

# POSITIVE DRIVE INDICATORS

7  
370

Rotary controls

## 1. DESIGN

**1.1** Suitable for use on control spindles at any angle.

**1.2** The basic movement is housed in a sealed case. (See fig. 4). The fixed reference is obtained mechanically using the frame of the machine. Movement of the handwheel causes a reaction which is transferred via two similar crown gear wheels, one attached outside the movement case (shrouded) and one inside running loose on the centre spindle. Meshing with each of these are two identical planet pinions, fixed to a shaft which passes through the handwheel and movement case. The result of this arrangement is that the two crown wheels maintain a fixed position relative to the machine frame, irrespective of the rotation of the indicator and the handwheel. Hence a gear train mounted on the inner crown wheel can derive motion from the case spindle, so when the indicator is firmly mounted in a handwheel, by rotating the handwheel the spindle also rotates.

The rotation of the spindle is indicated by pointers on a calibrated dial (turns and parts of a turn) which remains stationary because of the attachment via the anchor pin (or similar) to the machine frame.

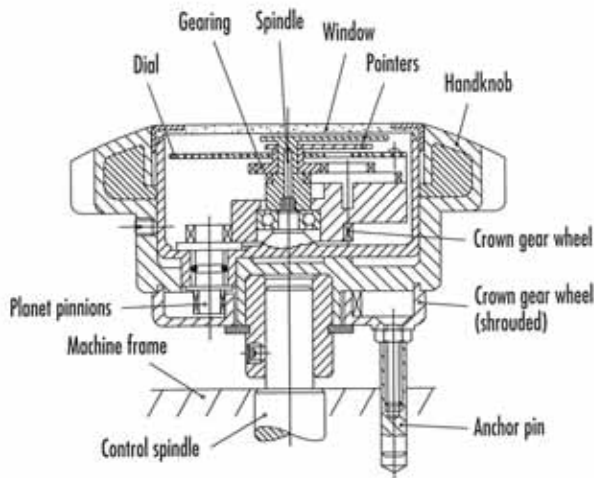


FIG. 4

## 2. RATIOS

**2.1** For each complete turn of the larger red pointer a corresponding part of a turn of the smaller black pointer occurs. The number of turns of the red pointer necessary to cause the black pointer to make one complete turn is the ratio of the indicator.

Example: a ratio of 12:1 means that 12 turns of the red pointer are necessary to cause a complete turn of the black pointer (see fig. 5). 12 turns of the handwheel cover the entire setting range. Each unit graduation is 1/12 of the entire dial.

## 3. CHOICE OF RATIO

**3.1** Zero set the control spindle.

**3.2** Count how many turns are required to cover the entire setting range.

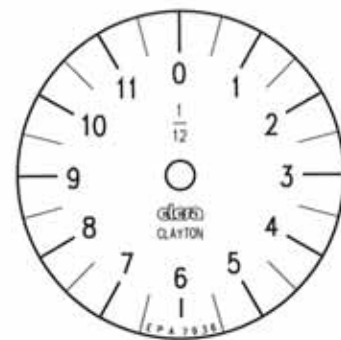
**3.3** The result of this operation is the searched ratio. Should it not correspond to a standard ratio, choose the next highest one.

**3.4** For maximum utilisation of the dial, hence accuracy, it is desirable to choose a higher ratio, which is as near as possible to the handwheel turns required to cover the entire setting range.

For instance, if 11 handwheel turns are necessary, the ratio 12:1 would be advisable so that 11/12 of the scale available will be utilised.

If you select, say, ratio 24:1 you could only utilise 11/24 of the scale and reading would be less accurate.

**3.5** Indicators with standard ratios are normally ex-stock to suit most applications. Optional ratios are available subject to sufficient quantity.



Example of 12:1 standard clockwise dial.

FIG. 5

HANDWHEEL INDICATOR	page	MBT.	VHT.	VDC.	EWV.	VAD.
		374	376	378	381	382
PA01	372	•	•	•		•
PA02	372	•	•	•	•	•
PA05	372					•
PA11	373	•	•	•		•
PA12	373	•	•	•	•	•

#### 4. DIALS

- 4.1** Dials are available for all standard ratios in both clockwise (D) and anticlockwise (S) configurations. (See fig. 5).
- 4.2** These can be used to give actual readings or to give comparative readings which have to be read in conjunction with a conversion table.
- 4.3** If the above standard dial arrangement is not acceptable then subject to certain conditions a special dial could be designed.

#### 5. INSTALLATION INSTRUCTIONS

- 5.1** Zero set the spindle.
- 5.2** Turn the external planet pinion of the indicator, until the pointers are zero set.
- 5.3** Take the handwheel/knob with the hole for the indicator planet pinion at 12 o'clock and turn the back gear disc until its anchor stud is in the correct position to locate into the machine frame. Gently fit the zeroed indicator into the handwheel, inserting the planet pinion smoothly into the corresponding hole. Gently adjust the back disc until the planet pinion is geared to the crown gear wheel. Recheck the zero and ensure that the anchor stud position is correct. Uniformly tighten the radial securing screws with a moderate torque to prevent distortion of the case and thus locking the movement.
- 5.4** Fit the standard anchor pin to extend the anchor stud such that it can be inserted in a hole on the frame of the machine. Adjust the height of

the anchor pin so that no undue strain is caused to the back disc in operation. Tighten the locknuts.

**5.5** Fit the indicator handwheel assembly to the spindle, check the reference position, and lock to the spindle using the socket head grub screws.

**5.6** Check operation of unit over the rotation range.

#### Positive Drive Indicator Description

Model      -

Ratio      -

Clockwise graduations - D

Anticlockwise graduations - S

Example PA01 Ratio 12:1 Clockwise graduations  P  A  0  1  -  0  0  1  2  -  D

# PA01 PA02 PA05

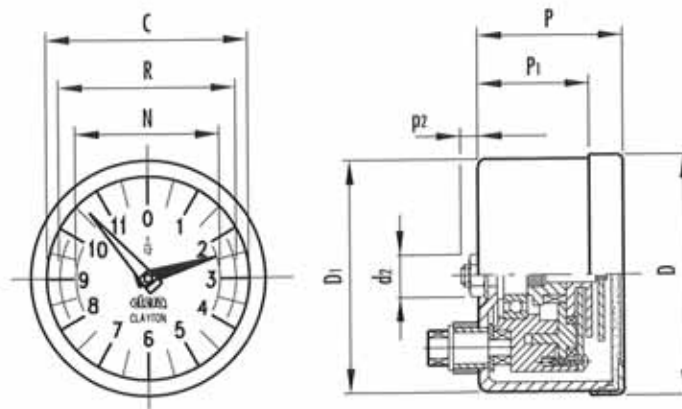
ELESA original design

## Positive drive indicators

- Use on control spindles in any position.
- Ballrace bearing.
- Zinc plated mild steel case.
- Polished AISI 303 stainless steel bezel.
- Clear glass window.
- Matte silver, anodised aluminium dial, with black graduations.
- Attractive modern design pointers.
- Maximum working temperature of 100° C.



When ordering please specify code and description (see page 370 how to select the ratio).



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Rotary controls

Standard elements	Main dimensions						Dial			Weight
	D	P	D1	P1	d2	p2	C	N	R	grams
PA01	49.6	30	48.3	20.5	8	1.6	42	30	37	145
PA02	68.4	32	67.0	19.3	8	1.0	60	44	51	215
PA05	112.7	32	111.0	18.8	8	1.0	102	76	89	425

### Standard ratios available

Ratio	PA01				PA02				PA05			
	Clockwise		Anti-clockwise		Clockwise		Anti-clockwise		Clockwise		Anti-clockwise	
	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
6					CE.24301	PA02-0006-D	CE.24302	PA02-0006-S				
10					CE.24401	PA02-0010-D	CE.24402	PA02-0010-S	CE.25201	PA05-0010-D	CE.25202	PA05-0010-S
12	CE.24101	PA01-0012-D	CE.24102	PA01-0012-S	CE.24501	PA02-0012-D	CE.24502	PA02-0012-S	CE.25301	PA05-0012-D	CE.25302	PA05-0012-S
20	CE.24201	PA01-0020-D	CE.24202	PA01-0020-S	CE.24601	PA02-0020-D	CE.24602	PA02-0020-S				
24					CE.24701	PA02-0024-D	CE.24702	PA02-0024-S				
30					CE.24801	PA02-0030-D	CE.24802	PA02-0030-S	CE.25601	PA05-0030-D	CE.25602	PA05-0030-S
36					CE.24901	PA02-0036-D	CE.24902	PA02-0036-S	CE.25701	PA05-0036-D	CE.25702	PA05-0036-S
60									CE.25901	PA05-0060-D	CE.25902	PA05-0060-S
100									CE.26101	PA05-0100-D	CE.26102	PA05-0100-S

Optional ratios available subject to sufficient quantity:

PA01	PA02	PA05
2, 4, 5, 6, 8, 10, 15, 16, 24, 30, 36, 40, 48, 50, 60, 72, 100, 120	2, 4, 5, 8, 15, 16, 40, 48, 50, 60, 72, 100, 120, 150, 200	2, 4, 5, 6, 8, 15, 16, 20, 24, 40, 48, 50, 72, 120, 150, 200

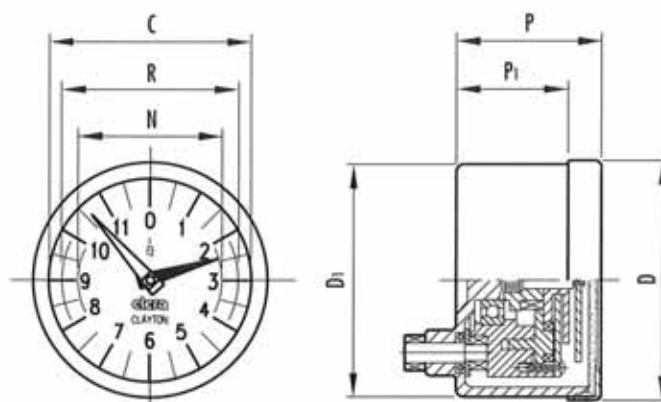
Special options on request: Special dial - special ratios - single pointer - perspex window



## Positive drive indicators

- Use on control spindles in any position.
- Ballrace bearing.
- Glass-fibre reinforced polyamide-based (PA) technopolymer case.  
Resistant to solvents, oils, greases and other chemical agents.
- Transparent polyamide-based (PA-T) window (practically unbreakable), resistant to solvents, oils, greases and other chemical agents (avoid contact with alcohol when cleaning the window).
- Bezel moulded over the window and ultrasonically welded with the case.
- Protection completely sealed to protection class IP65 according to IEC529 (see page 385 for details).
- Stub type spindle moulded integrally with case.
- Matte silver anodised aluminium dial with black graduations.
- Attractive modern design pointers.
- Maximum working temperature of 100° C.

When ordering please specify code and description (see page 370 how to select the ratio).



Standard elements	Main dimensions				Dial			Weight grams
	D	P	D1	P1	C	N	R	
PA11	49.8	30	48.2	23	42	30	37	80
PA12	68.5	32	67.0	25	60	44	51	130

### Standard ratios available

Ratio	PA11				PA12			
	Clockwise		Anti-clockwise		Clockwise		Anti-clockwise	
	Code	Description	Code	Description	Code	Description	Code	Description
10	CE.74021	PA11-0010-D	CE.74022	PA11-0010-S	CE.74401	PA12-0010-D	CE.74402	PA12-0010-S
12	CE.74031	PA11-0012-D	CE.74032	PA11-0012-S	CE.74501	PA12-0012-D	CE.74502	PA12-0012-S
20	CE.74053	PA11-0020-D	CE.74052	PA11-0020-S	CE.74601	PA12-0020-D	CE.74602	PA12-0020-S
30	CE.74069	PA11-0030-D	CE.74070	PA11-0030-S	CE.74801	PA12-0030-D	CE.74802	PA12-0030-S

### Optional ratios available subject to sufficient quantity

PA11	PA12
2, 4, 5, 6, 8, 15, 16, 24, 36, 40, 48, 50, 60, 72, 100, 120	2, 4, 5, 6, 8, 15, 16, 24, 36, 40, 48, 50, 60, 72, 100, 120, 150, 200

Special options on request: Special dial - special ratios - single pointer



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