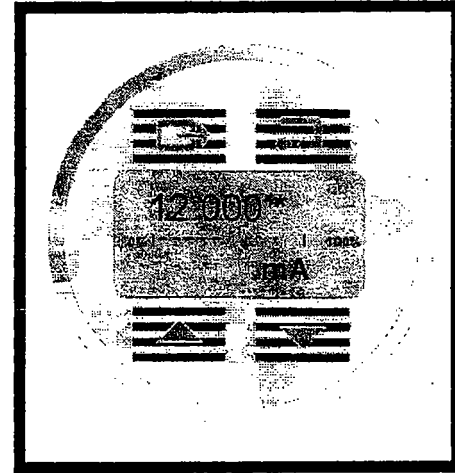


Transmitters
Accessory CoMeter (Communicating Meter)



PN24981A

WARNING notices as used in this manual apply to hazards or unsafe practices which could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices which could result in property damage.

NOTES highlight procedures and contain information which assist the operator in understanding the information contained in this manual.

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WARNING
POSSIBLE PROCESS UPSETS

Maintenance must be performed only by qualified personnel and only after securing equipment controlled by this product. Adjusting or removing this product while it is in the system may upset the process being controlled. Some process upsets may cause injury or damage.

NOTICE

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READ FIRST

WARNING

INSTRUCTION MANUALS

Do not install, maintain, or operate this equipment without reading, understanding and following the proper ABB Automation instructions and manuals, otherwise injury or damage may result.

RETURN OF EQUIPMENT

All Flowmeters and/or Signal Converters being returned to ABB Automation for repair must be free of any hazardous materials (acids, alkalis, solvents, etc). A Material Safety Data Sheet (MSDS) for all process liquids must accompany returned equipment. Contact ABB Automation for authorization prior to returning equipment.

Read these instructions before starting installation; save these instructions for future reference.

Contacting ABB Automation Inc.

Should assistance be required with any ABB Instrumentation product, contact the following:

Telephone:

ABB Instrumentation Technical Support Center
1 (800) 697-9619

E-Mail:

ins.techsupport@us.abb.com

1.0 COMETER - LCD INDICATOR WITH HART PROGRAMMING CAPABILITY





The name **CoMeter** is an acronym for **COMMUNICATING METER**.

It can be connected, plug & play, into the standard terminal block of the 600T & 600T EN Series Pressure Transmitter as well as V10 & V11 Series Temperature Transmitter.

It is capable of providing both reading and configuration operations. When used in connection with the analog-only version, it functions only as a programmable meter. The LCD display has three lines; the first one is used for 5 numeric characters, up to 99999, plus a minus (-) sign on the left and a star (*) sign, up on the right, to indicate HART communication is in progress; the second line is a 10 segment bargraph used to show the output, from 0% to 100% in 10% steps; the third line is used for seven alphanumeric

characters to display units or messages.

In addition to the display, the plastic membrane has 4 push buttons used for programming and for menus navigation. And more precisely, they are:

top left position:	ESCAPE key	
top right position:	ENTER key	
bottom left position:	NEXT key	
bottom right position:	PREVIOUS key	

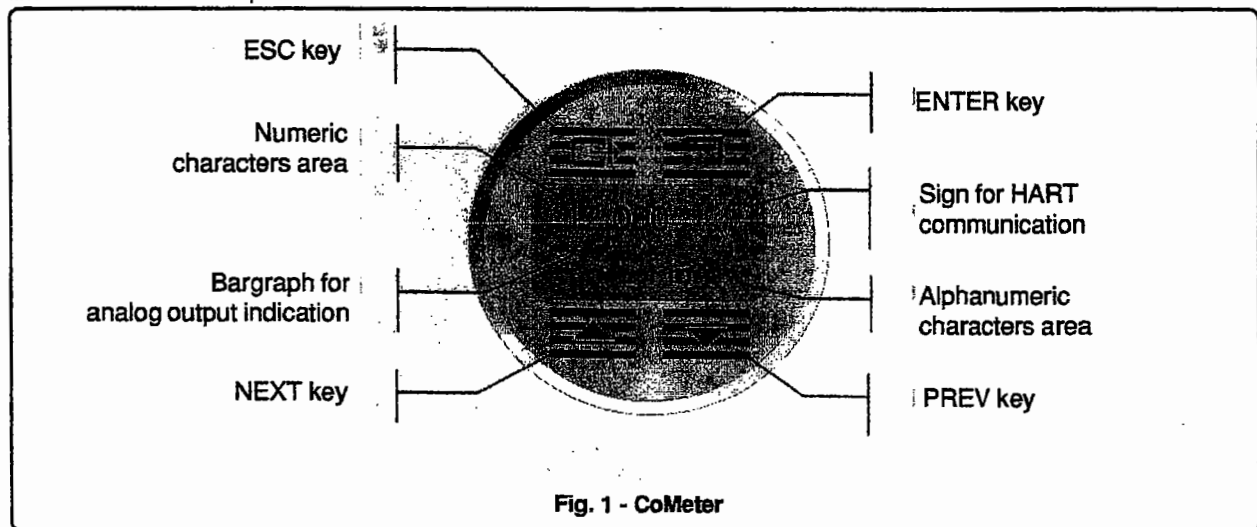


Fig. 1 - CoMeter

***** **NOTE:** the installation and usage of the CoMeter on a 600T Series Pressure Transmitter, not Enhanced, requires the terminal block upgrade or substitution.

The normal operating condition for the CoMeter is to display the analog output signal of the transmitter, expressed in milliamps (this is the default setting), in percentage or in engineering units, with all the units available as for the HART Communication Protocol.

In addition to the indicator function, the CoMeter can be used as a configuration tool, where both the CoMeter itself and the transmitter can be configured.

In fact, there are two main menus : **ConF METER**" and **"ConF XMTR"**.

ACCESS TO CONFIGURATION

To enter these menus, the keys **PREV** and **NEXT** must be pressed simultaneously for 3 seconds, then the user can switch between the XMTR and the METER configuration using the **NEXT** and the **PREV** key.

***** **NOTE:** when the Configuration action is finished, remember to press the **ESC** key to return to display the previous selected value.

ConF METER - METER CONFIGURATION

PASSWORD

The access to the configuration menus can be protected by a 5 digit numeric password.

The password can be defined and enabled under the **ConF METER** menu.

See figure 2 for the access to the **"ConF PASSWORD"** menu. Once you have entered the **"ConF PASSWORD"** menu the cursor flashes on the most significant digit.

Press **ENTER**, if you want to change the digit, initially set to zero (0).

Use the **NEXT** and **PREV** key to increase or decrease the value of the single digit, use the **ENTER** key to move the cursor to the next digit, use the **ESC** key to move back to the previous digit.

When the string **"UPDATE?"** appears on the display, use the **ENTER** key to accept the new password or the **ESC** key to abort the password definition.

When all digits are set to zero, the password is disabled.

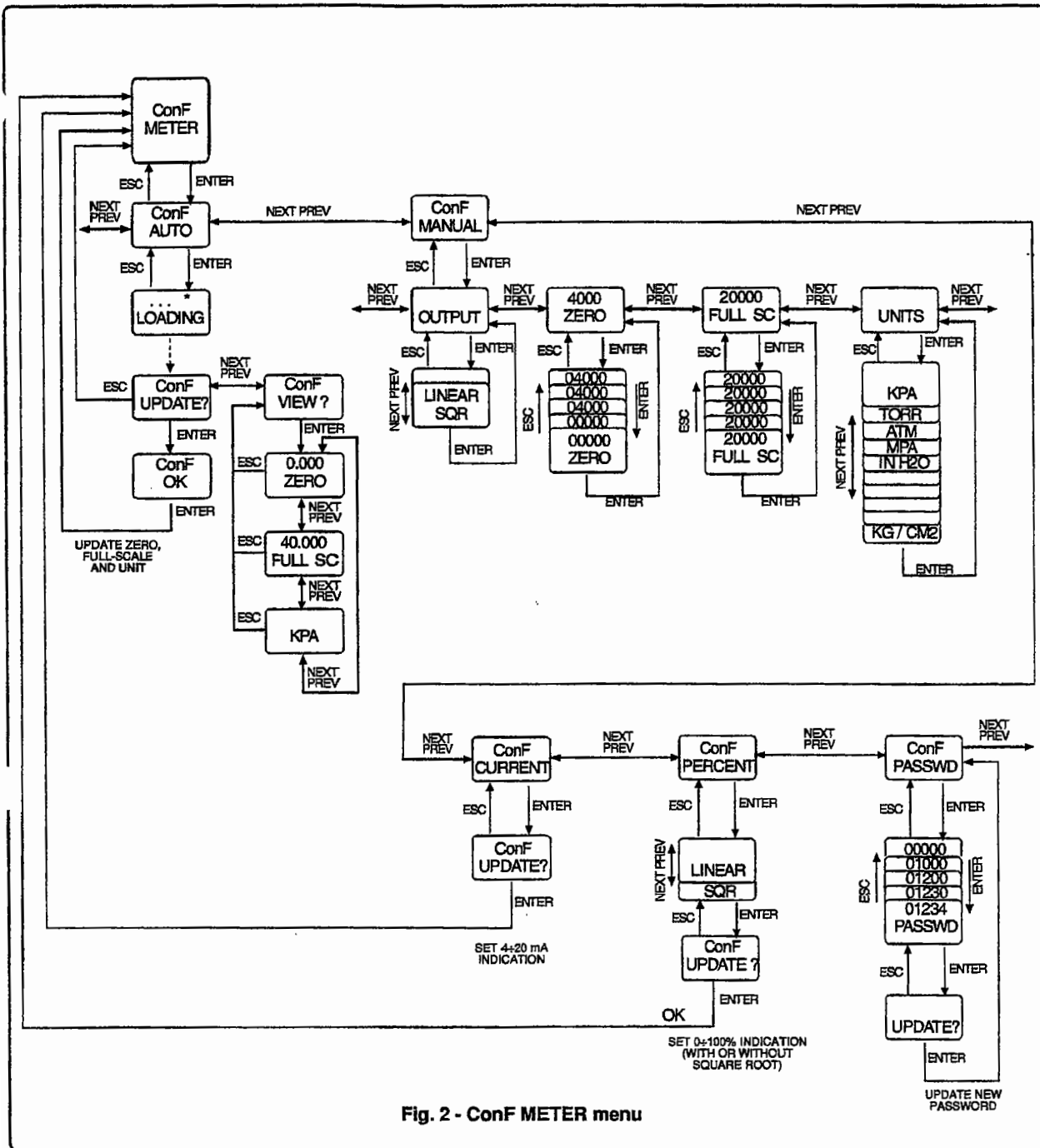


Fig. 2 - ConF METER menu

The other options under ConF METER menu are:

ConF AUTO

By selecting this option, the CoMeter is automatically updated with the LRV, URV and Unit of the HART transmitter connected. Before accepting the transmitter configuration by pressing ENTER at the request "ConF UPDATE?", it is possible to view the LRV (ZERO), the URV (FULL SC) and the UNIT.

If the output transfer function of the transmitter is not linear, the CoMeter shows the message: **ConF NO_LIN** and the user cannot update the configuration.

It is necessary to change the output transfer function of the transmitter to linear.

See Fig. 2- "ConF METER" menu, for ConF AUTO procedure.

ConF MANUAL

The selection of MANUAL configuration allows the user to manually define the CoMeter configuration, i.e. define the LRV (ZERO), the URV (FULL SC), and the UNIT, as well as to decide for a LINEAR on SQR output function. LRV and URV can have a value between -99999 and +99999. Refer to Fig. 2- ConF METER menu for the detailed procedure. To have the CoMeter display the analog output current or the output percentage, select respectively:

ConF CURRENT or ConF PERCENT

Under **ConF PERCENT** option, the user can select linear or SQR output. When SQR output is selected, the output is linear from 0 to 20% (to 4% of input). Refer to Fig. 2 - ConF METER for details on the procedures.

Then the **CONF** option appears.

Using **PREV** or **NEXT** key, the user can select **CONF**, **TRIM**, **REVIEW** or **PV** option, and with the **ENTER** key he moves into the menu.

When entering **CONF** and **TRIM** menu a message "**LOOP IN_MAN**" appears to remind that a modification can change the transmitter output, so for security the loop should be put in Manual.

ConF XMTR - TRANSMITTER CONFIGURATION

There are four selections available under the ConF XMTR menu:

CONF, **TRIM**, **REVIEW** and **PV** (Refer to Figure 3 below).

By pressing **ENTER** on the ConF XMTR menu, the string **LOADING** appears on the display, with the blinking star (*) indicating communication activity, i.e. the CoMeter is reading the transmitter information.

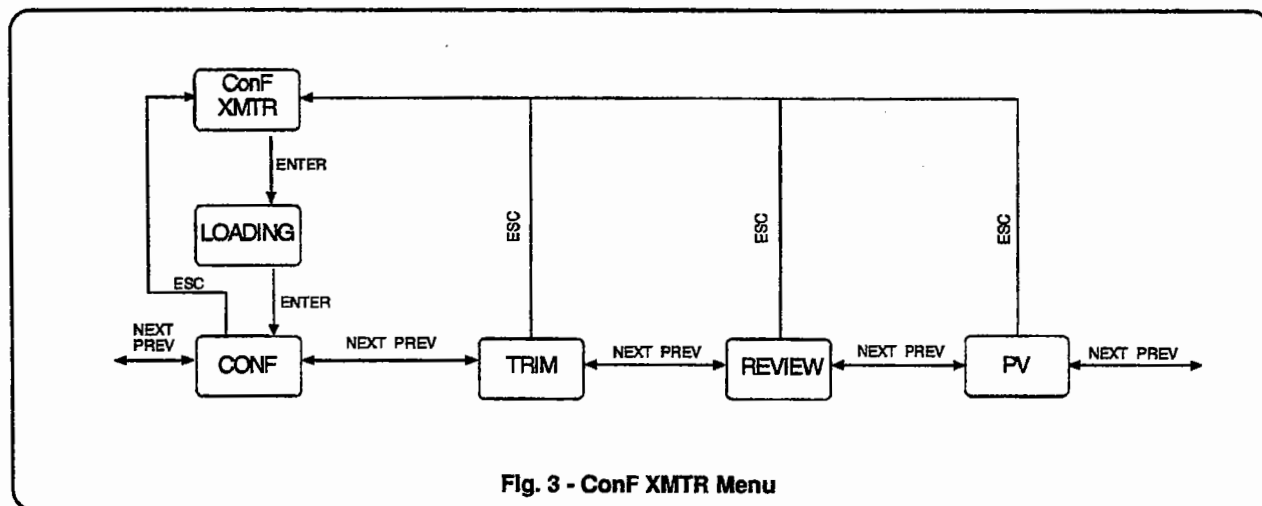


Fig. 3 - ConF XMTR Menu

See below a list of the available operation under the selected option:

CONF menu

Change LRV
Change URV
Change DAMPING
Change UNITS
Change SENSOR
UP/DOWN

TRIM menu

Reranging (RERANG.)
Loop test (LOOPST)
Output trim (OUTTRIM)
Lead Resistance (LEAD_R)

REVIEW menu

TAG
Final Assembly Nr. (XMTR N.)
Sensor Serial Nr. (SENSOR)
Up/Down scale (UP/DOWN)
UNITS
LRV
URV
LRL (See Sensor Units)
URL (See Sensor Units)
DAMPING
Under Range (UNDER_R)
Over Range (OVER_R)
Default Value (DEF_VAL)

PV menu

Primary variable (PRIMARY)
Secondary variable (2ND)
Tertiary variable (3RD)
Fourth variable (4TH)

Use PREV or NEXT key to scroll through the options and ENTER key to change or view the values. The procedure for changing the numeric value already been described in PASSWORD operation, i.e., the cursor flashes on the most significant digit. Use the NEXT and PREV keys to increase or decrease the value of the single digit; the minus sign (-) automatically appears or disappears when the value increases above 9 or decreases below 0, as well as for the decimal point(.). Use the ENTER key to move the cursor to the next digit, use the ESC key to move back to the previous digit.

An ENTER on the last digit will cause the value to be sent to the transmitter. Refer to figures 4, 5, 6 & 7 for menu breakdown and details.

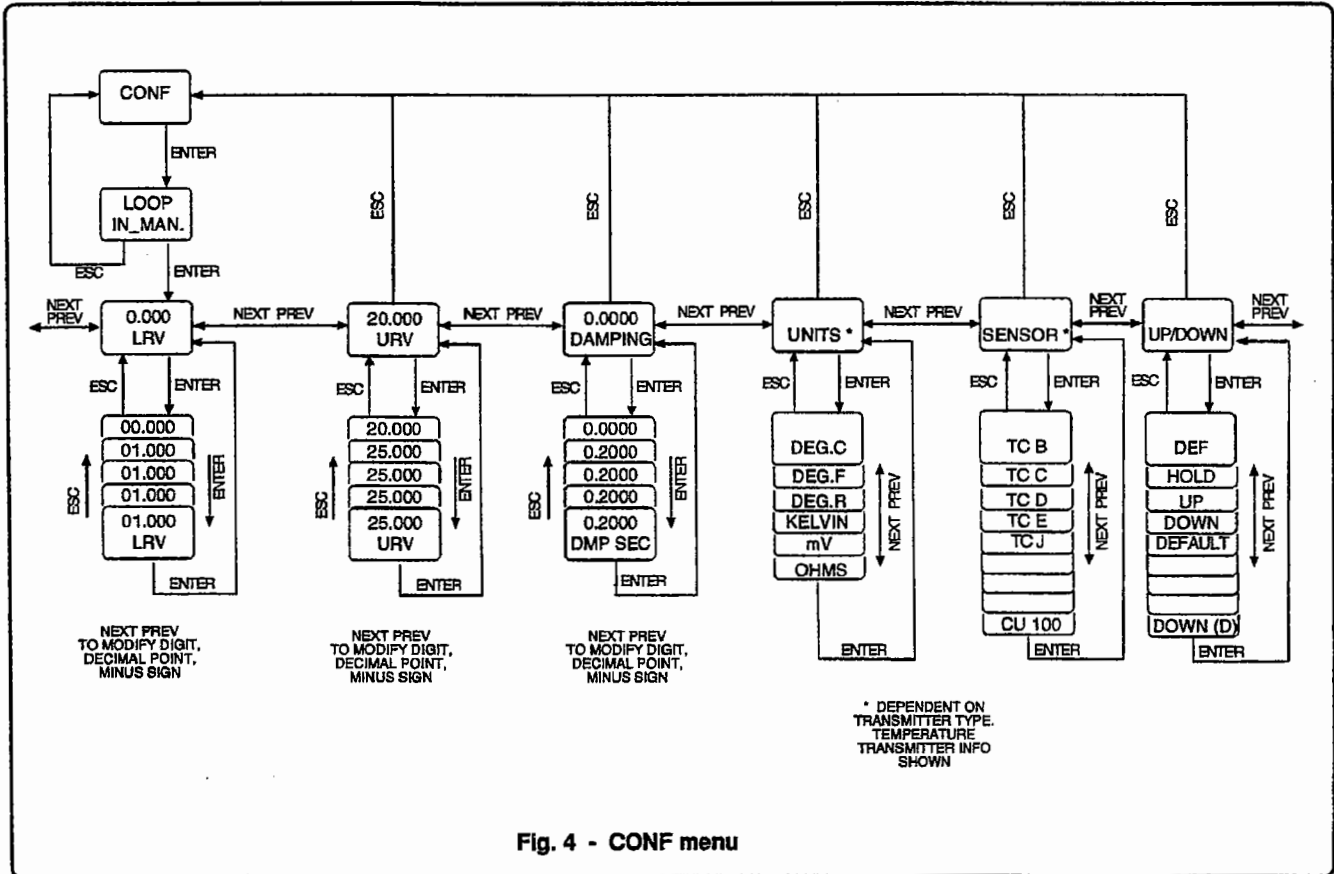


Fig. 4 - CONF menu

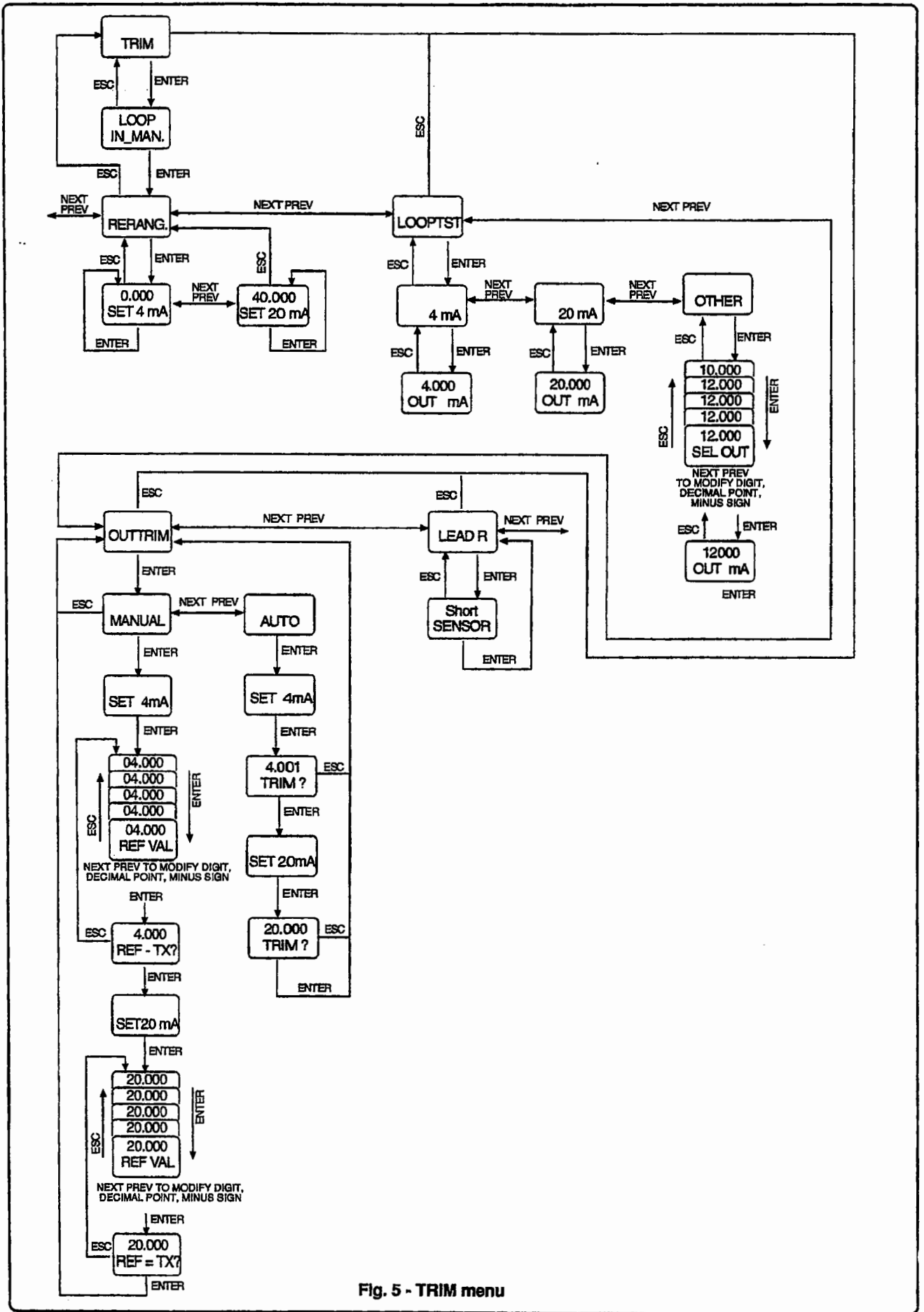


Fig. 5 - TRIM menu

COMETER - LCD INDICATOR WITH HART PROGRAMMING CAPABILITY

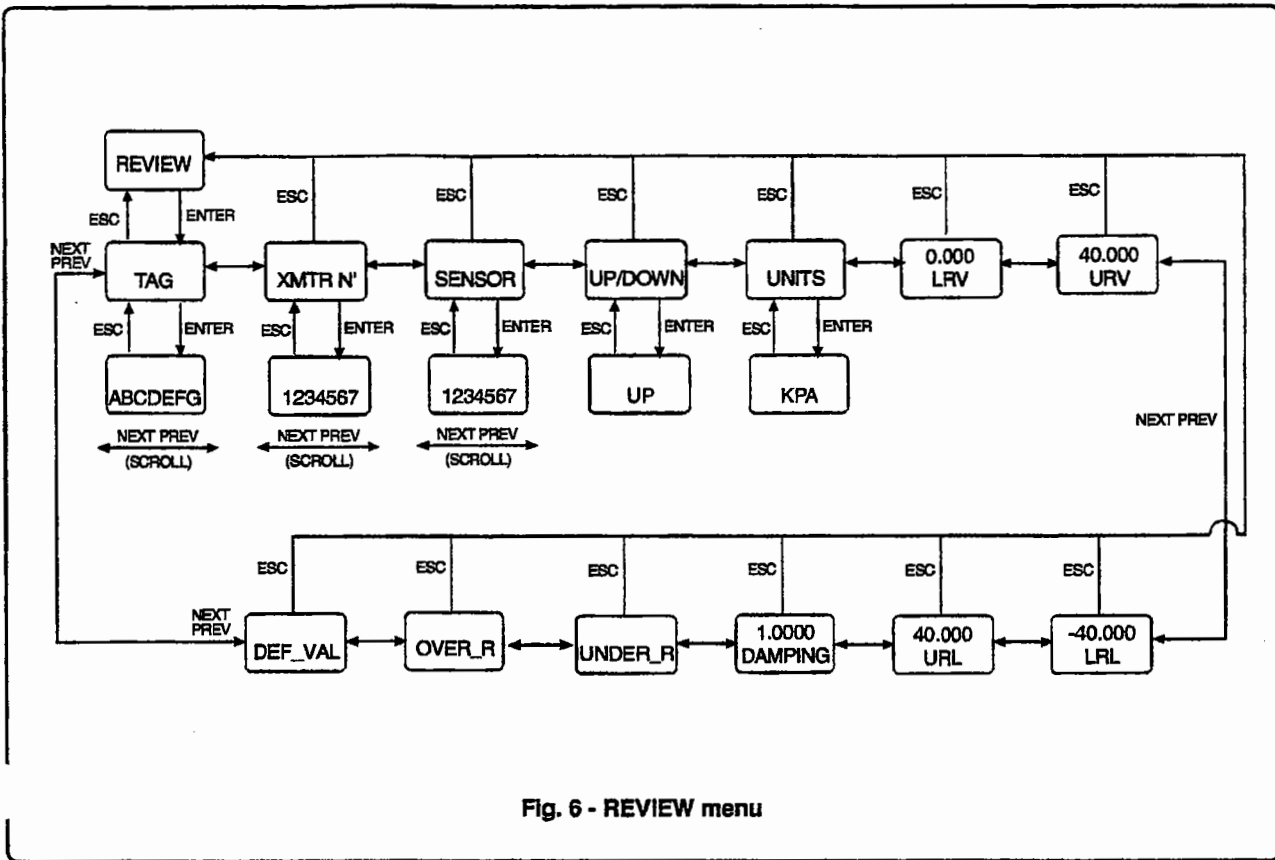


Fig. 6 - REVIEW menu

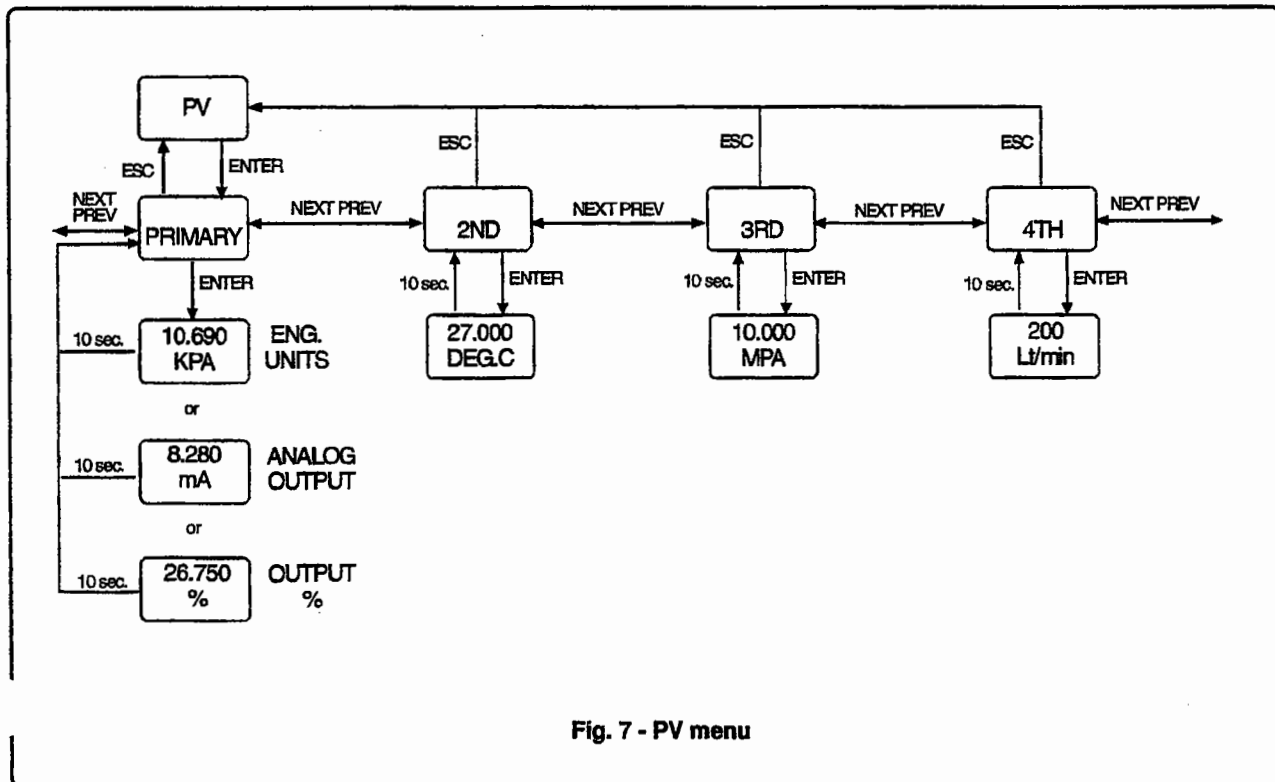


Fig. 7 - PV menu

2.0 COMETER SPECIFICATIONS

FUNCTIONAL SPECIFICATIONS

Input range: 4 to 20 mA nominal

Operating range: 3.6 to 22 mA (ensuring HART functionality)

Maximum overload (for 2 minutes)
110 mA (23 mA indication)
A current less than 3.4 mA will blank the display

Voltage drop

- less than 2.6 V dc @ full scale and 20°C
- 2.8 Vdc @ max temperature (including HART modulation)

Meter/indication range

- 5-digit (+ 99999 counts) with 7.6 mm. high (3 in), 7-segment numeric characters plus sign and digital point
- 10-segment bargraph display (10% per segment)
- 7-digit with 6 mm high (0.23 in), 14-segment alphanumeric characters.

Keypad

four tactile membrane keys for programming and menu configuration

Temperature limits °C (°F)

- Ambient (operating temperature)
-20 to +70 (-4 to +158)
Lower limit can be down to -40 (40) keeping loop integrity and without meter damage (the display will be blank)
- Storage
-30 to +85 (-22 to +185)

Relative humidity

- Reference: 60% ± 25%
- Operative, transportation and storage limits :
0 and 100% condensing permissible

Electromagnetic compatibility (EMC)

Comply with EN50081-2 for emission and EN50082-2 for immunity requirements and tests; CE marking.

Update time

0.7 second

Resolution

+ 0.025% (12-bit conversion = 1/4000)

PERFORMANCE SPECIFICATIONS

Stated at ambient temperature of 23°C + 3 (75°F + 5), relative humidity of 50% + 20% and atmospheric pressure

Ambient temperature effect

Total reading error per 20K (36°F) change between the ambient limits of -20 and +70°C (-4 and +158OF).
+ 0.15% of max span (16 mA).

Indication accuracy

- digital+0.10% of max span(16 mA) +1 digit
- analog (bargraph) : 10%

PHYSICAL SPECIFICATIONS

Materials

Housing

Plastic enclosure with two miniature plugs for connection into 600T EN transmitter jacks.

Environmental protection

Hazardous atmospheres

INTRINSIC SAFETY

- ATEX/CESI Approval; Certificate n. 99 ATEX076U to 94/09/EC Group 2 category 1 Gas

FACTORY MUTUAL

- Nonincendive : Class I, Div. 2, Group A,B,C,D
- Intrinsically safe: Class I, II,III Div. 1, Group A,B,C,D

Electrical Connections/Mounting

Suitable for plugging into 600T EN terminal block; rotation in 15° step allows proper viewing when installed into the transmitter.

PN24981A



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ADDENDUM FOR COMETER - ANALOG LCD INDICATOR WITH HART PROGRAMMING CAPABILITY AND PROMETER - PROGRAMMABLE INDICATOR

The name **CoMeter** is an acronym for **COMMUNICATING METER**. The name **ProMeter** stands for **PROGRAMMABLE METER**.

It can be connected, plug & play, into the standard terminal block of the 600T EN Series Pressure Transmitter.

It is capable to provide both reading and configuration operations, when used in connection with the analog-only version, the ProMeter is only an indicator. The LCD display has three lines; the first one is used for 5 numeric characters, up to 99999, plus a minus (-) sign on the left and a star (*) sign, up on the right, to indicate HART communication is in progress (Hart Communication is not for ProMeter); the second line is a 10 segments bargraph used to show the output, from 0% to 100% in 10% steps;

the third line is used for seven alphanumeric characters to display units or messages.

In addition to the display the plastic membrane has 4 push buttons used for programming and for menus navigation.

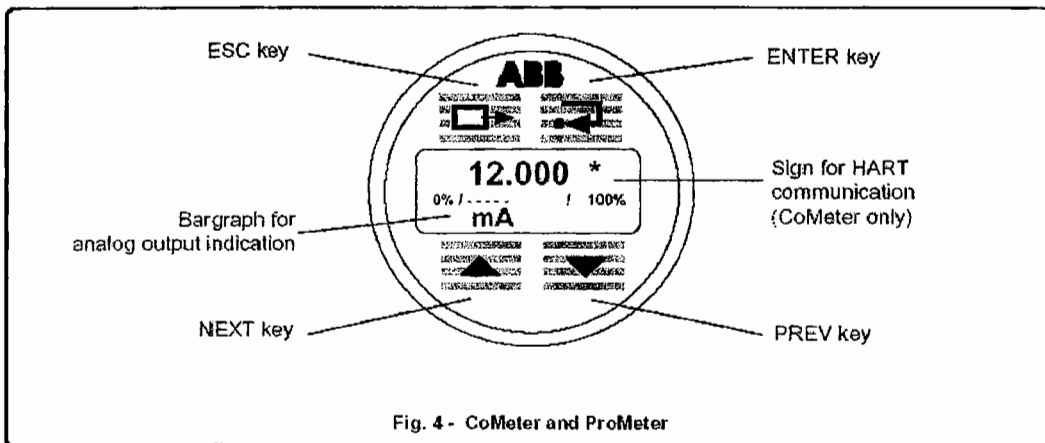
And more precisely, they are:

top left position: **ESCAPE** key

top right position: **ENTER** key

bottom left position: **NEXT** key

bottom right position: **PREVIOUS** key



*** NOTE:** the installation and usage of the two indicators CoMeter and ProMeter on a 600T Series Pressure Transmitter, not Enhanced, requires the terminal block upgrade or substitution.

The normal operating condition for CoMeter and ProMeter is to display the analog output signal of the transmitter, expressed in milliAmpere (this is the default setting), or in percentage or in engineering unit, with all the units available as for the HART Communication Protocol.

In addition to the indicator functionality, the CoMeter can be used as a configuration tool, where both the CoMeter itself and the transmitter can be configured. ProMeter is programmable only. In the CoMeter, in fact, two are the main menu : **ConF METER**" and **"ConF XMTR"**.

ACCESS TO CONFIGURATION

To enter these menu, in both indicators, the keys **PREV** and **NEXT** must be pressed simultaneously for 3 seconds, then the user can switch between the XMTR and the METER configuration using the **NEXT** and the **PREV** key. In the ProMeter entry is directly in Manual Configuration, as shown in the next page.

*** NOTE:** when the Configuration action is finished, remember to press the **ESC** key to return to display the previous selected value.

ConF METER - METER CONFIGURATION

PASSWORD

The access to the configuration menus can be protected by a 5 digits numeric password.

It is under the ConF METER menu that the password can be defined and enabled.

See figure 5 for the access to the **"ConF PASSWORD"** menu. Once you have entered the **"ConF PASSWORD"** menu the cursor is blinking on the most significant digit.

Press **ENTER**, if you want to change the digits, initially set to zero (0).

Use the **NEXT** and **PREV** key to increase or decrease the value of the single digit, use the **ENTER** key to move the cursor to the next digit, use the **ESC** key to move back to the previous digit.

When the string **"UPDATE?"** appears on the display you can use the **ENTER** key to accept the new password or the **ESC** key to abort the password definition.

When all digits are set to zero, the password is disabled.

ADDENDUM FOR COMETER - ANALOG LCD INDICATOR WITH HART PROGRAMMING CAPABILITY AND PROMETER - PROGRAMMABLE INDICATOR

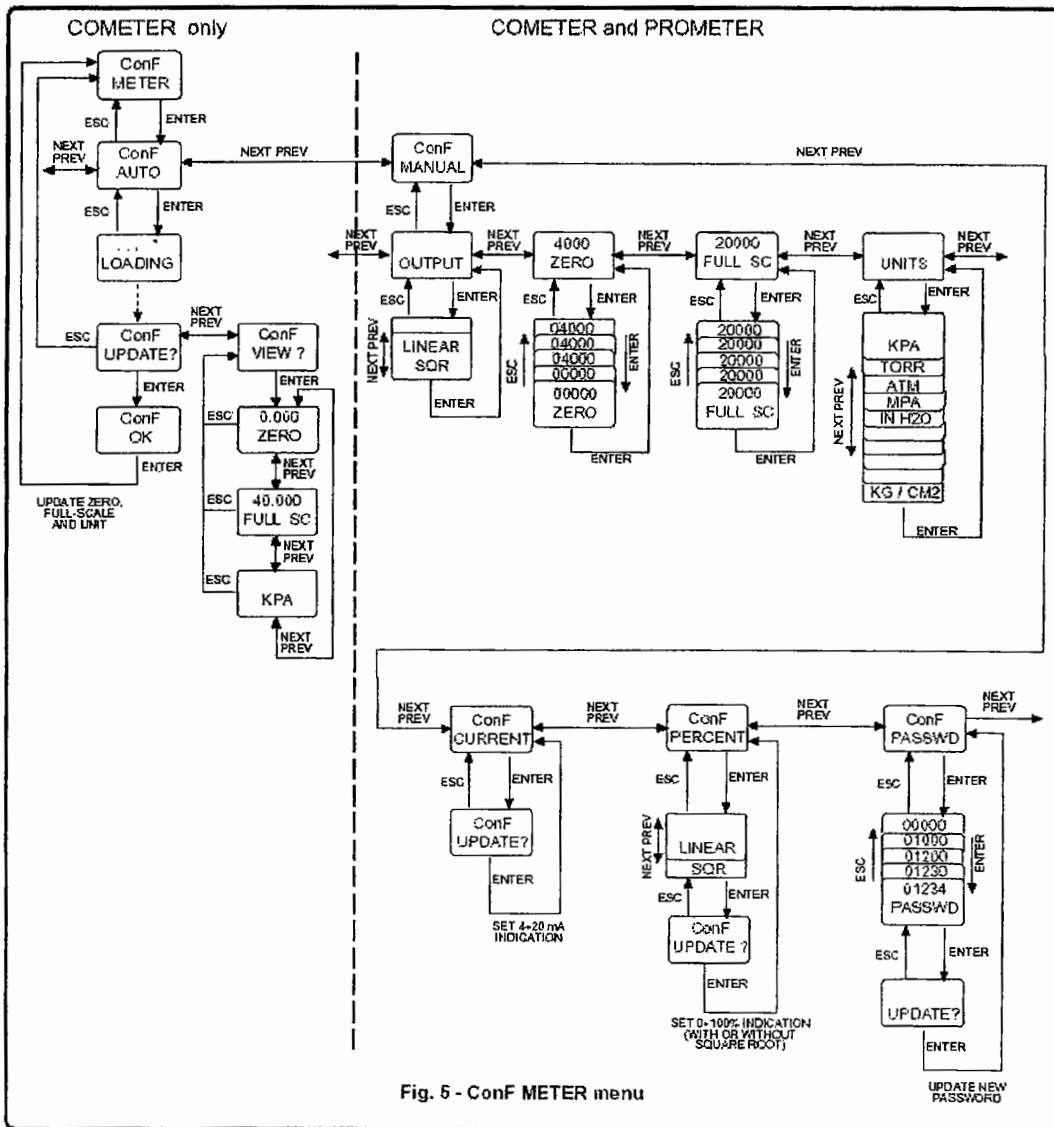


Fig. 5 - ConF METER menu

The other options under ConF METER menu are:

ConF AUTO

By selecting this option, the CoMeter is automatically updated with the LRV, URV and Unit of the HART transmitter connected. Before accepting the transmitter configuration by pressing ENTER at the request "ConF UPDATE?", it is possible to view the LRV (ZERO), the URV (FULL SC) and the UNIT. If the output transfer function of the transmitter is not linear, ProMeter and CoMeter show the message: ConF NO_LIN and the user cannot update the configuration. It is necessary to change the output transfer function of the transmitter to linear. See Fig. 5 - "ConF METER" menu, for ConF AUTO procedure.

ConF MANUAL

The selection of MANUAL configuration allows the user to define manually CoMeter and ProMeter configuration, i.e. define the LRV (ZERO), the URV (FULL SC), and the UNIT, as well as to decide for a LINEAR or SQR output function. LRV and URV can have a value between -99999 and +99999. Refer to Fig. 5- ConF METER menu for detail on the procedure. For having the CoMeter to display the analog output current or the output percentage, select respectively:

ConF CURRENT and ConF PERCENT

ADDENDUM FOR COMETER - ANALOG LCD INDICATOR WITH HART PROGRAMMING CAPABILITY AND PROMETER - PROGRAMMABLE INDICATOR

Under Conf PERCENT option, the user can decide for linear or SQR output. When SQR output is selected, the output is linear from 0 to 20% (to 4% of input). Refer to Fig. 5 - Conf METER for details on the procedures.

Conf XMTR - TRANSMITTER CONFIGURATION (CoMeter only)

Four are the operations under the Conf XMTR menu: **CONF, TRIM, REVIEW** and **PV**.

By pressing ENTER on the Conf XMTR menu, the string **LOADING** appears on the display, with the blinking star (*) indicating communication activity, i.e. the CoMeter is reading the transmitter information.

Then the **CONF** option appears. Using PREV or NEXT key, the user can select **CONF, TRIM, REVIEW** or **PV** option, and with the ENTER key he moves into the menu. When entering CONF and TRIM menu a message "LOOP IN_MAN" appears to remind that a modification can change the transmitter output, so for security the loop should be put in Manual.

See below a list of the available operation under the selected option:

CONF menu	TRIM menu	REVIEW menu	PV menu
Change LRV Change URV Change DAMPING Change UNITS Change OUTPUT	Reranging (RERANG.) Loop test (LOOPST) Output trim (OUTTRIM) Zero adjustment (SNSZERO)	TAG 8 Final Assembly Nr. (XMTR N.) Sensor Serial Nr. (SENS N.) Up/Down scale (UP/DOWN) UNITS LRV URV LRL (See Sensor Units) URL (See Sensor Units) DAMPING OUTPUT	Primary variable (PRIMARY) Secondary variable (2ND) Tertiary variable (3RD) Fourth variable (4TH)

Use PREV or NEXT key to scroll through the options and ENTER key to change or view the values. The procedure to change the numeric value remains the one already explained for PASSWORD operation, i.e., the cursor starts blinking on the most significant digit, then use the NEXT and PREV key to increase or decrease the value of the single digit (the minus sign(-) automatically appears or disappears when the value increases above 9 or decreases below 0, as well as for the decimal point(.). Use the ENTER key to move the cursor to the next digit, use the ESC key to move back to the previous digit. An ENTER on the last digit will cause the value to be sent to the transmitter. Refer to figures 6, 7, 8 and 9 for details.

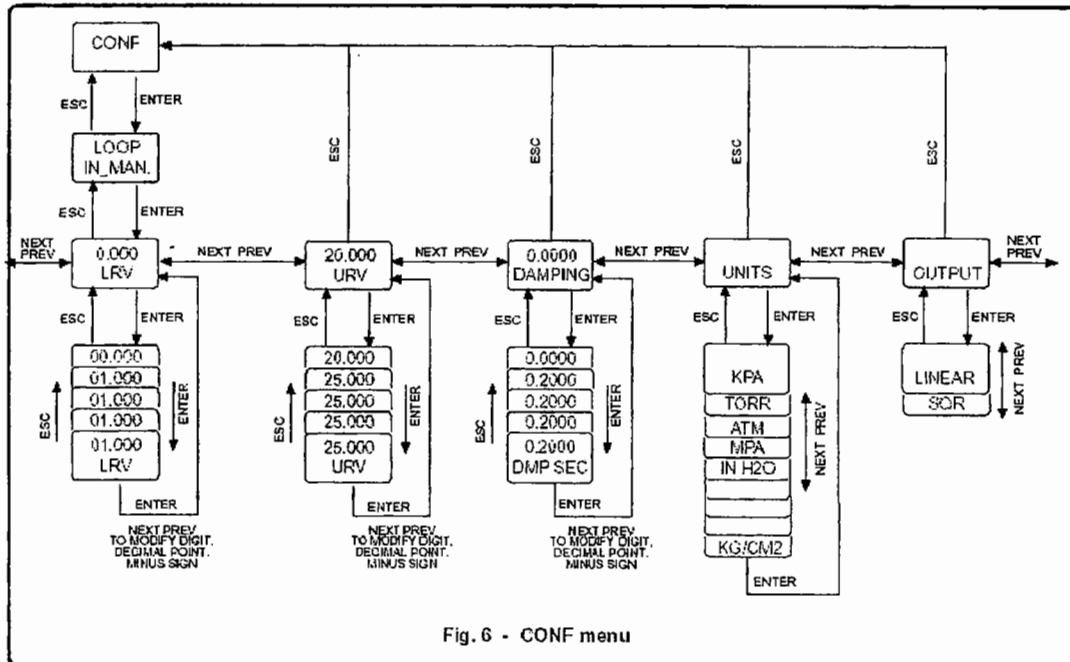


Fig. 6 - CONF menu

ADDENDUM FOR COMETER - ANALOG LCD INDICATOR WITH HART PROGRAMMING CAPABILITY AND PROMETER - PROGRAMMABLE INDICATOR

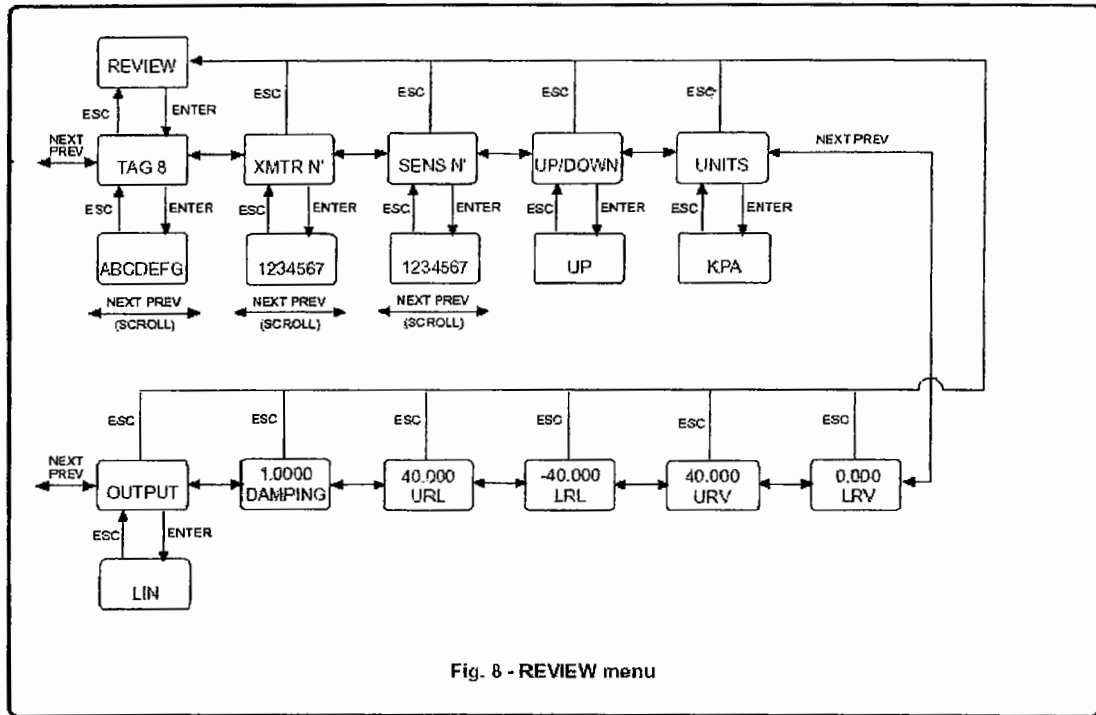


Fig. 8 - REVIEW menu

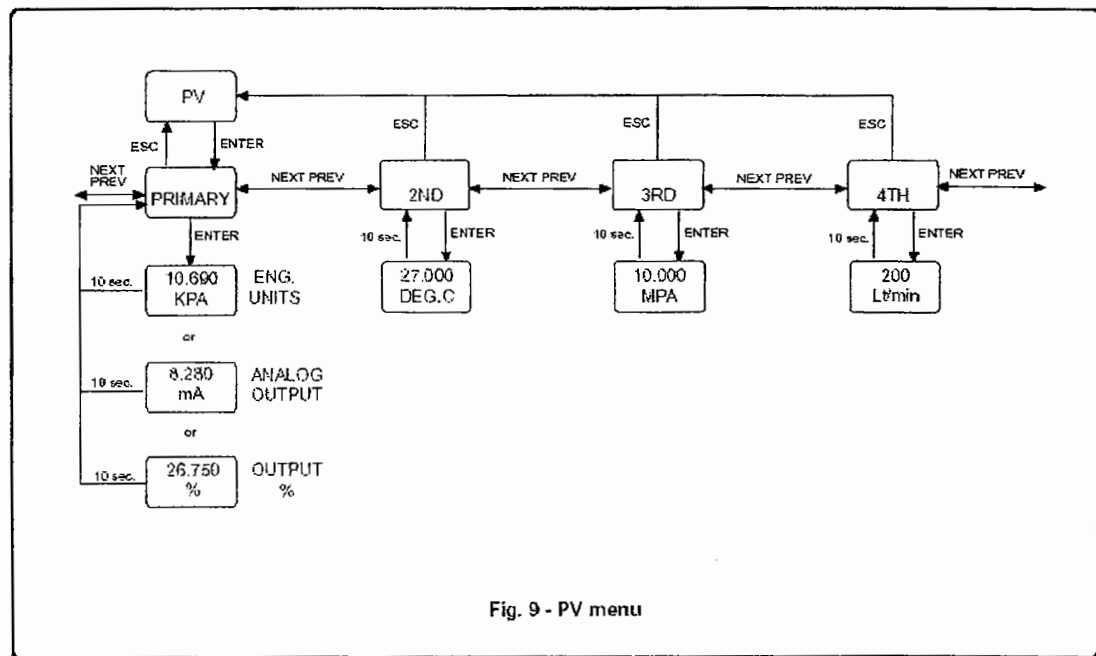


Fig. 9 - PV menu