

SKF TKTL 31



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Safety recommendations

- Always read and follow the operating instructions for use.
- Never stare directly into the laser source. Class II laser product.
- Never aim the laser beams into anyone's eyes.
- Never open the instrument.
- Never use the instrument under rain or very wet conditions
- Not for intrinsically safe area
- All repair work should be taken care of by an SKF repair shop.
- Here is a table of hazardous substance name and concentration for TKTL 31:

Part name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated biphenyls	Polybrominated diphenyl ethers
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	(PBDE)
Laser module	x	•	•	•	•	•

The table is prepared in accordance with the provisions of SJ/T11364.

- : Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.
- x: Indicates that said hazardous substance contained in at least of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

EC Declaration of conformity

We, SKF Maintenance Products, Meidoornkade 14, 3992 AE Houten, The Netherlands herewith declare under our sole responsibility that the products described in these instructions for use, are in accordance with the conditions of the following Directive(s):
EMC DIRECTIVE 2014/30/EU
and are in conformity with the following standards:

CE-EMC:

EN 61326-1:2013, EN 61326-2-2:2013

Emission: CISPR 11:2009+A1: 2010, Class B

Immunity: IEC 61000-4-2:2008

IEC 61000-4-3:2010

IEC 61000-4-8:2009

RED-EMC:

RADIO EQUIPMENT DIRECTIVE 2014/53/EU

EN 301489-1 V2.1.1 :2017-02, EN 301489-17 V3.1.1 :2017-02

RED-RF:

EN 300328 V2.1.1 :2016-11

RED-EMF:

EN 62479 :2010, EN 62311 :2008

RED-LVD:

EUROPEAN LOW VOLTAGE DIRECTIVE 2014/35/EU

EN 60950-1 :2006/A11 :2009/A1 :2010/A12 :2011/A2 :2013

Laser standards: 21 CFR, ch 1-J

WEEE: European Directive 2012/19/EU

RoHS: RoHS DIRECTIVE (EU) 2015/863

CE requirements: CE certified



Houten, The Netherlands, March 2020

A handwritten signature in black ink that reads 'Gondová' in a cursive script.

Mrs. Andrea Gondová

Manager Quality and Compliance

1. Introduction

The SKF TKTL 31 is a portable, lightweight multi-functional instrument for safely measuring temperatures at a distance. Simply aim and pull the trigger and the temperature is shown on the display. Users can also measure contact temperatures using the probe supplied.

This feature rich instrument also has the facility to store measured values such as Maximum, Minimum, Difference, Average, High Alarm, Low Alarm, Emissivity setting.

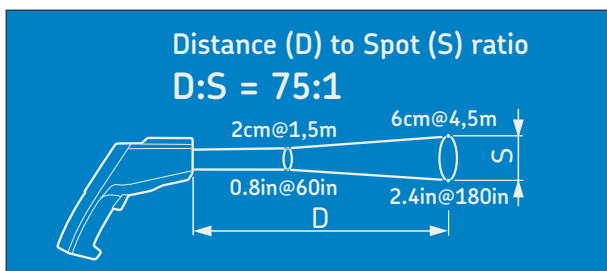
2. Quick start

1. Simply aim the thermometer at the measure target with Lens (8) and press Meas. key (6) to display the surface temperature.
2. The Distance:Spot is 75:1.
The two laser points are the reference for the target spot size. Please make sure the target area is within the field of view.

3. Features

- LCD black and white display, backlit
- Dual laser targeting
- Type-K thermocouple probe
- Adjustable emissivity
- High accuracy
- Fast response time
- DS ratio of 75:1

As the distance (D) from the object increases, the spot size (S) of the area measured by TKTL 31 becomes larger. The relationship between distance and each unit is listed below. The spot size indicates 90% measured energy.

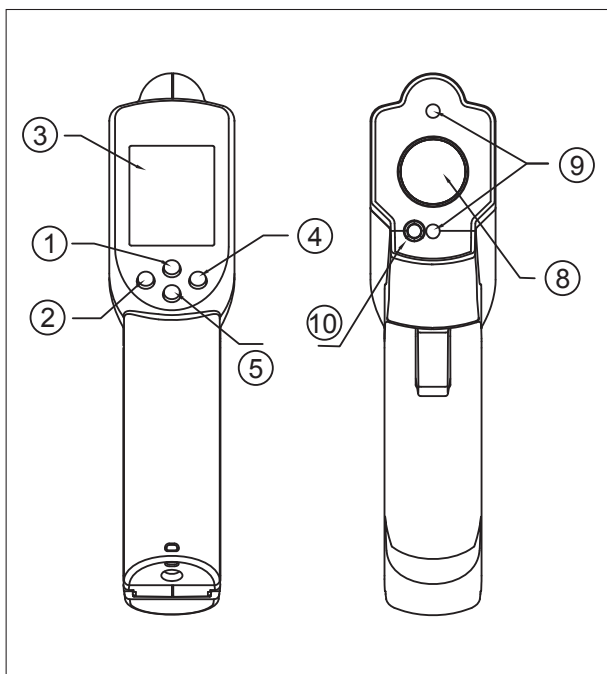


4. Technical data

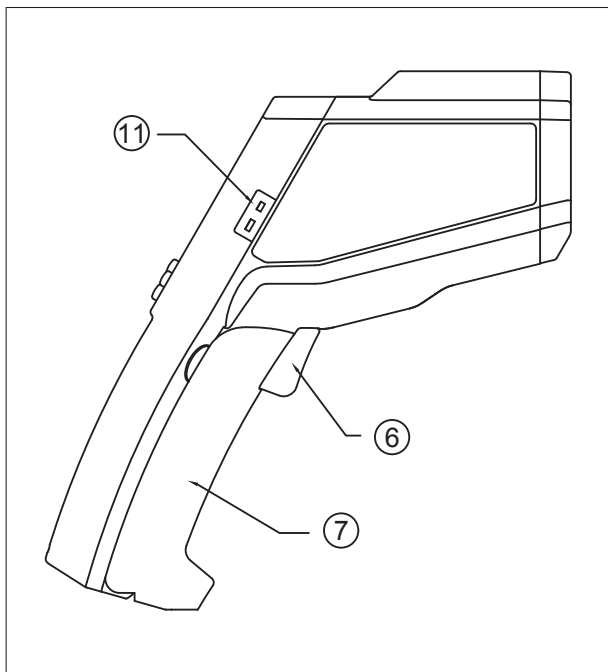
Designation	TKTL 31
Temperature range	
Infrared measurement	-60 to 1 600 °C (-76 to 2 912 °F)
Using a probe	-64 to 1 400 °C (-83.2 to 2 552 °F)
Probe supplied	TMDT 2-30, suitable for use up to 900 °C (1 650 °F)
Probe types suitable	K type probes
Full range accuracy	
Tamb = 25°C	Tobj = 15 to 35 °C, +/- 1.0 °C (1.8 °F)
Tamb = 23 +/- 3°C	Tobj = 0 to 1 600 °C, +/-2% of reading or 2 °C (4 °F) whichever is greater
Tamb = 23 +/- 3°C	Tobj = -60 to 0 °C, +/- (2 + 0.05/°) °C
Tamb = 23 +/- 6°C	With probe: , +/- 1% of reading or 1 °C (1.8 °F) whichever is greater
Response time	1 sec
Optics	Sense emitted, reflected and transmitted energy.
Distance to spot size	75:1
Spectral response	8-14 µm
Emissivity variable	0.1-1.0
Laser	Class 2
Maximum laser power	1 mW
Laser pointers	2 laser dots
Laser wavelength	635 - 660 nm
Display	
Display	LCD black and white display, backlit
Displayed resolution	0.1 °C/F from -83.2~999.9, otherwise 1° C/F
Controls	
Buttons	4 buttons and 1 trigger. Function as per instructions for use
User selectable backlit display	yes, On/off
User selectable laser pointers (2x)	yes, On/off
Measurement modes	Max, min, average, differential, probe/IR dual temperature
Alarm modes	High and low level alarm level with warning beep
Dimensions	
Unit	203 × 197 × 47 mm (8.0 × 7.7 × 1.8 in)
TL1 Carrying case dimensions	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in)
Weight (including case)	1 300 g (2.87 lb)

Designation	TKTL 31
Batteries	
Type	2 × AAA Alkaline type IEC LR03
Operating time	Typ.180, min. 140 hours continuous use without Laser and Backlight
Auto switch off	Automatic after 60 seconds after trigger is released
Probe mode	Automatic after 12 minutes
Environment	
Operating temperature	0 to 50 °C (32 to 122 °F) 10 to 95% R.H.
Storage temperature	-10 to 60 °C (14 to 140 °F) 10 to 95% R.H.

5. Front panel and button description

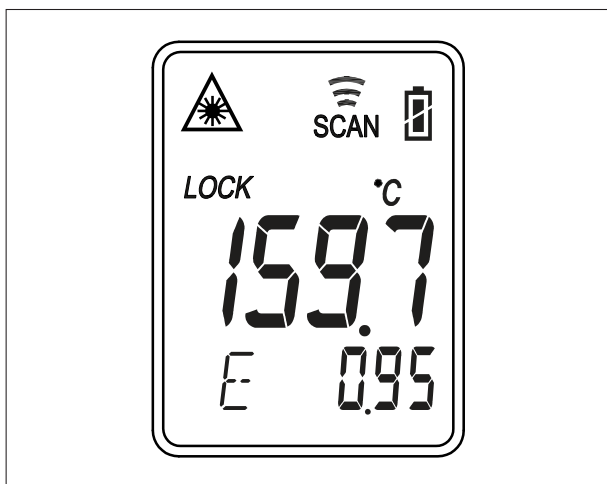


Item	Description
1	Emmissivity key
2	Down key
3	LCD
4	Up key
5	Mode key
8	Infrared lens
9	Laser
10	LED



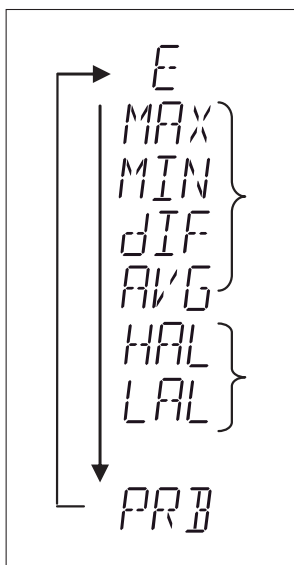
Item	Description
6	Meas. key
7	Battery cover
11	Thermocouple socket

6. Display overview



Default screen

7. Menu overview



- Press Emissivity key (1) for setting the emissivity
 $\blacktriangle E \blacktriangledown$
- Press Emissivity key (1), then press Up key (4) or Down key (2) to set the emissivity, then press Mode key (5) to confirm it. The emissivity can be changed from 0.10 (10E) to 1 (100E).
- Press Mode key (5) for scrolling more display function as follows. Here will show the emissivity data. (The default emissivity is 0.95.)

- Press Mode key (5) for the Maximum (MAX), Minimum (MIN), Difference between MAX and MIN (DIF) and Average (AVG) modes. During the measurement, the special modes reading will be displayed beside the mode icon.
- Press Up key (4) or Down key (2) to change the High Alarm (HAL) or Lo Alarm (LAL), then press Meas. key (6) to confirm it. When the reading is outside the High Alarm (HAL) or Lo Alarm (LAL) limit. The High or Low icon will flash and you will hear a beep sound.
- Connect the thermocouple with Thermocouple socket (11) and put the probe in/on the target, the thermometer will display the temperature automatically without pressing any button. To see the minimum or maximum data during the probe measurement, please hold down the Up key (4) or Down key (2).

BEWARE:

- After measuring high temp, the probe may remain HOT for a while.
- ** The thermometer will automatically shut off if left idle for more than 60 sec, unless in PRB mode. (In PRB mode, it will shut off if left idle for more than 12 minutes.)

8. Measurement settings

- In MAX, MIN, DIF, AVG mode:
Press Up key (4) for LOCK mode ON/OFF.
The lock mode is particularly useful for continuous monitoring of temperatures for up to 60 minutes.
- Press Down key (3) for °C or °F transferred.
- In all modes: First hold on the Meas. key (6) and press Up key (4) for backlight function ON/OFF, and press Down key (2) for laser function ON/OFF.
(With flash light to be turned on in the same time as laser)

9. Maintenance

9.1 Storage & cleaning

It should be stored at room temperature. The sensor lens is the most delicate part of the thermometer. The lens should be kept clean at all times, care should be taken when cleaning the lens using only a soft cloth or cotton swab with water or medical alcohol, allowing the lens to fully dry before using the thermometer. Do not submerge any part of the thermometer.

9.2 LCD error messages

The thermometer incorporates visual diagnostic messages as follows: 'Hi' or 'Low' is displayed when the temperature being measured is outside of the settings of HAL and LAL.

'Er2' is displayed when the thermometer is exposed to rapid changes in the ambient temperature.

'Er3' is displayed when the ambient temperature exceeds 0 °C (32 °F) or +50 °C (122 °F). The thermometer should be allowed plenty of time (minimum 30 minutes) to stabilize to the working/room temperature.

Error 5-9, for all other error messages it is necessary to reset the thermometer. To reset it, turn the instrument off, remove the battery and wait for a minimum of one minute, reinsert the battery and turn on. If the error message remains, please contact SKF for further assistance.

'Hi' or 'Lo' is displayed when the temperature being measured is outside of the measurement range.

9.3 Batteries

The thermometer incorporates visual low battery indication as follows:

- 'Battery OK': measurements are possible.
- 'Battery Low': battery needs to be replaced, measurements are still possible.
- 'Battery Exhausted': measurements are not possible.

When the 'Low Battery' icon indicates the battery is low, the battery should be replaced immediately with AAA, 1.5V batteries.

Please note: It is important to turn the instrument off before replacing the battery otherwise the thermometer may malfunction. Dispose of used battery promptly and keep away from children. If the device is not to be used for a long time, turn the power off, remove and store the batteries in a cool, dry place.

NOTE:

- Under an electromagnetic field of 3V/m from 1 to 6GHz the maximum error is +17.4 °C.

10. Notes

How does Infrared work?

Infrared thermometers measure the surface temperature of an object. The unit's optics sense emitted, reflected, and transmitted energy, which is collected and focused onto a detector.

The unit's electronics translate the information into a temperature reading, which is displayed on the unit.

The laser is used for aiming purpose only.

- **Field of View**

Make sure the target is larger than the unit's spot size.

The smaller the target, the closer you should be.

When accuracy is critical, make sure the target is at least twice as large as the spot size.

- **Distance & Spot Size**

As the distance (D) from the object increases, the spot size (S) of the area measured by the unit becomes larger.

See figure at the beginning of this manual.

- **Locating a hot Spot**

To find a hot spot aim the thermometer outside the area of interest, then scan across with an up and down motion until you locate hot spot.

- **Reminders**

- Do not use the unit to measure shiny or polished metal surfaces (stainless steel, aluminum, etc.). See Emissivity.
- The unit can not measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.
- Steam, dust, smoke, etc., can prevent accurate measurement by obstructing the unit's optics.

- **Emissivity**

Emissivity is a term used to describe the energy-emitting characteristics of materials.

Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit).

Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with masking tape or black paint. Allow time for the tape to reach the same temperature as the material underneath it.

Measure the temperature of the tape or painted surface.

11. Emissivity table

Substance	Thermal emissivity	Substance	Thermal emissivity
Asphalt	0,90 to 0,98	Cloth (black)	0,98
Concrete	0,94	Human skin	0,98
Cement	0,96	Leather	0,75 to 0,80
Sand	0,90	Charcoal (powder)	0,96
Earth	0,92 to 0,96	Lacquer	0,80 to 0,95
Water	0,92 to 0,96	Lacquer (matt)	0,97
Ice	0,96 to 0,98	Rubber (black)	0,94
Snow	0,83	Plastic	0,85 to 0,95
Glass	0,90 to 0,95	Timber	0,90
Ceramic	0,90 to 0,94	Paper	0,70 to 0,94
Marble	0,94	Chromium oxides	0,81
Plaster	0,80 to 0,90	Copper oxides	0,78
Mortar	0,89 to 0,91	Iron oxides	0,78 to 0,82
Brick	0,93 to 0,96	Textiles	0,90

12. Spare parts

Designation	Description
TMDT 2-30	Contact probe
TDTC 1/X	General toolcase without inlay, size X



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