# LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main features</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Installation</td>
<td>5</td>
</tr>
<tr>
<td>2.1</td>
<td>Unpacking and setting up</td>
<td>5</td>
</tr>
<tr>
<td>2.2</td>
<td>Starting the instrument</td>
<td>6</td>
</tr>
<tr>
<td>2.3</td>
<td>Short instructions for use</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Description of the components</td>
<td>9</td>
</tr>
<tr>
<td>3.1</td>
<td>Instrument base</td>
<td>9</td>
</tr>
<tr>
<td>3.2</td>
<td>Vertical column, measuring head and movement of the head</td>
<td>9</td>
</tr>
<tr>
<td>3.3</td>
<td>Power supply</td>
<td>10</td>
</tr>
<tr>
<td>3.4</td>
<td>Measuring system</td>
<td>10</td>
</tr>
<tr>
<td>3.5</td>
<td>Automatic measuring value correction</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Measuring</td>
<td>11</td>
</tr>
<tr>
<td>4.1</td>
<td>Basic principles</td>
<td>11</td>
</tr>
<tr>
<td>4.2</td>
<td>Display and function keys</td>
<td>12</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Definition of display symbols</td>
<td>12</td>
</tr>
<tr>
<td>4.3</td>
<td>Program functions</td>
<td>13</td>
</tr>
<tr>
<td>4.4</td>
<td>Probing procedure at the contact point</td>
<td>15</td>
</tr>
<tr>
<td>4.5</td>
<td>Establishing the probe constant for length measurements with inversion of the probing direction</td>
<td>16</td>
</tr>
<tr>
<td>4.6</td>
<td>Measuring features with flat surfaces</td>
<td>17</td>
</tr>
<tr>
<td>4.7</td>
<td>Measuring features with cylindrical surfaces</td>
<td>17</td>
</tr>
<tr>
<td>4.8</td>
<td>MODE 1, Measuring lengths in one direction, without probe constant</td>
<td>18</td>
</tr>
<tr>
<td>4.9</td>
<td>MODE 2, Measuring lengths in two directions, with probe constant</td>
<td>19</td>
</tr>
<tr>
<td>4.10</td>
<td>Procedure for detecting the culmination point</td>
<td>20</td>
</tr>
<tr>
<td>4.11</td>
<td>MODE 3, continuous display</td>
<td>26</td>
</tr>
<tr>
<td>4.12</td>
<td>PRESET function</td>
<td>28</td>
</tr>
<tr>
<td>4.13</td>
<td>Measuring parallelism deviations</td>
<td>32</td>
</tr>
<tr>
<td>4.14</td>
<td>Use of the fine adjustment</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>Instrument configuration</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Error messages</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>Maintenance</td>
<td>40</td>
</tr>
<tr>
<td>7.1</td>
<td>Cleaning</td>
<td>40</td>
</tr>
<tr>
<td>7.2</td>
<td>Charging the battery</td>
<td>41</td>
</tr>
<tr>
<td>8</td>
<td>Delivery programme</td>
<td>41</td>
</tr>
<tr>
<td>8.1</td>
<td>Optional accessories</td>
<td>42</td>
</tr>
<tr>
<td>9</td>
<td>Technical data</td>
<td>45</td>
</tr>
<tr>
<td>9.1</td>
<td>Description of the RS 232 interface</td>
<td>46</td>
</tr>
<tr>
<td>9.1.1</td>
<td>Monodirectional data transmission</td>
<td>46</td>
</tr>
<tr>
<td>9.1.2</td>
<td>Bidirectional data transmission</td>
<td>46</td>
</tr>
<tr>
<td>10</td>
<td>Warranty</td>
<td>46</td>
</tr>
<tr>
<td>11</td>
<td>Declaration of conformity</td>
<td>47</td>
</tr>
</tbody>
</table>
1 MAIN FEATURES

Fig. 1

1. Cap cover
2. Housing
3. Mounting pin
4. Probe fixing arm
5. Probe
6. Guiding and support faces
7. Cast-iron base
8. Handwheel for displacement
9. Knurled screw for the fine adjustment
10. Knurled screw for locking the measuring-head drive
11. Control panel
1 MAIN FEATURES

The TESA-Hite Magna 400 / 700 is a mains-independent height gauge, which is suitable for measuring lengths in the form of external, internal, step, height, depth and distance dimensions. A cast-iron base with finish-ground supporting face ensures the stability of the TESA-Hite Magna 400 / 700. A rigid column is located under the protective cover, equipped with a guide system that is straight. On this slides the measuring head and the movement of the head is measured by the magnetic measuring system magnaµsystem (TESA patent). The measured readings are obtained in a very simple and reliable manner. Firstly the probe is brought into contact with the point to be measured then immobilised to permit it to stabilise; then, by performing a further slight rotation of the drive system, the measured reading is automatically recorded by a dynamic process, with the measuring force at all times remaining constant. An acoustic signal confirms that the reading has been recorded and it is immediately displayed and, if required, transmitted via the RS 232 output. Cylindrical surfaces (bores and shafts) can also be measured simply and reliably by automatically probing to find the culminating point. The automatic microprocessor assisted correction makes the TESA-Hite Magna 400 / 700 even more accurate: Correction values memorised in the instrument compensate for systematic errors when measuring lengths.

2 INSTALLATION

2.1 Unpacking and setting up

The TESA-Hite Magna 400/700 is delivered ex factory, packed to protect it from impact and corrosion. Please use the original packing materials for any subsequent transport.

IMPORTANT:

Your instrument is supplied with a 6V rechargeable battery already inserted. For recharging the battery, see section 7.2.

Before fitting the standard accessories, release the measuring carriage by unscrewing the light grey knurled screw (10) Fig. 1 on the hand wheel.

Securely fit the probe 5 to the probe-fixing arm 4 itself fitted to the mounting pin 3. Ensure that the two knurled screws on the probe-fixing arm are well tightened. After, unlock the measuring head by moving the slide downward until the insert touch the granite plate; exert a force on the handwheel, like if you would do a probing down; this will unlock the transport carriage from the measuring carriage.

However, we recommend you firstly read this instruction manual.
2.2 Starting the instrument

After the instrument is turned on (ON/OFF), a double bar appears on the screen (Fig. 2)

![Fig. 2]

To enter in the measuring mode, move the measuring head until the reference mark has been crossed.

After having crossed the reference, the TESA-Hite Magna 400 / 700 is in the measuring mode and the following display appears:

![Display with keys]

Switch-on auto Print mode
Establish the probe constant
Enter in ZZ mode
Introduction of a PRESET

For more detailed information on the probing procedure for taking readings, please consult the chapter 4.

**Remark:**
By turned on, if first the F1, then the F1 and ON/OFF keys are simultaneously activated; after deactivate the ON/OFF and then the F1 keys; the instrument will go in the configurations menu. For further information about it, please consult the chapter 5.
2.3 Short instructions for use

Display and keys

- Main display
- Active functions
- Functions available through keys F1 to F4
- Function keys F1 to F4
- Switching ON / OFF
- Cancel last function or last probing
- Change unit
- Transmit a reading to a peripheral

MODE 1  Measuring length in one direction, without calibration
MODE 2  Measuring length in two directions, with calibration

Procedure for detecting the culmination point

Probe normally without releasing the probe; wait about 1 second in the probing zone. The system will automatically switch to culmination-point detection mode. Move either the part or the TESA-Hite Magna 400/700 so that measuring probe passes through the culmination point. The TESA-Hite Magna 400/700 has a system for automatically detecting the shape of the surface being probed (concave or convex). Hence it is not necessary to indicate to the TESA-Hite Magna 400/700 whether it is probing a bore or a shaft as this will be detected automatically according to the upward or downward probing of the maximum or minimum culmination point. Once the symbol ▲ or ▼ appears on the display, the system will have automatically detected the maximum or minimum point of the bore or shaft to be measured. The measuring head can now be withdrawn.

MODE 3  Continuous display
3 DESCRIPTION OF THE COMPONENTS

3.1 Instrument base

The base is chemically nickel-plated in order to make it very resistant to corrosion. Its lower face, which has been machined to ensure that it is rigorously flat, guarantee the stability of the TESA-Hite Magna 400 700. The lugs 6 (Fig. 1) are designed especially for supporting the TESA-Hite Magna 400 / 700 against a parallel rule or for guiding it along such a rule, for example.

3.2 Vertical column, measuring head and movement of the head

The rigid vertical column is perpendicular to the base, to which it is permanently fixed. A measuring head slides on the guide and the movement of the head is recorded by the magnetic measuring system magna system (TESA patent). The measuring head can be moved in infinitesimal increments by the fine-adjustment system, for example when using fine probes or measuring small bores. The knurled screw 9 (Fig. 1) is used to lock the measuring-head movement that is thus left free for scanning. However, if necessary, the head itself can also be locked by using the built-in system.
**TESA-hite Magna 400 / 700**

**Clamping of the measuring head:** Move the measuring slide upward until the stop; exert a force on the handwheel, like if you would do a probing up; this will lock the transport carriage on the measuring carriage. To unlock the carriage do the same, but in the opposite direction.

### 3.3 Power supply

The TESA-Hite 400 / 700 is powered by a 6V rechargeable battery (N° 00760157). This is recharged using the mains adapter N° 04761054 and the cable EU N° 04761055 or US N° 04761056 (see chapter 7.2 – Charging the battery).

### 3.4 Measuring system

The TESA-Hite Magna 400 / 700 incorporates the magnetic measuring system magna-µ system which digitally records the measured dimension, called the mesurande (TESA patent). From point A, the reading system can be moved downwards to the respective trigger points. Once one of these points has been reached, the reading of the value is triggered, that is to say that the position of the measuring head in relation to the magnetic scale is read off by the sensor. The distance C, symmetrical in relation to the position of each trigger point in the travel of the measuring system is kept for seeking the culminating point when probing cylindrical surfaces. (Read section 4.7 also).

3.5 Automatic measuring value correction

It is agreed that a perfectly accurate measuring instrument is impossible to produce. Therefore, the value indicated by any instrument comprises a deviation from the true value; this deviation is composed of the bias errors and the random errors. Random errors cannot be predicted since they are the result of influences that cannot be controlled, e.g. the value dispersion. Bias errors, on the other hand, as for example the deviations of the scale divisions on the material measure or the form and positional errors of the measuring head guides can be corrected once they have been measured. To correct length measurements, after the TESA-Hite Magna 400 / 700 has been completely assembled; the actual errors are determined step-by-step by means of a system of stepped gauge.
blocks. The correction values thus calculated will subsequently be memorised in the electronic module of the instrument. Thus, every measurement read off by the TESA-Hite Magna 400 / 700 will be automatically corrected before being displayed.

4 MEASURING

4.1 Basic principles

To measure with the TESA-Hite Magna 400 / 700 necessarily means that the way the measured values are determined depends to a large extent on the kind of measurement tasks the user has to carry out. Special attention should be paid to the main following points:

• Determining the reading by one or two probe contacts
• Measuring with or without change of probe direction
• Measuring with or without seeking the culmination point.

4.2 Display and function keys

![Diagram of display and function keys]

- **Active functions**

- **Main display**

- **Functions available through keys F1 to F4**

- **Function keys F1 to F4**

- **Transfer a reading to a peripheral**

- **Cancel last function or probing**

- **Change unit**

- **Switching ON / OFF**
4.2.1 Definition of display symbols

1. Length measurements in one direction, without probe constant (Measuring mode 1)
2. Length measurements in two directions, with probe constant (Measuring mode 2)
3. Continuous display (Measuring mode 3)
4. Display of the difference between the last two probe contacts (Measuring mode 2)
5. Display of the difference between the last two displayed readings (Measuring modes 1 and 2)
6. Measurements with 2 probe contacts per length measurement (Measuring mode 2)
7. Measurements with 1 probe contact per length measurement (Measuring mode 2)
8. Establishing a new reference (Measuring modes 1, 2 and 3)
9. «PRESET» function (presetting of numerical values) (Measuring modes 1, 2 and 3)
10. Automatic data transfer to a peripheral
11. Confirmation and further registering of data in the instrument memory
12. Increment digit, in measuring mode this indicates the detection of the maximum culmination point
13. Increment digit, in measuring mode this indicates the detection of the minimum culmination point
14. Shifting a digit to the left
15. Start the measurement of the parallelism deviation
### 4.3 Program functions

#### MEASUREMENT TASKS

<table>
<thead>
<tr>
<th>Length dimensions</th>
<th>Form dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step dimensions</td>
<td>Determining distances during a continuous measurement process</td>
</tr>
<tr>
<td>Height dimensions</td>
<td>Parallelism deviations</td>
</tr>
<tr>
<td>Depth dimensions</td>
<td></td>
</tr>
</tbody>
</table>

**External dimensions:**
- Rib width
- Shaft diameter (culmination)

**Internal dimensions:**
- Groove width
- Bore diameter (culmination)

**Centre distances:**
- Ribs, shafts, grooves, bores

<table>
<thead>
<tr>
<th>Measurements without change of probe direction</th>
<th>Measurements with change of probe direction</th>
<th>« Continuous » display with the program functions excluded</th>
<th>Measuring the MAX – MIN deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without taking the probe constant</td>
<td>With taking the probe constant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measuring mode 1** | **Measuring mode 2** | **Measuring mode 3** |
**Measuring mode 1**
Length measurements in one direction without probe constant

**Measuring mode 2**
Length measurements in two directions with probe constant

**Measuring mode 3**
Continuous display

---

**Turn instrument On**

- **St1**
  - Take the reference point
  - Measure

- **St2**
  - Take the reference point
  - Measure

- **Set display to zero or « PRESET »**
  - Mode 3
  - Measure
4.4 Probing procedure at the contact point

In order to ensure the reliability of the measured values, the following condition must be fulfilled: the probe 5 should be firmly attached to the probe fixing arm 4 which in turn is fixed to the mounting pin 3. Make sure that both knurled screws on the fixing arm are tightened.

Probe contact procedure for the reading the measured values

- Use the handwheel 8 (Fig. 1) to rapidly move the measuring head.
- Use the knurled ring to bring the probe into contact with the measuring point on the work piece, but not right up to the switch point.
- Pause for a second or so.
- Approach the measuring head by continuing to turn the knurled ring slowly until an acoustic signal confirms the taking of the reading.
- Withdraw the probe from the surface of the work piece.

For optimum results when taking the readings, the measuring point should always be probed with the same careful regular movement. When the speed with which the measuring head approaches the work piece is reduced to an absolute minimum at the end of its travel, the probe will make precise and bounce-free contact. The readings thus obtained will be reliable and highly repeatable.
4.5 Establishing the probe constant for length measurements with inversion of the probing direction

When bores, shafts, grooves, etc. are measured with a change of probe direction, a gauge-head constant must be taken into account. In order that the user may effect all these measurements without having to resort to time some calculations, the gauge-head constant is determined on a suitable master gauge whose actual dimension is known. Setting piece No. 00760231 is provided with the instrument. By combining the three gauge blocks of which it consists, it has a total internal or external dimension of 6.350 mm / .250 in.

**Remark**
- Use only the setting piece supplied with the TESA-Hite Magna 400 / 700 bearing with the N° 00760231 and the same production number as the instrument.
- The final TESA-Hite Magna 400 / 700 verification and the certificate supplied both refer to this reference gauge.

The gauge-head constant, which is a permanent correction factor, is calculated by the built-in program once the measurements on the master-gauge have been completed; it is then recorded and automatically taken into account for all subsequent measurements.

By applying a gauge-head constant, the following features – which can affect the measurements – will be considered or compensated:
- Diameter of the probe ball or disc used.
- Elastic distortion of the probe and its support under the action of the measuring force.
- Hysteresis errors of the measuring system.

The gauge-head constant must be redetermined after any change in the measuring conditions. Main causes of change:
- Turning the instrument off.
- Changing the probe.
- Changing the probe position.

The «Determination a gauge-head constant» function requires at least two probe contacts at each measuring point. The difference between the two readings at each measuring point should not exceed 1 µm. Should the instrument indicate a greater difference, it will be displayed and the operator must either accept that difference or repeat the gauge-head constant determination operation.
4.6 Measuring features with flat surfaces

The probes used for contacting flat surfaces are those producing point contact. Such probes are either ball, barrel or disk shaped (see standard and optional accessories).
In measuring mode 1, the measurements are taken exclusively by probing. All measurements must be taken in the same direction.
In measuring mode 2, the measurements can involve one or two contacts and can be recorded with or without inverting the probe direction.

4.7 Measuring features with cylindrical surfaces

Probes appropriate for contacting cylindrical surfaces are identical to those used for flat surfaces.
If the diameter of bores or shafts has to be determine in addition to their height, the two contacts have to be made at the diametrically opposed culmination points.

To determine the culminating point, proceed as follows:
• Use the handwheel 8 to rapidly move the measuring head and the probe
• Use the knurled ring to bring the probe into contact – slightly off centre – with the bore or shaft to be measured, but not right up to the switch point.
• Pause for a second or so.
• Move the measuring head forward by continuing to turn the knurled ring slowly until an acoustic signal confirms the taking of the reading.
• After about 1 second, the probing force will be displayed graphically on the control-panel display.
• Keep the probing force within the limits and manually move the part or the TESA-Hite Magna 400 / 700 so that the probe passes through the culmination point. Once the symbol ▲ or ▼ appears on the display, the system will have automatically detected the maximum or minimum point of the bore or shaft to be measured.
• The measuring head can now be withdrawn.
• Repeat the operation in the other direction to determine the diameter.
4.8 MODE 1 Measuring lengths in one direction, without probe constant

Measuring without inversion of gauge-head direction (Mode St 1)

**Important**
To ensure optimum instrument measuring accuracy, the standard probe-fixing arm (N° 00760143) must be aligned on the working surface. The accessory N° 00760225 can be used to do this alignment.
4.9 MODE 2 Measuring lengths in two directions, with probe constant

Measuring with inversion of gauge-head direction (Mode St 2)

**Important**
To ensure optimum instrument measuring accuracy, the standard probe-fixing arm (N° 00760143) must be aligned on the working surface with the air cushion deactivated. The accessory N° 00760225 can be used to do this alignment.

Automatic Print Available after switch-on
Changing the Dimension of the setting piece

If the reading dispersion is too great, the display indicates:
Deviation not accepted, recalibrate
Accept with resolution adapted as follows:

<table>
<thead>
<tr>
<th>Range</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 µm</td>
<td>± 0.01 mm</td>
</tr>
<tr>
<td>10 µm</td>
<td>± 0.005 in</td>
</tr>
<tr>
<td>50 µm</td>
<td>± 0.1 mm</td>
</tr>
<tr>
<td>&gt; 50 µm</td>
<td>± 0.05 in</td>
</tr>
</tbody>
</table>
4.10 Procedure for detecting the culmination point

The TESA-Hite Magna 400 / 700 has an automatic system for determining the shape of the surface being probed (concave or convex). Hence, it is not necessary to indicate to the TESA-Hite Magna 400 / 700, whether the surface being probed is flat, a bore or a shaft, as it can independently detect whether there is a culminating point and, according to whether it is an upward or a downward probe, whether it is a maximum or a minimum. In short, just probe normally and release the key if the surface is flat or wait about 1 second in the probing zone to see whether the probe is in contact with a bore or a shaft and whether the diameter is to be measured. The system automatically switches to culminating-point detection mode. Then just move the part or the TESA-Hite Magna 400 / 700 so that the probe passes through the culmination point. Once the symbol ▲ or ▼ appears on the display, the system will have automatically detected the maximum or minimum point of the bore or shaft to be measured. At this point, the measuring key can be released.
**MEASURING**

**Without searching for the culmination point**

---

**With searching for the culmination point**

**Plane parallel surfaces**

---

**Search for culmination point unnecessary**

**Cylindrical surfaces**

---

**Remark:**
Not convenient for external dimensions

**Without determining Ø**

---

**With determining Ø**

With manual probing movements to find culmination points

Automatic triggering of memorising
Detailed procedure for detecting the culmination point

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1.png" alt="Display Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image2.png" alt="Display Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image3.png" alt="Display Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image4.png" alt="Display Image" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Recording constant OK.**
- **Probe reference**

- **Reference OK.**

- **Probe diameter**
  - Internal, downward.
  - Normal probing

- **Beep**

- **Wait 1 second**
  - In probing zone

- **Warning**
  - Place the gauge head slightly off-centre with respect to the bore axis.
  - After waiting about 1 second in the probing zone.
  - Culmination proposal: if passing through the neutral point without culmination=normal probing.
  - Adjust the force in upper zone

- **Move the part or the TESA-Hite Magna so that the gauge head passes through the maximum or the minimum point.**
- **Culmination point detected.**
- The bar graph indicates the current measuring force.
Detailed procedure for detecting the culmination point

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>Culmination point overshot.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>To improve accuracy, it is possible to make several passes through the culmination point. Only the highest or lowest point will be memorised.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>Gauge head released. First point memorised. Await next action.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>Aborts culmination. Return to last measurement displayed.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>• Place the gauge head slightly off-centre with respect to the bore axis. • Wait about 1 second. • Move the part or the TESA-Hite Magna. Second contact. Culmination point detected. The bar graph indicates the current measuring force.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
<td>End of bore measurement. Display centre of diameter</td>
</tr>
</tbody>
</table>

---

TESA-hite Magna 400 / 700

23
## Detailed procedure for detecting the culmination point

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F3</strong></td>
<td><img src="image1.png" alt="Image" /></td>
<td></td>
<td><strong>Call up diameter display.</strong></td>
</tr>
<tr>
<td><strong>Beep</strong></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="F1 F2 F3 F4" /></td>
<td><strong>Force diameter mode</strong></td>
</tr>
<tr>
<td><strong>Cancel diameter mode</strong></td>
<td><img src="image4.png" alt="Image" /></td>
<td>![](</td>
<td>image5.png)</td>
</tr>
</tbody>
</table>

### External diameter

**Probe, downward.**

Normal probing

- Place the gauge head slightly off-Centre with respect to the shaft axis.
- Wait 1 second in probing zone.
- Adjust the force in the lower zone.

#### Culmination proposal.

Move the part or the TESA-Hite Magna so that the gauge head passes through the maximum or the minimum point.

**Point de rebroussement détecté.**

The bar graph indicates the current measuring force.

**Gauge head released.**

First point memorised. Await next action.

Aborts culmination. Return to last measurement displayed.
Detailed procedure for detecting the culmination point

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
</table>
|               | ![Beep Beep](image) |             | • Place the gauge head slightly off-Centre with respect to the shaft axis.  
• Wait about 1 second.  
• Move the part or the TESA-Hite Magna. |
|               | ![Beep Beep](image) | ![F1 F2 F3 F4](image) | Second contact.  
Culmination point detected.  
The bar graph indicates the current measuring force. |
|               | ![Beep Beep](image) | ![F1 F2 F3 F4](image) | End of shaft measurement.  
Display centre of diameter. |
|               | ![Beep Beep](image) | ![F3](image) | Force diameter mode  
Cancel diameter mode |
|               | ![Beep Beep](image) | ![F3](image) | Forced display of diameter  
Displays centre  
Quit diameter display priority. |
|               | ![Beep Beep](image) | ![F3](image) | Measure depth of groove.  
Probing mode 1 (St1) |
**TESA-hite Magna 400 / 700**

Detailed procedure for detecting the culmination point

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td></td>
<td>Contact force too weak: culmination point not detected.</td>
</tr>
</tbody>
</table>

### 4.11 MODE 3 Continuous display

Continuous display mode, as its name indicates, permits the TESA-Hite Magna 400 700 to continuously display the height of the measuring probe. To do this, proceed as follows:
- Enter ZZ mode by pressing the F3 key
- Block the measuring head, please consult the chapter 3.2
- The counter can be reset at any time and at any height by means of the F2 key.

**Detailed procedure of the continuous display mode**

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td><img src="image.png" alt="F1" /> Switch-on auto Print mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td><img src="image.png" alt="F2" /> Establish the probe constant</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td><img src="image.png" alt="F3" /> Enter in ZZ mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td><img src="image.png" alt="F4" /> Introduction of a PRESET</td>
<td></td>
</tr>
</tbody>
</table>

**Continuous display**

- Return in St 1 mode
- Set the display to zero
- Introduction of a PRESET
## Detailed procedure of the continuous display mode

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td><img src="image" alt="Diagram" /></td>
<td>mm/in</td>
<td>Switch-on auto Print mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1</td>
<td>Establish the probe constant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F2</td>
<td>Enter in ZZ mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F3</td>
<td>Introduction of a PRESET</td>
</tr>
</tbody>
</table>

If you enter from St 2 into the ZZ mode, the probe constant will be memorised. By the exit of the ZZ mode the instrument will return in St 2. Attention to take again the probe constant if you have moved or changed the gauge head.

<table>
<thead>
<tr>
<th>Diagram</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>F1</td>
<td>Enter in St 1 mode</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Establish the probe constant</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Enter in ZZ mode</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Introduction of a PRESET</td>
</tr>
</tbody>
</table>

In ZZ mode, it is also possible to measure parallelism deviations (see chapter 4.13).
4.12 PRESET function

The purpose of the PRESET function is to enter a value corresponding to the distance from the point of contact when reading the reference and the real reference. For example, when the base plate is the reference but it is not directly on that plate that you want to measure. In this case, you use a standard gauge block and enter its measurement as PRESET.

Thenceforth, probing the reference can be done on the shim itself.

**« PRESET » function Mode 1 and 2**

- Choice: 1 - 2 - 9 - 0
- Choice: 0 - 9 - 2 - 1
- Shift one position to the left
- Confirm preselected reading
- Cancel preselected reading

**« PRESET » function: Sample entry -50.145 mm**
**TESA-hite Magna 400 / 700**

**9**

**IMPORTANT**
Each time a new reference is requested, the remaining in memory.

**Deleting « PRESET »**
Two possibilities:

**A**

**B**

**« PRESET » function : Cancellation**
Access and entry of « PRESET »
As for Modes 1 and 2
4.13 Measuring parallelism deviations

The measurement of the parallelism deviations is carried out in ZZ measuring mode. Place the gauge head in front of the surface to be controlled, do the probing and wait about 1 second in the probing zone. A bar graph appears and the measurement can be started by means of the F1 key and will be ended by means of the F4 key.

Detailed procedure of measuring parallelism deviations

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>mm /in</td>
<td>Switch-on auto Print mode</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F1</td>
<td>Establish the probe constant</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F2</td>
<td>Enter in ZZ mode</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F3</td>
<td>Introduction of a PRESET</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F4</td>
<td>Continuous display</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>mm /in</td>
<td>Return in St 1 mode</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F1</td>
<td>Set the display to zero</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Display Image" /></td>
<td>F2</td>
<td>Introduction of a PRESET</td>
</tr>
</tbody>
</table>
## Detailed procedure of measuring parallelism deviations

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F2</strong></td>
<td>mm /in</td>
</tr>
<tr>
<td></td>
<td><strong>Set the continuous display to zero</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F1</strong></td>
<td>Return in St 1 mode</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F2</strong></td>
<td>Set the display to zero</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F4</strong></td>
<td>Introduction of a PRESET</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F1</strong></td>
<td>Start the measurement</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F1</strong></td>
<td>Capture the values</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F4</strong></td>
<td>Finish the measurement</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F4</strong></td>
<td>Display of the result value MAX-MIN</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F3</strong></td>
<td>Return in ZZ mode continuous display; allow to do a new measurement of parallelism deviations.</td>
</tr>
<tr>
<td></td>
<td><img src="https://via.placeholder.com/150" alt="" /></td>
<td><strong>F4</strong></td>
<td>Display the MAX value</td>
</tr>
</tbody>
</table>
Detailed procedure of measuring parallelism deviations

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1" alt="Display of the result value MAX" /></td>
<td>F3</td>
<td>Return in ZZ mode continuous display; allow to do a new measurement of parallelism deviations.</td>
</tr>
<tr>
<td></td>
<td><img src="image2" alt="Display of the result value MIN" /></td>
<td>F3</td>
<td>Return in ZZ mode continuous display; allow to do a new measurement of parallelism deviations.</td>
</tr>
<tr>
<td></td>
<td><img src="image3" alt="ZZ mode Continuous display" /></td>
<td>F1</td>
<td>Return in St 1 mode</td>
</tr>
<tr>
<td></td>
<td><img src="image4" alt="Switch-on auto Print mode" /></td>
<td>F1</td>
<td>Establish the probe constant</td>
</tr>
</tbody>
</table>

Return in ZZ mode continuous display; allow to do a new measurement of parallelism deviations.

Display the MAX – MIN value

Display the MIN value

Display the MAX value

Introduction of a PRESET

Set the display to zero

Introduction of a PRESET

Switch-on auto Print mode

Establish the probe constant

Enter in ZZ mode

Introduction of a PRESET
4.14 Use of the fine adjustment

The fine adjustment is used when one wants to precisely adjust a height in 3 «ZZ» mode. It can also be used when seeking the culmination point of a bore or a shaft. Indeed, in such a case, the probing force can be very finely adjusted affording great stability.

5 INSTRUMENT CONFIGURATION

To enter into the configuration mode, you have to activate by turned on the instrument, first the F1, then simultaneously the F1 and ON/OFF keys; after deactivate the ON/OFF and then the F1 key.

The configuration menu allows the following functions:

- **F1**: Activates or deactivates the Beep, when probing or detecting the culmination point. By default the Beep strong is active (BEEP Hi).
- **F2**: By default the TESA-Hite Magna 400 / 700 turns off after 20 min (AUTO OF). To turn it off only with the ON/OFF button, set this option on ON.
- **F3**: Change the resolution of the instrument (0.001 / 0.005 / 0.01 mm). By default the resolution is 0.001 mm.
Detailed procedure of the instrument configuration menu

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1</strong> and <strong>ON</strong> simultaneously</td>
<td>SET</td>
<td><strong>mm /in</strong></td>
<td>Activates or deactivates the Beep</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F1</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F2</strong></td>
<td>Automatic turn off or not</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F3</strong></td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F4</strong></td>
<td>Exit of the configuration menu</td>
</tr>
</tbody>
</table>

| **F1** | BEEP Hi | **mm** |
| **F1** | Activates the Beep Lo |
| | **F4** | Return to the configuration menu |

| **F1** | BEEP Lo |
| **F1** | Deactivates the Beep |
| | **F4** | Return to the configuration menu |

| **F1** | BEEP OF |
| **F1** | Activates the Beep Hi |
| | **F4** | Return to the configuration menu |

| **F4** | SET |
| **F1** | Activates or deactivates the Beep |
| | **F2** | Automatic turn off or not |
| | **F3** | Change the resolution |
| | **F4** | Exit of the configuration menu |
TESA-hite Magna 400 / 700

Detailed procedure of the instrument configuration menu

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F2</td>
<td>Turn off only with the ON/OFF button</td>
</tr>
<tr>
<td></td>
<td><img src="auto_on.png" alt="Auto On" /></td>
<td>F4</td>
<td>Return to the configuration menu</td>
</tr>
<tr>
<td>F2</td>
<td><img src="auto_off.png" alt="Auto Off" /></td>
<td>F2</td>
<td>Automatic turn off</td>
</tr>
<tr>
<td></td>
<td><img src="auto_off.png" alt="Auto Off" /></td>
<td>F4</td>
<td>Return to the configuration menu</td>
</tr>
<tr>
<td>F4</td>
<td><img src="set_mm.png" alt="Set mm" /></td>
<td>F1</td>
<td>Activates or deactivates the Beep</td>
</tr>
<tr>
<td></td>
<td><img src="set_mm.png" alt="Set mm" /></td>
<td>F2</td>
<td>Automatic turn off or not</td>
</tr>
<tr>
<td></td>
<td><img src="set_mm.png" alt="Set mm" /></td>
<td>F3</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td><img src="set_mm.png" alt="Set mm" /></td>
<td>F4</td>
<td>Exit of the configuration menu</td>
</tr>
<tr>
<td>F3</td>
<td><img src="resolution_mm.png" alt="Resolution mm" /></td>
<td>F3</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td><img src="resolution_mm.png" alt="Resolution mm" /></td>
<td>F4</td>
<td>Exit of the configuration menu</td>
</tr>
</tbody>
</table>
Detailed procedure of the instrument configuration menu

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="0.005 mm" /></td>
<td>mm /in</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="0.01 mm" /></td>
<td>mm /in</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="0.001 mm" /></td>
<td>mm /in</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="0.0001 in" /></td>
<td>mm /in</td>
<td>Change the resolution</td>
</tr>
</tbody>
</table>

Exit of the configuration menu
Detailed procedure of the instrument configuration menu

<table>
<thead>
<tr>
<th>Probe/Contact</th>
<th>Display</th>
<th>Active keys</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="mm / in" /></td>
<td>mm / in</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F4</td>
<td>Exit of the configuration menu</td>
</tr>
<tr>
<td>F4</td>
<td><img src="image" alt="mm / in" /></td>
<td>mm / in</td>
<td>Activates or deactivates the Beep</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F2</td>
<td>Automatic turn off or not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F3</td>
<td>Change the resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F4</td>
<td>Exit of the configuration menu</td>
</tr>
<tr>
<td>F4</td>
<td><img src="image" alt="mm" /></td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Then, to enter into the measuring mode, moves slowly the measuring carriage to pass the reference mark. For more detailed information, please consult chapter 2.2.
6 ERROR MESSAGES

The error messages can be erased by pressing the key or by turning off the instrument using the key

- The message Error 4 indicates a problem in the measuring system, sensor or scale. It can also be caused by moving the measuring head too fast.
- The messages Error 6 and Error 9 indicate a fault in the electronic system.
- The acoustic message Beep Error detects a probe used too quickly.
- If an error message persists, send the instrument to your TESA after-sales service agent.

7 MAINTENANCE

7.1 Cleaning

The TESA-Hite Magna 400 / 700 must be used in a place that complies with the extreme operating and storage conditions indicated in the technical data.

The magnetic measuring system does not require particular maintenance; however, to clean the TESA-Hite Magna 400 / 700, use exclusively a dry, lint-free cloth. Do not use aggressive solvents.

Warning
The cleaning of the guides and the magnetic rule is a delicate operation; we consequently recommend that you proceed with the utmost caution.

Preparation
Remove the housing by unscrewing the 3 screws located on the top of the base.

Cleaning the guides
Clean the guide rails Fig. 3 with a lint-free cloth and relubricate the guide rails with watch oil.

Cleaning the glass rule
Clean the magnetic rule, Fig. 3, with a lint-free cloth, possibility slightly moistened with alcohol (do not use other solvents)
7.2 Charging the battery

First of all, you should know that new batteries or batteries that are not used for a long period of time only attain their full performance after 30 to 40 charges. Fully recharging the battery pack with the mains adaptor N° 04761054 requires about 8 hours. The TESA-Hite Magna 400 / 700 can then be used for about 60 hours. If the battery charge is not sufficient (under 5.8 V), the battery symbol appears on the display. The operator can continue with the measurements for about 15 minutes. Once this time has gone, the operating function will deteriorate.

For charging batteries, use only the original adaptor N° 04761054 and proceed as follows:
– Connect mains adaptor to the socket located on the back of the TESA-Hite Magna 400 / 700.
– Connect adaptor to the mains 110 to 240 Vac / 50 to 60 Hz with connecting cable supplied.
– Complete charging takes about 8 hours.
– After full recharging, the adaptor may remain connected to the mains up to max. 24 hours without danger to the battery.
– During the recharging it is still possible to use the instrument; the time necessary for the recharge will simply be longer.

Note
Unused batteries will gradually lose charge as time goes by and, if not recharged, deteriorate. They must therefore be charged at intervals which do not exceed 6 months.

8 DELIVERY PROGRAMME

The order numbers are the following:
TESA-Hite Magna 400 00730047
TESA-Hite Magna 700 00730059

Each TESA-Hite Magna is supplied with the following standard accessories:
- 1 Standard insert holder 00760143
- 1 Standard measuring insert with a 5 mm tungsten carbide ball tip 00760164
- 1 Master piece with nominal dimension 6.350 mm / 0.250 in 00760231
- 1 Rechargeable 6V battery 00760157
- 1 Mains adaptor 110 to 240 Vac / 50 to 60 Hz 04761054
- 1 Cable EU 04761055
- 1 Cable US 04761056
- 1 SCS calibration certificate
- 1 Instruction manual with a declaration of conformity
- 1 Shipping box
8.1 Optional accessories

All insert holder and measuring insert from MICRO-HITE can be used with the TESA-Hite Magna.

**Measuring insert**
With tungsten carbide ball tip, Ø 10 mm.

N° 00760060*

**Measuring insert**
With tungsten carbide ball tip, Ø 3 mm.

N° 00760061*

**Measuring insert**
With tungsten carbide measuring face (convex), for inspecting cylindrical bores or establishing internal thread position (metric or similar).

D= 2,2 mm for M3 to M16  N° 00760066
D= 4,5 mm for M6 to M48  N° 00760067
D= 9,7 mm for M12 to M150  N° 00760068

E = 1 mm / Ø 4,5 mm  N° 00760074
E = 2 mm / Ø 14 mm  N° 00760075*
E = 3 mm / Ø 19 mm  N° 00760076

**Measuring insert**
With disc-shaped, tungsten carbide measuring face for measuring grooves, turned grooves, centring shoulders, etc.

**Measuring insert**
With small tungsten carbide measuring face, Ø 2 mm,

N° 00760082

**Indexing of the insert holder**
To screw on the mounting pin

N° 00760225
**Insert holder**
For measuring inserts with M1,4 threads (see opposite) and M2,5 threads.

![Diagram of insert holder](image1)

- **ø** 1 mm  
  N° 00760096*
- **ø** 2 mm  
  N° 01860201*
- **ø** 3 mm  
  N° 01860203*
- **Key**  
  N° 01860307*

**Measuring insert**
With tungsten carbide ball tip with M1,4 thread.

![Diagram of measuring insert](image2)

- **ø** 1 mm  
  N° 01860201*
- **ø** 2 mm  
  N° 01860202*
- **ø** 3 mm  
  N° 01860203*

**Measuring insert**
With a Ø 10 mm tungsten carbide cylindrical face and 12 mm length. Hardened stainless steel body.

![Diagram of measuring insert](image3)

- **ø** 1 mm  
  N° 00760093*
- **ø** 2 mm  
  N° 00760094*

**Insert holder**
For increasing the measuring depth.

![Diagram of insert holder](image4)

- **Depth 110 mm (L = 75 mm)**  
  N° 00760086
- **185 mm (L = 150 mm)**  
  N° 00760087

**Insert holder**
For extending the application range.

![Diagram of insert holder](image5)

- **Depth 110 mm (L = 75 mm)**  
  N° 00760086
- **185 mm (L = 150 mm)**  
  N° 00760087

**Partial set of accessories**  
N° 00760173
With those of the above accessories marked by an asterisk «*». Supplied in a polypropylene case (not shown on these pages).

**Full set of accessories**  
N° 00760148
With all above accessories. Supplied in a polypropylene case (not shown on these pages).
**Probe insert set**  
N° 00760175  
*Supplied in a suited plastic case.*

**Composition of the set:**

1. **Insert holder**
   - N° 00760177

2. **Probing pin**
   - In hardened steel for grooves, centring shoulders, blind bores, etc.
   - Tilted through 8°
   - N° 00760178

3. **Probing pin**
   - In hardened steel, shouldered, for depth measurement
   - N° 00760179

**3 Measuring inserts**

1. **Measuring insert**
   - With a hardened ball tip, Ø 0.9 mm
   - Ø 1.9 mm
   - Ø 2.9 mm
   - N° 00760180  N° 00760181  N° 00760182

2. **Extensions**
   - Length 20 mm, thread M3 to M3
   - Length 20 mm, thread M3 to M2.5
   - N° 00760184  N° 00760185

**TESA PRINTER SPC**  
N° 06430000

*Supplied with:*

1. Roll heat sensitive paper
   - N° 04765013

1. Mains adaptor, 100 to 240 Vac / 50 to 60 Hz, 6.6 Vdc / 750 mA
   - N° 04761054

1. Cable EU
   - N° 04761055

1. Instruction manual with declaration of conformity
### 9 TECHNICAL DATA

#### CHARACTERISTICS

<table>
<thead>
<tr>
<th>TESA-Hite Magna 400</th>
<th>TESA-Hite Magna 700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring span</td>
<td>415 mm / 16 in</td>
</tr>
<tr>
<td></td>
<td>715 mm / 28 in</td>
</tr>
<tr>
<td>Application range</td>
<td>570 mm / 22 in</td>
</tr>
<tr>
<td></td>
<td>870 mm / 34 in</td>
</tr>
<tr>
<td></td>
<td>625 mm / 24 in</td>
</tr>
<tr>
<td></td>
<td>925 mm / 36 in</td>
</tr>
<tr>
<td></td>
<td>795 mm / 31 in</td>
</tr>
<tr>
<td></td>
<td>1095 mm / 43 in</td>
</tr>
<tr>
<td>Maximum permissible error*</td>
<td>8 µm / 0.0003 in</td>
</tr>
<tr>
<td>Repeatability*</td>
<td>on flat surface: 2s=3µm / 2s&lt;0.00015in</td>
</tr>
<tr>
<td></td>
<td>within bores: 2s&lt;5µm / 2s&lt;0.00020in</td>
</tr>
<tr>
<td>Maximum perpendicularity error (frontal)</td>
<td>----</td>
</tr>
</tbody>
</table>

#### Display

- liquid crystal display (LCD)
- 83 x 49 mm
- 0.001/0.005/0.01 mm – .0001/.0002/.001 in
- 7 plus minus sign
- 12 mm
- symbols for the functions
- grey cast iron with rectified sole
- through mechanical contact
- magnetic scale
- 12±1.5 10^{-6} K^{-1}

#### Measuring head

- on ball-bearings
- with a handwheel
- 1 m/s
- automatic

- 1.5N ±0.5N (acoustic signal)
- 8 keys for selecting the functions and entering the values

- no
- 6V rechargeable battery
- 60 hours, recharging time 8 hours
- RS-232
- yes
- yes
- 10°C to 40°C
- -10°C to 60°C
- 100%

#### Measuring head lock

- yes

#### Data output

- yes

#### Measuring head lock

- yes

#### Operating temperature range

- yes

#### Storage temperature range

- 10°C to 40°C
- -10°C to 60°C
- 100%

#### Maximum relative humidity

- 100%

#### Weight

- 14 kg
- 16 kg

#### Degree of protection

- IP55 (Electronic box and measuring system: IP65)
- EN 50081-1, EN 50081-2
- EN 50082-1, EN 50082-2

* Valid with standard accessories
9.1 Description of the RS 232 interface

To link the TESA-Hite Magna 400 / 700 to a Printer SPC or a PC, use the cable 04761052.

Transmission speed: 4800 bauds
Character length: 7 bits
Start: 1 bit
Stop: 2 bits
Parity: even

9.1.1 Monodirectional data transmission

The data transfer is done by activating the function key .

Transfer
mm ±9999.999(9) <cr/lf>
In ±99.9999 <cr/lf>

9.1.2 Bidirectional data transmission

This transmission mode allows direct control of the height gauge from a PC. Given instructions are as follows:

Each command must be ended using ASCII code «CR»

?<cr> Measured value
ID ?<cr> Product identification number TE...<cr/lf>
VER ?<cr> Instrument version 2.1<cr/lf>
UNI ?<cr> Unit system MM ou IN<cr/lf>
MM<cr> Work in metric (mm) <cr/lf>
IN<cr> Work in inch (in) <cr/lf>

The pin assignment on the 9 pin (female) connector is as follow:

Control panel | PC
---|---
2 TXD (Data Out) | 2 RXD
3 RXD (Data Req) | 3 TXD
5 GND | Sub-D 9 pole male
Other pins are leaved unused

10 WARRANTY

We guarantee this product against any fault of design, manufacture or material for a period of 12 months from the date of purchase. Any repair work carried out under the guarantee conditions is free of charge. Our responsibility is limited to the repair of the product or, if we consider it necessary, to its free replacement.

The following are not covered by our guarantee: batteries and damages due to incorrect handling, failure to observe the instruction manual, or attempts by any non-qualified party to repair the product; any consequences whatever which may be connected either directly or indirectly with the product supplied or its use.

(Extract from our General Terms of Delivery, December 1, 1981).
11 DECLARATION OF CONFORMITY

We thank you very much for your confidence in purchasing this product. We hereby certify that it was inspected in our works.

Declaration of conformity and confirmation of traceability of the indicated values

We declare under our sole responsibility that this product is in conformity with all technical data as specified in our sales literature (instruction manual, leaflet, general catalogue). In addition, we certify that the measuring equipment used to check this product refers to national reference standards. Traceability of the measured values is ensured by our Quality Assurance.

Name of manufacturer
TESA SA

Address of manufacturer
TESA SA
Rue du Bugnon 38
CH-1020 Renens
(Switzerland)

We declare that the following product(s)

Name of product       TESA-Hite Magna 400 / 700
Type of product       00730047 / 00730059

is (are) in conformity with the provisions of the European directive
2004/108/CE

And is (are) in conformity with the provisions of the European Standards
EN 61326-1

Renens, the 22.02.2010

Manager of Quality Assurance.