A/Z OFF — As same as A/Z OFF key ＋ SHIFT key

※ Above are effective once with the pulse input and its width is more than 100 ms of pulse width.

- HOLD — HOLD of display, comparison output, BCD output (Option), current output (Option) and voltage output (Option)
- LOCK — Prohibition of front panel key operation
- A−SEL — When optional A−OUT is installed, analog output with relative value at "OPEN", and analog output with absolute value at "SHORT" will be made.

※ Above are effective during input of level input with "SHORT" against more than 100 ms.

- Equivalent circuit input section for external control



2-5. Comparator function

- Set value — −999 999 to 999 999
- Number of set value — 4 points of S1, S2, S3 and S4
- Set value of hysteresis data

  0 to 99 digit
  (Each set value ×2, ×5 and ×10, at the time of increment setting.)
- Setting hysteresis time width

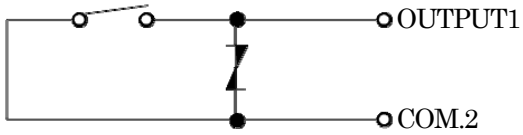
  0 to 9.9 s
- Hysteresis direction

  Selectable whichever "On−delay" or "Off−delay".
- Comparator conversion rate

  30 times/s

2-6. Contact output signal

- S1, S2, S3, S4 — Makes the contact shorted when more or less than comparator set value.
- S0 — Makes the contact shorted in case of whichever condition depending on the setting as below.
  ・At the time of full value (100 % of rated load)
  ・When the load exists between the selected two set values among S1, S2, S3 and S4.
- RUN — Makes the contact shorted at the time of Measurement Mode of the instrument.
- ERROR — Makes the contact shorted when various kinds of ERROR(s) is/are occurred or when power supply is OFF.
- Specifications for contact — 1a contact. 1b contact is only for ERROR output
  AC125 V 0.1 A
  DC30 V 0.5 A
  Equivalent circuit of contact output section



2-7. Various kinds of functions

- Zero tracking — Stabilizes the deviation of zero point within the constant conditions.
- Digital filter — Stabilizes the data through software inside of CPU.
- Stabilization Filter — Strengthens/stabilizes the digital filter only when load variation width is within the constant range.
- Change of target for load display
  Selects the target of display from Gross weight and Net weight.
- Change of target of HOLD
  By the combination of "Display", "Comparator judgement display, Contact output" and "Option", target of HOLD can be made.
- Sheet key lock — Prohibition of operation of sheet key.
  ※Different operation, such as LOCK function at external control.
- Change of target output — Each output target such as optional current output, voltage output and BCD output can be changed into whichever "Display value", "Net weight" and "Gross Weight".
- Changeover of "+ display mode" "+/− display mode"
- Changeover of comparator target
  For each of comparator S1, S2, S3 and S4, target can be selectable from "Display", "Net weight" and "Gross weight".
- Light on/off the bar meter display.
- Light on/off the comparator setting display

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3. General Specifications

- Operating temperature/humidity range
  Temperature −10 ℃ to 50 ℃
  Humidity 85 %RH (Non condensing.)
- Power supply voltage AC100 V (AC85 V to AC132 V)
- Power supply frequency
  50/60 Hz
- Power consumption Approx. 22 VA (at AC100 V without option.)
  Approx. 30 VA at Max.(When options are installed.)
- Insulation resistance 100 MΩ or more at DC500 V (AC power supply ↔Main body)
- Withstand voltage 1 500 V for 1 min (AC power supply ↔Main body)
- Outline dimensions 192 mm × 96 mm × 175 mm (excludes protruding parts)
- Weight Approx. 1.9 kg (without option.)

4. Specifications at the time of shipment

- Bridge power supply DC10 V
- Span adjustment 2 000 display at the input of 0.3 mV/V
- Tare weight 0 mV/V
- The minimum scale 1
- Decimal point Non
- Power supply voltage AC100 V (AC85 V to AC132 V) 50/60 Hz

5. Accessories

- Instruction Manual 1 piece
- Time lag fuse (1 A) 1 piece
- AF/CG short bar 2 pieces
- Unit seal 1 piece
- Plug for BCD output 1 piece (Only when optional BCD output is installed.)

6. Options

6-1. Current output

- P/N CSD814B−P07
- Specifications

Output	DC4 mA to 20 Ma
Load resistance	510 Ω or less
Non−linearity	0.05 %F.S.
Over range	Less than approx. −8 % of full scale and more than +8 % of full scale.

6-2. Voltage output

- P/N CSD814B−P23 (DC0 V to DC1 V)
- P/N CSD814B−P24 (DC0 V to DC5 V)
- P/N CSD814B−P25 (DC0 V to DC10 V)
- P/N CSD814B−P26 (DC1 V to DC5 V)
- Specifications

Output	DC0V to DC1V, DC0V to DC5V, DC0V to DC10V, DC1V to DC5V
Load resistance	5 kΩ or more
Non−linearity	0.05 %F.S.
Over range	Less than approx. −8 %F.S. and more than +8 %F.S.

6-3. BCD output

- P/N CSD814B−P15
- Specifications

Output

・BCD 6 digits Parallel output, with polarity
(Output ON at minus, and output OFF at plus.)
・P.C.(Print Command) :ON during constant time after conversion of BCD output has completed.
・ERROR : ON when various kinds of error(s) has(have) occured.
・OVR (Over)
Above are Open collector outputs V_{CE}=DC30 V, Ic=DC20 mA at Max.
※Other than the Measurement Mode, renewal of output shall not be provided.

Input

・HOLD
Hold of Display, Comparative output, BCD output (Option), Current output (Option) and Voltage output(Option)
・BCD−ENABLE
※Above BCD related output will be forced OFF. (High−impedance)
・By the combination of 2 input condition of SEL.1 and SEL.2, target for BCD output can be changed as follows:

Both SEL.1 and SEL.2 are open	: Interlock with load display.
Short of SEL.1 only	: Cancelled portion of A/Z
Short of SEL.2 only	: Net weight is frozen.
Both SEL.1 and SEL.2 are short	: Gross weight is frozen.

※ Above Level inputs are effective during input is applied with short at more than 100 ms.

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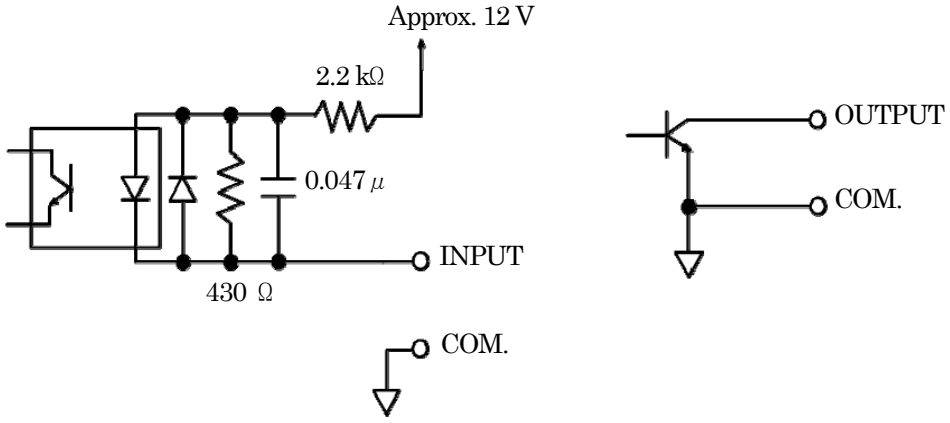
BCD output connector pin configuration Suitable plug : 57−30500

1	1×10^0	18	2×10^4	35	N.C.
2	2×10^0	19	4×10^4	36	N.C.
3	4×10^0	20	8×10^4	37	N.C.
4	8×10^0	21	SEL.1	38	D.P 10^1
5	1×10^1	22	SEL.2	39	D.P. 10^2
6	2×10^1	23	POL.	40	D.P. 10^3
7	4×10^1	24	COM.	41	D.P. 10^4
8	8×10^1	25	ERROR	42	N.C.
9	1×10^2	26	1×10^5	43	N.C.
10	2×10^2	27	2×10^5	44	N.C.
11	4×10^2	28	4×10^5	45	BCD-ENABLE
12	8×10^2	29	8×10^5	46	OVR.
13	1×10^3	30	N.C.	47	P.C.
14	2×10^3	31	N.C.	48	P.C.
15	4×10^3	32	N.C.	49	HOLD
16	8×10^3	33	N.C.	50	COM.
17	1×10^4	34	N.C.		

※ Don't connect with N.C. pin.

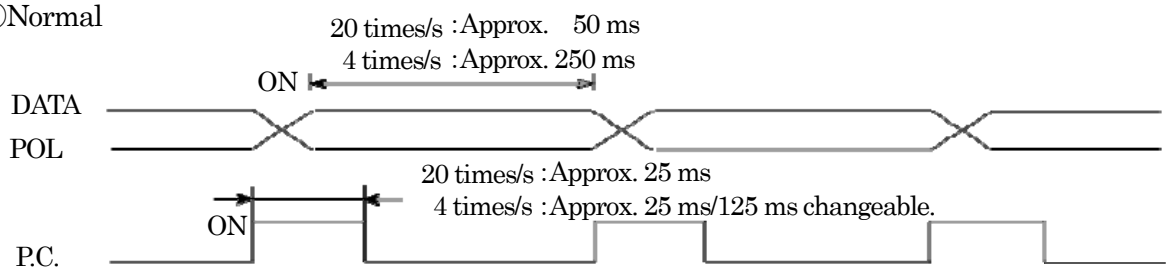
• Equivalent circuit for BCD input/output



SPECIFICATIONS

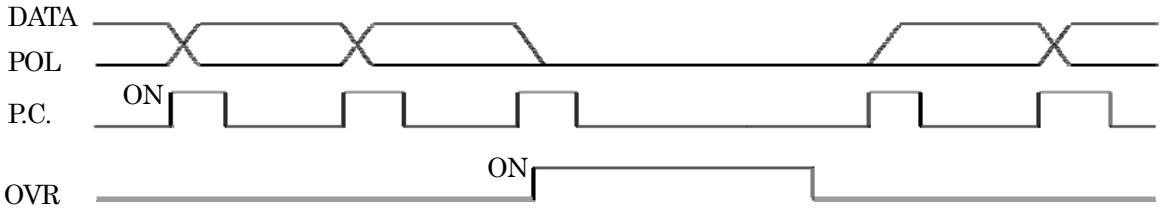
Timing Chart

①Normal



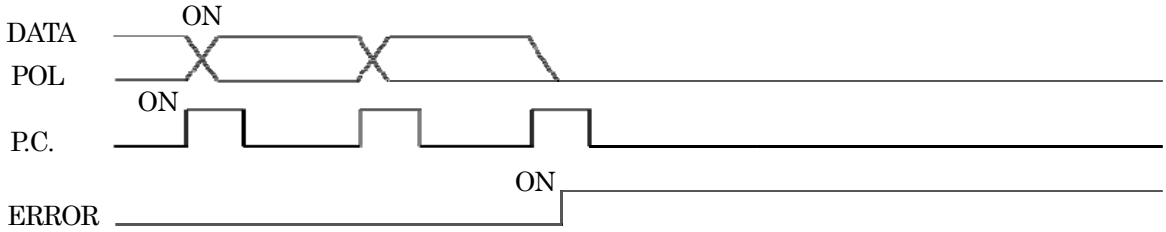
※ At the time of data output each of P.C., DATA and POL, output transistor will become ON. (Negative logic electrically.)

②When the data is overbalanced.



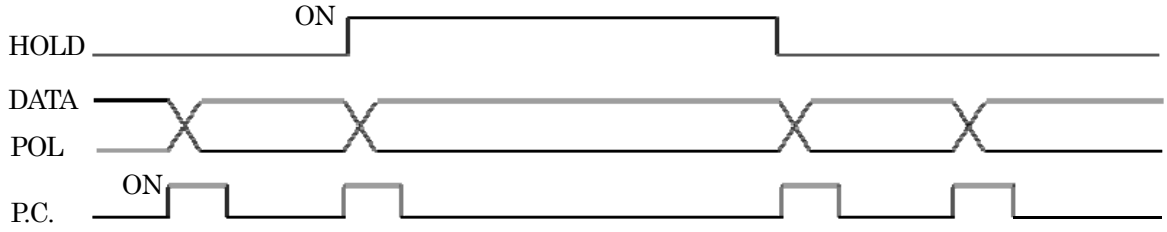
※ At the time of OVR output, output transistor at OVR signal will become ON(Negative logic electrically). Moreover, for each P.C., DATA and POL, output transistor will become OFF (Positive logic electrically). at the time of OVR output is applied.

③When ERROR is occurred.



※ At the time of ERROR output, output transistor at ERROR signal will become ON (Negative logic electrically). Moreover, for each P.C., DATA and POL, output transistor will become OFF(Positive logic electrically) at the time of ERROR output is applied. (However, only for P.C., OFF condition is made after 1 pulse of operation is finished.

④When HOLD signal is input



※ At the time of HOLD signal input, output transistor for P.C. will become OFF condition (Positive logic electrically).

※ However, as for P.C., OFF condition is made after 1 shot of operation is finished.

6-4. RS–232C Interface

- P/N CSD814B–P74
- Specifications

  Baud rate : Select among 600, 1 200, 2 400, 4 800, 9 600 and 19 200 bps.
  Data bit length : Select from 7 bits and 8 bits.
  Parity bit : Select from Non, Even and Odd.
  Stop bit : Select from 1 bit and 2 bits.
  Terminator : CR+LF
  Communication method
  : Half duplex
  Synchronous method
  : Start–stop synchronous method
  Sending data : ASCII code

  ※ Communication will stop when other than the Measurement Mode is executed.

- RS–232C connector pin configuration Suitable plug: DE–9S–NR by JAE or equivalent.

1	CD	6	N.C.
2	TXD	7	RTS
3	RXD	8	CTS
4	N.C.	9	N.C.
5	S.G.		

※Connector pin shall not be prepared.

※Don't connect with N.C. pin.

- Function

①Reading–out the load (Gross weight, Net weight, Tare weight)
②Reading–out the comparator set value (S1, S2, S3, S4)
③Reading–out the comparator judgement.
④Reading–out the condition (Input/Output of A/Z, ERROR).
⑤Change of comparator set value (S1, S2, S3, S4).
⑥Change of condition (Input/Output of A/Z, ZERO).
⑦Communication Error code (Error code for communication).

6-5. RS–422 Interface

- P/N CSD814B–P76
- Specification
  - Baud rate : Select from 600, 1 200, 2 400, 4 800, 9 600 and 19 200 bps
  - Data bit length : Select from 7 bits and 8 bits.
  - parity bit : Select from Non, Even and Odd.
  - Stop bit : Select from 1 bit and 2 bits.
  - Terminator : CR+LF
  - Communication method : Half–duplex
  - Synchronous method : Start–stop synchronous method.
  - Address : Select one among 0 to 9.
  - Sending data : ASCII code.
  - Cable length : Approx. 1 km
  - Number of connection : 10 pieces at maximum.
  - Termination : Built–in (Yes/No can be selected by a short between the terminals.)
  - Monitor LED for Input/Output is attached.

※ The communication will stop during the Mode other than the Measurement.

- RS–422 layout of terminal board

SDA	Differential output
SDB	Differential output
RDA	Differential input
RDB	Differential input
TRM	Cable end resistance
S.G.	Signal ground

- Function
  ①Load can be read out. (Gross weight, Net weight, Tare weight)
  ②Comparator set value can be read out. (S1, S2, S3, S4)
  ③Comparator judgement can be read out.
  ④Conditions can be read out. (Input/Output of A/Z, ERROR)
  ⑤Change of comparator set value (S1, S2, S3, S4)
  ⑥Change of condition (Input/Output of A/Z, Zero)
  ⑦Communication Error code (Error code related with Communication.)

6-6. Serial interface

- P/N CSD814B–P77
- Specifications : 2 wires method serial interface.
  - Baud rate : 600 bps
  - Data bit length : 8 bits
  - Parity bit : Odd
  - Stop bit : 1 bit
  - Sending Data : Binary code, BCD

※ The communication will stop during the Mode other than the Measurement Mode.

SPECIFICATION

6-7. Digi–Switch interface **※ Digi-Switch Interface is not supported for discontinued production.**

- P/N: CSD814B–P78
- Specifications: 6 digits set value at 4 steps of comparator and polarity can be set with the digital switch which connected externally.

Input

・6 digits digital switch of code type×4 steps and each polarity switch (S1, S2, S3, S4)
※Number of reading times of digital switch : Approx. 1 times/s
・PROHIBIT : Prohibition against reading the Digi–Switch
※Above Level inputs are effective during input is applied with the short at the interval of more than 100 ms.

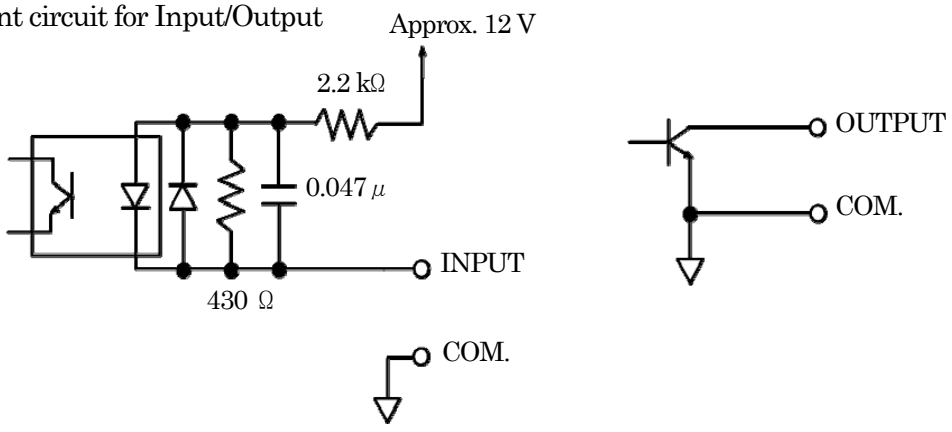
Output

・S1, S2, S3, S4 : (8 points comparators are selected in the Function Mode.)
Above mentioned are Open Collector output :
V_{CE}=DC30 V, Ic=DC30 mA at Max.
・Number of conversion times of open collector : 30 times/s
※In any mode except Measurement mode, reading input nor renewal of output can't be executed.

- Function: When this option is used, the following functions can be selected by setting Function.

・4 points/8 points comparators can be changeable.
※The operation when 4 points comparators are used.
Comparator setting function at the instrument side is ineffective. Setting display on the instrument interlocks with the Digi–switch located externally.
※The operation when 8 points comparators are used.
4 points comparator setting function at the instrument side should be set at the instrument side as usual. External 4 points comparators make the Open Collector output of S1, S2, S3 and S4 to be ON/OFF condition located on the optional P.C. board by the comparison with the setting of external Digi–Switch.
・Set value of external 4 points can be monitored at the instrument side in the Check Mode.
・Judged result from the external 4 points can be displayed on the setting display as "ON" or "OFF".
(At the time of 8 points comparators are applied.)

- Equivalent circuit for Input/Output



SPECIFICATION

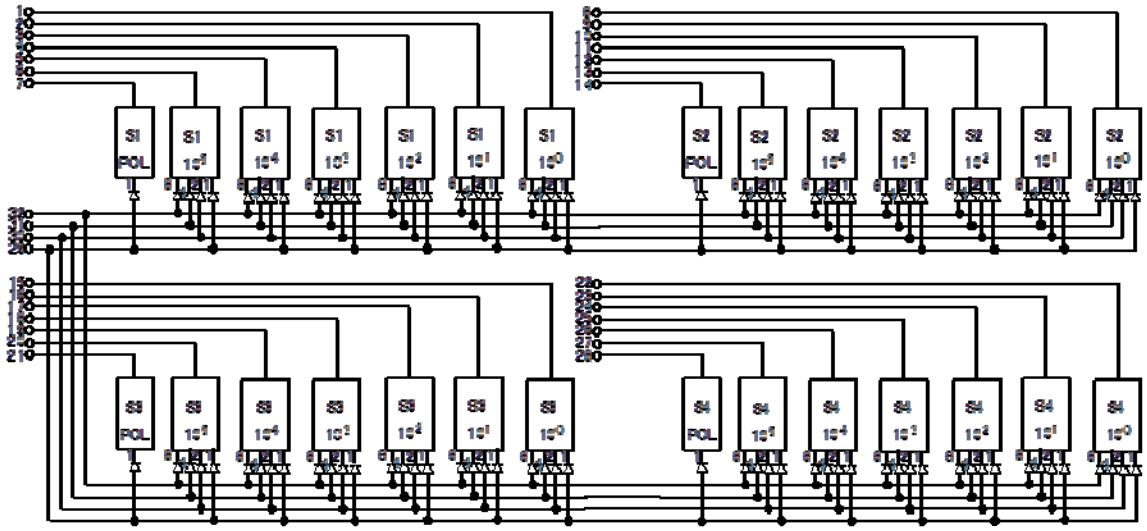
※ **Digi-Switch Interface is not supported for discontinued production.**

• Connector pin configuration for digital interface　Suitable plug : 57−30500

1	S1 10^0	18	S3 10^3	35	S3
2	S1 10^1	19	S3 10^4	36	S4
3	S1 10^2	20	S3 10^5	37	COM
4	S1 10^3	21	S3 POL	38	N.C.
5	S1 10^4	22	S4 10^0	39	N.C.
6	S1 10^5	23	S4 10^1	40	N.C.
7	S1 POL.	24	S4 10^2	41	N.C.
8	S2 10^0	25	S4 10^3	42	N.C.
9	S2 10^1	26	S4 10^4	43	N.C.
10	S2 10^2	27	S4 10^5	44	PROHIBIT
11	S2 10^3	28	S4 POL.	45	COM.
12	S2 10^4	29	1	46	N.C.
13	S2 10^5	30	2	47	N.C.
14	S2 POL.	31	4	48	N.C.
15	S3 10^0	32	8	49	N.C.
16	S3 10^1	33	S1	50	F.G.
17	S3 10^2	34	S2		

※Connector pin shall not be prepared.
※Don't connect with N.C. pin.

• Connecting diagram for Digi−Switch.



SPECIFICATION

6-8. Power supply voltage

- P/N

CSD814B–P63 (AC200V)
Power supply AC200V (AC170V to AC264V) 50/60 Hz
Max. power consumption Approx. 30 VA (When an option is installed.)

6-9. Combination with options ※ Digi-Switch Interface is not supported for discontinued production.

	P07	P23	P24	P25	P26	P15	P74	P76	P77	P78
P07	–	×	×	×	×	○	○	○	○	○
P23	×	–	×	×	×	○	○	○	○	○
P24	×	×	–	×	×	○	○	○	○	○
P25	×	×	×	–	×	○	○	○	○	○
P26	×	×	×	×	–	○	○	○	○	○
P15	○	○	○	○	○	–	×	×	×	×
P74	○	○	○	○	○	×	–	×	×	×
P76	○	○	○	○	○	×	×	–	×	×
P77	○	○	○	○	○	×	×	×	–	×
P78	○	○	○	○	○	×	×	×	×	–

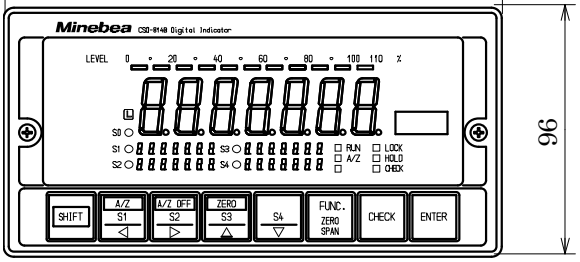
○: Possible, ×: Impossible

P07 : Current output (4 mA to 20 mA)
P23 : Voltage output (DC0 V to DC1 V)
P24 : Voltage output (DC0 V to DC5 V)
P25 : Voltage output (DC0 V to DC10 V)
P26 : Voltage output (DC1 V to DC5 V)
P15 : BCD output
P74 : RS–232C interface
P76 : RS–422 interface
P77 : Serial interface
P78 : Digi–Switch interface.

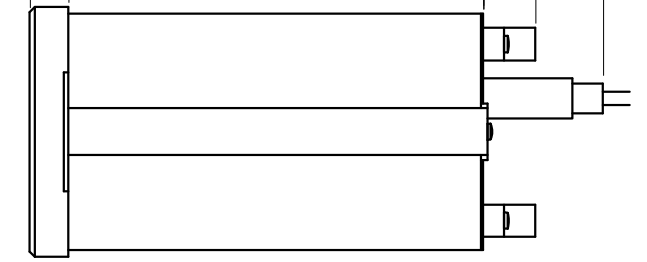
SPECIFICATION

7. Outline dimensions

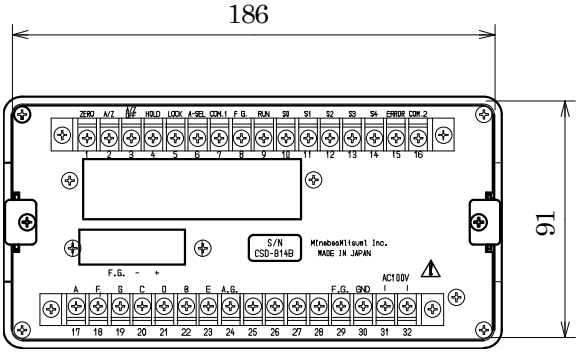
Front



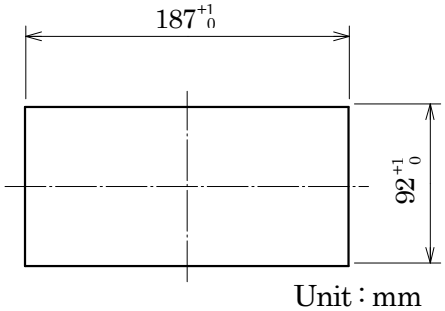
Size



Rear



Panel cut



Unit : mm

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