



Rotary controls



Gravity indicators

Positive drive indicators

Direct drive indicators

Handwheels with indicator

ELESA-CLAYTON position indicators

General features

ELESA-CLAYTON rotary controls are used to set and regulate a wide variety of machine functions.

In general these indicators are used to regulate flows, capacities, strokes, setting of speed variators, etc.

Each device consists of:

- a handwheel/knob, to manoeuvre the control spindle, thus changing the position of the machine element
- a position indicator, which provides the position of the machine element.

Position indicators

ELESA-CLAYTON position indicators can be classified according to the type of reading or movement.

The indicators are normally supplied separately from their relative handwheels/knobs, except for integral models, whose indicator is fitted in during the production.

Type of reading

Analogue: the reading is displayed by means of two rotating pointers over a graduated dial.

Digital-Analogue: the reading is directly displayed by means of a roller counter and a rotating pointer over a graduated dial.

Digital: the reading is directly displayed by means of a roller counter.

LCD Digital: the reading is directly displayed by means of a digital electronic display.

The analogue indicators are normally provided with a graduated dial and two pointers which indicate the number of turns and part of a turn made by the control spindle starting from an initial position zero.

The indicators with digital-analogue, digital and LCD digital reading are provided with a roller counter or a display which indicates the linear displacement of the machine element connected to the control spindle from the initial position zero.

Type of functioning

Gravity Movement: is used when the handwheel spindle is horizontal or max 60° inclined. The rotation of the handwheel with the indicator makes the pointers move while the dial, appropriately counterbalanced, is kept still by the gravity force.

Positive drive Movement: is used on spindles in any position. The rotation of the handwheel with the indicator makes the pointers move while the dial is kept still by an anchor pin fitted to the machine.

Direct drive Movement: is used on control spindles in any position, the indicator is directly mounted on the control spindle and is kept in position by means of a referring back pin.

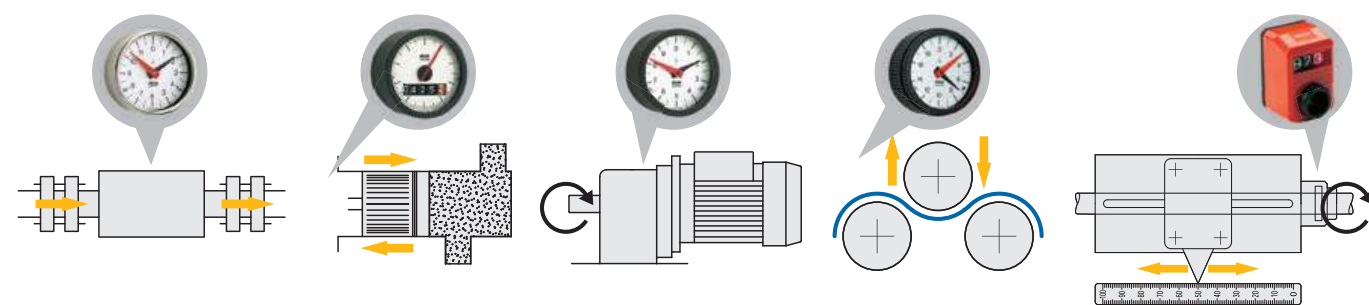
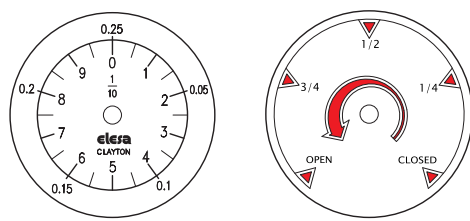
How to select the position indicators

- Establish if it is necessary to display a number of turns or a linear displacement. For the first application choose an analogue indicator. For the second one choose a digital-analogue, digital or LCD digital indicator.
- Establish the indicator and the spindle position on which depends the choice of the requested movement: gravity, positive drive or direct drive.
- Establish the required ratio for analogue types or the reading after one revolution for the following types: digital-analogue, digital and LCD digital.
- Establish the direction of rotation.
For clockwise increasing readings (right) = D.
For anticlockwise increasing readings (left) = S.
- Consider the conditions of use of the handwheel i.e. outdoors, vibrations, corrosive environments, etc. See the complete data on the page of the chosen indicator.
- Choose the appropriate handwheel/knob for the application considering the diameter and the grip required to transmit the necessary torque. Other factors to take into consideration are the control spindle diameter and whether a handle is required for quick operations.

Special executions

ELESA-CLAYTON position indicators standard range available on this catalogue satisfies most applications. Changes to adapt the indicator to particular applications are possible, for example:

- special dials for indicators with analogue or digital-analogue reading, to be developed on the customer's indications
- stainless steel metal parts for application on machines and equipment where laws or particular hygienic and environmental factors make it mandatory to use corrosion resistant materials
- gravity indicators with analogue reading with glycerine-filling for high vibration applications, which may interfere with the reading, and for avoiding condensation on the indicator window
- special ratios on the customer's request and for sufficient quantities, developed by ELESA Technical Department.



Type of reading	Type of Functioning	Type of indicator	
Analogue	Gravity	GA01 - GA02 - GA05 metal case page 694	
		GA11 - GA12 plastic case page 695	
		MBT-GA indicator fitted in the plastic knob page 696	
		PA01 - PA02 - PA05 metal case page 699	
	Positive drive	PA11 - PA12 plastic case page 700	
		GW12 plastic case page 697	
Digital-analogue	Gravity	MBT-GW indicator fitted in the plastic knob page 698	
		PW12 plastic case page 701	
		DD50 page 716	
Digital	Direct drive	DD51 page 718	
		DD52R page 721	
		DD51-E page 724	
LCD digital	Direct drive	DD52R-E page 726	
		DE51 page 728	
		MPI-15 page 732	

Gravity position indicators

Features

Suitable for use on control spindles with horizontal or max 60° inclined position.

The movement is housed in a sealed case (fig. 1). It consists of a counterweight system, fitted on a precision ballrace, which rotates on a central spindle integral with the indicator case, fitted on the handwheel/knob. At the end of the spindle there is a red pointer, which rotates with the handwheel/knob. A series of gears with different ratios transmits the rotation of the spindle to a black pointer. On the counterweight, a graduated dial is also fixed. If the indicator is fitted on spindles with horizontal position (or max 60° inclined) the dial is kept still by the gravity force and the pointers rotate over it when the handwheel/knob turns.

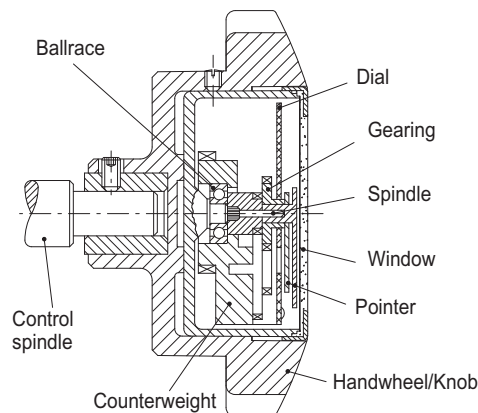


figure 1

Ratios

Each complete turn of the big pointer (red) corresponds to a fraction of turn of the small pointer (black). The number of turns of the red pointer, to make the black pointer to carry out one complete turn, is the ratio of the indicator.

Example: a ratio of 12:1 means that 12 turns of the red pointer correspond to a complete turn of the black pointer (fig. 2). 12 turns of the handwheel cover the entire setting range. For each turn of the handwheel, the black pointer indicates 1/12 of the entire dial.



figure 2

Choice of the indicator ratio

- Set the control spindle to the initial or referring position.
- Count the number of turns of the control spindle to cover the entire setting range.
- The result of this operation is the ratio. Should it not correspond to a standard ratio, choose the next highest one.
- For an optimal dial reading, and therefore for a more precise reading, we recommend to choose a ratio which is as near as

possible to the handwheel turns required to cover the entire setting range. For instance, if 11 turns are required, the ratio 12:1 is the most convenient, because 11/12 of the available graduation will be used. If 24:1 ratio would be chosen, only 11/24 of the graduation would be used and reading would be less accurate.

- Indicators with standard ratios are normally on stock to suit most requirements.

Dials

Dials are available for all standard ratios in both clockwise (D) or anticlockwise (S) configurations.

Standard dials give a number which can be translated, by means of conversion tables, to the value of the set-up executed.

On request and for sufficient quantities, special dials with marks or customised graduations can be supplied to have a direct reading.

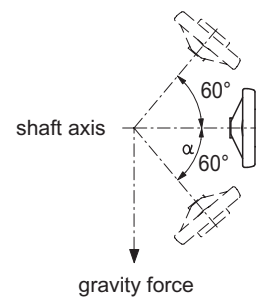


figure 3

Accuracy

The gravity indicator is more accurate when used on horizontal control spindles. It can be however used on spindles max 60° inclined, but the accuracy decreases as the angle of inclination α increases (fig. 3).

Assembly instructions

Assembly of the indicators to handwheels/knobs:

- couple the handwheel to the control spindle by means of a pin or a grub screw.
- set the control spindle to the initial or referring position, by rotating the handwheel.
- turn the indicator, by keeping it in the hands, until the pointers are in zero position.
- fit the zeroed indicator into the handwheel/knob and uniformly tighten the radial securing screws with a moderate torque to prevent distortion of the indicator case and thus locking the movement.

Assembly of integral indicators (built-in in the handwheel):

- set the control spindle to the initial or referring position.
- turn the indicator, by keeping it in the hands, until the pointers are in zero position.
- couple the integral indicator to the control spindle by tightening the grub screw, after checking that spindle and indicator are in zero position.

Possible assembly

Handwheels - Knobs	Gravity Indicators					
	GA01	GA02	GA05	GA11	GA12	GW12
	page 694			page 695		page 697
IZN-XX page 702	•	•		•	•	•
MBT-XX page 703	•	•		•	•	•
VHT-XX page 704	•	•		•	•	•
VC.792-XX page 705	•	•		•	•	•
VDSC-XX page 706		•			•	•
VDN-XX page 709			•			
VDC-XX page 710	•	•	•	•	•	•
VRTP-XX page 712		•			•	•
VAD-XX page 713	•	•	•	•	•	•

Features

Suitable for use on control spindles in any position. The movement is housed in a sealed case (fig.1). The handwheel/knob, containing the indicator, is coupled to the control spindle. On the rear of the handwheel/knob, a flange with internal crown gear wheel (shrouded) is fitted to the machine frame by means of an anchor pin (or similar). By so doing, during handwheel rotation, the flange is integral with the machine. The rotation of the handwheel causes the planet pinion to rotate, transmitting in this way the movement inside the indicator case. The rotation is then transmitted to both pointers by means of a gearing, while the graduated dial remains still, thanks to the fixing to the machine frame, by means of the anchor pin.

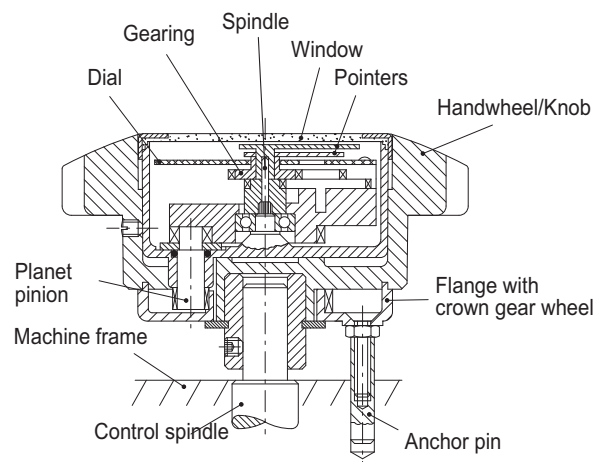


figure 1

Ratios

Each complete turn of the big pointer (red) corresponds to a fraction of turn of the small pointer (black). The number of turns of the red pointer, to make the black pointer to carry out one complete turn, is the ratio of the indicator. Example: a ratio of 12:1 means that 12 turns of the red pointer correspond to a complete turn of the black pointer (fig. 2). 12 turns of the handwheel cover the entire setting range. For each turn of the handwheel, the black pointer indicates 1/12 of the entire dial.



figure 2

Choice of the indicator ratio













- Set the control spindle to the initial or referring position.
- Count the number of turns of the control spindle to cover the entire setting range.
- The result of this operation is the ratio. Should it not correspond to a standard ratio, choose the next highest one.
- For an optimal dial reading, and therefore for a more precise reading, we recommend to choose a ratio which is as near as possible to the handwheel turns required to cover the entire setting range. For instance, if 11 turns are required, the ratio 12:1 is the most convenient, because 11/12 of the available graduation will be used. If 24:1 ratio would be chosen, only 11/24 of the graduation would be used and reading would be less accurate.
- Indicators with standard ratios are normally on stock to suit most requirements.

Dials

Dials are available for all standard ratios in both clockwise (D) or anticlockwise (S) configurations. Standard dials give a number which can be translated, by means of conversion tables, to the value of the set-up executed. On request and for sufficient quantities, special dials with marks or customised graduations can be supplied to have a direct reading.

Assembly instructions

- Drill a bore in the machine frame for the rear anchor pin of the flange.
- Set the control spindle to the initial or referring position.
- Remove the black protection cap of the planet pinion, turn the latter until the pointers are in zero position.
- Take the chosen handwheel/knob and mount the supplied anchor pin on the screw protruding from the rear flange. Be sure that the hole for the indicator planet pinion is at 12 o'clock. Turn the rear flange and position the anchor pin in line with the referring bore drilled on the machine.
- Gently fit the zeroed indicator into the handwheel/knob, inserting the planet pinion smoothly into the corresponding hole. To make the fitting of the indicator easier, gently turn by some degrees the rear flange until the planet pinion is geared to the internal crown gear wheel. Check that the indicator is zeroed and that the screw for the anchor pin is in the correct position.
- Uniformly tighten the lateral grub screws for fixing the indicator case with a moderate torque, to prevent distortion of the case itself and thus locking the movement.
- Adjust the height of the anchor pin so that no undue strain is caused to the flange and tighten the locknut.
- Couple the handwheel with the indicator to the zeroed control spindle. Be sure that the indicator pointers are in zero position and that the anchor pin is in line with the referring bore on the machine.
- Pin the handwheel on the spindle.
- Check the right functioning of the indicator over all the rotation range.

Handwheels - Knobs	Positive drive indicators					
						
	PA01	PA02	PA05	PA11	PA12	PW12
	page 699			page 700		page 701
	MBT-XX page 703	•	•	•	•	•
	VHT-XX page 704	•	•	•	•	•
	VC.792-XX page 705	•	•	•	•	•
	EWW-XX page 708		•		•	•
	VDC-XX page 710	•	•	•	•	•
	VAD-XX page 713	•	•	•	•	•



Position indicators

gravity drive, steel

CASE

Zinc-plated steel.

BEZEL

AISI 303 stainless steel.

WINDOW

Glass.

DIAL

Natural matte anodised aluminium.
Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

The black pointer indicates the number of turns of the spindle from the start position (0); the red pointer indicates the fractions of turn. Ballrace rotation: maximum reading accuracy.

RATIO

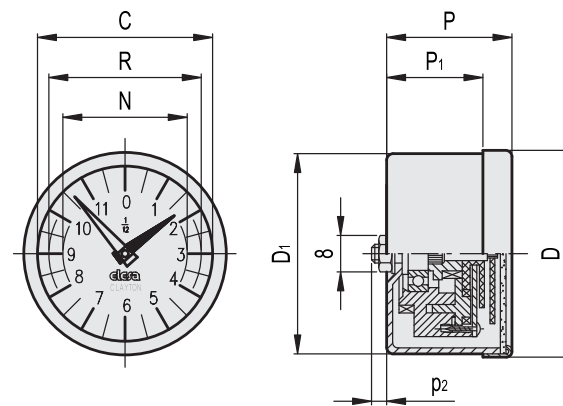
To choose the ratio see "Gravity position indicators introduction" (on page 690).

FEATURES AND APPLICATIONS

The knobs with integral gravity position indicator are suitable on spindles with horizontal or max 60° inclined axis.
To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 691).

SPECIAL EXECUTIONS ON REQUEST

- Special dial with logo or customized graduations
- Special ratios
- Liquid filled
- Single pointer
- Window in plexiglass instead of glass.



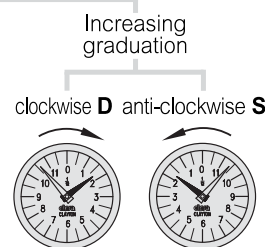
Series	D	P	D1	P1	p2	C	R	N	⚖️
GA01	49.6	30	48.3	20.5	1.6	42	37	30	140
GA02	68.4	32	67.0	19.3	1.0	60	51	44	210
GA05	112.7	32	111.0	18.8	1.0	102	89	76	420

Example of description for ordering



Ratio	Description	Ratio	Description	Ratio	Description	Ratio	Description
2	0002	12	0012	36	0036	100	0100
4	0004	15	0015	40	0040	120	0120
5	0005	16	0016	48	0048	150 *	0150
6	0006	20	0020	50	0050	200 *	0200
8	0008	24	0024	60	0060		
10	0010	30	0030	72	0072		

* Available only for GA02 and GA05



Position indicators

gravity drive, technopolymer

CASE

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.
Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable).
Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium.
Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

The black pointer indicates the number of turns of the spindle from the start position (0); the red pointer indicates the fractions of turn. Ballrace rotation: maximum reading accuracy.

RATIO

To choose the ratio see "Gravity position indicators introduction" (on page 690).

IP PROTECTION

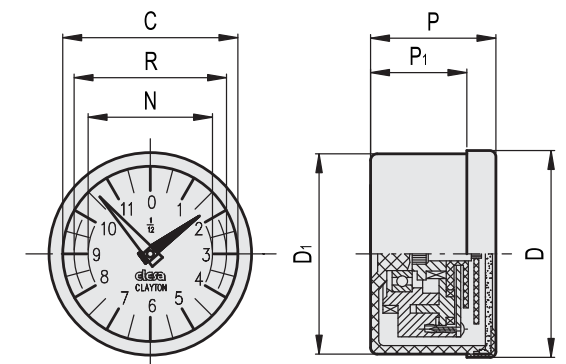
The ultrasonic welding of the window to the case guarantees the complete sealing with IP 67 protection class, see EN 60529 table (on page A23).

FEATURES AND APPLICATIONS

The knobs with integral gravity position indicator are suitable on spindles with horizontal or max 60° inclined axis.
To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 691).

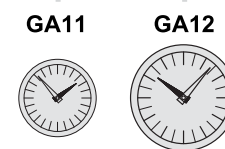
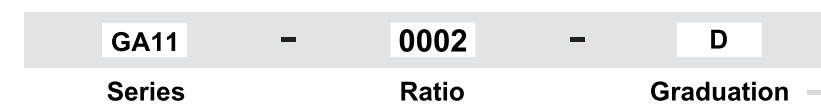
SPECIAL EXECUTIONS ON REQUEST

- Special dial with logo or customized graduations
- Special ratios
- Liquid filled
- Single pointer



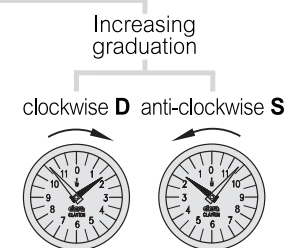
Series	D	P	D1	P1	C	R	N	⚖️
GA11	49.8	30	48.2	23	42	37	30	75
GA12	68.5	32	67.0	25	60	51	44	125

Example of description for ordering



Ratio	Description	Ratio	Description	Ratio	Description	Ratio	Description
2	0002	12	0012	36	0036	100	0100
4	0004	15	0015	40	0040	120	0120
5	0005	16	0016	48	0048	150 *	0150
6	0006	20	0020	50	0050	200 *	0200
8	0008	24	0024	60	0060		
10	0010	30	0030	72	0072		

* Available only for GA12



Knobs with integral indicator

gravity drive, technopolymer

DIAMOND CUT KNURLED KNOB

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish. Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable). Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium. Clockwise (D) or anti-clockwise (S) graduation, black colour.

STANDARD EXECUTION

Black-oxide steel boss, H7 reamed blind hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

READING

The black pointer indicates the number of turns of the spindle from the start position (0); the red pointer indicates the fractions of turn. Ballrace rotation: maximum reading accuracy.

RATIO

To choose the ratio see "Gravity position indicators introduction" (on page 690).

IP PROTECTION

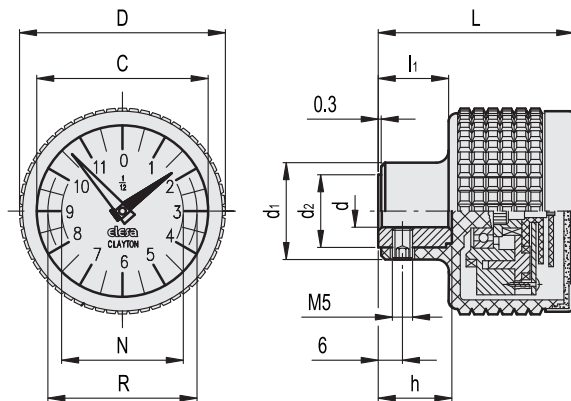
The ultrasonic welding of the window to the case guarantees the complete sealing with IP 67 protection class, see EN 60529 table (on page A23).

FEATURES AND APPLICATIONS

The knobs with integral gravity position indicator are suitable on spindles with horizontal or max 60° inclined axis.

SPECIAL EXECUTIONS ON REQUEST

- special dial with logo or customized graduations
- special ratios
- liquid filled
- single pointer.



Series	D	L	d1	d2	l1	dH7	h	C	R	N	⚖
MBT.50-GA11	51	48	24	18	16.5	8	17	42	37	30	120
MBT.70-GA12	70	52	28	22	19	10	22	60	51	44	200

Digital-analogue position indicators

gravity drive, technopolymer

CASE

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish. Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable). Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium. Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

Five-digits roller counter and one red pointer which turns on the graduated dial. The digit of the red roll shows the decimal values, while the pointer shows the hundredth. The display indicates the displacement of the mechanism controlled by the spindle from the start position (0). One complete turn of the machine spindle corresponds to a turn of the handwheel/knob and consequently to a turn of the red pointer. A turn of the red pointer corresponds to a determinate reading on the counter (see "reading on the counter after one revolution of the red pointer" in the table). Ballrace rotation: maximum reading accuracy.

IP PROTECTION

The ultrasonic welding of the window to the case guarantees the complete sealing with IP 67 protection class, see EN 60529 table (on page A23).

FEATURES AND APPLICATIONS

The knobs with integral gravity position indicator are suitable on spindles with horizontal or max 60° inclined axis. To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 691).

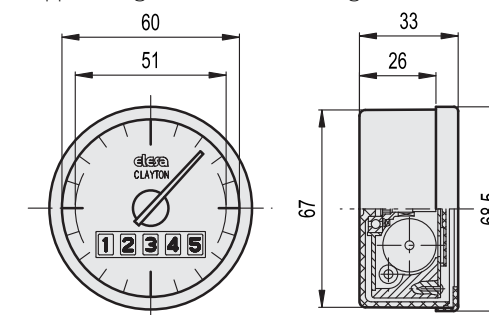


SPECIAL EXECUTIONS ON REQUEST

- No pointer
- Plain dial
- Special dial with logo or customized graduations
- Special readings after one revolution.

INSTRUCTIONS OF USE

These indicators are supplied with a screw on the rear case to prevent the mechanism from rotating during transportation, avoiding any displacement of reading. Before assembling the indicator into the handwheel, remove the screw from the back and fit the self-adhesive element supplied to guarantee IP 67 sealing.



Example of description for ordering

MBT.50-GA11 - 0002 - D

Series: MBT.50-GA11, MBT.70-GA12

Ratio	Description	Ratio	Description	Ratio	Description	Ratio	Description
2	0002	12	0012	36	0036	100	0100
4	0004	15	0015	40	0040	120	0120
5	0005	16	0016	48	0048	150 *	0150
6	0006	20	0020	50	0050	200 *	0200
8	0008	24	0024	60	0060		
10	0010	30	0030	72	0072		

Increasing graduation: clockwise D, anti-clockwise S

* Available only for MBT.70-GA12

Example of description for ordering

GW12 - 0002 - D

Reading on the counter after one revolution of the red pointer

00002	0000.2	000.02	00.002
00005	0000.5	000.05	00.005
00008	0000.8	000.08	00.008
00010	0001.0	000.10	00.010
00012	0001.2	000.12	00.012
00012(5)	0001.2(5)	000.12(5)	00.012(5)
00020	0002.0	000.20	00.020
00025	0002.5	000.25	00.025
00030	0003.0	000.30	00.030
00035	0003.5	000.35	00.035
00040	0004.0	000.40	00.040
00050	0005.0	000.50	00.050

Dial Graduation Number: 20, 50, 40, 100, 60, 100, 40, 50, 60, 70, 80, 100

Graduation: Graduated dial resolution, Increasing graduation (clockwise D, anti-clockwise S)

Divide the reading of the counter for the number of graduations of the dial. Example: 00002 / 20 = 0.1

Knobs with digital-analogue position indicator

gravity drive, technopolymer

DIAMOND CUT KNURLED KNOB

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish. Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable).

Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium.

Clockwise (D) or anti-clockwise (S) graduation, black colour.

STANDARD EXECUTION

Black-oxide steel boss, H7 reamed blind hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

READING

Five-digits roller counter and one red pointer which turns on the graduated dial. The digit of the red roll shows the decimal values, while the pointer shows the hundredth.

The display indicates the displacement of the mechanism controlled by the spindle from the start position (0). One complete turn of the machine spindle corresponds to a turn of the knob and consequently to a turn of the red pointer. A turn of the red pointer corresponds to a determinate reading on the counter (see "reading on the counter after one revolution of the red pointer" in the table).

Ballrace rotation: maximum reading accuracy.

IP PROTECTION

The ultrasonic welding of the window to the case guarantees the complete sealing with IP 67 protection class, see EN 60529 (on page A23).

FEATURES AND APPLICATIONS

The knobs with integral gravity position indicator are suitable on spindles with horizontal or max 60° inclined axis.

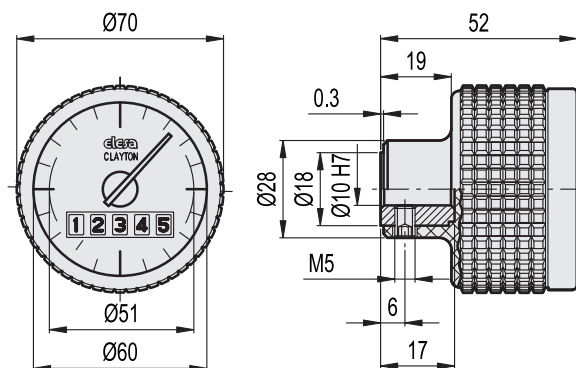


SPECIAL EXECUTIONS ON REQUEST

- No pointer
- Plain dial
- Special dial with logo or customized graduations
- Special readings after one revolution.

INSTRUCTIONS OF USE

See GW12 (on page 697).



Position indicators

positive drive, steel

CASE

Zinc-plated steel.

BEZEL

AISI 303 stainless steel.

WINDOW

Glass.

DIAL

Natural matte anodised aluminium.

Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

The black pointer indicates the number of turns of the spindle from the start position (0); the red pointer indicates the fractions of turn.

RATIO

To choose the ratio see "Positive drive indicators introduction" (on page 692).

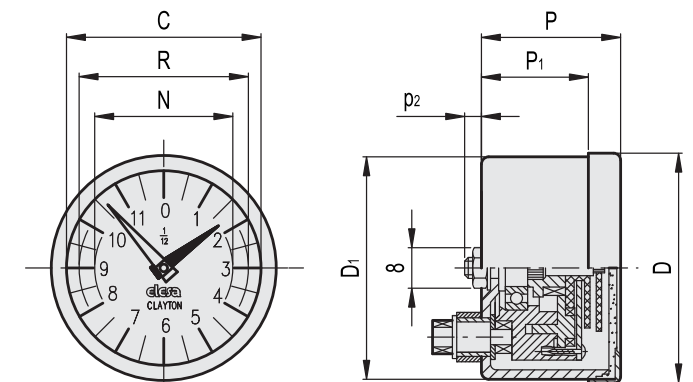
FEATURES AND APPLICATIONS

Digital-analogue positive drive indicators are suitable with spindles in any position.

To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 693).

SPECIAL EXECUTIONS ON REQUEST

- Special dial with logo or customized graduations
- Special ratios
- Single pointer
- Window in plexiglass instead of glass.



Series	D	P	D1	P1	p2	C	R	N	⚖
PA01	49.6	30	48.3	20.5	1.6	42	37	30	145
PA02	68.4	32	67.0	19.3	1.0	60	51	44	215
PA05	112.7	32	111.0	18.8	1.0	102	89	76	425

Example of description for ordering

MBT.70-GW12 - 00002 - D

Reading on the counter after one revolution of the red pointer

00002	0000.2	000.02	00.002
00002	0000.2	000.02	00.002
00005	0000.5	000.05	00.005
00008	0000.8	000.08	00.008
00010	0001.0	000.10	00.010
00012	0001.2	000.12	00.012
00012(5)	0001.2(5)	000.12(5)	00.012(5)
00020	0002.0	000.20	00.020
00025	0002.5	000.25	00.025
00030	0003.0	000.30	00.030
00035	0003.5	000.35	00.035
00040	0004.0	000.40	00.040
00050	0005.0	000.50	00.050

Dial Graduation Number
20
50
40
100
60
100
40
50
60
70
80
100

Graduation

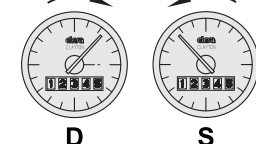
Graduated dial resolution

Divide the reading of the counter for the number of graduations of the dial.

Example:
00002 / 20=0.1

Increasing graduation

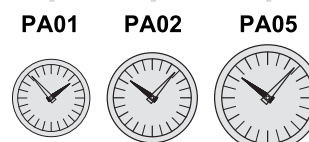
clockwise **D** anti-clockwise **S**



Example of description for ordering

PA01 - 0002 - D

Series Ratio Graduation



Ratio	Description	Ratio	Description	Ratio	Description	Ratio	Description
2	0002	12	0012	36	0036	100	0100
4	0004	15	0015	40	0040	120	0120
5	0005	16	0016	48	0048	150*	0150
6	0006	20	0020	50	0050	200*	0200
8	0008	24	0024	60	0060		
10	0010	30	0030	72	0072		

* Available only for PA02 and PA05

Increasing graduation

clockwise **D** anti-clockwise **S**



Position indicators

positive drive, technopolymer

CASE

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish. Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable). Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium. Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

The black pointer indicates the number of turns of the spindle from the start position (0); the red pointer indicates the fractions of turn.

RATIO

To choose the ratio see "Positive drive indicators introduction" (on page 692).

IP PROTECTION

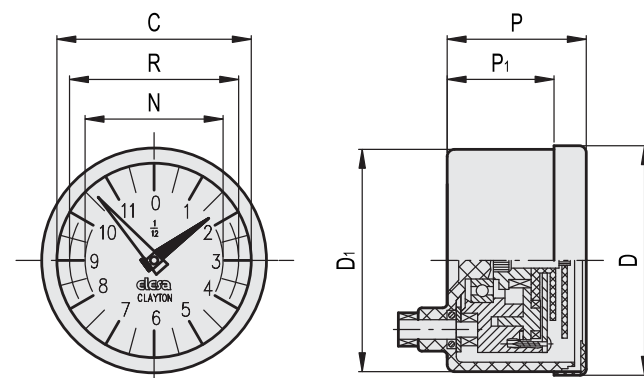
The ultrasonic welding of the window to the case guarantees the complete sealing with IP 65 protection class, see EN 60529 (on page A23).

FEATURES AND APPLICATIONS

Digital-analogue positive drive indicators are suitable with spindles in any position. To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 693).

SPECIAL EXECUTIONS ON REQUEST

- Special dial with logo or customized graduations
- Special ratios
- Single pointer



Series	D	P	D1	P1	C	R	N	⚖️
PA11	49.8	30	48.2	23	42	37	30	80
PA12	68.5	32	67.0	25	60	51	44	130

Digital-analogue position indicators

positive drive, technopolymer

CASE

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish. Moulded-in spindle.

BEZEL

Technopolymer. Moulded over the window.

WINDOW

Transparent polyamide based (PA-T) technopolymer (practically unbreakable). Resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol during cleaning operations).

DIAL

Natural matte anodised aluminium. Clockwise (D) or anti-clockwise (S) graduation, black colour.

READING

Five-digits roller counter and one red pointer which turns on the graduated dial. The digit of the red roll shows the decimal values, while the pointer shows the hundredth. The display indicates the displacement of the mechanism controlled by the spindle from the start position (0). One complete turn of the machine spindle corresponds to a turn of the handwheel/knob and consequently to a turn of the red pointer. A turn of the red pointer corresponds to a determinate reading on the counter (see "reading on the counter after one revolution of the red pointer" in the table).

IP PROTECTION

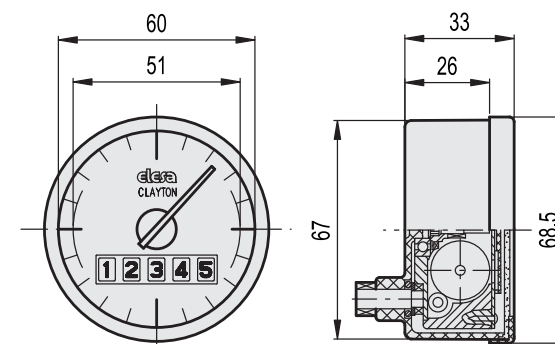
The ultrasonic welding of the window to the case guarantees the complete sealing with IP 65 protection class, see table EN 60529 (on page A23).

FEATURES AND APPLICATIONS

Digital-analogue positive drive indicators are suitable with spindles in any position. To choose the handwheel see the table "Handwheels/knobs-possible assembly with indicators" (on page 693).

SPECIAL EXECUTIONS ON REQUEST

- No pointer
- Plain dial
- Special dial with logo or customized graduations
- Special readings after one revolution.



Example of description for ordering

PW12 - 0002 - D

Reading on the counter after one revolution of the red pointer

00002	0000.2	000.02	00.002
00005	0000.5	000.05	00.005
00008	0000.8	000.08	00.008
00010	0001.0	000.10	00.010
00012	0001.2	000.12	00.012
00012(5)	0001.2(5)	000.12(5)	00.012(5)
00020	0002.0	000.20	00.020
00025	0002.5	000.25	00.025
00030	0003.0	000.30	00.030
00035	0003.5	000.35	00.035
00040	0004.0	000.40	00.040
00050	0005.0	000.50	00.050

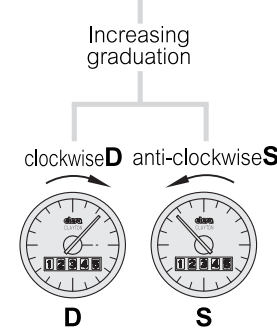
Graduation

Dial Graduation Number
20
50
40
100
60
100
40
50
60
70
80
100

Graduated dial resolution

Divide the reading of the counter for the number of graduations of the dial.

Example: 00002 / 20 = 0.1



Example of description for ordering

PA11 - 0002 - D

Series	Ratio		Ratio		Ratio		Ratio		
	Ratio	Description	Ratio	Description	Ratio	Description	Ratio	Description	
PA11	2	0002	12	0012	36	0036	100	0100	
	4	0004	15	0015	40	0040	120	0120	
	5	0005	16	0016	48	0048	150*	0150	
	6	0006	20	0020	50	0050	200*	0200	
	8	0008	24	0024	60	0060			
	10	0010	30	0030	72	0072			
	PA12	2	0002	12	0012	36	0036	100	0100
		4	0004	15	0015	40	0040	120	0120
		5	0005	16	0016	48	0048	150*	0150
		6	0006	20	0020	50	0050	200*	0200
8		0008	24	0024	60	0060			
10		0010	30	0030	72	0072			

* Available only for PA12

Knurled grip knobs for position indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, glossy finish.

STANDARD EXECUTION

Black-oxide steel boss, H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

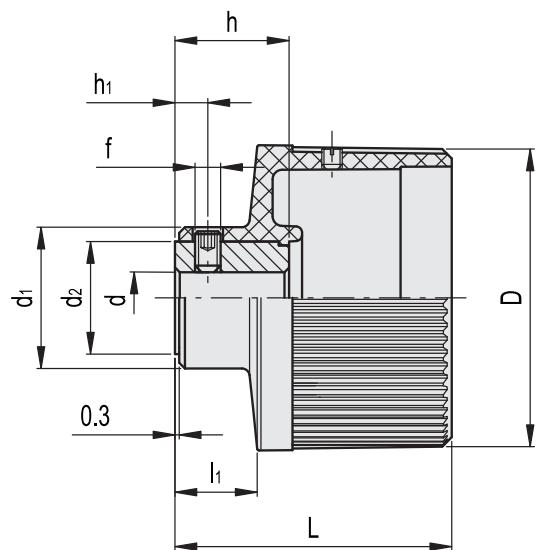
IZN-XX knurled grip knobs can be used with analogue and digital-analogue gravity indicators.

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" (on page 690) for gravity indicators type G.

ACCESSORIES ON REQUEST

Cover CP-XX (see page 715) for fitting instead of the indicator.



Code	Description	D	L	dH7	h	d1	d2	f	h1	l1	⚖	Handwheel indicator combinations
CE.30101	IZN.60-GXX1 A-10	59	53	10	22	27	22	M5	6	15	110	GA01-GA11
CE.30201	IZN.80-GXX2 A-12	79	57	12	24	33	26	M5	6	17	190	GA02-GA12-GW12

Diamond cut knurled knobs for position indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTIONS

Black-oxide steel boss, H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

- **MBT-GXX**: for gravity indicators.

- **MBT-PXX**: for positive drive indicators.

Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

ERGONOMY AND DESIGN

The particular knurling on the outside rim of the knob, provided with a structure of very fine pitch, allows a safe and comfortable grip, offering the operator the possibility of operating under the most different working conditions in a sensitive and ergonomic way and simplifying the adjustment of the knob during rapid rotation (or screwing) without any unpleasant angular work for the hand and wrist.

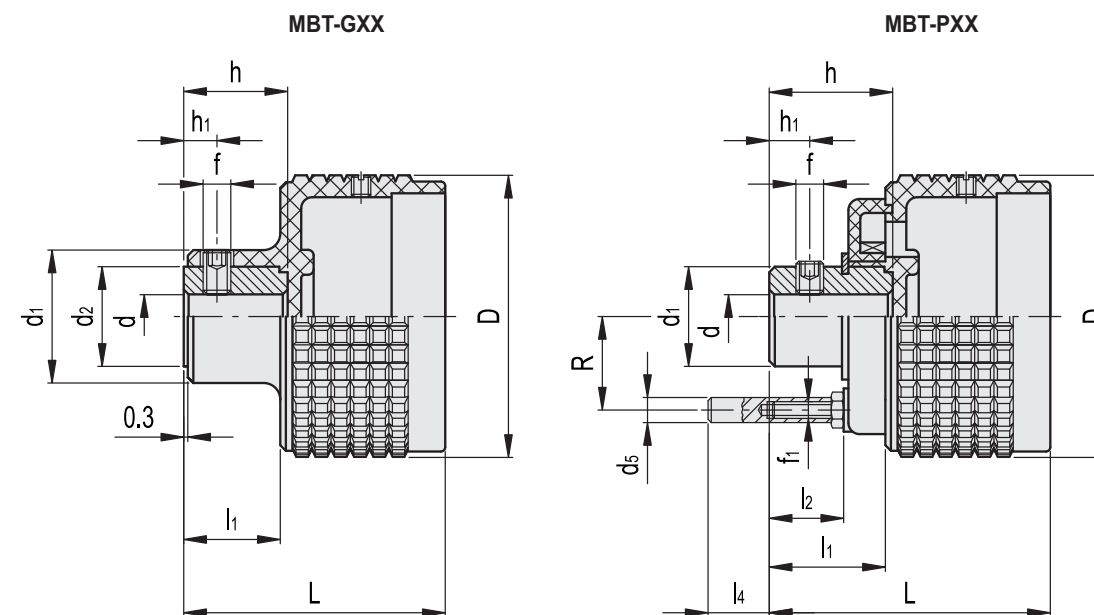
INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" (on page 690) for gravity indicators or positive indicators type G or positive drive indicators type P (on page 692).

ACCESSORIES ON REQUEST

Cover CP-XX (see page 715) for fitting instead of the indicator.



MBT-GXX

Code	Description	D	L	dH7	h	d1	d2	f	h1	l1	⚖	Handwheel indicator combinations
CE.30001-R	MBT.60-GXX1 A-8	58	52.5	8	17	24	18	M5	6	17	72	GA01 - GA11
CE.30051-R	MBT.80-GXX2 A-10	77	61	10	22	28	22	M5	6	22	130	GA02 - GA12 - GW12

MBT-PXX

Code	Description	D	L	dH7	h	d1	d5	f	f1	h1	l1	l2	l4	R	⚖	Handwheel indicator combinations
CE.30002-R	MBT.60-PXX1 A-8	58	55	8	20.5	18	6	M5	M4	5	18.5	10.5	14.5	19	87	PA01 - PA11
CE.30052-R	MBT.80-PXX2 A-10	77	59	10	22	30	6	M5	M4	6	20	12	13	28.5	218	PA02 - PA12 - PW12

Lobe knobs for position indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTIONS

Boss H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

- **VHT-GXX**: for gravity indicators.

Black-oxide steel boss.

- **VHT-GXX-SST**: for gravity indicators.

AISI 303 stainless steel boss.

- **VHT-PXX**: for positive drive indicators.

Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

Black-oxide steel boss.

FEATURES AND APPLICATIONS

The lobed shape with no cavities prevents unhealthy residues from depositing. Particularly suitable for applications on machines and equipment whose parts must be frequently cleaned by using water jets or steam.

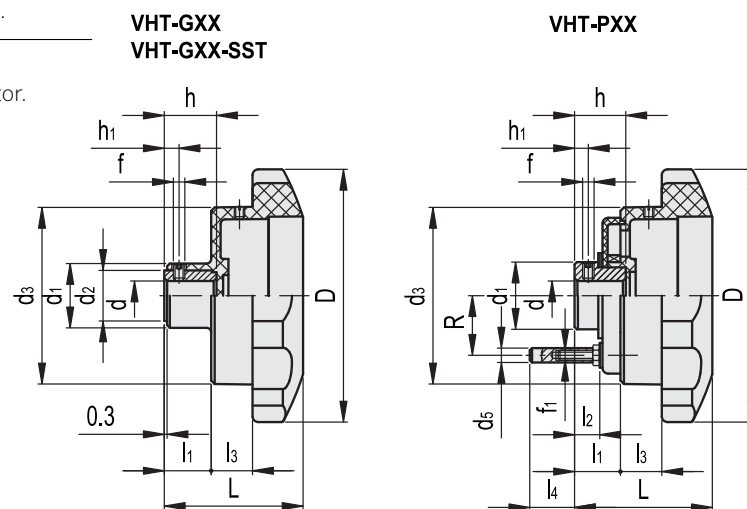
INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" for gravity indicators type G (on page 690) or positive drive indicators type P (on page 692).

ACCESSORIES ON REQUEST

Cover CP-XX (see page 715) for fitting instead of the indicator.



VHT-GXX

Code	Description	D	L	dH7	h	d1	d2	d3	f	h1	l1	l3	⚖	Handwheel indicator combinations
CE.30251	VHT.85-GXX1 A-10	85	51	10	17	24	18	58	M5	6	15.5	18	110	GA01 - GA11
CE.30351	VHT.110-GXX2 A-12	110	58	12	22	28	22	77	M5	6	20	18	180	GA02 - GA12 - GW12

VHT-GXX-SST

STAINLESS STEEL

Code	Description	D	L	dH7	h	d1	d2	d3	f	h1	l1	l3	⚖	Handwheel indicator combinations
CE.30255	VHT.85-GXX1-SST-10	85	51	10	17	24	18	58	M5	6	15.5	18	110	GA01 - GA11
CE.30355	VHT.110-GXX2-SST-12	110	58	12	22	28	22	77	M5	6	20	18	180	GA02 - GA12 - GW12

VHT-PXX

Code	Description	D	L	dH7	h	d1	d3	d5	f	f1	h1	l1	l2	l3	l4	R	⚖	Handwheel indicator combinations
CE.30252	VHT.85-PXX1 A-10	85	55	10	20.5	18	58	6	M5	M4	5	18.5	10.5	18	14.5	19	130	PA01 - PA11
CE.30352	VHT.110-PXX2 A-12	110	58	12	22	30	77	6	M5	M4	6	20	12	18	13.1	28.5	290	PA02 - PA12 - PW12

Lobe knobs for position indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTIONS

Black-oxide steel boss, H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

- **VC.792-GXX**: for gravity indicators.

- **VC.792-PXX**: for positive drive indicators.

Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

FEATURES AND APPLICATIONS

The ergonomic design enables an effective grip. The lobed shape with no cavities prevents unhealthy residues from depositing and guarantees perfect cleaning. Particularly suitable for applications on machines and equipment whose parts must be frequently cleaned by using water jets or steam.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

To choose the indicator see the table below for possible assembly with indicators.

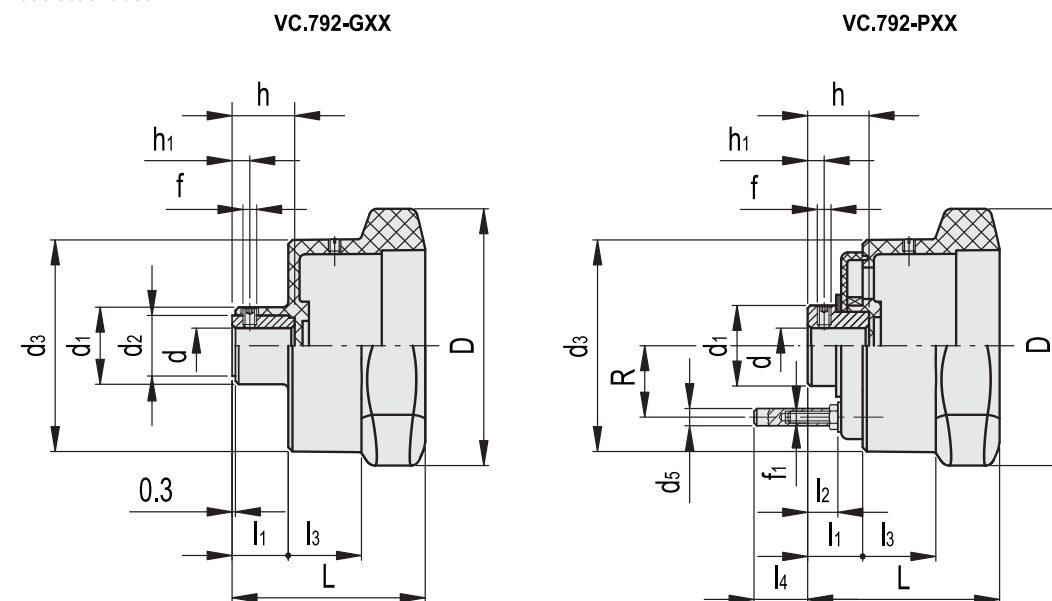
See also "Assembly instructions" for gravity indicators type G (on page 690) or positive drive indicators type P (on page 692).

ACCESSORIES ON REQUEST

Cover CP-XX (see page 715) for use without the indicator.

SPECIAL EXECUTIONS ON REQUEST

Knob with stainless steel boss.



VC.792-GXX

Code	Description	D	L	dH7	h	d1	d2	d3	f	h1	l1	l3	⚖	Handwheel indicator combinations
CE.30071	VC.792/72-GXX1 A-10	72	52	10	17	24	18	56	M5	6	15.9	19	79	GA01 - GA11
CE.30081	VC.792/98-GXX2 A-12	98	58	12	22	27.5	22	76.5	M5	6	20.5	19	147	GA02 - GA12 - GW12

VC.792-PXX

Code	Description	D	L	dH7	h	d1	d3	d5	f	f1	h1	l1	l2	l3	l4	R	⚖	Handwheel indicator combinations
CE.30073	VC.792/72-PXX1 A-10	72	55	10	20.5	18	56	6	M5	M4	5	18.5	10.5	19	14.5	19	85	PA01 - PA11
CE.30083	VC.792/98-PXX2 A-12	98	58	12	22	30	76.5	6	M5	M4	6	20	12	19	13.1	28.5	207	PA02 - PA12 - PW12

Handwheels for positions indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTION

Boss H7 reamed through hole.

- **VDSC-GXX2+I**: with revolving handle I.621+x (see page 576) in polyamide based (PA) technopolymer, black colour, matte finish. Black-oxide steel boss.

- **VDSC-GXX2-SST+I**: with revolving handle I.621+x-SST (see page 576) in polyamide based (PA) technopolymer, black colour, matte finish.

AISI 303 stainless steel boss.

- **VDSC-GXX2+IR**: with fold-away handle IR.620 (see page 584) in polyamide based (PA) technopolymer, black colour, matte finish. Black-oxide steel boss.

- **VDSC-GXX2-SST+IR**: with fold-away handle IR.620-SST (see page 584) in polyamide based (PA) technopolymer, black colour, matte finish.

AISI 303 stainless steel boss.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

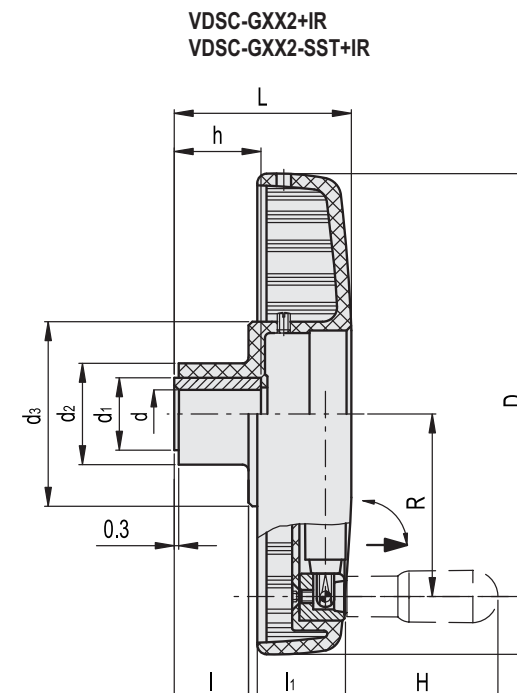
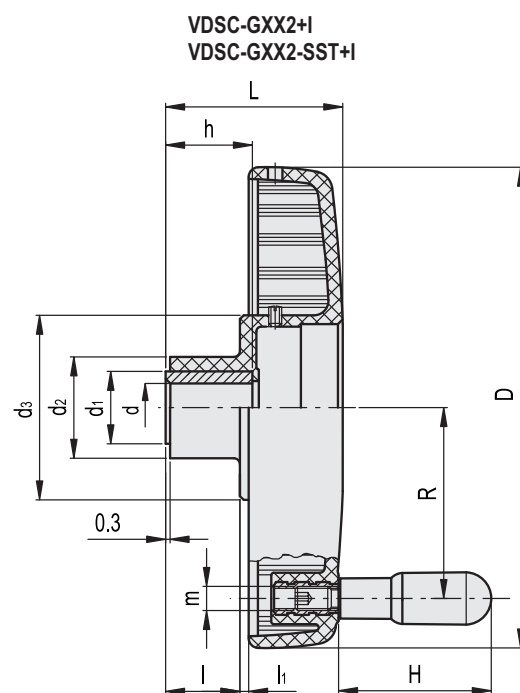
VDSC-XX solid handwheels can be used with analogue and digital-analogue gravity indicators.

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" for gravity indicators type G (on page 690).

ACCESSORIES ON REQUEST

Cover CP-XX (see page 715) for fitting instead of the indicator.



VDSC-GXX2+I

Code	Description	D	L	dH7	h	d1	d2	d3	I	l1	H	m	R	Handwheel indicator combinations	
CE.34015	VDSC.125-GXX2 A-8+I	125	63	8	22	22	35	76	22	14	65	M8	48.5	292	GA02 - GA12 - GW12
CE.34021	VDSC.125-GXX2 A-10+I	125	63	10	22	22	35	76	22	14	65	M8	48.5	290	GA02 - GA12 - GW12
CE.34075	VDSC.200-GXX2 A-16+I	200	70.5	16	34	30	42	76	30	2	90	M10	80	684	GA02 - GA12 - GW12
CE.34081	VDSC.200-GXX2 A-20+I	200	70.5	20	34	30	42	76	30	2	90	M10	80	680	GA02 - GA12 - GW12

VDSC-GXX2-SST+I

STAINLESS STEEL

Code	Description	D	L	dH7	h	d1	d2	d3	I	l1	H	m	R	Handwheel indicator combinations	
CE.34017	VDSC.125-GXX2 SST-8+I	125	63	8	22	22	35	76	22	14	65	M8	48.5	293	GA02 - GA12 - GW12
CE.34023	VDSC.125-GXX2 SST-10+I	125	63	10	22	22	35	76	22	14	65	M8	48.5	291	GA02 - GA12 - GW12
CE.34077	VDSC.200-GXX2 SST-16+I	200	70.5	16	34	30	42	76	30	2	90	M10	80	685	GA02 - GA12 - GW12
CE.34083	VDSC.200-GXX2 SST-20+I	200	70.5	20	34	30	42	76	30	2	90	M10	80	681	GA02 - GA12 - GW12

VDSC-GXX2+IR

Code	Description	D	L	dH7	h	d1	d2	d3	I	l1	H	R	Handwheel indicator combinations	
CE.34045	VDSC.160-GXX2 A-10+IR	160	66	10	30	26	38.5	77	25.5	7.5	60	63	437	GA02 - GA12 - GW12
CE.34051	VDSC.160-GXX2 A-12+IR	160	66	12	30	26	38.5	77	25.5	7.5	60	63	435	GA02 - GA12 - GW12
CE.34085	VDSC.200-GXX2 A-16+IR	200	77	16	36	40	49	77	35	4	80	77	784	GA02 - GA12 - GW12
CE.34091	VDSC.200-GXX2 A-20+IR	200	77	20	36	40	49	77	35	4	80	77	780	GA02 - GA12 - GW12

VDSC-GXX2-SST+IR

STAINLESS STEEL

Code	Description	D	L	dH7	h	d1	d2	d3	I	l1	H	R	Handwheel indicator combinations	
CE.34047	VDSC.160-GXX2 SST-10+IR	160	66	10	30	26	38.5	77	25.5	7.5	60	63	438	GA02 - GA12 - GW12
CE.34053	VDSC.160-GXX2 SST-12+IR	160	66	12	30	26	38.5	77	25.5	7.5	60	63	436	GA02 - GA12 - GW12
CE.34087	VDSC.200-GXX2 SST-16+IR	200	77	16	36	40	49	77	35	4	80	77	785	GA02 - GA12 - GW12
CE.34093	VDSC.200-GXX2 SST-20+IR	200	77	20	36	40	49	77	35	4	80	77	781	GA02 - GA12 - GW12

Handwheel for position indicators

Technopolymer

MATERIAL

Glass-fibre reinforced polypropylene based (PP) technopolymer, grey-black colour, matte finish.

REVOLVING HANDLE

IEL+x-SOFT (see page 572) in technopolymer coated with "soft-touch" thermoplastic elastomer (TPE), black colour, matte finish.

STANDARD EXECUTION

Black-oxide steel hub, H7 reamed hole. Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

FEATURES AND APPLICATIONS

This steering handwheel has been designed to be mounted on control shafts of machines or equipment and especially for guiding lift trucks and handling vehicles.

ERGONOMY AND DESIGN

The lowered profile of the steering handwheel makes it suitable for flush mounting on the control panel, thus reducing protruding parts to a minimum.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

The steering handwheel can be used with a position indicator PA02 (see page 699), PA12 (see page 700) or PW12 (see page 701) to read steering positions.

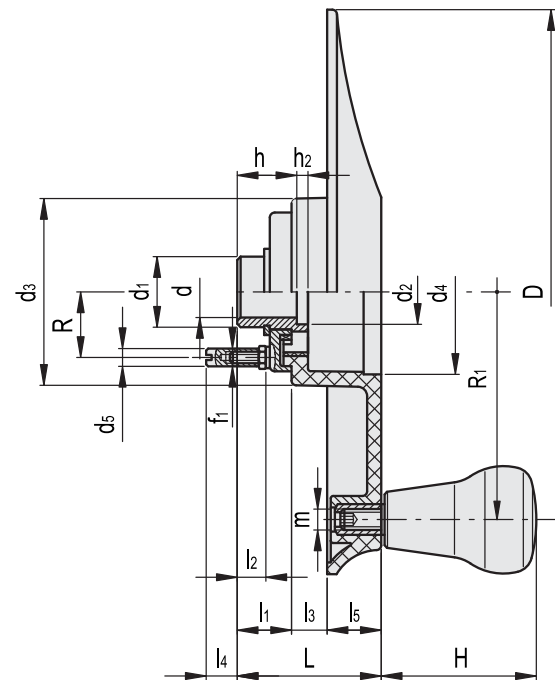
See also "Assembly instructions" (on page 692) for positive drive indicators type P.

ACCESSORIES ON REQUEST

- Axial retaining washer GN 184 (see page 971).
- Cover CP-XX (see page 715) for fitting instead of the indicator.

SPECIAL EXECUTIONS ON REQUEST

EWV-XX steering handwheel is suitable also for using with gravity indicators.



Code	Description	D	L	d ₇	h	d ₁	d ₂	d ₃	d ₄	d ₅	f ₁	h ₂	l ₁	l ₂	l ₃	l ₄	l ₅	H	m	R	R ₁	Δ
208141-C0	EWV.240-PXX2+IEL-A20-C0	240	59	20	24	30	25.5	79	68.5	6	M4	4	21	13	15	13	23	65	M10	28.5	97	810

Solid handwheels for position indicators

Duroplast

MATERIAL

High-strength, reinforced phenolic based (PF) Duroplast, black colour, glossy finish.

INDICATOR HOUSING

SC-XX (see page 715) made out of glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

REVOLVING HANDLE

I.301+x (see page 574) made out of Duroplast, black colour, glossy finish.

STANDARD EXECUTION

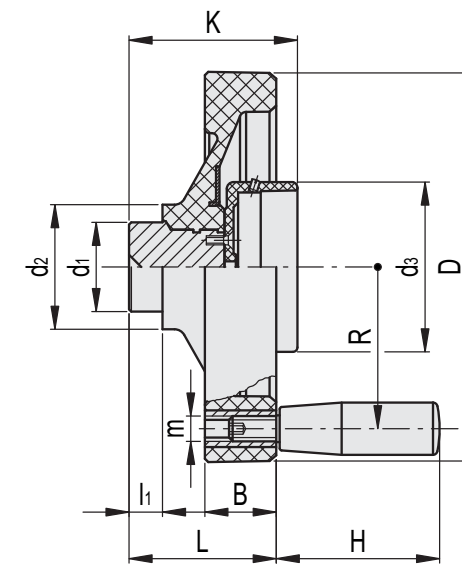
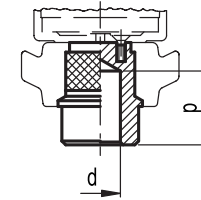
Black-oxide steel hub, not drilled. See table for the values of max d diameter and max p depth for drilling.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

VDN-XX solid handwheels can be used with analogue gravity indicators GA05 (on page 694). See also "Assembly instructions" for gravity indicators (on page 690).

SPECIAL EXECUTIONS ON REQUEST

Execution with hand reset: the indicator reading can be reset in any position within the positioning range, so that further readings can be referred to the reset point. To reset the reading turn the indicator housing until the two pointers reach the zero position, by keeping the indicator body still. By so doing the relevant position (phase) between the indicator and the handwheel can be changed by a small effort, but enough to avoid any accidental phase displacement.



Code	Description	D	L	d _{max}	p _{max}	d ₁	d ₂	d ₃	l ₁	B	K	H	m	R	Δ
CE.32121	VDN.250-GXX5+I	249	76	34	25	49	70	122	15	36	86	90	M10	106	2100
CE.32126	VDN.300-GXX5+I	301	87	42	35	58	82	122	18	36	98	90	M10	132	3138
CE.32131	VDN.350-GXX5+I	350	92	42	35	58	90	122	18	38	98	102	M10	157	4243

Rotary controls 7

Rotary controls 7

Handwheels for positions indicators

Duroplast

MATERIAL

High-resistance reinforced phenolic based (PF) Duroplast, black colour, glossy finish.

STANDARD EXECUTIONS

Black-oxide steel hub.

- **VDC-GXX**: for gravity indicators.

Not drilled hub, see table for maximum permissible boring diameters d' and d'' .

- **VDC-GXX+I**: for gravity indicators.

Not drilled hub, see table for maximum permissible boring diameters d' and d'' .

Revolving handle I.301+x (see page 574) in Duroplast, black colour, glossy finish.

- **VDC-PXX+I**: for positive drive indicators.

Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

Hub with H7 reamed through hole.

Revolving handle I.301+x (see page 574) in Duroplast, black colour, glossy finish.

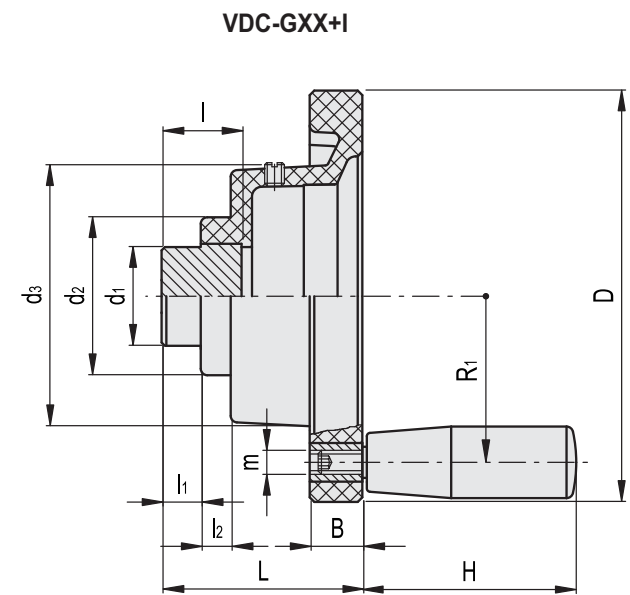
ERGONOMY

The rim with internal rear scallops (for models with diameter $D \geq 125$ mm) makes the grip and the manoeuvre of the handwheel easier especially in the versions without handle.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

To choose the indicator see the table below for possible assembly with indicators.

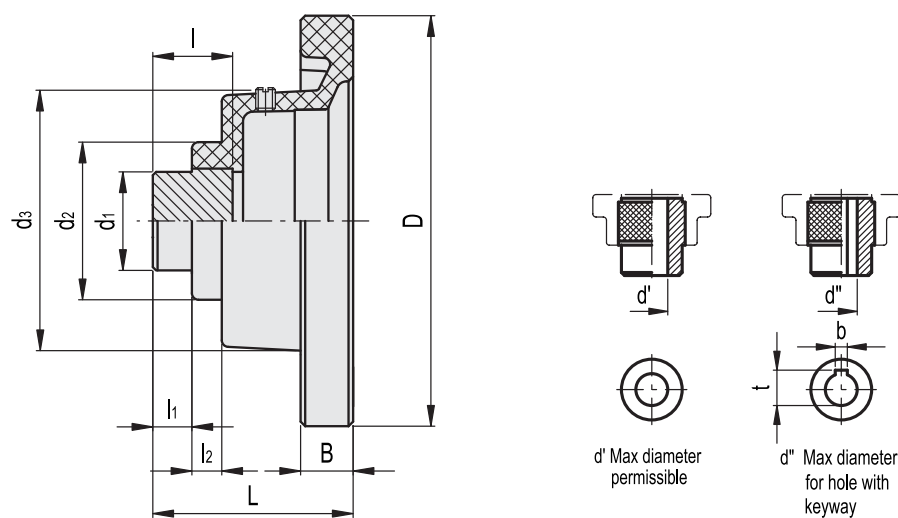
See also "Assembly instructions" for gravity indicators type G (on page 690) or positive drive indicators type P (on page 692).



VDC-GXX+I

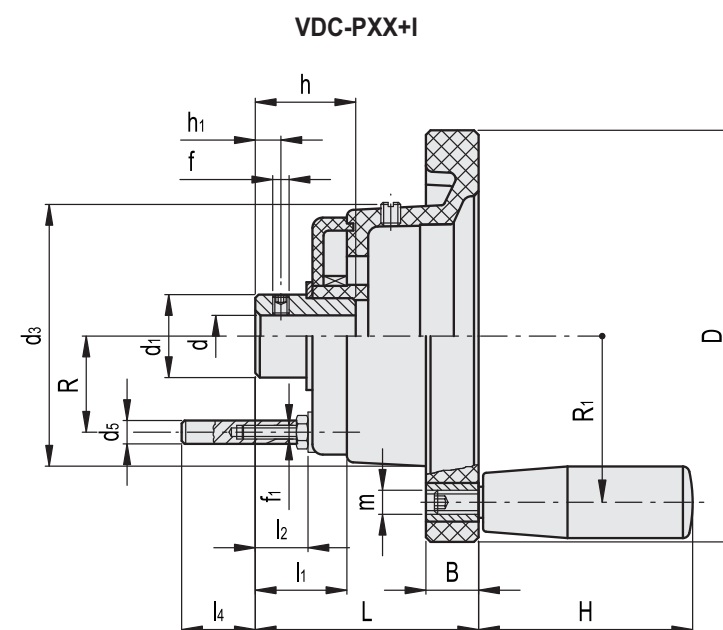
Code	Description	D	L	d'	d''	t	b	d1	d2	d3	l	l1	l2	B	H	m	R1	⚖	Handwheel indicator combinations
CE.30461	VDC.80-GXX1+I	87	57	20	16	18.3	5	25	40	58	23	11	8.5	14	40	M6	34.5	245	GA01 - GA11
CE.30481	VDC.100-GXX2+I	108	60	25	20	22.8	6	30	46	79	25	12	9.5	14	50	M6	45	375	GA02 - GA12 - GW12
CE.30511	VDC.125-GXX2+I	125	61	25	20	22.8	6	30	48	82	25	12	9	16	65	M8	53	480	GA02 - GA12 - GW12
CE.30611	VDC.140-GXX2+I	140	65	25	20	22.8	6	30	50	82	25	12	9	17	65	M8	60	540	GA02 - GA12 - GW12
CE.30711	VDC.160-GXX2+I	160	72	30	24	27.3	8	35	53	84	30	15	10	18	80	M8	68	750	GA02 - GA12 - GW12
CE.30811	VDC.180-GXX2+I	180	78	30	24	27.3	8	35	56	85	30	15	10	19	80	M10	77.5	890	GA02 - GA12 - GW12
CE.30911	VDC.160-GXX5+I	160	71	31	25	28.3	8	36	53	123	34	14	11	18	80	M8	68	825	GA05
CE.31011	VDC.180-GXX5+I	180	78	31	25	28.3	8	36	56	127	34	14	12	19	80	M10	77.5	1010	GA05
CE.31111	VDC.200-GXX5+I	200	79	35	29	32.3	8	40	59	127	34	13	15	20	80	M10	87	1180	GA05

VDC-GXX



VDC-GXX

Code	Description	D	L	d'	d''	t	b	d1	d2	d3	l	l1	l2	B	⚖	Handwheel indicator combinations
CE.30501	VDC.125-GXX2	125	61	25	20	22.8	6	30	48	82	25	12	9	16	400	GA02 - GA12 - GW12
CE.30601	VDC.140-GXX2	140	65	25	20	22.8	6	30	50	82	25	12	9	17	470	GA02 - GA12 - GW12
CE.30701	VDC.160-GXX2	160	72	30	24	27.3	8	35	53	84	30	15	10	18	650	GA02 - GA12 - GW12
CE.30901	VDC.160-GXX5	160	71	31	25	28.3	8	36	53	123	34	14	11	18	730	GA05
CE.31001	VDC.180-GXX5	180	78	31	25	28.3	8	36	56	127	34	14	12	19	940	GA05
CE.31101	VDC.200-GXX5	200	79	35	29	32.3	8	40	59	127	34	13	15	20	1080	GA05



VDC-PXX+I

Code	Description	D	L	dH7	h	d1	d3	d5	f	f1	h1	l1	l2	l4	B	H	m	R	R1	⚖	Handwheel indicator combinations
CE.30462	VDC.80-PXX1+I A-8	87	57	8	23	18	58	6	M5	M4	5	19	11	14.1	14	40	M6	19	34.5	230	PA01 - PA11
CE.30482	VDC.100-PXX2+I A-10	108	60	10	25	30	78	6	M5	M4	6	21	13	12.1	14	50	M6	28.5	45	390	PA02 - PA12 - PW12

Rotary controls 7

Rotary controls 7

Handwheels for positions indicators

Technopolymer

MATERIAL

High-resilience polypropylene based (PP) technopolymer, black colour, matte finish.

INDICATOR HOUSING

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTIONS

Black-oxide steel boss, H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

- **VRTP-GXX2**: without handle.

- **VRTP-GXX2+I**: with revolving handle I.621+x (see page 576) in polyamide based (PA) technopolymer, black colour, matte finish.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

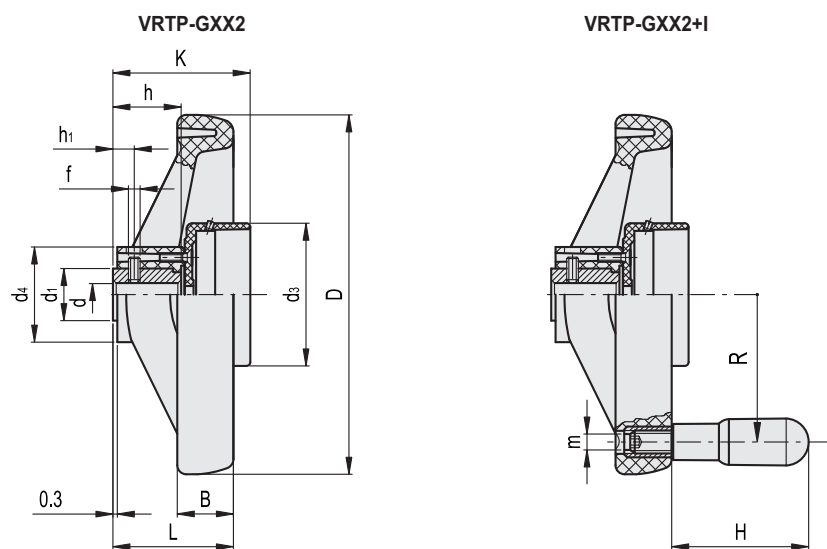
VRTP-XX two-spoke handwheels can be used with analogue and digital-analogue gravity indicators.

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" for gravity indicators type G (on page 690).

SPECIAL EXECUTIONS ON REQUEST

Execution with hand reset: the indicator reading can be reset in any position within the positioning range, so that further readings can be referred to the reset point. To reset the reading turn the indicator housing until the two pointers reach the zero position, by keeping the indicator body still. By so doing the relevant position (phase) between the indicator and the handwheel can be changed by a small effort, but enough to avoid any accidental phase displacement.



VRTP-GXX2

Code	Description	D	L	dH7	h	d1	d3	d4	f	h1	B	K	Handwheel indicator combinations
CE.33111-R	VRTP.160-GXX2 A-14	160	51	14	27	26	76	40	M8	12	25	63	340 GA02 - GA12 - GW12
CE.33211-R	VRTP.200-GXX2 A-16	200	61	16	34	30	76	48.5	M8	12	28	70	540 GA02 - GA12 - GW12
CE.33311-R	VRTP.250-GXX2 A-20	250	70	20	38	35	76	58	M8	12	32	74	790 GA02 - GA12 - GW12

VRTP-GXX2+I

Code	Description	D	L	dH7	h	d1	d3	d4	f	h1	B	K	H	m	R	Handwheel indicator combinations
CE.33121-R	VRTP.160-GXX2 A-14+I	160	51	14	27	26	76	40	M8	12	25	63	80	M8	65	425 GA02 - GA12 - GW12
CE.33221-R	VRTP.200-GXX2 A-16+I	200	61	16	34	30	76	48.5	M8	12	28	70	80	M8	84	625 GA02 - GA12 - GW12
CE.33321-R	VRTP.250-GXX2 A-20+I	250	70	20	38	35	76	58	M8	12	32	74	90	M10	105	890 GA02 - GA12 - GW12

Handwheels for position indicators

Aluminium

MATERIAL

Aluminium, epoxy resin coating, black colour, matte finish.

STANDARD EXECUTIONS

H7 reamed through hole.

Revolving handle (for +I versions) I.621+x (see page 576) in polyamide based (PA) technopolymer, black colour, matte finish.

- **VAD-GXX**: for gravity indicators, without handle.

- **VAD-GXX+I**: for gravity indicators, with handle.

- **VAD-PXX**: for positive drive indicators, without handle.

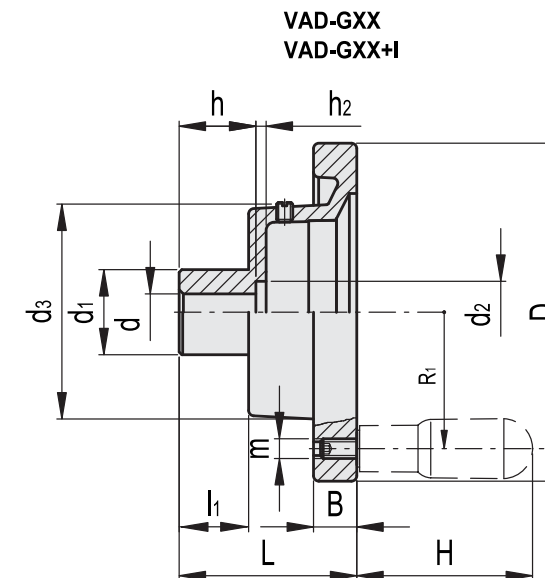
- **VAD-PXX+I**: for positive drive indicators, with handle.

Rear flange with internal crown gear wheel in acetal resin based (POM) technopolymer. Black-oxide steel screw and anchor pin.

INDICATOR CHOICE (TO BE ORDERED SEPARATELY)

To choose the indicator see the table below for possible assembly with indicators.

See also "Assembly instructions" for gravity indicators type G (on page 690) or positive drive indicators type P (on page 692).



VAD-GXX

Code	Description	D	L	dH7	h	d1	d2	d3	h2	h1	B	Handwheel indicator combinations
CE.28501	VAD.80-GXX1 A-10	80	48	10	16	26	20.5	56	3.5	15.5	13	175 GA01 - GA11
CE.28551	VAD.100-GXX1 A-10	100	58	10	17	28	20.5	56	3.5	17.5	14	235 GA01 - GA11
CE.28601	VAD.125-GXX2 A-12	125	61	12	18	31	25.5	76	4	18	15	370 GA02 - GA12 - GW12
CE.28651	VAD.160-GXX2 A-14	160	68	14	20	36	29	78	4	19	18	625 GA02 - GA12 - GW12
CE.28701	VAD.160-GXX5 A-14	160	64	14	23.5	36	25.5	120	4	20	18	760 GA05
CE.28721	VAD.200-GXX2 A-18	200	75	18	24	42	33	79	4.5	21	20.5	980 GA02 - GA12 - GW12
CE.28731	VAD.250-GXX2 A-22	250	81.5	22	28	48	37	80	4.5	24.5	23	1500 GA02 - GA12 - GW12

VAD-GXX+I

Code	Description	D	L	dH7	h	d1	d2	d3	h2	h1	B	H	m	R1	Handwheel indicator combinations
CE.28511	VAD.80-GXX1 A-10+I	80	48	10	16	26	20.5	56	3.5	15.5	13	45	M6	33.5	200 GA01 - GA11
CE.28561	VAD.100-GXX1 A-10+I	100	58	10	17	28	20.5	56	3.5	17.5	14	45	M6	42.5	270 GA01 - GA11
CE.28611	VAD.125-GXX2 A-12+I	125	61	12	18	31	25.5	76	4	18	15	65	M8	54	440 GA02 - GA12 - GW12
CE.28661	VAD.160-GXX2 A-14+I	160	68	14	20	36	28	78	4	19	18	80	M10	71	705 GA02 - GA12 - GW12
CE.28711	VAD.160-GXX5 A-14+I	160	64	14	23.5	36	25.5	120	4	20	18	80	M10	71	840 GA05
CE.28726	VAD.200-GXX2 A-18+I	200	75	18	24	42	33	79	4.5	21	20.5	90	M10	89	1065 GA02 - GA12 - GW12
CE.28736	VAD.250-GXX2 A-22+I	250	81.5	22	28	48	37	80	4.5	24.5	23	90	M10	113	1595 GA02 - GA12 - GW12

Housings

for position indicator, technopolymer

MATERIAL

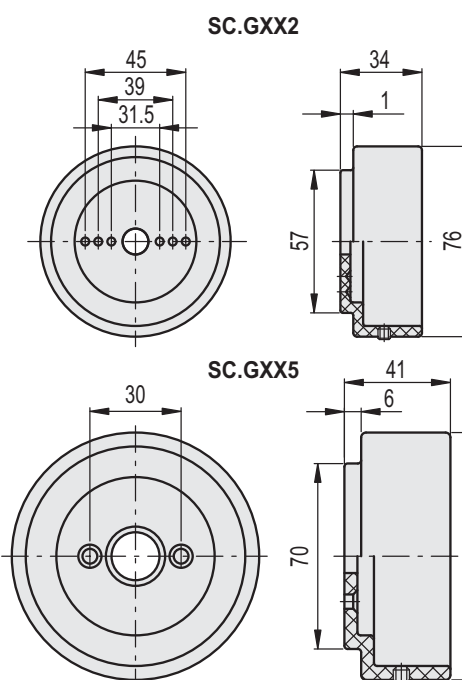
Glass-fibre reinforced polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTIONS

- **SC.GXX2:** three couples of dimples on the bottom of the housing (to drill according to the type of indicator) and two supplied M4x14 countersunk head screws.
- **SC.GXX5:** two holes for supplied M4x14 countersunk head screws.

APPLICATIONS

SC-XX housings are suitable with gravity indicators on any handwheel or other control devices.



Code	Description	⚖	Handwheel indicator combinations
CE.40002	SC.GXX2	72	GA02 - GA12 - GW12
CE.40005	SC.GXX5	191	GA05

Covers

Technopolymer

MATERIAL

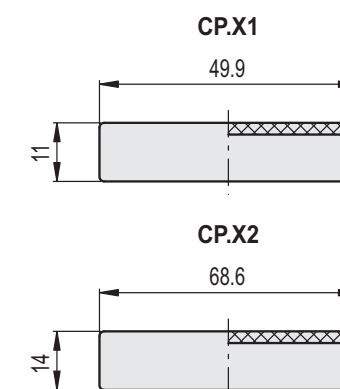
Polyester based (PBT) technopolymer, light grey colours, matte finish.

MOUNTING

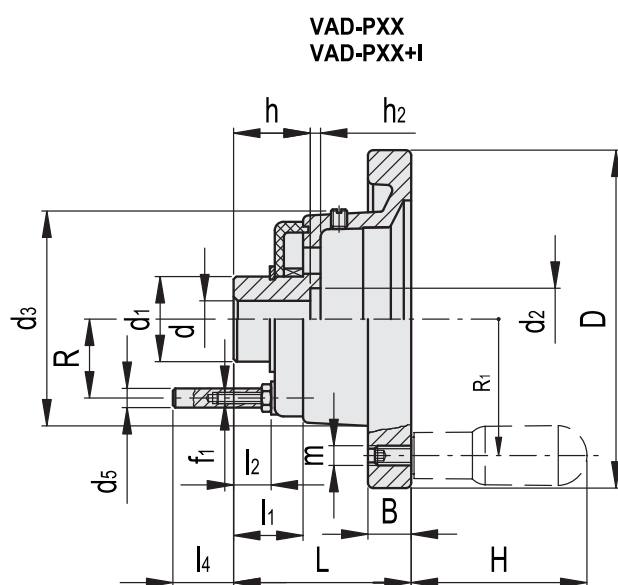
Push-fit. The cover can be removed by using a screwdriver in the proper cavity.

APPLICATIONS

CP-XX covers are suitable for closing the indicator housing when the indicator is not required.



Code	Description	⚖	Handwheels/knobs combinations
CE.40101	CP.X1	6	IZN.60-MBT.60-VHT.85
CE.40102	CP.X2	11	IZN.80-MBT.80-VHT.110-VDSC-XX - EWW-XX



VAD-PXX

Code	Description	D	L	d _{H7}	h	d ₁	d ₂	d ₃	d ₅	f ₁	h ₂	l ₁	l ₂	l ₄	B	R	⚖	Handwheel indicator combinations
CE.28502	VAD.80-PXX1 A-10	80	55	10	22.5	20	20.5	56	6	M4	3.5	18.5	11.5	13.6	13	19	205	PA01 - PA11
CE.28552	VAD.100-PXX1 A-10	100	63.5	10	22.5	20	20.5	56	6	M4	3.5	18.5	11.5	13.6	14	19	265	PA01 - PA11
CE.28602	VAD.125-PXX2 A-12	125	65.5	12	22.5	32	22.5	76	6	M4	4	19	12	13.1	15	28.5	450	PA02 - PA12 - PW12
CE.28652	VAD.160-PXX2 A-14	160	71.5	14	23.5	32	25.5	78	6	M4	4	20	13	12.1	18	28.5	680	PA02 - PA12 - PW12
CE.28702	VAD.160-PXX5 A-14	160	64	14	23.5	32	25.5	120	6	M4	4	20	13	12.1	18	28.5	760	PA05

VAD-PXX+I

Code	Description	D	L	d _{H7}	h	d ₁	d ₂	d ₃	d ₅	f ₁	h ₂	l ₁	l ₂	l ₄	B	H	m	R	R ₁	⚖	Handwheel indicator combinations
CE.28512	VAD.80-PXX1 A-10+I	80	55	10	22.5	20	20.5	56	6	M4	3.5	18.5	11.5	13.6	13	45	M6	19	33.5	230	PA01 - PA11
CE.28562	VAD.100-PXX1 A-10+I	100	63.5	10	22.5	20	20.5	56	6	M4	3.5	18.5	11.5	13.6	14	45	M6	19	42.5	300	PA01 - PA11
CE.28612	VAD.125-PXX2 A-12+I	125	65.5	12	22.5	32	22.5	76	6	M4	4	19	12	13.1	15	65	M8	28.5	54	520	PA02 - PA12 - PW12
CE.28662	VAD.160-PXX2 A-14+I	160	71.5	14	23.5	32	25.5	78	6	M4	4	20	13	12.1	18	80	M10	28.5	71	760	PA02 - PA12 - PW12
CE.28712	VAD.160-PXX5 A-14+I	160	64	14	23.5	32	25.5	120	6	M4	4	20	13	12.1	18	80	M10	28.5	71	840	PA05

Digital position indicators

direct drive, 3-digit counter, technopolymer

BASE AND CASE

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

Case in the following colours:

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

The ultrasonically welding between the base and the case prevents separation and avoids dust penetration.

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

It indicates the displacement of the mechanism controlled by the spindle from the start position (0).

Three-digit roller counter. The digits of red rolls show the decimal values.

The display can be in different positions (see "Table of the possible combinations").

- **AN**: inclined display, counter in upper position.
- **AR**: inclined display, counter in lower position.
- **FN**: front display, counter in upper position.
- **FR**: front display, counter in lower position.

INTERNAL GASKET

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

REAR GASKET

Foam polyethylene, supplied.

STANDARD EXECUTION

Boss with $\varnothing 10$ mm H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end, included in the supply.

- **DD50**: black-oxide steel boss.
- **DD50-SST**: AISI 303 stainless steel boss.

DIRECTION OF ROTATION

- **D**: clockwise. Increasing values with clockwise rotation of the boss.
- **S**: anti-clockwise. Increasing values with anti-clockwise rotation of the boss.

WEIGHT

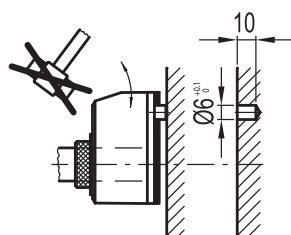
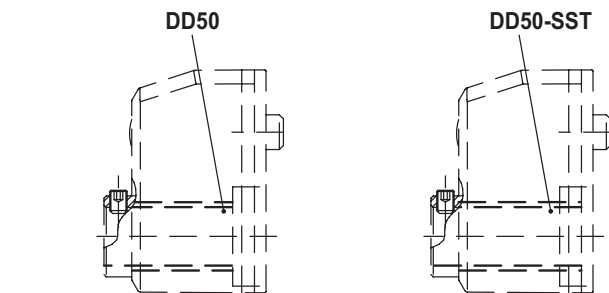
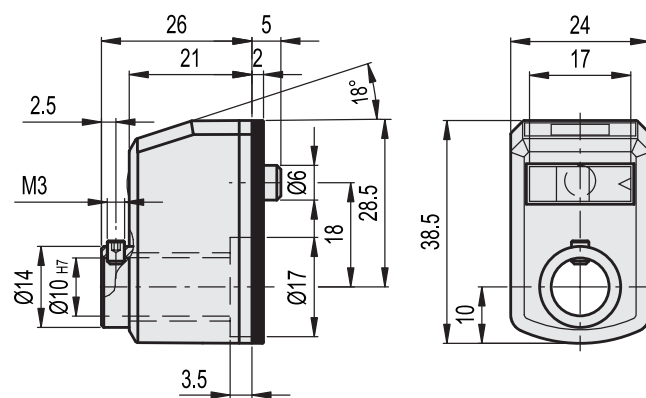
22 grams.

ERGONOMY AND DESIGN

Compact roller counter, ergonomically designed digits for rapid reading. The readability of the counter is increased by the magnifying window.

ASSEMBLY INSTRUCTIONS

1. Drill a $\varnothing 6$ mm by 10 mm hole in the body of the machine with a 18 mm centre distance from the spindle to fit the rear referring pin.
2. Set the spindle to the start or referring position.
3. Fit the indicator with the zeroed roller counter onto the spindle and make sure that the referring pin fit the hole.
4. Clamp the bushing to the spindle by tightening the grub screw with hexagon socket and cup end, according to UNI 5929-85.



DD50

Digital position indicators

SPECIAL EXECUTIONS ON REQUEST

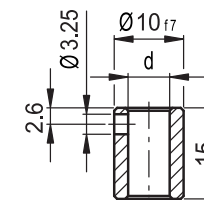
- Special readings after one revolution.
- Case in different colours.
- Completely sealed digital position indicators with IP 67 protection class, see table EN 60529 (on page A23) obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

FEATURES AND APPLICATIONS

Direct drive digital position indicators can be assembled on passing through spindles in any position to give direct reading of the positioning of a machine component. They are suitable also for motor driven applications (see "Example of description for ordering").

ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **RB50**: black-oxide steel reduction sleeves.
- **RB50-SST**: AISI 304 stainless steel reduction sleeves.



RB50

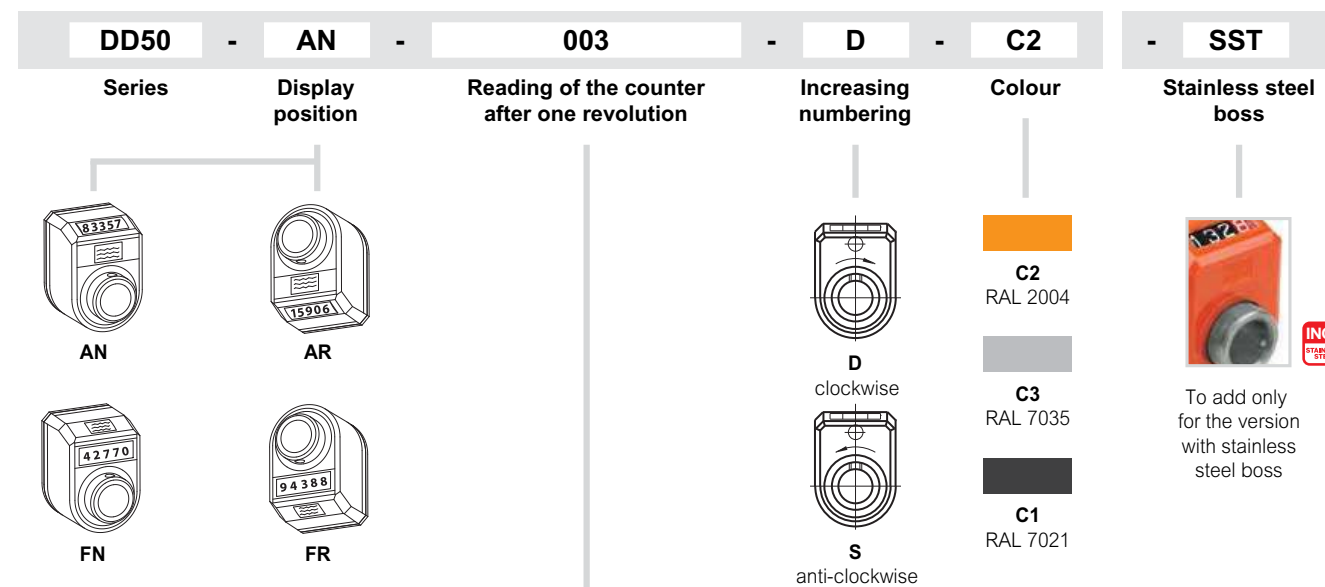
Code	Description	dH7
CE.80940	RB50-6	6
CE.80950	RB50-8	8

RB50-SST

STAINLESS STEEL

Code	Description	dH7
CE.90940	RB50-6-SST	6
CE.90950	RB50-8-SST	8

Example of description for ordering



003	003	003	Pitch	Speed (rpm) *
003	00.3	0.03	0.3	1500
010	01.0	0.10	1.0	1500
020	02.0	0.20	2.0	1250
030	03.0	0.30	3.0	830
040	04.0	0.40	4.0	625
050	05.0	0.50	5.0	500
100	10.0	1.00	10	250

* The maximum rotation speed (rpm) of the spindle reported in the table corresponds to a maximum rotation of 25000 units of the last roll on the right of the counter. Rotational speed tests have been performed in our laboratory under standard operating conditions. Small misalignments (not compromising the correct reading) of counter digits can occur due to high tolerances between gear teeth, designed to prevent damage from sudden acceleration or stop.

Digital position indicators

direct drive, 4-digit counter, technopolymer

BASE AND CASE

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

Case in the following colours:

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

The ultrasonically welding between the base and the case prevents separation and avoids dust penetration.

WINDOW

Transparent polyamide based (PA-T) technopolymer, moulded over the case and with a perfect seal (avoid contact with alcohol during cleaning operations).

DISPLAY

It indicates the displacement of the mechanism controlled by the spindle from the start position (0).

Four-digit roller counter. The digits of red rolls show the decimal values. An additional graduated scale next to the last decimal digit offers further accuracy of reading.

The display can be in different positions (see "Table of the possible combinations").

- **AN**: inclined display, counter in upper position.
- **AR**: inclined display, counter in lower position.
- **FN**: front display, counter in upper position.
- **FR**: front display, counter in lower position.

INTERNAL GASKET

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

REAR GASKET

Foam polyethylene, supplied.

STANDARD EXECUTIONS

Boss with Ø 14 mm H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end, included in the supply.

- **DD51**: black-oxide steel boss.
- **DD51-SST**: AISI 303 stainless steel boss.

DIRECTION OF ROTATION

- **D**: clockwise. Increasing values with clockwise rotation of the boss.
- **S**: anti-clockwise. Increasing values with anti-clockwise rotation of the boss.

WEIGHT

42 grams.

FEATURES AND APPLICATIONS

Direct drive digital position indicators can be assembled on passing through spindles in any position to give direct reading of the positioning of a machine component. They are suitable also for motor driven applications (see "Example of description for ordering").

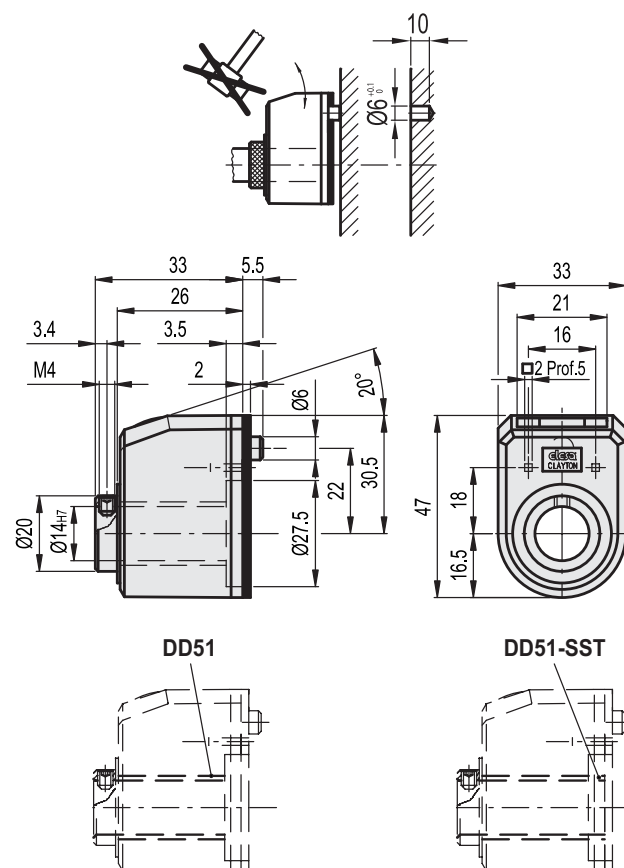
ERGONOMY AND DESIGN

Compact roller counter, ergonomically designed digits for rapid reading. The readability of the counter is increased by the magnifying window.

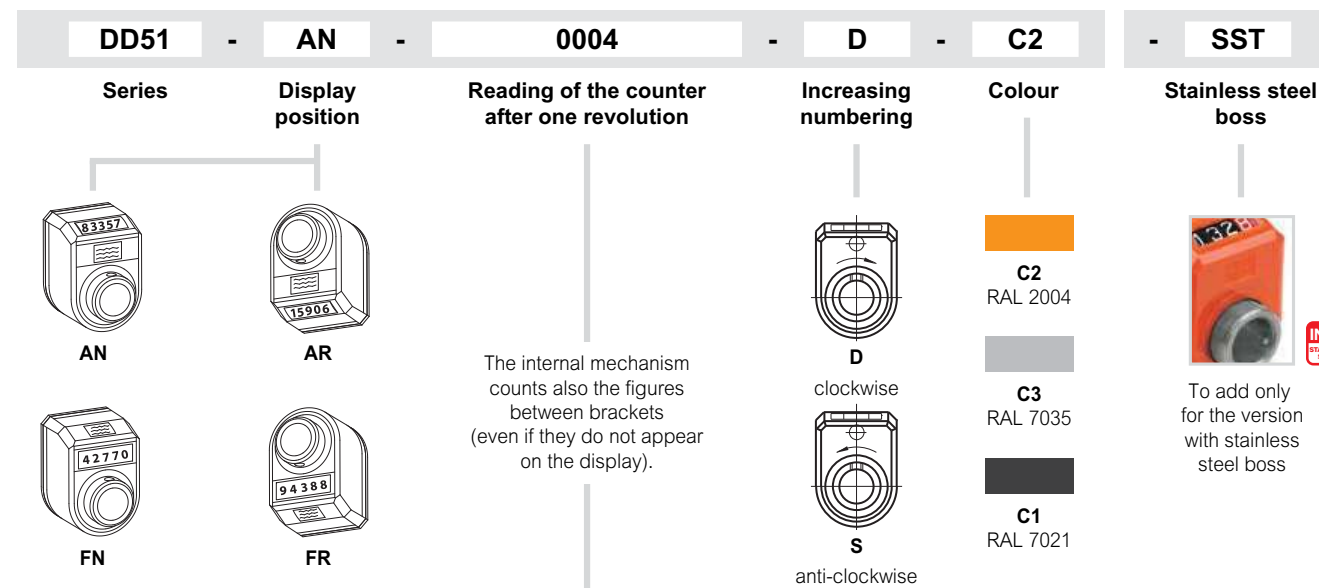


ASSEMBLY INSTRUCTIONS

1. Drill a Ø 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. Set the spindle to the start or referring position.
3. Fit the indicator with the zeroed roller counter onto the spindle and make sure that the referring pin fit the hole.
4. Clamp the bushing to the spindle by tightening the grub screw with hexagon socket and cup end, according to UNI 5929-85.



Example of description for ordering



0 0 0 4	0 0 0 .4	0 0 .0 4	0 .0 0 4	Pitch	Speed (rpm) *
0004	000.4	00.04	0.004	0.4	1500
0010	001.0	00.10	0.010	1.0	1500
0012(5)	001.2(5)	00.12(5)	0.012(5)	1.25	1500
0015	001.5	00.15	0.015	1.5	1500
0015(7)	001.5(7)	00.15(7)	0.015(7)	1.57	1500
0017(5)	001.7(5)	00.17(5)	0.017(5)	1.75	1420
0020	002.0	00.20	0.020	2.0	1250
0020(83)	002.0(83)	00.20(83)	0.020(83)	2.083	1200
0025	002.5	00.25	0.025	2.5	1000
0030	003.0	00.30	0.030	3.0	830
0040	004.0	00.40	0.040	4.0	625
0044	004.4	00.44	0.044	4.4	550
0050	005.0	00.50	0.050	5.0	500
0057	005.7	00.57	0.057	5.7	435
0060	006.0	00.60	0.060	6.0	415
0065(5)	006.5(5)	00.65(5)	0.065(5)	6.55	370
0075	007.5	00.75	0.075	7.5	330
0080	008.0	00.80	0.080	8.0	315
0083(3)	008.3(3)	00.83(3)	0.083(3)	8.33	300
0100	010.0	01.00	0.100	10.0	250
0120	012.0	01.20	0.120	12.0	205
0125	012.5	01.25	0.125	12.5	200
0157	015.7	01.57	0.157	15.7	150
0200	020.0	02.00	0.200	20.0	125

* The maximum rotation speed (rpm) of the spindle reported in the table corresponds to a maximum rotation of 25000 units of the last roll on the right of the counter. Rotational speed tests have been performed in our laboratory under standard operating conditions. Small misalignments (not compromising the correct reading) of counter digits can occur due to high tolerances between gear teeth, designed to prevent damage from sudden acceleration or stop.

SPECIAL EXECUTIONS ON REQUEST

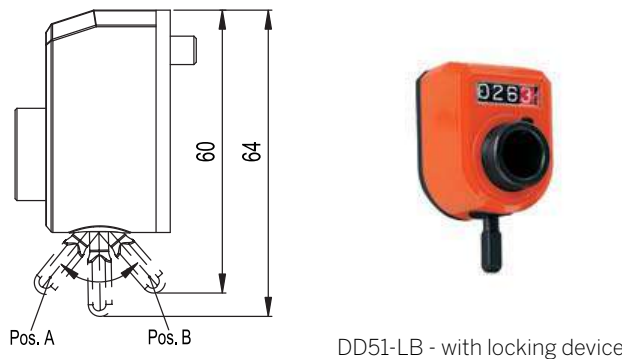
- Special readings after one revolution.
- Case in different colours.
- Completely sealed digital position indicators with IP 67 protection class, see table EN 60529 (on page A23) obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

LB - LOCKING DEVICE

The DD51-LB position indicators are designed to lock the spindle on which they are mounted to avoid the risk of accidental adjustment alterations due to vibrations. To lock or unlock the spindle rotation, simply move the lever, in pos. A equivalent to unlocked spindle, in pos. B equivalent to locked spindle.

Following repeated locking cycles, the special device is highly wear resistant and functions perfectly over time.

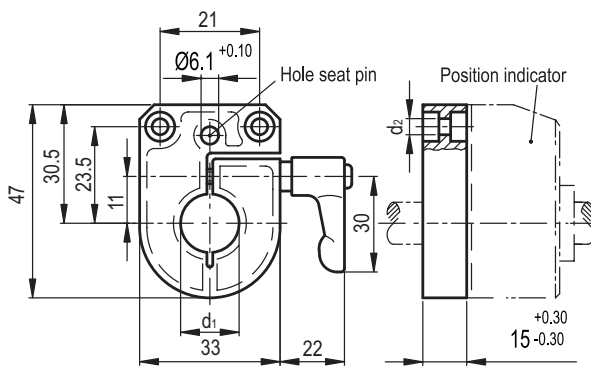
To order the indicator with spindle locking add the -LB index after the code and description (e.g. CE.84101-LB DD51-AN-00.50-D-C3-LB).



DD51-LB - with locking device

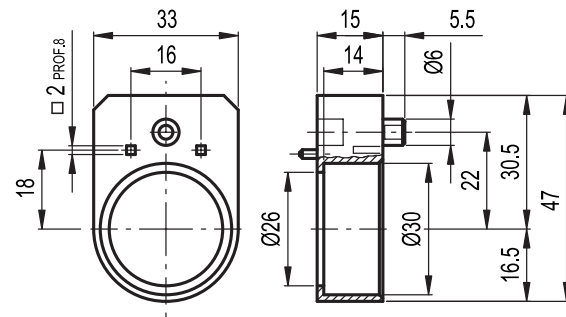
ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **GN 954.6:** zinc die-cast bases for spindle locking, epoxy resin coating, black colour, matte finish (see table). Type GN 302 adjustable handle. GN 954.6 locking bases allow an easy and quick locking of the spindles after their positioning. They are equipped with a Ø 6.1 mm to fit the referring pin of the indicator. They can be assembled with the handle either on the right or on the left and can be fitted to the machine by means of two M4 cylindrical head screws (not included in the supply).



Description	d1 +0.06/+0.02	d2	⚖️
GN 954.6-33-B8	B 8	4.5	112
GN 954.6-33-B10	B 10	4.5	109
GN 954.6-33-B12	B 12	4.5	107
GN 954.6-33-B14	B 14	4.5	102

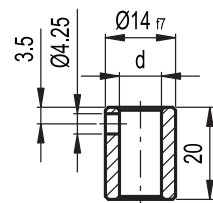
- **BS51:** glass-fibre polyamide based (PA) technopolymer spacer plate (code CE.85900).



- **MD51** (see page 730): polyamide based (PA) technopolymer fluted grip control knob.



- **RB51:** black-oxide steel reduction sleeves.
- **RB51-SST:** AISI 304 stainless steel reduction sleeves.



Code	Description	dH7
CE.85940	RB51-6	6
CE.85950	RB51-8	8
CE.85955	RB51-10	10
CE.85960	RB51-12	12

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

Digital position indicator direct drive, 5-digit counter, technopolymer

BASE AND CASE

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

Case in the following colours:

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

The ultrasonically welding between the base and the case prevents separation and avoids dust penetration.

WINDOW

Transparent polyamide based (PA-T) technopolymer, moulded over the case and with a perfect seal (avoid contact with alcohol during cleaning operations).

DISPLAY

It indicates the displacement of the mechanism controlled by the spindle from the start position (0).

Five-digit roller counter. The digits of red rolls show the decimal values. An additional graduated scale next to the last decimal digit offers further accuracy of reading.

The display can be in different positions (see "Table of the possible combinations").

- **AN:** inclined display, counter in upper position.
- **AR:** inclined display, counter in lower position.
- **FN:** front display, counter in upper position.
- **FR:** front display, counter in lower position.

INTERNAL GASKET

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

REAR GASKET

Foam polyethylene, supplied.

STANDARD EXECUTION

Boss with Ø 20 mm H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end.

- **DD52R:** black-oxide steel boss.
- **DD52R-SST:** INOX AISI 303 stainless steel boss.

DIRECTION OF ROTATION

- **D:** clockwise. Increasing values with clockwise rotation of the boss.
- **S:** anti-clockwise. Increasing values with anti-clockwise rotation in applications (see "Example of description for ordering").

WEIGHT

97 grams.

FEATURES AND APPLICATION

Direct drive digital position indicators can be assembled on passing through spindles in any position to give direct reading of the positioning of a machine component. They are suitable also for motor driven applications (see "Example of description for ordering").

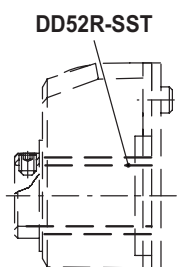
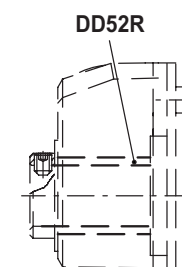
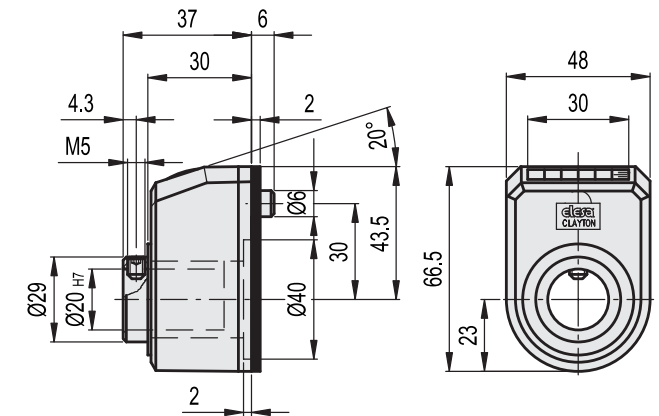
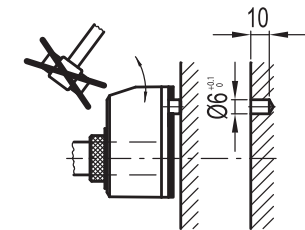
ERGONOMY AND DESIGN

Compact roller counter, ergonomically designed digits for rapid reading. The readability of the counter is increased by the magnifying window.



ASSEMBLY INSTRUCTIONS

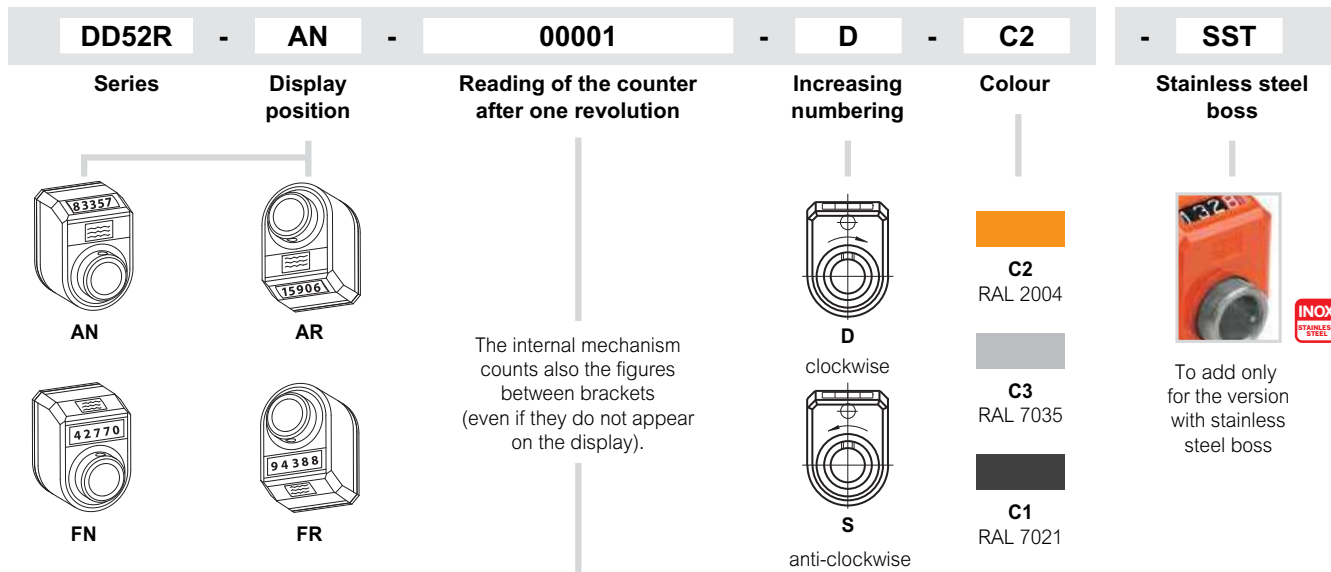
1. Drill a Ø 6 mm by 10 mm hole in the body of the machine with a 30 mm centre distance from the spindle to fit the rear referring pin.
2. Set the spindle to the start or referring position.
3. Fit the indicator with the zeroed roller counter onto the spindle and make sure that the referring pin fit the hole.
4. Clamp the bushing to the spindle by tightening the grub screw with hexagon socket and cup end, according to UNI 5929-85.



Rotary controls 7

Rotary controls 7

Example of description for ordering



The internal mechanism counts also the figures between brackets (even if they do not appear on the display).

To add only for the version with stainless steel boss

00001	0000.1	000.01	00.001	Pitch	Speed (rpm) *
00001	0000.1	000.01	00.001	0.1	1500
00004	0000.4	000.04	00.004	0.4	1500
00005	0000.5	000.05	00.005	0.5	1500
00009(6)	0000.9(6)	000.09(6)	00.009(6)	0.96	1500
00010	0001.0	000.10	00.010	1.0	1500
00012(5)	0001.2(5)	000.12(5)	00.012(5)	1.25	1500
00015	0001.5	000.15	00.015	1.5	1500
00015(8)	0001.5(8)	000.15(8)	00.015(8)	1.58	1500
00015(75)	0001.5(75)	000.15(75)	00.015(75)	1.575	1500
00016(07)	0001.6(07)	000.16(07)	00.016(07)	1.607	1500
00017(5)	0001.7(5)	000.17(5)	00.017(5)	1.75	1420
00019(6875)	0001.9(6875)	000.19(6875)	00.019(6875)	1.96875	1270
00020	0002.0	000.20	00.020	2.0	1250
00025	0002.5	000.25	00.025	2.5	1000
00025(4)	0002.5(4)	000.25(4)	00.025(4)	2.54	980
00030	0003.0	000.30	00.030	3.0	830
00031(5)	0003.1(5)	000.31(5)	00.031(5)	3.15	790
00031(75)	0003.1(75)	000.31(75)	00.031(75)	3.175	780
00035	0003.5	000.35	00.035	3.5	710
00038(095)	0003.8(095)	000.38(095)	00.038(095)	3.8095	650
00039(375)	0003.9(375)	000.39(375)	00.039(375)	3.9375	640
00040	0004.0	000.40	00.040	4.0	625
00042(9)	0004.2(9)	000.42(9)	00.042(9)	4.29	580
00050	0005.0	000.50	00.050	5.0	500
00050(8)	0005.0(8)	000.50(8)	00.050(8)	5.08	490
00052(94)	0005.2(94)	000.52(94)	00.052(94)	5.294	470
00056(47)	0005.6(47)	000.56(47)	00.056(47)	5.647	440
00060	0006.0	000.60	00.060	6.0	415
00062(5)	0006.2(5)	000.62(5)	00.062(5)	6.25	400
00063(5)	0006.3(5)	000.63(5)	00.063(5)	6.35	390
00066	0006.6	000.66	00.066	6.6	370
00070	0007.0	000.70	00.070	7.0	350
00075	0007.5	000.75	00.075	7.5	330
00076(923)	0007.6(923)	000.76(923)	00.076(923)	7.6923	325
00078(75)	0007.8(75)	00078(75)	00.078(75)	7.875	310
00080	0008.0	000.80	00.080	8.0	315
00090	0009.0	000.90	00.090	9.0	270
00100	0010.0	001.00	00.100	10.0	250
00105	0010.5	001.05	00.105	10.5	235
00118(125)	0011.8(125)	001.18(125)	00.118(125)	11.8125	205
00119(05)	0011.9(05)	001.19(05)	00.119(05)	11.905	210
00120	0012.0	001.20	00.120	12.0	200
00130	0013.0	001.30	00.130	13.0	190
00150	0015.0	001.50	00.150	15.0	160
00160	0016.0	001.60	00.160	16.0	150
00200	0020.0	002.00	00.200	20.0	125

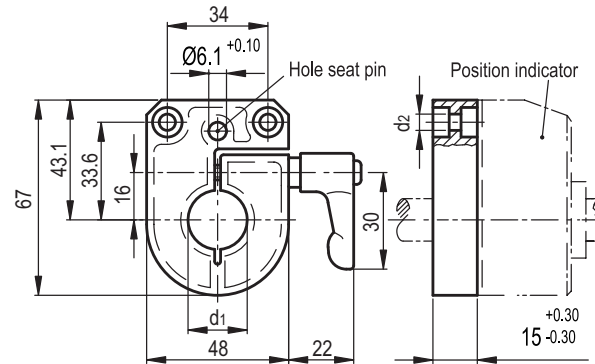
* The maximum rotation speed (rpm) of the spindle reported in the table corresponds to a maximum rotation of 25000 units of the last roll on the right of the counter. Rotational speed tests have been performed in our laboratory under standard operating conditions. Small misalignments (not compromising the correct reading) of counter digits can occur due to high tolerances between gear teeth, designed to prevent damage from sudden acceleration or stop.

SPECIAL EXECUTIONS ON REQUEST

- Special readings after one revolution.
- Case in different colours.
- Completely sealed digital position indicators with IP 67 protection class, see table EN 60529 (on page A23) obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

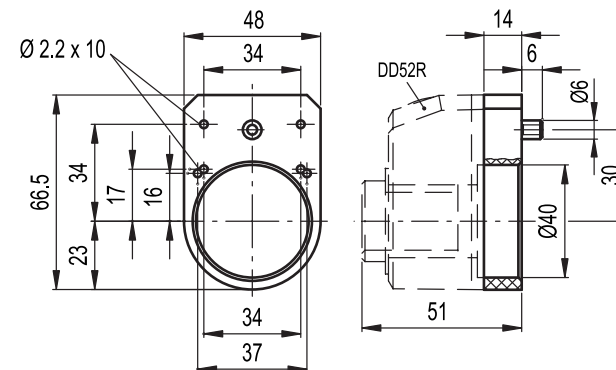
ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **GN 953.6**: zinc die-cast bases for spindle locking, epoxy resin coating, black colour, matte finish (see table). Type GN 302 adjustable handle. GN 953.6 locking bases allow an easy and quick locking of the spindles after their positioning. They are equipped with a Ø 6.1 mm hole to fit the referring pin of the indicator. They can be assembled with the handle either on the right or on the left and can be fitted to the machine by means of two M5 cylindrical-head screws (not included in the supply).

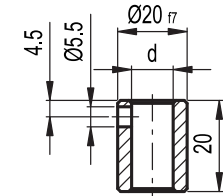


Description	d1 +0.06/+0.02	d2	⚖
GN 953.6-48-B12	B 12	5.5	179
GN 953.6-48-B14	B 12	5.5	175
GN 953.6-48-B15	B 15	5.5	173
GN 953.6-48-B16	B 16	5.5	168
GN 953.6-48-B20	B 20	5.5	161

- **BS52R**: glass-fibre reinforced polyamide based (PA) technopolyme spacer base (code CE.83950), designed with two pre-drilled holes for UNI 10227 self-tapping screws Ø 2.2 (not included in the supply).



- **RB52**: black-oxide steel reduction sleeves.
- **RB52-SST**: AISI 304 stainless steel reduction sleeves.



RB52

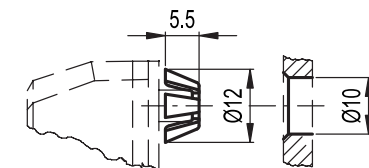
Code	Description	dH7
CE.87940	RB52-12	12
CE.87950	RB52-14	14
CE.87955	RB52-15	15
CE.87960	RB52-16	16

RB52-SST

STAINLESS STEEL

Code	Description	dH7
CE.97941	RB52-12-SST-304	12
CE.97951	RB52-14-SST-304	14
CE.97956	RB52-15-SST-304	15
CE.97961	RB52-16-SST-304	16

- **PE.6-10**: red technopolymer pin (code CE.83960).



Electronic position indicators

direct drive, 5-digit display, technopolymer

BASE AND CASE

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

Case in the following colours:

- **C2**: RAL 2004 orange, glossy finish.
- **C3**: RAL 7035 grey, glossy finish.

Available on request in RAL 7021 grey-black colour (C1).

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 ultrasonic welding between the base and the case prevents separation and avoids dust and liquid penetration.

BOSS

AISI 304 stainless steel with Ø 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 8,0 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 assembled 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-SST-IP67).

REAR GASKET

Foam polyethylene, included in the supply.

STANDARD EXECUTIONS

- **DD51-E-SST-IP65**: completely sealed indicator with IP 65 protection class, see EN 60529 table (on page A23).

- **DD51-E-SST-IP67**: completely sealed indicator with IP 67 protection class, see EN 60529 table (on page A23), obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

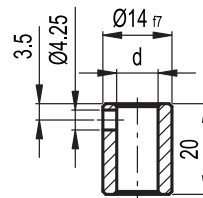
ASSEMBLY INSTRUCTIONS

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 fit 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.



ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

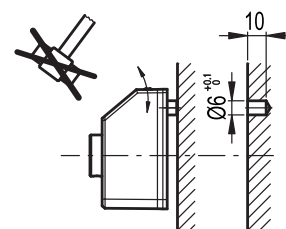
- AISI 304 stainless steel RB51 reduction sleeves.



RB51-SST

STAINLESS STEEL

Code	Description	dH7
CE.95941	RB51-6-SST-304	6
CE.95951	RB51-8-SST-304	8
CE.95956	RB51-10-SST-304	10
CE.95961	RB51-12-SST-304	12



FEATURES AND APPLICATIONS

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.

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.

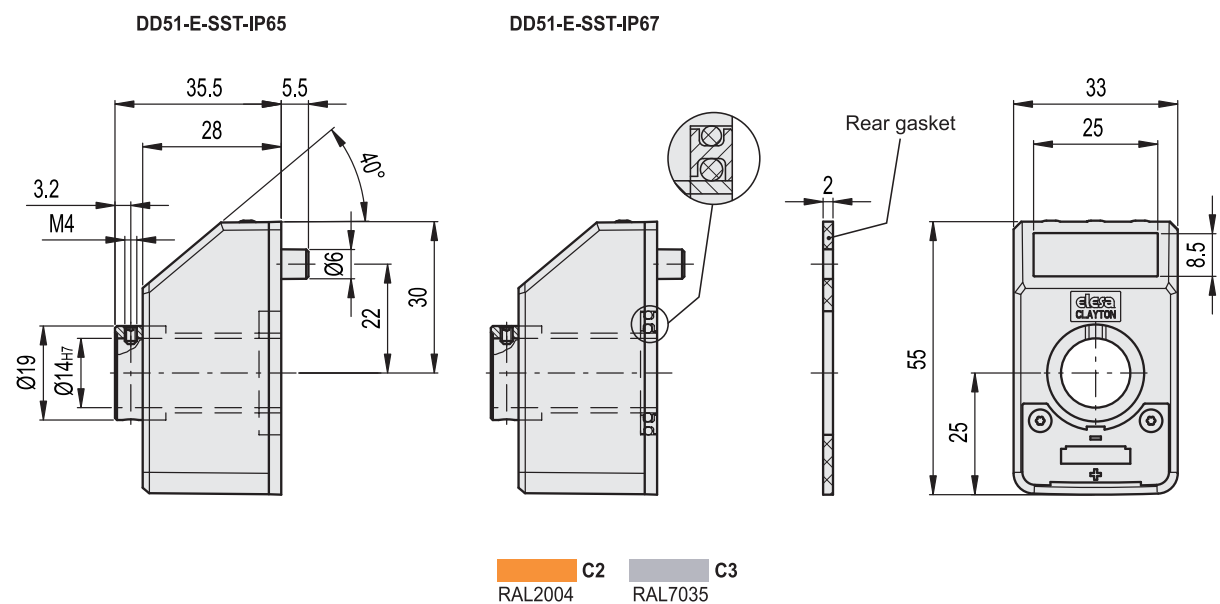
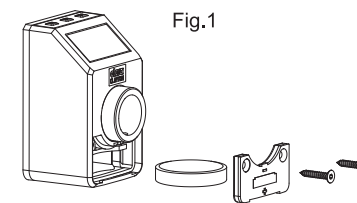
The high protection degree, IP 65 or IP67, makes the indicator suitable for applications that require frequent washing, even with intense water jets.

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 ensures long battery life (over 5 years). A special symbol appears on the display when it is necessary to replace the battery. The replacement can be performed easily by removing the front cover (Fig.1), without disassembly of the indicator from the control shaft and without the loss of configuration parameters.

Further technical information available in Operating instructions.



Code	Description	⚖
CE.99002	DD51-E-SST-IP65-C2	67
CE.99001	DD51-E-SST-IP65-C3	67
CE.99012	DD51-E-SST-IP67-C2	72
CE.99011	DD51-E-SST-IP67-C3	72

Mechanical and electrical characteristics	
Tension feed	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 class	IP65 or IP67
Working temperature	0 ÷ 50 °C
Storing temperature	-20 ÷ +60 °C
Relative humidity	Max. 95% at 25°C without condensation
Interference protection	IEC 61326-1 CE

(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 value of the max. speed affects the battery life.

Electronic position indicators direct drive, 6-digit display, technopolymer

BASE AND CASE

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

Case in the following colours:

- **C2**: RAL 2004 orange, glossy finish.
- **C3**: RAL 7035 grey, glossy finish.

Available on request in RAL 7021 grey-black colour (C1)

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 ultrasonic welding between the base and the case prevents separation and avoids dust and liquid penetration.

BOSS

AISI 304 stainless steel with Ø 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-SST-IP67).

REAR GASKET

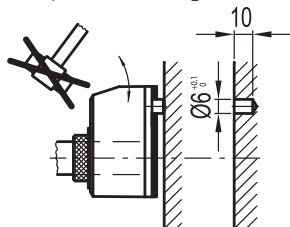
Foam polyethylene, included in the supply.

STANDARD EXECUTIONS

- **DD52R-E-SST-IP65**: completely sealed indicator with IP 65 protection class, see EN 60529 table (on page A23).
- **DD52R-E-SST-IP67**: completely sealed indicator with IP 67 protection class, see EN 60529 table (on page A23), obtained by means of a brass bushing with double seal ring inside the rear cavity of the base.

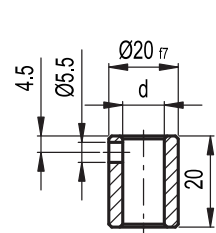
ASSEMBLY INSTRUCTIONS

1. Drill a Ø 6x10 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 fit 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.



ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

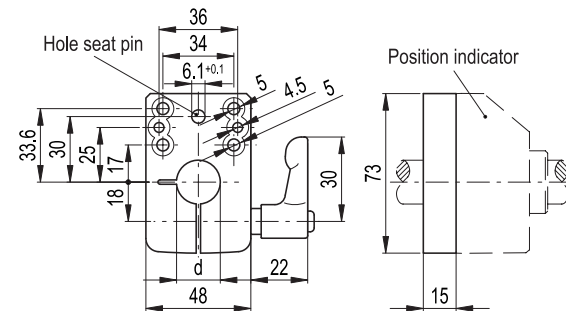
- **RB52-SST**: AISI 304 stainless steel reduction sleeves.



RB52-SST STAINLESS STEEL

Code	Description	dH7
CE.97941	RB52-12-SST-304	12
CE.97951	RB52-14-SST-304	14
CE.97956	RB52-15-SST-304	15
CE.97961	RB52-16-SST-304	16

- **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 Ø 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).



Code	Description	dH7
CE.99091	BSA52-E-12	12
CE.99093	BSA52-E-14	14
CE.99094	BSA52-E-15	15
CE.99095	BSA52-E-16	16
CE.99099	BSA52-E-20	20

FEATURES AND APPLICATIONS

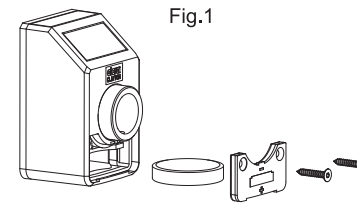
DD52R-E position indicators, with battery power supply, can be used on passing through shafts in any position to provide the reading of the absolute or incremental positioning of a machine component. The 6-digit display of 12.0 mm height ensures excellent readability even from a distance and from different viewing angles. The window in transparent technopolymer protects the LCD display against accidental shocks.

The high protection class, IP 65 or IP67, makes the indicator suitable for applications that require frequent washing, even with water jets. 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.

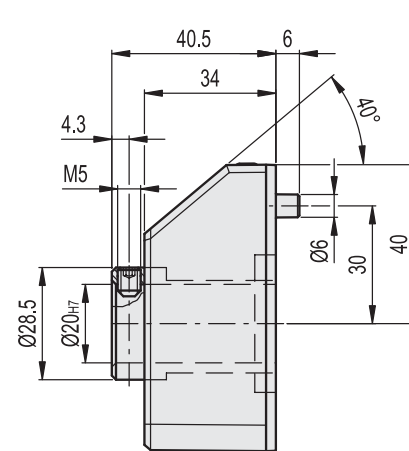
In the programming mode, through the 4 function keys, it is possible to program the reading after one revolution of the shaft, the direction of rotation, the display orientation, the resolution (number of decimal digits displayed), the source value and the offset value, the max. speed of rotation and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

The internal battery ensures long battery life (over 8 years). A special symbol appears on the display when it is necessary to replace the battery. The replacement can be performed easily by removing the front cover (Fig.1), without disassembly of the indicator from the control shaft and without the loss of configuration parameters.

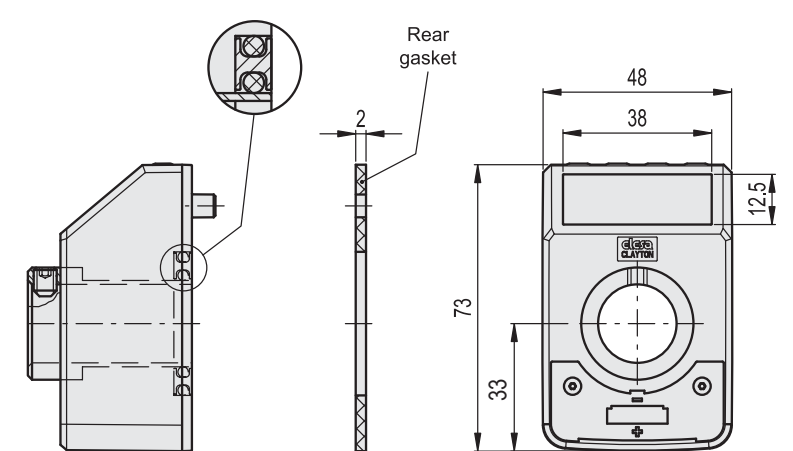
Further technical information available in Operating instructions.



DD52R-E-SST-IP65



DD52R-E-SST-IP67



C2 RAL2004
C3 RAL7035

STAINLESS STEEL

Code	Description	⚖
CE.99052	DD52R-E-SST-IP65-C2	129
CE.99051	DD52R-E-SST-IP65-C3	129
CE.99062	DD52R-E-SST-IP67-C2	141
CE.99061	DD52R-E-SST-IP67-C3	141

Mechanical and electrical characteristics	
Tension feed	Lithium battery CR2450 3.0 V
Battery life	8 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 programmable ⁽¹⁾
Rotation max. speed	300/600/1000 r.p.m ⁽²⁾ programmable ⁽¹⁾
Precision	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
Interference protection	IEC 61326-1 CE

(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 value of the max. speed affects the battery life.

Electronic position indicators

absolute reading, direct drive, technopolymer

BASE AND CASE

Polyamide based (PA) technopolymer certified self-extinguishing UL94 V-0.
Black base.
Black case, glossy finish.

DISPLAY

- Backlit LCD display showing two values: target position and current position.
- Adjustable reading (upper and lower).
- Cursor to indicate the rotation direction (clockwise/anti-clockwise) to reach the target position.
- Values displayed in mm or inches.

The visualization parameters can be set and modified by software at the installation of the machine.

FRONT MEMBRANE

Polyester. Resistant to solvents, alcohol, acids, alkali.

INTERNAL GASKET

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

REAR GASKET

Polyurethane, supplied.

BOSS

Black-oxide steel with $\varnothing 14$ mm H7 reamed hole, fitting to shaft by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

STANDARD EXECUTIONS

- **DE51-F:** front display, output with connectors.
- **DE51-F-Cable:** front display, output with cable and connectors.
- **DE51-A:** inclined display, output with connectors.
- **DE51-A-Cable:** inclined display, output with cable and connectors.

IP PROTECTION

Completely sealed indicator with IP 65 protection class, see EN 60529 table (on page A23).

FEATURES AND APPLICATIONS

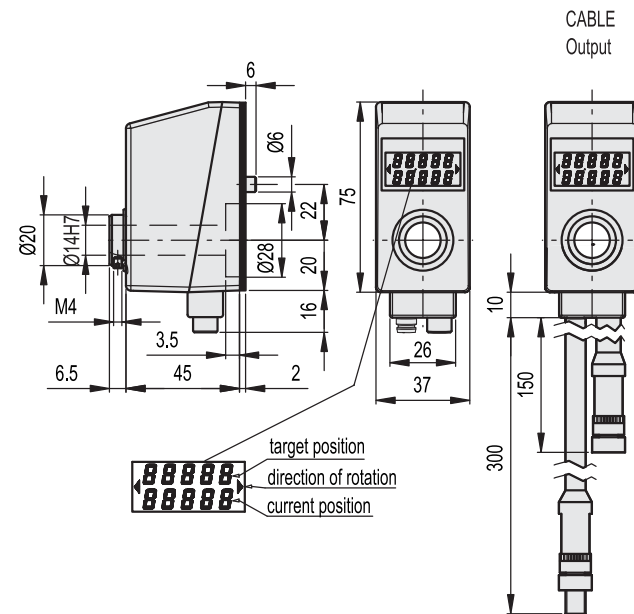
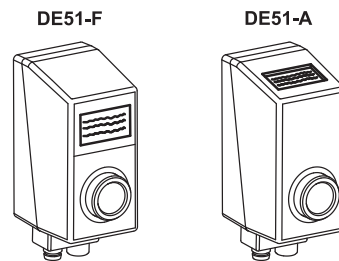
DE51 indicators can be used on passing through spindles in any position to give absolute reading of the current position and of the target one of a machine component.


DE51 indicator is a sophisticated measuring system based on an absolute multi-turn encoder and it is not affected by magnetic fields. Therefore it is able to guarantee perfect operation, even in the presence of electric motors.

Thanks to the long-life lithium battery (more than 10 years of life-expectancy) spindle positioning variations can be registered even when the power supply is off and it prevents the loss of the preset values in case of an electrical power failure.

DE51 indicators must be networked to the central memory unit (call Elessa Customer Care) or directly to the PLC.

The connection of DE51 electronic indicators directly to the PLC of the machine functions also as a safety system. In fact, in case of mismatch for the target position of even one DE51, the PLC prevents the machine from starting working, thereby avoiding inaccurate work.

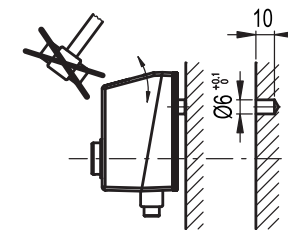


Code	Description	
CE.99111	DE51-F-F.14	125
CE.99121	DE51-A-F.14	125
CE.99112	DE51-F-F.14-Cable	125
CE.99122	DE51-A-F.14-Cable	125

Mechanical and electrical characteristics	
Input	24 Vdc \pm 20%, 30mA
Buffer memory	3V lithium battery min. guaranteed life expectancy 10 years for recording current and target values
Interface	RS485
Connection	M8 - 4PIN
MAX RPM number	600 RPM
Weight	120 g
Working temperature	0 \div 50 $^{\circ}$ C
Storing temperature	-20 \div +70 $^{\circ}$ C
Relative humidity	80% at 25 $^{\circ}$ C without condensation
Protection class	IP 65 according to EN 60529
General classification according to EN 61010 part 1	Protection class II Overvoltage protection category II Contamination factor 2
Immunity to interference	According to EN 61000-6-2
Interference emission	According to EN 61000-6-3

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. Set the spindle to the start or referring position.
3. Fit the indicator onto the spindle and make sure that the referring pin fit the hole.
4. Clamp the bushing to the spindle by tightening the grub screw with hexagon socket and cup end UNI 5929-85.
5. Network the indicator using cables with connectors type M8-4PIN (see table "Mechanical and electrical characteristics").

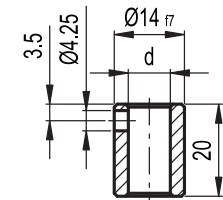


ACCESSORIES ON REQUEST (TO BE ORDERED SEPARATELY)

- **Connection cables** between PLC or central memory unit and DE51 or between two DE51 with different lengths (see table)
- **Terminal resistor** to avoid noises and interferences on the net (see table)

Code	Description	
CE.99136	CABLE-M8-SC-5mt	Connection cable between central memory to DE51
CE.99141	CABLE-M8-1mt	Connection cable for DE51 (length 1m)
CE.99143	CABLE-M8-3mt	Connection cable for DE51 (length 3m)
CE.99145	CABLE-M8-5mt	Connection cable for DE51 (length 5m)
CE.99146	CABLE-M8-6mt	Connection cable for DE51 (length 6m)
CE.99156	RE-M8-120ohm	Terminal resistor (resistance value 120ohm)

- **RB51:** black-oxide steel reduction sleeves (see table).



RB51

Code	Description	d#7
CE.85940	RB51-6	6
CE.85950	RB51-8	8
CE.85955	RB51-10	10
CE.85960	RB51-12	12

- **MD51** (see page 730): polyamide based (PA) technopolymer fluted grip control knob.



Fluted grip knob for digital indicators DD51 and DE51

Technopolymer

MATERIAL

Polyamide based (PA) technopolymer, black colour, matte finish.

STANDARD EXECUTION

Plain blind hole. Fitting by means of a supplied grub screw with hexagon socket and cup end UNI 5929-85.

SELF-ADHESIVE FRONT PLATE

Matte anodised aluminium. Supplied assembled.

APPLICATIONS

MD51 knob has been designed to be mounted on direct drive digital position indicators DD51 (on page 718) or on direct drive electronic position indicators DE51 (on page 728).

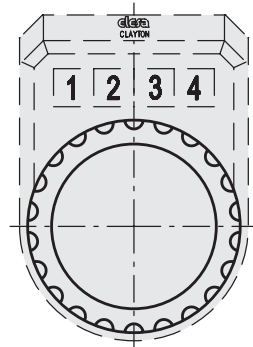
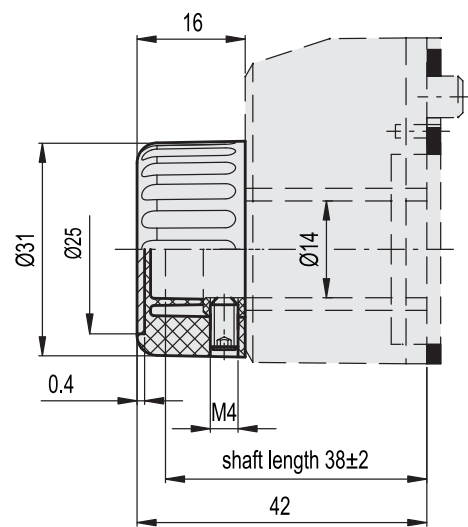
SPECIAL EXECUTIONS ON REQUEST

Stainless steel grub screw.

The front plate can be customized with words, marks, graphic symbols, etc... or supplied in other colours.

ASSEMBLY INSTRUCTIONS

1. Remove the grub screw from the indicator bushing.
2. Insert MD51 knob making sure that the grub screw seat matches the tapped blind hole of the indicator bushing.
3. Screw the grub supplied with the knob, to lock simultaneously the spindle, the indicator bushing and the knob.



Control knobs for position indicators

SPECIFICATION

TYPES

- Type **A**: Shaft-Ød₂ < Bore-Ø d₃
- Type **B**: Shaft-Ød₂ = Bore-Ø d₃

Aluminium
anodized, black

Stainless Steel-Socket set screw DIN 916
with internal hexagon and serrated point

Hub cover cap
Plastic, light grey

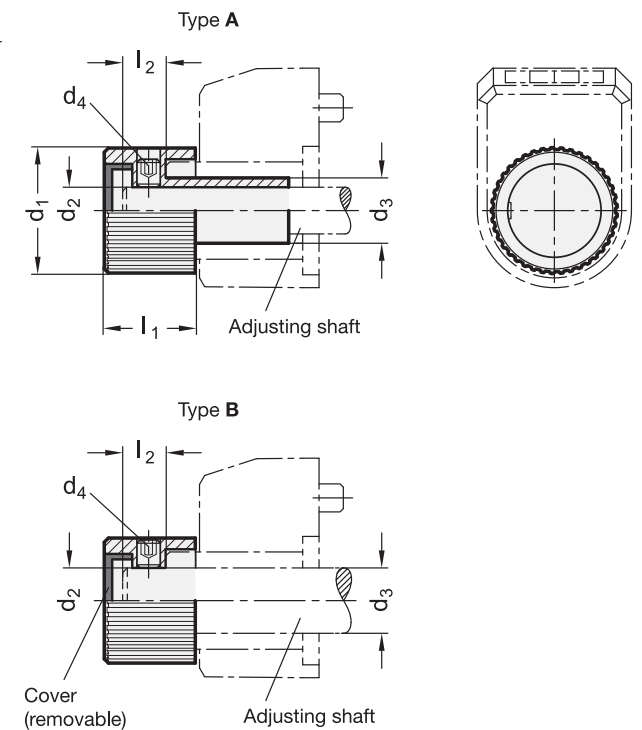
INFORMATION

Control knobs GN 957 are used in connection with position indicators. These control knobs offer a simple solution when the assembly requires manual fine adjustment for the application for which it has been designed.

The design of this knob adapts it to the diameter of the adjustment shaft, so that no adapter bushes RB51 are needed.

TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)



GN 957

Description	d ₁	d ₂ H9	d ₃	d ₄	l ₁	l ₂ min.	l ₂ max.	For position indicator	⚖
GN 957-22-B6-A	22	B 6	10	M 4	15.5	4.5	9.6	DD50	10
GN 957-22-B8-A	22	B 8	10	M 4	15.5	4.5	9.6	DD50	20
GN 957-27-B6-A	27	B 6	14	M 5	19.5	6	11.3	DD51	24
GN 957-27-B8-A	27	B 8	14	M 5	19.5	6	11.3	DD51	22
GN 957-27-B10-A	27	B 10	14	M 5	19.5	6	11.3	DD51	20
GN 957-27-B12-A	27	B 12	14	M 5	19.5	6	11.3	DD51	18
GN 957-42-B10-A	42	B 10	20	M 6	24	6.5	15	DD52R	72
GN 957-42-B12-A	42	B 12	20	M 6	24	6.5	15	DD52R	69
GN 957-42-B14-A	42	B 14	20	M 6	24	6.5	15	DD52R	60
GN 957-42-B15-A	42	B 15	20	M 6	24	6.5	15	DD52R	63
GN 957-42-B16-A	42	B 16	20	M 6	24	6.5	15	DD52R	60
GN 957-22-B10-B	22	B 10	10	M 4	15.5	4.5	9.6	DD50	77
GN 957-27-B14-B	27	B 14	14	M 5	19.5	6	11.3	DD51	14
GN 957-42-B20-B	42	B 20	20	M 6	24	6.5	15	DD52R	50

Code	Description	⚖
CE.85851	MD51-31-14-NR	9

Rotary controls 7

Rotary Controls 7

Magnetic measuring system

Length and angle modes

FEATURES AND APPLICATIONS

MPI-15 measuring system, made of a LCD multifunction display with built-in magnetic position sensor, combined with the magnetic band M-BAND-10 (to be ordered separately), is a complete system for the measurement of linear and angular displacement (with a minimum radius of 65 mm). Characterised by an extremely easy assembly, it allows precise alignment and positioning, reducing time and machining procedures to the minimum.

Multifunction LCD with 5 function keys.

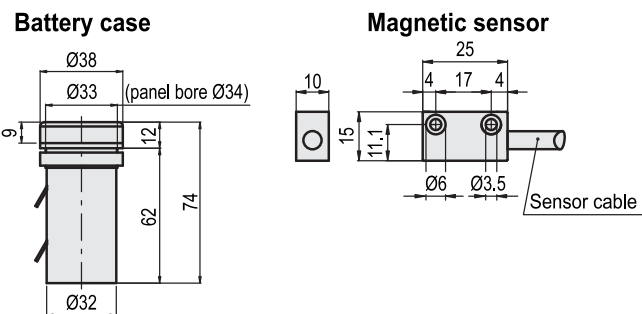
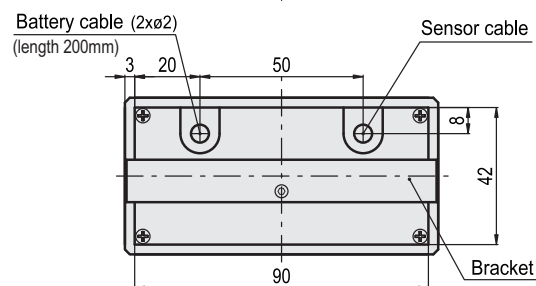
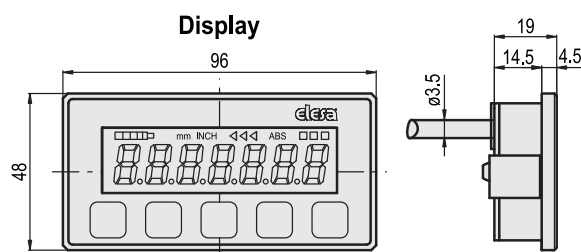
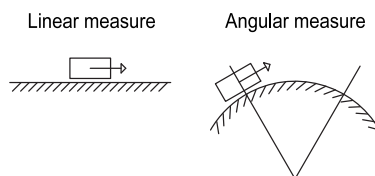
- Absolute/ incremental mode.
- Programmable offset function.
- External battery power supply 1.5 VDC.
- Buffered memory during battery substitution.
- Accidental polarity inversion protection.
- Magnetic sensor envelope material: anodized aluminium.

For further information read the operating instructions.

SPECIAL EXECUTIONS ON REQUEST

The special plate display may be supplied with customised graphic symbols, marks or writings.

Magnetic sensor with cable length different from the standard executions shown in the table, up to 20 m maximum.



MPI-15 Technical data

Battery life	1.5 years (C-type battery)
Resolution ⁽¹⁾	0.1 mm - 0.01 in - 0.01°
Precision ⁽²⁾	0.1 mm
Repeat accuracy ⁽³⁾	0.001 mm
Operating speed	max. 5 m/s
Self-diagnostic	battery check, sensor check, magnetic tape check
Programmable measuring unit	millimetres, inches, degrees (angles)
Working temperature	0 ÷ 50 °C
Storing temperature	-20 ÷ +70 °C
Relative humidity	Max. 95% at 25°C without condensation
Protection class	IP40 whole device IP54 front side according to EN 60529 IP67 magnetic sensor
Interference protection	IEC 61000-4-2

(1) Resolution: the smallest change in length that the system is capable of displaying.

(2) Precision: the maximum deviation of the value measured by the system from the actual one.

(3) Repeat accuracy: the degree of closeness between a series of measures of the same sample, when the single measurements are carried out leaving the asurement conditions unchanged.

MPI-15 ASSEMBLY INSTRUCTIONS

1. Make a drilling of 42 +0.2/+0.5 mm x 90 +0.2/+0.5 mm in the metal sheet for the installation of the display.
2. Fix the display to the panel by using the specific mounting bracket (the screw is included in the supply).
3. Make a drilling of diameter 34 +0.2/+0.5 mm in the metal sheet for the installation of the battery case.
4. Fix the battery case to the panel by using the specific nut.
5. Fix the magnetic sensor by using M3 screws (not included in the supply). Distance between sensor and magnetic band to ensure a correct reading of the displacement: max 2.5 mm.

ACCESSORIES ON REQUEST

M-BAND-10: the magnetic band M-BAND-10 is made of two separate parts: the magnetic band and the cover strip. The magnetic band is made of a magnetic tape, a carrier strip and an adhesive tape (Fig.2). The cover strip is made of a protection strip and an adhesive tape (Fig.1).

ASSEMBLY INSTRUCTIONS M-BAND-10

1. The cover strip must be installed over the magnetic band to protect it against possible mechanical damages.
2. Clean the mounting surface carefully.
3. Remove the protective foil from the adhesive tape of the magnetic band.
4. Stick the magnetic band on the mounting surface.
5. Clean the mounting surface carefully.
6. Remove the protective foil from the adhesive tape of the magnetic band.
7. Stick the cover strip on the magnetic band.
8. In the absence of a seat for the housing of M-BAND-10, secure the ends of the cover strip to prevent unintentional peeling.

M-BAND-10 Technical data

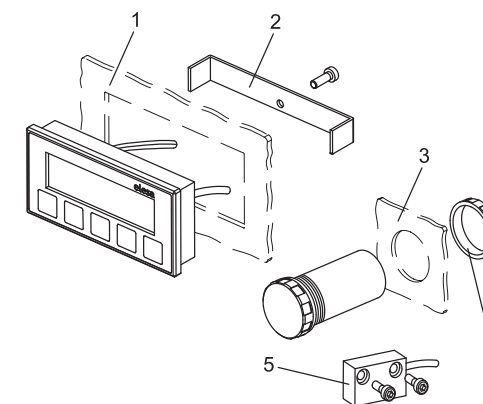
Precision	± 40 µm
Material	magnetic tape: nitrilic rubber
	carrier strip: stainless steel
	cover strip: stainless steel
	acrylic adhesive tape
Width	magnetic band: 10 mm ± 0.20 mm
	cover strip: 10 mm ± 0.20 mm
Thickness	magnetic band: 1.43 ± 0.15 mm
	cover strip: 0.23 mm
Magnetic pole pitch	5 mm
Operating and storage temperature	-40 ÷ +100 °C
Linear thermic expansion factor	17 x 10 ⁻⁶ /K

M-BAND-10

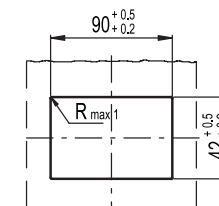
Code	Description	Band width [mm]	Band nominal thickness [mm]
CE.99903-#	M-BAND-10-#	10	1.66

Complete by specifying the length in decimetres (10=1 meter). Minimum length 0.5 m, maximum length 25 m.

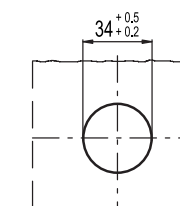
Example: CE.99903-15 M-BAND-10-15 magnetic band length 1.5 m.



Drilling template for display



Drilling template for battery case



(remove all drilling burrs before fitting the display / battery case)

Fig.1

Cover strip

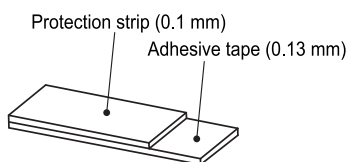


Fig.2

Magnetic band

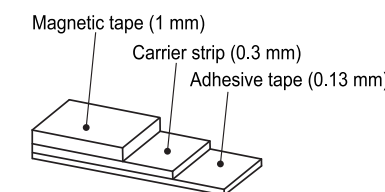
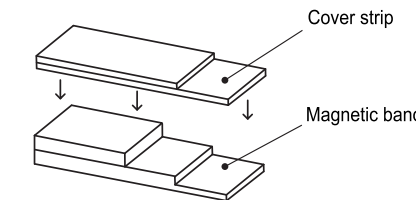


Fig.3

Proper assembling



MPI-15

Code	Description	⚖️
CE.99901-#	MPI-15-#	180

Complete by specifying the sensor cable length in decimetres (10=1 meter). Minimum length 0.2 m, maximum length 2.0 m.

Example: CE.99901-06 MPI-15-06 display with sensor cable length 0.6 m.

Direct drive electronic position indicators

One item for all applications

The position indicators **DD51-E** (see page 724) and **DD52R-E** (see page 726) 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. Thanks to the available functions and to the programmable parameters, one item can be used for many applications including all shaft pitch variations, direction of rotation, unit of measure etc.

Available functions

By using the function keys, it is possible to:

- select the incremental or the absolute measure mode
- convert the linear unit of measure (mm, inches) or select the angular measure mode (degrees)
- set the source value of the absolute counter
- select the offset value

Programmable parameters

The function keys allow to program:

- the reading after one revolution of the shaft
- the direction of rotation
- the resolution (number of decimal digits)
- the display orientation
- the source value and the offset value
- the max. speed of rotation
- the functions of the keys among different options available



Wide display

5 digit display of 8 mm (DD51-E) or **6 digit display** 12 mm (DD52R-E) 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.



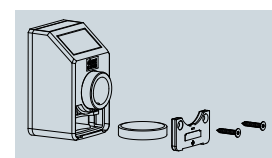
High protection class

IP65 or IP67 protection class. The indicator is suitable for applications that require frequent washing, even with water jets.



Corrosion resistance

AISI 304 stainless steel bushing with $\varnothing 14$ (DD51-E) or $\varnothing 20$ (DD52R-E) mm H7 reamed hole. High-resistance polyamide based (PA) technopolymer base and case.



Long battery life

The internal lithium battery ensures a battery **life of over 5** (DD51-E) **or 8** (DD52R-E) **years**. The battery replacement can be performed easily, without disassembly of the indicator from the control shaft and without the loss of parameter configuration.

Magnetic length and angle measuring system

The measuring system **MPI-15** (see page 732), made of a multifunction display with integrated magnetic position sensor, combined with the magnetic band **M-BAND**, is a complete system for the measurement of linear and angular displacement. Characterised by an extremely easy assembly, it allows precise alignment and positioning, reducing time and machining procedures to the minimum.

Magnetic measurement system:

- Absence of contact between moving parts
- No wear: no need of maintenance
- Not affected by moisture, dust, oils and process residues
- Insensitive to vibrations

Display

- Multifunction LCD with 5 function keys.
- Absolute/ incremental mode.
- Programmable measuring unit.
- Linear and angular measures.
- Programmable offset function.
- Resolution: 0.1 mm - 0.01 in - 0.01°
- Precision: 0.1 mm
- Repeat accuracy: 0.01 mm

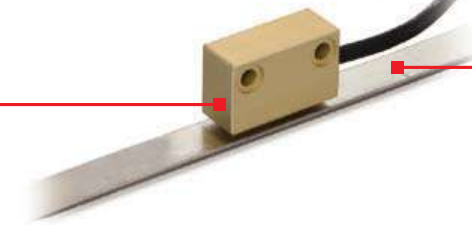
Power supply

- External battery 1.5 VDC.
- Buffered memory during battery substitution.



Magnetic sensor

- IP65 protection level
- Cable length up to 20 m.
- Operating speed up to 5m/s.
- Distance between sensor and magnetic band to ensure a correct reading of the displacement: 2.5 mm max.



Magnetic band

- Magnetic pole pitch 5 mm.
- Easy assembly thanks to the adhesive tape.
- Cover strip for protection against possible mechanical damages.