DD51-E

Direct drive electronic position indicators

INSTRUCTIONS FOR USE

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2.0 Software Version Art. Nr. ZDOIU-DD51E-R01

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 Elesa sales office.

2. System description

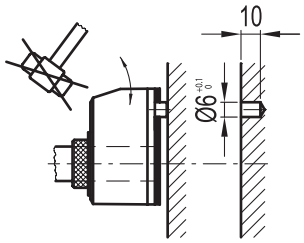
DD51-E position indicators, with battery power supply, can be used on passing through shafts in any position to provide the reading of the absolute or incremental positioning of a machine component.

Mechanical and electrical characteristics	
Power supply	Lithium battery CR2450 3.0 V
Battery life	5 years
Display	5-digit LCD of 8 mm height and special characters
Reading scale	-19999; 99999
Number of decimal digits	programmable (1)
Unit of measure	mm, inches, degrees programmable (1)
Rotation max. speed	300/600/1000 r.p.m. (2) programmable (1)
Precision	10.000 impulses/revolution
Protection level	IP65 or IP67
Working temperature	0° C ÷ +50° C
Storing temperature	-20° C ÷ +60° C
Relative humidity	max. 95% to 25° C without condensation
Interference	IEC 61000-4-2

(1) See paragraph 8.2
(2) 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 Ø 6x10 mm hole in the body of the machine with a 22 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

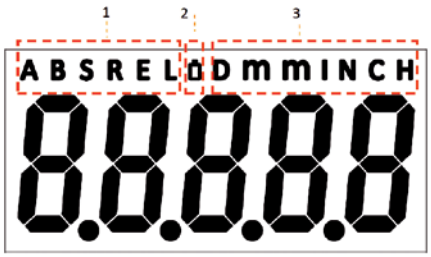
After you have read and understood the section “Safety Instructions”, proceed by switching on the indicator.

To turn the indicator on hold mm-inch while pressing 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)

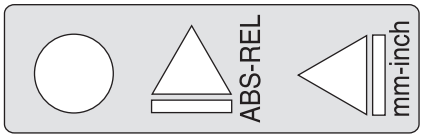
To turn the system off enter the programming mode, select the *rESEt* parameter then press the key ○. At this point, press the button ABS-REL for 5 seconds; the display will turn off and the indicator will go into low power mode of the battery.

5. Symbols on the display



1. Absolute / incremental mode
2. Battery
3. Unit of measure (mm/inch/degrees)

6. Key function



FUNCTION		
KEY	Operating mode	Programming mode
○	Access to the programming mode	Parameter selection / Confirm of parameter change
ABS-REL	Absolute or incremental mode selection	Digit increase / programming mode exit
mm-inch	Unit of measure selection	Scroll for parameters / digit selection

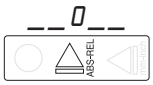
7. Operating mode

7.1 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



It is possible to change the key function by setting the parameter *__0__*

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 ○ + ABS-REL.
- *OFF*: the key ABS-REL is disabled and does not allow changing the selected measuring mode.

To program the parameters listed above, see paragraph 8.2.

7.2 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 *____0*

The available options are:

- *ALL* (default): of measure that can be selected: mm, inch, D
- *nodEG*: 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.

7.3 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 *OrG* (absolute value of reference) and *OFFS* (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 ○ + ABS-REL. The screen will display the last compensation value used (eg *OFS 0*). Choose the desired compensation value by pressing the key mm-inch, and then press the key ○ to confirm.

SThe screen will display the absolute value to the sum of the values of the parameters *OrG* and *OFFS*.

PTo program the offset values , see parameter *OFFS* 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 ○ + ABS-REL is not associated to any function in the operating mode

For programming the parameters listed above see paragraph 8.2.

7.4 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 *0___0*.

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 ○ + mm-inch is not linked to any function in the operating mode

For programming the parameters listed above see parameter *0___0* of paragraph 8.2.

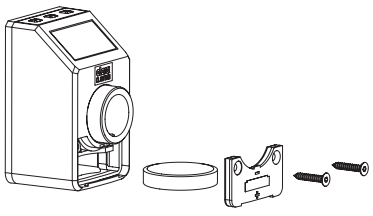
7.5 Battery replacement

The internal lithium CR2450 – 3.0 V battery ensures over 5 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.



8. Programming mode

Press the key ○ for 3 seconds to enter the programming mode. Depending on the setting of *PASS* parameter, the system may require you to enter a password.

Press the key ◁ (mm-inch) to scroll through the list of parameters.

Press the key △ (ABS-REL) 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 △ (ABS-REL) to increase the flashing digit.

Press the key ◁ (mm-inch) to select the next digit.

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

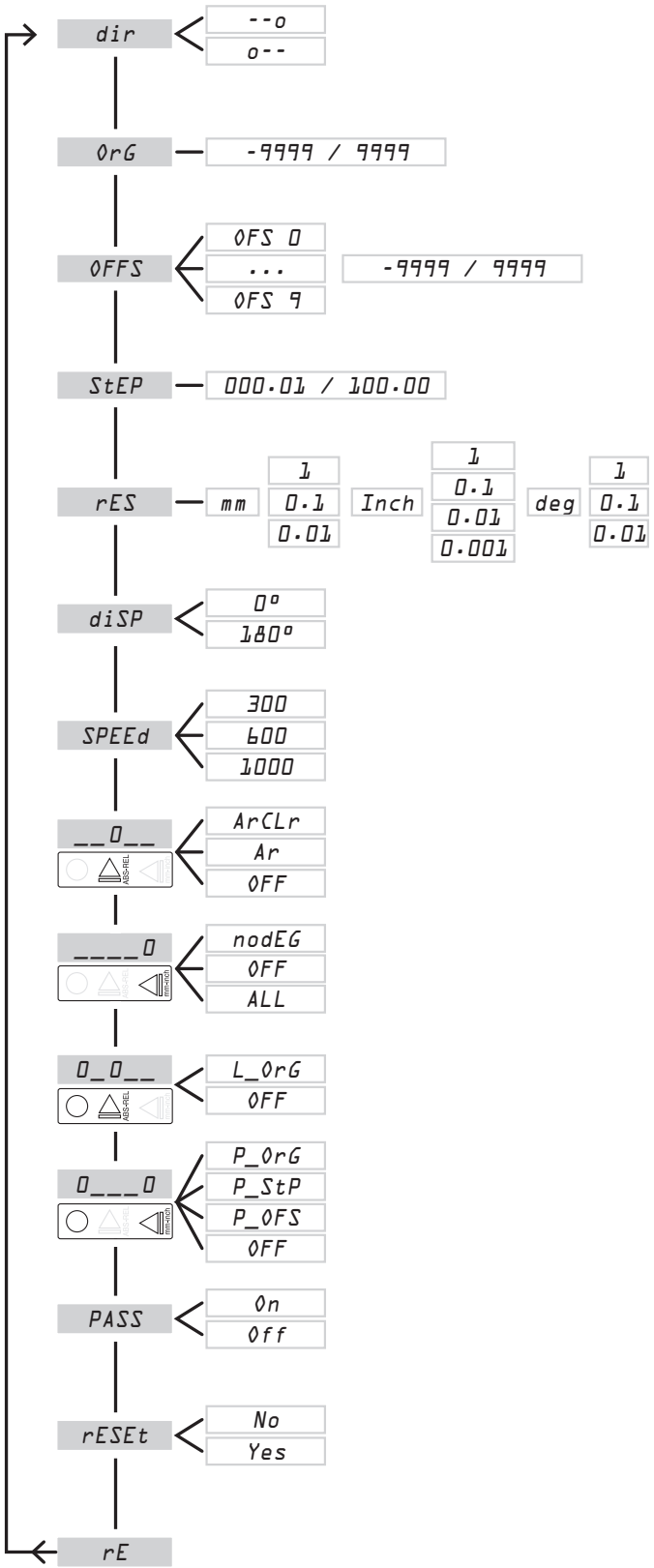
> The numeric values of the parameters must be inserted taking into account the selected unit of measure

8.2 Programming parameters

Press the key ○ for 3 seconds

Enter the password 22011 (only if *PASS* = *On*)

Press the key ◁ (mm-inch) 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
dir	Rotation direction	--o clockwise o-- counterclockwise	--o
OrG	Absolute reference value	-9999; 9999 The parameter value depends on the unit of measure selected.	0
OFFS	Compensation values (Offset)	-9999; 9999 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.	0
StEP	Reading after one revolution	0.01; 100.00	001.00
rES	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
diSP	Display orientation	0°: display right 180°: display reverse	0°
SPEEd	Reading max speed [rpm]	300; 600; 1000	600
__0__	Key function  	ArCLr: switching from ABS to REL the counter is set to zero. Ar: switching from ABS to REL the counter is not set to zero. OFF: the key is not assigned to any function in the operating mode	ArCLr
____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
0_0__	Key combination function  	L_OrG: the key combination sets the absolute value to the sum of OrG + OFFS parameters OFF: Ithe key combination is not assigned to any function in the operating mode	L_OrG
0___0	Key combination function  	The key combination activates the direct programming of the following parameters: P_OrG: parameter OrG P_StP: parameter StEP P_OFS: parameter OFFS OFF: Ithe key combination is not assigned to any function in the operating mode	P_OrG
PASS	Password	ON: the system requires the password 22011 to enter the programming mode OFF: the system does not require a password to enter the programming mode	OFF

Parameter	Description	Available options	Standard value
rESEt	Setting of Parameters to standard values	YES: the parameters are set to the standard values NO: the parameters maintain the values set by the user	NO
rE	Software version	The software version is shown on the display.	

9. Problem solving

Message on the display	Description	Action
-----	Exceeding the reading scale (-19999;99999) 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.
S_Err	The shaft speed has exceeded the max system speed.	Press the key to go back to the value reading and re-set the absolute reference.
 Flashing battery symbol	Low Battery	Replace the battery (see paragraph 7.5).