TUFNER
WEIGHING SYSTEMS

T905 INDICATOR USER'S MANUAL

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SAFETY PRECAUTIONS

For safe operation of the weighing indicator, please follow these instructions:

- Calibration inspection and maintenance of the indicator are prohibited by non-professional staff
- Please ensure that the indicator rests on a stable surface
- The indicator is a piece of static sensitive equipment; Please cut off power during electrical connections
- Touching the internal components by hand is prohibited
- DO NOT exceed the rated load limit of the unit
- DO NOT step on the unit
- DO NOT jump on the scale
- DO NOT use this product if any of the components are cracked
- DO NOT use for purposes other then weight taking
- To avoid damaging the battery do not keep charger plugged in once battery is fully charged
- Make sure the weight is not over the Max capacity as it could damage the load cell inside
- Material that has a static electric charge could influence the weighing. Discharge the static electricity of the samples, if possible. Another solution to the problem is to wipe both sides of the pan and the top of the case with an anti-static agent

Please take anti-static prevention measures

Any accumulated charge on the body of the human operator should be discharged first before opening the protective container with ESDS devices inside. The discharge can be accomplished by:

- Putting a hand on a grounded surface or, ideally, by wearing a grounded Anti-static Wrist Strap and an Anti-static Mat

PREPARATION & SET UP

- Plug into a wall outlet to avoid interference with other wirings
- Turn on the indicator while there is no load
- Calibration may be required before weighing when the scale is initially installed or moved from a location

FEATURES

Suitable for Bench scales, floor scales and truck scales, this indicator works with 32bit CPU and 24bit high precision ADC. It is made with a Stainless Steel housing. Excellent performance make it proper for varied interface function. Waterproof connector and cable connection fixed inside.
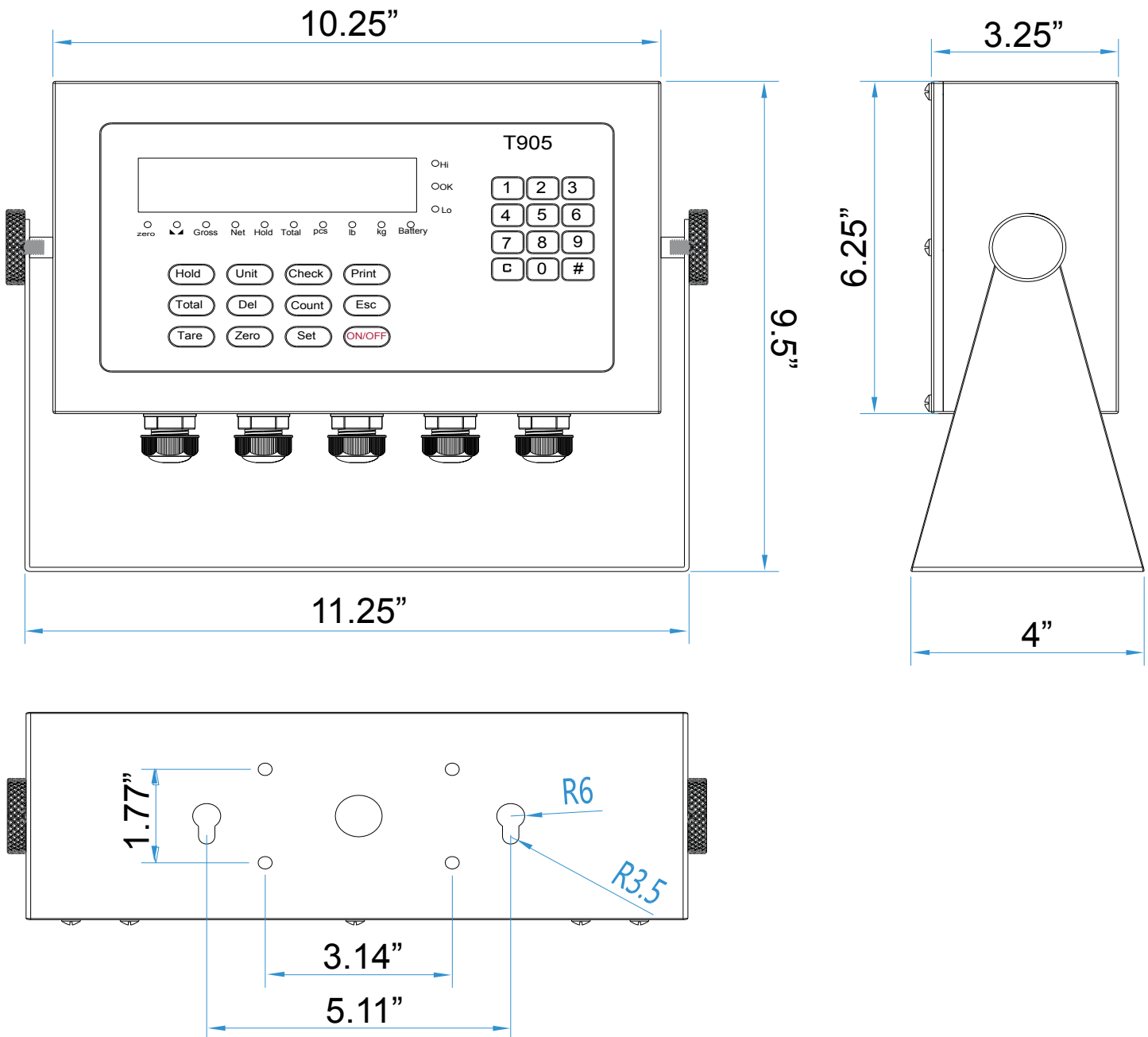
- Multiple weighing units: (lb/kg)
- Gross/Tare/Pre-Set Tare/Zero
- Multiple Hold functions
- Count weighing
- Accumulation weighing
- Check weighing
- Overload / Underload indication
- Connects to printer
- Splash proof keyboard and display
- Connects to a Remote Display/Scoreboard
- Power saving mode
- Can connect to a PC or printer for data logging (optional)
- Wireless capability (optional)
- 20 mm Letter LED display
- Rechargeable battery
- RS232 output

Technical Parameters

- Accuracy class: 5000 e
- Resolution - Display: 30,000 ; ADC: 2,000,000
- Zero stability error: TK0 < 0.1μV//K
- Span stability error: TKspn < ± 6 ppm//K
- Sensitivity (internal): 0.3 μV / d
- Input voltage: -30 to +30mV DC
- Excitation circuit: 5 VDC, 4 wire connection, 12 load cell of 350ohm max
- AC power: AC 110V
- Battery 6V4Ah
- Operation temperature: -10 °C ~ +40 °C
- Operation humidity: ≤85%RH
- Storage temperature: -40 °C ~ +70 °C (32-104°F)
- Weight: 7lbs (3.2kg)
- Dimensions: 11.25" x 4" x 9.5" (260x160x80mm)

SPECIFICATIONS
FIGURE 1: INDICATOR MEASUREMENTS

10.25"

T905

Hi
OK
Lo

1	2	3
4	5	6
7	8	9
C	0	#

zero Gross Net Hold Total pcs lb kg Battery

Hold Unit Check Print
Total Del Count Esc
Tare Zero Set ON/OFF

9.5"

11.25"

3.25"

6.25"

4"

1.77"

R6

R3.5

3.14"

5.11"

POWER SUPPLY

AC Adapter
We recommend to plug into a wall outlet to avoid interference with other wirings.

Battery
Please charge the internal battery fully before first time use. To keep the battery in best condition, fully discharge the battery every month by leaving the indicator on until the indicator powers off, and then recharge fully. If the battery is not going to be used for a long period of time it is recommended to remove it to avoid leakage.

- When the Battery is low the battery indicator light flashes red
- During charging the red light will stay lit
- The light will turn green once fully charged

T905 (LED)

Keypad and Display
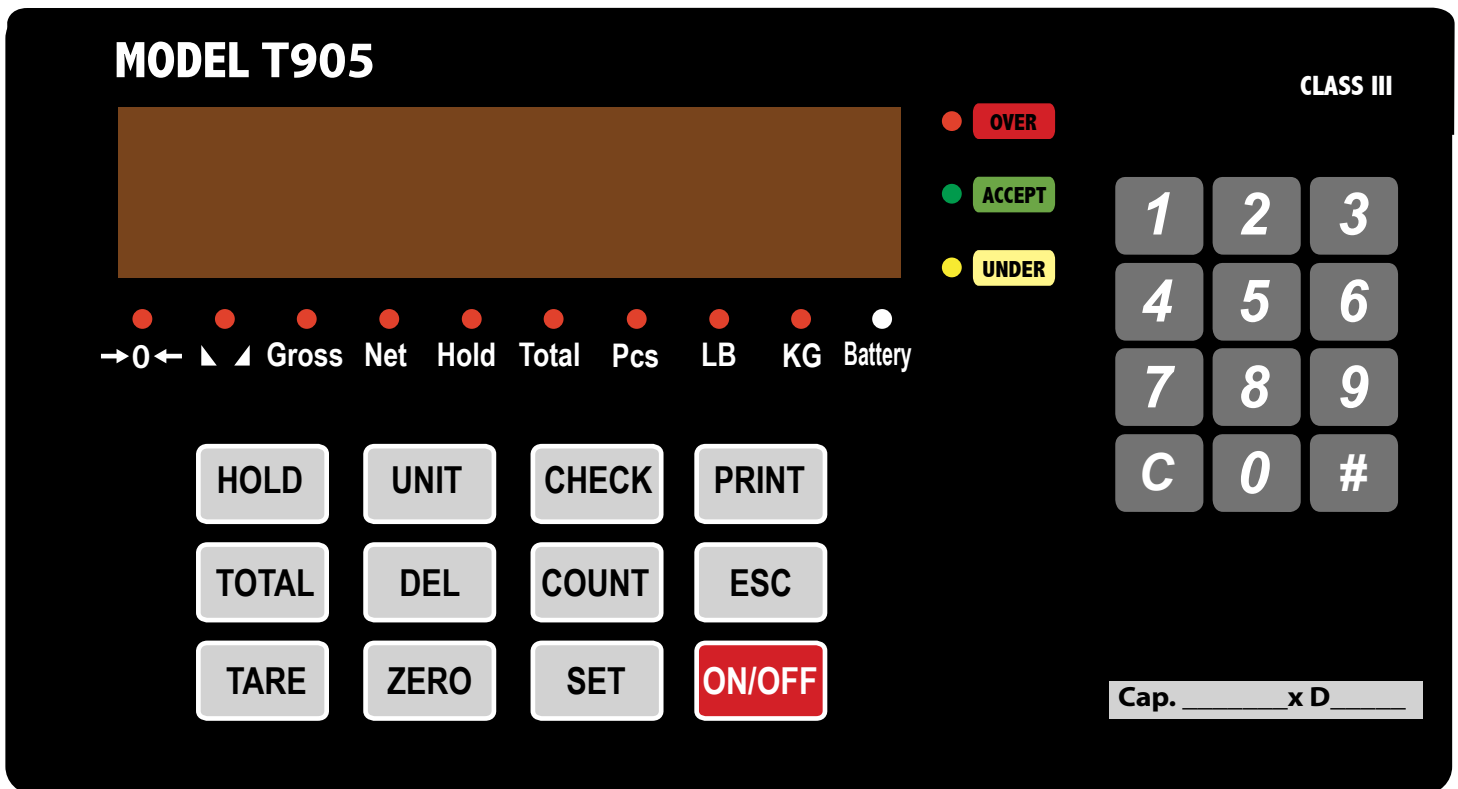
DISPLAY AND KEY DESCRIPTION

HOLD	Holds the weight on the scale Depending on the parameter setting
UNIT	Shifts between weighing units
CHECK	Checking the record by number
PRINT	Print the weighing data
TOTAL	In gross mode: get the tare weight In net mode: clear the tare, get the Gross
DEL	Delete the previous weighing data and the saved record
COUNT	Use the scale to count product based on a sample weight
ESC	Back to weighing
TARE	1. Zero's the scale. Used when using a container to hold objects 2. Clears the tare to see the gross weight
ZERO	Zero's the scale
SET	Confirm the action
ON/OFF	Powers the Indicator On or Off if held for 2 seconds
C	Clear the input
#	Confirm the input
→()←	The scale is at zero
◣◢	The scale is stable
Gross	Shows you are in Gross weight mode (includes tare); default mode
Net	Shows you are in Net weight mode (weight without tared weight)
Hold	Shows you are in Hold mode
Total	Shows you are in Accumulation mode
Pcs	Shows you are in Counting mode
LB	The weight is shown in pounds
KG	The weight is shown in kilograms
Battery	Flashes red = low battery, Solid red = charging, Green = fully charged
Over	Flashes when weight is higher than set alarm parameter
Accept	Flashes when weight is within the set alarm parameters
Under	Flashes when weight is lower than set alarm parameter

OPERATING INSTRUCTIONS

Power On

- Turn on the power by pressing the ON/OFF button for 2 seconds. Once on, the scale will flash the voltage and then begin to auto-check and count down from 0-9 sequentially before entering the weighing mode
  Note: Anything on the scale before powering on will automatically be tared out.

Zeroing

- The zero function is used only when the scale is empty and is not at zero due to material build up
- Pressing the ZERO key while the scale is stable will reset your scale to 0
- Depending on what your manual zero range parameter is set to, you can zero out any weight within your set selection, after that you will receive an error and will need to tare out the weight

Unit Selection

- To switch between measuring units (kg/lb) press the UNITS key

Tare Function

To Tare: When in gross mode, press TARE to enter net mode and tare out the weight

- The Tare function is used when you only wish to see the current change in weight, not the entire amount of weight that is on the scale
- When the indicator is in gross mode (gross light is shown) pressing the TARE key will Tare the current weight on the scale and enter the net mode (net light shown)
- For example if you are using a container add the container to the scale, press tare and the display will show the tare symbol →()← and reset back to 0
- Add your product to the scale to weigh without the weight of the container
- To exit Tare mode press the TARE key again to enter gross mode and you will see the total weight of the container and the product

Note: If you remove the container the scale will show the minus weight of the container

To use a pre-set tare weight
- Press and hold the TARE key and SET key at the same time
- Input the weight you want tared on the keypad
- Press TARE key to confirm
- Press TARE to reset back to 0

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Accumulation

- The accumulated function is used to add multiple weights and total them together
- You can add up to 999 different weights together
- In weighing mode load the first weight, once stable press the TOTAL key to enter the accumulated mode. The "total" light will display

 TOTAL

- Remove the first weight and add the second weight to the scale
- Once stable press TOTAL key to add the weight to the accumulated total

  TOTAL

- Repeat previous steps until all desired weights have been added to the total (max 999 times)
- When you are done and want to display the accumulated total, press the TOTAL and SET key together. The accumulated number "n###" (the number of weights you are adding together) will flash on the display followed by the total

TOTAL **+** **SET**

- If you want to print the accumulated total, hold the PRINT key for one second
- To exit accumulated mode, press the ESC key
- To delete the saved weights press the DEL key followed by the set key to confirm

DEL **SET**

- Repete this process to cleaer all saved weights

Counting Function

- The counting function is used to count a high volume of identical parts. You can do this by setting a sample and then either adding to the sample or taking away from the sample to count the number of objects on the scale
- In weighing mode: press COUNT to enter count mode   COUNT
- Then press COUNT and SET at the same time to set your sample with the keypad

COUNT **+** SET   `000000`   `000050`

- (ex. If you are counting pencils, you would add a sample of pencils to the scale, if you add 50 pencils to the scale you would enter 50 on the keypad.)
- Press # on the keypad to set your sample
- The scale is now ready to start counting, load your product on the scale and the indicator will show the quantity

`50` **+ 450 pencils** `500`

- (ex. if you add 450 pencils to your sample of 50, the scale will read 500 pencils)
- To see the weight on the scale press COUNT
- To exit counting mode press the ESC key
- If you want to count a different product hold the COUNT and SET keys together to enter a new sample

Hold

There are 4 different hold functions you can choose from in the C11 parameter
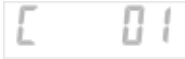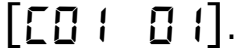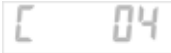
1. Peak Hold: Grabs the highest weight (for materials testing, ie. tension and pulling force)
- Press the HOLD key then add weight to the scale
- The indicator will show the highest weight it recorded and hold it on the screen until a higher weight is placed on the scale

2. Manual Hold: Grabs the current weight and holds it so it will not change/fluctuate
- While weighing, press HOLD and the indicator will hold the current weight on the screen until HOLD is pressed again

3. Auto Hold: If the weight on the scale is above 20d (20 x division) and is stable, the indicator will hold that weight on the screen for 3 seconds then go back to general weighing
- Pressing the hold key is unnecessary, holding is done automatically when the scale is stable

4. Average Hold: Used for animal weighing, the indicator will display the average weight sampled from 3 seconds
- Add livestock to scale and press HOLD
- Indicator screen will show "L0C" for 3 seconds, then display the average weight from those 3 seconds
- Press HOLD again to exit holding mode

Print

- If the indicator is connected to a printer and the weight on the scale is stable press the PRINT key to print the current weight

Note: In tare mode the printer can not print if negative weight is shown

CALIBRATION PROCEDURE

1. Turn on the scale by holding ON/OFF ⏻.
2. Press SET and ESC together to access the setup menu.
3. If done correctly, the display should now show $[\ \ \ \ 01$
4. Press # to access the C1 channel. The display should show $[C01\ \ 01]$.
5. On they keypad enter which unit you want to calibrate in (1 = kg, 2 = lb).
6. Press # to save your value. The display will now show $[\ \ \ \ 02$
7. Press # to access the C2 channel. The display should show $[C02\ \ 00]$.
8. Use the keypad enter the setting for the decimal places desired (The C2 channel is used to adjust the decimal point on the scale. A value of 1 means there is one digit behind the decimal point 1= 0.0, a value of 2 = 0.00)
9. On they keypad set your value. The display will now show $[\ \ \ \ 03$
10. Press # to access the C3 channel. The display should show $[C03\ \ 01]$.
11. On they keypad enter the value of your desired graduation.
    (The C3 channel adjusts the divisions on the scale. A value of 1 selected and C2 set to 1, the scale will read in 0.1 lb. increments.)
12. Press # to set your value. The display will now show $[\ \ \ \ 04$
13. Press # to access the C4 channel. The display will show $[000000]$.
14. On they keypad enter the maximum capacity you want to use for your scale.
    (The C4 channel is used to enter in the max capacity of the scale; Make sure the number you enter does not exceed the max capacity of your scale.)
15. Press # to set your value. The display will now show $[\ \ \ \ 05$
16. Press # to access the C5 channel. The display should show $[C05\ \ \ 00]$.
17. The C5 channel calibrates zero on the scale. Make sure the scale is empty.
18. Press 1 on the keypad to change the value to 1.
19. Press # to zero calibrate. The display will count down from 10-1 while the scale is calibrating. When the display shows 0 the zero calibration is complete.
20. Press # to to continue. The display will now show $[\ \ \ \ 06$
21. Press # to access the C06 channel. The display will show $[C06\ \ \ 00]$.
22. The C6 channel is used to calibrate the scale with a known weight. Press 1 on the keypad to set the value of C6 to $[C06\ \ \ 01]$.
23. Press # to to continue. The display will flash $SPAN$, and then show $[000000]$.
24. On the keypad enter the weight of the calibration weight you will use (must be at least 10% of your max capacity you set in C04.
25. Place your calibration weight on the empty scale and # .

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CALIBRATION CONT.

26. The scale will count down from 10 to 0. Once 0 has been reached, the display will show `CALEnd`.

27. Press `#` to continue. The display will now show `C      07`

28. Press `ESC` to save and exit the setup menu.

29. The scale has now been calibrated. The display will show the value of the calibration weight on the scale.

30. If the scale does not show the value of the calibration weight, check that the feet on the platform are not screwed in too tightly, and verify that the platform is level.

31. Unload the scale; the display should read `000000`.

32. If the scale does not display 000000, check that the feet on the platform are not screwed in too tightly, and verify that the platform is level.

INDICATOR PARAMETER SETTINGS

The parameter settings menu has a calibration section (C01 to C07 explained above) and a parameter settings section (C08 and up).

To access the calibration section the seal switch (located at one corner of the PCB) must be OFF. This will allow access to all C01 and up settings. If the seal switch is ON, then only C08 and up can be accessed by the user. If you break the official seal by opening the back of the indicator to access the seal switch, you may need to have the indicator recertified. Be sure to adjust the seal switch back to the original setting after calibration/configuration has been performed.

To enter calibration/parameter settings, follow the procedure below:

1. Press and hold the SET and ESC key at the same time to enter the parameter settings
2. Navigate through the settings (C01 to C45) by using the number keypad
3. Press the # key to enter/edit the parameter setting

Press the ESC key to save and exit settings at any time

Table 1. Indicator Parameter Settings

Function	Parameter	Settings/Options
Weighing Unit	C01	1 = kg 2 = lb
Decimal Setting	C02	0 = no decimal 1 = #.# 2 = #.## 3 = #.### 4 = #.####
Graduation Setting (readability of the least significant digit)	C03	options: 1/2/4/10/20/50 Example with no decimal places (ie C02=0) 1 = 1 lb 2 = 2 lb 5 = 5 lb 10 = 10 lb 20 = 20 lb 50 = 50 lb
Maximum Capacity	C04	set max capacity ex. 100kg = 0100.00
Zero Calibration	C05	0 = zero calibration not needed 1 = set the zero calibration (Please ensure scale is empty and the stable light is on)
Calibration	C06	0 = calibration not needed 1 = ready to calibrate with calibration weight
Restore Default Settings	C07	0 = do not restore 1 = restore to default settings

Function	Parameter	Settings/Options
Hold Function	C08	0 = turn off hold function 1 = Peak hold - Grabs the highest weight 2 = Manual hold - Grabs the current weight 3 = Auto hold - Automatically holds data when stable 4 = Average hold - for animal weighing, averages the weight from a sample of 3 seconds 5 = Auto Average hold - Average hold without the need to press the hold key
Unit Switch	C09	0 = turn off unit switch 1 = turn on unit switch
Power Saving Mode	C10	0 = turn off power saving setting 3 = turn off display if no change within 3 minutes 5 = turn off display if no change within 5 minutes
Automatic Power Off	C11	0 = turn off auto power off 1 = power off automatically if no change within 10 minutes 2 = power off automatically if no change within 20 minutes 3 = power off automatically if no change within 30 minutes 4 = power off automatically if no change within 40 minutes 5 = power off automatically if no change within 50 minutes 6 = power off automatically if no change within 60 minutes
Alarm Setting	C12	0 = turn off alarm 1 = turn on alarm
Upper Limit Alarm	C13	Set upper limit within the max. capacity
Lower Limit Alarm	C14	Set lower limit within the max. capacity
Inner Code Display	C15	check the inner code (raw data)
Preserved menu	C16	
Preserved menu	C17	
Communication Setting for the RS232 Port	C18	Set the serial interface data output method: 0 = Turn off serial interface data output 1 = Command request mode, connect computer. 2 = Print mode, connect printer 3 = Continuous sending mode, connect computer or display
Preserved menu	C19	
Manual Zero Range	C20	0 = turn off manually zero setting 1 = ±1% max capacity 2 = ±2% max capacity 4 = ±4% max capacity
Initial Zero Range	C21	0 = no initial zero setting 1 = ±1% max capacity 2 = ±2% max capacity 5 = ±5% max capacity 10 = ±10% max capacity 20 = ±20% max capacity

Function	Parameter	Settings/Options
Zero Tracking	C22	0= turn off zero tracking 0.5 = ±0.5d d = division 1.0 = ±1.0d 2.0 = ±2.0d 3.0 = ±3.0d 4.0 = ±4.0d 5.0 = ±5.0d Note: the zero tracking range can not be bigger than manual zero range
Zero Tracking Time	C23	0 = turn off zero tracking time 1 = 1 second 2 = 2 seconds 3 = 3 seconds
Overload Range	C24	00 = turn off overload range 01-99d = overload range setting d = division
Negative Display	C25	0 = -9d 10 = -10% max. capacity 20 = -20% max. capacity
Standstill Time	C26	0 = quick 1 = medium 2 = slow
Standstill Range	C27	1 = 1d d = division 2 = 2d 5 = 5d 10 = 10d
Digital Filter (for filtering moving weight such as animals)	C28	0 = turn off dynamic filter 1 = 1 digital filter strength 2 = 2 digital filter strength 3 = 3 digital filter strength 4 = 4 digital filter strength 5 = 5 digital filter strength 6 = 6 digital filter strength Note: The higher the number, the higher the filter strength
Noise Filter	C29	0 = turn off noise filter 1 = 1 digital filter strength 2 = 2 digital filter strength 3 = 3 digital filter strength
Communication Format	C41	0 = turn off continuous transmit 1 = format 1 2 = format 2 3 = format 3 4 = format 4
Baud Rate	C42	0 = 600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 19200 6 = 38400 7 = 57600 8 = 115200

| Function	Parameter	Settings/Options
Odd-Even Check	C43	0 = 8n 1 = 7o 2 = 7e
Interval	C44	0 = no limit 1 = 100ms 2 = 200ms 3 = 500ms 4 = 1s 5 = stable transmit
Checksum	C45	0 = no 1 = yes
Simple Command Support	C46	0 = no 1 = yes
Commanding Format	C51	0 = turn off commanding mode 1 = simple commanding 2 = standard commanding
Baud Rate	C52	0 = 600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 19200 6 = 38400 7 = 57600 8 = 115200
Odd-Even Check	C53	0 = 8n 1 = 7o 2 = 7e
Response Format	C54	0 = format 1 1 = format 5 2 = format 4
Slave ID	C55	0-99
Print Mode	C61	0 = turn off printing mode 1 = turn on printing mode
Baud Rate	C62	0 = 600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 19200 6 = 38400 7 = 57600 8 = 115200

Table 3. Default Parameter Settings

Function	Parameter	Default
Weighing Unit	C01	1
Decimal Setting	C02	0
Graduation Setting	C03	1
Maximum Capacity	C04	10000
Zero Calibration	C05	0
Calibration	C06	0
Restore Default	C07	0
Hold Function	C08	0
Unit Switch	C09	9
Power Saving Mode	C10	0
Automatic Power Off	C11	0
Alarm Setting	C12	01
Upper Limit Alarm	C13	000000
Lower Limit Alarm	C14	000000
Inner Code Display	C15	999999
Communication Setting	C18	1
Manual Zero Range	C20	2
Initial Zero Range	C21	10
Zero Tracking	C22	0.5
Zero Tracking Time	C23	1
Overload Range	C24	9
Negative Display	C25	10
Standstill Time	C26	1
Standstill Range	C27	2
Digital Filter	C28	0
Noise Filter	C29	2
Communication Format	C41	2
Baud Rate	C42	1
Odd-Even Check	C43	0
Interval	C44	1
Checksum	C45	0
Simple Command	C46	0
Commanding Format	C51	1
Baud Rate	C52	4
Odd-Even Check	C53	0
Response Format	C54	0
Slave ID	C55	0
Print Mode	C61	1
Baud Rate	C62	4

BATTERY INSTALLATION

The indicator works with AC power, please note the voltage is proper and check if the AC power side is earthing.
Voltage transformer and stable circuit is build in the indiciator please dont open it without professional instruction.
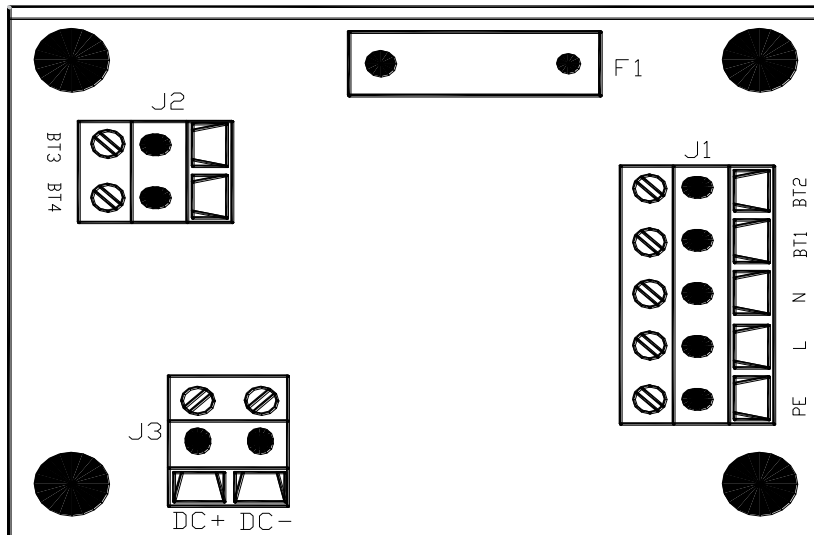
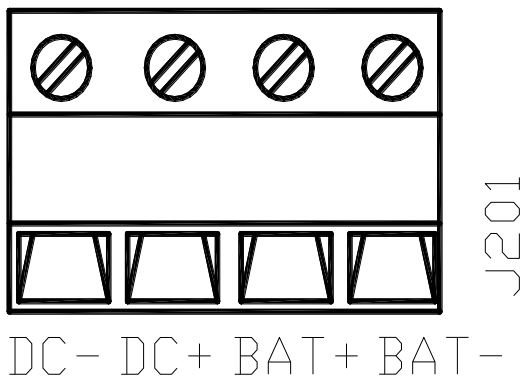Stable Circuit connection
J1 Inditial level for AC power input and voltage transfomer
J2 Second level for voltage transformer
F1 220V 0.25A fuse

PCB indicator power connection

Postive battery connect with BAT+ , negative batter connect with BAT-

SCALE INSTALLATION

T905 maxi. Supports 12 x 350ohm load cells. (4 wires or 6 wires load cell) The connection between load cells and indicator is by terminal block. the connection diagram as below.

EXC+ SEN+ SEN- EXC- SIG+ SIG-
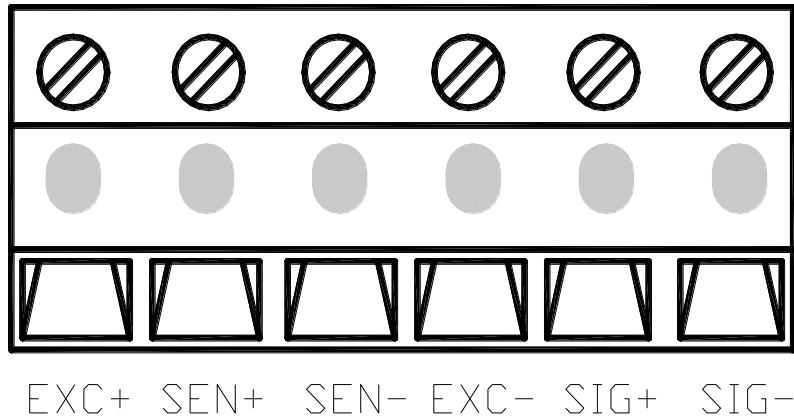
4 Wire load cell connection

EXC+ SEN+ SEN- EXC- SIG+ SIG-
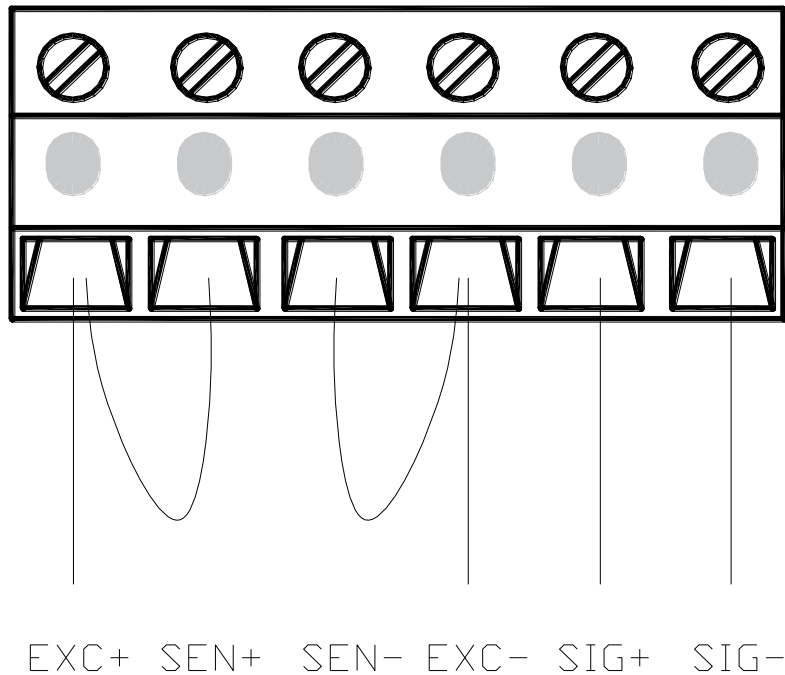
EXC+, EXC-, SIG+, SIG- (load cell) to EXC+, EXC-, SIG+, SIG- (indicator)
EXC+ and SEN+ to be short circuit
EXC- and SEN+ to be short circuit

6 Wire load cell connection

EXC+ SEN+ SEN- EXC- SIG+ SIG-
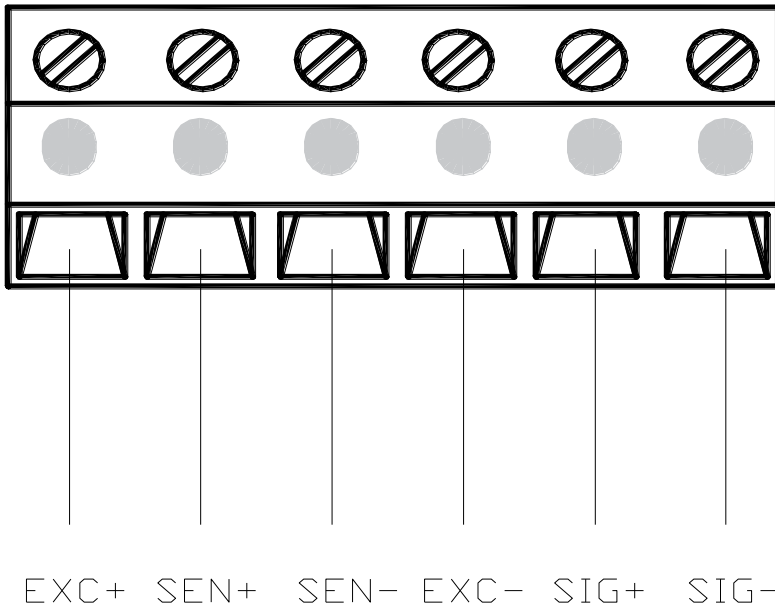
EXC+,SEN+, SEN-, EXC-,SIG+,SIG- (load cell) to EXC+,SEN+, SEN-, EXC-,SIG+,SIG- (indicator)

Communication Interference

T905 owns 3pcs RS232 , 1 pc RS485 and 1 pc USB-Com.
1 RS232 is electrical isolation with load cell and can be set in C18 parameter, DEFAULT off.
RS485 and USB-COM are electrical isolation too.
The communication function is set in C41 ~ C79 parameter.

RS 232 connection as below.

I_RS232_3   RS232_2   RS232_1

RX3 TX3 GND RX2 TX2 GND RX1 TX1 GND
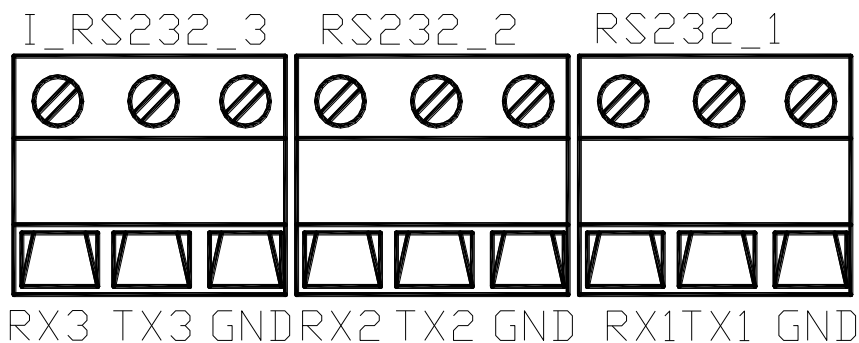
USB-COM as below
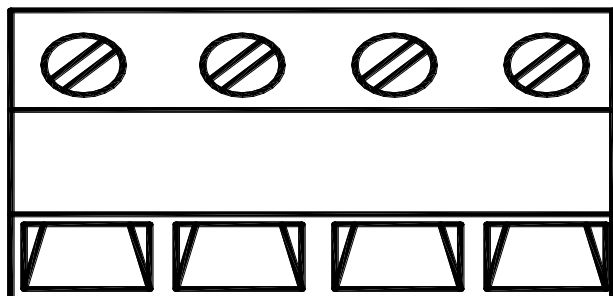
USBV+ D- D+ GND

RS485 as below.

I_RS485_1
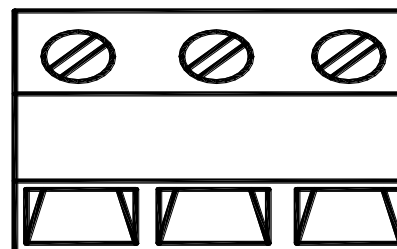
A B GND

PIN	Definition	Interface	Function
RX1	RS232-1 recieve	RS232-1	Continues Tranmit
TX1	RS232-1 transmit		
GND	Earthing		
RX2	RS232-1 recieve	RS232-2	Printing
TX2	RS232-1 transmit		
GND	Earthing		
8X3	RS232-1 recieve	RS232-3 Electrical Isolation	C18: Commanding mode Printing mode Continues transmit mode
TX3	RS232-1 transmit		
GND	Earthing		
A	RS485 output A	RS485 Electrical isolation	Commanding mode
B	RS485 output B		
USBV+	USB power	USB to COM Electrical isolation	Commanding mode
D-	Data-		
D+	Data+		
GND	USB earthing		

OUTPUT FORMAT

Computer Continuous Sending Mode (Format 1)

| | | , | | | , | | | | | | | | | | | | CR | LF |

S 1   S 2   S 3   Data   S 4
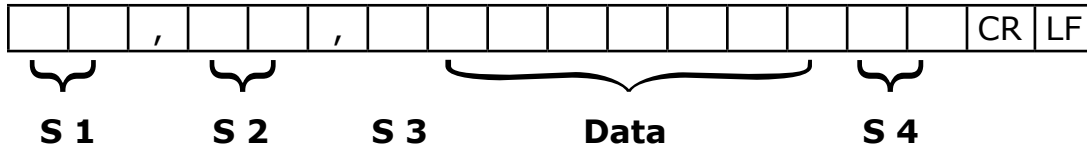
S1:   weight status, ST=standstill, US=not standstill, OL=overload
S2:   weight mode, GS=gross mode, NT=net mode
S3:   weight of positive and negative, "+" or "-"
Data: weight value, including decimal point
S4:   "kg" or "lb"
CR: carriage return
LF: line feed

RS232 SERIAL OUTPUT FORMAT

Follow the pin out of Table 5 below to connect the indicator the RS-232 Serial device

Table 5. DB9 Pin Description

DB9 Pin	Definition	Function
2	TXT	Transmit Data
3	RXD	Receive Data
5	GND	Ground Interface

The serial output format depends on the settings for parameter C18. The serial output consists of a string of ASCII characters. Here is a list of the serial parameters
- 8 data bits
- 1 stop bits
- No parity
- No handshaking

Note: With the RS232 Output option we have data logging software available as seen in Figure 5.

FIGURE 5. DATA LOGGING SOFTWARE

Below are the formats of the serial output
- C18=0 - Turn off serial interface data output
- C18=1 - Continuous sending mode, connect 2nd big display
- C18=2 - Print mode, connect printer
- C18=3 - Command request mode, connect computer.
- C18=4 - PC continuous sending mode, connect computer
- C18=5 - PC/big display, continuous sending mode
- C18=6 - Print to adhesive label printer

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Compatible for Yaohua A9 (Format 3)

ASCII code to show the data. The transmission data is the current weight.
Each one is by 12 groups of data.

X bit	Note
1	02(XON) start
2	+ or - symbol
3	High bit of weighing data
:	Weighing data:
:	Weighing data:
8	Low bit of weighing data
9	Decimal bits from right to left(0~4)
10	Odd or even checking for high 4 bits
11	Odd or even checking for low 4 bits
12	03(XOFF) end

PC or Remote Display Continuous Sending Mode (Format 4)

<STX>	<POL>	XXXXX.XX	<L/K>	<G/N>	<STAT>	<CR>	<LF>

Start Transmission

Polarity:
<SP> = Positive
"-" = Negative

Weight Data

Units:
lb = punt
kg = kilogram
pcs = pieces*

Gross/Net:
GR = Gross
NT = Net

Status:
<SP> = Valid
M = Motion
O = Over/under range

Carriage Return

Line Feed

PC or Remote Display Continuous Sending Mode (Format 5)

<STX>	<POL>	XXXXX.XX	<sp>	<Lb/KG>	<sp>	<GR/NT>	<CR>	<LF>

Start Transmission

Polarity:
<SP> = Positive
"-" = Negative

Weight Data

Space

Units:
lb = punt
kg = kilogram
pcs = pieces*

Space

Gross/Net:
GR = Gross
NT = Net

Carriage Return

Line Feed

Commanding Format

Standard comand

Use ASCII code to response

Transmit:

Format	STX	ADDRESS	COMMAND	VERIFY	ETX
Content	02	A-Z / 20	A-F,T,Z	3H 3L	03

No address, use space (20hex), 6 bits in total.

Responsing:

Format	STX	ADDRESS	COMMAND	REPLY	VERIFY	ETX
Content	02	A-Z / 20	B-D	(W)	3H 3L	03
Content	02	A-Z / 20	A,T,Z,N,X		3H 3L	03

W: symbol+weight+decimal position

Back 6/14 bit

Command list:

A: shaking hand

B: gross weight

C: tare weight

D: net weight

T: tare

Z: zero

N: command can't be done

X: Non commanding

Simple commanding:

Code	Name	Function
T	Tare	Reduce tare or clear tare
Z	Zero	Tare to be zero
P	Printing	Print the current weight
R	Read gross/net weight	Response to format 1

Note:

If set salve ID is not 0, transmit with ID.

PRINTING

The following are the printing formats on an tufner ticket printer:

Standard Printing mode

```
S/N:              XXX
Date:      05/01/2017
Time:       11:30:52
Net            25.6lb
Tare           10.3lb
Gross          35.9lb
```

Accumulation Printing mode

```
Date:      05/01/2017
Time:       11:30:52
N001:          25.6lb
N002:          10.3lb

Total          35.9lb
Count             002
```

Counting Printing mode

```
Date:      05/01/2017
Time:       11:30:52
Pieces     xxxxxx pcs
APW        xxxx.xx kg
Net:           25.6lb
Tare:          10.3lb
Gross:         35.9lb
```

Checking Printing mode

```
Date:      05/01/2017
Time:       11:30:52
Number            231
Weight         10.3kg
```

HELPFUL DEFINITIONS

Division: The amount of increments a scale offers. How accurate the scale can be

Capacity: the maximum amount the scale can contain

Initial Zero Range: The percentage of weight allowed on the scale when indicator is powered on that will automatically zero.
example: If initial zero range is set to 10% of the max. capacity and your max. capacity is 100lbs, you can place up to 10lbs of weight on the scale and when the indicator is powered on, it will automatically zero out the weight.

Manual Zero Range: The percentage of weight allowed on the scale where the indicator will let you manually zero (anything above this percent will be tared)

Zero Tracking Range: A subset to the manual zero range; if the weight on the scale is not stable, the zero tracking range still allows you to zero within a set division of the scale

Zero Tracking Time: A subset to the zero tracking range, it is the time allowed for the scale to fall within the zero tracking range tolerance and still qualify to be zero'd

Overload Range: Weight allowance that is out of the set calibrated range. Adds a tolerance to the calibrated max. capacity without having to recalibrate.
example: If your scale has a max. capacity of 1000lbs with a division of 1 and you set the overload range to 60, you can add 1060lbs of weight to the scale without it displaying an error code

Negative Display: How far you can go in the negative direction before displaying an error code

Standstill Time: How fast the scale will stabilize

Standstill Range: How much the scale can fluctuate before being determined stable

Digital Filter: For filtering moving weight, such as animals, It changes how sensitive the scale is to variations in movement.

Noise Filter: A filter for how susceptible the scale is to general variations

Baud Rate: The rate at which information is transferred in a communication channel.
example: In the serial port context, "9600 baud" means that the serial port is capable of transferring a maximum of 9600 bits per second.

TROUBLESHOOTING

Error Codes

Error	Reason	Solution
UUUUUU	1. Overload 2. Wrong connection with load cell 3. Load cell has quality problem	1. Reduce the weight 2. Check load cell connection 3. Inspect load cell; Check the input/output 4. See Q&A section
∩∩∩∩∩∩∩	1. Calibration is no good 2. Wrong connection with load cell 3. Load cell has quality problem	1. Make sure scale is level 2. Check load cell connection 3. Check load cell input and output resistance 4. See Q&A section
Err 1	During calibration, weight is not used or the weight is above the max. capacity	Use correct weight within the defined range
Err2	During calibration, the weight is below the minimum required weight	The calibration weight minimum is 10% of the max. capacity set in C04. Recommended to use 60%-80% of max. capacity if possible
Err3	During calibration, the input signal is negative	1. Check all wire connections 2. Check load cell 3. Recalibrate 4. PCB replacement needed if steps 1-3 fail
Err4	During calibration signal is unstable	After the platform is stable, start calibration
Err5	EEPROM Error	Change PCB
Err6	Exceed Zero Range	Remove the load and See Q&A section
Err9	The number to chick is too big	Input again with proper number
Err 10	No information	The accumulation is empty

Q&A

Q:	**The scale does not turn on**
A:	Make sure the power cord is plugged in, and that there is power. One easy way to test this is by connecting another appliance to the same outlet and see if it's operational
Q:	**The reading goes negative when a load is applied**
A:	Try interchanging the Sig+ and Sig- wiring connected to the load cell and/or junction box (if one is used)
Q:	**How do I resolve ERR6 error?**
A:	Please follow the procedure below: 1) Turn on the indicator and make sure nothing is on the scale, and that the scale is level and not wobbling 2) Press and hold the "PRINT and HOLD" key simultaneously for a few of seconds 3) The screen will read "C01" 4) Using the arrow keys, change C01 to C20. You have to change the 1st digit from 0 to 2 first before you can change the 2nd digit 1 to a 0. 5) Press "PRINT" key to enter C20 parameter 6) Change the value of C20 on the right to 100 if possible using the up arrow key. If 100 is not available change to 20 7) Press "PRINT" key to enter your selection 8) The screen will read "C21" now 9) Press "PRINT" key to enter C21 parameter 10) Change the value on the right of C21 to 100 if available, 20 if not 11) Press "PRINT" key to enter your selection 12) he screen will read "C22" now 13) Press "TOTAL" key to save and exit 14) Power the indicator off and then on, and see if this resolves the ERR 6 issue. If not, then following the Q&A answers below for resolving "nnnnnn"and "uuuuuu" errors
Q:	**How do I resolve "nnnnnn" and "uuuuuu" error?**
A:	1) Check to see if the cable that runs from the indicator to the junction box is damaged. If it is, replace the cable. 2) Open up the junction box (if available) and check to see if there is any water damage. If so, replace the junction box 3) Make sure all the wires on all 5 terminal blocks (5 wires on each terminal block) are not loose. Re-tighten the screws even if the wires seem to be connected 4) Recalibrate 5) If steps 1-4 do not work, there is a possibility one or more load cells are defective (consult with sales@tufner.com for further instructions)

CONTACT US

Please e-mail sales@tufner.com for any sales/support related questions.

Don't forget to visit our website at:

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