CAS
S · C · A · L · E

Owner's Manual

EXP-5500

EXPLOSION PROOF INDICATOR

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1. Introduction

We greatly appreciate for your purchase of the CAS Explosion proof indicator.
These goods have hold excellent performance and splendid properties through strike tests as well as devoting ourselves under severe quality management.
The EXP-5500 indicator is specially designed not to transmit the internal flame to external area even if a internal explosion occurs in explosive environment, and is shaped firmly and delicately designed to coincide with the requirements of severe industrial field.
Before using EXP-5500, It is recommended to read this manual carefully and to apply the function application fully.

2. Explosion Structure & Class (Ex d ⅡB T4)

Section	Description	Marking
Type of protection	Flameproof enclosure	Ex d
Apparatus Group	Surface Industries	ⅡB
Temperature Class	Max. surface temperature 135℃	T4

Explosion Class	T1	T2	T3	T4
Class 1 (USE)	Acetone, Ammonium, Carbon Monoxide, Titan, Acetic Acid, Ethyl Acetate, Toluene, Propane, Benzene, Methanol, Methane	Ethanol, Buanol, Butane, Acetic Anhydridede	Gasoline, Hexane	Acetaldehyde, Ethyl Ether
Class 2 (USE)	Cool Gas	Ethylene Oxide		
Class 3 (Don't use)	Water Gas Hydrogen	Acetylene		

(Be able to use EXP-5500 only in the inside thick line)

3. Cautions

(1) Cautions when install EXP- 5500 at explosion zone.

■ Check to tighten bolts on a front cover.
■ Certainly Connect EXP-5500 AC POWER to AC220V, 50Hz/60Hz AC power.
(Optional : AC110V, 50Hz/60Hz)
■ Should use power supply cable included an earthing line.
■ When connect AC POWER at explosion a zone, certainly use PLUGS AND RECEPTACLES(Cable Gland).

(2) Cautions when check EXP-5500 at a fixed period.

■ Certainly cut off power supply Before open the front cover.
■ When assemble the front cover, certainly tighten bolts.

♣ CHECK ITEMS

ITEMS	Check Method	Description	Remark
CASE	Naked eye	Have no rust, damage	Clean, Exchange
Display Window	Naked eye	Have no damage	Exchange
BOLT	Naked eye, Touch	Don't get loose. Have no rust, dust.	Tighten, Clean
PACKING	Naked eye. Touch	Have no crack, notable modify.	Exchange
Cable Gland	Naked eye, Touch	Have no damage, blazing fire. Don't get loose.	Tighten, Exchange
Terminal	Naked eye	Don't get loose.	Tighten

(3) Entering Method of External Wire

■ External Wire should be passed through CABLE GLAND and connected to terminal.
■ The Conduit is used PF 1/2" size.

(4) CAUTIONS before uses EXP-5500

■ Do not press the keys hardly, for the keys are in operation with soft touch.
■ Keep away EXP-5500 from the rain.
■ Avoid sudden temperature change.
■ Do not install EXP-5500 in a place with high voltage and excessive electrical noises.
■ Keep it in dry place.
■ Do not use under direct rays.
■ Do not use at the place with excessive electrical noises and vibration.

4. The Features of EXP-5500

(1) Features

- ■ High quality, High accuracy
- ■ Appropriate for weight and measurement system
- ■ Easy operation and various options
- ■ Sub display of 12 digit(VFD)
- ■ RFI/EMI screened
- ■ WATCHDOG circuitry (System restoration)
- ■ WEIGHT BACK-UP (Weight memory at sudden power failure)

(2) Main Function

- ■ Store date, time and calculated data at sudden power failure
- ■ Adjustable display rate(Digital filter function)
- ■ Various printer connection -(option)
- ■ Tare weight setting with keys
- ■ Storage of measured times
- ■ External input 4 relay (zero, start, stop, tare/print)
- ■ External output 4 relay (zero, high, low, final)
- ■ Users can set the desirous max. weight and a division freely
- ■ Print date and time by built-in clock
- ■ Self hardware test
- ■ Independent zero calibration
- ■ Analog output (0~10V, 0~24mA) -OPTION

5. Technical Specification

■ Analog Part & A/D Conversion

Loadcell Exciting Voltage	DC 10V
Zero Adjust Range	0.05 mV ~ 30 mV
Input Sensitivity	2 μV/D (H-44, OIML)
	0.5 μV/D (Non H-44, OIML)
System Linearity	0.02% of FS
A/D internal resolution	1 / 200,000
A/D external resolution	5,000 dd (H-44, OIML)
	30,000 dd (H-44, OIML)
A/D conversion speed	20 times/sec

■ Digital Part

Span calibration	Full Digital Calibration : SPAC™ (Single pass automatic span calibration)
Input noise	below ±0.3μVpp
Input impedance	over 10 MΩ
Display	VFD 7 Digit (13mm)
Sub Display	VFD 12 Digit (8mm)
Division	×1, ×2, ×5
Display below zero	"-" minus signal
Permitted limit tare	Full capacity

"STABLE" ▼ LAMP	Weight is stable
"HIGH" ▼ LAMP	Displays on/off status of high limit relay
"LOW" ▼ LAMP	Displays on/off status of low limit relay
"HOLD" ▼ LAMP	Hold in Weight
"NET" ▼ LAMP	ON (net weight), OFF (gross weight)
"TARE" ▼ LAMP	tare is used
"ZERO" ▼ LAMP	"0" kg

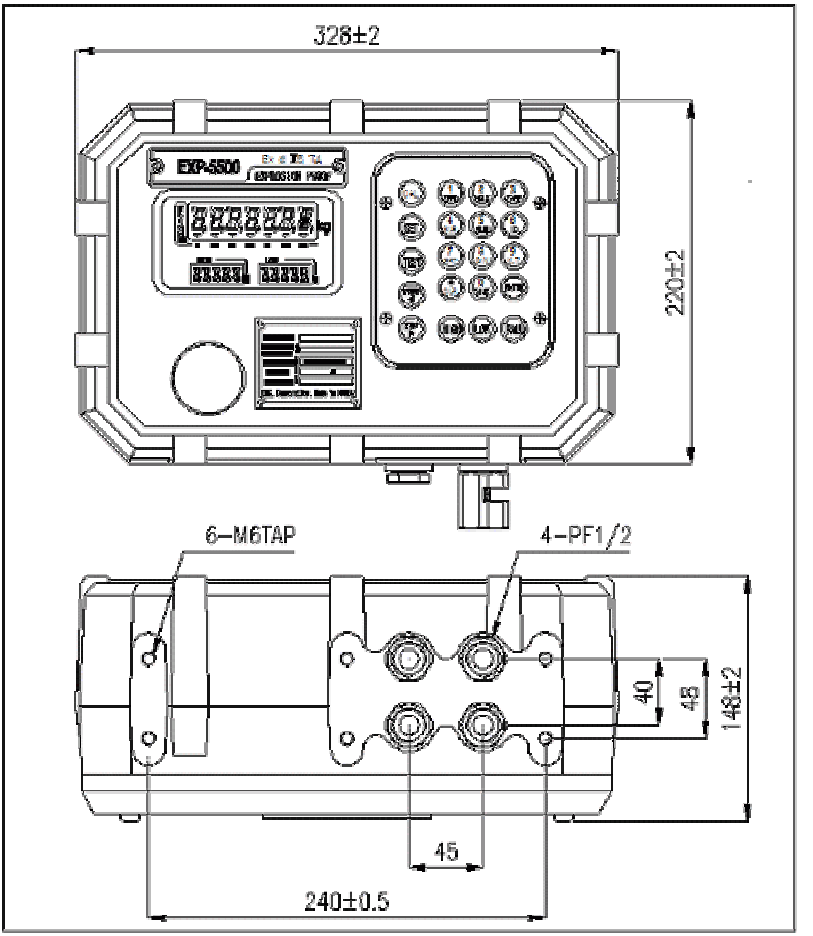
■ External input / output

External input	Load cell 5, external input 4, power
Interface	RS232C, RS485
External ouput relay	Zero, High, Low, Final

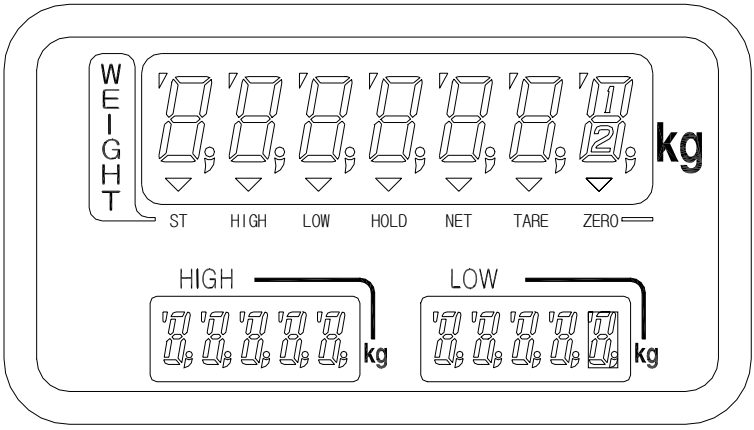
■ General Specification

Power	AC 220V, 50/60 Hz Optional : AC 110V, 50/60 Hz
Size	324(W) x 218(D) x 155(H)
Temperature	-10℃ ~ +40℃
Weight/Internal Cubic Volume	Approx. 12.3 kg / 5000 ㎤
Current	Approx. 0.1 A

6. MEASURE OF APPEARANCE



7. Front Display Description



(1) Weight display

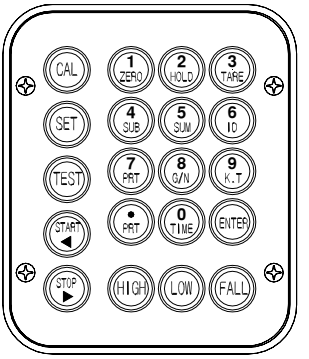
Display Annunciator (▼)

ST annunciator : lights up when the weight to be in stable condition.
HIGH annunciator : lights up when high limit relay is activated.
LOW annunciator : lights up when low limit relay is activated.
HOLD annunciator : lights up when you press 'HOLD' key to weigh moving or alive
NET annunciator : lights up when the weight to be displayed currently is net weight.
TARE annunciator : lights up when tare weight is stored.
ZERO annunciator : lights up when current weight is 0 kg.

(2) Sub display

HIGH : Display of high limit value.
LOW : Display of low limit value.

(3) Keyboard



■ **CAL Key**
Used to enter "CAL" mode

■ **SET Key**
Used to enter "SET" mode

■ **TEST Key**
Used to enter "TEST" mode

■ **START KEY**
Used as start key in packer mode.

■ **STOP KEY**
Used as stop key in packer mode.

■ **ZERO & '1' Key**
Used to return the display to the center of ZERO when the platform is empty
(user selected the zero range within 2% or 10% of the maximum capacity, see function "F-08").

■ **HOLD & '2' Key**
Use to calculate the average and maximum of weight value and display it at "VFD" display.

■ **TARE & '3' Key** (automatic tare weight input)
Used for weighing item by using the container.
When this key is pressed, the scale stores current weight as the tare weight.
If you press "TARE" key in unload condition, tare setting is released.

■ **SUB & '4' Key**
Used to print total weight of previously weighed result by ID number.
For example, let's assume that the current specified ID number is 13.
The print form is as belows.

```
---------------------------
        SUM TOTAL
---------------------------
DATE   :  1997. 9. 25
TIME   :        9:30
ID     :          13
COUNT  :           5
TOTAL  :    350.0 kg
```

After printing is done, the total weight and count corresponding to the ID number is initialized to 0.

■ **SUM & '5' Key**

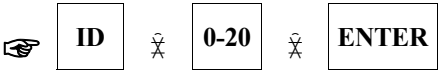
Used to print total weight regardless of ID number.
The print form is as belows.

```
---------------------------
        SUM TOTAL
---------------------------
DATE   :  1997. 9. 25
TIME   :        9:30
COUNT  :          25
TOTAL  :    750.0 kg
```

After printing is done, the total weight and count remains.
If you want to initialize them, press this key

■ **ID & '6' Key**

Type "ID" key and the ID code using by numeric key and then the ID code is registered.
The code range is from 0 to 20.



■ **PRT & '7' Key**

When pressing this key, the current designated printing form is printed.

■ **G/N & '8' Key**

Toggle key between GROSS weight and NET weight. The annunciators and display will alternate between GROSS and NET as well.
In case tare weight is REGISTERED, tare plus item's weight is GROSS weight and only item's weight is NET weight.

■ **K.T & '9' Key**

When you already know the tare weight, press K.T Key and input tare weight using by numeric keys and memorize it by pressing ENTER key.

■ **CLR & '-' Key**

Usage 1: Used for correct wrong input during inputting ID number or TARE weigh.
Usage 2: Used to enter such floating point number as 0.2, 0.01 etc.

■ **TIME & '0' Key**

Used to check date and time.

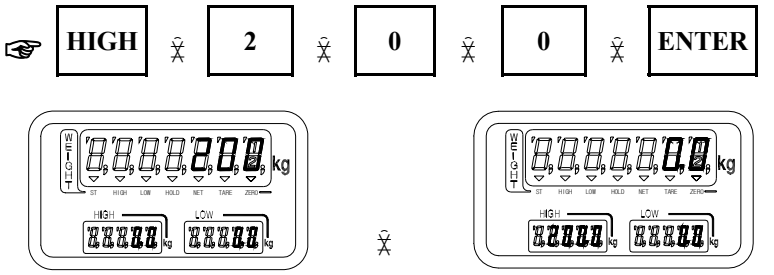
■ **ENTER Key**

Used to store current condition and exit in CALIBRATION, TEST, SET mode.

■ **HIGH Key**

Display high limit value on VFD, or change high limit value.

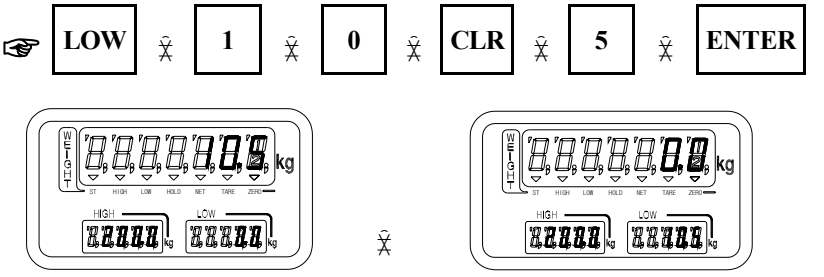
* The way to change High Limit Value.



■ **LOW Key**

Display low limit weight on VFD, or change low limit value.

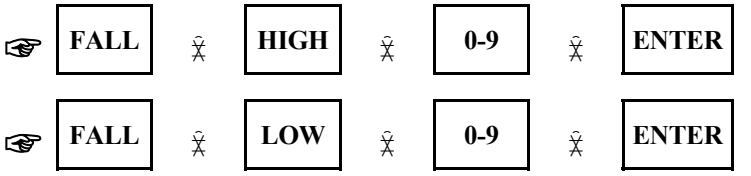
* The way to change Low Limit Value.



■ **FALL Key**

By pressing the "FALL" key and then "HIGH" or "LOW" key,
high fall limit or low fall limit is displayed on VFD

* The way to change High_fall or Low_fall limit value.



■ **0 - 9 Key**

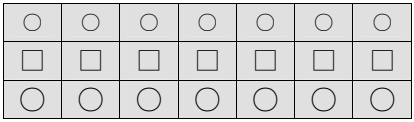
Used to change setting value.

8. Installation & Connection

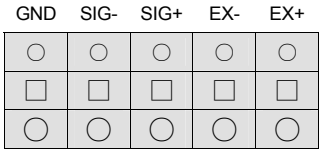
(1) Internal terminal connection

■ MAIN PCB PART

- T1 : RS232C, RS485



- T2 : Load Cell



■ POWER PCB PART

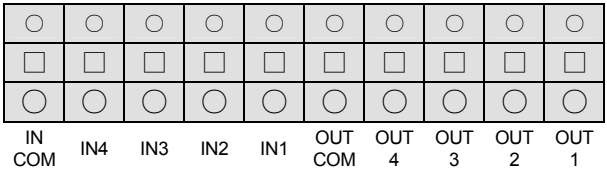


☞ AC IN : 220V, 50/60Hz (Optional : AC110V, 50/60Hz)

☞ GND : Ground

■ RELAY PCB PART

- T1 : External I/O



(2) Load cell connection

Connect load cell wire to terminal in the indicator.
* Must connect load cell wire to be through electro-pipe.
Note. Each load cell manufacturer's or model's wire color could be different.
In that case, please note the following diagram.

▷ Manufactures's wire color

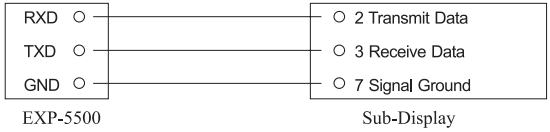
Terminal / Company	EX+	EX-	SIG+	SIG-	GND
CAS	RED	WHITE	GREEN	BLUE	CASE
KYOWA	RED	BLACK	GREEN	BLUE	CASE
INTERFACE	RED	BLACK	GREEN	WHITE	CASE
P.T	RED	BLACK	GREEN	WHITE	CASE
BLS	RED	BLACK	WHITE	RED	YELLOW
SHOWA	RED	BLUE	WHITE	BLACK	CASE
SHINKOH	RED	BLACK	GREEN	WHITE	CASE
TMI	RED	WHITE	GREEN	BLUE	YELLOW
TML	RED	BLACK	WHITE	GREEN	CASE
TFAC	RED	BLUE	WHITE	BLACK	YELLOW
HUNTLEIGH	GREEN	BLACK	RED	WHITE	CASE

▷ Resolution to loadcell output rate

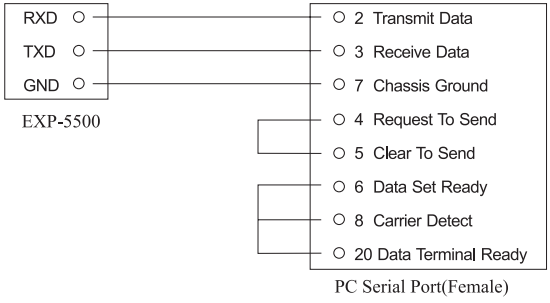
10V impression to loadcell Max. loadcell output	Recommended resolution
4 mV	1/4,000 (Max)
8 mV	1/8,000 (Max)
10 mV	1/10,000 (Max)

(3) RS 232C Connection

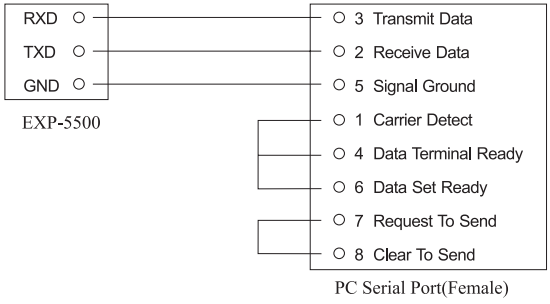
■ Sub-Display (CD-3000A, CD-3010A, CD-3040A, CD-3060A)



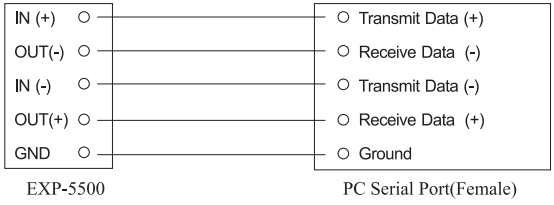
■ Computer - 25P



■ Computer - 9P



(4) RS 422 / 485 Connection -option-



9. Communication Program

■ GW-BASIC Language

```
10 OPEN "COM1:9600,N,8,1" As #1
20 IF LOC(1) = 0    THEN 60
30 A$ = INPUT$(1,1)
40 PRINT A$ ; " ";
50 GOTO 20
60 B$=INKEY$ : IF B$ ="" THEN 20
70 PRINT B$ ; " ";
80 PRINT #1,B$;
90 GOTO 20
```

■ C Language

```
#include <bios.h>
 #include <conio.h>
 #define COM1            0
 #define DATA_READY 0x100
 #define TRUE            1
 #define FALSE           0
 #define SETTINGS ( 0x80 | 0x03 | 0x00 | 0x00)
 int main(void)
 { int in, out, status, DONE = FALSE;
    bioscom(0, SETTINGS, COM1);
    cprintf("... BIOSCOM [ESC] to exit ...\n");
    while (!DONE)
    { status = bioscom(3, 0, COM1);
      if (status & DATA_READY)
      if ((out = bioscom(2, 0, COM1) & 0x7F) != 0)    putch(out);
      if (kbhit())
      {   if ((in = getch()) == '\x1B')    DONE = TRUE;
          bioscom(1, in, COM1);
      }
    }
    return 0;
 }
```

10. Tramsmit Data Format

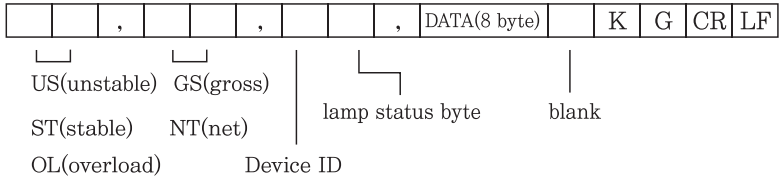
(1) Baud rate : 1200 bps - 19200 bps
Choose Baud rate in SET mode(F30).
Refer to SET mode.

(2) Data bit: 8 , Stop bit: 1 , Parity bit: None

(3) Code : ASCII

(4) When data is sent to computer ?
Set in SET mode(F31).

(5) Data Format



(6) Device ID
1 Byte device ID is output to allow the receiver side to selectively receive information supplied from the indicator.

(7) Lamp State Byte : This bit indicates lamp state.

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
1	stable	high	low	hold	net	tare	zero

(8) Data (8 Byte) : Weight data with decimal point.
ex) If transmit weight data 13.5kg this indicator will transmit ASCII code of
'0' '0' '0' '0' '1' '3' '.' '5'

11. TEST MODE

(1) How to enter this mode

Turn on the power while pressing the 'TEST' key on the front of the indicator.
pressing the 'TEST' key in the weighing mode

(2) Test Menu (TEST 1 - TEST 7)

TEST 1 : Key test
TEST 2 : VFD display test
TEST 3 : Load cell test, A/D conversion test
TEST 4 : Serial interface test
TEST 5 : Printer test
TEST 6 : External I/O test
TEST 7 : Analog out test (0~24mA, 0~10V)

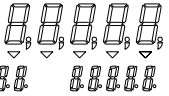
TEST 1

FUNCTION : Key test			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu Other : perform test	--		Press the key to be test and the no. and code corresponding to the key is displayed
	tESt1	PUSH	

< Key List >

CAL	SET	TEST	START ◀	STOP ▶	1 ZERO	2 HOLD	3 TARE	4 SUB	5 SUM
10	20	30	40	90	1	2	3	4	5
6 ID	7 PRT	8 G/N	9 K.T	0 TIME	. CLR	ENTER	HIGH	LOW	FALL
6	7	8	9	0	11	12	13	14	15

TEST 2

FUNCTION : VFD display test			
KEY	VFD		DESCRIPTION
ENTER : next mode STOP : to initial menu Other : perform test	□ □ □ □ □ □ □		
	tESt2	diSP	

TEST 3

FUNCTION : Load cell test, A/D conversion test			
KEY	VFD		DESCRIPTION
ENTER : next mode STOP : to initial menu CAL : gain + SET : gain - TEST : display speed + START : display speed -	23500		23500 : A/D conversion value G - 0 : gain '0' F - 1 : display speed '1'
	G - 0	F - 1	

REF 1. Check whether digital value is changing. If the digital value is fixed or zero is displayed please check the connection of load cell

TEST 4

FUNCTION : Serial interface test			
KEY	VFD		DESCRIPTION
ENTER : next mode STOP : to initial menu Other : transmit key	01---03		01 : receive 03 : transmit ('3/tare' key)
	tESt4	rS232	

REF 1. Do this test after the connection of serial port of computer and serial port of indicator is done.
REF 2. Do this test after baud rate is specified in SET mode (F30).

TEST 5

FUNCTION : Printer test (RS port)			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu Other : perform test	**Good**		GOOD : no error in printer
	tESt5	**Print**	

REF 1. Perform test only when the printer option are installed.
REF 2. Previously specify the printer which will be used in the conversion mode (F-20)
REF 3. The test output format of printer is like follows.

Computer And Sensor

Computer And Sensor
CAS Corporation
TEL 82-2-2225-3500
FAX 82-2-475-4668
TEST OK

TEST 6

FUNCTION : External I/O test			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu 1,2,3,4 : perform test Ext. key : perform test	**tESt 6**		IN 3 : If inputted external input 3 key, display "in3" OUT 2 : Display "out2" to turn on external relay output2
	in 3	**oUt 2**	

TEST 7

FUNCTION : Analog out test (0~4mA, 0~0V)			
KEY	**VFD**		**DESCRIPTION**
ENTER, STOP : to initial menu Other : high/zero toggle	**tESt 7**		HIGH : output maximum weight ZERO : output zero value
	dout	**ZEro**	

12. Calibration Mode

(1) How to enter this mode

Turn on the power while pressing the 'CAL' key on the front of the indicator.
pressing the 'CAL' key in the weighing mode

(2) CAL Menu (CAL 1 - CAL 7)

CAL 1 : Maximum Capacity
CAL 2 : Minimum Division
CAL 3 : Setting Weight
CAL 4 : Zero Calibration
CAL 5 : Span Calibration
CAL 6 : Span FINE Calibration
CAL 7 : Weight factor

CAL 1

FUNCTION : Set Maximum Capacity (1~9,999)			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu Numeric key : change set value	**500**		500kg
	CAL 1	**CAPA**	

REF 1. The maximum capacity means the maximum weight the scale can measure.

CAL 2

FUNCTION : Set Minimum Division (0.001~0)			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu Numeric key : change set value	**0.1**		0.1kg
	CAL 2	**div**	

REF 1. The minimum division means the value of one division.
REF 2. External resolution is obtained by dividing the min. division by the maximum capacity.
Set the resolution to be within 1/10,000.
REF 3. When you press other keys except '1' '2' '5' and '0'. A retry beep will sound.

CAL 3

FUNCTION : Setting Weight In Span Calibration			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu Numeric key : change set value	**500**		500kg
	CAL 3	**SEt**	

REF 1. The setting weight shall be within the range of 10 % ~ 100 % of maximum weight.

CAL 4

FUNCTION : Zero Calibration			
KEY	**VFD**		**DESCRIPTION**
ENTER : zero calibration STOP : to initial menu	**24000**		24000 : zero A/D value - - - : processing zero calibration UCCESS : zero calibration is completed. program moves into span calibration automatically.
	CAL 4	**ULoAd**	

REF 1. If Zero calibration is done without any error, SUCCESS message is displayed and program moves into CAL 5 automatically.
REF 2. If the zero value is too low, ERROR message (ERR 16) is displayed.
REF 3. If the zero value is too high, ERROR message (ERR 15) is displayed.
REF 4. Zero calibration can be done independently, Pressing "ZERO" key instead of "SET key" will perform this function.

CAL 5

FUNCTION : Span Calibration			
KEY	**VFD**		**DESCRIPTION**
ENTER : span calibration STOP : to initial menu	**LOAD**		Load the weight which was set in CAL 3 and press SET key. - - - : Under span calibration... SUCCESS :span calibration is completed. Check whether the displayed weight is same with setting weight.
	CAL 5	**LoAd**	

REF 1. If Span calibration is done without any error, SUCCESS message is displayed. The weight of setting weight is displayed on VFD screen. Check the weight.

REF 2. If the span is low, Error message (ERR 14) is displayed. In that case, Calibrate with lower resolution. Please check the span value to be resolution × 20 in TEST 3.

CAL 6

FUNCTION : Span FINE Calibration			
KEY	**VFD**		**DESCRIPTION**
ENTER : next mode STOP : to initial menu CAL : increase 0.2 Digit SET : decrease 0.2 Digit	**500** ▽▽▽▼▽▽▽		500kg
	CAL 6	**Adj**	

REF 1. EXP-5500 move to this menu after CAL5 is done successfully. Confirm if the displayed weight is equal to the setting weight you entered in CAL3, and after you clear out the baggage plate confirm if the displayed weight is "0". If "0" is displayed, press CLR key 2 times to move to weighing mode.

REF 2. The bias is "0" when the central lamp lights up as in the above VFD screen, and each lamp denotes the bias of -3, -2, -1, 0, 1, 2, 3 from the left lamp.

CAL 7

FUNCTION : Weight constant calibration			
KEY	**VFD**		**DESCRIPTION**
ENTER, STOP : exit from the CAL mode Numeric key : input of password	**FACtor**		input the password
	CAL 7	**FACt**	

REF 1. The ordinary user need not to use this menu, since it is used for calibration test without balance weight.

REF 2. When you press the ENTER key 2 times, it exit from the CAL mode and moved to weighing mode after VFD screen displayed "CAL END" .

13. SET mode

(1) How to enter this mode

Turn on the power while pressing the 'SET' key on the front of the indicator.
pressing the 'SET' key in the weighing mode

(2) SET Menu (F 01 - F 47)

GENERAL FUNCTION	
F01 Date	year, month, day
F02 Time	hour, minute, secocd
F03 Digital filter	1 ⇔ 9
F04 Stable condition	1 digit ⇔ 9 digit
F05 Automatic zero condition	0 digit ⇔ 9 digit
F06 Weight backup	Save current data at sudden power failure
F07 Hold type	Average hold / Maximum hold
F08 Zero key operation range	±2% / ±10%
F09 Operation condition of ZERO/TARE key	Stable / Unstable

PRINTER FUNCTION	
F20 Set employed printer	No printer / 7000D serial printer / other Serial printer
F21 Set automatic / manual print	Manual / Automatic
F22 Set print-form	6 kinds of print form
F23 Initialize weight number & stored value.	Initializes accumulative weight data

SERIAL COMMUNICATION FUNCTION	
F30 Set baud-rate	1200, 2400, 4800, 9600, 19200bps
F31 Output availability	Unused, Stream, Stable, Data request
F33 Device number	00 ⇔ 99

EXTERNAL I/O FUNCTION & OPTIONAL FUNCTION	
F40 Measurement type	Limit, Checker, Limit Type Checker, Packer Mode, Unused relay output
F41 Timer - finish signal start delay	00 ~ 99
F42 Zero output set	Zero / Zero band
F43 External input 4 set	Tare key / Print key
F44 Option selection	No option / Analog option
F45 Analog out data	0 / 1 (Net / Gross)
F46 Output current at display zero	00000 ~ 24000 (00.000mA ~ 24.000mA)
F47 Output current at full scale	00000 ~ 24000 (00.000mA ~ 24.000mA)

GENERAL FUNCTION

F01

Function	Change of date		
Set value	Example VFD	Sub VFD	Meaning
	98'03'02	F01 dAtE	March 2st,1998
	00'05'12		May 12st,2000

Note 1. Move the cursor to the desired number by pressing START, STOP key.
Note 2. Modify the year, month and date by pressing the numerical keys.

F02

Function	Change of time		
Set value	Example VFD	Sub VFD	Meaning
	12'30'01	F02 timE	A.M 12:30:01
	15'30'00		P.M 3:30:00

Note 1. Move the cursor to the desired number by pressing START, STOP key.
Note 2. Modify the time by pressing the numerical keys.

F03

Function	Digital Filter		
Set value (1~9)	Example VFD	Sub VFD	Meaning
	1	F03 dF	In high speed
	5		In normal speed
	9		very slowly

Note 1. Adjust the speed variation of the weight on the screen to be suitable for the current usage.

F04

Function	Stable condition set of weight		
Set value (1~9)	Example VFD	Sub VFD	Meaning
	1	F04 Stb	Stable lamp is off even with the change of only one division
	5		Stable lamp is on with changing of the weight below five division
	9		Stable lamp is on with changing of the weight below nine division

F05

Function	Automatic zero condition set		
Set value (00~99)	Example VFD	Sub VFD	Meaning
	00	F05 AZEro	No compensation
	23		Compensation for gradual change below two division for 3 sec.
	89		Compensation for gradual change below eight division for 9 sec.

Note 1. The first digit indicates count, the second digit indicates time unit.
Note 2. A time unit is similar to 1 second but is not exactly same.

F06

Function	Weight Backup		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F06 bAC	weight backup is off
	1		weight backup is on

Note 1. If the AC power is OFF suddenly and weight backup is ON, the scale recovers previous weight after the power is ON.
Note 2. On and Off are alternately displayed by pressing the numerical keys.

F07

Function	Hold type se		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F07 HoLd	Average hold : Compute the average weight of osculating weights.
	1		Peak hold : Compute the maximum weight among oscillating weights.

F08

Function	Zero key operation range set		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F08 rAnGE	2 % : zero key operation within 2 % of maximum weight
	1		10 % : zero key operation within 10 % of maximum weight

F09

Function	Operation condition of zero, tare key (stable/unstable)		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F09 Zt-C	Operation only in weigh stable state
	1		Constant Operation

PRINT FUNCTION

F20

Function	Employed printer set		
Set value (0～2)	Example VFD	Sub VFD	Meaning
	0	F20 Print	Printer is not used.
	1		7000 series serial printer
	2		Other serial printer

F21

Function	Automatic print		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F21 A-Prt	Manual print
	1		Automatic print

Note 1. Upon setting the automatic print, the print is carried out without pressing the key when the weight is in stable state.

F22

Function	Print form		
Set value (0～5)	Example VFD	Sub VFD	Meaning
	0	F22 Prt-F	Form 0 (Serial No.,Code No.,Net weight)
	1		Form 1 (Weigh No., Net weight)
	2		Form 2 (Gross, Tare, Net weight)
	3		Form 3 (Time, Net weight)
	4		Form 4 (Code No., Net weight)
	5		Form 5 (date, time, serial No., net weight)

Note 1. Serial No. increment from 1 to 999 and initialized to 1 after "SUM" key pressed or power-off.

Note 2. Weigh No. increment from 1 to 999 and is not initialized to 1 after power-off. In F23 of set mode, The weighing can be initialized.

F23

Function	Initialization of number measured daily		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F23 CLEAr	Maintain current number
	1		Initialization (starting from No.1)

- - - - - - - - - - - - - Output Form Example - - - - - - - - - - - - -

【 Output Form 0 】

Serial No., Code No., Net weight

```
1998.5.5   13:00
001,   CODE_11,    50.0 kg
002,   CODE_12,   100.0 kg
003,   CODE_19,   200.5 kg
```

【 Output Form 1 】

Weigh No., Net weight

```
1998.5.5   13:00
No.10          50.0 kg
No.11         100.0 kg
No.12         200.5 kg
```

【 Output Form 2 】

Gross, Tare, Net weight

```
1998.5.5   10:25
Gross :      1000.0 kg
Tare  :         0 kg
Net   :      1000.0 kg

Gross :      2000.0 kg
Tare  :       500.0 kg
Net   :      1500.0 kg
```

【 Output Form 3 】

Time, Net weight

```
1998.5.5   10:25
10:10,       100.0 kg
11:00,       200.0 kg
12:30,       200.0 kg

13:45,       100.0 kg
15:20,       200.0 kg
17:45,       500.0 kg
```

【 Output Form 4 】

Code No., Net weight

```
1998.5.5   13:00
CODE_11,       50.0 kg
CODE_12,      100.0 kg
CODE_19,      200.5 kg
```

【 Output Form 5 】

Date, time, Serial No., Net weight

```
1998.5.5   13:00
001,         1000.0 kg
1998.5.5   10:35
002,         2000.0 kg
```

SERIAL INTERFACE

F30

Function	Baud-rate set		
Set value (0～4)	Example VFD	Sub VFD	Meaning
	0	F30 bAUd	1200bps
	1		2400bps
	2		4800bps
	3		9600bps
	4		19200bps

F31

Function	Output availability (computer, sub-display)		
Set value (0～3)	Example VFD	Sub VFD	Meaning
	0	F31 SEnd	No data output
	1		Transmission in an state of stable & unstable
	2		Transmission only in stable state
	3		Transmission only when requiring data

Note 1. The default value is set to 0 at factory.
Note 2. when F31 is set to 3, the command of transmission is the byte which is specified in F33.
Note 3. F20 should not be set to 1 for the good functioning of F20.

F33

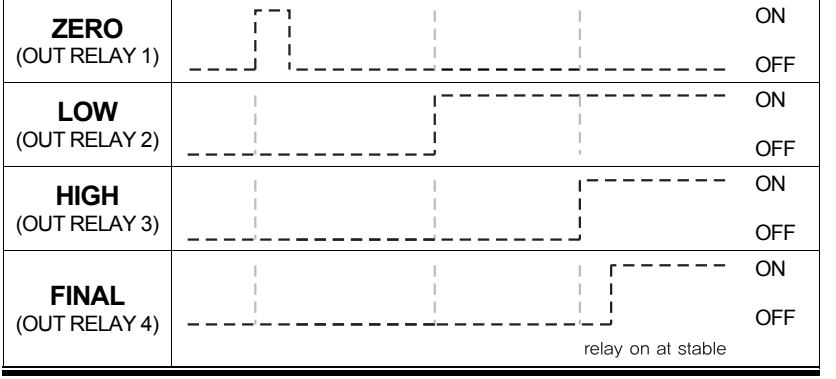
Function	Device Number (Identification number of each indicator)		
Set value (00～99)	Example VFD	Sub VFD	Meaning
	00	F33 id	Device No. 01
	05		Device No. 05

EXTERNAL I/O FUNCTION & OPTIONAL FUNCTION

F40

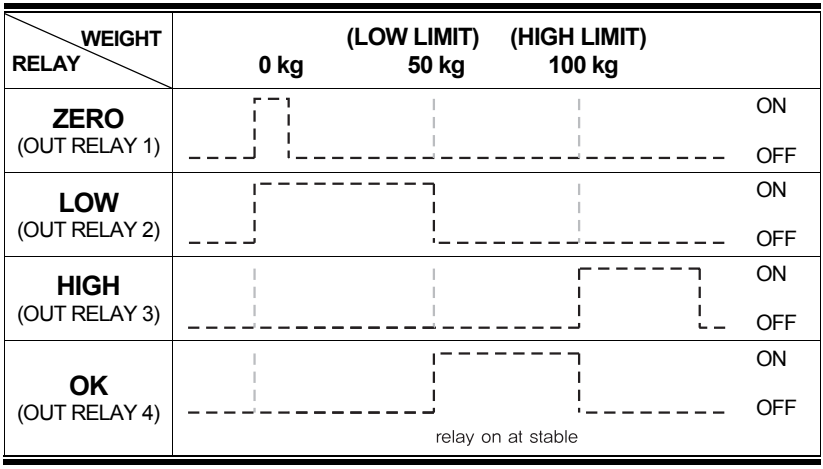
Function	Relay mode		
Set value (0～4)	Example VFD	Sub VFD	Meaning
	0	F40 rELAY	Limit Mode
	1		Checker Mode
	2		Limit type Checker Mode
	3		Packer Mode
	4		Relay is not used.

▷ Limit Mode (F40 → 0)



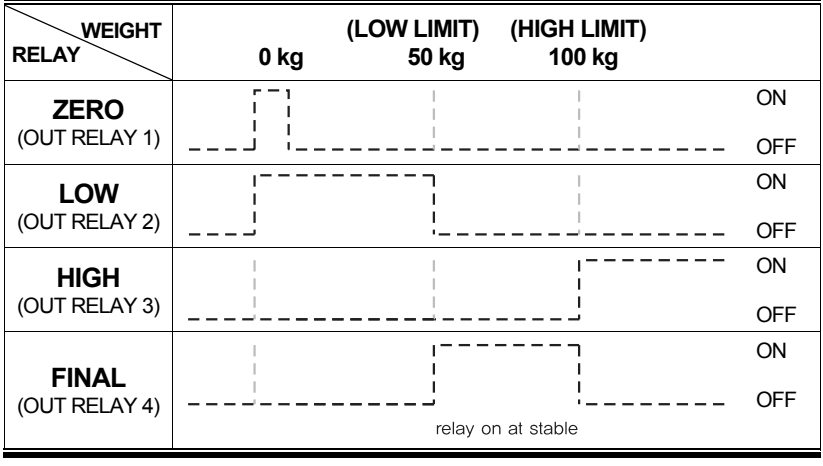
Note : When low_fall limit and high_fall limit are set,
Low limit relay will come ON (Weight = Low_limit - Low_fall_limit).
High limit relay will come ON (Weight = High_limit - High_fall_limit).

▷ Checker Mode (F40 → 1)



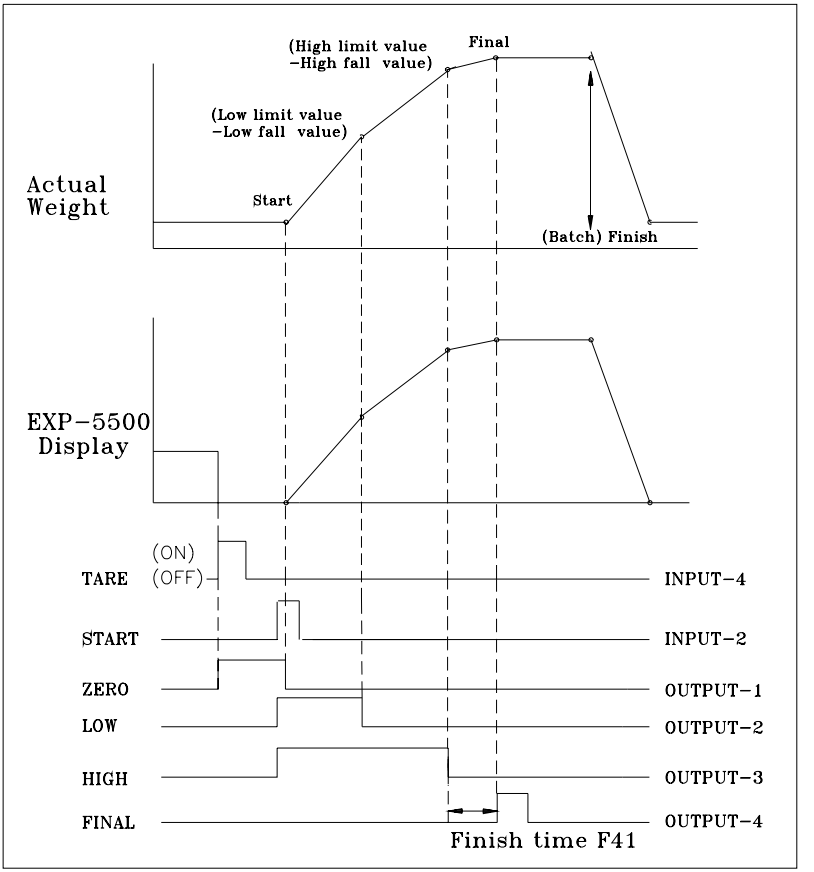
Note : When weight is stable relay turns on, and then turns off after delay for time at F41

▷ Limit type Checker Mode (F40 → 2)



Note : Relay output becomes OFF at zero state.

▷ Packer Mode (F40 → 3)



F41

Function	Delay time of complete relay		
Set value (00～99)	Example VFD	Sub VFD	Meaning
	00	F41 dELAY	No delay.
	13		Delay for 1.3 sec.
	55		Delay for 5.5 sec.

F42

Function	Operational renge of zero relay		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F42 Z-rE	Relay ON at zero
	1		Relay ON within 5e (minimum division×5)

F43

Function	Function external input 4 (tare/print)		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F43 S-in4	Use as tare key
	1		Use as print key

F44

Function	Analot output (0~10V, 4~20mA)		
Set value (0,1)	Example VFD	Sub VFD	Meaning
	0	F44 oP1	No option
	1		Analog output

F45

Function	Analog output data		
Set value (0,1)	Main display	Sub VFD	Description
	0	F45 n-9	Net weight data
	1		Gross weight data

F46

Function	Output current at zero		
Set value (0~24,000)	Main display	Sub VFD	Description
	4000	F46 ZEro	4.000 mA
	4015		4.015 mA

F47

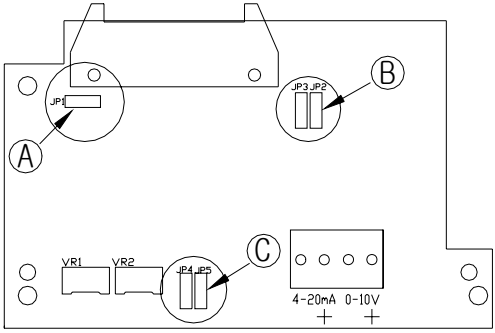
Function	Output current at full scale		
Set value (0~24,000)	Main display	Sub VFD	Description
	20000	F47 HigH	20.000 mA
	21215		21.215 mA

▷ Current output option

▣ Specification

Output current	Max. 0 - 24 mA
Resolutions	Over 1/1000
Temp. coefficient	0.01%/℃
Max. Load impedance	500Ω MAX.

▣ Installation



- A : JP1 ☞ CI-5000 series select

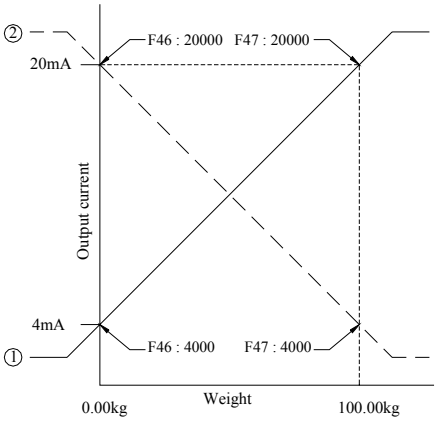
- B : JP3 JP2 ☞ 0~24mA select

- C : JP4 JP5 ☞ fixing mode select

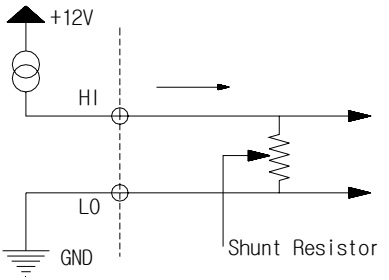
▣ Setting output current

Output current can be scaled from zero to full capacity by set mode F46 and F47.
The setting range is 0.000mA to 24.000mA, by steps of 0.001mA.

- Max capa. : 100kg, Min capa. : 0.05kg
case ① F46 : 4000, F47 : 20000
case ② F46 : 20000, F47 : 4000



▣ For example, to convert current to voltage :



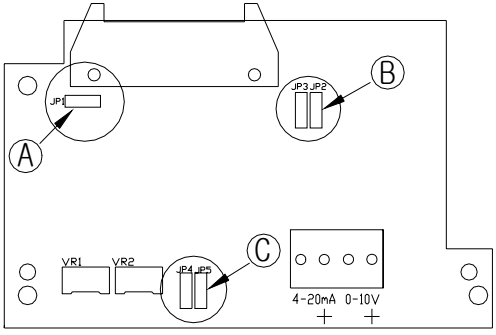
Resistor.
If you add a 250Ω resistor, the output will be 1V to 5V.

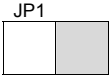
▷ Voltage output option

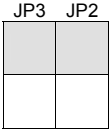
▣ Specification

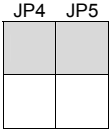
Output voltage	0 - 10V
Resolution	over 1/1000
Temp. coefficient	0.01%/℃

▣ Installation



- A :  ☞ CI-5000 series select

- B :  ☞ 0~10V select

- C :  ☞ fixing mode select

▣ When weight indication is 0, Output voltage is 0V output.

When weight indication is max., Output voltage is 10V.

▣ Set mode setting

F44 : 1
F46 : 0
F47 : 0

14. Main usage of EXP-5500

Example 1. Zero Compensation

	VFD display or Key	on Platform	Description
STEP 1		Empty	Zero point drift
STEP 2	☞ **ZERO** on the keypad.		
STEP 3		Empty	ZERO Compensation that is, return the display to the center of ZERO.

Note. Set ZERO Range to 2 % or 10 % of maximum capacity in SET Menu(F08).
Set ZERO keys availability in SET Menu(F09).

Example 2. To display NET or GROSS weight.

	VFD display or Key	on Platform	Description
STEP 1		Container and Content (Article)	Article weight: 13.00 kg Tare weight : 5.00 kg Net weight is on the display now.
STEP 2	☞ **G/N** on the keypad.		
STEP 3		Container and Content (Article)	Gross weight is on the display now.
STEP 4	☞ **G/N** on the keypad.		
STEP 5		Container and Content (Article)	Net weight is on the display now.

Note. NET annunciator appears when gross weight is on the display.
NET annunciator disappears when net weight is on the display.

Example 3. To change the display speed.

	VFD display or Key	on Platform	Description
STEP 1		Article	Weighing mode
STEP 2	☞ **SET** on the keypad.		trip to SET mode
STEP 3		Article	Here is SET mode
STEP 4	☞ **0,3** on the keypad.		SET Menu 3
STEP 5			current value of SET Menu 3 is "5". "5" : normal speed
STEP 6	☞ **9** on the keypad.		change "5" to "9". "9" : slowest
STEP 7			
STEP 8	☞ **ENTER** on the keypad.		Save & Exit
STEP 9		Article	return to Weighing mode

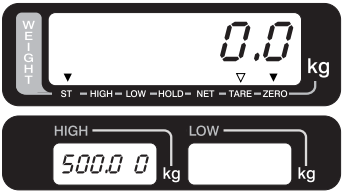
Example 4. To memorize ID(article identifier)

Let's assume that the ID of an article,"iron" is 10.

	VFD display or Key	on Platform	Description
STEP 1		Empty	
STEP 2		Article ("iron")	
STEP 3	☞ **ID** on the keypad.		
STEP 4		Article ("iron")	
STEP 5	☞ **1,0** on the keypad.		ID code of "iron"
STEP 6		Article ("iron")	
STEP 7	☞ **ENTER** on the keypad.		
STEP 8		Article ("iron")	The EXP-5500 memorize ID code of "iron".

Note. The range of ID code is 0 ~ 20.

Example 5. High limit value input

	VFD display or Key	on Platform	Description
STEP 1		Empty	
STEP 2	☞ **HIGH** on the keypad.		
STEP 3			
STEP 4	☞ **500.0** on the keypad.		Input High limit value
STEP 5	☞ **ENTER** on the keypad.		
STEP 6		Empty	High limit value is registered and displayed on FIP

Note. After typing HIGH key and desired high limit value (e.g.,500.0kg), press the ENTER key to register 500.0 as the high limit value. In case that a number with decimal point is input, use the CLR key.
For instance, if 500.0kg is input as the high value, press the key in the order from HIGH key 5 key, 0 key, 0 key, CLR key, 0 key to the ENTER key.

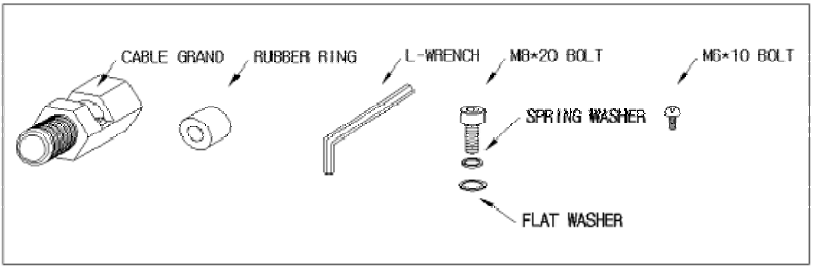
Example 6. High_fall limit value input

	VFD display or Key	on Platform	Description
STEP 1		Empty	
STEP 2	☞ **FALL, HIGH** on the keypad.		
STEP 3	☞ **5, CLR, 2** on the keypad.		Input High_fall limit value
STEP 4	☞ **SET**		
STEP 5		Empty	High_fall limit value is registered and displayed on FIP

Note. After typing FALL, HIGH and desired high_fall limit value (e.g.,5.2kg), press the SET key to register 5.2 kg as the high_fall limit value. In case that a number with decimal point is input, use the CLR key. For instance, if 5.2kg is input as the high_fall value, press the key in the order from 5 key, CLR key, 2 key, FALL key to the HIGH key.

15. ACCESSORY

NAME	QUANTITY
1. CABLE GLAND ASS'Y (PF 1/2″)	1 EA
2. RUBBER RING (¢ 8)	4 EA
3. L TYPE WRENCH	1 EA
4. BOLT (M8×20)	2 EA
5. SPRING WASHER (¢ 8)	2 EA
6. FLAT WASHER (¢ 8)	2 EA
7. BOLT (M6×10)	4 EA



16. Check message and trouble shooting

(1) Weight mode

Err 01

▣ Reason

stable to initialize the scale.

☞ Solution

Place the scale on a stable surface.

Err 02

▣ Reason

The zero range deviates from the set range.

☞ Solution

Confirm that there is nothing on the weighing platform.
If nothing exist, do calibration in CAL mode.

Err 03

▣ Reason

Press any key for long time or have problem key part.

☞ Solution

If have not problem key part, call A/S.

Err 04

▣ Reason

The high_fall value you just entered is over high_limit value.
The low_fall value you just entered is over low_limit value.

☞ Solution

The high_fall value should be below high_limit value.
The low_fall value should be below low_limit value.

Err 05

▣ Reason

The high_limit value you just entered is over maximum capacity.
The low_limit value you just entered is over high_limit value.

☞ Solution

The high_limit value should be below maximum capacity.
The low_limit value should be below high_limit value.

Err 06

▣ Reason

Poor connection with Printer.

☞ Solution

Check the connection between EXP-5500 & Printer.

no LC

▣ Reason

Load cell connection failure or error in A/D conversion part.

☞ Solution

Check the Load Cell connector to see if the polarity of signal is reversed.

Over

▣ Reason

The display weight is larger than the Maximum Capacity you've set.

☞ Solution

Don't load the article whose weight is larger than the Max. Capacity on the platform scale. This may damage Load Cell.

(2) Calibration Mode

Err 11

▣ Reason

The resolution is set to be exceeded the limit 1/10,000.

☞ Solution

lower the resolution. modify the allowed weight in CAL1 or modify the division in CAL2 so that the resolution should be below 1/10,000.

Err 12

▣ Reason

The weight for span calibration is set to be lower than 10% of the maximum capacity of the scale.

☞ Solution

Set the weight for span calibration in CAL3 to be more than 10% of the maximum capacity.

Err 13

▣ Reason

The weight for span calibration is set to be exceeded 100% of the maximum capacity of the scale.

☞ Solution

Set the weight for span calibration to be within the maximum capacity of the scale in CAL1.

Err 14

▣ Reason

Load cell output is too small at SPAN calibration.

☞ Solution

Setting of current resolution is not possible due to the error in load cell.
proceed calibration again with less resolution.

Err 15

▣ Reason

Load cell output is too large at ZERO calibration.

☞ Solution

Check whether the platform empty.
Proceed calibration again after checking in A/D TEST mode.

Err 16

▣ Reason

Load cell output is too small at ZERO calibration.

☞ Solution

Check whether the platform empty.
Proceed calibration again after checking in A/D TEST mode.

Err 17

▣ Reason

The weight is unstable.

☞ Solution

Check whether load cell is properly connected.

MEMO

MEMO


CAS
S • C • A • L • E