

LOAD CHECKING DEVICE

CHECK MAN

Model : C M — 5

CALIBRATION Instruction Manual (Ver. 2)



Make sure to read this manual before using this unit. Then, keep it in a safe location. The specifications of the system may be changed without prior notice.

FCC FUJI CONTROLS CO., LTD.

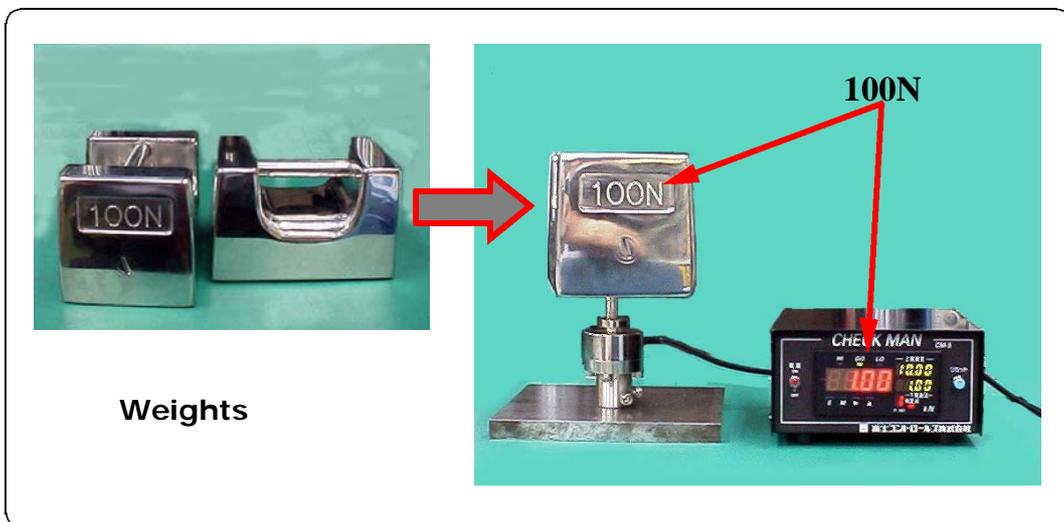
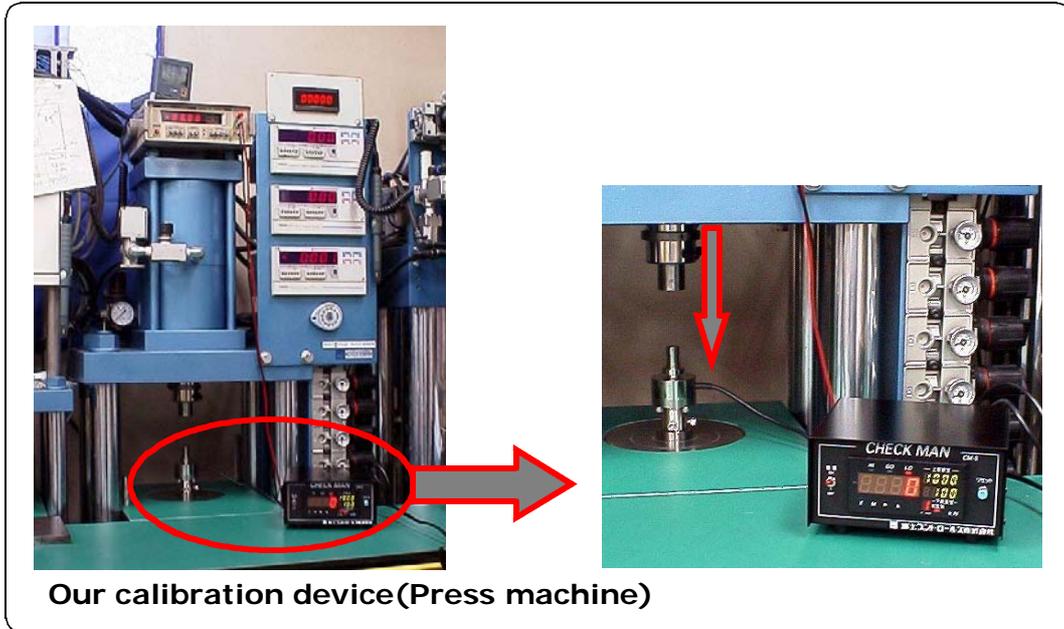
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One of two types of load calibrations can be selected:
Actual value calibration and **Equal value calibration**.

Actual value calibration

By the press machine or the weight that accurate weight can be confirmed, add the fixed load to Load cell of CHECKMAN. Then, you register the value of the power in the measurement device of CHECKMAN.



Equal value calibration

To perform an equal value calibration, you need the latest data for the load cell that you will be using. Inputting the value of Rated Output and Rated Capacity on the calibration certificate of the Load cell, the measurement device computes amplification rate automatically and completes the calibration operation.

Samples of Calibration Certificate

試験成績表 Calibration Certificate

型式: Type **CM1-200K** 定格容量: Rated Capacity **1,961 KN(200kgf)** 製品番号: Serial No. **S121343**

性能: Performance (試験温度: Ambient Temp. **23** °C) 定格出力: Rated Output **1,9999** mV/V

入力抵抗: Input Resistance	402.08	Ohms
出力抵抗: Output Resistance	350.40	Ohms
零バランス: Zero Balance	0.0196	mV/V
絶縁抵抗: Insulation Resistance	2000	M Ohms

温度による零点の影響: Temperature Effect on Zero Balance ± 0.05 %R.O./10°C
 温度による出力の影響: Temperature Effect on Rated Output ± 0.1 %Load/10°C
 温度補償範囲: Compensated Temp. Range **-10 To 70** °C
 非直線性: Nonlinearity **-0.079** %R.O.
 ヒステリシス: Hysteresis **0.008** %R.O.

推奨入力電圧: Excitation Recommended **12** V DC
 電気的配線: Wiring Color Code 入力 赤(+), 白(-) Input RED(+), WHITE(-)
 出力 緑(+), 青(-) Output GRN(+), BLU(-)

検査者: Tested by **L.L.TANG** 責任者: Certified by **SAMY**

試験成績表 CALIBRATION CERTIFICATE

品名: Description **荷重変換器**
 形名: Model **SH-50KN**
 定格容量: Rated Capacity **50KN**
 製造番号: Serial No. **M027702**
 定格出力: Rated Output **comp (-) 1.502 mV/V**
Tens (+) 1.499 mV/V
 直線性: Non-Linearity **0.15 %R.O.**
 ヒステリシス: Hysteresis **0.15 %R.O.**
 抵抗: Resistance Input **349.5 Ω**
 Output **350.8 Ω**

校正ケーブル: Calibration Cable, Dia. & Length **#8 . 5 m**
 室内温度・湿度: Ambient Temp. & Hum **20 °C & 50 %**

— 一般仕様: SPECIFICATIONS

初期平衡度: Zero Balance **± 10 %R.O.**
 絶縁抵抗: Insulation Resistance **> 1000 M Ω at 50V**
 零点の温度特性: Temperature Characteristic on Zero Balance **0.005 %R.O./°C**
 出力の温度特性: Temperature Characteristic on Output **0.010 %/°C**
 温度補償範囲: Temperature Range **-10 °C ~ 60 °C**
 許容過負荷: Safe Overload Rating **150 %R.C.**

* 定格出力は 1mV/V=2000x10⁻⁶ ロイム (ブリッジ電圧に関係なく) で測定して下さい。

試験成績表

供試品名: CLB-300K	基準荷重	出力	偏差	出力	偏差
製造番号: E0261	N	mV/V	mV/V	mV/V	mV/V
試験日: 01/03/26	0.0	0.0000		0.0001	
室温: 23.0 °C	500.0	0.3564		0.3573	
入力抵抗: 349.5 Ω	1000.0	0.7138		0.7147	
出力抵抗: 349.4 Ω	1500.0	1.0716		1.0728	
絶縁抵抗: 1.0 kMΩ以上	2000.0	1.4300		1.4311	
ブリッジ電圧: 10.0 DCV	2500.0	1.7893		1.7899	
	3000.0	2.1482			

定格容量: **3000.0 N**
 定格出力 (R.O.): **2.1482 mV/V**
 基準ピッチ: **0.3580 mV/V**
 非直線性: **0.12 %R.O.**
 ヒステリシス: **0.06 %R.O.**
 再現性: **0.00 %R.O.**
 クリープ: **%R.O.**

日付: Date **2001 02 09**

検査者: Tested by **[Signature]** 責任者: Certified by **[Signature]**

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FOR YOUR INFORMATION

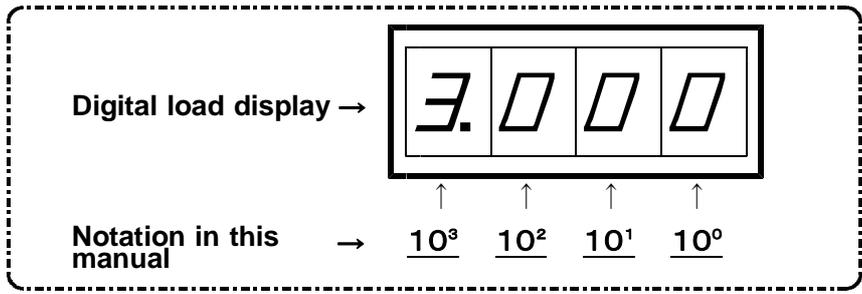
1. Specifications

Type of load cells that can be connected	Either 350 or 700 ohm types
Recommended input voltage	10V $\pm 0.3V$ (When 350 ohm type load cell connected)
Range of zero position adjustment	Approximately within ± 0.3 mV/V
Range of amplification rate	Approximately 1.2 mV/V through 2.6 mV/V
Maximum display value	3000

2. Display of the user settable items

In the setting mode, each of the user settable item names will be displayed in the Lower-limit display, in alphabetical order, and the current value for that item will be displayed in the Digital load display. The decimal point will flash.

The "Digital load display" displays numbers and letters. When it displays four digits, a decimal point will flash next to the digit which can be specified at that time. On the following pages, the use of each digit is described as follows.



3. Membrane switches used for various settings, changing specified values, and to select functions.

Specify and change the settings by using the four keys in different combinations. This system employs a **double-key safety function*** method that requires you to press two keys simultaneously to enter the operation mode.

- ⑪ **ENTER** key
In the descriptions from here on, this key is just referred to as **E**.
- ⑫ **MODE** key
In the descriptions from here on, this key is just referred to as **M**.
- ⑬ **SHIFT** key
In the descriptions from here on, this key is just referred to as **▶**.
- ⑭ **INCREMENT** key
In the descriptions from here on, this key is just referred to as **▲**.

* **Double-key safety function:** Press both the **E** and **▲**, the **▶** and **▲**, or the **E** and **M** keys at the same time to enter the operation mode. Make sure to press the **E** or **▶** key first in the examples above.

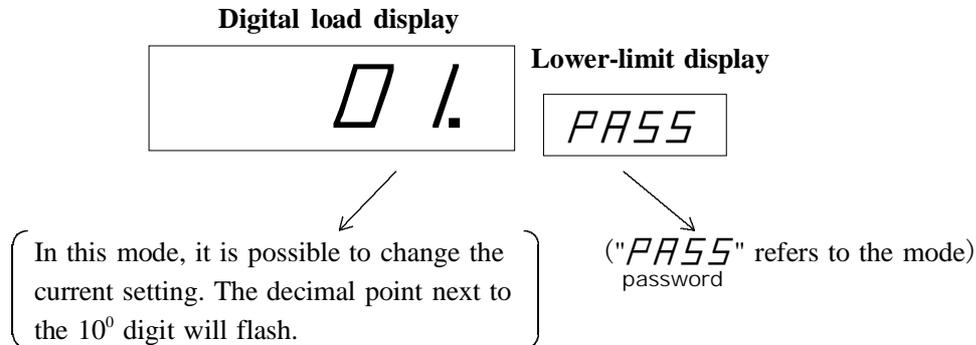
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LOAD CALIBRATION MODE

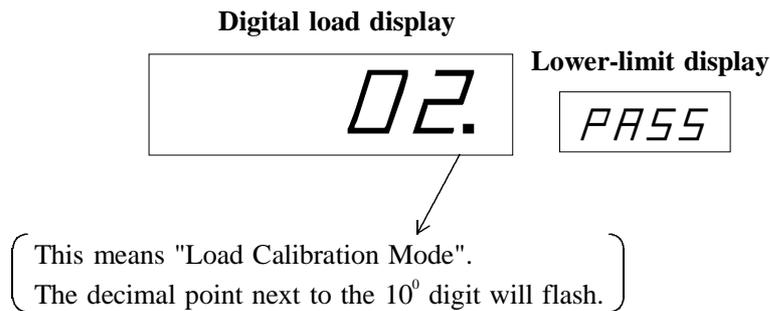
First, enter the Load Calibration Mode using the double-key function.

1. Press the **⏏** and **⏏** keys. (Press the **⏏** key, first.) During this operation, you cannot measure loads.

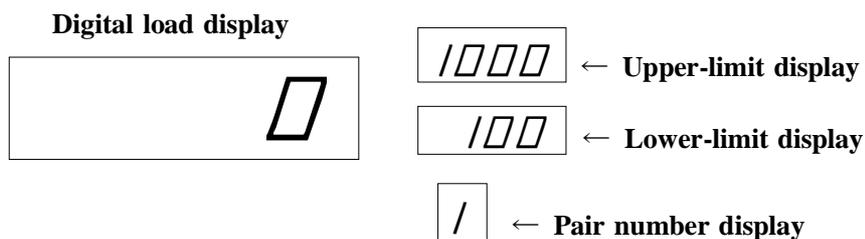


2. Press the **⏏** key.

Each time you press the **⏏** key, the numbers shown in the load display will cycle in the following order: "01. 02. 03. 99. 01." When "02." is showing, release the key.



3. Press the **⏏** key. Now, you can measure loads.



4. That completes the operation to change Load CalibrationMode.

- If you want to procedure **Actual Value Calibration**, go to page 3.
- If you want to procedure **Equal Value Calibration**, go to page 6.

FOR YOUR INFORMATION

Press the  key while holding down the  key. The Lower-limit display will show the word "PASS". This means you have to select a setting mode. There are four modes, "01", "02", "03", and "99". The table below describes each. ("01" is selected when the system is delivered.)

MODE	FUNCTIONS
01	① Modify and store upper and lower limit comparison values. ② Select a different pair of upper and lower limit values.
02	① Load calibration mode.
03	① Select a measurement mode (peak value mode or end value mode). ② Enter the power supply frequency (50 or 60 Hz).
99	① Prohibit making entries or changes to the settings. (You can still view the values of the pairs of upper and lower limits.)

ACTUAL VALUE CALIBRATION

Connect the load cell cable to the 5P connector on the back of the CM-5 housing, and lock it securely in place. Then, flip the lever of Power switch up to the power ON. Do not add the load to the load cell until the direction.

1. Press and hold the **[E]** and **[M]** keys for approximately three seconds. (Press the **[E]** key, first.) --- The system will be in the pair number selection mode.

Digital load display

Lower-limit display

CAL !

 ← " CAL !" means **Actual value calibration**
and " CAL " means **Equal value calibration**.

Each time you press the **[A]** key, the names shown in the Lower-limit display will cycle in the following order: "CAL !" CAL " CAL !" When "CAL !" is showing, release the key.

2. Press the **[M]** key. --- The system will be in the Decimal Point selection mode.

Digital load display

.

↙

The digit next to the flashing decimal point can be changed.

Lower-limit display

d.P.

 ← d.P. means **"Decimal Point"**.

3. Press the **[P]** key.

The **[P]** key is used to select a different digit place. Each time you press the **[P]** key, the decimal point will move to the lower digit place in the following order: "10³ → 10² → 10¹ → 10⁰ → No display → 10³" Select the digit place, and go to the next operation.

4. Press the **[M]** key. --- Now, you will set the zero value.

Digital load display

Lower-limit display

ZER

 ← "ZER" means **"ZERO"**.

If you press the **[E]** key at this point, the decimal point selection will be completed and you can measure loads.

5. Press the **[M]** key. --- The zero value has set and set the calibration value.

Digital load display

2.102

Lower-limit display

(EXAMPLE) The value set last time will be displayed.

The present state of the load cell was A/D converted and inputted into the measurement device.

ERROR displays

Pressing the **M** key, if values shown below displayed. Each value means that load cell is damaged and should be replaced.

Err 1

ZERO value < -0.3mV/V

or

Err 2

ZERO value > 0.3mV/V

6. Add the fixed power to Load cell of CHECKMAN.

By the press machine or the weight that accurate weight can be confirmed, add the fixed load to Load cell of CHECKMAN. We recommended. the load very close to the rated capacity of the load cell. Even if it is the worst, 55% of the rated capacity must be required.



7. Input the value of the fixed load added to the load cell.

Digital load display

2.102

Lower-limit display

SPAn

The value set last time will be displayed.

The 10^3 digit place is flashing. If you press the **▶** key or the **▲** key, you can change the number of the 10^3 digit place.

※ Depending on the model, the position of the decimal point will vary. It will either be next to the 10^1 or the 10^2 digit. See the section, "Digital load display," on page 27.

Now for practice, try to change the current value "2.102" to "1.905."

7-1. First, change the value of the 10^3 digit.

Each time you press the **▲** key, the number shown in the 10^3 digit place (next to the flashing decimal point) will change, in the following order: "2 → 3 → 0 → 1 → 2". (The maximum number available in the 10^3 digit place is "3.") Change this digit to "1".

7-2. Press the \blacktriangleright key. --- Then you can change the value of the 10^2 digit.

The \blacktriangleright key is used to select a different digit place. Press this key once and the decimal point next to the 10^2 digit will flash.

7-3. Next, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

7-4. Then, press the \blacktriangleright key. --- Now you can change the value of the 10^1 digit.

Press this key once and the decimal point next to the 10^1 digit will flash.

7-5. Next, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

7-6. Press the \blacktriangleright key. --- Now you can change the value of the 10^0 digit.

Press this key once and the decimal point next to the 10^0 digit will flash.

7-7. Last of all, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

That completes the operation to change the value to "1905."

8. Press the \blacksquare key. --- That completes the operation to change the value to "1905."

ERROR displays

Pressing the \blacksquare key, if values shown below displayed. How to set it up is wrong. Please do it again.

The image shows a rectangular box containing the text "Err 3" in a stylized, italicized font.

Added fixed load to the load cell is insufficient.

The image shows a rectangular box containing the text "Err 4" in a stylized, italicized font.

Added fixed load to the load cell is excessive.

The image shows a rectangular box containing the text "Err 5" in a stylized, italicized font.

Added fixed load to the load cell is excessive.

9. Reset the "PASS" to the original mode number.

Select " \square /" (allows changes in the upper and lower limit values, and you can select the limit pair) or " \square " (prohibit all changes) as described in steps 1 and 2 on the previous page. After the setting is changed, press the \blacksquare key.

EQUAL VALUE CALIBRATION

You need the latest data for the load cell that you will be using. Then, connect the load cell cable to the 5P connector on the back of the CM-5 housing, and lock it securely in place. You are ready to flip the lever of Power switch up to the power ON. Do not add the load to the load cell during the operation.

1. Press and hold the **[E]** and **[M]** keys for approximately three seconds. (Press the **[E]** key, first.) --- The system will be in the pair number selection mode.

Digital load display **Lower-limit display**

$\overline{CAL} \overline{2}$

←

" $\overline{CAL} \overline{1}$." means **Actual value calibration**
and " $\overline{CAL} \overline{2}$." means **Equal value calibration.**

Each time you press the **[A]** key, the names shown in the Lower-limit display will cycle in the following order: " $\overline{CAL} \overline{1}$." " $\overline{CAL} \overline{2}$." " $\overline{CAL} \overline{1}$." When " $\overline{CAL} \overline{2}$." is showing, release the key.

2. Press the **[M]** key. --- The system will be in the Decimal Point selection mode.

Digital load display **Lower-limit display**

.

$\overline{d.P.}$

←

$\overline{d.P.}$ means "Decimal Point".

↙
The digit next to the flashing decimal point can be changed.

3. Press the **[P]** key.

The **[P]** key is used to select a different digit place. Each time you press the **[P]** key, the decimal point will move to the lower digit place in the following order: " $10^3 \rightarrow 10^2 \rightarrow 10^1 \rightarrow 10^0 \rightarrow$ No display $\rightarrow 10^3$ " Select the digit place, and go to the next operation.

4. Press the **[M]** key. --- Now, you will set the zero value.

Digital load display **Lower-limit display**

$\overline{ZER0}$

←

$\overline{ZER0}$ means "ZERO".

If you press the **[E]** key at this point, the decimal point selection will be completed and you can measure loads.

5. Press the **[M]** key. --- The zero value has set and begin the operation for calibration.

Digital load display **Lower-limit display**

1.985

$\overline{SP1 n}$

↙

(EXAMPLE) The value set last time will be displayed. This means 1.985 mV/V.

The present state of the load cell was A/D converted and inputted into the measurement device.

ERROR displays

Pressing the **M** key, if values shown below displayed. Each value means that load cell is damaged and should be replaced.

Err 1

ZERO value < -0.3mV/V

or

Err 2

ZERO value > 0.3mV/V

6. SPIN Setting Operation

Input the value of Rated Output on the calibration certificate of the load cell.

Digital load display

1.985

Lower-limit display

SP In

The value set last time will be displayed.

The 10^3 digit place is flashing. If you press the **▶** key or the **▲** key, you can change the number of the 10^3 digit place.

※ Depending on the model, the position of the decimal point will vary. It will either be next to the 10^1 or the 10^2 digit. See the section, "Digital load display," on page 27.

Now for practice, try to change the current value "1.985" to "2.148" which shown on the sample of Calibration Certificate.

Sample of Calibration Certificate

試験成績表			
項目	標準容量	出力	線形
	N	mV/V	mV/V
供試品名	CLB-300K		
製造番号	E0261		
試験日	01/03/26		
室温	23.0 °C	0.000	0.0001
入力抵抗	349.5 Ω	1000.0	0.7133
出力抵抗	349.4 Ω	1500.0	1.0716
絶縁抵抗	1.0 kMΩ以上		
ブリッジ電圧	10.0 DCV		
定格容量	3000.0 N		
定格出力(R.O.)	2.1482 mV/V		
基準ピッチ	0.3580 mV/V		
非直線性	0.12 %R.O.		
ヒステリシス	0.06 %R.O.		
再現性	0.00 %R.O.		
クリープ	%R.O.		

試験成績表	
供試品名	: CLB-300K
製造番号	: E0261
試験日	: 01/03/26
室温	: 23.0 °C
入力抵抗	: 349.5 Ω
出力抵抗	: 349.4 Ω
絶縁抵抗	: 1.0 kMΩ以上
ブリッジ電圧	: 10.0 DCV
定格容量	: 3000.0 N
定格出力(R.O.)	: 2.1482 mV/V
基準ピッチ	: 0.3580 mV/V
非直線性	: 0.12 %R.O.
ヒステリシス	: 0.06 %R.O.
再現性	: 0.00 %R.O.
クリープ	: %R.O.

RATED CAPACITY
"3000"

RATED OUTPUT
"2.148"

6-1. First, change the value of the 10^3 digit.

Each time you press the **▲** key, the number shown in the 10^3 digit place (next to the flashing decimal point) will change, in the following order: "2 → 3 → 0 → 1 → 2". (The maximum number available in the 10^3 digit place is "3.") Change this digit to "•"

6-2. Press the \blacktriangleright key. --- Then you can change the value of the 10^2 digit.

The \blacktriangleright key is used to select a different digit place. Press this key once and the decimal point next to the 10^2 digit will flash.

6-3. Next, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

6-4. Then, press the \blacktriangleright key. --- Now you can change the value of the 10^1 digit.

Press this key once and the decimal point next to the 10^1 digit will flash.

6-5. Next, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

6-6. Press the \blacktriangleright key. --- Now you can change the value of the 10^0 digit.

Press this key once and the decimal point next to the 10^0 digit will flash.

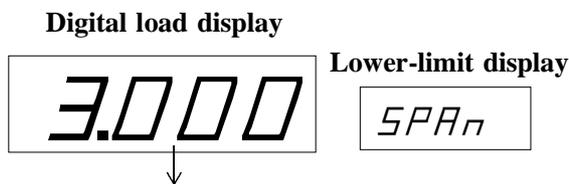
6-7. Last of all, press the \blacktriangle key.

Each time you press the \blacktriangle key, the number in the currently selected digit will change, in the following order: "0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0" Change this digit to "."

That completes the operation to change the value to "2148."

7. Press the \blacksquare key. --- That completes the operation to change the value to "1905."

8. SPAN Setting Operation Input the value of Rated Capacity on the calibration certificate of the load cell.



The value set last time will be displayed. This means 3.000 kN.

The 10^3 digit place is flashing. If you press the \blacktriangleright key or the \blacktriangle key, you can change the number of the 10^3 digit place. Please see the procedure 7 described in the previous page. If you don't have to change the value skip this procedure and go to 10.

※ Depending on the model, the position of the decimal point will vary. It will either be next to the 10^1 or the 10^2 digit. See the section, "Digital load display," on page 27.

9. Press the **M** key. --- That completes the operation and you can measure loads.

ERROR displays

Pressing the **M** key, if values shown below displayed. How to set it up is wrong. Please do it again.

Err 3

→ SPIN value < Approx. 1.2 mV

Err 4

→ SPIN value > Approx. 2.6 mV

Err 5

→ $K_2 = \frac{\text{SPAN value}}{\text{SPIN value} - \text{ZERO value}} \quad (K_2 > 1)$

10. Reset the "PASS" to the original mode number.

Select "**0 /**" (allows changes in the upper and lower limit values, and you can select the limit pair) or "**99**" (prohibit all changes) as described in steps 1 and 2 on the previous page. After the setting is changed, press the **E** key.