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USE AND MAINTENANCE MANUAL
EN90 – EN90F
PROGRAMMABLE INDICATOR FOR HAND-WHEELS

Manual purpose

This manual has been designed by the Manufacturer to provide the necessary information regarding the EN90 instrument to those who are authorized to carry out safely its installation, maintenance, dismantling and disposal. All the necessary information for buyers and planners can be found in the sales catalogue. In addition to adopting good technical construction methods, this information should be read carefully and strictly applied. Nonobservance of this information could cause risks for the health and safety of people and economic damage. This information, provided by the Manufacturer in the original language (Italian) is also available in other languages to satisfy legislative and/or commercial needs. This manual must be kept in good conditions by a responsible person in an ideal place so that it is always available for consultation. In case this manual is lost or deteriorates, a replacement should be requested directly to the manufacturer quoting the manual code. This manual reflects the state of the instrument at the time of input in the market: however, the manufacturer reserves the right to make changes, add or improve the manual without notice.

Identification of the product

The identification label is applied on the instrument.

To determine the identification code of the instrument, consult also the sales catalogue.

Environmental conditions

Temperature range: min. 0°C - max. +50°C.

It is forbidden to use the instrument other than for its intended use and in potentially explosive conditions or where anti-explosive elements are used.

Storage

Here below are some recommendations to be followed for the storage of the instrument:

- Avoid environments with excessive humidity and those exposed to bad weather (avoid open areas).
- Avoid placing the instrument directly on the ground.
- Store the instrument in its original packing.

Conformity declaration and EC marking

The instrument respects the following EC Community Directive:
2014/30/EU Electromagnetic compatibility, 2011/65/EU RoHS.

Maintenance

The instrument does not require particular maintenance except cleaning, to be done only with a soft cloth slightly dampened with ethylic alcohol or water. Do not use hydrocarbon solvents (petrol, thinners, etc.): the use of these products could affect the proper functioning of the instrument. Repairs should be done only and exclusively at the FIAMA technical assistance centre.

Calibrations and tests

It is advisable to calibrate the instrument periodically, once every working year.

To do the calibration, follow the procedure indicated in the present manual.

Assistance request

For any kind of technical assistance request, contact the sales department of the Manufacturer directly indicating the information given on the identification label, the number of hours used and the type of defect.

Manufacturer's responsibility

The manufacturer declines any responsibility in case of :

- Use of the instrument contrary to the national safety and accident-prevention laws.
- Incorrect installation, incorrect procedures or nonobservance of the instructions provided in the present manual.
- Defective electrical power supply.
- Modifications or tampering.
- Operations carried out by untrained or unqualified staff.

The safety of the instrument also depends on the strict observance of the procedures indicated in the manual: always operate the instrument in its functioning capacity and carry out a careful routine maintenance.

Note:

- All phases of inspection and maintenance should be carried out by qualified staff.
- The configurations provided in the manual are the only ones permitted.
- Do not try to use the instrument in any way which is contrary to the provided indications.
- The instructions in this manual do not substitute but are complimentary to the obligations of the applicable legislation regarding safety laws.

Installation

Before installing the instrument, take note of the following warnings:

- a) Connect the instrument following strictly the instructions of the manual.
- b) It is the responsibility of the user to check, before using, the correct settings of the parameters of the instrument to avoid damage to persons or things.
- c) The instrument **MUST NOT BE IN FUNCTION IN A DANGEROUS ENVIRONMENT** (inflammable or explosive).
- d) The unit has parts sensitive to electrostatic charges, therefore handling of the inner electronic parts must be carried out with appropriate care to avoid permanent damage.

Description

Programmable electronic indicator for hand-wheels for the measurement of linear or rotary movements on various types of industrial equipment (packaging, woodworking, metalworking, etc.). The device integrates inside the same container a position transducer, display unit, battery and has been designed specifically to be inserted within hand-wheels.

The display has 5 digits which are 7.5mm high plus negative sign (range -99999 - +99999) which can easily be read also at a distance.

With the 3 buttons on the front (protected by a transparent cover) it is possible to program the value to be displayed for each rotation, measurement direction (CW or CCW) and activate the following functions: reset/preset of displayed value, absolute or relative measurement, mm/inch conversion.

The housing is made of a self-extinguishing tecnopolymer and protected by a transparent polycarbonate cover which is shock-resistant.

The power is supplied by a ½AA 3.6V battery which lasts approximately 4 years. When the battery power is low, an icon will appear in the display. The configuration parameters are retained when the battery is substituted.

The EN90 is a gravity indicator applicable only to shafts which are horizontal and can be supplied with the P125P, P150P, P175P, P200P hand-wheels. Due to the free rotation on ball bearings and the balancing counterweight, the display is always kept in a horizontal position irrespective of the hand-wheel orientation.

The EN90F is a fixed-reaction indicator which is suitable for shafts which can have any orientation and is supplied with the P125FP, P150FP, P175FP, P200FP hand-wheels.

Programming

Using a screw driver which has a flat thin head, delicately remove the round cover which protects the buttons. To access programming of the parameters, keep ▲ pressed until **PASS** appears on the display. Now press 2 times **ENTER/RESET** and 3 zeroes will appear. The first digit on the right will be blinking: with ▲ (digit increase) and ◀ (digit selection) insert the pass code which is 273 and confirm with enter/reset. In case of incorrect insertion of the password, the unit exits programming.

The various parameters can be scrolled with ▲ and in order of appearance they are:

u IS	visualized value after 1 complete rotation
ndEC	number of decimal places
tAST I	button activation mode *
d lr	counting direction

* When the Offset, Preset, and Origin Change functions are set, also the *OFFSE*, *PrSE*, *PrSO PrS I*, *PrS2* parameters will appear (see further below).

To modify the selected parameter press two times **ENTER/RESET** (the first time displays only the value). With ▲ and ◀ set the desired value and confirm with **ENTER/RESET**.

To set a negative number, press ◀ until the last digit on the left blinks then press ◀ once again and after press ▲ so that the minus sign will appear.

To exit programming press ◀.

Visualized value after 1 complete rotation: *u IS*

This parameter, together with the following one, defines the value which is displayed after one rotation of the hollow shaft. The allowable range is from 0,0001 to 99999.

The decimal place is set after programming the last digit on the left: after pressing ◀, the decimal place will blink and with ▲ it can be moved to the desired position. Confirm with **ENTER/RESET**.

Number of decimal places: *ndEC*

It is the number of decimal places to visualize on the display, allowed range from 0 to 4.

Example 1: if each rotation of the hollow shaft will cause a displacement of 50, set *u IS*=50 and *ndEC*=0.

Example 2: if each rotation of the hollow shaft will cause a displacement of 12,345 and the desired output on the display is 12.3, set *u IS*=12.345 and *ndEC*=1.

Button activation mode: *t ASE I*

This parameter programs the button functions.

The value is a number with 3 digits, each corresponding to a button: the digit on the right sets the **ENTER/RESET** button, the digit in the middle sets ▲ while the last digit on the left sets ◀.

The possible values are in the following table:

VALUE	◀	▲	ENTER/RESET
0	Not active	Not active	Not active
1	mm/inch conversion	abs/rel measurement	Reset
2	Not active	Not active	Preset
3	Not active	Not active	Fast Preset
4	Not active	Not active	Change of origin 0,1,2
5	Not active	Not active	Offset
6	Not active	Not active	Fast Offset
7	Not active	Not active	Delayed reset * (after 3s)
8	Not active	Not active	Delayed preset * (after 3s)

* Delayed means that to activate the function (reset or preset), it is necessary to keep **ENTER/RESET** pressed for approximately 3 s.

Reset: reset function of the displayed value; after pressing **ENTER/RESET**, the displayed value is set to zero.

Preset: preset function of the displayed value; after pressing **ENTER/RESET**, the displayed value becomes equal to the value in the *PrSE* parameter, which can be set immediately after *t ASE I* (when the digit on the right is set to 2).

Fast Preset: the fast setting of the displayed value on the display; after pressing **ENTER/RESET** *PrSE* appears and pressing 2 times **ENTER/RESET** it is possible to set the value directly (use ▲ and

◀ and then confirm with **ENTER/RESET**). This function is useful when the displayed value must be corrected often.

Origin change (correction of the displayed value for tool changes): with this function 3 different origins (0,1,2) can be set and with **ENTER/RESET** it is possible to switch from one origin to another. After setting 4 in the first digit on the right of the **LRSL** parameter, **Pr50** will appear and after pressing 2 times **ENTER/RESET** it is possible to set the nominal value for tool 0 (for example the radius of cutter 0), which is then confirmed by pressing **ENTER/RESET**.

Now **Pr51** will appear which is the nominal value for tool 1 (for example the radius of cutter 1): set the correct value and confirm with **ENTER/RESET**.

Finally **Pr52** will appear which is the nominal value for tool 2 (for example the radius of cutter 2): set the correct value and confirm with **ENTER/RESET**.

In practice **Pr50**, **Pr51**, and **Pr52** are the nominal values associated to the three different tools which are used.

As a special case, if **Pr50** is set to zero, **Pr51** and **Pr52** are the values to display in origin 1 and in origin 2 respectively.

ABS/REL function: Enables passing from an absolute to relative value; after pressing ▲, the displayed value is temporarily set to zero to measure a relative motion of the shaft. On the display the **REL** icon indicates that the current display is relative to the reference point that has just been created. Pressing again ▲ causes the absolute value to be displayed and the **ABS** icon will appear.

mm/inch conversion: Pressing ◀ converts the measurement from millimeters to inches and back. When in inch mode, the **INCH** icon will appear and the displayed value will have an additional decimal place. When the parameter **ndEC=4** the mm/inch conversion is not available.

Offset: This parameter is added to or subtracted from the displayed value to correct it in case, for example, of a tool change or to compensate tool wear. After setting a positive offset value, the displayed value will be the measured value plus the offset value. After setting a negative offset value, the displayed value will be the measured value minus the offset value.

Fast Offset: After pressing **ENTER/RESET**, **OFFSt** appears and by pressing two times **ENTER/RESET** it is possible to set directly the value to be displayed (use buttons ▲ ◀ and confirm with **ENTER/RESET**). This function is useful if it is necessary to correct often the displayed value.

Counting direction **d lr**

It sets the counting direction, allowed values 0 or 1.

By setting 0, the displayed value increases turning the instrument anti-clockwise.

By setting 1, the displayed value decreases turning the instrument clockwise.

Adjustment of displayed value

After the installation of instrument on the machine and setting of all parameters, in order to visualize on the display the correct value it is necessary to carry out the reset or preset.

Position the shaft in a point in which the correct measure that has to be visualized is known exactly (for example the stroke end point) or measure the position in that point of the shaft. Program parameter **LRSL** with value 3 in the first digit on the right and exit programming.

Now press **ENTER/RESET** and **Pr5t** will appear, press again 2 times **ENTER/RESET** and set the correct value to display, then confirm with **ENTER/RESET**. The display will now show the desired value.

If the required value is zero, instead of the preset function it is possible to use the reset function by setting 1 in the first digit on the right in the **LRSL** parameter so that pressing **ENTER/RESET** will bring the displayed value to zero.

Now that the instrument is adjusted, it is necessary to insert the desired **LRSL** parameter to avoid accidental reset/preset of the displayed value.

To prevent the device from moving while the **RESET** button is pressed, it is suggested to block its rotation with a finger.

Battery replacement

The instrument is supplied with a ½AA 3,6V lithium battery, which assures a typical functioning of approximately 4 years.

When the battery runs down, an icon appears on the display.

To enter into the battery-holder it is necessary to remove the front cover by carefully inserting a flat screwdriver on the sides. After taking off the cover, pull the battery out and substitute it with a new one, paying attention to the polarity: the positive pole must face the side of the **ENTER/RESET** button. The instrument is protected against inversion of polarity and wrong insertion, and in this case will not switch on.

Removing the battery from the instrument switches it off after a few seconds: at this point do not rotate the hollow shaft to avoid losing the correct displayed value. As soon as the battery is fitted, the instrument switches on with the same value on the display which was present at the moment when it was switched off. If the shaft has not be moved, the displayed value will be correct. In case the shaft moved when the instrument was off, to re-establish the correct measure it is necessary to repeat the adjustment process.

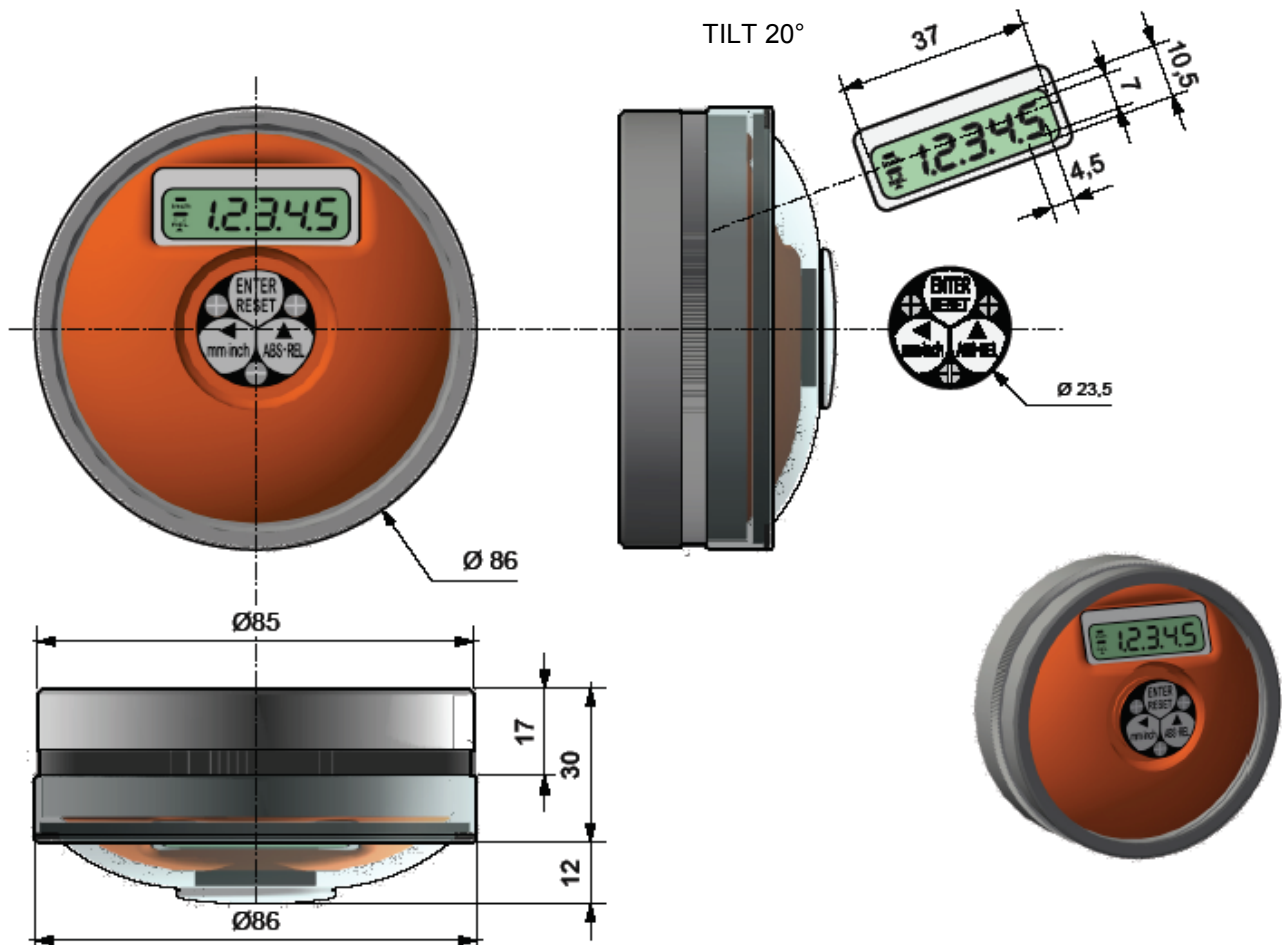
Display icons

1. Indicator of low battery, it is activated when is it necessary to change the battery.
2. Indicator of inches measurement.
3. Indicator for origin 1 and 2
4. Indicator of relative displayed value.
5. Not used.

Error message

ouEr: the current displayed value passed the maximum value that can be visualized (possible range: from -99999 to 99999).

Dimensions



General characteristics

Max. rotation speed	1000 RPM for brief periods
Resolution	4000 impulses/revolution
Range	-99999; 99999
Display	High readability LCD with 7.5mm high digits
Keyboard	3 digits for programming and functions activation
Available functions	reset/preset, absolute/incremental value, mm/inch conversion, 3 distinct origins for tool changing
Power supply	battery ½ AA, voltage 3,6V (lithium thionyl chloride)
Battery life	Typical 4 years continuous use
Weight	100g
Protection degree	IP54
Working temperature	0-50°C
Relative humidity	35-85%
Electromagnetic compatibility	2014/30/EU
RoHS	2011/65/EU

Manufacturer

All communications to the manufacturer should be addressed to:

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