



Wireless spindle positioning system



DESIGNED
FOR ENGINEERING

WIRELESS SPINDLE POSITIONING SYSTEM

The wireless system, consisting of UC-RF control unit and up to 36 electronic position indicators DD51-E-RF and DD52R-E-RF, is designed for an efficient manual spindle positioning.

DD51-E-RF and DD52R-E-RF position indicators (Elesa Patent) are networked to UC-RF control unit via radio frequency (RF), so that connecting cables are not required for an easy and quick installation.

Current and target positions are transmitted via RF, from and to the control unit, facilitating machine set-up.

Efficient Machine Set-Up

The system allows to save time during the format alignment process.

- Once the set-up profile has been called up by PLC, UC-RF control unit transmits the target position to each DD51-E-RF and DD52R-E-RF position indicator.
- The current / target position is displayed on LCD display of DD51-E-RF and DD52R-E-RF indicator.
- The operator manually sets the position of the spindles following the arrow displayed on LCD display (clockwise/anti-clockwise rotation).
- Once all the spindles are correctly set, UC-RF control unit communicates to PLC of the machine that the set-up has been completed.

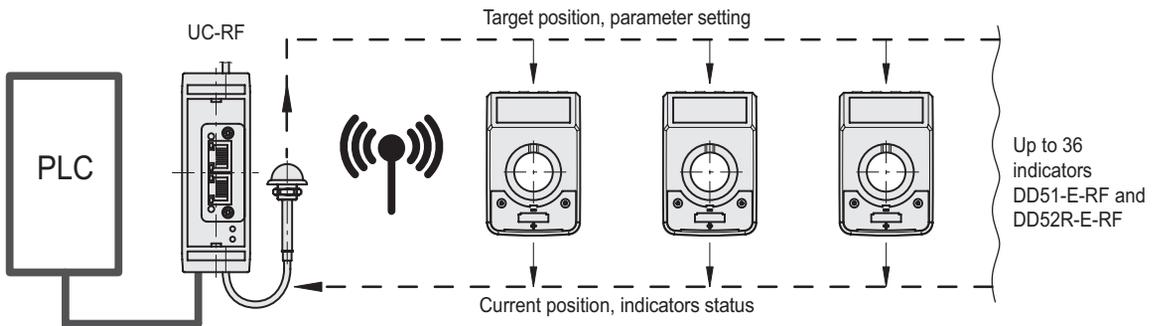
Easy installation

Up to 36 position indicators can be networked (via radio frequency) to a single control unit.

No cables required to connect the position indicators to the control unit.

Safety

The system can prevent the machine from starting up until the machine set-up is completed, avoiding production issues and risks for the operators.



WIRELESS SPINDLE POSITIONING SYSTEM

Flashing display

When the DD51-E-RF and DD52R-E-RF indicators receive a new target position from the UC-RF, the display starts flashing as indication of a non-correct position. On the display appears the distance to the new target position; the display will stop flashing once the operator reaches the zero, meaning the indicator has been correctly moved to the new target position

Net ID

Each UC-RF and each indicator can be set on up to 100 different net IDs. This feature ensures that multiple UC-RF can coexist in the same space exchanging information with the correct indicators without any interference with other machines.

Battery check and replacement

When the battery of the indicator is almost out of power, it sends a warning to the PLC, allowing a quick battery replacement.

The indicator maintains the data and position acquired during setting whilst the battery is replaced.

System protection

The radio-frequency communication between the UC-RF master and the DD indicators can also occur in environments where WIFI, BLUETOOTH, mobile phones etc are present. Besides, since the communication between the indicators and the UC-RF follows a proprietary ELESA protocol, it is not possible to have access to the PLC via the UC-RF.

LED

Four LED's on the UC-RF master allow the operator to check the correct installation and data transmission.

Electronic digital position indicator

Data transmission by radio frequency

BASE AND CASE

High-resistance polyamide based (PA) technopolymer.

Black base.

Case in the following colours:

- **C1:** RAL 7021 grey-black, glossy finish.
- **C2:** RAL 2004 orange, glossy finish.
- **C3:** RAL 7035 grey, glossy finish.
- **C55:** RAL 5005 blue, glossy finish.

Cover with perfectly sealed gasket and AISI 304 stainless steel UNI 6955 type self-tapping screws with six-lobe socket TORX®T06 (registered trademark by TEXTRON INC.).

The bonding between the base and the containment case using a high-performance sealant, in addition to preventing the penetration of dust and liquids, prevents them from detaching during use.

BOSS

AISI 304 stainless steel with $\varnothing 14$ mm H7 reamed hole, fitting to shaft by means of AISI 304 stainless steel grub screw, hexagon socket and cup end UNI 5929-85, included in the supply.

WINDOW

Transparent polyamide based (PA-T) technopolymer, moulded over the case and with a perfect seal. Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DISPLAY

5-digit LCD of 8 mm height and special characters.

The visualization parameters can be set and modified by the operator by means of appropriate keys:

- values displayed in mm, inches or degrees
- display of mode for use (absolute or incremental mode)
- reading orientation (right or reverse).

KEYBOARD

Polyester membrane. Resistant to solvents, alcohol, acids, alkalis.

INTERNAL GASKET

O-ring front sealing in NBR synthetic rubber, between the case and the boss.

Brass bushing with double O-ring sealing in NBR synthetic rubber inside the rear cavity of the base (DD51-E-RF-SST-IP67).

REAR GASKET

Foam polyethylene, supplied.

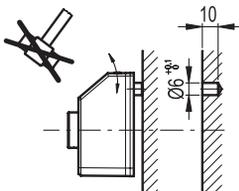
STANDARD EXECUTIONS

- **DD51-E-RF-SST-IP65:** completely sealed indicator with IP 65 protection class, see EN 60529 table (on page -).

- **DD51-E-RF-SST-IP67:** completely sealed indicator with IP 67 protection class, see EN 60529 table (on page -) obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

ASSEMBLY INSTRUCTIONS

1. Drill a $\varnothing 6$ mm by 10 mm hole in the body of the machine with a 22 mm centre distance from the spindle to fit the rear referring pin.
2. Fit the indicator onto the spindle and make sure that the referring pin fit the hole.
3. Clamp the boss to the spindle by tightening the grub screw with hexagon socket and cup end, according to UNI 5929-85.



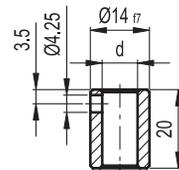
reddot winner 2023
innovative product

ELESA Original design

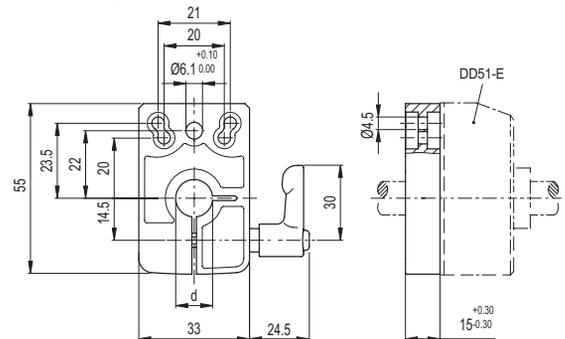
ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **MDX-51:** polyamide based (PA) technopolymer knob.
- **RB51-SST:** AISI 304 stainless steel reduction sleeves.

RB51-SST		STAINLESS STEEL	
Code	Description	dH7	Δ
CE.95941	RB51-6-SST-304	6	20
CE.95951	RB51-8-SST-304	8	18
CE.95956	RB51-10-SST-304	10	13
CE.95961	RB51-12-SST-304	12	8



- **BSA51-E:** die-cast zinc alloy bases for spindle locking, epoxy resin coating, black colour, matte finish. GN 302.1 adjustable handle with die-cast zinc alloy lever body and AISI 304 stainless steel clamping element. A $\varnothing 6.1$ mm hole to fit the referring pin of the indicator. Handle positioned either on the right or on the left. Fitting to the machine by means of two M4 cylindrical-head screws (not included in the supply).



BSA51-E

Code	Description	dF9	Δ
CE.85925	BSA51-E-8	8	108
CE.85927	BSA51-E-10	10	139
CE.85929	BSA51-E-12	12	102
CE.85931	BSA51-E-14	14	99

FEATURES AND APPLICATIONS

DD51-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. The 5-digit display of 8,0 mm height ensures excellent readability even from a distance and from different viewing angles.

The window in transparent technopolymer protects the LCD display against accidental shocks.

In the operating mode, by using the 3 function keys, it is possible to select the incremental or the absolute mode, the unit of measure (mm, inches or degrees), reset the absolute counter or load a preset source value and the preset offset value.

In the programming mode, through the 3 function keys, it is possible to program the reading after one revolution of the shaft, the direction of rotation, the display orientation, the resolution (number of decimal digits displayed), the source value and the offset value, the max. speed of rotation and set the functions of the keys among different options available.

The internal battery has a battery life of 1.5 years. A specific symbol appears on the display when the battery needs replacing. It is easy to replace the battery by removing the front cover (Fig. 1) without having to remove the indicator from the drive shaft and without losing the configuration parameters.

Further technical information available in Operating instructions.

QUICK POSITIONING SYSTEM

DD51-E-RF indicators (Elesa Patent) are networked to the control unit UC-RF via radio frequency (RF), constituting a wireless system for rapid positioning of the machine parts (fig.2).

The wireless connection allows:

- reading of the current position
- setting of the target position
- configuration of all operational parameters

The radio frequency system network allows different machines to coexist in the same space without problems of mutual interference.

This system is particularly suitable for applications that require frequent format changes, facilitating the correct adjustment of the target/current position of the machine parts, also representing a safety system. In fact, even if a single DD51-E-RF indicator is not placed in the target position, PLC doesn't allow the beginning of the machine production cycle, thus avoiding production issues.

The installation of the system is quick and easy as it does not require the use of connecting cables between the control unit and the indicators.

Further technical information available in Operating instructions.

COMPATIBILITY

The "-W2" electronic indicators are compatible exclusively with the electronic indicators and control unit of the same "-W2" version.

Mechanical and electrical characteristics	
Power supply	Lithium battery CR2450 3.0 V
Battery life	up to 1.5 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)
Resolution	10.000 impulses / revolution
Protection class	IP65 or IP67
Working temperature	0 ÷ 50 °C
Storing temperature	-20 ÷ +60 °C
Relative humidity	Max. 95% at 25°C without condensation
Conditions of use	For use in closed and sheltered places only
Altitude	Up to 2000 m
RF frequencies	2400-2416MHz

(1) See the operating instructions.

(2) Default: 600 r.p.m.

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

The maximum speed value, the number of drives and the frequency of transmissions affect battery life.

Battery life depends on the conditions of use (setup, temperature, ...). The indicated value is an estimate made in temperature conditions > 20 °C and <30 °C, and default setup. Furthermore, this value refers to the condition of the device when it leaves the Elesa factory. Long storage times must always be considered for the estimation of the battery life when the device becomes operational.

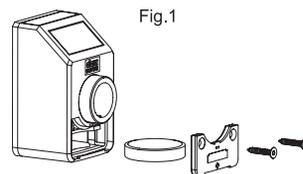


Fig.1

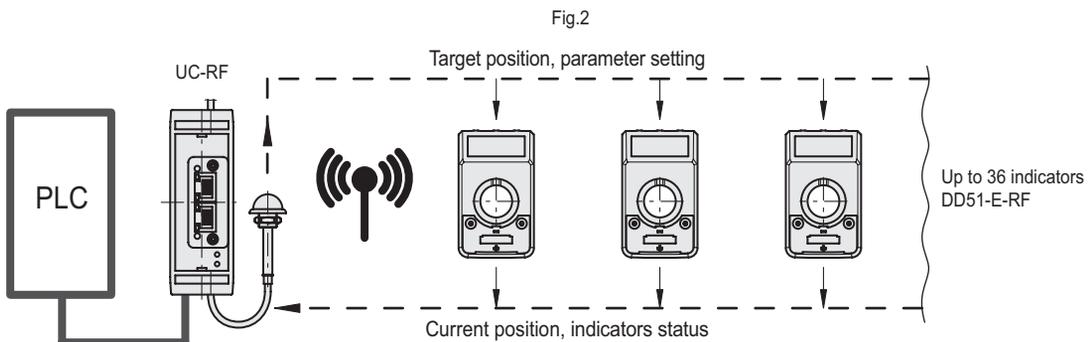
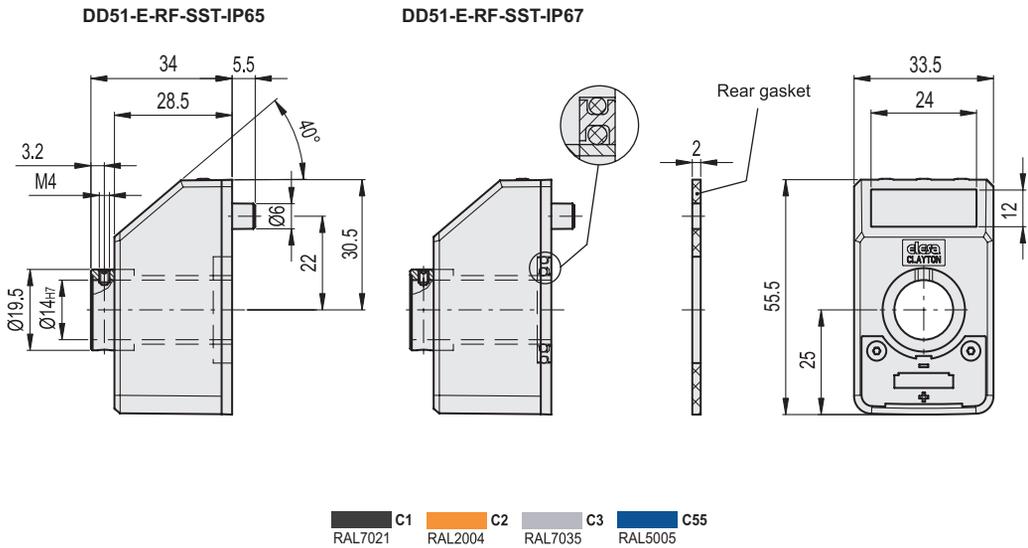


Fig.2



C1 RAL7021
 C2 RAL2004
 C3 RAL7035
 C55 RAL5005

DD51-E-RF

STAINLESS STEEL

Code	Description	⚖
CE.99303-W2	DD51-E-RF-W2-SST-F.14-IP65-C1	166
CE.99302-W2	DD51-E-RF-W2-SST-F.14-IP65-C2	166
CE.99301-W2	DD51-E-RF-W2-SST-F.14-IP65-C3	166
CE.99305-W2	DD51-E-RF-W2-SST-F.14-IP65-C55	166
CE.99313-W2	DD51-E-RF-W2-SST-F.14-IP67-C1	172
CE.99312-W2	DD51-E-RF-W2-SST-F.14-IP67-C2	172
CE.99311-W2	DD51-E-RF-W2-SST-F.14-IP67-C3	172
CE.99315-W2	DD51-E-RF-W2-SST-F.14-IP67-C55	172

DD52R-E-RF



Electronic digital position indicator

Data transmission by radio frequency

BASE AND CASE

High-resistance polyamide based (PA) technopolymer. Black base.

Case in the following colours:

- **C1:** RAL 7021 grey-black, glossy finish.
- **C2:** RAL 2004 orange, glossy finish.
- **C3:** RAL 7035 grey, glossy finish.
- **C55:** RAL 5005 blue, glossy finish.

Cover with perfectly sealed gasket and AISI 304 stainless steel UNI 6955 type self-tapping screws with six-lobe socket TORX®T06 (registered trademark by TEXTRON INC.).

The bonding between the base and the containment case using a high-performance sealant, in addition to preventing the penetration of dust and liquids, prevents them from detaching during use.

BOSS

AISI 304 stainless steel with $\varnothing 20$ mm H7 reamed hole, fitting to shaft by means of AISI 304 stainless steel grub screw, hexagon socket and cup end UNI 5929-85, included in the supply.

WINDOW

Transparent polyamide based (PA-T) technopolymer, moulded over the case and with a perfect seal. Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DISPLAY

- 6-digit LCD of 12,0 mm height and special characters.
- The visualization parameters can be set and modified by the operator by means of appropriate keys:
- values displayed in mm, inches or degrees
- display of mode for use (absolute or incremental mode)
- reading orientation (right or reverse).

KEYBOARD

Polyester membrane. Resistant to solvents, alcohol, acids, alkalis.

INTERNAL GASKET

O-ring front sealing in NBR synthetic rubber, between the case and the boss.

Brass bushing with double O-ring sealing in NBR synthetic rubber inside the rear cavity of the base (DD52R-E-RF-SST-IP67).

REAR GASKET

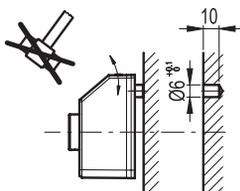
Foam polyethylene, supplied.

STANDARD EXECUTIONS

- **DD52R-E-RF-SST-IP65:** completely sealed indicator with IP 65 protection class, see EN 60529 table on page.
- **DD52R-E-RF-SST-IP67:** completely sealed indicator with IP 67 protection class, see EN 60529 table on page obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

ASSEMBLY INSTRUCTIONS

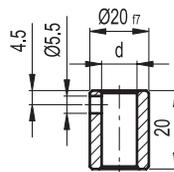
1. Drill a $\varnothing 6$ mm by 10 mm hole in the body of the machine with a 30 mm centre distance from the spindle to fit the rear referring pin.
2. Fit the indicator onto the spindle and make sure that the referring pin fit the hole.
3. Clamp the boss to the spindle by tightening the grub screw with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



ELESA Original design

ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **MDX-52:** polyamide based (PA) technopolymer knob.
- **RB52-SST:** AISI 304 stainless steel reduction sleeves.

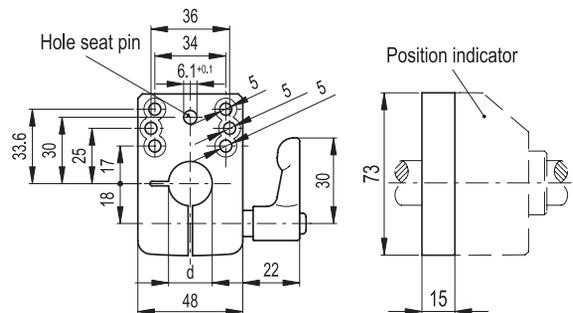


RB52-SST

STAINLESS STEEL

Code	Description	dh7	Δ
CE.97941	RB52-12-SST-304	12	33
CE.97951	RB52-14-SST-304	14	26
CE.97956	RB52-15-SST-304	15	23
CE.97961	RB52-16-SST-304	16	19

- **BSA52-E:** die-cast zinc alloy bases for spindle locking, epoxy resin coating, black colour, matte finish. GN 302 adjustable handle with die-cast zinc alloy lever body and AISI 304 stainless steel clamping element. A $\varnothing 6.1$ mm hole to fit the referring pin of the indicator. Handle positioned either on the right or on the left. Fitting to the machine by means of two cylindrical-head screws (not included in the supply).



BSA52-E

Code	Description	df9	Δ
CE.99091	BSA52-E-12	12	239
CE.99093	BSA52-E-14	14	233
CE.99094	BSA52-E-15	15	35
CE.99095	BSA52-E-16	16	228
CE.99099	BSA52-E-20	20	221

FEATURES AND APPLICATIONS

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. The 6-digit display of 12.0 mm height ensures excellent readability even from a distance and from different viewing angles.

The window in transparent technopolymer protects the LCD display against accidental shocks.

In the operating mode, by using the 4 function keys, it is possible to select the incremental or the absolute mode, the unit of measure (mm, inches or degrees), reset the absolute counter or load a preset source value and the preset offset value.

In the programming mode, through the 4 function keys, it is possible to program the reading after one revolution of the shaft, the direction of rotation, the display orientation, the resolution (number of decimal digits displayed), the source value and the offset value, the max. speed of rotation and set the functions of the keys for the different options available.

The internal battery has a battery life of 2.5 years. A specific symbol appears on the display when the battery needs replacing. It is easy to replace the battery by removing the front cover (Fig. 1) without having to remove the indicator from the drive shaft and without losing the configuration parameters.

QUICK POSITIONING SYSTEM

DD52R-E-RF indicators (Elesa Patent) are networked to the control unit UC-RF via radio frequency (RF), constituting a wireless system for rapid positioning of the machine parts (fig.2).

The wireless connection allows:

- reading of the current position
- setting of the target position
- configuration of all operational parameters

The radio frequency system network allows different machines to coexist in the same space without problems of mutual interference. This system is particularly suitable for applications that require frequent format changes, facilitating the correct adjustment of the target/current position of the machine parts, also representing a safety system. In fact, even if a single DD52R-E-RF indicator is not placed in the target position, PLC doesn't allow the beginning of the machine production cycle, thus avoiding production issues.

The installation of the system is quick and easy as it does not require the use of connecting cables between the control unit and the indicators.

Further technical information available in "Operating instructions".

COMPATIBILITY

The "-W2" electronic indicators are compatible exclusively with the electronic indicators and control unit of the same "-W2" version.

Mechanical and electrical characteristics	
Power supply	Lithium battery CR2477 3.0 V
Battery life	up to 2.5 years
Display	6-digit LCD of 12 mm height and special characters
Reading scale	-199999; 999999
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)
Resolution	10.000 impulses / revolution
Protection class	IP65 or IP67
Working temperature	0 ÷ 50 °C
Storing temperature	-20 ÷ +60 °C
Relative humidity	Max. 95% at 25°C without condensation
Conditions of use	For use in closed and sheltered places only
Altitude	Up to 2000 m
RF frequencies	2400-2416MHz

(1) See the operating instructions.

(2) Default: 600 r.p.m.

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

The maximum speed value, the number of drives and the frequency of transmissions affect battery life.

Battery life depends on the conditions of use (setup, temperature, ...). The indicated value is an estimate made in temperature conditions > 20 °C and <30 °C, and default setup. Furthermore, this value refers to the condition of the device when it leaves the Elesa factory. Long storage times must always be considered for the estimation of the battery life when the device becomes operational.

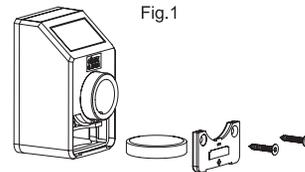


Fig.1

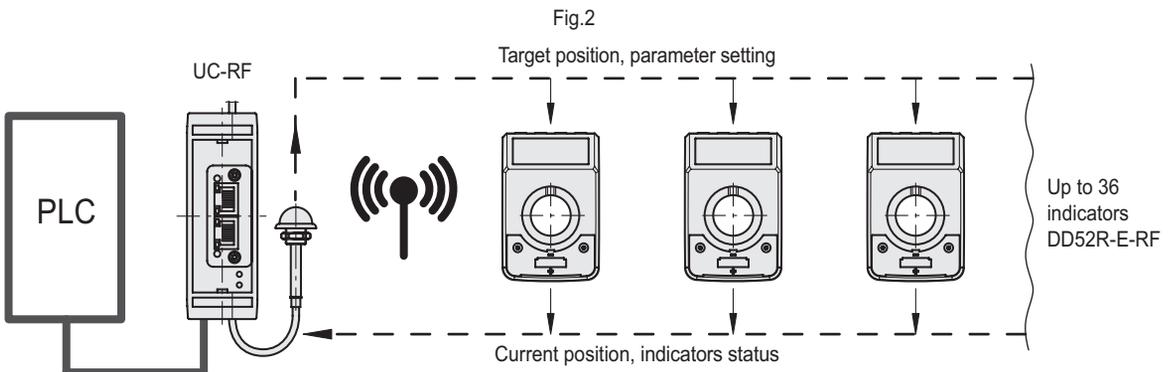


Fig.2

Control unit for RF indicators

PLC connection, data transmission via radio frequency

MATERIAL

ABS reinforced polycarbonate, self-extinguishing.

STANDARD EXECUTIONS

- **UC-RF ETHERNET/IP**: control unit with Ethernet/IP serial interface.
- **UC-RF EtherCat**: control unit with EtherCat serial interface.
- **UC-RF PROFINET IO**: control unit with Profinet IO serial interface.
- **UC-RF MODBUS TCP**: control unit with Modbus TCP serial interface.

UC-RF control unit can manage up to 36 position indicators. DD51R-E-RF or DD52R-E-RF or MPI-R10-RF. Compatible for mounting on DIN RAIL. Two LEDs (green and red) for correct diagnostics.

FEATURES AND APPLICATIONS

The UC-RF control unit, connected to the PLC via one of the available buses, allows the latter to read the current position measured by the connected indicators, their status (battery status, errors, settings,...), their configuration parameters and to transmit to each one a possible target position and to configure the parameters (Fig.1).

UC-RF is compatible with all Eles RF indicators such as: DD51-E-RF, DD52R-E-RF and MPI-R10-RF, receiving their actual position from the indicators (Fig.1).

The radio frequency system network allows different machines to coexist in the same space without problems of mutual interference. This system is particularly suitable for applications that require frequent format changes, facilitating the correct adjustment of the target/current position of the machine parts, also representing a safety system.

In fact, if even just one indicator were not in the target position, the PLC would not allow the machine's production cycle to start, thus avoiding starting incorrect productions.

ACCESSORIES ON REQUEST

FC-UC: antenna extensions.

SPECIAL EXECUTION ON REQUEST

Control unit with interface to other buses.

COMPATIBILITY

The control unit "-W2" version is compatible exclusively with the electronic indicators and the magnetic measuring systems of the same "-W2" version.



ELESA Original design

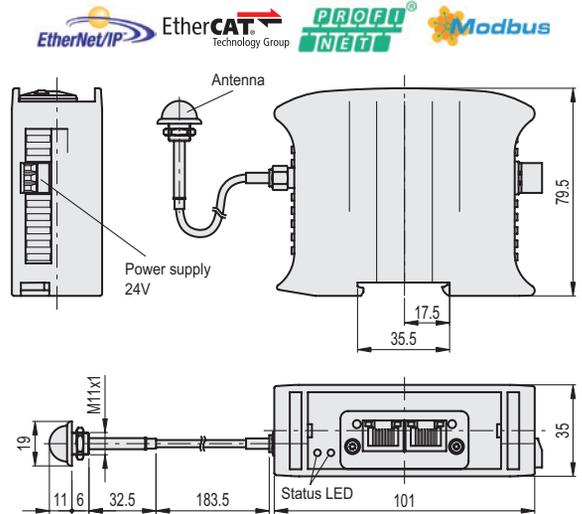
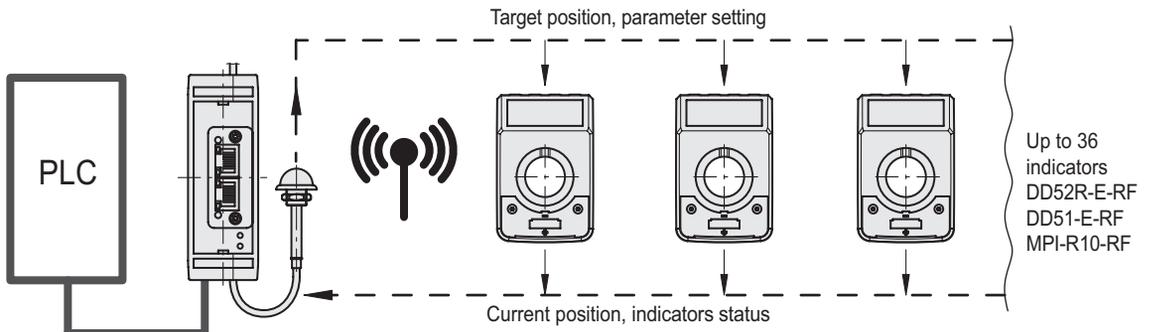


Fig.1



Code	Description	⚖
CE.99225-W2	UC-RF-W2 ETHERNET/IP	272
CE.99226-W2	UC-RF-W2 ETHERCAT IO	265
CE.99231-W2	UC-RF-W2 PROFINET IO	265
CE.99229-W2	UC-RF-W2 MODBUS TCP	275



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