



**DD52R-E-RF**  
**(GN 9153)**  
Electronic position indicators

OPERATING INSTRUCTION

**elesa**<sup>®</sup>

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## 1. Safety Instructions

The product has been designed and manufactured in accordance with the current regulations. The product leaves the factory ready for use and complies with the safety standards.

To maintain the product in this state, it is necessary that it is assembled and used properly, in the closest compliance with this instruction manual and with the following specific safety precautions.

Ensure that the user has read and understood the instruction manual and in particular the chapter "Safety Instructions".

In addition to the instruction manual, all the rules of law must be observed, in regard to accident prevention and environmental protection.

This manual is intended as an indispensable supplement to the existing documentation (catalogues, data sheets and assembly instructions).



The use without complying with the descriptions / specific parameters, in combination with systems / machines / processes to be controlled, it can lead to a malfunction of the product, causing:

- health hazards,
- environmental hazards,
- damage to the product and its proper functionality.

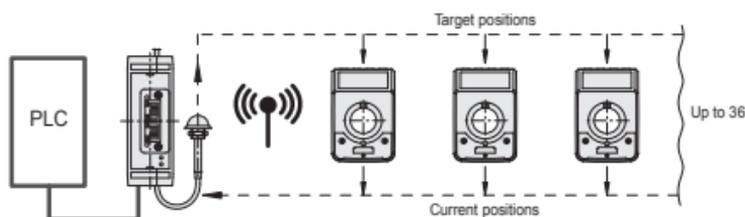
Do not open nor modify the case of the indicator.

Tampering with this product may endanger the correctness and accuracy of its operation. In case of malfunction, do not attempt any repairs to the units and contact Elessa sales office.

## 2. System description

DD52R-E-RF, position indicators, with battery power supply, can be used on passing through shafts in any position to provide the reading of the absolute or incremental positioning of a machine component.

DD52R-E-RF position indicators must be connected to UC-RF control unit via radio frequency network.



### Mechanical and electrical characteristics

Power supply	Lithium battery CR2477 3.0 V
Battery life	3 years
Display	6-digit LCD of 12 mm height and special characters
Reading scale	-199999; 999999
Number of decimal digits	programmable <sup>(1)</sup>
Unit of measure	mm, inches, degrees programmable <sup>(1)</sup>
Rotation max. speed	300/600/1000 r.p.m. <sup>(2)</sup> programmable <sup>(1)</sup>
Precision	10.000 impulses/revolution
Protection level	IP65 or IP67
Operating temperature	0°C ÷ +50°C
Storage temperature	-20°C ÷ +60°C
Relative humidity	max. 95% a 25°C without condensation
Environment	indoor use
Altitude	up to 2000 m
Interference	IEC 61326-1

<sup>(1)</sup> See paragraph 8.2

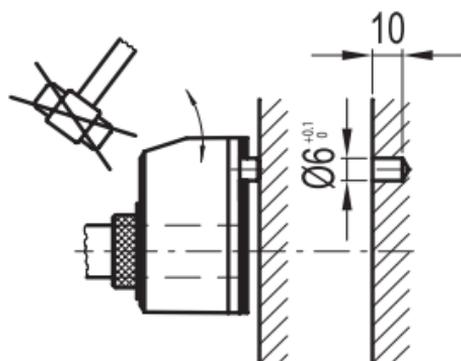
<sup>(2)</sup> Default: 600 r.p.m.

Higher rotation speeds to 600 r.p.m. can be maintained for short periods of time.

The value of the max speed affects the battery life.

### 3. Assembly

1. Drill a  $\varnothing 6 \times 10$  mm hole in the body of the machine with a 30 mm centre distance from the shaft to fit the rear referring pin.
2. Fit the indicator onto the shaft and make sure that the referring pin fits into the hole.
3. Clamp the bushing to the shaft by tightening the grub screw with hexagon socket and cup end, according to UNI 5929-85.



### 4. Turning on the system

After you have read and understood the section “Safety Instructions”, proceed by switching on the indicator.

To turn the indicator on hold  then press the key .

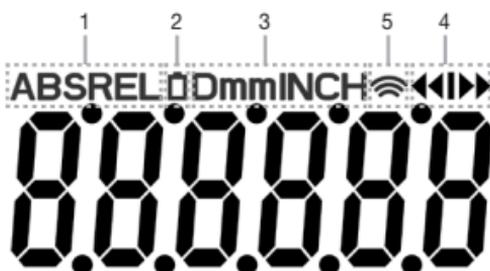
The display will light up and the indicator will be ready to be used.

#### 4.1 Turning off the system

(only for storage)

To turn the system off enter the programming mode, select the *rESEt* parameter then press the key . At this point, press the button  and then press the  key; the display will turn off and the indicator will go into low power mode of the battery.

## 5. Symbols on the display



1. Absolute / incremental mode
2. Battery
3. Unit of measure (mm / inch / degrees)
4. Target position indications
5. Indicator networked to the UC-RF

## 6. Key function



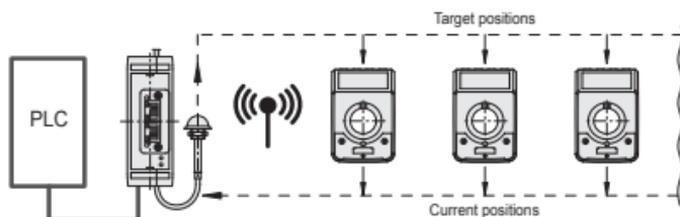
FUNCTION		
KEY	Operating mode	Programming mode
	Access to the programming mode	Parameter selection / Confirm of parameter change
	Displaying target position / Distance to go to target position	Digit decrease / Scroll for parameters
	Absolute or incremental mode selection	Digit increase / Scroll for parameters
	Unit of measure selection	Programming mode exit / Digit selection

## 7. Operating mode

### 7.1 System explanation

The system comprises the following components:

- Master UC-RF
- Max 36 electronic position indicators DD52R-E-RF



The master UC-RF is to be connected to the PLC and allows the transmission of the information between the PLC and the position indicators. The master exchanges information with the position indicators via radio frequency and facilitates the setting of the target position and the control of the current position of each indicators, actions that can be made directly from the PLC.

### 7.2 Programming the network parameter (nEt id) and the channel parameter (nEt ch)

DD52R-E-RF indicators must be networked to the UC-RF control unit via radio frequency. After setting the network number on the PLC (see UC-RF manual), select the parameter **r A d i o** on the indicator (see page 11).

The parameters to set are:

- **nEt id**: id 00/99
- **nEt ch**: ch 01/36

These parameters must be set according to the PLC recipe to guarantee a perfect communication between UC-RF and DD52R-E-RF.

### 7.3 Reaching the target position

During the regulation, the target positions are sent from the PLC to the indicators through the master. As consequence, one of the symbols reported below will appear on the top right of the display, to suggest the direction of rotation of the spindle to get to the target position:

- ◀◀ Counter-clockwise rotation. The symbol flashes.
- ▶▶ Clockwise rotation. The symbol flashes.
- ◀| Counter-clockwise rotation. Target position almost reached. The arrow flashes.
- |▶ Clockwise rotation. Target position almost reached. The arrow flashes.
- | Target position reached.

The menu function  $\_ \_ \_ D \_ \_ \_$  allows the customer to choose between the options  $d\_tArG$  or  $d\_to\_G0$ , factory setting  $d\_tArG$ .

If the function  $\_ \_ \_ D \_ \_ \_$  is set on  $d\_tArG$ , turn the spindle according to the direction shown by the flashing arrows  $\blacktriangleleft$  or  $\blacktriangleright$  to get to the target position. Press the

button  to see the target position set on the PLC.

If the function  $\_ \_ \_ D \_ \_ \_$  is set on  $d\_to\_G0$ , as soon as the indicator receives a new position from the PLC, the display starts flashing, showing the distance between the actual and the target position. To get to the target position, it is necessary to rotate the shaft following the flashing arrows  $\blacktriangleleft$  or  $\blacktriangleright$  until the number on the display becomes zero. Once the target position is reached, the display will stop flashing showing the actual position of the indicator. If the spindle is moved and get out of the desired tolerance, the display will start flashing again. To visualise the actual position while the

display is flashing, keep pressed the button .

#### 7.4 Absolute / incremental measuring mode selection

 Press the key to select the absolute or incremental measuring mode.

The measuring mode selected is shown on the display by the symbols:

- *ABS*: absolute measuring mode
- *REL*: incremental measuring mode

$\_ \_ \_ D \_ \_ \_$  | It is possible to change the key function by setting the parameter  $\_ \_ \_ D \_ \_ \_$



The available options are:

- *ArCLr* (default): passing from *ABS* to *REL* the counter is set to zero.
- *Ar*: passing from *ABS* to *REL* the counter is not set to zero. In this case, the counter is set to zero by pressing  + .
- *OFF*: the key  is disabled and does not allow changing the selected measuring mode.

To program the parameters listed above, see paragraph 8.2.

## 7.5 Unit of measure selection

Press the key to select the unit of measure needed. The options available are millimeters, inches and degrees.



The measuring mode selected is shown on the display by the symbols:

- *mm*: millimeters
- *INCH*: inches
- *D*: degrees



It is possible to change the key function by setting the parameter \_\_\_\_\_ *D*

The available options are:

- *ALL* (default): units of measure that can be selected: mm, inch, D
- *nodEG*: units of measure that can be selected: mm, inch
- *OFF*: the key is disabled and does not allow changing the selected measuring mode.

To program the parameters listed above, see paragraph 8.2.

## 7.6 Setting the absolute reference

After having selected the absolute measuring mode and stopped the shaft in the starting position or in the reference position, press the key combination



to set the absolute value to the sum of the values of the parameters *Origin* (absolute value of reference) and *OFFSET* (compensation value).

The value of compensation (offset) allows you to adjust the value shown on the display in such a way that takes into account, for example, wear or tool change. The system allows you to store up to 10 values of compensation. Press the key

combination  + . The screen will display the last compensation value used (eg *OFFS D*). Choose the desired compensation value by pressing the key , and then press the key  to confirm.

The screen will display the absolute value to the sum of the values of the parameters *Origin* and *OFFSET*.

To program the offset values, see parameter *OFFSET* of paragraph 8.2.



It is possible to change the function of the keys combination by setting the parameter *0\_\_0\_\_*

The available options are:

- *L\_OrG*: the reference value and the compensation value are set as shown above. Choose the desired offset among the 10 available values, then press the key  to confirm;
- *OFF*: the keys combination  +  is not associated to any function in the operating mode.

To program the parameters listed above, see paragraph 8.2.

### 7.7 Direct programming of the absolute reference value (source) - of the compensation value (offset) - of the reading after one revolution

The function of the keys combination  +  allows direct access to the programming of one of the following parameters, depending on the value assigned to parameter *D\_ \_ \_ \_ D*.

*D\_ \_ \_ \_ D* | It is possible to change the function of the keys combination by setting the parameter *D\_ \_ \_ \_ D*



The available options are:

- *P\_OrG*: direct programming of the absolute reference value (OrG parameter)
- *P\_StP*: direct programming of the reading after one revolution (STEP parameter)
- *P\_OfS*: direct programming of the compensation value (OFFS parameter)
- *OFF*: the keys combination  +  is not associated to any function in the operating mode

For programming the parameters listed above see parameter *D\_ \_ \_ \_ D* of paragraph 8.2.

### 7.8 Programming target position

The function of the keys combination allows, if the parameter *D\_ D\_ \_ \_* has been set on *tArGEt*, to program or to load one of the 32 target positions.

*D\_ D\_ \_ \_* | It is possible to change the function of the keys combination by setting the parameter *D\_ D\_ \_ \_*



The available options are:

- *L0Ad\_t*: choose one of the 32 available target positions, then press  to confirm
- *Pr0G\_t*: choose to program one of the 32 available target positions, then press  to start programming

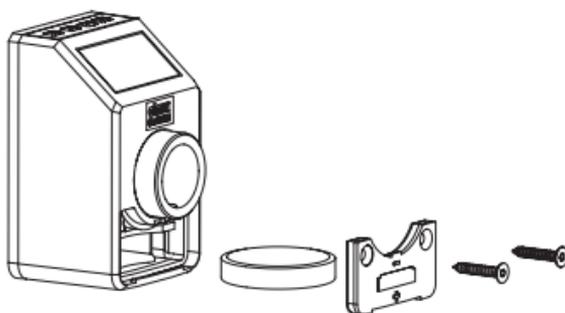
### 7.9 Battery replacement

The internal lithium CR2477 - 3.0 V battery ensures over 3 years battery life.

The symbol  is shown on the display when the battery replacement is required.

The replacement is made by simply removing the front cover without disassembly of the indicator from the control shaft and keeping unchanged all the configuration parameters.

To simply remove the battery from the battery compartment, we recommend the use of a magnet. By replacing the battery in less than 5 seconds, all the measurement and settings will not be lost. If more time is required and the display turns off, the settings of the device have to be set or verified again.



## 8. Programming mode

Press the key  for 3 seconds to enter the programming mode. Depending on the setting of *PASS* parameter (see table on page 15), the system may require you to enter a password.

Press the key   to scroll through the list of parameters.

Press the key  to exit the programming mode. The programming mode is automatically dropped after 30 seconds of inactivity.

### 8.1 Programming parameters with numeric values

Press the key  to increase the flashing digit.

Press the key  to decrease the flashing digit.

Press the key  to select the next digit.

Press the key  to confirm the value and go back to the list of parameters.



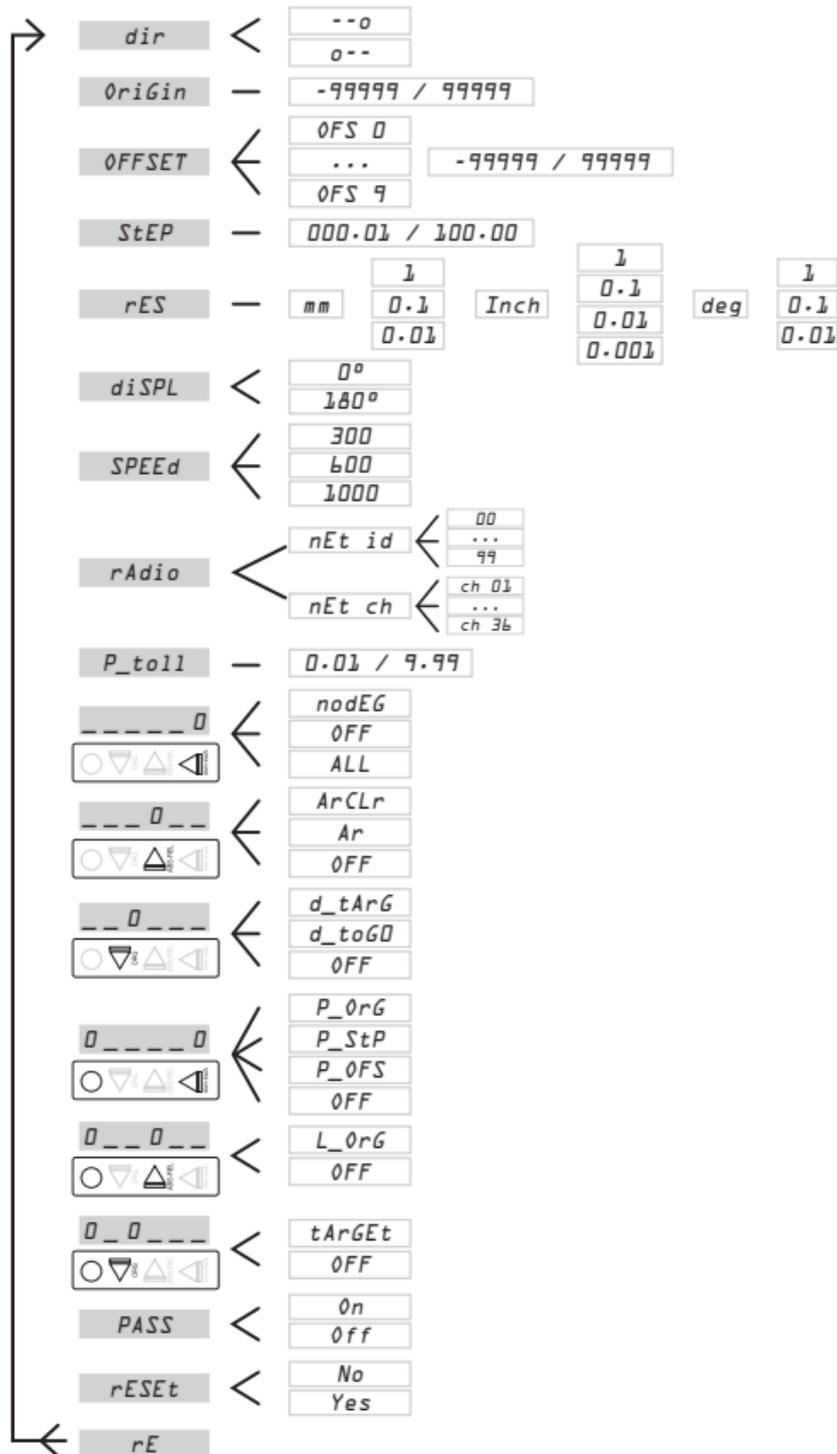
The numeric values of the parameters must be inserted taking into account the selected unit of measure.

### 8.2 Programming parameters

Press the key  for 3 seconds

Enter the password 22011 (only if *PASS* = 0n)

Press the key   to scroll through the list of parameters



The available parameters and their descriptions are listed in the following table.

Parameter	Description	Available options	Standard value
<i>dir</i>	Rotation direction	--o clockwise o-- counterclockwise	--o
<i>Origin</i>	Absolute reference value	-99999; 99999 The parameter value depends on the unit of measure selected.	0000.0
<i>OFFSET</i>	Compensation values (Offset)	-99999; 99999 The system allows you to store up to 10 compensation values: OFS 0 ... OFS 9 The parameter value depends on the unit of measure selected.	0000.0
<i>STEP</i>	Reading after one revolution	0.01; 100.00	001.00
<i>rES</i>	Resolution	mm: 1; 0.1; 0.01 inches: 0.001; 0.01; 0.1; 1 degrees: 0.01; 0.1; 1	mm: 0.1 inches: 0.01 degrees: 1
<i>diSPL</i>	Display orientation	0°: display right 180°: display reverse	180°
<i>SPEED</i>	Reading max speed [rpm]	300; 600; 1000	600
<i>rAdio</i>	Parameters to be networked to the UC-RF control unit via radio frequency.	nEt id: id0...id9 nEt ch: ch01...ch36	id 00 ch01
<i>P_toll</i>	Tolerance of target position	0.01; 9.99 The parameter value depends on the unit of measure selected.	0.10
----- 0 	Key function	ALL: selectable units of measure: mm, inch, D noDEG: selectable units of measure: mm, inch OFF: the key does not allow the unit of measure conversion	ALL

Parameter	Description	Available options	Standard value
<p>--- <i>D</i> ---</p> 	<p>Key function</p> 	<p><i>ArCLr</i>: switching from <i>ABS</i> to <i>REL</i> the counter is set to zero.</p> <p><i>Ar</i>: switching from <i>ABS</i> to <i>REL</i> the counter is not set to zero.</p> <p><i>OFF</i>: the key is not assigned to any function in the operating mode.</p>	<i>ArCLr</i>
<p>--- <i>D</i> ---</p> 	<p>Key function</p> 	<p><i>d_tArG</i>: during the positioning press the key  on the display will appear the target position to reach.</p> <p><i>d_toGD</i>: during the positioning keep pressed the key  on the display will appear the actual position of the indicator.</p> <p><i>OFF</i>: the key is not assigned to any function in the operating mode.</p>	<i>d_toGD</i>
<p><i>D</i> --- <i>D</i></p> 	<p>Key combination function</p> 	<p>The key combination activates the direct programming of the following parameters:</p> <p><i>P_OrG</i>: parameter <i>OrG</i></p> <p><i>P_StP</i>: parameter <i>StEP</i></p> <p><i>P_OrS</i>: parameter <i>OrFS</i></p> <p><i>OFF</i>: the key combination is not assigned to any function in the operating mode.</p>	<i>P_OrG</i>



## 9. Problem solving

Message on the display	Description	Action
-----	Exceeding the reading scale (-199999; 999999). The value cannot be shown on the display.	The system continues to measure displacements; the value will be shown on the display again if re-included in the reading scale.
<i>S_Err</i>	The shaft speed has exceeded the max system speed (see table on page 26).	Press  to go back to the value reading and re-set the absolute reference.
 Flashing battery symbol	Low Battery	Replace the battery (see paragraph 7.7).