



**Safety Information**

**Installation:**

Designed for use within installation Category II Environments as defined in IEC664: 1980/PD6499: 1981 and UL

873. To avoid possible shock hazard install in a grounded metal enclosure, prevent live parts being touched and ground the sensor sheath. Following wiring diagrams and local regulations.

**Configuration:**

All functions are front key selectable, it is the responsibility of the installing engineer to ensure that the configuration is safe. Use the program lock (via password function) to protect critical functions from tampering.

**CE Conformity Declaration**

D3600 Series digital panel meters are in accordance to:

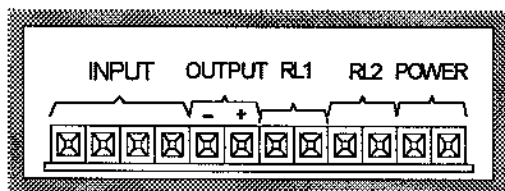
EN 50081-2: 1993

EN 50082-2: 1995

and comply with the basic directives:

89/336/CEE

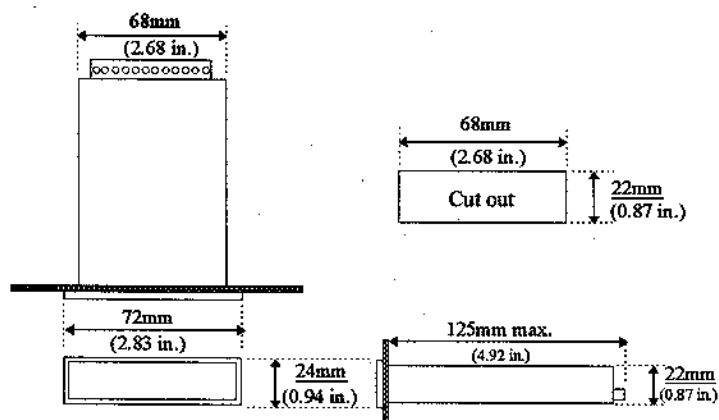
93/68/CEE



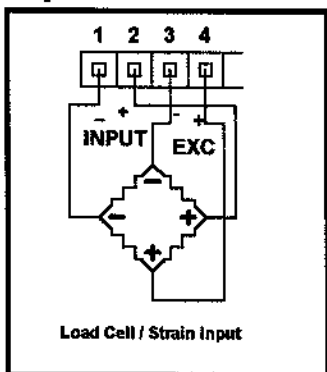
1 2 3 4 5 6 7 8 9 10 11 12

REAR CONNECTORS

**OUTLINE & CUTOUT DIMENSIONS**

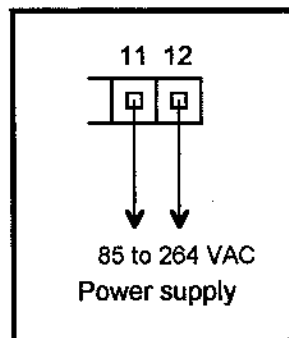


**Input connections**



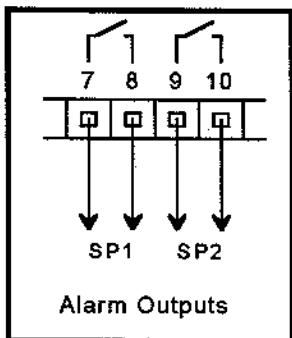
Load Cell / Strain Input

**AC Power connections**



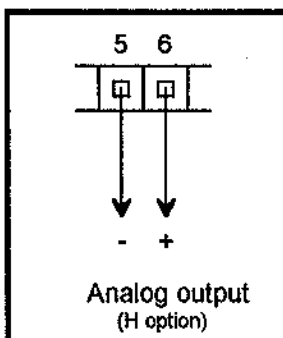
85 to 264 VAC  
 Power supply

**Relay connections**

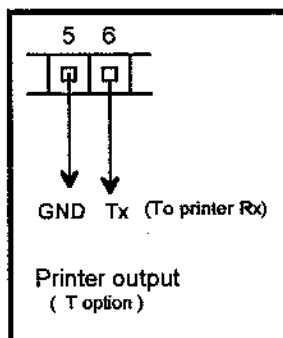


Alarm Outputs

**Optional output connections**



Analog output  
 (H option)






Printer output  
 ( T option)


# Keyboard Operation and Setup

## 1. Entering the Setup menu.

- a) Simultaneously press both the  and the  key.



## 2. Moving through the menus.


- a) Use the  key to scroll down through the menus, scroll through a choice of parameters, or to set the intensified digit to the desired numerical value.
- b) Use the  key to select a sub-menu, scroll to the next digit when entering a numerical value, save your choice of a parameter by pressing this key when the desired parameter is displayed, or to exit the setup mode press the  key whenever the End prompt appears on the display.

e.g. To select one decimal point press the  key when the display shows 999.9 under the dECP sub-menu.

## 3. Helpful Hints on using the Flow chart

- a) The arrows on the flow chart match the arrow on the key that you need to press to go to the next step of the chart that you want.


e.g. When you first enter the Setup mode the Cal prompt appears. At this time you may press either the  key to go into the calibration sub-menu, or you may press the  key to scroll down the main menu to the KY 1 prompt.

- b) Some of the prompts offer you one of two choices when you press the  key to enter the parameter selection. You will be either choosing from a predefined list of parameters, or you will be entering a numerical value. When it is a predefined list of parameters these are all listed in sequence on the flow chart, but when you need to enter a numerical value there is a short explanation of what the value will be controlling listed on the chart.

## 4. Entering a numeric value







- a) Whenever you select a prompt that requires a numeric value to be entered the farthest right hand digit will be lit brighter than the other digits (intensified).

- b) The value of this digit may be changed by pressing the  key. Once the desired number is displayed; press the  key to move over to the next digit (which will now be intensified).

- c) When the farthest left digit is intensified and is displaying the desired number press the  key again and the prompt you first entered will be displayed.



- d) If a mistake was made during entry press the  key again to re-enter this parameter; otherwise press the  key to scroll down to the next prompt.

e.g. To enter the number 5000 at the rDHI prompt:

1. Press the  key to enter the value, the display will show the previously entered value with the farthest right hand digit intensified.
2. Use the  key to set this first digit to 0; then press the  key to go to next digit.
3. Repeat this for the next two digits; then at the farthest left hand digit enter a 5.
4. The display should now show 5000 with the 5 intensified; Press the  key to exit.
5. The display will show rDHI again. Press the  key to step to End and then press the  key to exit setup.

**NOTE:** The range of input values that may be entered at rdLO and rdHI are -19.99 to 99.99 mV DC. The A/D converter is linear over the entire range of +/- 120.00 mV DC but the 4 digit display doesn't allow anything over 99.99 to be entered.

## Programmable Key Functions (Ky 1 and Ky 2 menus)

The two front panel keys may be defined by the user to perform one of several different functions while in the normal measurement mode. These choices are programmed at the Ky 1  and Ky 2  menus.

**NOTE:** Whenever a change is made to the KY 1 operation it is necessary to re-enter Setup and change the KY 2 setting since the meter automatically chooses some predefined combinations which may not be desirable for your application.

The choices are listed on the flow chart but a more detailed explanation of how each function will work is as follows:

### 1. Alarm Setpoints (Factory Default; Alarm 1/2 Menu)

- a) To display the current setpoint press the key defined as the alarm key for less than 2 seconds; the previously entered value will be displayed for approximately 2 seconds, then the meter will return to the normal measurement mode.
- b) To change the current setpoint press the alarm key and hold it for more than 2 seconds until the farthest right hand digit is intensified. Then follow the procedure for entering a numerical value use the arrow keys.
- c) To acknowledge a latched alarm press the alarm key for less than 2 seconds whenever the alarm LED is lit. **NOTE:** The reset will occur depending on the type of latching alarm defined in the alarm menu.

### 2. Peak/Valley Display (Peak 1/2 Menu)

- a) To switch to the peak/valley display mode press the key defined for this function. The appropriate Alarm LED will light indicating that you are in the peak/valley display mode.
- b) To exit the peak/valley mode press the key again and the display will return to the normal measurement mode and the alarm LED will turn off.
- c) To reset the peak or valley when first entering the peak/valley mode; press the appropriate key and hold it in for greater than 2 seconds. The value will be reset and the Alarm LED will be lit.


**NOTE:** If a combination of key operation of one peak detector and one alarm is desired; then you must define KY 1 as the alarm (AL 1) and KY 2 as the PEAK function.


Whenever KY 1 is defined as the PEAK function then KY 2 will only offer a choice of either PEAK or tArE.

### 3. Tare/Auto-zero (Tare Menu)



- a) To zero the display press the key defined as the tArE key. Any display reading may be zeroed in this manner.
- b) To automatically take a tare (zero the display) at initial power-up; select the AUtO parameter in the Tare menu.
- c) To revert to the previously stored tare value on initial power-up select the StOr prompt in the Tare menu.
- d) When Tare is set for Ky 1 then Ky 2 is automatically set to the Gross/net function !!!
- e) When Tare is set for KY 2 then KY 1 may still be defined as the AL 1 or Peak function.

### 4. Gross/Net Display Modes (Ky 2 menu ONLY!)

- a) The net value is displayed when the AL 2 light is on.  
(The net value is the display value after the tare value has been subtracted)
- b) To switch to the Gross display mode press the  key and the display will change and the AL 2 LED will go off.  
(The Gross display is the reading before the Tare value has been subtracted.)

**NOTE:** The  key must be defined as the Tare key for this function to operate.

### 5. Printer Function (Print Output Menu)

- a) To transmit one print-out press the  key once whenever the Prn and KEY parameters were selected in Setup.
- b) To start/stop a continuous print-out press the  key when the Prn and KEY parameters were selected under Setup.
- c) To always have a continuous print-out select AUtO under the Print output menu.

## Special Options Menu

Most of the features in this menu are explained on the flow chart and are easy to understand. However, a few are a little more difficult and are explained in more detail below:

### 1. Linearization Type (LIn)

- a) With a normal linear signal applied set this parameter to **OFF**.  
 b) To select automatic square root extraction for use as a flow indicator with an orifice plate transducer select **rOOt** at the **LIn** prompt.

The meter will then use the following equation to derive the display reading:

$$\text{Display} = \sqrt{\text{Flow}} \otimes \sqrt{\text{rdHI}}$$

*Flow is defined first by entering the rdLO and rdHI prompts based upon data supplied by the transmitter manufacturer. The meter will then take the square root of the present flow input and then multiply this by the square root of the rdHI prompt which is the maximum flow rate.*

Since this method of calculation is being used to compensate for a non-linear flow rate the read-out responds differently than a normal linear reading. The following table gives five points on the curve to demonstrate this:

% of signal	% of Read-out
0.0	0.0
25.0	50.5
50.0	70.7
75.0	86.6
100.0	100.0

e.g. 0 to 30 mV represents 0 to 100.0 gallons per minute; the CAL menu is set for:

**VLO = 00.00**    **rdLO = 000.0**            **VHI = 30.00**    **rdHI = 100.0;**    **rOOt** is selected at the **LIn** prompt







Then the input versus the read-out would be:

Input mV	Display
0.0	0.0
7.5	50.5
15.0	70.7
22.5	86.6
30.0	100.0

## 2. Automatic Calibration (ACAL)



This function allows you to calibrate the unit to an applied signal. You may calibrate to a low signal (zero) and then at a later time calibrate to the high signal (span). Then at any time that you want to make this calibration effective you can activate it.

A good example of a practical application for this would be for level indication of a tank. When the tank is empty you could do the low (zero) calibration point. Then later in the day, or even later in the week, you can perform the high (span) calibration. This way you don't have to interfere with the normal process of filling and emptying the tank in order to calibrate the meter. You can perform the calibration at any convenient time in your normal process.

- a) Under the **CAL** menu enter the low calibration point (zero) at the **rdLO** prompt and the high calibration point at the **rdHI** prompt.
- b) Exit the Setup mode and reset power to the meter. It will now read the approximate engineering units based upon the data entered in the **CAL** menu. You may proceed with the actual calibration to the applied inputs at any time as described in the following steps.
- c) Under the **SPEC** menu go to the **ACAL** prompt and press the  key; the display will show **ACLO**.
- d) Press the  key again, the unit will go through a reset cycle, during which the display will light all segments and decimal points.
- e) The display will now show **CA 1** (Calculation 1) alternating with the input reading at this time. Make sure that the input applied is the input that you want to read-out as the value entered at the **rdLO** prompt; then press the  key.
- f) The unit will return to the normal measurement mode. If you are ready to also do the span at this time proceed immediately with the next step. As mentioned above the next step may be done at any convenient time.
- g) Enter the **ACAL** menu again but step to the **ACHI** prompt. Press the  key; the display will go through the reset function.
- h) The display will show **CA 2** (Calculation 2) alternating with the input reading. Make sure that the input applied is the input that you want to read-out as the value entered at the **rdHI** prompt; then press the  key.
- i) The unit will then return to the normal measurement mode. If you want to activate these calculations then enter the **ACAL** menu one more time. At the **CALC** prompt press the  key. The meter will activate the calculations and go through the reset procedure one last time. The unit is now calibrated exactly to your process signals.

## 3. Factory Defaults (dEF)











At times it may be desirable to reset all of the programming in the unit and start over again. For example, if the unit isn't performing as expected and you have lost track of what menus you have been changing. There is a simple one step procedure to accomplish this.

- a) Enter the **SPEC** menu and step down to the **dEF** prompt. Press the  key; the display will show **SEt**.
- b) Press the  key again; the display will go through the reset which lights all segments and decimal points. The unit will now be set for factory defaults.

## Miscellaneous Functions (Zero & Span trimming; Analog Out; Passwords)

### 1. Zero & Span Trimming (ZEro & SPAn)
















This function is the digital equivalent of the zero and full scale potentiometers on a discrete component panel meter. It is to be used for fine tuning the display if it isn't reading the exact numbers that you desired after your programming is completed. It is only recommended to use this if your calibration is within +/- 100 counts of your desired reading. If you are off by more than this it is most likely that there is something wrong with the signal or there is a programming error. In this case consult the factory.

- a) To adjust the unit to display zero press the  key at the ZErO prompt; the display will show the present input reading with the farthest right hand digit intensified. Use the  key to adjust the display to read zero or your lowest desired reading. NOTE: You must continuously press and release the key to cause the display to change. Use the  key to change the up & down direction of the  key. Once you are satisfied with the display reading; press and hold the  key for more than 2 seconds. The meter will store the changes and return to the normal measurement mode.
- b) To adjust the unit to display the desired high display reading press the  key at the SPAn prompt; the display will show the present input reading with the farthest right hand digit intensified. Use the  key to adjust the display to read the desired value. NOTE: You must continuously press and release the key to cause the display to change. Use the  key to change the up & down direction of the  key. Once you are satisfied with the display reading; press and hold the  key for more than 2 seconds. The meter will store the changes and return to the normal measurement mode.

## 2. Analog Output (AnOU)

The flow chart explains the choices for the AnOU menu. Below is an example of programming the analog output.



e.g. It is desired to have a 4 to 20 mA output at display values of 0 to 5000 and to track the normal display reading.

1. At the AnOU prompt press the  key; the display will show rnG.
2. Press the  key again, the display will show 0-20 or some previously programmed value.
3. Press the  key to scroll until 4-20 appears on the display; press the  key to save this.
4. The display will show rnG. Press the  key once to step to the StLO prompt; press the  key.
5. The display will show 0000 with the right hand zero intensified (or some previously stored value); if it isn't 0000 use the  key to change the numbers to zero and use the  key to scroll across the display and save the value.
6. When done the display will show StLO again. Press the  key once to step to the StHI prompt; press the  key.
7. The display will show 9999 with the right hand nine intensified; change this to 5000 using the arrow keys. Remember when you are at the left hand digit you must press the  key when the proper number is displayed and the unit will save this and exit to the StHI prompt.
8. Press the  key once to step to the SOUr prompt; press the  key to enter and verify that this is set to rEAd.
9. After the source for the analog output has been defined; the analog output setup is complete. Press the  key once to step to the End prompt and then press the  key to exit.

## 3. Password (PASS)

The password menu controls access to either all of the menu or just limit access to some of the functions. Once a password has been entered the unit will ask for the password whenever the protected function is operated.

e.g. If a password is entered at the FULL prompt; then:

1. When both of the keys are pressed simultaneously to enter setup the unit will display the prompt PASS; press the  key.
2. The display will show 0000 with the right hand zero intensified; enter the passcode using the arrow keys in the usual manner. When the left hand digit is intensified and is ready; press the  key again. The unit will now proceed with the desired operation as normal.

# D3600 Series Specifications

## Common Specifications

Environmental	
Warm up time	1 min.; except T/C 5 min.
Operating temperature	-10 to +60°C
Storage temperature	-40 to +85°C
Humidity	0 to 90% non-condensing
Mechanical	
Front protection	IP65/NEMA 4
Dimensions	3/64 DIN; 24 x 72 x 125 mm (0.94" x 2.83" x 4.92")
Case Material	polycarbonate UL94V.2
Unit Weight	0.4 Pound (200 g)
Shipping Weight	1 Pound
Conversion	
All Models	
Measuring system	Continuous integration charge balancing converter
Internal resolution	1 part over 200,000
Conversion time	settable at 200, 400, 800 msec. (D3620 & D3640); fixed at 400 msec. on the model D3630
Response time for a step change	1.0 sec. to rated accuracy
Digital filter	walking window mean value; select: slow, normal, or fast
N.M.R.R.	60 dB @ 50 and 60 Hz (without digital filter)
C.M.R.R.	>135 dB from input to supply
AC Supply Voltage	
90-264 ACV @ 47-70Hz	
Power consumption	4 VA
Isolation	>2500 Vrms
Relay Outputs	
Normally Open; 250 VAC @ 5 A / 24 VDC @ 1 A	

## Input Specifications/ Misc.

Volt input	
D3620	
Zero Drift	±20 ppm/°C of F.S.
Span Drift	±50 ppm/°C of range
Input Impedance	>1 Mohm
Input Current	<10 nA
Current input	
D3620	
Zero Drift	±40 ppm/°C of F.S.
Span Drift	±70 ppm/°C of range
Input resistance	< 20 ohm
T/C input	
D3630	
Zero Drift	±(1μV/°C + 20 ppm/°C of F.S.)
Span Drift	±50 ppm/°C of range
Cold junction comp. error	<0.02°C/°C
Input Impedance	>1000 Mohm
Burn out current	500 nA ( software enable/disable)
RTD input	
D3630	
Zero Drift	±0.01°C/°C
Span Drift	±50 ppm/°C of range
Input Impedance	>1000 Mohm
RTD excitation current	500 μA
Max. line resistance	10 ohm with 3 wire connection
Millivolt input	
D3640	
Zero Drift	±(1μV/°C + 20 ppm/°C of F.S.)
Span Drift	±50 ppm/°C of range
Input Impedance	>1000 Mohm
Input Current	<10 nA

## Input Ranges/Accuracy

D3620	measuring range	resolution	accuracy / F.S.
voltage	0 - 10 VDC	0.01%	±0.06%
	1 - 5 VDC	0.02%	±0.06%
	±1.000 V f.s.	0.01%	±0.06%
	±10.50 V f.s.	0.01%	±0.06%
current	4 - 20 mA	0.01%	±0.08%
	0 - 20 mA	0.01%	±0.08%
	±1.00 mA	0.01%	±0.08%
	±22.00 mA f.s.	0.01%	±0.08%
D3630	measuring range	resolution	accuracy / F.S.
T/C J	-200 to +750°C (-328 to 1382°F)	0.1°C	±0.7°C
T/C K	-200 to +1300°C (-328 to 2372°F)	0.1°C	±0.8°C
T/C T	-200 to +400°C (-238 to 752°F)	0.1°C	±0.5°C
T/C R	-50 to +1750°C (-58 to 3182°F)	1°C	±2°C
T/C S	-50 to +1750°C (-58 to 3182°F)	1°C	±2°C
RTD Pt100 DIN 43760	-200 to +850°C (-199 to 1562°F)	0.1°C	±0.7°C
RTD Ni100 DIN 43760	-60 to +130°C (-76 to 356°F)	0.1°C	±0.7°C
D3640	measuring range	resolution	accuracy / F.S.
voltage	±30.0 mV f.s.	0.01%	±0.06%
	±120.0 mV f.s.	0.01%	±0.06%

## Output Specifications/Accuracy

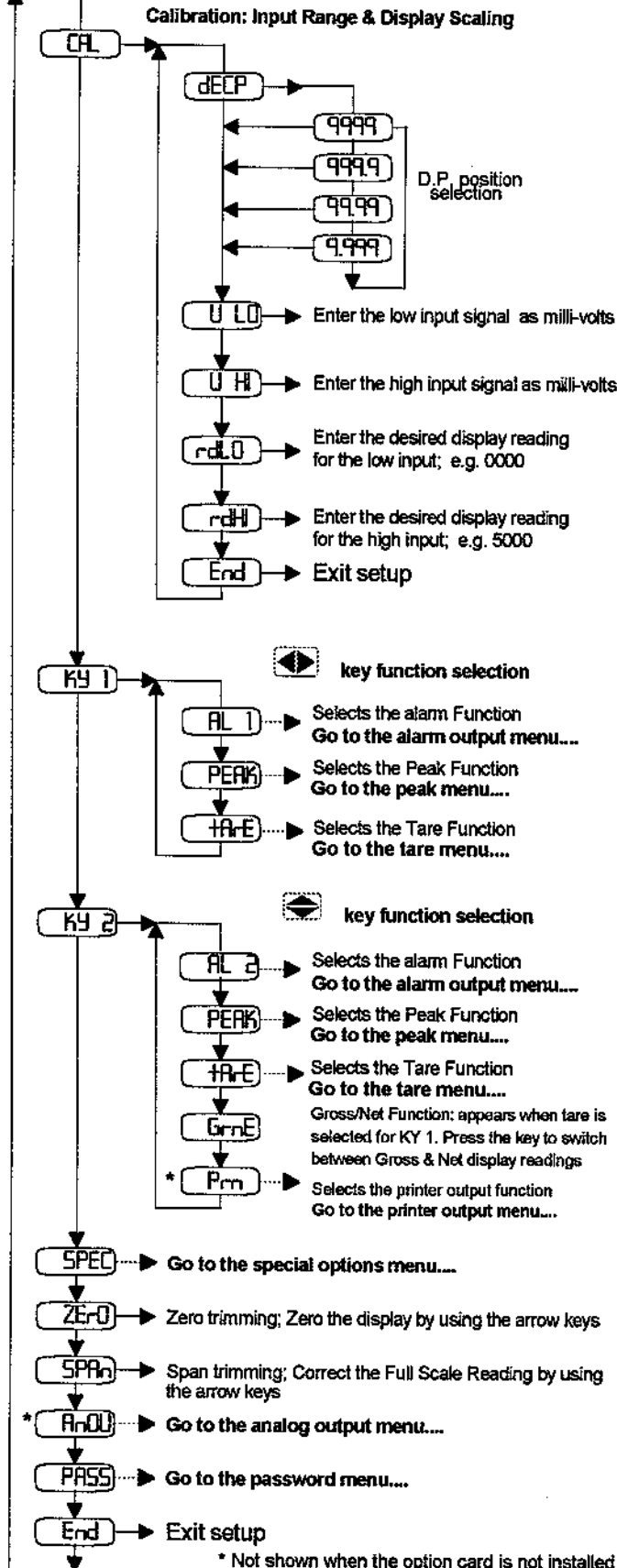
Analog output - Option H	
Current source	0-20 or 4-20 mA
Load resistance	0 to 550 ohm
Voltage	
0 to 10 VDC	
Output impedance	10 ohm
Accuracy: Voltage & Current	±0.1 % of Full Scale
Isolation: Voltage & Current	500 Vrms
RS232 serial output; Option I	
Connection type	Output only
Voltage level	V.24 compatible
Baud rate	300, 600, 1200, 2400, 4800, 9600
Isolation	200 Vrms

## Excitation output supply specifications

Excitation supplies	
D3620	24 VDC ±5% @ 30 mA max.; short circuit protected
D3640	10 VDC ± 0.1% @ 30 mA max.; short circuit protected

# MAIN AND INPUT MENU

Entering setup menu



# MODEL D3640

## Helpful Hints/ Flow chart Symbols

The and the on the flow chart represent the key on the front of the meter.

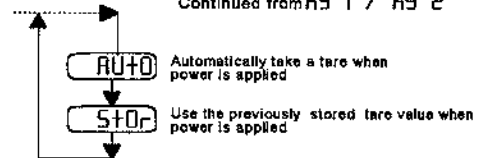
The or on the flow chart represents the key on the front of the meter.

The on the flow chart tells you to go to the one of the sub-menu flow charts.

e.g. Under the KY 1 menu you press the key at the AL 1 prompt to select the alarm function. The dashed arrow then designates that you need to go to the Alarm 1/2 flowchart.

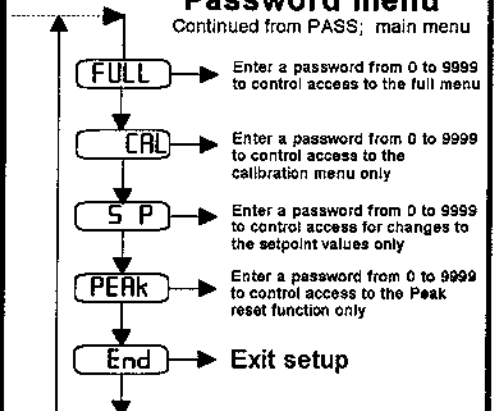
## Tare menu

Continued from KY 1 / KY 2



## Password menu

Continued from PASS; main menu

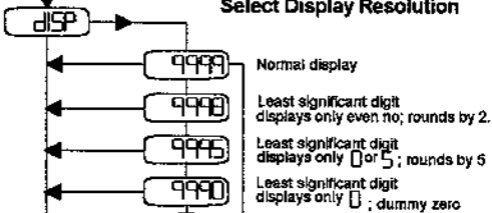




# Special options menu

Continued from the SPEC prompt in the main menu

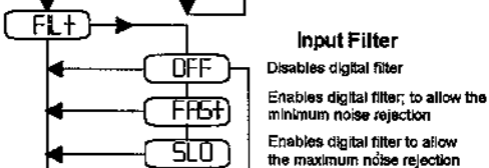
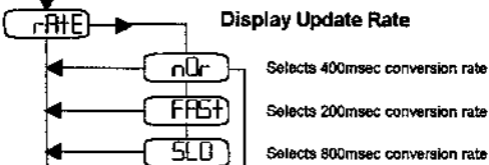
## Select Display Resolution



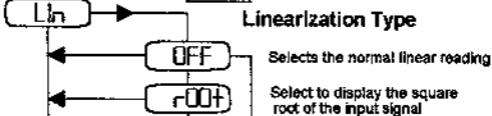
**OVer** → Sets an over-range value which causes the display to flash if the reading exceeds this value

**Undr** → Sets an under-range value which causes the display to flash if the reading is below this value

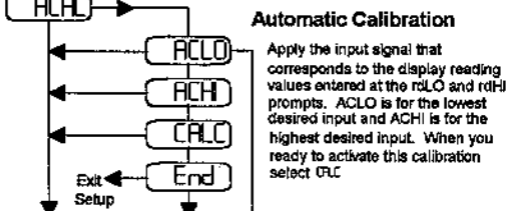
## Display Update Rate



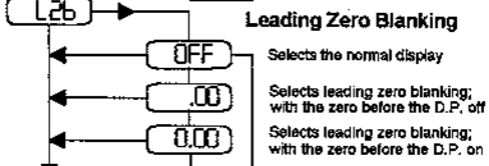
## Linearization Type



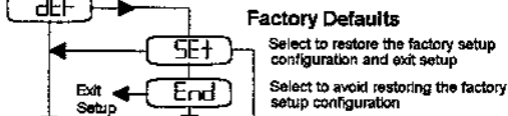
## Automatic Calibration



## Leading Zero Blanking



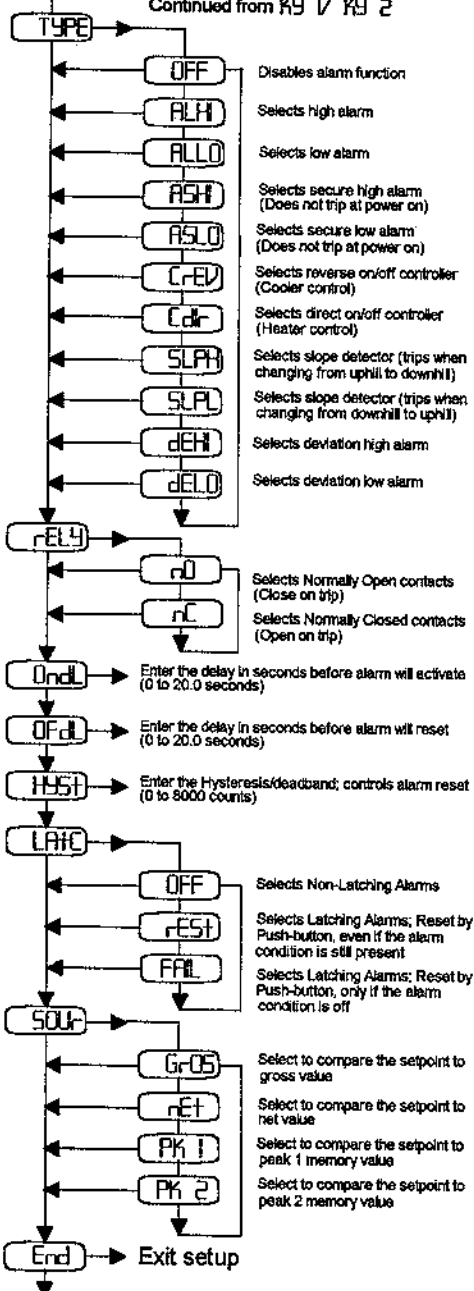
## Factory Defaults



**End** → Exit setup

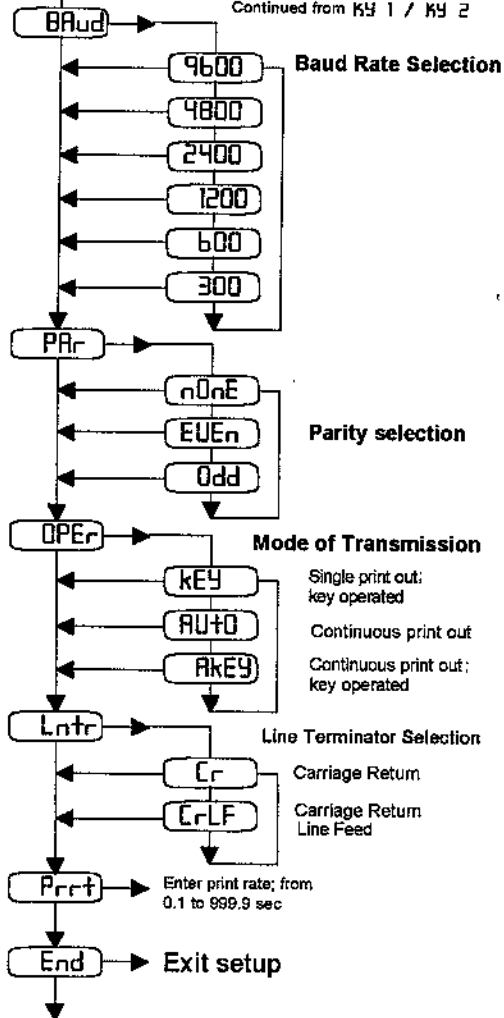
## Alarm 1 / 2 menu

Continued from KY 1 / KY 2



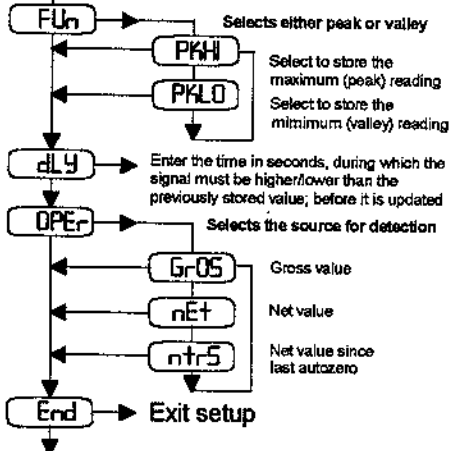
## Print output menu

Continued from KY 1 / KY 2



## Peak 1 / 2 menu

Continued from KY 1 / KY 2



## Analog Output menu

Continued from ANOU; main menu

