Rotary Indicators

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Clayton® Rotary Indicators

GA01 GA02 GA05
Gravity controlled analogue indicators, for use on control spindles with positions ranging from horizontal up to 60° inclined. Zinc-plated mild steel case and polished AISI 303 stainless steel bezel. Clear glass window, matte silver anodised aluminium dial with black graduations. Counterweight fitted with a sensitive ballrace bearing for improved reading accuracy.

GA11 GA12
Gravity controlled analogue indicators, for use on control spindles with positions ranging from horizontal up to 60° inclined. Case and bezel in special technopolymer with transparent polycarbonate window ultrasonically welded and completely sealed to protection class IP67 according to IEC 529. Matte silver anodised aluminium dial with black graduations.

MBT.60/GA11 MBT.70/GA12
Gravity controlled analogue indicators integral with hand knobs, for use on control spindles, with positions ranging from horizontal up to 60° inclined. Case and bezel in special black technopolymer with transparent polycarbonate window ultrasonically welded and completely sealed to protection class IP67 according to IEC 529. The outside rim has been designed with a truncated diamond knurl that provides a comfortable grip and aids adjustment of the knob during rotation.

GW12
Gravity controlled digital-analogue indicators, for use on control spindles with positions ranging from horizontal up to 60° inclined. Case and bezel in special black technopolymer with transparent polycarbonate window ultrasonically welded and completely sealed to protection class IP67 according to IEC 529. Matte silver anodised aluminium dial with black graduations.

Five figures digital counter with 1 decimal place on red wheel.

DD52R
Direct drive digital position indicators to be mounted on passing through control spindles in any position. Special technopolymer case ultrasonically welded to its support. Standard colours grey and orange. Four or five figures digital counter with 1 or 2 decimal places on red wheel. The magnifying window (lens effect) improves the readability. Digit height 6 mm. Black oxide steel or stainless steel insert with standard H7 tolerance reamed hole. Rotational speed: the indicator is designed also for use in motor driven applications.

PA01 PA02 PA05
Positive drive controlled analogue indicators, for use on control spindles in any position. Zinc-plated mild steel case and polished AISI 303 stainless steel bezel. Clear glass window, matte silver anodised aluminium dial with black graduations.

PA11 PA12
Positive drive controlled analogue indicators, for use on control spindles in any position. Case and bezel in special black technopolymer with transparent polycarbonate window ultrasonically welded and completely sealed to protection class IP67 according to IEC 529. Matte silver anodised aluminium dial with black graduations.

Standard ratios with clockwise and anti-clockwise rotation:

DD51 Ø = 47 mm: 00.50 - 01.00 - 001.0 - 001.25 - 001.5
DD02 Ø = 64 mm: 000.50 - 001.00 - 0001.0 - 0002.0 - 0002.5 - 0003.0 - 0004.0
DD02 Ø = 47 mm: 00.50 - 001.00 - 0001.0 - 0002.0 - 0002.5 - 0003.0 - 0004.0
DD05 Ø = 68 mm: 000.20 - 000.50 - 0001.0 - 0002.0 - 0002.5 - 0003.0 - 0004.0
DD05 Ø = 47 mm: 00.50 - 001.00 - 0001.0 - 0002.0 - 0002.5 - 0003.0 - 0004.0

PA01 Ø = 50 mm: 10/1 - 12/1 - 20/1 - 24/1 - 30/1 - 36/1
PA02 Ø = 68 mm: 6/1 - 10/1 - 12/1 - 20/1 - 24/1 - 30/1 - 36/1
PA05 Ø = 113 mm: 10/1 - 12/1 - 30/1 - 36/1 - 60/1 - 100/1

PA11 Ø = 50 mm: 10/1 - 12/1 - 20/1 - 24/1 - 30/1 - 36/1 - 60/1 - 100/1
PA12 Ø = 68 mm: 6/1 - 10/1 - 12/1 - 20/1 - 30/1 - 36/1

MBT.
Diamond cut knurled knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer with outside rim having a truncated diamond knurl that provides a comfortable grip and aids adjustment of the knob during rotation. Black oxide steel insert with standard H7 tolerance reamed hole and socket head grub screw with cup end.

VHT. VHT. INOX
Lobe hand knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer. The special type of design of the rim (lobes, blended radius and well proportioned rim height) allows the operator to have a firm grip and apply a high torque.

VHT. VHT. INOX
Lobe hand knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer. The special type of design of the rim (lobes, blended radius and well proportioned rim height) allows the operator to have a firm grip and apply a high torque.

VHT. VHT. INOX
Lobe hand knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer. The special type of design of the rim (lobes, blended radius and well proportioned rim height) allows the operator to have a firm grip and apply a high torque.

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Lobe hand knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer. The special type of design of the rim (lobes, blended radius and well proportioned rim height) allows the operator to have a firm grip and apply a high torque.

VHT. VHT. INOX
Lobe hand knobs for use with indicators having gravity (G type) or positive drive (P type) movements. Material: special black technopolymer. The special type of design of the rim (lobes, blended radius and well proportioned rim height) allows the operator to have a firm grip and apply a high torque.
1. ROTARY CONTROLS

1.1 ELES.CLAYTON rotary controls are used for setting and regulating a wide variety of machine functions. The handwheels/knobs and matching indicators are available in numerous styles and designs.

2. INDICATORS

Devices for visual reading of machine settings. The following describes the various movement types and displays:

2.1 Movement types:

- The GRAVITY CONTROLLED design (page 360) is normally used when the handwheel spindle is horizontal or up to 60 degrees inclined. Rotation of the handwheel causes the pointers to move while the dial is kept stationary by the gravitational force.

- The DIRECT DRIVE design (page 366) allows the indicators to be used on spindles in any position. The digital position indicator is directly mounted on the passing through control spindle.

- The POSITIVE DRIVE design (page 370) allows the indicator to be used on spindles at any angle. Rotation of the handwheel causes the pointers to move while the dial remains stationary, being secured by an anchor pin attached to the machine.

2.2 Displays:

- ANALOGUE: the reading is displayed by means of two rotating pointers over a dial as on a clock.

- DIGITAL/ANALOGUE: the reading is displayed by means of a digital counter combined with one rotating pointer over a dial.

- DIGITAL: the reading is displayed by means of a digital counter.

2.3 All these indicators are used where it is required to know, maintain, or set machine or control functions (m, mm, kg, l, r.p.m., degrees...), the indicator giving reference to a previously determined zero or fixed condition. Dials are calibrated in turns and parts of a turn, digital counters provide a direct reading of the setting. The indicators are supplied separately and housed in the handwheels/knobs when mounted. Integral models have a built-in movement inside the hand knobs.

3. APPLICATIONS

3.1 Examples of applications are:

- Linear distance set of machine components.
- Control of speed variators.

- Flow of fluids (valve positioning).
- Setting of machine rolls (printing machines, steel stock and sheet metal straightening machines...).
- Setting of metering pumps (piston stroke).
- Angle setting.
- Ventilation shutter controls.
- Locking systems.
- Machine tools, woodworking machines, textile machines, packaging machines, Food processing machines...controls.

4. HANDWHEELS AND HANDKNOBS

4.1 ELES.CLAYTON handwheels and handknobs are ergonomically designed for ease of use, and are proven against the varied stresses and conditions experienced in service. Materials used are both plastic and metal. Please refer to the specific catalogue pages for further information.

5. HOW TO SELECT THE ROTARY CONTROL

5.1 Decide which type of movement is required based on the spindle position (see 2.1).

5.2 Select the style of display (see 2.2).

5.3 Calculate the ratio required for analogue displays or the reading after one revolution for digital-analogue and digital displays (see page 360 or 370).

5.4 Specify the direction of rotation.

For increasing readings clockwise = D
For increasing readings anticlockwise = S

5.5 Consider the operating conditions e.g. outdoors, vibration, corrosive environments etc. Refer to relevant indicator page for technical data.

5.6 Decide which is the appropriate handwheel/knob for the application, bearing in mind the diameter and grip required to transmit the necessary torque. Other factors are spindle diameter and whether a handle is required for quick operation.

6. SPECIAL OPTIONS

6.1 The range of ELES.CLAYTON rotary controls satisfies most applications. In some cases special options may be required, if so please contact ELES.A sales department.
GRAVITY INDICATORS

1. DESIGN

1.1 Suitable for use on control spindles with positions ranging from horizontal up to 60° inclined.
1.2 The basic movement is housed in a sealed case (see fig. 1). It consists of a balance weight fitted with a sensitive balance and this assembly is supported on a sub-type control spindle. The spindle carries a red indicating pointer at its forward end and is part of the case. When the indicator is firmly mounted in a handwheel, by rotating the handwheel the spindle also rotates. Mounted on the weight are several gears which transfer the rotational movement of the spindle out from and back to a gear carrying a black pointer. Also mounted on the weight is a calibrated dial. With the indicator mounted with its spindle horizontal, the dial remains stationary by the gravitational force and the pointers rotate over it when the case turns.

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. 2). 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.

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**Figure 1**

**Figure 2**

**Table**

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>HANDBHEEL</th>
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<tbody>
<tr>
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<td>362</td>
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<tr>
<td>GA02</td>
<td>362</td>
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<tr>
<td>GA05</td>
<td>362</td>
</tr>
<tr>
<td>GA11</td>
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<td>GA12</td>
<td>362</td>
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<td>MB1.7/6GAI2</td>
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</table>
4. DIALS

4.1 Dials are available for all standard ratios in both clockwise (D) and anticlockwise (S) configurations. (See fig. 2.)

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. ACCURACY

5.1 A gravity controlled indicator is most accurate when used on a horizontal control spindle, but it can be used on spindles mounted at angles inclined up to 60° to the horizontal, but the precision of reading will decrease as the angle of inclination (A) increases (see fig. 3).

6. INSTALLATION INSTRUCTIONS

6.1 Where a handwheel/knob requires modification to suit the shaft or securing arrangement for the control spindle, please refer to the appropriate catalogue page for details and advice.

6.2 Separate indicator and handwheel installation is as follows:

6.2.1 Lock the handwheel to the spindle by means of a pin or socket head grub screw.

6.2.2 Zero set the spindle, by rotating the handwheel.

6.2.3 Turn the indicator until the pointers are zero set.

6.2.4 Fit the zeroed indicator into the handwheel and uniformly tighten the radial securing screws with a moderate torque to prevent distortion of the case and thus locking the movement.

6.3 Integral indicator installation is as follows:

6.3.1 Zero set the spindle.

6.3.2 Turn the indicator until the pointers are zero set.

6.3.3 Tighten the integral indicator to the spindle with the socket head grub screw and check both zero set positions.

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**Gravity Indicator Description**

- **Model**: [Blank]
- **Ratio**: [Blank]
- **Clockwise graduations - D**: [Blank]
- **Anticlockwise graduations - S**: [Blank]

**Example GA01 Ratio 12:1 Clockwise graduations**: GA01-0012-D

* For Integral Indicators, prefix MBT.50/ or MBT.70/

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**Table**

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</tbody>
</table>
GA01 GA02 GA05
EIESA original design

Gravity indicators
- Use on control spindles with positions ranging from horizontal up to 60° inclined (see page 361: Accuracy).
- Ballrace bearing.
- Zinc plated mild steel case.
- Polished AISI 303 stainless steel bezel.
- Clear glass window.
- Matte silver, arcedule aluminium dial, with black graduations.
- Attractive modern design pointers.
- Maximum working temperature of 100°C.

When ordering please specify code and description (see page 360 how to select the ratio).

<table>
<thead>
<tr>
<th>Standard elements</th>
<th>Main dimensions</th>
<th>Dial</th>
<th>Weight</th>
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<th>Ratio</th>
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<th>GA01 Anti-clockwise Code</th>
<th>GA02 Clockwise Code</th>
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<th>GA05 Clockwise Code</th>
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<td>CE.20302 GA02-0006-S</td>
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<td>CE.20502 GA02-0012-S</td>
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<td>CE.20502 GA02-0012-S</td>
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<td>CE.22201 GA05-0100-D</td>
<td>CE.22202 GA05-0100-S</td>
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Optional ratios available subject to sufficient quantity:

GA01 2, 4, 5, 6, 8, 10, 15, 16, 24, 30, 36, 40, 48, 50, 60, 72, 100, 120
GA02 2, 4, 5, 6, 8, 10, 15, 16, 20, 40, 50, 72, 120, 150, 200
GA05 2, 4, 5, 6, 8, 10, 15, 16, 40, 48, 50, 72, 120, 150, 200

Special options on request: Special dial - special ratios - liquid filled - single pointer - perspex window
Gravity indicators

- **Use** on control spindles with positions ranging from horizontal up to 60° inclined (see page 361: Accuracy).
- **Ballrace bearing.**
- **Glass-fibre reinforced polyamide-based (PA) technopolymer case.** Resistant to solvents, oils, greases and other chemical agents.
- **Black** standard colour with matte finish.
- **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 IP67 according to IEC 529 (see page 385 for details).
- **Stub type spindle** moulded integrally with case.
- **Matt 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 360 how to select the ratio).

<table>
<thead>
<tr>
<th>Standard elements</th>
<th>Main dimensions</th>
<th>Dia</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>GA11</td>
<td>D: 49.8 P: 30 P1: 23</td>
<td>D1: 48.2</td>
<td>C: 42 N: 30 R: 37</td>
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<td>GA12</td>
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<td>D1: 67.0</td>
<td>C: 60 N: 44 R: 51</td>
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<table>
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Optional ratios available subject to sufficient quantity

- GA11: 2, 4, 5, 6, 8, 15, 16, 36, 48, 50, 60, 72, 100, 120
- GA12: 2, 4, 5, 6, 8, 15, 16, 40, 48, 50, 60, 72, 100, 120, 150, 200

Special options on request: Special dial - special ratios - liquid filled - single pointer
MBT.50/GA11
MBT.70/GA12

ELESA original design

Gravity indicators
(integral with handknobs)

- Use on control spindles with positions ranging from horizontal up to 60° inclined (see page 361: Accuracy).
- 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 IP67 according to IEC60529 (see page 386 for details).
- Sub type spindle moulded integrally with case.
- Matte silver anodised aluminium dial with black graduations.
- Attractive modern design pointers.
- Black oxide steel insert with standard H7 tolerance reamed hole.
- Complete with socket head grub screw with cup end for fitting to shaft (according to UNI 5929-85)
- Maximum working temperature of 100° C.

When ordering please specify code and description (see page 360 how to select the ratio).

Installation instructions see page 361.

The outside rim has been designed with a truncated diamond knurl that provides a comfortable grip and aids adjustment of the knob during rotation.

<table>
<thead>
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<th>Standard elements</th>
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Standard ratios available

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<td>CE.56182</td>
<td>MBT.50/GA11</td>
<td>CE.56006</td>
<td>MBT.50/GA11</td>
<td>CE.56007</td>
<td>MBT.50/GA11</td>
</tr>
<tr>
<td>40</td>
<td>CE.56183</td>
<td>MBT.50/GA11</td>
<td>CE.56184</td>
<td>MBT.50/GA11</td>
<td>CE.56008</td>
<td>MBT.50/GA11</td>
<td>CE.56009</td>
<td>MBT.50/GA11</td>
</tr>
</tbody>
</table>

Optional ratios available subject to sufficient quantity

<table>
<thead>
<tr>
<th>MBT.50/GA11</th>
<th>MBT.70/GA12</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 5, 6, 8, 15, 16, 36, 46, 50, 60, 72, 100, 120</td>
<td>2, 4, 5, 6, 8, 15, 16, 36, 46, 50, 60, 72, 100, 120, 150, 200</td>
</tr>
</tbody>
</table>

Special options on request: Special dial - special ratios - liquid filled - single pointer
Gravity indicators
digital-analogue

- Use on control spindles with positions ranging from horizontal up to 60° inclined (see page 361: Accuracy).
- Ball race 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 IP67 according to IEC 529 (see page 385 for details).
- Sub type spindle moulded integrally with case.
- Matte silver anodised aluminium dial with black graduations.
- Display provided with 5 figures digital counter (4 block units and 1 red decimal) and with a red pointer on the graduated dial. The counter wheels are compact with ergonomically designed numbers for rapid reading.
- Linear red colour pointer for precision reading of the decimals on the dial. The pointer doubles as the dial the reading of the decimals on the red wheel of the counter. One complete turn of the pointer corresponds to a complete turn of the machine spindle (on request and for sufficient quantities the pointer can be relieved to the machine spindle).
- Maximum working temperature of 100° C.

On request and for sufficient quantities version PW12 (positive drive).

Installation instructions see page 361.

When ordering please specify code and description.

---

<table>
<thead>
<tr>
<th>Standard elements</th>
<th>Main dimensions</th>
<th>Dial</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>GW12</td>
<td>68.5</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>51</td>
<td>120</td>
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</table>

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Reading after one revolution of the red pointer

<table>
<thead>
<tr>
<th>Reading</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>000.2</td>
<td>CE.72241</td>
<td>GW12-0000.2-0</td>
</tr>
<tr>
<td>000.5</td>
<td>CE.72241</td>
<td>GW12-0000.5-0</td>
</tr>
<tr>
<td>001.0</td>
<td>CE.72301</td>
<td>GW12-0001.0-0</td>
</tr>
<tr>
<td>002.0</td>
<td>CE.72301</td>
<td>GW12-0002.0-0</td>
</tr>
<tr>
<td>002.5</td>
<td>CE.72621</td>
<td>GW12-0002.5-0</td>
</tr>
<tr>
<td>004.0</td>
<td>CE.72701</td>
<td>GW12-0004.0-0</td>
</tr>
<tr>
<td>005.0</td>
<td>CE.72741</td>
<td>GW12-0005.0-0</td>
</tr>
</tbody>
</table>

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Clockwise

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE.72242</td>
<td>GW12-0000.2-5</td>
</tr>
<tr>
<td>CE.72402</td>
<td>GW12-0000.5-5</td>
</tr>
<tr>
<td>CE.72502</td>
<td>GW12-0001.0-5</td>
</tr>
<tr>
<td>CE.72582</td>
<td>GW12-0002.0-5</td>
</tr>
<tr>
<td>CE.72622</td>
<td>GW12-0002.5-5</td>
</tr>
<tr>
<td>CE.72702</td>
<td>GW12-0004.0-5</td>
</tr>
<tr>
<td>CE.72742</td>
<td>GW12-0005.0-5</td>
</tr>
</tbody>
</table>

---

Anticlockwise

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE.72242</td>
<td>GW12-0000.2-5</td>
</tr>
<tr>
<td>CE.72402</td>
<td>GW12-0000.5-5</td>
</tr>
<tr>
<td>CE.72502</td>
<td>GW12-0001.0-5</td>
</tr>
<tr>
<td>CE.72582</td>
<td>GW12-0002.0-5</td>
</tr>
<tr>
<td>CE.72622</td>
<td>GW12-0002.5-5</td>
</tr>
<tr>
<td>CE.72702</td>
<td>GW12-0004.0-5</td>
</tr>
<tr>
<td>CE.72742</td>
<td>GW12-0005.0-5</td>
</tr>
</tbody>
</table>

---

Dial graduations:

- 20 divisions: 0.01
- 50 divisions: 0.01
- 100 divisions: 0.01
- 40 divisions: 0.05
- 50 divisions: 0.05
- 80 divisions: 0.05
- 100 divisions: 0.05

---

Optional reading after one revolution available on request and for sufficient quantities 0001.2(S), 0001.4

Special options on request: No pointer, plain dial - special dial - special readings after one revolution
Thank you for viewing product information on TEA’s range of engineering components.

Now please contact us at the nearest office to you for any further information, prices and availability:

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