Operating instruction
IM/695FI_9

600T EN Series

Model 695FI
Field Indicator

ABB

ABB

The Company

ABB is an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The NAMAS Calibration Laboratory No. 0255(B) is just one of the ten flow calibration plants operated by the Company, and is indicative of ABB dedication to quality and accuracy.

BS EN ISO 9001

St Neots, U.K. – Cert. No. Q5907
Stonehouse, U.K. – Cert. No. FM 21106

UNI EN 29001 (ISO 9001)

RINA QUACER   ISO 9001   CISQ

Lenno, Italy – Cert. No. 9/90A

Stonehouse, U.K. – Cert. No. 0255

Use of Instructions

⚠ Warning.
An instruction that draws attention to the risk of injury or death.

✱ Note.
Clarification of an instruction or additional information.

⚠ Caution.
An instruction that draws attention to the risk of damage to the product, process or surroundings.

ⓘ Information.
Further reference for more detailed information or technical details.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department ABB.

Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.

2. Warning labels on containers and packages must be observed.

3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.

4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.

5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.

6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable may be obtained from the Company address on the back cover, together with servicing and spares information.

CONTENTS

GENERAL DESCRIPTION

Model 695FI field indicator provides simple and low cost remote indication of a process variable on an easy to read display. Various types of display are available: the 90° scale analog, the LCD digital, ProMeter and CoMeter.

It is on the various meter faceplate that calibration adjustments are located.

Two types of connection configurations are described. One involves the indicator coupled to an associated transmitter terminal block. The other utilizes the indicator as a junction box in the 4 to 20 mA line between transmitter and receiver. See the chapter "ELECTRICAL CONNECTIONS" for details.

TRANSPORT

After final calibration the instrument is packed in a carton (Type 2 of ANSI/ASME N 45.2.2-1978) intended to provide protection from physical damage.

HANDLING

The instrument does not require any special precautions during handling although normal good practice should be observed.
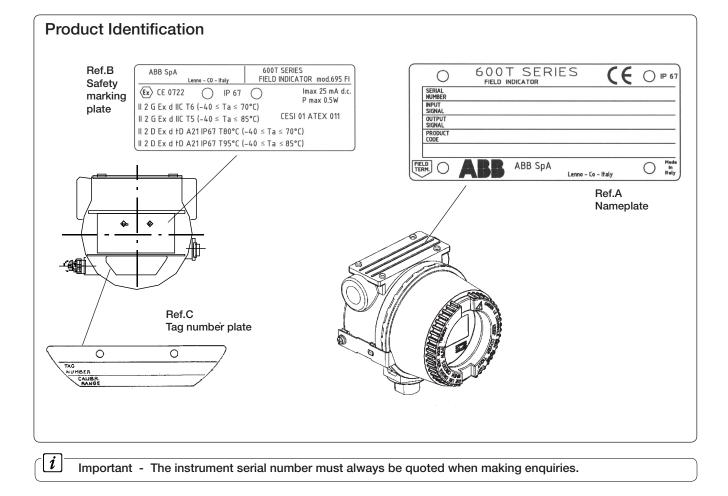
STORAGE

The instrument does not require any special treatment if stored as despatched and within the specified ambient conditions level (Temperature from -40 ÷ +85°C / -40 to 185°F, 0÷100% RH of humidity). There is no limit to the storage period, although the terms of guarantee remain as agreed with the Company and as given in the order acknowledgement.

PRODUCT IDENTIFICATION

The instrument is identified by the plates shown below. The Nameplate provides information concerning the product code, the input signal, the product serial number (see Ref. A). Please refer to this number when making enquiries.

The Safety Marking plate provides information of Ex protection; it is affixed only when the indicator is required for hazardous area installation (see Ref. B).

The Tag plate provides the customer tag number and the calibration range (see Ref. C) .

Product Identification

Ref.B Safety marking plate

ABB SpA — Lenno – CO – Italy
600T SERIES FIELD INDICATOR mod.695 FI
Ex CE 0722   IP 67   Imax 25 mA d.c. P max 0.5W
II 2 G Ex d IIC T6 (–40 ≤ Ta ≤ 70°C)
II 2 G Ex d IIC T5 (–40 ≤ Ta ≤ 85°C)   CESI 01 ATEX 011
II 2 D Ex d tD A21 IP67 T80°C (–40 ≤ Ta ≤ 70°C)
II 2 D Ex d tD A21 IP67 T95°C (–40 ≤ Ta ≤ 85°C)

Ref.C Tag number plate

TAG NUMBER
CALIBR. RANGE

600T SERIES FIELD INDICATOR   CE   IP 67
SERIAL NUMBER
INPUT SIGNAL
OUTPUT SIGNAL
PRODUCT CODE
FIELD TERM.   ABB   ABB SpA Lenno – Co – Italy   Made in Italy

Ref.A Nameplate

ℹ️ Important - The instrument serial number must always be quoted when making enquiries.

INSTALLATION

The Field Indicator unit may be mounted to a 50 mm (2 inch) pipe by means of its mounting bracket. The unit can be rotated in the most appropriate viewing angle and locked in position.

⚠ **WARNING** - In order to ensure operator safety and plant safety it is essential that installation is carried out by suitably trained personnel according to the technical data provided in the specification for the relevant model.
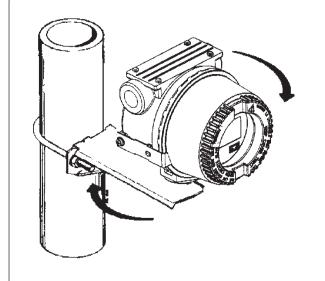

Fig. 1 - Field indicator installation

⚠ **WARNING** - The indicator should not be installed where it may be subjected to mechanical and thermal stresses or where it may be attached by existing or foreseeable aggressive substances.

Analog display, digital display and CoMeter can be installed in the housing as shown in fig. 1, in any convenient position as the internal meter may be rotated as required.
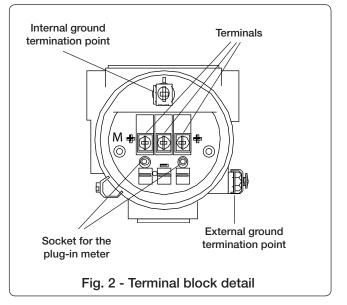
ELECTRICAL CONNECTIONS

⚠ **WARNING** - For installation in Hazardous Areas, i.e. areas with dangerous concentrations of e.g. gases or dusts that may explode if ignited, the installation must be carried out in accordance with relative standards either EN 60079-14 or IEC 60079-14 and/or with local authority regulations, for the relevant type of protection adopted.

Access to the signal terminals is gained by removing the meter; to remove the meter, first unscrew the housing cover by turning it. Unplug the meter by pulling it out gently. On the meter housing two connection ports for cable glands or conduit fittings are provided. These ports are protected with plastic plugs for transit purpose. The unused port plastic plug must be replaced for Hazardous Area installations with flameproof (explosion proof) protection (see relevant warning).

⚠ **WARNING** - For installation in Hazardous Areas, i.e. areas with danger of fire and/or explosion, prior to making electrical connections, ensure compliance with safety information on the Safety Marking plate. Failure to comply with this warning can result in fire or explosion.

⚠ **WARNING** - For Hazardous Areas installations, at least six (6) threads on the cover must be engaged in order to meet flameproof (explosion-proof) requirements.
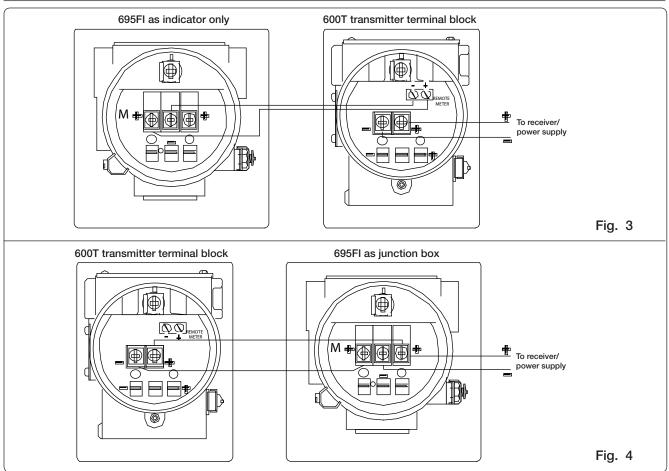

Fig. 2 - Terminal block detail

The field indicator can be connected in accordance with the following two configurations:
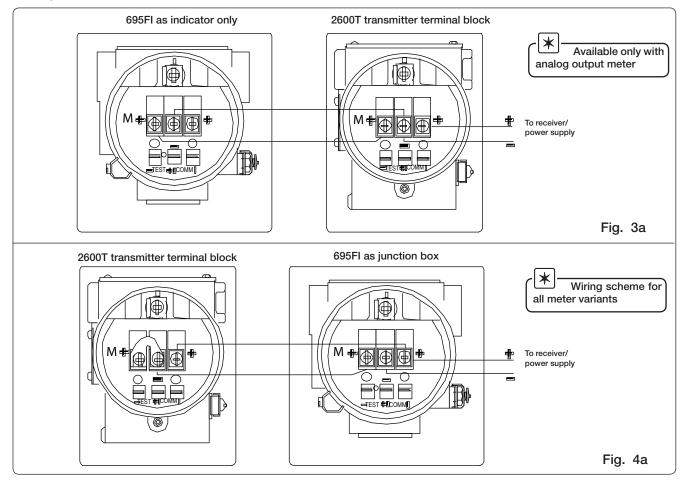
1) Indicator only, i.e. coupled to the transmitter's terminal block (fig. 3)
2) Junction box, i.e. inserted in any point of the 4 to 20 mA line connecting the transmitter to its receiver/power supply (fig. 4).

In any cases the line resistance to the field indicator connection should not exceed 15 ohm. This limitation does not apply to the scheme in Fig. 4.

. . . ELECTRICAL CONNECTIONS

695FI as indicator only   600T transmitter terminal block

M

REMOTE
METER

To receiver/
power supply

Fig. 3

600T transmitter terminal block   695FI as junction box

REMOTE
METER

M

To receiver/
power supply

Fig. 4

If the terminal block of the transmitter is the latest version with three terminals, the connection is to be realized as explained in pictures 3a and 4a.

695FI as indicator only   2600T transmitter terminal block

M   M

TEST COMM   TEST COMM

✴ Available only with analog output meter

To receiver/
power supply

Fig. 3a

2600T transmitter terminal block   695FI as junction box

M   M

TEST COMM   TEST COMM

✴ Wiring scheme for all meter variants

To receiver/
power supply

Fig. 4a

CALIBRATION PROCEDURE

The field indicator housing may be grounded using the external earth connection.

When the wiring connections are complete plug the meter and check that the cover O-ring gasket is properly in place, screw on the cover and tighten.
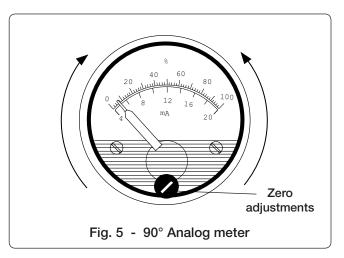
⚠ WARNING - For Hazardous Areas installations, the connection of cables and conduits to the indicator shall be made in accordance with the requirements of the relevant type of protection. Cables and cable-glands must be in accordance with the type of protection. Unused openings for connection shall be closed with blanking elements suitable for the relevant type of protection. With the exception of intrinsically safe indicators, the means provided for this shall be such that the blanking element can be removed only with the aid of tools. The blanking elements must be certified for the type of protection. See standards either EN 60079-14 or IEC 79-14. The indicator connections must also guarantee the degree of protection of the indicator enclosure, e.g. IPxx according to EN 60529 standard (or IEC60529).

⚠ WARNING - For Hazardous Areas installations, when the ambient temperature is higher than 70°C/158°F, the cable used for the connections must be suitable for 5°C/41°F above the ambient temperature.

ANALOG OUTPUT METER CALIBRATION

The analog output meter provides a 90° scale indication. It has either a 0 to 100 linear scale or a 0 to 10 square root scale or special on request.
The calibration of the analog type meter, only involves zeroing. Fig. 5 shows the location of the zero adjustment.

Zero adjustments

Fig. 5 - 90° Analog meter

The calibration is quite simple using one of the following methods:
- with the loop unpowered adjust the zero screw to read exactly the true zero mark on the scale.
- with the transmitter transmitting 4 mA adjust the zero screw to read exactly the live zero of the scale.

CALIBRATION PROCEDURE . . .

COMETER AND PROMETER CALIBRATION AND USE

The name CoMeter is an acronym for COMMUNICATING METER. ProMeter stands for PROGRAMMABLE METER. They can be connected, plug & play, into the terminal block of the 695FI field indicator.
The CoMeter is capable to provide both reading and configuration operations; the ProMeter is indicator only (HART Communication is not for ProMeter). 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 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:
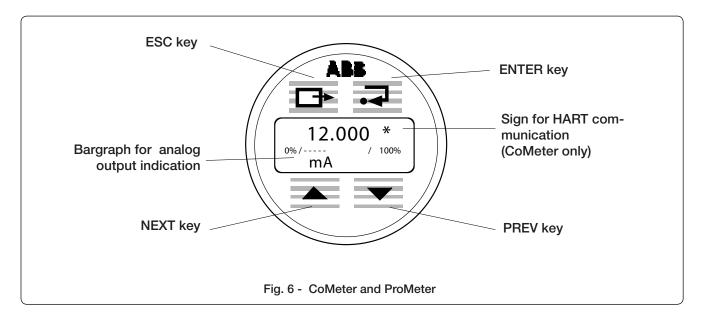
top left position:	ESCAPE key
top right position:	ENTER key
bottom left position:	NEXT key
bottom right position:	PREVIOUS key

Fig. 6 - CoMeter and ProMeter

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 only programmable.
In fact, two are the main menu : ConF METER" and "ConF XMTR".

ACCESS TO CONFIGURATION

To enter these menù for 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. The ProMeter enters directly into the 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.
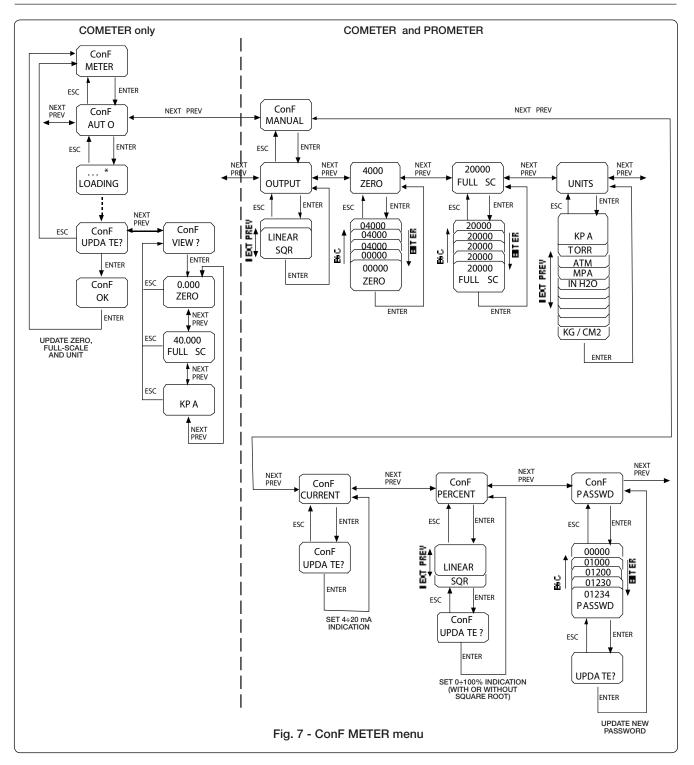It is under the ConF METER menu that the password can be defined and enabled.
See figure 7 for the access to the "ConF PASSWORD" menu.
Once you have entered the "ConF PASSWORD" menu the cursor is blinking on the most significant digit.
Press ENTER, if you want to change the digits, initially set to zero (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.
Next there are pictures to guide the configuration actions for the CoMeter.

COMETER only

COMETER and PROMETER

ConF
METER

ConF
AUT O

. . . *
LOADING

ConF
UPDA TE?

ConF
VIEW ?

ConF
OK

0.000
ZERO

40.000
FULL SC

KP A

UPDATE ZERO,
FULL-SCALE
AND UNIT

ConF
MANUAL

OUTPUT

LINEAR
SQR

4000
ZERO

04000
04000
04000
00000
00000
ZERO

20000
FULL SC

20000
20000
20000
20000
20000
FULL SC

UNITS

KP A
T ORR
ATM
MPA
IN H2O

KG / CM2

ConF
CURRENT

ConF
UPDA TE?

SET 4÷20 mA
INDICATION

ConF
PERCENT

LINEAR
SQR

ConF
UPDA TE ?

SET 0÷100% INDICATION
(WITH OR WITHOUT
SQUARE ROOT)

ConF
P ASSWD

00000
01000
01200
01230
01234
P ASSWD

UPDA TE?

UPDATE NEW
PASSWORD

Fig. 7 - 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 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. 7 - "ConF METER" menu, for ConF AUTO procedure.

ConF MANUAL
The selection of MANUAL configuration allows the user to define manually 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.7 - 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

CALIBRATION PROCEDURE . . .

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. 7 - 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.
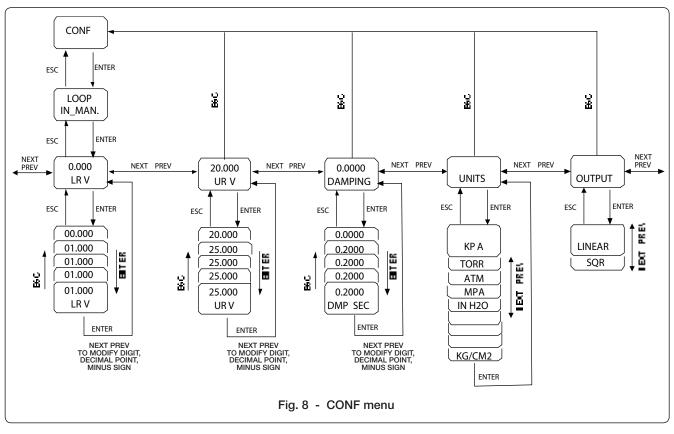
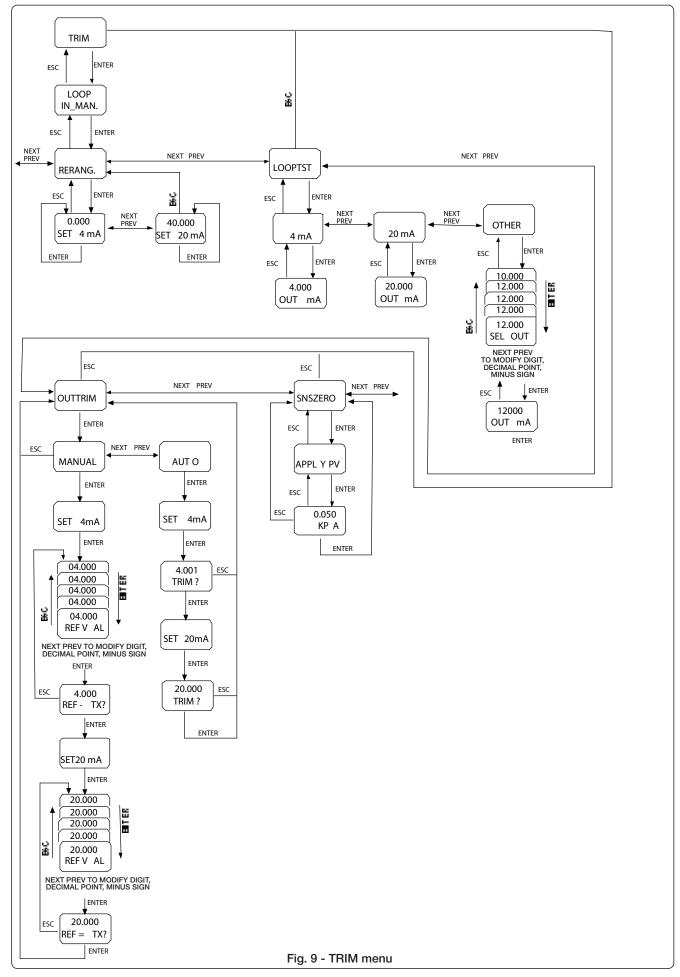See below a list of the available operation under the selected option:

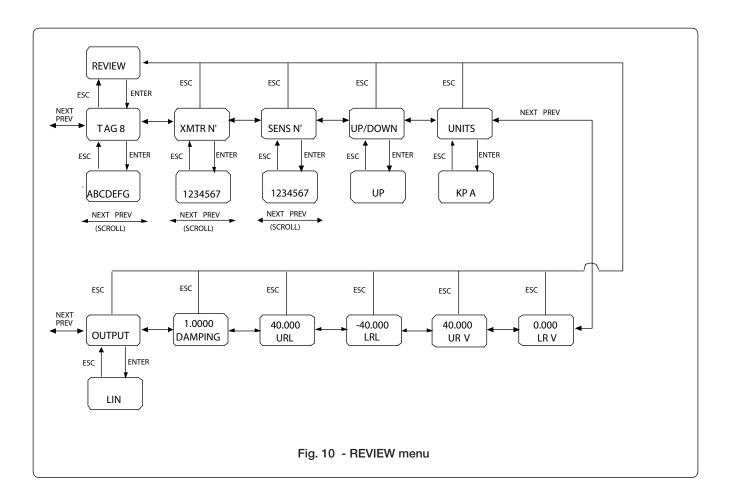| CONF menu	TRIM menu	REVIEW menu	PV menu
Change LRV Change URV Change DAMPING Change UNITS Change OUTPUT	Reranging (RERANG.) Loop test (LOOPTST) Output trim (OUTTRIM) Zero adjustment (SNSZERO)	TAG 8 Final Assembly Nr. (XMTR N.) Sensor Serial Nr. (SENS N.) Up/Down scale (UP/DOWN) UNITS LRV URV LRL (See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

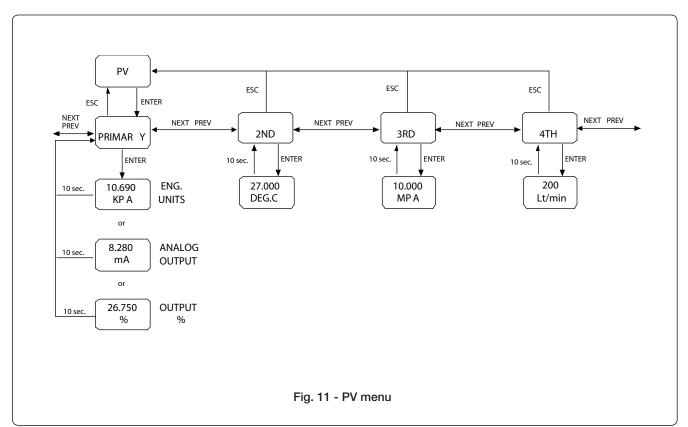Use PREV or NEXT key to scroll through the options and ENTER key to change or view the values.
The procedure to change the numeric value remains the one already explained for PASSWORD operation, i.e., the cursor starts blinking on the most significant digit, then use the NEXT and PREV key to increase 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.
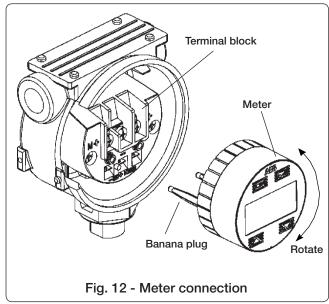Refer to figures 8, 9, 10 and 11 for details.

Fig. 8 - CONF menu

Fig. 9 - TRIM menu

Fig. 10 - REVIEW menu

REVIEW

ESC / ENTER

TAG 8 — XMTR N' — SENS N' — UP/DOWN — UNITS

ESC (on each top branch)

NEXT PREV

ESC / ENTER (on each)

ABCDEFG — 1234567 — 1234567 — UP — KP A

NEXT PREV (SCROLL)

OUTPUT — 1.0000 DAMPING — 40.000 URL — -40.000 LRL — 40.000 UR V — 0.000 LR V

ESC (on each)

NEXT PREV

LIN

ESC / ENTER

Fig. 10 - REVIEW menu

Fig. 11 - PV menu

PV

ESC / ENTER

PRIMARY — 2ND — 3RD — 4TH

NEXT PREV

ESC (on 2ND, 3RD, 4TH)

ENTER

10 sec.

10.690 KP A — ENG. UNITS

27.000 DEG.C

10.000 MP A

200 Lt/min

or

8.280 mA — ANALOG OUTPUT

or

26.750 % — OUTPUT %

Fig. 11 - PV menu

DISASSEMBLY AND REASSEMBLY

To remove the internal meter proceed as follows:
1) Remove the field indicator cover
2) Unplug the meter (see fig. 12)
3) Replace it immediately by plugging another meter or install the proper link between the meter connections.

> ✳ **NOTE** - This operation is important for Intrisic Safe loop application, as, with the meter removed, the voltage drop accross the field indicator can rise up to 4 V.

4) If another meter has been fitted (see Fig. 12), rotate it, as required for viewing convenience.
   The meter can rotate, in 15° steps, 90° clockwise and 255° counterclockwise: further rotation causes damage of the meter stop or of the "banana" connections and should be avoided.
5) Check that the cover O-ring gasket is properly in place and screw on the cover.

Fig. 12 - Meter connection

PERFORMANCE SPECIFICATIONS

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

Indication accuracy
 • analog indicator : ± 2% fsd
 • CoMeter and ProMeter :
  - digital ± 0.10% of max span(16 mA) ± 1 digit
  - analog (bargraph) : 10%

Ambient temperature
 Total effect per 1 K (1.8 °F) change between the limits of -20 and +80°C (-4 and +176 °F).
 CoMeter and ProMeter: ± 0.15% of max span (16 mA)

EMI/RFI
 Total effect : ± 0.10% from 20 to 1000 MHz and for field strengths up to 10 V/m when instrument is properly installed.

FUNCTIONAL SPECIFICATIONS

Input range: 4 to 20 mA nominal

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

Maximum overload (for 2 minutes)
 - Analog indicator : 150% of input range
 - CoMeter and ProMeter: 110 mA (23 mA indication).
 A current less than 3.4 mA will blank the display

Voltage drop
 - analog indicator : 0.2 Vdc
 - ProMeter : 2Vdc
 - CoMeter
  • less than 2.6 V dc @ full scale and 20°C
  • 2.8 Vdc @ max temperature (including HART modulation)

Meter/indication range
 - CoMeter and ProMeter
  • 5-digit (± 99999 counts) with 7.6 mm. high (5/16 in), 7-segment numeric characters plus sign and digital point
  • 10-segment bargraph display
  • 7-digit with 6 mm. high (1/4 in), 14-segment alphanumeric   characters.

Temperature limits
 • Ambient (is the operating limit)
  - analog indicator: -25 to +85°C (-13 to +185°F)
  - CoMeter and ProMeter : -20 to +70°C (-4 to +158°F)
   Lower limit can be down to -40 (-40) keeping loop integrity and without meter damage (the display will be blank)
 • Storage
  -40 to +85°C (-40 to +185°F)

Relative humidity
 • Reference: 60% RH ±25%
 • Operative, transportation and storage limits :
  0 and 100% RH condensing permissible

EMI/RFI (SAMA PMC 33.1)
 • Operative limits : Class 3 abc, field strengths up to 30V/m   (Frequency range: 20 to 1000 MHz)

Update time
 • Analog indicators : 0.5 sec
 • CoMeter and ProMeter : 0.7 sec

Resolution for CoMeter and ProMeter
 ± 0.025% (12-bit conversion)

ADDENDUM FOR "EX SAFETY" ASPECTS AND "IP" PROTECTION (EUROPE)

According to ATEX Directive (European Directive 94/9/EC of 23 March 1994) and relative European Standards which can assure compliance with Essential Safety Requirements, i.e., EN 60079-0 (General requirements) EN 60079-1 (Flameproof enclosures "d") EN 60079-11 (Intrinsic safety "i") EN 60079-26 (Equipments, group II, category 1G), the field indicator of the 600T EN SERIES model 695FI have been certified for the following group, categories, media of dangerous atmosphere, temperature classes, types of protection. Examples of application are also shown below by simple sketches.

a) Certificate ATEX II   Category 1 equipment for Zone 0 (Gas) and Zone 20 (Dust)
For Category 1 Stainless Steel enclosure only
II 1 G Ex ia IIC T6 T5 Ga (-40°C<Ta<+40°C)
II 1 G Ex ia IIC T4 Ga (-40°C<Ta<+85°C)
II 1 D Ex ia IIIC T50°C Da (-40°C<Ta<+40°C)
II 1 D Ex ia IIIC T95°C Da (-40°C<Ta<+85°C)

Category 2 equipment for Zone 1 (Gas) and Zone 21 (Dust)
For Category 2 aluminium alloy or alternatively Stainless Steel enclosure
II 2 G Ex ia IIC T6 T5 Gb (-40°C<Ta<+40°C)
II 2 G Ex ia IIC T4 Gb (-40°C<Ta<+85°C)
II 2 D Ex ia IIIC T50°C Db (-40°C<Ta<+40°C)
II 2 D Ex ia IIIC T95°C Db (-40°C<Ta<+85°C)

CESI certificate number 01ATEX015
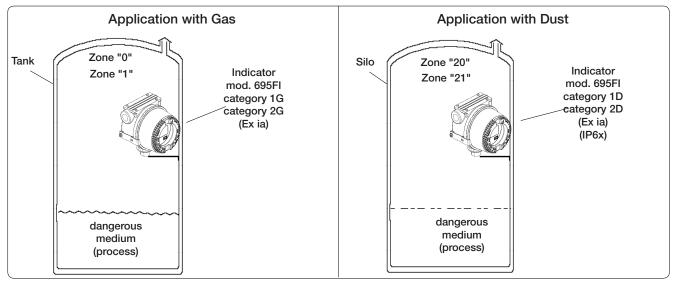The meaning of ATEX code is as follows:
- II :   Group for surface areas (not mines)
- 1 or 2: Category
- G :   Gas (dangerous media)
- D :   Dust (dangerous media)
- T50°C: Maximum surface temperature of the indicator enclosure with a Ta (ambient temperature) +40°C for Dust (not Gas) with a dust layer up to 50 mm depth.
- T95°C: As before for Dust for a Ta +85°C

Note: the number close to the CE marking of the indicator safety label identifies the Notified Body which carries out the surveillance for the production of the indicator.

The other marking refers to the protection type used according to relevant EN standards:
- Ex ia :   Intrinsic safety, protection level "a"
- IIC :   Gas group
- T4:   Temperature class of the transmitter (which corresponds to 135°C max) with a Ta from -50°C to +85°C
- T5:   Temperature class of the transmitter (which corresponds to 100°C max) with a Ta from -50°C to +40°C
- T6:   Temperature class of the transmitter (which corresponds to 85°C max) with a Ta from -50°C to +40°C

About the applications, this indicator can be used in "Zone 0" or "Zone1" (Gas) and "Zone 20" or "Zone 21" (Dust) classified areas (continuous hazard) as it is shown on the following sketch:

Application with Gas	Application with Dust
Tank — Zone "0" Zone "1" — Indicator mod. 695FI category 1G category 2G (Ex ia) — dangerous medium (process)	Silo — Zone "20" Zone "21" — Indicator mod. 695FI category 1D category 2D (Ex ia) (IP6x) — dangerous medium (process)

ADDENDUM FOR "EX SAFETY" ASPECTS AND "IP" PROTECTION (EUROPE)

b) Certificate   ATEX II 2 G Ex d IIC T6 (-40°C $\leq$ Ta $\leq$+70°C)
                       ATEX II 2 G Ex d IIC T5 (-40°C $\leq$ Ta $\leq$+85°C)
                       ATEX II 2 D Ex d tD A21 IP67 T80°C (-40°C $\leq$ Ta $\leq$+70°C)
                       ATEX II 2 D Ex d tD A21 IP67 T95°C (-40°C $\leq$ Ta $\leq$+85°C)

CESI Certificate number 01ATEX011
The meaning of ATEX code is as follows:

II :	Group for surface areas (not mines)	
2 :	Category	
G :	Gas (dangerous media)	
D :	Dust (dangerous media)	
Ex d:	Explosionproof	
IIC :	Gas group	
T6 :	Temperature class of the indicator (which corresponds to 85°C max) with a Ta (ambient temperature) +70°C	
T5 :	Temperature class of the indicator (which corresponds to 100°C max) with a Ta (ambient temperature) +85°C	

T80°C: Maximum surface temperature of the indicator enclosure with a Ta (ambient temperature) +70°C
         for Dust (not Gas) with a dust layer up to 5 mm. For application with dust layer between 5 and 50 mm,
max   surface temperature must be consider according to IEC 61241-14 chapter 6.3.3.3
     T95°C: As before for Dust for a Ta +85°C

      Note: the number close to the CE marking of the indicator safety label identifies the Notified Body which carries
           out the Surveillance for the production of the indicator.

The other marking refers to the protection type used according to relevant EN Standards:

About the applications, this indicator can be used in "Zone 1" (Gas) and "Zone 21" (Dust) classified areas (occasional hazard) as it is shown in the following sketch:

Application with Gas	Application with Dust
Zone "1"	Zone "21"
mod. 695FI category 2G (Ex d)	mod. 695FI category 2D (Ex d) (IP6x)

IP code

About the degree of protection provided by the enclosure of the field indicator, the 600T EN SERIES has been certified IP67 according to EN 60529 standard (this is equivalent to IEC 60529).
The first characteristic numeral indicates the protection of the inside electronics against ingress of solid forein objects including dusts. The assigned "6" means an enclosure dust-tight (no ingress of dust).
The second characteristic numeral indicates the protection of the inside electronics against ingress of water. The assigned "7" means an enclosure water-protected against a temporary immersion in water under standardized conditions of pressure and time.

PRODUCTS & CUSTOMER SUPPORT

A Comprehensive Instrumentation Range

Analytical Instrumentation

- *Transmitters*
  On-line pH, conductivity, and dissolved oxygen transmitters and associated sensing systems.

- *Sensors*
  pH, redox, selective ion, conductivity and dissolved oxygen.

- *Laboratory Instrumentation*
  pH and dissolved oxygen meters and associated sensors.

- *Water Analyzers*
  For water quality monitoring in environmental, power generation and general industrial applications including: pH, conductivity, ammonia, nitrate, phosphate, silica, sodium, chloride, fluoride, dissolved oxygen and hydrazine.

- *Gas Analyzers*
  Zirconia, katharometers, hydrogen purity and purge-gas monitors, thermal conductivity.

Controllers & Recorders

- *Controllers*
  Digital display, electronic, pneumatic. Discrete single-loop and multi-loop controllers which can be linked to a common display station, process computer or personal computer.

- *Recorders*
  Circular and strip-chart types (single and multi-point) for temperature, pressure, flow and many other process measurements.

Electronic Transmitters

- *Smart & Analog Transmitters*
  For draft, differential, gauge and absolute pressure measurement. Also, liquid level and temperature.

- *I to P Converters and Field Indicators*

Flow Metering

- *Magnetic Flowmeters*
  Electromagnetic, insertion type probes and watermeters.

- *Turbine Flowmeters*

- *Wedge Flow Elements*

- *Mass Flow Meters*
  Transmitters, sensors, controllers and batch/display units.

Level Control

- *Submersible, Capacitance & Conductivity.*

Pneumatic Instrumentation

- *Transmitters*

- *Indicating Controllers*

- *Recording Controllers*

Customer Support

ABB provides a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

Italy
ABB SpA - ABB SACE Division
Tel: +39 (0) 344 58111
Fax: +39 (0) 344 58278

United Kingdom
ABB Ltd
Tel: +44 (0)1480 475321
Fax: +44 (0)1480 470787

United States of America
ABB Inc.
Tel: +1 215-674-6000
Fax: +1 215-674-718

Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification. Periodic checks must be made on the equipment's condition.

In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.

2. Copies of operating and maintenance records relating to the alleged faulty unit.