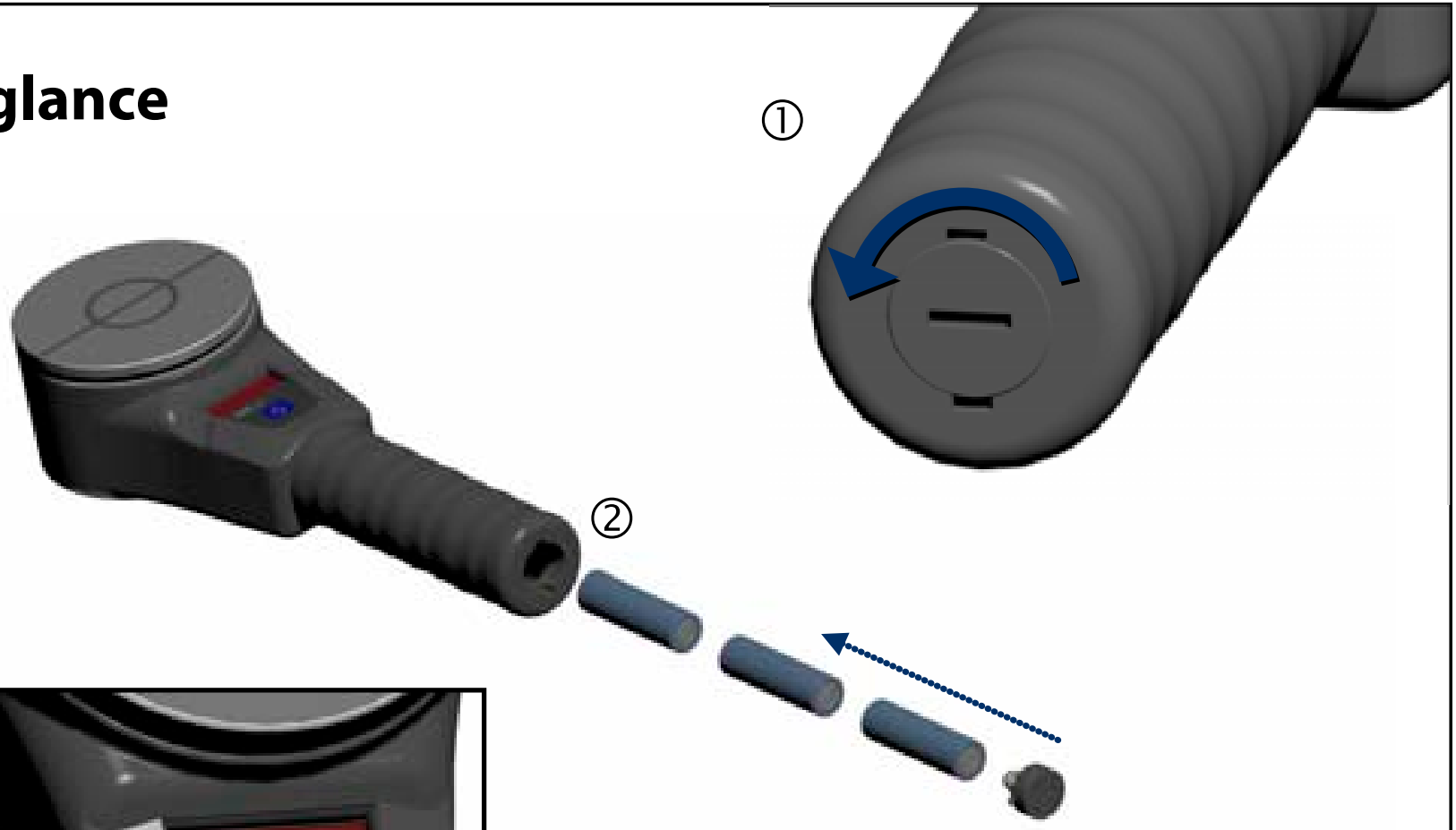
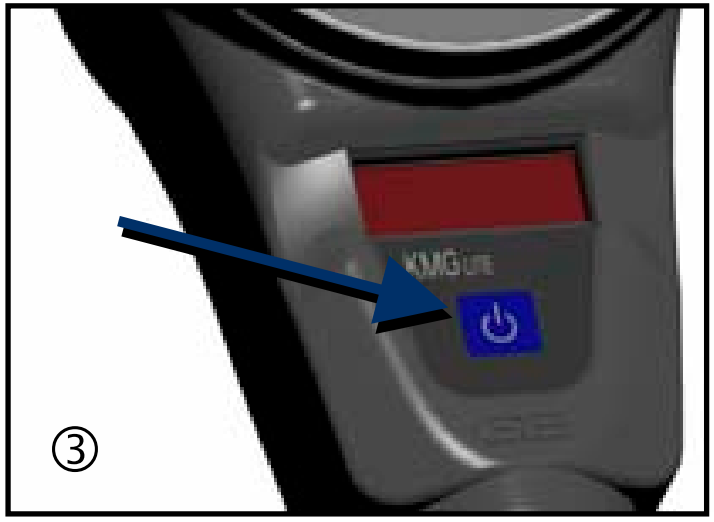
KMG-Lite

Hand-held instrument for measuring dynamic forces
at closing edges of power-operated doors and gates

User manual

At a glance





3 x AA 1.5V battery

Contents

1. General notes

This chapter provides important advice on using this documentation.

The documentation contains information that must be applied if the product is to be used safely and efficiently.

Please read this documentation carefully and familiarise yourself with the operation of the product before putting it to use. Keep this documentation to hand so that you can refer to it when necessary.

Identification

Darstellung	Bedeutung	Bemerkungen
ⓘ	Note	Offers helpful tips and information
➲	Objective	Denotes the objective that is to be achieved via the steps described
▶	Step	Carry out steps
➥	Cross-reference	Refers to more extensive or detailed information
	Display	Shows the display output

2. Safety advice

This chapter gives general rules which must be followed and observed if the product is to be handled safely.

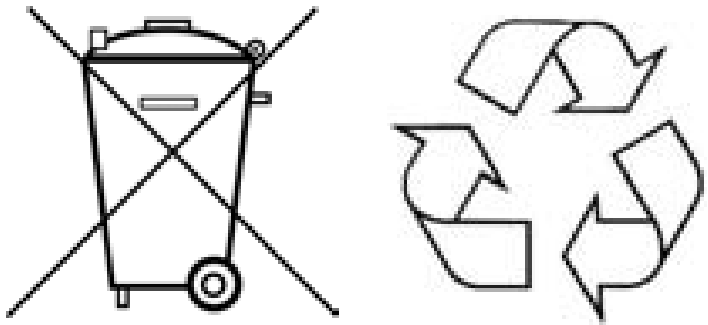
Product safety/ preserving warranty claims

- Operate the instrument only within the parameters specified in the Technical data. *(➡ S. 30)*
- Always use the instrument properly and for its intended purpose. Do not use force.
- Do not open the instrument except for changing the batteries as instructed in chapters *5* and *8*.
- The instrument must be sent to annual calibration. *(➡ S. 27)*

- When not used, keep the gauge inside its transport case und protect it from humidity and mechanical stress.

Ensure correct disposal

- Take used batteries to the collection points provided for them.
- At the end of its useful life send the product back to GTE. We will take care of its proper and ecological disposal.



3. Intended purpose

This chapter gives the areas of application for which the product is intended.

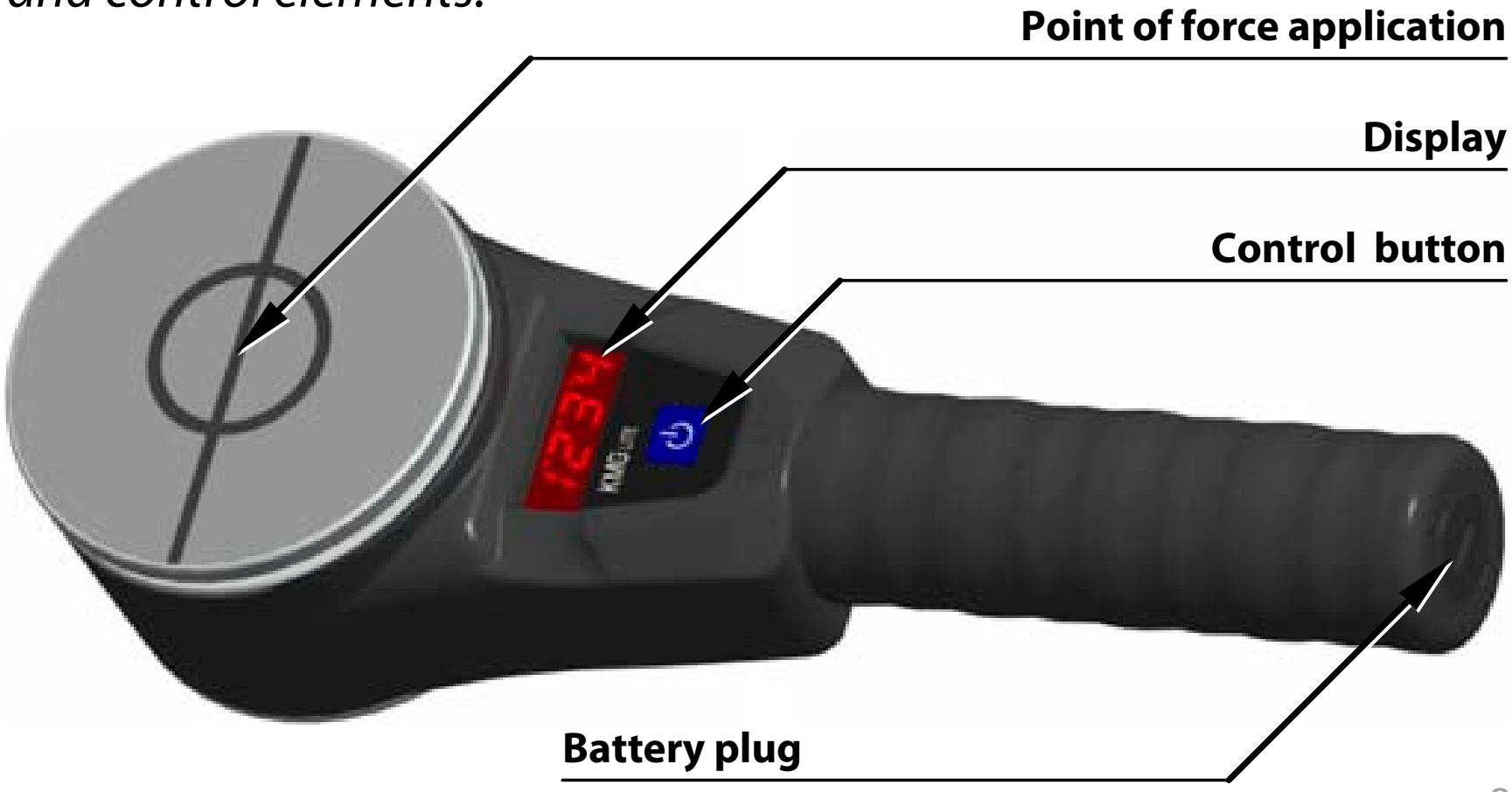
Only use the product for those applications which it was designed for.

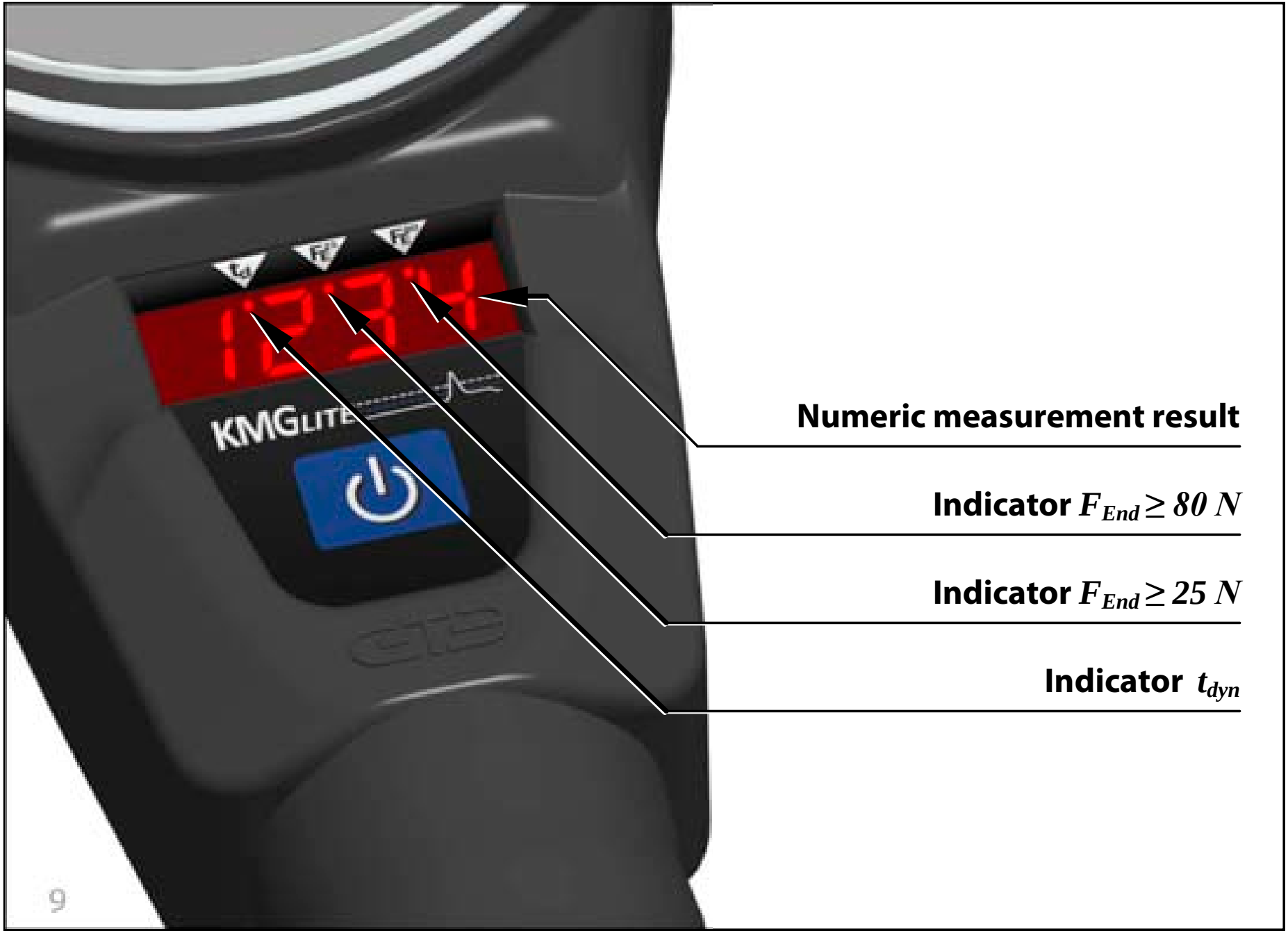
KMG-Lite is a compact handheld measurement instrument for determining dynamic closing forces of power-operated doors and gates.

Please consult specifications for the admissible maximum force. *(➡ S. 30)*

4. Product description

This chapter describes the structure of the product and its display and control elements.



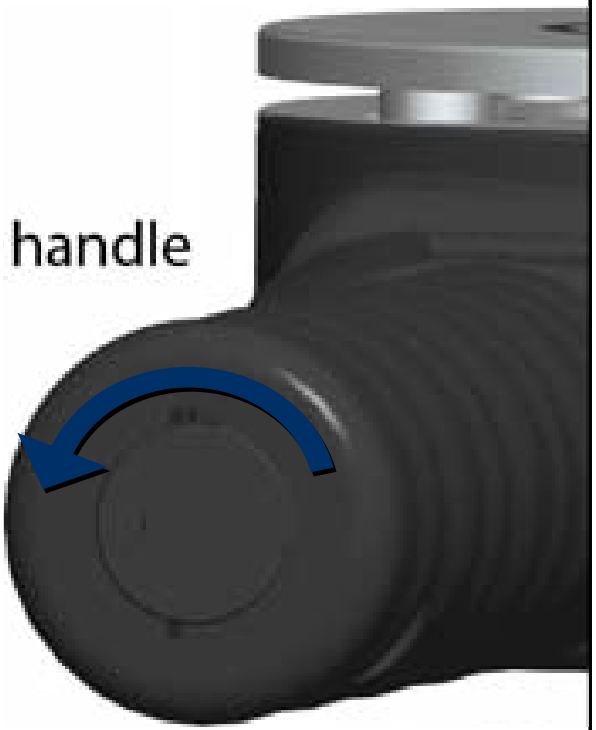

Numeric measurement result
Indicator $F_{End} \geq 80\ N$
Indicator $F_{End} \geq 25\ N$
Indicator t_{dyn}

5. Commissioning

This chapter describes the steps required to commission the product.

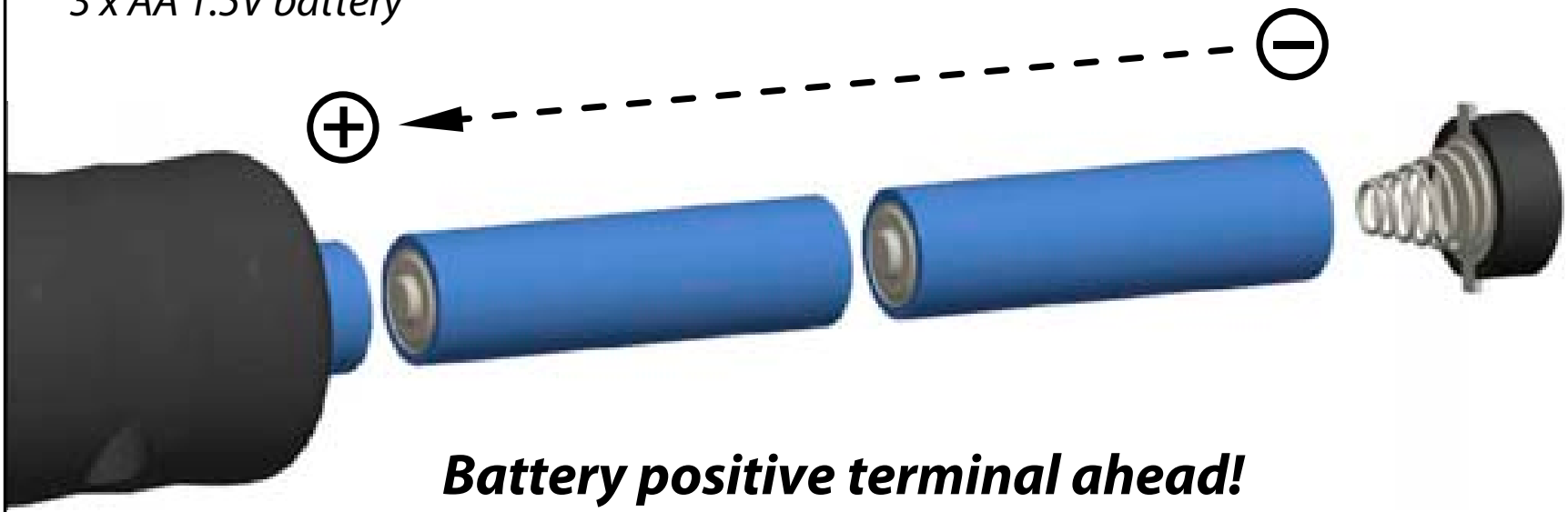
- **Removing the protective film on the display:**
  - Pull the protective film off carefully.

- **Inserting batteries:**
  - Remove battery plug at the end of the handle by twisting it counter clockwise and pulling it out.



- Insert three AA - type batteries with 1.5V each.
  Mind the polarity!
- Close battery plug: Press the batteries with the battery plug against the spring resistance inside the handle and lock it by twisting it clockwise.

3 x AA 1.5V battery

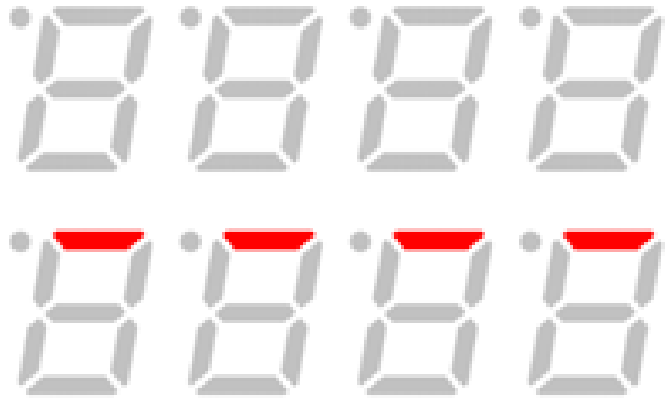


Battery positive terminal ahead!

➲ **Activate the instrument:**

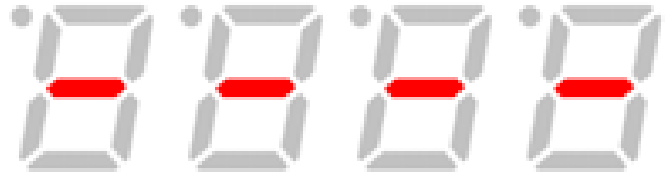
▶ Press the control button once.

ⓘ While starting up the devices tests itself.



Startup test

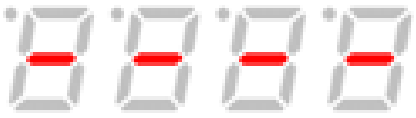
ⓘ The instrument is ready after three seconds.



Ready for measurement

6. Measuring

This chapter describes the steps required to measure with the product.



➲ **Activate the instrument:**

- ▶ Press the control button once.
- ▶ Wait for measure attendance.

➲ **Apply the force vertically and axial**

ⓘ Measuring automatically starts at 20 N.

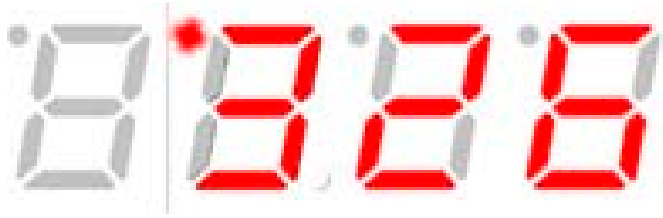
- Simultaneously with the measurement, the normative evaluation of the temporal force curve starts.

Measurement/ Evaluation

- **Display of measurement results:**
- After the measurement and evaluation are finished, the instrument automatically displays the dynamic peak force F_{dyn} that has occurred within measurement. The measurement unit for this value is Newton (N).

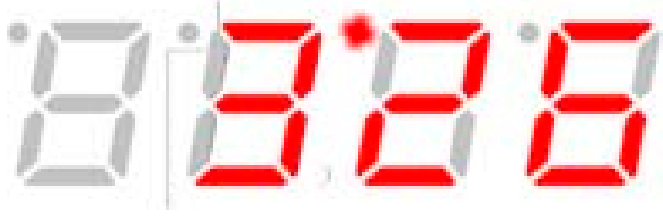
Measurement result:
F_{dyn} *= 326 N*

- If the dynamic time (t_{dyn}) exceeded the normative 0.75 seconds, the LED within the second display segment flashes.



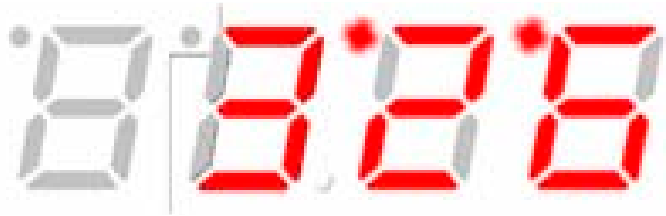
Measurement result:
$F_{dyn} = 326\ N$
$t_{dyn} > 0{,}75\ s$

- If the force value at the end of the 5s measurement period (F_{End}) exceeded 25 N, the LED within the third display segment flashes.



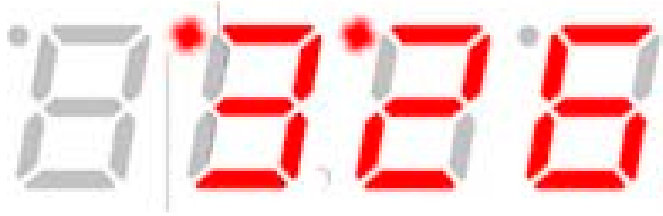
Measurement result:
$F_{dyn} = 326\ N$
$F_{End} > 25\ N$

- If the force value at the end of the 5s measurement period (F_{End}) exceeded 80 N, the LED within the third display segment flashes.



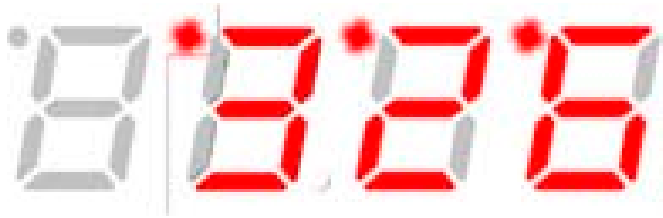
Measurement result:
F_{dyn} = 326 N
F_{End} > 80 N

- If the force value at the end of the 5s measurement period (F_{End}) exceeded 25N and the dynamic time (t_{dyn}) exceeded 0.75 s, the LEDs within the second and the third display segment flash.



Measurement result:
F_{dyn} = 326 N
t_{dyn} > 0,75 s
F_{End} > 25 N

ⓘ If the force value at the end of the 5s measurement period (F_{End}) exceeded 80N and the dynamic time (t_{dyn}) exceeded 0.75 s, the LEDs within the second, third and fourth display segment flash.

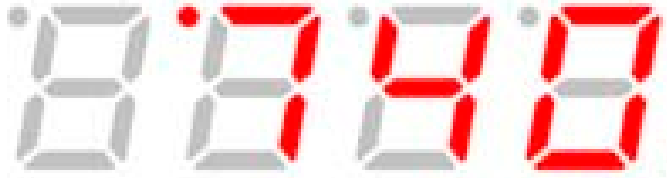


Measurement result:
$F_{dyn} = 326\ N$
$t_{dyn} > 0{,}75\ s$
$F_{End} > 80\ N$

➲ **Display of the value t_{dyn} :**

▶ After measurement press the control button once.

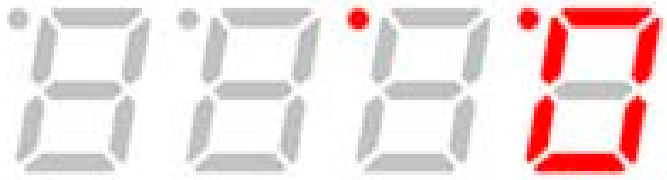
ⓘ The display shows the value for the dynamic time in Milli-seconds (ms).



$t_{dyn} = 740\ ms = 0{,}74\ s$

ⓘ The LED within the second display segment is lit for orientation.

- **Display of the value F_{End} :**
  - ▶ After measurement press the control button twice.
  - ⓘ The display now shows the value of the final force in Newton (N).



$F_{End} = 0\ N$

- ⓘ The LED within the second display segment is lit for orientation.

- ⓘ By pressing the control button again, the display returns to the dynamic peak force with the flashing segments for indication of t_{dyn} and F_{End} standard violation.

ⓘ Regardless of the current display state the instrument is always ready to start a new measurement whenever the required trigger force > 20 N is detected.

➲ **Deactivate the instrument:**

▶ Keep the control button pressed for more than 2 seconds.

ⓘ After 5 minutes of inactivity the device automatically turns itself off.

7. Warning- and error signals

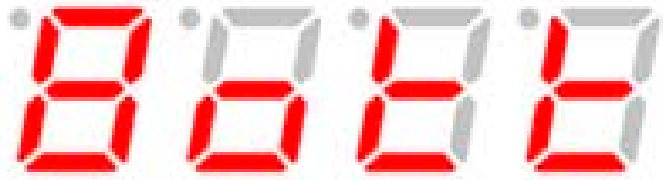
This chapter explains all display signals that indicate an abnormal system state.

Exceedance of measurement range

If the measured dynamic peak force exceeds the specified upper limit of 1600 N, the display shows a flashing “1600”. The measurement results for t_{dyn} and F_{End} are not affected.

Low battery warning

If the battery voltage falls below a critical value, the display shows the message ”Batt“. By pressing the control button you can still continue your measurements.

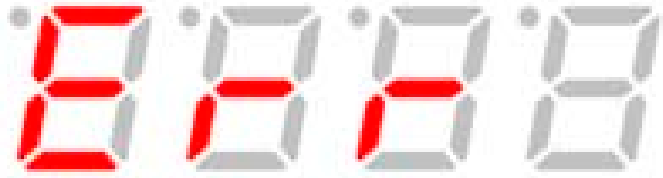


- Change the batteries as soon as possible.

Error signal „Load rejection“

If the device senses a zero force offset on startup the display shows the message “Err“. This message can also occurr if the

device is used outside the specified temperature/humidity range or if the force application plate got stuck.



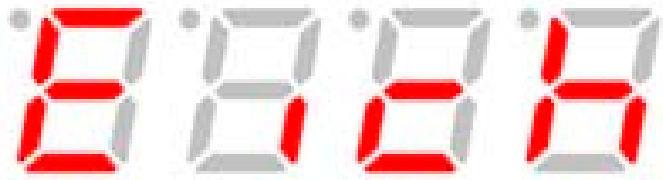
- Make sure the device is unloaded while starting up.
- Make sure that all environmental conditions are within the specified range.
- Make sure that the force application plate is neither stuck nor soiled. (➥ *S. 24*)
- Reboot the device.

ⓘ By pressing the control button you can continue your measurement regardless of the displayed error.

- If this error message should occurr although the instrument is used within the specified temperature range, please send it to GTE for calibration. *(➡ S. 27)*

Error signal “Eich“-table missing

If the instrument’s display should show the message “Eich“ after startup, the system is unable to find its calibration reference.



- Send the device to GTE for calibration. *(➡ S. 27)*

8. Care and maintenance

This chapter describes the steps that help to maintain the functionality of the product and to extend its service life.

- **Safekeeping the instrument:**
  - When not used, keep the gauge inside its transport case und protect it from humidity and mechanical stress.
  - Protect the instrument from dirt. Dust and other particles must not get into the measurement head.

ⓘ A soiled instrument can cause reduced measurement accuracy. In case of doubt send the device to GTE for calibration. As part of the calibration sensitive parts can be cleaned from dust particles.

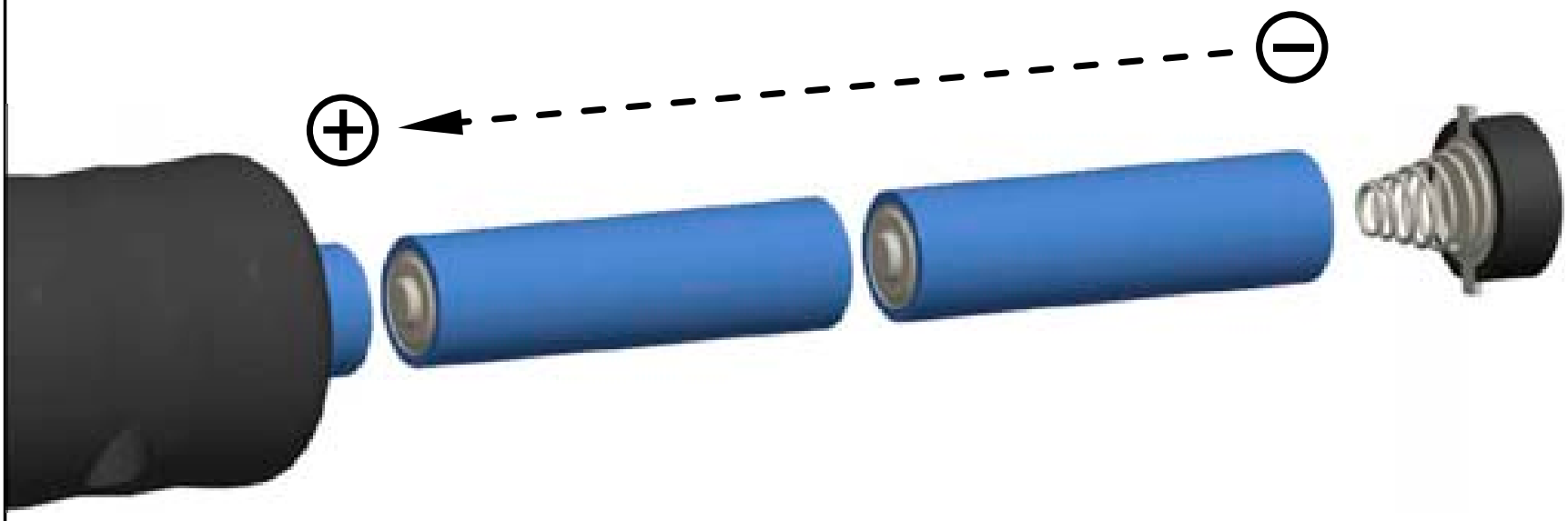
➲ **Cleaning the housing:**

▶ Clean the housing with a moist cloth (soap suds) if it is dirty. Do not use aggressive cleaning agents or solvents!

➲ **Changing the batteries:**

▶ Remove battery plug at the end of the handle by twisting it counter clockwise and pulling it out.

- Remove old batteries and take care of proper disposal.
- Insert three AA - type batteries with 1.5 V each.
  Mind the polarity! Positive terminals ahead!
- Close battery plug: Press the batteries with the battery plug against the spring resistance inside the handle and lock it by twisting it clockwise.



9. Calibration

To ensure the measurement accuracy the instrument has to be calibrated every year.

ⓘ Annual calibration is also mandatory according to DIN 18650 as well as EN 12453.

The calibration badge on the bottom of the device indicated when the next calibration of your *KMG-Lite* is due.

GTE offers two extent of calibration service.

- Our standard service calibrates your device and protocols the calibration with a factory calibration certificate.

- If your device should be dirty or having problems to achieve its initial measurement accuracy we additionally offer a special maintenance and calibration service.

10. Accessories

As additional accessory for *KMG-Lite* we offer a Spacer-Set, which contains a robust measurement tripod and distance pieces for typical measurement poir

Tripod for vertical doors

Opening heights: 30

and 50 cm

Distance elements

for horizontal gates

and doors:

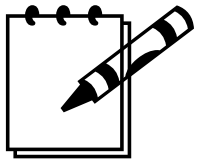
30 and 50 cm

Art.-Nr.: 320-2303-001

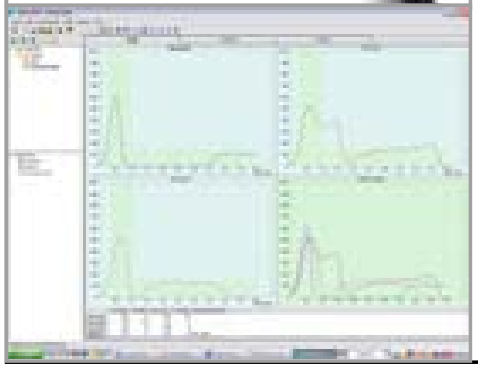
11. Specifications

Voltage supply:	3 x 1.5 V - AA - Battery (Mignon)
Power consumption:	< 25 mA
Battery duty:	> 100 hours
Temperature range:	0 ... 40 °C
Humidity range:	20 ... 90 % r. H. (not condensing)
Dimensions of measurement plane:	80 mm ∅, Height 50 mm
Dimensions:	250 x 80 x 50 mm (L x W x H)
Weight:	1 kg
Measurement range:	25 N ... 1600 N
Measurement accuracy*:	typ. > 10 N
Measurement error (max.):	25 N ... 200 N: ± 10 N 200 N ... 1600 N ± 5 % of reading
Spring rate (mech. filter):	500 N/mm
Slew rate / fall time:	≤ 5 ms

** Maximum accuracy only possible when force is applied vertically and axial.*



Notes



KMG-2000-G

Our high end closing force meter for all applications.

- High grade metal housing
- Measurement range up to 2000 N
- Graphical display with user menu
- Internal memory for 500 measurements
- USB-Interface for PC-Connection
- Rechargeable battery operation
- PC-Software for visualization, archiving and printing of measurement protocols

KMG-2000-G

- www.gte.de/KMG

GTE Industrieelektronik GmbH
Helmholtzstr. 21, 38-40
41747 Viersen, GERMANY
☎ +49-2162 / 3703-0 🖷 +49-2162 / 3703-25

kmg@gte.de

www.kmg-lite.de

Art.-Nr.: 320-2010-200
V1.2 - Mai 2018 Technical