

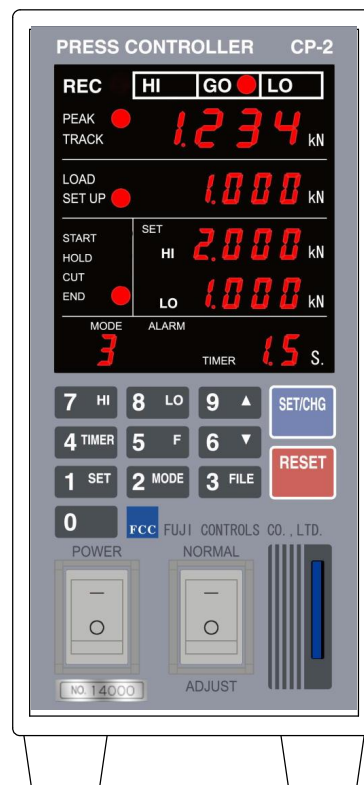
Press Load Control Device

Press Controller

CP-2 Type

Instruction Manual

(Ver. 1.05)



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We thank you for the purchase of our CP-2 Type Press Controller.

In order to demonstrate the performance of this product enough, please be sure to read this instruction manual to the last in the use. Please keep this manual carefully so that it can be referred to, when it becomes necessary and use this equipment for long time.

- In the case that this equipment is transferred to some other party, it is necessary to attach this instruction manual together with the equipment.
- This equipment is produced for the use in Japan. In the case of use in the other countries, the user should observe the laws and regulations for the safety in such countries.



In order to operate safely and correctly

Please be observed following matters

Following matters shall be securely observed.

- Use this equipment as an instrument for stamping. If it is used for some other purpose without having consultation with us, the function, and performance cannot be assured.
- Power source of AC100V +/- 10% 50/60Hz should be used. Do not connect with other power source.
- Use this equipment at ambient temperature between 0°C to 50°C. (Humidity: 80% maximum; Dew formation is not allowed) Avoid areas where the equipment is directly exposed to the sunlight or hot wind.
- Do not modify, disassemble, or repair by yourself. Please consult with us if necessary. If any repair or modification is carried out without our consent, we are not responsible for any failure or incident caused by such act.

In this instruction, following symbols are indicated for the warning and caution in order to prevent the injury of operators or other personnel and also to prevent the damage of property/equipment.

 Warning	It indicates the potential situation by the misuse that may result in death or serious injury.
 Caution	It indicates the potential situation by the misuse that may cause slight or minor injury. This also indicates alarm that property damage may occur when equipment is not used safely.

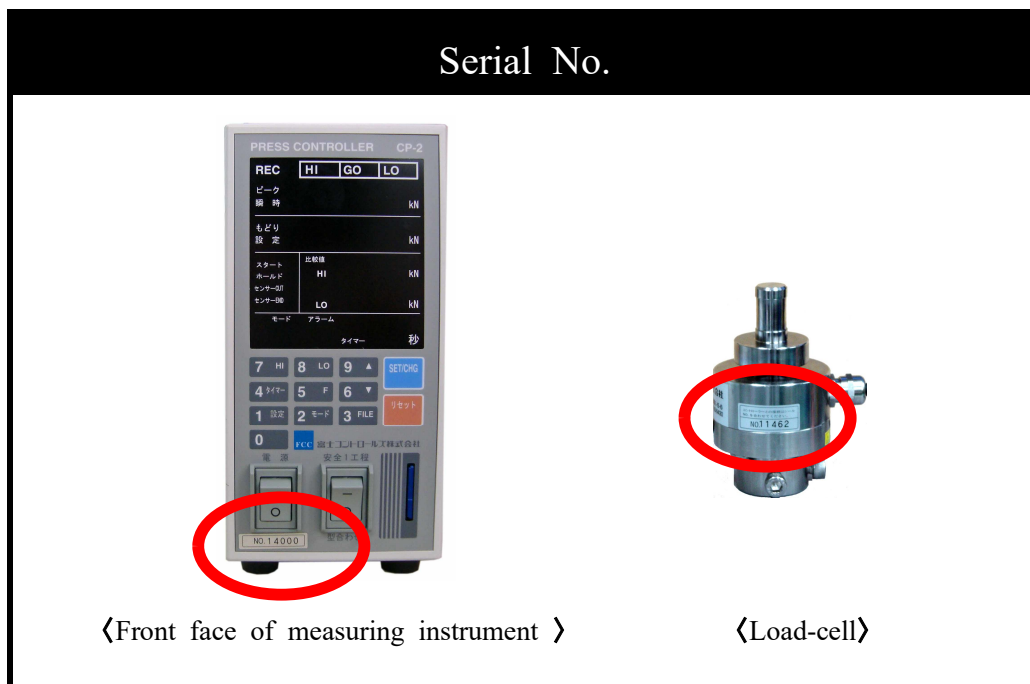
CP-2 display (place of decimal point) is that of 03 (30kN rated loads) Load Cell being used.

Unpacking:

Please make sure that the following materials are packaged in the Press Controller package. Load adjustment is carried out using a pair of instruments for measuring and load-cell. Please make sure that the same serial number is placed on the each product. Especially, pay attention when multiple units are purchased.

Package details:

- Instrument body for measuring (serial No.:)
- Load-cell (serial No.:) ※For some load-cells, cables having metal connector on both ends are packed separately.
- Power source cable (with metal connectors): Special for AC 100V 50/60Hz
- Cable for electromagnetic valve (with metal connectors) ※ Not pertained in case of mode 9.
- SD memory card
- Instruction manual (this document)



In the case that SD memory card is not inserted, the error will be occurred and then becomes abnormal end.

Please always use after the insertion of SD memory card to the main body.

◎For the method of error cancellation, please refer to Page-22, “Error message of SD memory card” and “Cancellation method.”

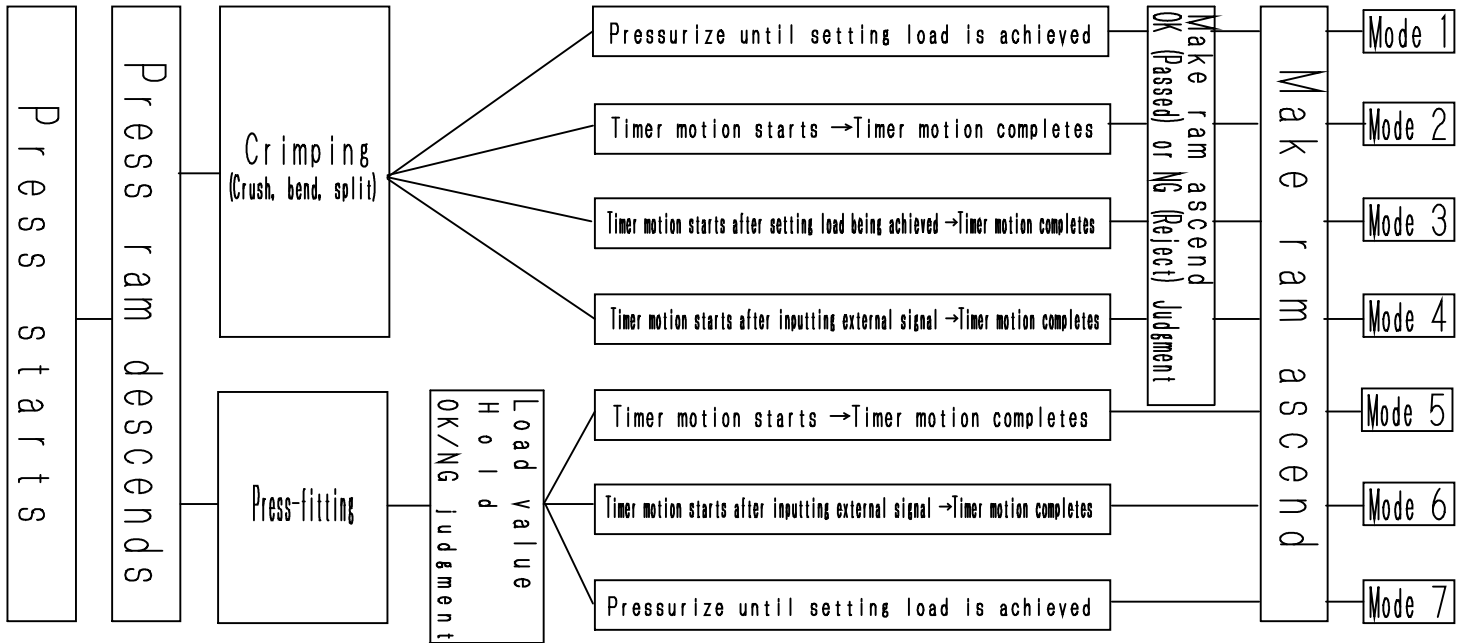
◎If the case that the SD memory card is not required, please consult with us separately.

◎Operation will not be guaranteed except the use of attached SD memory card.

Equipment features:

Press controller of CP-2 type is equipped with press control circuits and load control function for the air-press. When press-fit operation or crimping operation is carried out in the stamping process, this control device is possible to measure, compare, judge the load, and simultaneously control the loads, which are applied to the product. Press controller is available with various types of control modes. Please select appropriate one that matches to the operation.

Modes and control details are as follows:



Mode 1: Constant load pressurizing control

This mode makes press ram ascend instantly after reached to the set load.

The OK/NG judgment of the applied loads is carried out on the actual load just after ascending.

Mode 2: Crimping timer control 1

This mode makes press ram ascend after the set time has past.

Timer starts the operation by the signal at the cylinder lower limit position. OK/NG judgment for the applied loads is carried out simultaneously when press ram ascends.

Mode 3: Crimping timer control 2

This is an alternate mode of mode 2. The timer starts operation when reached to the set load.

Mode 4: Crimping external control

This is an alternate mode of mode 2. The timer starts operation when controller receives external signal as the trigger.

Mode 5: Press-fit timer control

OK/NG judgment of the press-fit loads is carried out first.

After the OK judgment with the input of measurement completion signal, the timer starts operation and the press ram ascends after the set time has past.

Mode 6: Press-fit press external control

This is an alternate mode of mode 5.

If OK judgment is made after the press-fitting, the timer starts the operation when controller receives external signal as the trigger.

Mode 7: Post-press-fit constant loads pressurizing control

This is an alternate mode of mode 5.

If OK is judgment is made after the press-fitting, press ram ascends immediately when reached to the set loads.

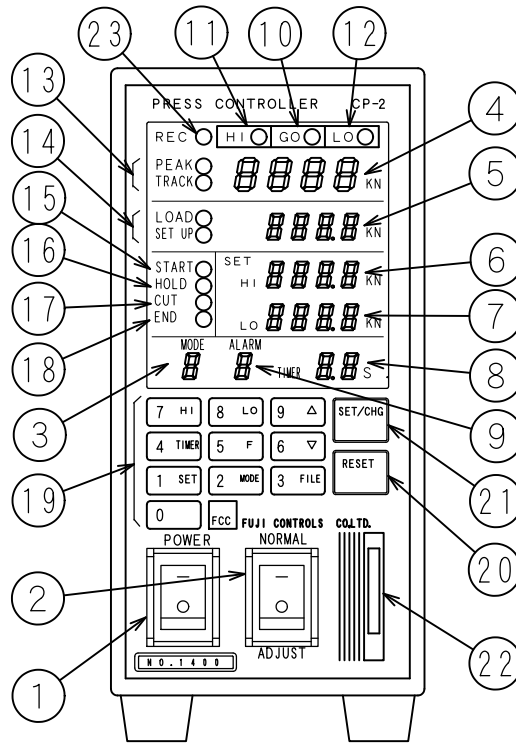
Mode 9: Press control circuit non-operation

In this mode, only measurement or comparison judgment is carried out in press-fitting or crimping operation, but press control circuit does not operate.

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Name of each portion and functional description:



No.	Name	Functions
(1)	Power source switch	Power enters when upper side is pushed. Electronic noise beeps and LED and ROM/RAM self-check is carried out for nine seconds when power source switch is turned on. (It is not possible to operate during checking)
(2)	Switch - switching operation function	When upper side is pushed, "safety one process operation" is activated. When lower side is pushed, "die matching operation" is activated. Safety one process: This is a normal operation. Press operates one process and judges loads while comparing when inputting press start signal. Die matching: Only press function is operative. The "comparison judgment" and "various controls" of press controller original functions do not work. Please refer to "die matching" in page 7.
(3)	Control mode display portion	Setting mode Nos. are displayed. [1] to [9] The [-] is displayed when the above (2) switch is "die matching."
(4)	Display portion for value of final loads or press-fit loads	Value of loads which are judged while comparing is displayed. (The value is displayed when measuring) Display details change depending on mode being used.
(5)	Setting load display portion Final load display portion	Products setting loads or final loads for post-judgment are displayed. (These are not displayed in modes 2 and 4)
(6)	Upper limit comparison value display portion	Upper limit comparison value related to loads for press-fitting or crimping
(7)	Lower limit comparison value display portion	Lower limit comparison value related to loads for press-fitting or crimping
(8)	Pressurizing time display portion	Pressurizing time in timer mode (this is not displayed in modes 1, 7 and 9)

(9)	Alarm display portion	Operation is interrupted and buzzer beeps. And, the details are displayed using numbers. 0: Load value is NG; 1: Emergency stop order input; 2: Cycle time error is operated; 9: SD memory card writing error
(10)	OK product display lamp (GO)	This lamp lights up when value of load is judged as OK. "Lower limit comparison value \leq Load of press-fitting or crimping \leq Upper limit comparison value" The signal is output on back surface terminal base Nos. 23 and 24 at relay contact point (normal open).
(11)	NG (upper limit) display lamp (HI)	In the case that load value surpasses upper limit setting value, this lamp lights up. "Upper limit comparison value $<$ Load value of press-fitting or crimping" signal is output on back surface terminal base Nos. 20 and 22 at relay contact point (normal open). Buzzer sounds for two seconds simultaneously when the lamp lights up. ※In the case that alarm display is No. 1 or 2, the lamp also lights up.
(12)	NG (lower limit) display lamp (LO)	In the case that load value is lower than lower limit setting value, this lamp lights up. "Load value of press-fitting or crimping $<$ lower limit comparison value" The signal is output on back surface terminal base Nos. 20 and 21 at relay contact point (normal open). Buzzer beeps for two seconds simultaneously when the lamp lights up. ※In the case that alarm display is No. 1 or 2, the lamp also lights up.
(13)	Load measuring mode display portion	When measuring of crimping loads or press-fitting loads is completed, either peak value (initial setting value) or instantaneous value (load value when completing hold) is displayed.
(14)	Setting value mode display lamp	The above (5) value is displayed as a load setting value or return value (final load value).
(15)	Start lamp	This lamp lights up when press ram is at top dead center (origin). (Synchronized with upper limit signal)
(16)	Hold lamp	This lamp lights up when press hold is input. (Press hold in this instruction means the lamp is emitted during the press ram is descending and not emitted at the bottom dead end) ⚠ Warning: In "Safety one process," after input of hold signal, press ram continuously descends even if start signal is turned off. In order to prevent danger, it is necessary to adjust (dog position so that) the hold signal always enters just before upper die contacts with the product.
(17)	Sensor <i>CUT</i> lamp	This lamp lights up when measurement start signal is activated. When the lamp is lights up, load measurement is not carried out. If this is not wired, measurement starts simultaneously when start button is pushed. Contact point a: This is closed when the signal is activated.
(18)	Sensor <i>END</i> lamp	This lamp lights up when measurement completion signal is activated. This is used in modes 5, 6 or 7. Input signal for terminal b specs. Contact point b: This is opened when signal is activated.
(19)	Ten keys	These are used when upper/lower limit comparison value, setting load value or pressurizing time is registered or changed.
(20)	Reset key	This is used for canceling or display initializing when registering or changing is carried out. Canceling of prohibition of press starting after judging NG, clearing displayed value and initializing judgment result signal are carried out. (When this button is pushed when press process ends, return value switches to setting value)

(21)	SET/CHG key	This is used for changing or setting various values when registering them.
(22)	SD card slot	SD memory card is inserted/taken out from this slot.
(23)	REC lamp	This lamp is turned on during the recording to SD memory card.



Regarding upper/lower limit comparison value, it is necessary to establish the value so that this complies with the following formula: Upper limit comparison value \gt Lower limit comparison value. If the formula: Upper limit comparison value \lt Lower limit comparison value is established, buzzer sounds and the register are not accepted.

Important: In the case that result of judgment is HI (high) or LO (low), it is impossible to restart if reset key button is not pushed. (Initial setting)
Restart is also possible without pushing reset key button switch. Refer to page 17 “Press restart permission selection” if necessary.

Technical terms:

1. Display portion for measuring load

Press controller has the following function: It is possible to select mode for measuring loads of press-fitting or crimping using either peak value (initial setting value) or instantaneous value (measured at fixed point.)

1-1. Peak value (Initial setting) mode

When signal for ending measurement is input, measured peak value is compared with upper/lower limit comparison value and judged. The load measuring mode display lamp "peak" blinks while measuring and lights up after measuring.

1-2. Instantaneous value mode

When signal for ending measurement is input, then measured value is compared with upper/lower limit comparison value and judged. The load measuring mode display lamp "instantaneous" blinks while measuring and lights up after measuring.

2. Safety one process/die matching

2-1. Safety one process

This is a normal operation circuit. Press start signal should be continued to input until press hold is activated. If push button is released before press hold activation, signal that is emitted to electromagnetic valve for driving ram is released. After press hold is input, electromagnetic signal is output regardless of press start signal being ON or OFF. Regarding electromagnetic valve signals, those for SV-1 are output (Connector pins Nos. 1 and 2 for electromagnetic valve) simultaneously when press start is instructed and in addition, those for SV-2 are output (Connector pins Nos. 3 and 4 for electromagnetic valve) when press hold is input.

Press start signal should be released once when press upper limit signal is input. If press start signal is again input when press upper limit signal is input, electromagnetic valve signal is output. When press start signal is continuously input, only one process portion of electromagnetic valve signal is output and press will not restart.

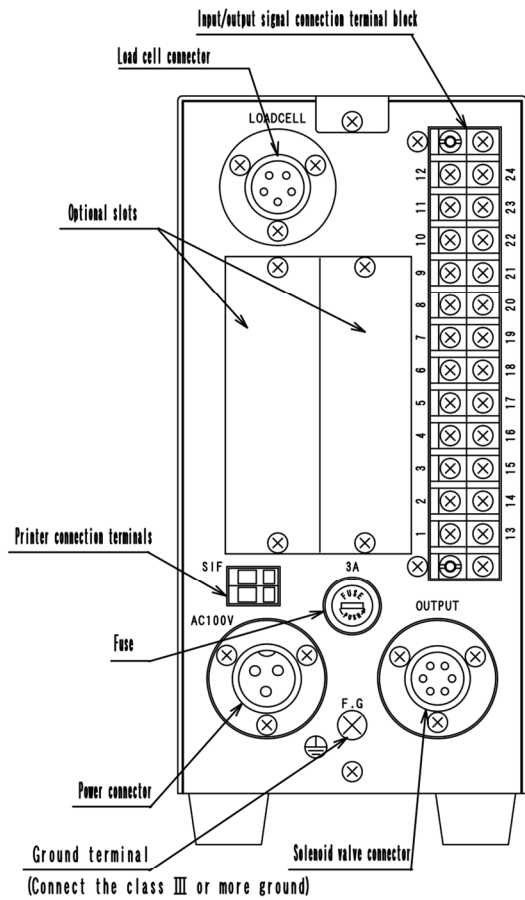
2-2. Die matching

Control function for each mode will not work. Only load measurement function is operative. Only load value which load-cell measures every moment is displayed. (Displayed value is not retained)

For press control circuit, only electromagnetic valve SV-1 (Connector Nos. 1 and 2 for electromagnetic valve) is output when press start signal is input. If inching mechanism is installed on the press side, as electromagnetic valve SV-1 works in every press start signal, it is possible for inching to operate.

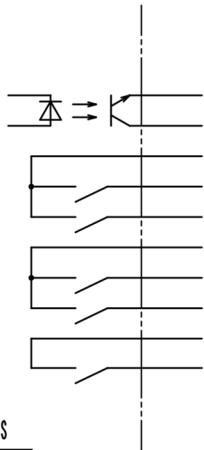
※ Regarding inching mechanism for air-circuit etc., please contact us.

Press controller input/output



Input/output signal terminal block

- 1 External input (normal open)
- 2 Measurement end input (normal Close)
- 3 Measurement start input (normal Close)
- 4 COM (negative terminal for a photo sensor, etc)
- 5 +12V for sensors
- 6 Press hold input (normal open)
- 7 Press upper limit input (normal open)
- 8 COM
- 9 +12V for sensors
- 10 Press start input (normal open)
- 11 Emergency stop input (normal open)
If you need type "b" relay contacts, please ask us
- 12 COM
- 13 COM
- 14 +12V for sensors
- 15 Set load reached output COM (photo-coupler negative terminal)
- 16 Set load reached output (photo-coupler output 30 VDC/30mA)
- 17 Press upper/hold output - COM
- 18 Press hold output (normal open)
- 19 Press upper limit output (normal open)
- 20 HI/LO output - COM
- 21 LO output (normal open 100 VAC, 0.5A)
- 22 HI output (normal open 100 VAC, 0.5A)
- 23 GO output - COM
- 24 GO output (normal open 100 VAC, 0.5A)



Solenoid valve connector numbers

(numbers refer to respective pin numbers)

1. Press main solenoid valve (SV-1) (L) white wire
2. Press main solenoid valve (SV-1) (N) black wire
3. Press low speed solenoid valve (SV-2) (L) red wire
4. Press low speed solenoid valve (SV-2) (N) green wire
(the solenoid valve output is 100 VAC:.....S SR)

• Relay Output Contact rating: AC100V/0.5A, DC30V/0.5A

• +12V Sensor power terminals 5, 9, and 14 commoned. The total current capacity of all three is 0.2A

• COM terminals 4, 8, 12, and 13 are common.

- Terminal bases 1 to 14 are terminal bases for input signal connection. (Signal is non-voltage contact point or photo sensor)
 - 1 - COM: External input – This is used for modes 4, 6. Input “a contact point”.
 - 2 - COM: Measurement-end signal – Connect “b contact point.” (Usual: ON; activated: OFF) – Modes 5, 6 and 7 are used.
 - 3 - COM: Measurement-start signal – Measurement does not start if it is short. Measurement is carried out when it is open.
(It is open from starting measurement to starting ram ascending)
 - 6, 7, 10, 11 – COM: Input “a contact point” for all.



Press hold should be input while upper jig contacts with product after upper limit signal switches off. However, this is not bottom dead center signal. Unless press lower limit signal is input, press control circuit will not operate correctly in any mode. (Upper limit signal and hold limit signal MUST NOT be input simultaneously)

- Terminal bases 15 to 24 are terminal bases for output signal connection. Use them if necessary.

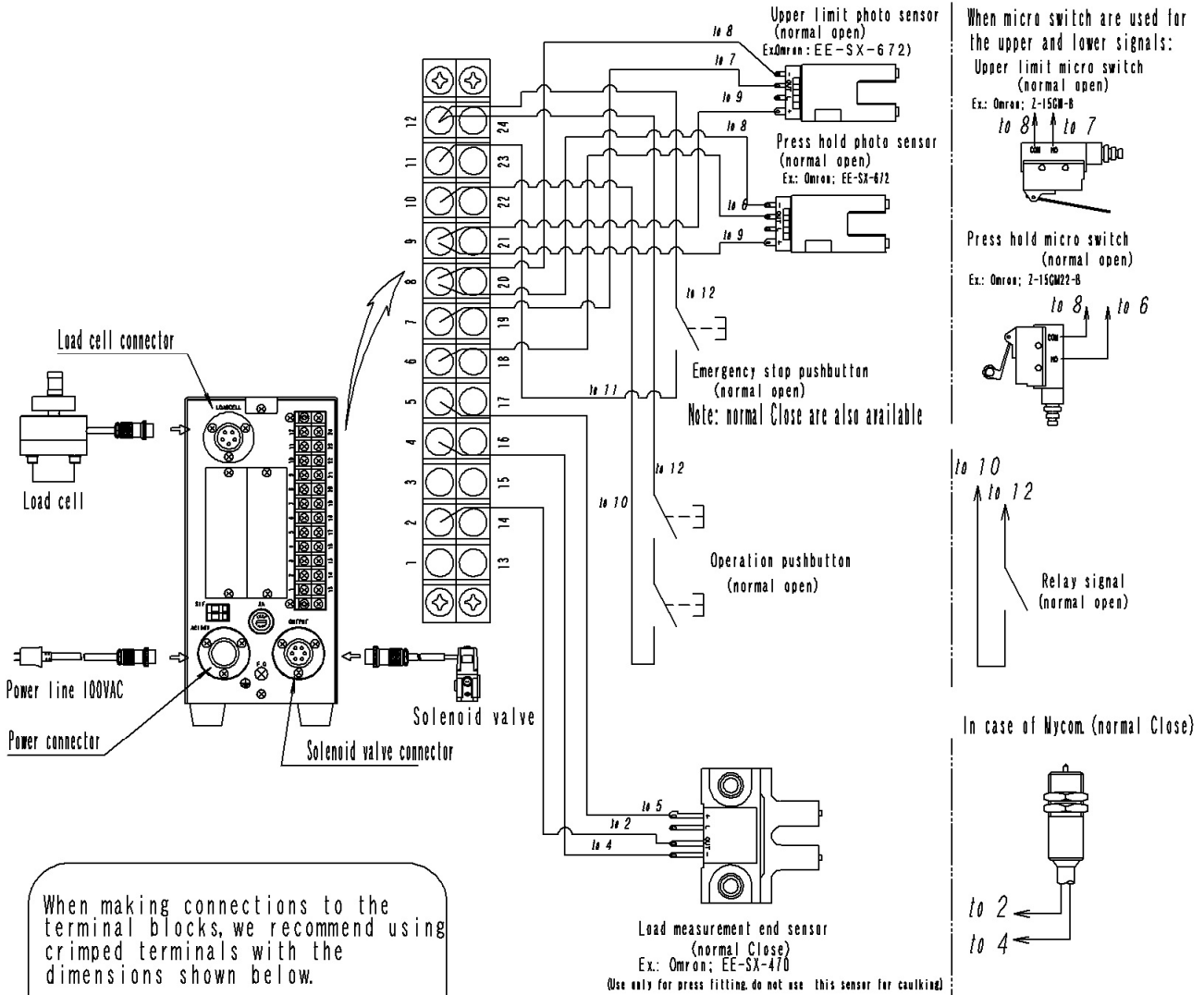
15, 16: Signal achieving setting load (effective only during safety one process)	Modes 1 to 7; after starting, if setting load is achieved, the signal is output. The output continues until reset or next start is applied.
	Mode 9; after starting, if load is setting load or greater, the signal is output. The output continues until reset or next start is applied.

Press controller wiring diagram at back surface (reference)

The following wiring diagram is a general example of connection. For other than this, please consult with us.

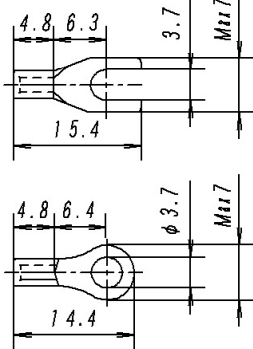
⚠ Caution

Power source is AC 100V +/- 10% 50/60Hz. Please do not connect with the other power source by any means.



When making connections to the terminal blocks, we recommend using crimped terminals with the dimensions shown below.

Crimping terminal for M3.5



(Unit: mm)

*In the case that input signal is PLC,

- In the case of relay output (contact point a signal for all)

Press hold input: 6 and COM (common)

Press upper limit input: 7 and COM

Press start input: 10 and COM

Emergency stop input: 11 and COM

Note: COM is common for 4, 8, 12 and 13

*In the case of transistor (NPN)

(Output which becomes 0V when all are operated)

Press hold input: 6 and COM

Press upper limit input: 7 and COM

Press start input: 10 and COM

Emergency stop input: 11 and COM

Note: COM is common and 0V.

Display in every mode:

□ Safety one process

Selection mode	1	2	3	4	5	6	7	8 ※1	9
Peak / instantaneous LED ※2	○	○	○	○	○	○	○	○	○
Return/setting LED	Return	—	—	—	—	△	△	△	—
	Setting	○	—	○	—	—	—	□	○
Mode display (digital) ※3	1	2	3	4	5	6	7	—	9
Timer display (digital) ※4	—	○	○	○	○	○	—	—	—

○: Display or lighting up

—: Non-display

△: After starting, lamp lights up and digital display is carried out just after zero point returning to next starting.

□: Lamp lights up and digital display is carried out until reset is operated or press hold signal is input after starting.

※1: Mode 8 is specific specifications. (Refer to us for specifications etc.)

※2: After starting, either lamp for peak or instantaneous lamp flashes (lights up).

※3: Digital number (modes 1 to 9) is displayed.

※4: Digital number (0.0 sec. to 9.9 seconds.) is displayed.

□ Die matching

Each LED for peak, instantaneous, return and setting and each digital display for return / setting, mode, alarm and timer turn off light.

Necessary wiring (input) and alarm display in every mode

●: Necessary; ▲: Wiring is possible; ×: Not necessary

Input signal	A		B		1	2	3	4	5	6	7	8	9
Press start	10-12				●	●	●	●	●	●	●	—	●
Press upper limit	7-8				●	●	●	●	●	●	●	—	×
Press hold limit	6-8				●	●	●	●	●	●	●	—	×
Measurement start	3-4				×	×	×	×	▲	▲	▲	—	▲
Measurement end	2-4				×	×	×	×	●	●	●	—	●
External	1-4				×	×	×	●	×	●	×	—	×
Emergency stop	11-12				▲	▲	▲	▲	▲	▲	▲	—	×

Press start: This is a start order.

A: Terminal base; B: Mode

Press upper limit: Input is carried out when press ram is upper limit (zero point). (Contact point a)

Start lamp lights up simultaneously when input is carried out.

Press hold: After press start signal is input and press ram moves upper limit, the input is carried out on the way of descending (moving). (Contact point a) Hold lamp lights up simultaneously when input is carried out.

Measurement start: Input is carried out after press start signal is input. (Contact point a)

Sensor CUT lamp lights up simultaneously when input is carried out. If wiring is not carried out, measurement starts simultaneously when start is applied.

Measurement end: Input is carried out after press hold limit signal and load measurement start signal are input.

(Contact point b) Sensor END lamp lights up simultaneously when input is carried out.

External: Input is carried out after press hold signal is input. (Contact point a)

Emergency stop: This is effective only when operation function switching switch is in "Safety one process" and electromagnetic valve is operating. This is not operated when press ram is returning to zero point.

◎Start conditions: Press start signal should be input. (Only when safety one process is in activation^{※1})

Press upper limit should be input. (Start lamplights up)

Press hold (hold lamp), measurement start (sensor CUT), measurement end (sensor END), external and emergency stop should not be input.

Previous alarm should be reset. (Restart permission)

※1: At the time of die matching operation, linked with the input of press start signal, the main electromagnetic valve is operated.

◎Operation flow (mode 1 to 7)

Press start is input → Press Main electromagnetic valve is activated (ON) → Press ram descends → Press upper limit signal is OFF → Descending continues → Press hold is ON^{※2} → Electromagnetic valve for press lower speed is activated (ON)^{※3} → Die contacts with product → Operated in each mode^{※4} → Return conditions in each mode are completed → Operation of electromagnetic valve for main/lower speed ends (OFF) → Press ram ascends → Zero point return → One cycle operation is completed

※2: If press start signal is OFF prior to the input of press hold, electromagnetic valve stops the operation, and press ram returns to zero point.

※3: When press hold is input, even If press start signal is OFF, ram continues to descend.

(Hold): Regarding electromagnetic valve for main/lower speed, operation is kept.

※4: Mode 1: Pressurizing is carried out until reaching to the set load value

Mode 2: Pressurizing is carried out until timer operation is completed. (Timer operation starts by receiving press hold signal)

Mode 3: After achieving setting load value, pressurizing is carried out until timer operation is completed.

Mode 4: After external signal is input, pressurizing is carried out until timer operation is completed.

Mode 5: After measurement end signal is input, pressurizing is carried out until timer operation is completed.

Mode 6: After measurement end signal and external signal are input, pressurizing is carried out until timer operation is completed.

Mode 7: After measurement end signal is input, pressurizing is carried out until reaching to the set load value.

◎ Flow of the operation (mode 9)

Press start is input → Load measurement starts → Measurement end signal is input → Load display is fixed → Comparison judgment → Relay output (this is continued until reset is operated)

◎Table of alarm display

If alarm sounds while press operation is ongoing (during the operation of main electromagnetic valve), press ram stops descending (pressurizing) and returns to zero point.

Alarm 0: Load value NG

This is displayed when load value for comparison judgment does not comply with upper/lower limit value which was previously established. Lamp for HI (high) or LO (low) lights up and relay output is carried out. Relay output continues until reset operation is carried out.

Alarm 1: Emergency stop input

This is displayed when emergency stop is input by ram returning to the zero point (main electromagnetic valve is operating) after press start is input. Lamps for HI (high) and LO (low) simultaneously light up and relay output is carried out. Relay output continues until reset operation is carried out.

Alarm 2: Cycle time error operation (cycle-over)

This is an internal timer. (Initial value: 10 seconds.) This operates after press start is input. This is displayed when the internal timer operation completes before operation in each mode is completed. Lamps for HI (high) and LO (low)

simultaneously light up and relay output is carried out. Relay output continues until reset operation is carried out.

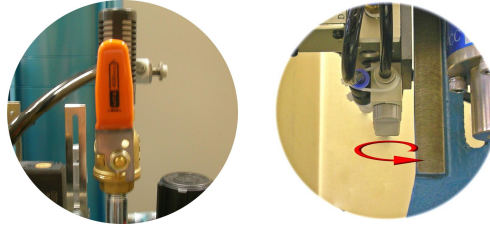
Alarm 9: SD memory card writing error

While record of SD memory card is valid and writing is carried out, the error is occurred and to be abnormally stopped if the writing is not carried out such as the situation like SD memory card is not inserted. For restoration, push reset key after the confirmation of the state of SD memory card. By releasing error status, data recording command shall be carried out once again.

When installed to the air-press (For the case of QC press)

1. How to make die matching (inching operation)?

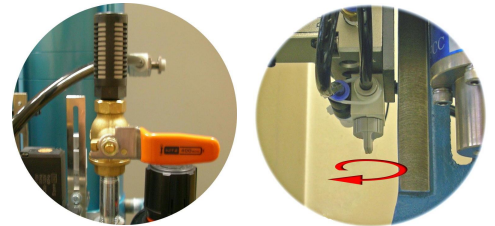
- (1) Switch switching operation function of press controller to “Die matching” position.
- (2) Inching valve should be closed.



- (3) Press ram descends while press start signal is input and ram stops when press start signal is off.
- (4) Ram ascends when inching valve opens.
- (5) Repeat the above operations (3) and (4) and carry out die setting. It is easy to operate if regulator or speed controller is appropriately throttled.

Fine adjustment for jig matching: In the state that ram stops when inching operation is carried out, ram slowly descends when air pressure is reduced with regulator and ram ascends when air pressure is boosted. Die matching is easily carried out utilizing this.

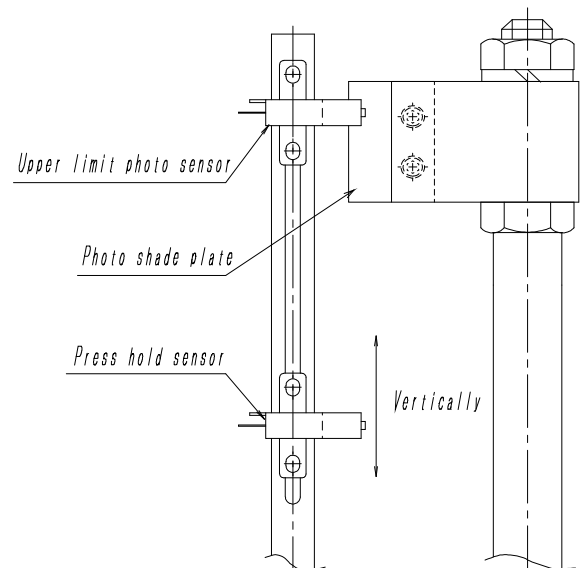
- (6) When die matching is completed, inching valve should be full open.



2. Press hold sensor adjustment

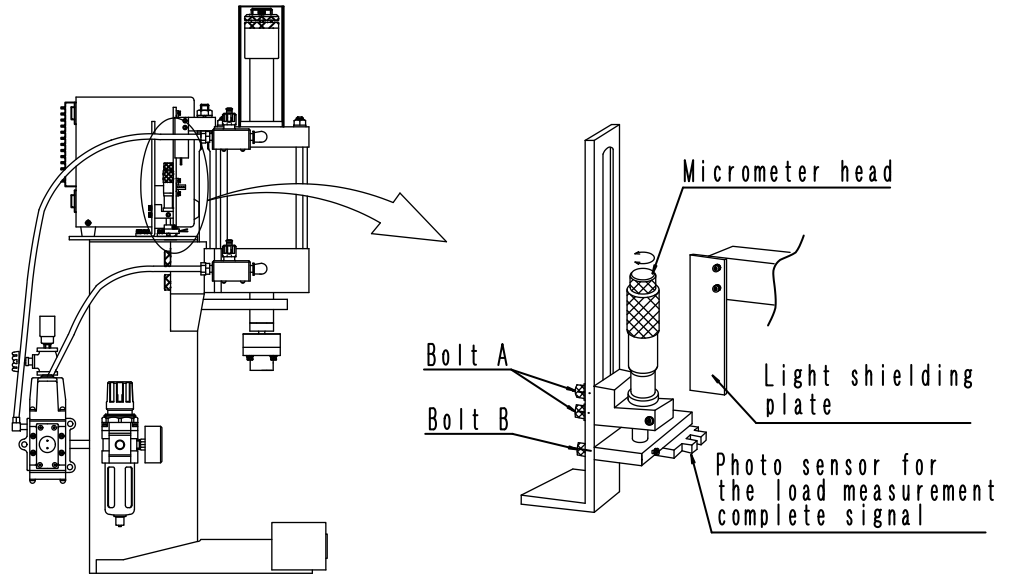
- (1) Switch for press controller switching operation function should be switched to “Die matching.” Place product which is not press-fitted on die (jig) and make upper die slowly descend with inching operation and stop just before contacting with the product.
- (2) In order to make press hold sensor being operated state by shade plate at this position, loosen two bolts fixing press hold sensor switch to adjust while sliding switch vertically.
- (3) It is possible to verify operation of press hold sensor using hold lamp on the face of press controller panel. (Lamp lights up when switch is operated)

- For safety, press hold sensor position should be set to the lowest possible position.



3.Position adjustment related to photo sensor for press-fit load measurement end signal

- (1)Switch switching operation function of press controller should be switched to “Die matching.” Turn inching valve dial so that inching valve is full close.
- (2)Supply air pressure should be adjusted to 0.2MPa by turning regulator dial counterclockwise.
- (3)Products for which press-fit is completed should be placed on lower die and upper die should be slowly descended by carrying out inching operation and ram should be stopped in the state that product is completely depressed. When ram stops completely, regulator is adjusted and supply pressure is reduced to 0.1MPa.
- (4)Bolts A and B should be loosened and metal fitting for installing micro head should be vertically moved and fixed with bolt A at the position near shade plate lower end where photo sensor operates.



Important: Sensor END lamp for press controller lights up if photo sensor for press-fit measurement end signal is activated. Please adjust the photo sensor so that press-fit measurement end signal is input on after press hold sensor is operated.

- (5)Turn micro head dial and lower photo sensor until sensor END lamplight of press controller turns off. Slowly reverse the micro head and raise photo sensor to the position at which sensor end lamplights up.
- (6)Raise photo sensor about 0.3mm from the position at which sensor end lamplights up while reading scale of micro head. (Because this prevents that it is not possible to measure press-fit pressure correctly when die conflicts with product in final stage of press-fitting)
- (7)Tighten bolt B so that photo sensor does not move.
- (8)Turn inching valve dial so that inching valve is full open.

⚠ Warning	Do not bring body to press ram since the ram ascends when inching valve is fully opened. Because there is a possibility of getting hurt.
------------------	--

- (9)The adjustments related to photo sensor position are completed.

4. Stroke adjustment (modes 1 and 7 are not used)

- (1) Descent stroke of press ram can be adjusted by the mechanical stopper. Slowly loosen the cap screw at the top of stopper. Since stopper has threads, it is easy to turn freely.
- (2) If position adjustment is completed, tighten cap screw firmly to fix. (Stroke becomes short by turning clockwise) After the completion of adjustment, it is necessary to install acrylic cover for sure protection.
- (3) In the case that stroke is adjusted, it is necessary to verify the operation of photo sensor for press-fit load measurement end signal.
※ Example of stopper utilization: (1) Prevention from stamping without product; (2) In the case that press-fit dimensions are determined by the press stroke

5. Adjustment related to press output and descending speed

- (1) Press output is adjusted by the regulator. Refer to “Air-press instruction manual.”
Press output should not be set to the load-cell rating loads or greater. If excessive loads are applied, this might destroy the load-cell caused by the permanent deformation.
- (2) Press descending speed is adjusted using speed controller for descending.
- (3) Press ascending speed is adjusted using speed controller for ascending.

6. How to verify the press output

- (1) Switch for switching operation function is set to “Die matching” side.
- (2) Products for which crimping or press fitting was terminated are to be placed on die.
- (3) Push “0” (zero) key and then push “SET/CHG” key for making load display to “0”.
- (4) Input press start signal to make press ram descend.
* Continue to input start signal until (6).
- (5) When upper die touches with product, press loads are displayed with digital.
- (6) After confirmation of press output, press start signal is switched to “OFF” to make press ram ascend.



If cylinder mechanical stopper works or cylinder is at the stroke end position, correct output confirmation cannot be made.



Do not push reset key when pressurizing. For press start signal, continuously input the signal from press start to the end of output confirmation.

Various settings and changing method

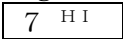
1. Register of upper/lower limit comparison value

This is changing method of upper/lower limit comparison value. It is possible to memorize ten types of upper/lower limit comparison value. The following values are registered as initial values:


Channel No.	Upper limit comparison value	Lower limit comparison value
CH 0	10.00	1.00
CH 1	11.00	2.00
CH 2	12.00	3.00
CH 3	13.00	4.00
CH 4	14.00	5.00
CH 5	15.00	6.00
CH 6	16.00	7.00
CH 7	17.00	8.00
CH 8	18.00	9.00
CH 9	19.00	10.00

Important: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points. Decimal point position differs depending on load-cell being used.

1-1. Register/change of the upper limit comparison value

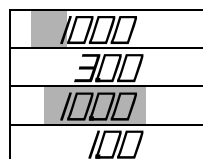
1. Push key “  ”



 Letters marked with mesh is flashed.
Display shows the channel of CH “0” which is now used.

In the case that channel is changed, push ten-key for the channel No.
If no change is necessary, move to “2” at below. (Channel “0” should be changed)

2. Push key “  ”.



← This is in the state of waiting for inputting figure of upper most rank for upper limit comparison value.
← This is upper limit comparison value at present.

Please Input renewed upper limit comparison value using ten-key from upper to lower rank figure. Figure that is flashing is the part for input. When “1000” is changed to “985”, input “0985” by using ten-key.


3. Push key “  ”.




This action terminates the operation.
When values for the other channels are changed, newly carry out from 1 to thereafter.

◎ If “Reset” key is pushed prior to 3, the operation is cancelled.


1-2. Register/change of the lower limit comparison value



1. Push key “  ”.

Lo- 
300
1000
100

 Letters marked with mesh is flashed.
Display shows the channel of CH “0” which is now used.

In the case that channel is changed, push ten-key for the channel No.
If change is not necessary, move to “2” below. (Value in Channel “0” is changed)


2. Push key “  ”.

 100
300
1000
 00

← This is the state of waiting for the input of uppermost rank figure for lower limit comparison value.

← This is the present lower limit comparison value.

Please Input renewed lower limit comparison value using ten-key from upper to lower rank figure. Figure that is flashing is the part for input. When “100” is changed to “95”, input “0095” by using ten-key.

3. Push key “S  ”.



This action terminates the operation.

When values for the other channels are changed, newly carry out from 1 to thereafter.

◎If “Reset” key is pushed prior to push “SET/CHG” key of 3, operation is cancelled.



If incorrect value of “Upper limit comparison value < Lower limit comparison value” is set, it becomes unable to input. The setting should always be made to “Upper limit comparison value > Lower limit comparison value”.

1-3.Change of upper/lower limit comparison value channel

This is the operation for switching channel of upper/lower limit comparison value being registered in advance.

[Example: Channel is switched from “0” to “5”]

1. 1. Push key 5^F .

FU _n C
300
1000
100

FU_nC Letters marked with mesh is flashed.
In the case that letters other than “FU_nC” are displayed, push RESET key.

2. Push SET/CHG key

FU _n C
1000
100

3. Push 7^{HI} key

C-CH
FU _n C
1000
100

C-CH : This is the display of switching operation for comparison value channel.

4. Push SET/CHG key

0
C-CH
1000
100

0 : This displays the channel that is now being used.

5. Input channel No. that is called up by using ten-key (0 to 9)

5
C-CH
1000
100

← Push 5^F key.

6. Push SET/CHG key

FU _n C
1500
600

Upper/lower limit comparison value for channel 5 is displayed
← this shows upper limit comparison value.
← this shows lower limit comparison value.

7. Push RESET key



In these procedures, channel is switched.

(For the register of upper/lower limit comparison value, channel that is called up is displayed at first)

◎ If RESET key is pushed prior to pushing SET/CHG key in the above 6, all previous operations are cancelled.
(Push one time before the stage of operation 4 or two times for the case after the pushing SET/CHG key in the operation 4)

Important: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points.

2. Register and change of load value setting

This is the changing method of setting loads in constant load pressurizing control. These are used in the mode 1, 3, 7, and 9. It is possible to memorize ten types of load value setting. The following values are registered as initial values.

Channel No.	Setting load value
CH 0	1.00
CH 1	2.00
CH 2	3.00
CH 3	4.00
CH 4	5.00
CH 5	6.00
CH 6	7.00
CH 7	8.00
CH 8	9.00
CH 9	10.00

Important:: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points.

2-1. Register and change of load value setting

1. Push key.

SEL3
300
1000
100

Letter X marked with mesh flashes.

Display shows the channel of CH “3” which is now used.

In the case that channel is changed, push ten-key for the channel No.

If change is not necessary, move to “2” below. (Value in channel “3” is changed)

2. Push key

0300
300
1000
100

This is the state of waiting for input of uppermost rank figure of setting load value.

The flashing Nos. below are set load value at present.

Please input new setting load value from upper to lower rank figure by using ten-key. Flashing figure is the part for input.

When “300” is changed to “265”, input “0265” by using ten-key.

3. Push key



This action terminates the operation.

When values for the other channels are changed, newly carry out the procedure from 1 to thereafter.

◎If “” key is pushed prior to push “” key of 3, the operations made so far is cancelled.

2-2. Change of channel for set load value

This is an operation for switching channel of registered set load value. These are used in the modes 1, 3 and 7.

[Example: Change from channel “0” to “5”]

1. Push 5^F key

FUnC
300
1000
100

FUnC Letters marked with mesh is flashed.
In the case that letters other than “FUnC” are displayed, push RESET key.

2. Push SET/CHG key

FUnC
1000
100

3. Push 1^{SET} key

S-CH
FUnC
1000
100

S-CH This indicates the changing operation of setting value comparison channel

4. Push SET/CHG key

0.
S-CH
1000
100

0. This displays the channel that is now being used.

5. Input channel No. for called up by using ten-key (0 to 9)

5
S-CH
1000
100

←Channel is changed to CH 5 by pushing 5^F key.

6. Push SET/CHG key

FUnC
1000
100

7. Push RESET key



The channel has been switched.
(For registering of set load value, the channel called up here is displayed at first)

©If RESET key is pushed prior to pushing SET/CHG key in 6, all operations made so far are cancelled. (Push one time before the stage of operation 4 or push two times for the case after the pushing SET/CHG key in the operation 4) Please carry out the operation from 1 for all procedures again.

Important: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points.

3, Time change of pressurizing timer

This is a changing operation of time for pressurizing timer. (Initial value: 1.0 second)

1. Push 4 TIMER key

Pr-t
1000
100
5 1.5

Letters Pr-t marked with mesh is flashed.
In the case that letters other than Pr-t are displayed, push either RESET key or correct key.

2. Push SET/CHG key

.5	← / Figure flashing is the place waiting for input.
Func	
1000	
100	
5 1.5	← This is the pressurizing time (seconds) so far.

Please input new time by using ten-key (from upper to lower rank figure).
When “1.5 seconds” is changed to “2 seconds,” please input “2” and “0”.
If pressurizing time is determined, proceed to the following procedure.

3. Push SET/CHG key

0
1000
100
5 2.0

←This is the new pressurizing time.



Pressurizing time has finally been changed.

◎If RESET key is pushed prior to pushing SET/CHG key in the above 3, all operations made so far are cancelled. Please return to the above 1 and carry out all procedures again.

Important: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points.

4. Time change of cycle time error

This is a procedure for the time change of cycle time error. (Initial value: 10 seconds)

1. Push 5^F key

FUnC
300
1000
100

FUnC Letters marked with mesh is flashed.
In the case that letters other than “ FUnC ” are displayed, push RESET key.

2. Push SET/CHG key

FUnC
1000
100

3. Push 4^{TIMER} key

Tl -t
FUnC
1000
100

Tl -t This indicates the setting mode for cycle time error.

4. Push SET/CHG key

10
Tl -t
1000
100

10 This shows time setting at present.

5. Time can be set from 1 to 99 seconds.

Input setting time.

20
Tl -t
1000
100

← This shows the time changed at “20-seconds.”

6. Push SET/CHG key

FUnC
1000
100

7. Push RESET key



Time for cycle time error has been changed.

©If RESET key is pushed prior to pushing SET/CHG key in the above 6, all operations made so far are cancelled.

5. Change of load measuring method

The initial setting of loads (final loads, press-fit loads) to be measured and judged is peak value. The following procedure shows the method of changing the value to instantaneous value:

For peak value and instantaneous value, please refer to “Technical terms” in page 2.

1. Push 5 ^F key

FUNC
300
1000
100

FUNC Letters marked with mesh are flashed.
In the case that letters other than “FUNC” are displayed, push RESET key.

2. Push SET/CHG key

FUNC
1000
100

3. Push 2 ^{MODE} key

SH-P
FUNC
1000
100

SH-P This indicates selection mode for load measuring.

4. Push SET/CHG key

/
SH-P
1000
100

/ This shows that present measuring mode is for peak value.

5. For switching to instantaneous value mode, Push 0 key.

0
SH-P
1000
100

←The measuring at present shows instantaneous mode “0”.

6. Push SET/CHG key

FUNC
1000
100

7. Push RESET key

The mode has been changed from peak value to instantaneous value.



In the case that the mode shall be returned from instantaneous value mode to peak value mode, please push [1] key in process 5. When changing the mode, confirmation by using load measuring display lamp (peak, instantaneous) is not possible. After the mode is switched, operate press one process to “Safety one process.” Display lamp flashes during pressurizing and lights up at the completion of pressurizing.

©If [Reset] key is pushed prior to pushing [SET/CHG] key in the above 6, all operations made so far are cancelled.

6. Selection of press re-start permission

This is an operation to select reset key operation whether it is necessary for re-start or not when buzzer sounds and alarm displays at occurrence of defective product etc. In the initial setting, reset is necessary.

1. Push 5^F key

FUNC
300
1000
100

FUNC Letters marked with mesh are flashed.
 In the case that letters other than "**FUNC**" are displayed, push RESET key.

2. Push SET/CHG key

FUNC
1000
100

3. Push 5^F key

rSE
FUNC
1000
100

rSE This indicates the selection mode for restart permission.

4. Push SET/CHG key

0
rSE
1000
100

0 This shows the present setting mode that is not possible to restart without pushing reset key.

5. In order to switch so that it is not necessary to operate reset key

/
rSE
1000
100

 Push 1 key.

6. Push SET/CHG key

FUNC
1000
100

7. Push RESET key



The mode has been switched in which it is not necessary to operate reset key.
 (The press can be started without pushing the reset key when alarm sounds)

©In the case that the mode shall be returned to the reset key required operation, push 0 key when the process is in 5.
 After completion of the change, verify the operation of reset key by operating press in "Safety one process" for intentional occurrence of NG at the time of restart. (For easy way to occur the NG situation, compulsory indicate NG display by using OK product with changing upper/lower limit comparison value)

©If RESET key is pushed prior to pushing SET/CHG key in the above 6, all operations made so far are cancelled.
 (Push one time before the stage of operation 4 or push two times for the case after the pushing SET/CHG key in the operation 4)

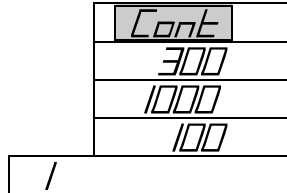
7. Change of control mode

This is an operation for changing mode from delivery to other press control mode.

(Please, carry out this operation after the change of [Safety one process – Die matching] switch to the “Safety one process” side)

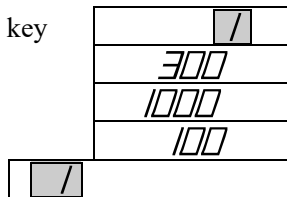
<Example: Change of the mode from “mode 1” to “mode 7”>

1. Push 2 MODE key



Letters “ Cont ” marked with mesh are flashed.
In the case that letters other than “ Cont ” are displayed, push RESET key.

2. Push SET/CHG key

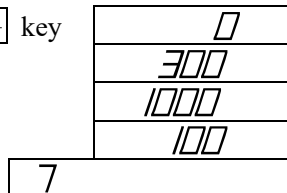


This shows that present mode setting is “1”.

Please, input the figure of the new mode:

No.	Mode	Remarks
1	Pressure control at constant load	Return of set load value
2	Crimping timer control 1	Timer starts when receiving press hold signal
3	Crimping timer control 2	Timer starts when receiving set load value
4	Crimping external control	Timer starts by external signal after input of press hold
5	Press-fit timer control	Timer starts when loads are “GO”
6	Press-fit press external control	Timer starts by external signal when load is “GO”
7	Pressure control at constant load after press-fitting	Return of set loads when load is “GO”
8	Specific mode	
9	Non-operation at press control circuit	Load measuring or comparison judgment is only carried out

3. Push SET/CHG key



Mode has been switched from mode 1 (Pressure control at constant load) to mode 7 (Pressure control at constant load after press-fitting).

8. Change of set value prohibition lock

This is an operation for prohibiting the change of set value by using front operation keys. (Initial value: 3)

1. Push 5 ^F key

FU _n C
300
1000
100

FU_nC Letters marked with mesh are flashed.
In the case that letters other than “FU_nC” are displayed, push RESET key.

2. Push SET/CHG key

FU _n C
1000
100

3. Push 6 ▽ key

LoC
FU _n C
1000
100

LoC This shows operation display related to the change of set value prohibition lock.

4. Push SET/CHG key

3
LoC
1000
100

3 This display shows that it is possible to change the set value.

5. Push 5 ^F key

5
LoC
1000
100

5 This display shows that the change is prohibited.

6. Push SET/CHG key

FU _n C
1000
100

7. Push RESET key



By the completion of above procedures, the change of set value is not possible by the front key operation.
(However, the confirmation of set value is possible)

If RESET key is pushed prior to pushing SET/CHG key in the above 6, all operations made so far are cancelled.
(Push one time before the stage of operation 4 or push two times for the case after the pushing SET/CHG key in the operation 4) Please carry out the operation from 1 for all procedures again.

Important: CP-2-003 (load-cell of 3kN rating loads is used) displays down to three decimal points.

In order to release the change of set value prohibition lock, push 3 key when the process is in 5.

Communication Record to SD Memory Card

1.Outline

At the completion of load measurement, measured results and set value can be recorded in the SD memory card. It generates CSV type data file.

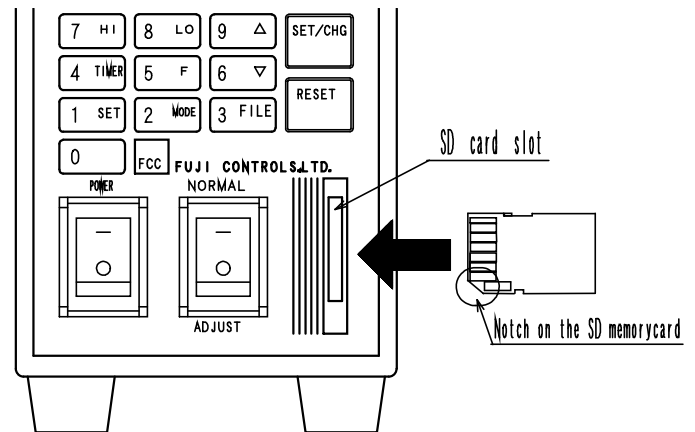
DATE	TIME	COUNT	DATA1	DATA2	STATE	HI limit	LO limit	TARGET	TIMER	MODE	ALM
2012/3/27	14.43.48	1	0.393		HI&LO	1.777	0.001	0.444			
2012/3/27	14.43.51	2	0.393		HI&LO	1.777	0.001	0.444			
2012/3/27	14.43.55	3	0.392		HI&LO	1.777	0.001	0.444			
2012/3/27	14.44.01	4	0.381		HI&LO	1.777	0.001		0.5	2	1
2012/3/27	14.44.04	5	0.39		HI&LO	1.777	0.001		0.6	2	1
2012/3/27	14.44.07	6	0.393		HI&LO	1.777	0.001		0.7	2	1
2012/3/27	14.44.20	7	0.532		HI&LO	1.777	0.001	0.444	0.6	3	1
2012/3/27	14.44.24	8	0.515		HI&LO	1.777	0.001	0.444	0.8	3	1
2012/3/27	14.44.27	9	0.515		HI&LO	1.777	0.001	0.444	0.7	3	1
2012/3/27	14.44.36	10	0.517		HI&LO	1.777	0.001		0.6	4	1
2012/3/27	14.44.40	11	0.518		HI&LO	1.777	0.001		1.1	4	1
2012/3/27	14.44.44	12	0.519		HI&LO	1.777	0.001		1.3	4	1
2012/3/27	14.45.10	13	0.478	0.515	HI&GO&LO	1.777	0.001		0.4	5	1
2012/3/27	14.45.13	14	0.48	0.513	HI&GO&LO	1.777	0.001		0.3	5	1
2012/3/27	14.45.16	15	0.483	0.516	HI&GO&LO	1.777	0.001		0.5	5	1
2012/3/27	14.45.19	16	0.009	0	HI&LO	1.777	0.001		0	5	1
2012/3/27	14.45.22	17	0.127	0.228	HI&LO	1.777	0.001		0	5	1

Item	Contents
Date	YY/MM/DD
TIME	Hr. Min. Sec.
COUNT	Operated quantity
DATA1	Load value compared and judged
DATA 2	Final load value
STATE	Result of compared judgment
Hi limit	Compared value at upper-limit
Lo limit	Compared value at lower-limit
TARGET	Pressurized time
MODE	Control mode
ALM	Alarm indication
ID	Production number (four decimal places)

2.Insertion of SD memory card

As shown at right, insert the card by paying attention for the direction of notch provided to the SD memory card in the SD card slot located to the main body until the click noise is heard.

Do not carry out the measurement for 5 seconds after insertion of the card. There may be the case of error indication.



3.Taking out of SD memory card

Please make sure that no lamp is turning on (If on, it is in processing).

Push the SD memory card once to the insertion slot, and then remove your hand from the card. The SD card will come out a bit from the slot after the clicking noise. By pinching SD memory card with fingers to this side and take the card out.

4.Data file to be generated in the SD memory card: Number of renewed measured data (Initial value: 1000 times)

Following data file will be generated in the SD memory card after the completion of the lord measurement.

CP-2D***.CSV (***: 000 to 199)

The measured results and set value are filed one after the other in this data file.

In the case that the number of filed data has exceeded 200, it forcibly save the data by overwritten on the oldest data file, however it may have a possibility to take time for couple of seconds.

In average, the time for writing data in the card takes about 1 second. (It is depending upon the condition) Please always maintain the measuring tact time for 1 second or more.

The measurement is possible while writing in the SD memory card though, if the writing of previous data in the card is not completed at the end of measurement, the next measurement cannot be started till the completion of previously measured data is written in.

SD memory card specification

- : SD (SDHC, SDXC is incompatible)
- : Data capacity is up to 2GB

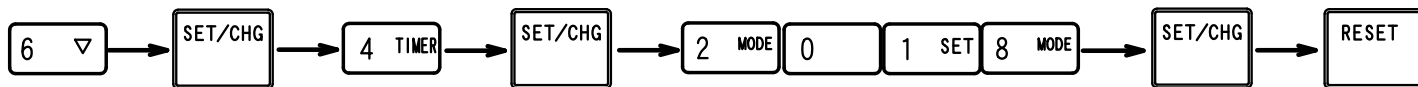
5. Time setting

Current date and time to be recorded in the SD memory card is set.

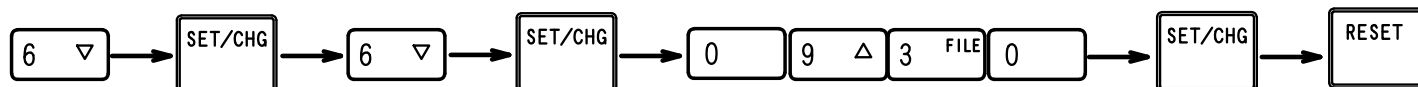
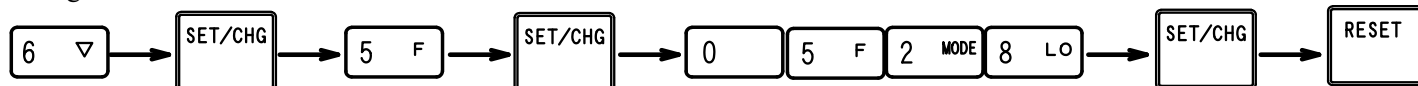
The date and time is set when shipped from the factory, however, please carry out the fine adjustment if it is necessary.

Example of set-up: Time at 9:30 on May 28, 2012

Setting of Christian era

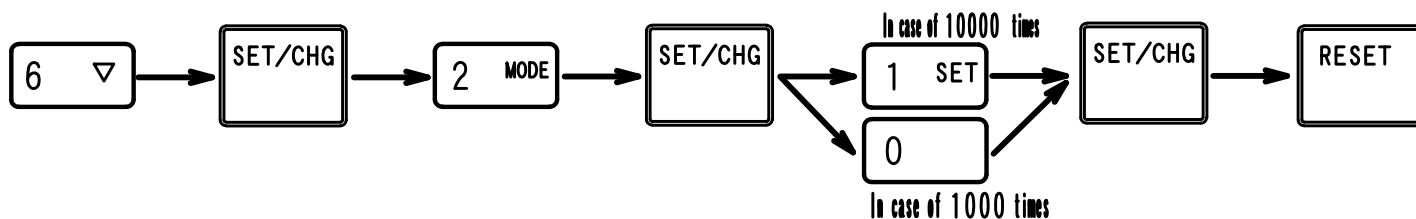


Setting of date



Setting of time

6. Change of the renewal number of the measured file (Initial value: 1000 times)



The renewal number of the measured file is changed from 1000 times for 1 file to 10000 times.

7. Finish of measured file recording

Data file of measured results recorded in the SD memory card can be finished with the record made so far by this operation.

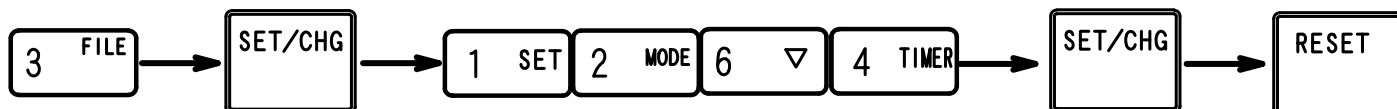
Once this operation is carried out, the next measured result will be recorded to the new file from the count 1.



8. Format of the SD memory card

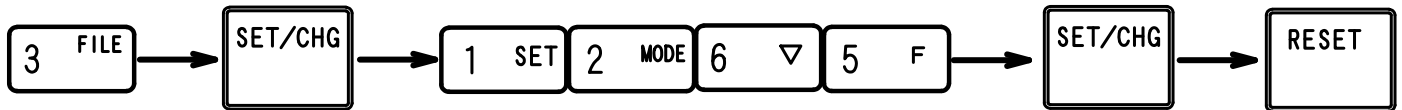
Format of SD memory card can be made in this operation.

In the case that the format is made by the other method, type of format cannot be matched to the CP-2 and may result the delayed processing speed. Therefore, please always carry out the format with this operation. (Approx. 5 seconds)



9. Self check of the SD memory card

Self check of the SD memory card can be made in this operation. If there is no problem, the display will be unchanged.



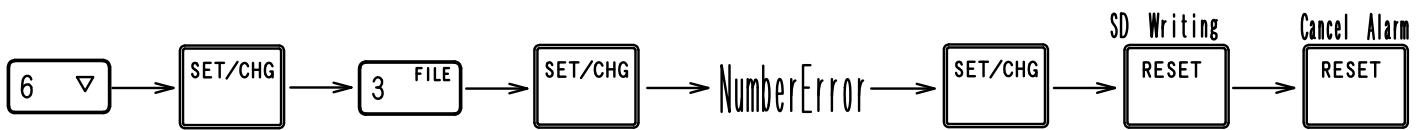
10. Error message of SD memory card and cancellation method

When the record of SD memory card is in valid status and writing command is directed, and if the writing was not normally carried out such as the SD memory card is not inserted in place etc., the operation will be stopped with abnormal status after the occurrence of error. In this case, the alarm [9] is displayed and REC lamp continuously lights up.

For cancellation, confirm the status of SD memory card, after count for 5 seconds, and push the reset key.

Important: If REC lamp is turned off, the writing is completed. If the REC lamp is still turned on, the system will not be operated even switched to the [Die matching] position.

Error No. indication of SD memory card



Error status of the SD memory card is displayed. By reset operation, writing to the card will be re-executed.

Important: Please pay attention that if [00] is put in the error number and above operation is carry out, the error objective data will be deleted.

Error	Error description
Error 01	SD memory card is not set to the main body. Please reconfirm whether or not that SD memory card is in the SD card slot or properly be inserted once again.
Error 02	Formatting error. Formatting of SD memory card was failed. Please carry out the format of SD memory card once again after the error cancellation.
Error 03	Compatibility of the type of format is not met. Format type of the CP-2 is FAT16.
Error 04	Processing of SD memory card is not ready yet.
Error 33	SD memory card is in the write protect status.
Error 88	CP-2 readable file is not existed. (In the case that original file is not available)
Error 8B	This is the error displayed when the number of SD memory card data file is going to exceed the allowed range.
Error 8C	Data cannot be filed as free space of the SD memory card is not available.
Error 91	Data file is in the mode of reading only attribution.

Maintenance and noise countermeasures

1. Maintenance

1. In self-checking when turning on the power, sometimes verify that all LED lamps light up.
2. Periodically inspect whether or not there is looseness at the connection of the back surface terminal base.

2. Noise countermeasures

Noise countermeasures are made to the press controller. However, the controller should be installed with the distance from noise occurrence source as much as possible. In the case that the equipment is unwillingly used near the instruments having noise occurrence possibility, the installation shall be made after constraining the noise occurrence with noise killer.

Cause of noise and cases of symptom

1. In the case that there are electromagnetic valves or relays which operate during the start of pressing to making of the judgment are placed within the distance of several meters from the press equipment.
2. During the continuous operation, load value fairly higher than the set load value is sometimes displayed.

Failure

1. Load-cell damage: In the case that either rating loads or more of loads or large forces from lateral direction are applied to the load-cell, permanent strain will be occurred and the following symptoms may appear:

- (1) Final load value indication is displayed; either of [LoAd], [oFL3] or [oFL4] is shown and sounds the buzzer.
- (2) When power is switched on, number of two figures or more is shown in the display after the self-check.
- (3) Final load value or press-fit load value that is extremely abnormal is shown in the display.

2. Failure of the controller: If following symptom is come up, please contact our company.

- (1) Figure in the digital display cannot be readable: Failure of LED

No lighting LED can be find out at the time of self-check after the power on.

- (2) At the time of self-check, [nG] is displayed then stopped. Abnormal was found to the RAM or ROM being assembled inside of the controller.

3. If It seems the failure:

Condition	Please investigate following points
All values on the press controller panel face are not shown	<ul style="list-style-type: none"> • Is power supply code connected? • Is power supply switch turned off? • Is fuse blown?
Either of [LoAd], [oFL3], or [oFL4] is shown in the display	<ul style="list-style-type: none"> • Is 5P connector at the end of load cell cable tidily treated?
Load display is unchanged	<ul style="list-style-type: none"> • Is measurement start signal still in put? • Did you push the reset key after the judgment of NG product?
It doesn't show the press-fit value or it doesn't fix the final load value.	<ul style="list-style-type: none"> • Does load measurement end sensor correctly function? (In case of modes 5, 6 and 7) • Is operating function change switch on the "Die matching" side? • Does switch for press hold operate? • Is press upper limit signal input during the press is in operation?
Press doesn't operate. (Press ram doesn't start)	<ul style="list-style-type: none"> • Is emergency stop signal input? • Does switch for press upper limit signal operate? (Does start lamp of controller light up?) • Is wiring in the come-off state? • After the NG product judgment, do you push the reset key? • Is switch for hold signal operated when press is at upper limit? (Press can not start when hold lamp lights up) • Is the power correctly supplied? • Is the air normally supplied? • Is the electromagnetic valve normally operated?
Pressurizing force of press is unstable	<ul style="list-style-type: none"> • Is the set pressure of supplied air abnormally high?

Contact when occurrence of failure: Engineering Dept. (Tel. 03-3265-5437)

Prior to the contact with us, please confirm the type of press controller and the serial number.

Specifications (Measuring instruments/Load-cell)

Measuring instrument specifications

Type	CP-2
Display	Four-figure display
Decimal point	Possible to set to the optional position
Zero point correction	Automatic correction in every start signal input
Span	Internal computation processing by the ten-key input
Load calibration	Calibrated using actual loads at the time of shipment
Set value for comparison	Ten patterns of upper/lower limit value are memorized
Set value of the load	Ten patterns are memorized
Timer control	0 to 9.9 seconds (Possible to change between 0 to 99 seconds) * For change method, please contact us separately)
Output signal	Press cylinder upper/lower limit position signal relay contact point output Comparison signal relay output (LO, GO, HI) Set load attainment signal photo coupler open collector output
Electromagnetic valve driving output	AC100V; Standard: Two circuits; (Three circuits are provided only for the specific mode)
Speed of internal system	Approximately 4000 times/second
Load measuring range	Refer to the following "Load digital display portion" item
Accuracy of load display	0.5 or 1.0% (FS) +/- 1 digit (23.0 +/- 3°C) in whole range of load-cell
Motion mode	Nine types
Dimensions (mm)	W:96×D:175×H:206 (excluding protruding portions)Refer to the drawing in Page 25
Weight	2,400gr (excluding load-cell)
Power source	AC100V +/- 10%, 50/60Hz

Combination load-cell specifications:

Configuration	Ram shank installed type				Ultra thin type		Ultra compact type		Lower mount type
Model	003	03	10(U)	20(U)	003F1	03F1	003L	01L	10(L)
Rated capacity	3kN	30kN	100kN	200kN	3kN	30kN	3kN	10kN	100kN
Allowable extra load	150%	150%	120%	120%	120%	120%	120%	120%	120%
Input/output resistance	Approx. 350Ω	Approx. 350Ω	Approx. 700Ω	Approx. 700Ω	Approx. 350Ω	Approx. 350Ω	Approx. 350Ω	Approx. 350Ω	Approx. 350Ω
Cable length	2m	2m	2m	2m	2m	2m	1.5m	1.5m	3m
Accuracy*1	0.5%	0.5%	1.0%	0.5%	1.0%	1.0%	1.0%	1.0%	1.0%
Unit in display*2	0.001kN	0.01kN	0.1kN	0.1kN	0.001kN	0.01kN	0.001kN	0.01kN	0.1kN

*1 F.S.±1 digit (23±3°C) Integrated with CP-2

*2 Unit in display is the indication when connected to the controller.

Digital load display portion: Upper limit comparison value. Lower limit comparison value is also the same display.

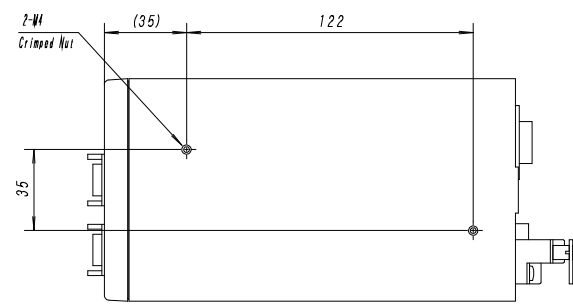
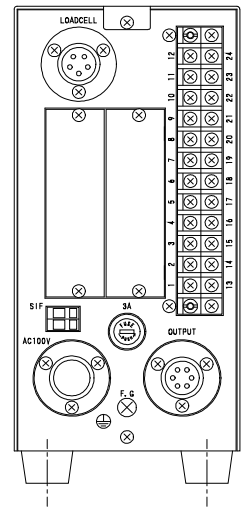
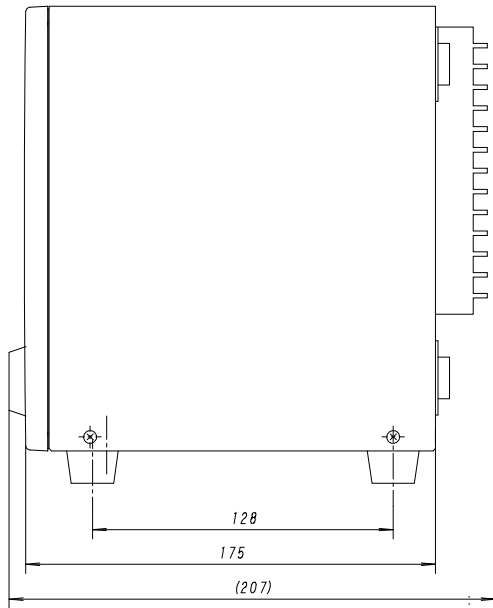
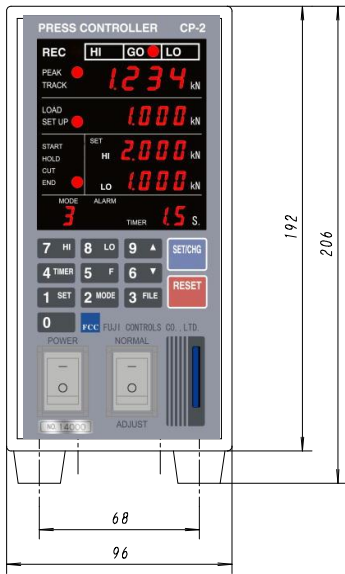
Model	Value shown in the display
CP-2-03 (For F1, L1 is also the same)	0.00kN to 30.00kN
CP-2-003 (For F1, L1 is also the same)	0.000kN to 3.000kN
CP-2-10U or 10L	0.0kN to 100.0kN
CP-2-20U	0.0kN to 200.0kN

Method of determining model:

Model of press controller for the load control device is determined by the combination of measuring instrument and load-cell. For example, in the case that load-cell with the rated load of 3kN, and ram shank installed type are combined with the CP-2 measuring instrument, the combination becomes [CP-2] + [003]. And, the model of press controller is "CP-2-003."

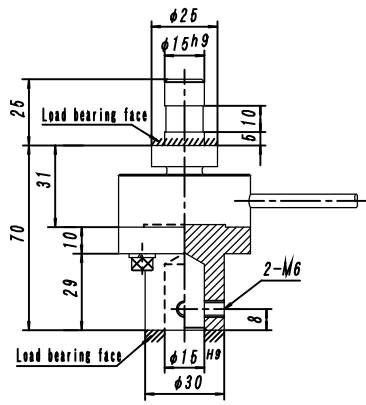
If ultra thin type load-cell with 3kN rated load is combined, the combination becomes [CP-2] + [003F1]. And, the model is "CP-2-003F1."

Drawings

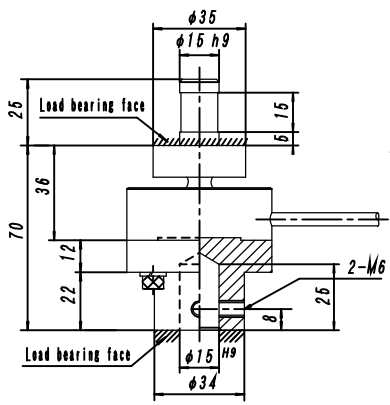


Load-cell dimensions

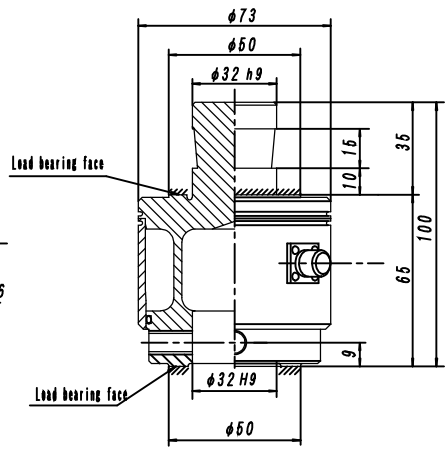
003



03

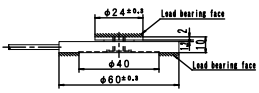


10U/20U

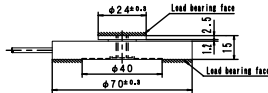


Outline dimensions in the drawing are reference drawing. For detailed dimensions, please ask us separately.

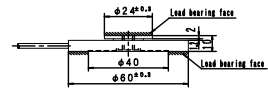
003F1



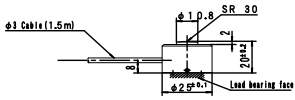
03F1



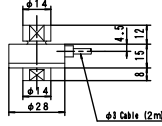
0003F1



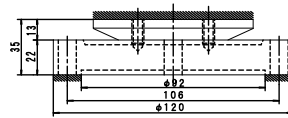
003L/03L



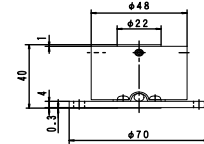
0003F2



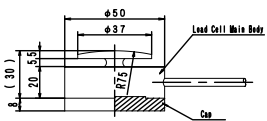
03F4



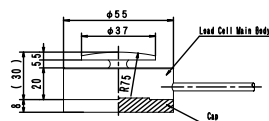
10L



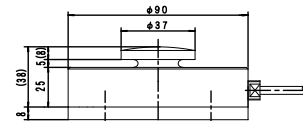
003F2



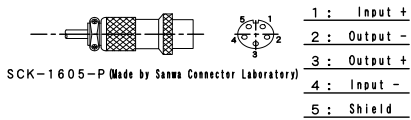
03F2



10F2



Connector (Plug) Wire Connection
(Common to all Load Cell)



Outline dimensions in the drawing are reference drawing. For detailed dimensions, please ask us separately.