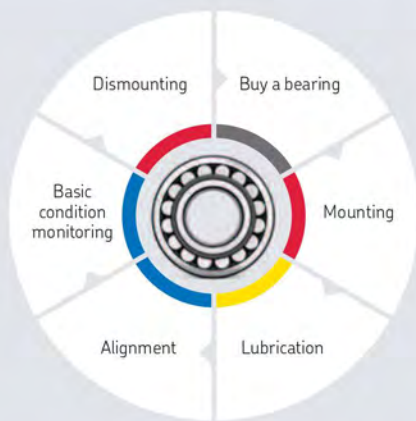


SKF Maintenance and Lubrication Products

Alignment tools



Instruments

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Alignment

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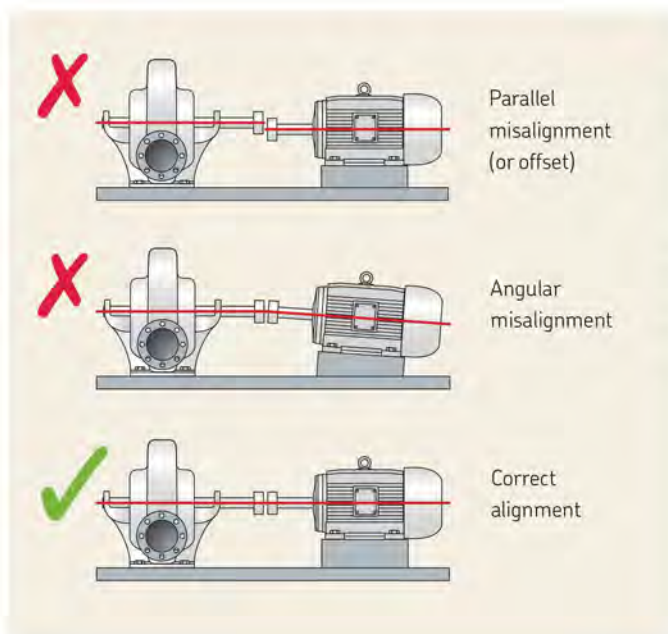
Alignment



Accurate shaft alignment really matters

Reduce machinery breakdowns and increase your uptime

It's a fact. Shaft misalignment is a major contributor to rotating machinery breakdowns. Accurately aligning shafts can prevent a large number of machinery breakdowns and reduce unplanned downtime that results in a loss of production. In today's challenging environment of reducing costs and optimising assets, the necessity of accurate shaft alignment is now greater than ever.



What is shaft misalignment?

Machines need to be aligned in both the horizontal and vertical plane. The misalignment can be caused by both parallel or angular misalignment. The possible consequences of shaft misalignment are serious to any company's bottom line and include:

- Increased friction and thereby energy consumption
- Premature bearing and seal failure
- Premature shaft and coupling failure
- Excessive seal lubricant leakage
- Failure of coupling and foundation bolts
- Increased vibration and noise



What methods can be used to align shafts?

In general, it's clear that laser alignment systems are quicker and easier to use than dial indicators, have better accuracy and don't require special skills to get accurate results virtually every time.

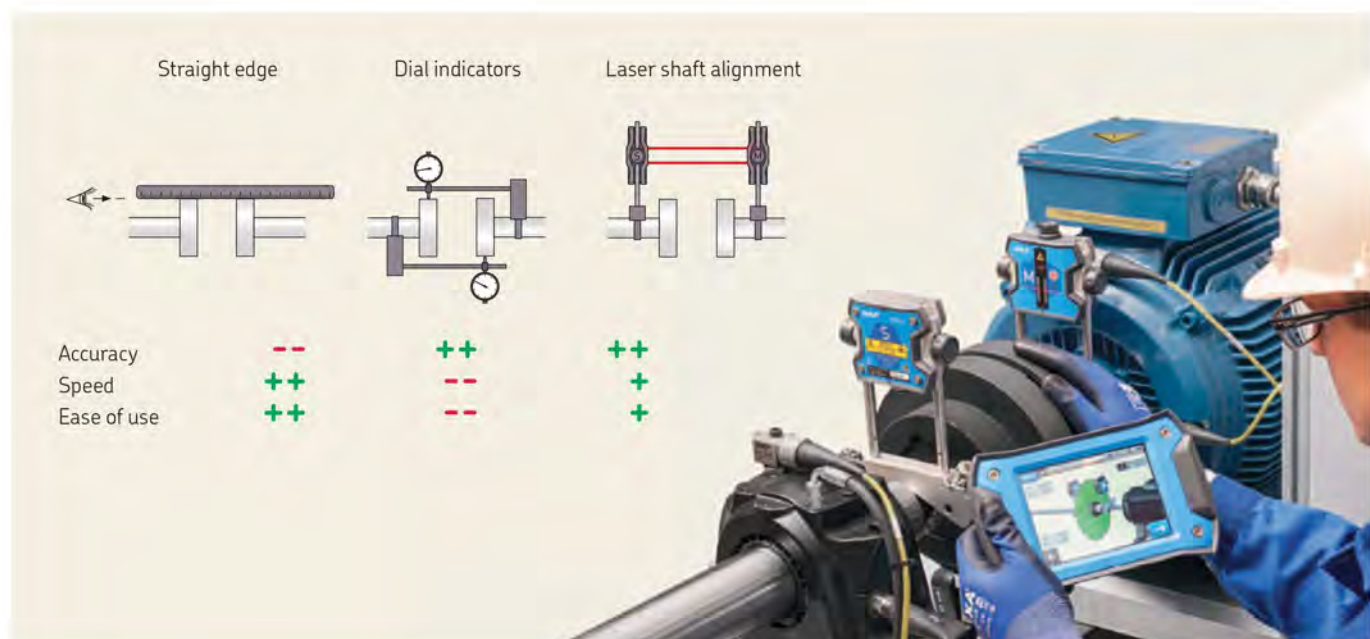
Which type of laser alignment system should be considered?

Before purchasing a system, identify the applications where it is to be used and make a list of requirements. Buying an expensive system that can accommodate virtually every need can be a costly mistake, as the technicians need to be skilled in using it.

The majority of alignment tasks consist of such things as a horizontally placed electric motor with a pump or fan with a single coupling. For such tasks, the technician needs a system that is quick and easy to use and doesn't need a long set up time.

What can SKF offer?

SKF has developed, after extensive consultation with users, a range of affordable, easy to use shaft alignment tools that are suitable for a majority of alignment tasks.



New technology makes shaft alignment easier and more affordable

SKF Shaft Alignment Tool TKSA 11



Mobile devices allow high resolution graphics, intuitive usage, automatic software updates and display unit choice.

The SKF TKSA 11 is an innovative shaft alignment tool that uses smartphones and tablets and intuitively guides the user through the shaft alignment process. With a focus on the core alignment tasks, the TKSA 11 is designed to be a very easy-to-use instrument that is especially suitable for alignment learners and compact applications. The SKF TKSA 11 is the first instrument on the market that uses inductive proximity sensors, enabling accurate and reliable shaft alignment to be affordable for every budget.

- Live view of the instrument and motor position makes the measurement and horizontal alignment intuitive and easy.
- The TKSA 11 app offers a fully functional demonstration mode allowing the complete alignment process to be experienced without the need to purchase the TKSA 11.
- The TKSA 11 is designed to give a fast return on its investment and is also affordable for almost every budget.
- By using inductive proximity sensors, the measurement is no longer affected by bright sunlight, the influence of backlash is reduced and the instrument becomes more robust. All enabling the TKSA 11 to deliver accurate and reliable shaft alignments.
- Automatic alignment reports give a complete overview of the alignment process and results. Reports can easily be shared via email or cloud services.
- Also available as TKSA 11D2 with rugged, industrial display device and pre-installed apps included.



Download on the
App Store

GET IT ON
Google Play

The intuitive and affordable laser shaft alignment system

SKF Shaft Alignment Tool TKSA 31

The TKSA 31 is SKF's most affordable solution for easy laser shaft alignment. The ergonomic display unit with touch screen makes the instrument very easy to use and the built-in machine library helps storing alignment reports for multiple machines. Large sized laser detectors in the measuring heads reduce the need for pre-alignments and the embedded soft foot tool helps establish the foundation for a successful alignment. Additional functions such as live view and automatic measurement support fast and effective alignment tasks and make the TKSA 31 an innovative laser shaft alignment tool that is affordable for almost every budget.

- Easy measurements can be performed by using the well-known three position measurement (9-12-3 o'clock) with additional positioning flexibility of 40° around each measurement position.
- High affordability is achieved by focussing on the standard shaft alignment process and essential functions to allow quick and effective shaft alignments.
- "Automatic measurement" enables hands-free measurements by detecting the position of the heads and only taking a measurement when the heads are in the right position.
- Automatic reports are generated after each alignment and can be customised with notes about the application. All reports can be exported as pdf files.
- The machine library gives an overview of all machines and alignment reports. It simplifies the machine identification and improves the alignment workflow.



Live view supports intuitive measurements and facilitates horizontal and vertical machine position corrections.



The advanced laser shaft alignment system with enhanced measuring and reporting capabilities

SKF Shaft Alignment Tool TKSA 41



Free measurement allows alignment measurements to start at any angle and finish with an angular sweep of just 90°.



Machine library gives an overview of all machines and alignment reports.

The TKSA 41 is an advanced laser alignment solution for achieving accurate shaft alignments. With two wireless measurement units, large sized detectors and powerful lasers, the instrument performs precise measurements in even the most challenging conditions.

The ergonomic display unit with intuitive touch screen navigation makes your alignments fast and easy, whilst innovative features, like the "free measurement", increase the alignment performance. With the focus on improving alignment practices, the SKF Shaft Alignment Tool, TKSA 41, is one of the industry's best value alignment solutions.

- Wireless communication improves instrument handling and allows alignments of difficult to reach applications from a safe position.
- Automatic measurement enables hands-free measurements by detecting the head position and taking a measurement when the heads are rotated into the right position.
- Automatic reports are generated after each alignment. The reports can be customised with notes and pictures from the built-in camera for the most comprehensive overview. All reports can be exported as pdf files.
- Live view supports intuitive measurements and facilitates horizontal and vertical alignments.
- The simplicity of the TKSA 41 provides greater confidence for the performance of alignment tasks on all types of horizontal rotating machines.
- QR codes can be used to further simplify machine identification and improve the alignment workflow.

Comprehensive and intuitive shaft alignment utilising tablets and smart phones

SKF Shaft Alignment Tool TKSA 51



The TKSA 51 shaft alignment tool provides high measurement flexibility and performance suitable for entry-level to expert alignment jobs. Designed to work with the SKF shaft alignment apps on a tablet or smart phone, this intuitive tool is easy to use and requires no special training. The included accessories enable use of the TKSA 51 for a wide range of alignment applications with horizontal and vertical shafts, such as motors, drives, fans, pumps, gearboxes and more. The apps include tutorial videos to show operators how to perform accurate measurements.

- **Measurement flexibility** – The well-known, three-position measurement gains additional flexibility as measurements can start at any angle and require a total minimal rotation of only 40 degrees. This enables operators to perform alignments of applications with limited space.
- **Automatic reports** – Alignment reports are generated automatically and can be customised with notes, a machine picture and a signature via touchscreen. The reports can be easily exported as PDF files and shared with other mobile apps.
- **Comprehensive and compact** – A range of included components, such as magnetic mounting brackets and extension rods and chains, increase the TKSA 51's versatility, yet it remains compact, lightweight and easy to carry.
- **3-D live view** – This feature enables intuitive positioning of the heads for quick alignment measurements and displays the horizontal and vertical alignment correction live. The apps enable 3-D rotation of the virtual motor to correspond with the actual machine position view.
- **Disturbance compensation** – Measurement values are averaged over time to provide greater accuracy in presence of external disturbances.
- Also available as TKSA 51D2 with rugged, industrial display device and pre-installed apps included

Alignment applications

The TKSA 51 uses dedicated apps for alignments of horizontal and vertical shaft and the correction of soft foot.

The apps are icon-driven and very easy to use. All apps are free of charge and features a fully functional demonstration mode that allows the alignment process to be experienced before purchasing the instrument.



Shaft alignment



Vertical shaft alignment



Soft foot

Versatility and performance for professional alignment

SKF Shaft Alignment Tool TKSA 71



TKSA 71 delivers precision and durability

Designed for professional alignment in harsh industrial environments, the TKSA 71 complements SKF's offering with a high-end shaft alignment tool. The instrument is very versatile with ultra-compact measuring units for use in extremely narrow spaces. Its dedicated software applications enable different types of alignments, including horizontal and vertical shafts, spacer shafts and machine trains.

Superior alignment performance and long-term industrial durability are achieved with an innovative instrument design that offers high measurement accuracy and excellent protection against dust and water in harsh environments.

- **Easy-to-use** – Intuitive software applications, guided alignment processes and explanatory videos
- **Wide range of applications** – Comprehensive accessories and dedicated software applications

- **Superior alignment performance** – Up to 10 m measurement distance, disturbance compensation, measurement flexibility, only 40° total rotation, automatic measurement and customised alignments with target values
- **Protection against harsh environments** – Completely sealed measuring units (IP67) to withstand dust and water
- **Ultra-compact measuring units** – Use in extremely narrow spaces
- **Robust carrying case** – Excellent protection, convenient transport and wireless in-case charging

Complete system for your alignment needs

The TKSA 71 base model includes standard accessories for most alignment tasks. It is supplied in a rugged case that meets most airline requirements for cabin luggage.

The TKSA 71/PRO model includes additional accessories such as sliding brackets, magnetic bases and offset brackets that are useful for more demanding alignment jobs.

This model is supplied in a larger, rugged trolley case.

The TKSA 71D2 and TKSA 71D2/PRO include an additional display device with a protective cover and pre-installed apps. Both systems are ready for use without internet connection or account setup.



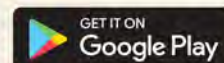
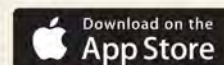
Measuring device: (1) Measuring units (M & S) with standard V-bracket, (2) Wireless charging pods with USB cable, (3) Tape measure

Standard accessories: (4) Extension chains, (5) Extension rods, (6) Mounting magnets

Advanced accessories: (7) Sliding brackets, (8) Offset brackets, (9) Additional extension rods, (10) Magnetic bases

Alignment applications

The TKSA 71 functions quickly and intuitively using six software apps tailored for different alignment jobs. Designed for use without prior training, these simple-to-use apps are available free of charge for both Android and iOS platforms. Common features include comprehensive, automatic reports, export and sharing options, machine library with QR code identification, instructional videos within the app, built-in tolerance guidelines, 3-D live view, disturbance compensation and a fully functional demonstration mode.



Shaft alignment

Easy and intuitive alignments of horizontal shafts with additional features including automatic measurement, minimal 40° total rotation, 9-12-3 guidance and alignment customisation with target values¹⁾.



Soft foot

Assists technician in verifying that machine is standing evenly on all four feet. The app supports the operator identifying and correcting a soft foot¹⁾.



Vertical shaft alignment

Easy and intuitive alignment of vertical shaft machines with shimming support for different bolt configurations¹⁾.



Spacer shaft alignment

Accommodates special requirements of spacer shafts and facilitates the alignment process²⁾.



Machine train shaft alignment

Enables operator to align three connected machines, giving a complete overview of machine train alignment and allowing the operator to select stationary feet²⁾.



Values

Allows the shaft alignment tool to be used as digital dial gauges; operators can record absolute, zeroed and halved readings to perform customised alignments with manual calculations²⁾.

¹⁾ Compatible with: TKSA 51, TKSA 51D2, TKSA 71, TKSA 71/PRO, TKSA 71D2, TKSA 71D2/PRO. ²⁾ Compatible with: TKSA 71, TKSA 71/PRO, TKSA 71D2, TKSA 71D2/PRO.

Rugged, industrial display device

TKSA DISPLAY2

The TKSA DISPLAY2 is an Android tablet intended for use with SKF Shaft Alignment Tools.

- Protective cover for industrial use
- 8 inch screen diagonal
- 8 hours of continuous operation
- All shaft alignment apps pre-installed
- Ready for use without account setup or internet connection
- Included with shaft alignment kits TKSA 11D2, TKSA 51D2, TKSA 71D2 and TKSA 71D2/PRO



Selection chart

	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
User interface Type of display device	phone, tablet (iOS & Android)	touch screen display device	touch screen display device	phone, tablet (iOS & Android)	phone, tablet (iOS & Android)	phone, tablet (iOS & Android)
Display device included	TKSA 11: no ¹⁾ TKSA 11D2: yes	yes	yes	TKSA 51: no ¹⁾ TKSA 51D2: yes	TKSA 71: no ¹⁾ TKSA 71D2: yes	TKSA 71/PRO: no ¹⁾ TKSA 71D2/PRO: yes
Measurement positions The "9-12-3" measurement directs the user to three pre-defined measurement positions. The "free" measurement allows the user to freely select the measurement positions. All measurements are guided.	9-12-3	9-12-3	free	free	free	free
Wireless measuring heads	●	—	●	●	●	●
Measurement distance Maximum possible distance between the brackets of the measuring heads.	18,5 cm	2 m ²⁾	4 m	5 m	10 m	10 m
Minimal shaft rotation Describes the minimal required total shaft rotation angle to perform alignment measurements.	180°	140°	90°	40°	40°	40°
Camera Machine picture(s) can be taken and added to alignment reports.	●	—	●	●	●	●
Machine library Overview of all registered machines and previous alignment reports.	—	●	●	●	●	●
QR code recognition QR labels can be used to simplify the machine identification and increase the usage convenience.	—	—	●	●	●	●
Machine view The machine view describes how the machine is shown on the display. The free 3D rotation allows to view the machine from all directions.	fixed 2D view	fixed 3D view	fixed 3D view	free 3D rotation	free 3D rotation	free 3D rotation
Target values Using target values for alignment, it is possible to compensate for thermal expansion or similar adjustments.	—	—	—	●	●	●
Disturbance compensation Measurement values are averaged over time, allowing accurate measurements in the presence of laser distortions from air temperature gradients or similar disturbances.	—	—	—	●	●	●

Supported alignment applications	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
Horizontal shaft alignment	●	●	●	●	●	●
Soft foot correction	—	●	●	●	●	●
Vertical shaft alignment	—	—	—	●	●	●
Spacer shaft	—	—	—	—	●	●
Machine train	—	—	—	—	●	●
Digital dial gauge mode	—	—	—	—	●	●

Alignment accessories	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
Extension chains	optional	optional	included	included	included	included
Extension rods	optional	optional	included	included	included	included
Magnetic V-brackets	optional	optional	optional	included	included	included
Offset brackets	optional	optional	optional	optional	optional	included
Sliding brackets	optional	optional	optional	optional	optional	included
Magnetic base	—	optional	optional	optional	optional	included
Spindle bracket	optional	—	—	optional	optional	optional

¹⁾ Optional TKSA DISPLAY2 with pre-installed apps is recommended

²⁾ With supplied USB cables

Accessories		Compatible				
Ordering designations	Content and description	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA71(/PRO)
Extension chains						
TKSA 41-EXTCH	2 × Extension chains of 500 mm (19.7 in.) for shaft diameters up to 300 mm (11.8 in.)	—	●	●	—	—
TKSA 51-EXTCH	2 × Extension chains of 1 m (3.3 ft.) for shaft diameters up to 450 mm (17.7 in.)	●	—	—	●	●
Rods						
TKSA ROD90	4 × threaded rods of 90 mm (3.5 in.)	—	●	●	—	—
TKSA ROD150	4 × threaded rods of 150 mm (5.9 in.)	—	●	●	—	—
TKSA 51-ROD80	4 × threaded rods of 80 mm (3.1 in.)	●	—	—	●	●
TKSA 51-ROD120	4 × threaded rods of 120 mm (4.7 in.)	●	—	—	●	●
Magnetic V-brackets						
TKSA MAGVBK	2 × Magnetic V-brackets, supplied without rods or chains	—	●	●	—	—
TKSA 51-VBK	1 × Standard V-bracket, supplied with 2 × threaded rods of 80 mm (3.2 in.), 1 × standard chain of 480 mm (18.9 in.) and 4 × magnets	●	—	—	●	●
Spindle brackets Rods						
TKSA 51-SPDBK	1 × Spindle bracket, supplied with 2 × threaded rods of 80 mm (3.2 in.)	●	—	—	●	●
Sliding brackets						
TKSA 51-SLDBK	1 × Adjustable sliding bracket for use with shaft diameters >30 mm (1.2 in.) or bore diameters >120 mm (4.7 in.), supplied without rods	●	—	—	●	●
TKSA SLDBK	2 × Wheels to be used with standard V-Bracket (TKSA VBK), supplied without V-bracket	—	●	●	—	—
Offset brackets						
TKSA EXT50	2 × Offset brackets of 50 mm (2 in.) compatible with standard (TKSA VBK) and magnetic V-brackets (TKSA MAGVBK) and magnetic base (TKSA MAGBASE)	—	●	●	—	—
TKSA EXT100	2 × Offset brackets of 100 mm (3.9 in.) compatible with standard (TKSA VBK) and magnetic V-brackets (TKSA MAGVBK) and magnetic base (TKSA MAGBASE)	—	●	●	—	—
TKSA 51-EXT50	1 × Offset bracket 50 mm (2 in.), supplied with 2 × rods 80 mm (3.2 in.)	●	—	—	●	●
Magnetic base						
TKSA MAGBASE	2 × Magnetic bases, supplied with 2 × fixation screws M8 × 20 mm	—	● ¹⁾	● ¹⁾	●	●
Other accessories						
TKSA DISPLAY2	1 × Industrial display device (Android tablet with protective cover and pre-installed apps)	●	—	—	●	●
TKSA 11-EBK	2 × Extendable V-brackets, supplied with 4 × threaded rods of 120 mm (4.7 in.) and 4 × threaded rods of 80 mm (3.1 in.), supplied without chains	●	—	—	—	—
TKSA VBK	2 × Standard V-brackets, supplied without rods or chains	—	●	●	—	—
TKSA 41-QR	5 × A4 sheets with 12 × QR code stickers per sheet (total of 60 × stickers)	—	—	●	●	●

¹⁾ Requires offset brackets TKSA EXT50 or TKSA EXT100 for usage with TKSA 31 and TKSA 41.

Technical data

Designation	TKSA 11	TKSA 31	TKSA 41
Sensors and communication	2× Inductive proximity sensors Inclinometer ±0.5°, Bluetooth 4.0 LE	29 mm (1.1 in.) CCD with red line laser Class 2 Inclinometer ±0.5°, Wired, USB cables	29 mm (1.1 in.) CCD with line laser Class 2 Inclinometer ±0.5°, Bluetooth 4.0 LE and wired, USB cables
System measuring distance	0 to 185 mm (0 to 7.3 in.) between brackets 3 × reference bars included up to 200 mm (7.9 in.)	0,07 to 4 m (0.23 to 13.1 ft) (up to 2 m (6.6 ft) with cables supplied)	0,07 to 4 m (0.23 to 13.1 ft)
Measuring errors	<2%	<0,5% ±5 µm	< 0,5% ±5 µm
Housing material	PC/ABS plastic	20% Glass filled Polycarbonate	20% Glass filled Polycarbonate
Operating time	Up to 18 hours, rechargeable LiPo battery	N/A	Up to 16 hours Rechargeable LiPo battery
Dimensions	105 × 55 × 55 mm (4.1 × 2.2 × 2.2 in.)	120 × 90 × 36 mm (4.7 × 3.5 × 1.4 in.)	120 × 90 × 36 mm (4.7 × 3.5 × 1.4 in.)
Weight	155 g (0.34 lb)	180 g (0.4 lb)	220 g (0.5 lb)
Operating device	TKSA DISPLAY2, Samsung Galaxy Tab Active 2 and iPad Mini recommended iPad, iPod Touch, iPhone SE, Galaxy S6 or above (all not included)	5.6" colour resistive touchscreen LCD display. High Impact PC/ABS with overmould	5.6" colour resistive touchscreen LCD display. High Impact PC/ABS with overmould
Software/App update	Apple AppStore or on Google Play Store	via USB stick	via USB stick
Operating system requirements	Apple iOS 9 or Android OS 4.4.2 (and above)	N/A	N/A
DU Operating time	N/A	Up to 7 hours (100% backlight)	Up to 8 hours (100% backlight)
Dimensions	N/A	205 × 140 × 60 mm (8.1 × 5.5 × 2.4 in.)	205 × 140 × 60 mm (8.1 × 5.5 × 2.4 in.)
Weight	N/A	420 g (0.9 lb)	640 g (1.4 lb)
Alignment method	Alignment of horizontal shafts 3 position measurement 9–12–3	Alignment of horizontal shafts, 3 position measurement 9 –12 –3 (with min. 140° rotation), automatic measurement, soft foot	Alignment of horizontal shafts, 3 position measurement 9 –12 –3, automatic measurement, measurement (with min. 90° rotation), soft foot
Live correction values	Only for horizontal	Vertical and horizontal	Vertical and horizontal
Extra features	Automatic .pdf report	Machine library, screen orientation flip, automatic .pdf report	Machine library, QR code reading, screen orientation flip, automatic .pdf report
Fixture	2× V-brackets with chains, width 15 mm (0.6 in.)	2× V-brackets with chains, width 21 mm (0.8 in.)	2 × V-brackets with chains, width 21 mm (0.8 in.)
Shaft diameters	20 to 160 mm (0.8 to 6.3 in.)	20 to 150 mm (0.8 to 5.9 in.) 300 mm (11.8 in.) with optional extension chains (not included)	20 to 150 mm (0.8 to 5.9 in.) 300 mm (11.8 in.) with optional extension chains (not included)
Max. coupling height ¹⁾	55 mm (2.2 in.) with standard 80 mm rods (Unit should be mounted on the coupling when possible)	105 mm (4.2 in.) with standard rods 195 mm (7.7 in.) with optional extension rods (not included)	105 mm (4.2 in.) with standard rods 195 mm (7.7 in.) with extension rods (included)
Power adapter	Charging via micro USB port (5V) Micro USB to USB charging cable supplied Compatible with 5V USB chargers (not included)	Input: 100V–240V 50/60Hz AC power supplier Output: DC 12V 3A with EU, US, UK, AUS adapters	Input: 100V–240V 50/60Hz AC power supplier Output: DC 12V 3A with EU, US, UK, AUS adapters
Operating temperature	0 to 45 °C (32 to 113 °F)	0 to 45 °C (32 to 113 °F)	0 to 45 °C (32 to 113 °F)
IP rating	IP 54	IP 54	IP 54
Carrying case dimensions	355 × 250 × 110 mm (14 × 9.8 × 4.3 in.)	530 × 110 × 360 mm (20.9 × 4.3 × 14.2 in.)	530 × 110 × 360 mm (20.9 × 4.3 × 14.2 in.)
Total weight (incl. case)	2,1 kg (4.6 lb)	4,75 kg (10.5 lb)	4.75 kg (10.5 lb)
Calibration certificate	Supplied with 2 years validity	Supplied with 2 years validity	Supplied with 2 years validity
Case content	Measuring unit; 3 reference bars; 2 shaft brackets with chains 480 mm (18.9 in.) and rods 80 mm (3.1 in.); micro USB to USB charging cable; measuring tape 2 m (6.6 ft); printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case	2 measuring units (M&S); display unit; 2 shaft brackets with chains 400 mm (15.8 in.) and threaded rods 150 mm (5.9 in.); chain tightening rod; power supply with country adapters; 2 micro USB to USB cables; measuring tape; printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case	2 measuring units (M&S); display unit; 2 shaft brackets with chains 400 mm (15.8 in.) and threaded rods 150 mm (5.9 in.); chain tightening rod; 4 threaded extension rods 90 mm (3.5 in.); power supply with country adapters; 2 micro USB to USB cables; measuring tape; printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case; A4 sheet with 12 × QR code stickers

¹⁾ Depending on the coupling, the brackets can be mounted on the coupling, reducing the coupling height limitation.

TKSA 51

20 mm (0.8 in.) PSD with line laser Class 2
Inclinometer $\pm 0.1^\circ$; Bluetooth 4.0 LE

0,07 to 5 m (0.23 to 16.4 ft)

$<1\% \pm 10 \mu\text{m}$

Anodized Aluminum front and PC/ABS plastic back cover

Up to 8 hours, rechargeable Li-ion battery
fast charging: 10 min. charging for 1h usage

52 x 64 x 50 mm (2.1 x 2.5 x 2 in.)

190 g (0.4 lb)

TKSA DISPLAY2, Samsung Galaxy Tab Active 2 and iPad Mini recommended
iPad, iPod Touch, iPhone SE, Galaxy S6 or above (all not included)

Apple AppStore or on Google Play Store

Apple iOS 9 or Android OS 4.4.2 (and above)

N/A

N/A

N/A

Alignment of horizontal and vertical shafts,
3 position measurement 9 -12 -3, automatic measurement,
measurement (with min. 40° rotation), soft foot

Vertical and horizontal

Machine library, QR code reading, target values, disturbance compensation,
3D machine free view, screen rotation on tablets, automatic .pdf report

2 x V-brackets with chains,
width 15 mm (0.6 in.)

20 to 150 mm (0.8 to 5.9 in.)

450 mm (17.7 in.) with extension chains (included)

45 mm (1.8 in.) with standard rods
plus 120 mm (4.7 in.) per set of extension rods

Charging via micro USB port (5V)
Micro USB to USB split charging cable supplied
Compatible with 5V USB chargers (not included)

0 to 45°C (32 to 113°F)

IP 54

355 x 250 x 110 mm (14 x 9.8 x 4.3 in.)

2,9 kg (6.4 lb)

Supplied with 2 years validity

2 measuring units (M&S); 2 shaft brackets with chains 480 mm (18.9 in.),
threaded rods 80 mm (3.1 in.) and magnets; 4 threaded extension rods
120 mm (4.7 in.); 2 extension chains 980 mm (38.6 in.); USB to micro USB
split charging cable; measuring tape; printed certificate of calibration and
conformance; quick start guide (EN); SKF carrying case; A4 sheet with 12 x
QR code stickers

TKSA 71, TKSA 71/PRO

20 mm (0.8 in.) 2nd gen. PSD with line laser Class 2
inclinometer $\pm 0.1^\circ$; Bluetooth 4.0 LE

0,04 to 10 m (0.13 to 32.8 ft)

$<1\% \pm 10 \mu\text{m}$

Anodized aluminum front and PC/ABS plastic back cover

Up to 8 hours, rechargeable Li-ion battery, wireless fast charging
10 min. charging for 1h usage

52 x 64 x 33 mm (2.1 x 2.5 x 1.3 in.)

130 g (0.3 lbs)

TKSA DISPLAY2, Samsung Galaxy Tab Active 2 and iPad Mini recommended
iPad, iPod Touch, iPhone SE, Galaxy S6 or above (all not included)

Apple AppStore or on Google Play store

Apple iOS 9 or Android OS 4.4.2 (and above)

N/A

N/A

N/A

Alignment of horizontal and vertical shafts,
3 position measurement 9 -12 -3, automatic measurement,
measurement (with min. 40° rotation), soft foot,
machine trains, values, spacer shafts

Vertical and horizontal

Machine library, QR code reading, target values, disturbance compensation,
3D machine free view, screen rotation on tablets, automatic .pdf report

2 x V-brackets with chains,
width 15 mm (0.6 in.)

20 to 150 mm diameter (0.8 to 5.9 in.),

450 mm (17.7 in.) with extension chains (included)

45 mm (1.8 in.) with standard rods
plus 120 mm (4.7 in.) per set of extension rods

Wireless charging via supplied charging pods
micro USB to USB split charging cable supplied

0 to 45°C (32 to 113°F)

IP67 for measuring units and carrying case

TKSA 71 carrying case: 365 x 295 x 170 mm (14.4 x 11.6 x 6.7 in.)

TKSA 71/PRO trolley case: 610 x 430 x 265 mm (24 x 16.9 x 10.4 in.)

TKSA 71: 3,9 kg (8.6 lb)

TKSA 71/PRO: 12,5 kg (27.6 lb)

Supplied with 2 years validity

2 measuring units (M&S); 2 shaft brackets with chains 480 mm (18.9 in.),
threaded rods 80 mm (3.1 in.) and magnets; 4 threaded extension rods 120 mm
(4.7 in.); 2 extension chains 980 mm (38.6 in.); micro USB to USB split charging
cable; 2 wireless charging pods; measuring tape; printed certificate of calibration
and conformance; quick start guide (EN); industrial rugged case (IP 67); A4 sheet
with 12 x QR code stickers

Additionally with TKSA 71/PRO:

4 threaded extension rods 120 mm (4.7 in.); 2 offset brackets 50 mm (2 in.);
2 sliding brackets; 2 magnetic bases

For accurate vertical machinery alignment

SKF Machinery Shims TMAS series

Accurate machine adjustment is an essential element of any alignment process.

- Made of high quality stainless steel, allowing re-use
- Easy to fit and to remove
- Close tolerances for accurate alignment
- Thickness clearly marked on each shim
- Fully de-burred
- Pre-cut shims are supplied in packs of 10 and complete kits are also available
- Shim packs and kits are available with thicknesses in millimeter and inch

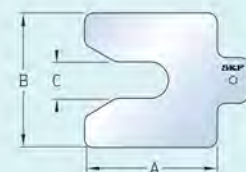


A 2 inch	B 2 inch	C 0.51 inch
Pack designation	Thickness (inch)	
TMAS 2-002	0.002	
TMAS 2-005	0.005	
TMAS 2-010	0.010	
TMAS 2-020	0.020	
TMAS 2-025	0.025	
TMAS 2-050	0.050	
TMAS 2-075	0.075	
TMAS 2-100	0.100	
TMAS 2-125	0.125	

A 3 inch	B 3 inch	C 0.83 inch
Pack designation	Thickness (inch)	
TMAS 3-002	0.002	
TMAS 3-005	0.005	
TMAS 3-010	0.010	
TMAS 3-020	0.020	
TMAS 3-025	0.025	
TMAS 3-050	0.050	
TMAS 3-075	0.075	
TMAS 3-100	0.100	
TMAS 3-125	0.125	

A 4 inch	B 4 inch	C 1.26 inch
Pack designation	Thickness (inch)	
TMAS 4-002	0.002	
TMAS 4-005	0.005	
TMAS 4-010	0.010	
TMAS 4-020	0.020	
TMAS 4-025	0.025	
TMAS 4-050	0.050	
TMAS 4-075	0.075	
TMAS 4-100	0.100	
TMAS 4-125	0.125	

A 5 inch	B 5 inch	C 1.77 inch
Pack designation	Thickness (inch)	
TMAS 5-002	0.002	
TMAS 5-005	0.005	
TMAS 5-010	0.010	
TMAS 5-020	0.020	
TMAS 5-025	0.025	
TMAS 5-050	0.050	
TMAS 5-075	0.075	
TMAS 5-100	0.100	
TMAS 5-125	0.125	



Each pack designation consists of 10 shims.

Imperial		Thickness (inch)								
Designation	Size (inch)	0.002	0.005	0.010	0.020	0.025	0.050	0.075	0.100	0.125
TMAS 4IN/KIT	4 x 4	20	20	20	20	20	20	20	20	10
TMAS 5IN/KIT	5 x 5	20	20	20	20	20	20	20	20	10
TMAS 340IN ¹⁾	4 x 4	20	20	20	20	20	20	20	20	10
	5 x 5	20	20	20	20	20	20	20	20	10
TMAS 360IN	2 x 2	20	20	20	–	20	20	–	20	–
	3 x 3	20	20	20	–	20	20	–	20	–
	4 x 4	20	20	20	–	20	20	–	20	–
TMAS 380IN	2 x 2	20	20	20	20	20	20	20	20	10
	3 x 3	20	20	20	20	20	20	20	20	10
TMAS 510IN ¹⁾	2 x 2	20	20	20	20	20	20	20	20	10
	3 x 3	20	20	20	20	20	20	20	20	10
	4 x 4	20	20	20	20	20	20	20	20	10
TMAS 680IN ²⁾	2 x 2	20	20	20	20	20	20	20	20	10
	3 x 3	20	20	20	20	20	20	20	20	10
	4 x 4	20	20	20	20	20	20	20	20	10
	5 x 5	20	20	20	20	20	20	20	20	10

¹⁾ Supplied in two carrying cases ²⁾ Supplied in three carrying cases

Metric		Thickness (mm)								
		0,05	0,10	0,20	0,25	0,40	0,50	0,70	1,00	2,00
Designation	Size (mm)	Quantities								
TMAS 50/KIT	50 × 50	20	20	20	20	20	20	20	20	10
TMAS 75/KIT	75 × 75	20	20	20	20	20	20	20	20	10
TMAS 100/KIT	100 × 100	20	20	20	20	20	20	20	20	10
TMAS 340	100 × 100	20	20	20	20	20	20	20	20	10
	125 × 125	20	20	20	20	20	20	20	20	10
TMAS 360	50 × 50	20	20	–	20	–	20	–	20	20
	75 × 75	20	20	–	20	–	20	–	20	20
	100 × 100	20	20	–	20	–	20	–	20	20
TMAS 380	50 × 50	20	20	20	20	20	20	20	20	20
	75 × 75	20	20	20	20	20	20	20	20	20
TMAS 510	50 × 50	20	20	20	20	20	20	20	20	10
	75 × 75	20	20	20	20	20	20	20	20	10
	100 × 100	20	20	20	20	20	20	20	20	10
TMAS 720 ¹⁾	50 × 50	20	20	20	20	20	20	20	20	20
	75 × 75	20	20	20	20	20	20	20	20	20
	100 × 100	20	20	20	20	20	20	20	20	10
	125 × 125	20	20	20	20	20	20	20	20	10



¹⁾ Consists of TMAS 340 + TMAS 380

A 50 mm	B 50 mm	C 13 mm
Pack designation	Thickness (mm)	
TMAS 50-005	0,05	
TMAS 50-010	0,10	
TMAS 50-020	0,20	
TMAS 50-025	0,25	
TMAS 50-040	0,40	
TMAS 50-050	0,50	
TMAS 50-070	0,70	
TMAS 50-100	1,00	
TMAS 50-200	2,00	
TMAS 50-300	3,00	

A 75 mm	B 75 mm	C 21 mm
Pack designation	Thickness (mm)	
TMAS 75-005	0,05	
TMAS 75-010	0,10	
TMAS 75-020	0,20	
TMAS 75-025	0,25	
TMAS 75-040	0,40	
TMAS 75-050	0,50	
TMAS 75-070	0,70	
TMAS 75-100	1,00	
TMAS 75-200	2,00	
TMAS 75-300	3,00	

A 100 mm	B 100 mm	C 32 mm
Pack designation	Thickness (mm)	
TMAS 100-005	0,05	
TMAS 100-010	0,10	
TMAS 100-020	0,20	
TMAS 100-025	0,25	
TMAS 100-040	0,40	
TMAS 100-050	0,50	
TMAS 100-070	0,70	
TMAS 100-100	1,00	
TMAS 100-200	2,00	
TMAS 100-300	3,00	

A 125 mm	B 125 mm	C 45 mm
Pack designation	Thickness (mm)	
TMAS 125-005	0,05	
TMAS 125-010	0,10	
TMAS 125-020	0,20	
TMAS 125-025	0,25	
TMAS 125-040	0,40	
TMAS 125-050	0,50	
TMAS 125-070	0,70	
TMAS 125-100	1,00	
TMAS 125-200	2,00	
TMAS 125-300	3,00	

A 200 mm	B 200 mm	C 55 mm
Pack designation	Thickness (mm)	
TMAS 200-005	0,05	
TMAS 200-010	0,10	
TMAS 200-020	0,20	
TMAS 200-025	0,25	
TMAS 200-040	0,40	
TMAS 200-050	0,50	
TMAS 200-070	0,70	
TMAS 200-100	1,00	
TMAS 200-200	2,00	
TMAS 200-300	3,00	



Each pack designation consists of 10 shims.



The universal adjustable re-useable chock

SKF Vibracon

SKF Vibracon is a machinery mounting chock that is easily and accurately adjusted. The chock accommodates the angular difference, up to 4°, between machine and the mounting base without expensive machining of the base or the extra work of installing epoxy resin chocks. The self-levelling capability, combined with the height adjustment feature, eliminates the possibility of a soft foot in the production line throughout the life cycle of the machinery.

CS series

Carbon steel



CSTR series

Surface treated
carbon steel



SS series

Stainless steel



The SKF Vibracon is available in different materials to meet the need of your application, even those in the harshest environments. This adjustable chock is available in standard carbon steel (CS series) and in surface-treated carbon steel (CSTR series) for improved corrosion protection. Developed to withstand the most challenging conditions, a stainless steel version (SS series) is offered with the highest corrosion protection available.

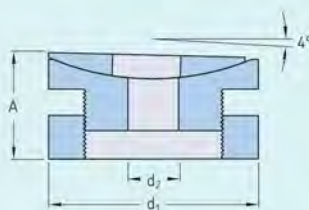


ASTR series

Surface treated alloy steel low profile

Dimensions (mm)

Designation			A min	A max	d ₁	d ₂
SM 12-CS	SM 12-CSTR	SM 12-SS	30	38	60	17
SM 16-CS	SM 16-CSTR	SM 16-SS	35	45	80	21
SM 20-CS	SM 20-CSTR	SM 20-SS	40	50	100	25
SM 24-CS	SM 24-CSTR	SM 24-SS	45	57	120	31
SM 30-CS	SM 30-CSTR	SM 30-SS	50	62	140	37
SM 36-CS	SM 36-CSTR	SM 36-SS	55	67	160	44
SM 42-CS	SM 42-CSTR	SM 42-SS	60	72	190	50
SM 48-CS	SM 48-CSTR	SM 48-SS	70	85	220	60
SM 56-CS	SM 56-CSTR	SM 56-SS	75	90	230	66
SM 64-CS	SM 64-CSTR	SM 64-SS	80	95	250	74



Designation	A min	A max	d ₁	d ₂
SM 16 LP-ASTR	20	30	80	21
SM 20 LP-ASTR	20	30	100	25
SM 24 LP-ASTR	20	30	120	31
SM 30 LP-ASTR	20	30	140	37
SM 36 LP-ASTR	20	40	160	44
SM 42 LP-ASTR	35	45	190	50

SKF Vibracon adjustment tools

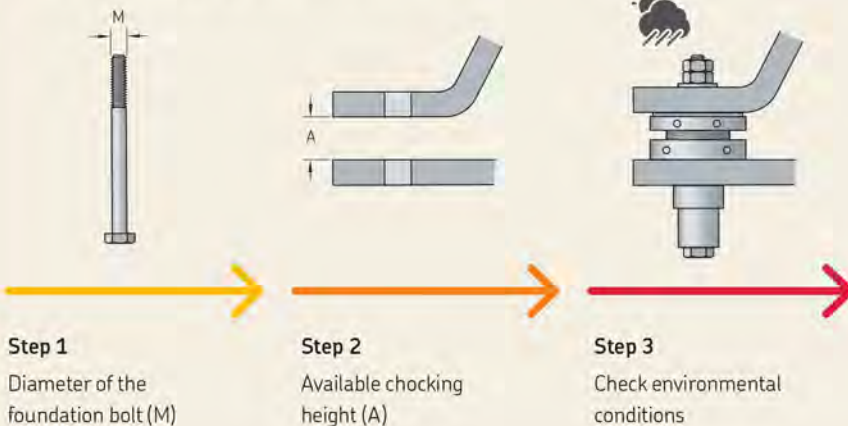
The SKF Vibracon adjustment tools are especially designed for safe height alteration of the SKF Vibracon chocks with comfort.



Technical data

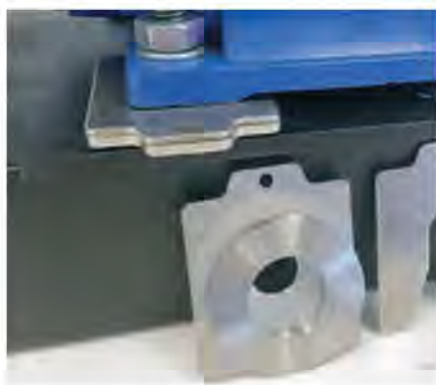
Designation	SKF Vibracon Type range
SMAT 006	SM 12–SM 16
SMAT 008	SM 20–SM 24
SMAT 010	SM 30–SM 48
SMAT 012	SM 56–SM 64
SMAT 006 LP-3	SM 12 LP–SM 20 LP
SMAT 006 LP-4	SM 24 LP–SM 42 LP

How to select the appropriate SKF Vibracon chock



Vibracon selection tool
www.mapro.skf.com/vibracon

Please contact your local SKF Authorised Distributor or SKF sales representative for support, customization or more information about SKF Vibracon.



Shims to fix angular soft foot

SKF Spherical Shims

SKF Spherical Shims remove angular soft foot problems and can be used in combination with traditional pre-cut shims. Soft foot is a common condition found in rotating equipment that makes alignments time consuming and often unsuccessful. While parallel soft foot can be corrected with traditional shims, angular soft foot can be corrected effectively with SKF Spherical Shims or SKF Vibracon chocks.

Product characteristics:

- Angular soft foot compensation up to 2 degrees
- Can be used in combination with traditional shims
- Suitable for bolt size M10–M42 (3/8"–1 1/2")
- Made of high-quality stainless steel, enabling re-use
- No installation skills required
- Supplied in packs of two

Parallel soft foot

Short foot



Angular soft foot

Bent foot

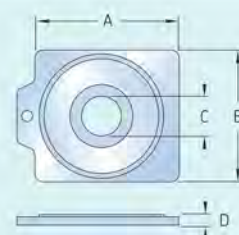


Angled



Dimensions (mm)

Designation	A	B	C	D
SM SPS-A2	50	50	15	3,9
SM SPS-B2	75	75	23	5,5
SM SPS-C2	100	100	32	7,0
SM SPS-D2	125	125	44	7,5



Note: Should you be unable to find a suitable product, please contact your local SKF Authorised Distributor or SKF sales representative.



Straight bolt tensioning for longer endurance

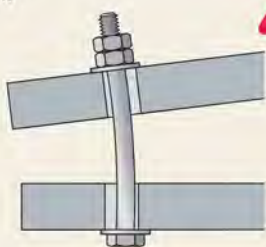
SKF Spherical Washers

Spherical washers are designed to create an exact, parallel plane between the bolt head and the face of the nut. SKF spherical washers automatically adjust and compensate for the angular deviation between the planes and prevent the bolt from bending.

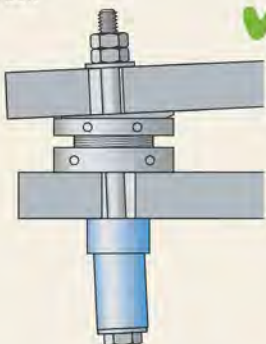
Product characteristics:

- Automatically compensates for angular errors
- Evenly distributed bolt tension
- Reduces bolt fatigue from bending bolts
- Improved bolt stretch possible due to increased clamping length
- Surface treated for protection in humid and harsh environments
- Available in standard and low-profile (LP) versions

Bent bolt



Straight bolt



Line contact

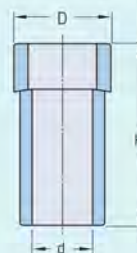


Spherical contact



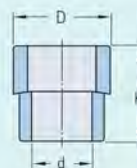
Dimensions - standard (mm)

Designation	D	d	H
SMSW 16 -ASTR	33	17	60
SMSW 20 -ASTR	42	23	60
SMSW 24 -ASTR	47	27	60
SMSW 27 -ASTR	52	30	60
SMSW 30 -ASTR	56	34	60
SMSW 36 -ASTR	67	40	60
SMSW 42 -ASTR	82	46	60
SMSW 48 -ASTR	92	52	60



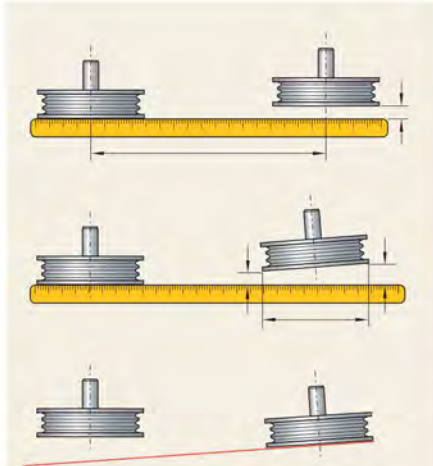
low-profile (mm)

Designation	D	d	H
SMSW 16LPAST	33	17	20
SMSW 20LPAST	42	23	22
SMSW 24LPAST	47	27	24
SMSW 27LPAST	52	30	26
SMSW 30LPAST	56	34	28
SMSW 36LPAST	67	40	30
SMSW 42LPAST	82	46	34

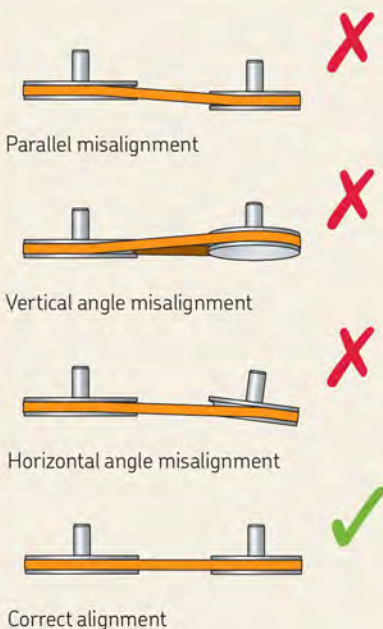


SKF Belt Alignment Tools

One of the common reasons for unplanned downtime of belt-driven machinery is pulley misalignment. Pulley misalignment can increase wear on pulleys and belts as well as increasing the noise and vibration level, that can result in unplanned machinery downtime. Another side effect of increased vibration is premature bearing failure. This too can cause unplanned machinery downtime.



Measuring parallel and angular misalignment using a straight edge or a piece of string



Traditional belt alignment methods

These methods are usually visual in combination with a straight edge and/or length of string. Although quick to perform, they are often inaccurate.

Laser belt alignment methods

Using a laser belt alignment tool is quicker and more accurate than traditional methods. Belt alignment tools can either align the pulley faces or the pulley grooves.

Accurate pulley and belt alignment can help you:

- Increase bearing life
- Increase machinery uptime, efficiency and productivity
- Reduce wear on pulleys and belts
- Reduce friction and thereby energy consumption
- Reduce noise and vibration
- Reduce costs of replacing components and machinery downtime



Belt-driven machinery downtime caused by misalignment is a thing of the past

SKF TKBA Series

SKF offers a range of three different belt alignment tools to enable accurate alignment for almost all applications. The tools are designed to be easy to use without any special training. The laser position indicates the nature of misalignment allowing easy and accurate adjustment.



Versatile tools for pulley and sprocket alignment

TKBA 10 and TKBA 20

The SKF TKBA 10 and TKBA 20 allow pulleys and sprockets to be aligned on the side face. The unit magnetically attaches to the inside or outside face of almost any belt pulley or chain sprocket and has no small parts or targets that can get lost. A laser line is projected from the transmitter unit to the reflector unit mounted on the opposite pulley. A reference line on the reflector unit directly indicates the offset and vertical angle misalignment. The reflected laser line shown on the transmitter unit shows the horizontal angle misalignment of all three.

- Powerful magnets allow fast and easy attachment
- Facilitates simultaneous adjustment of tension and alignment
- Can be used on almost all machines using V belts, banded belts, ribbed belts and most other belts as well as chain sprockets
- SKF TKBA 10 utilises a red laser and can be used for distances up to 3 m (10 ft)
- SKF TKBA 20 utilises a highly visible green laser and can be used for distances up to 6 m (20 ft). It can even be used outdoors in sunny conditions
- Sturdy aluminium housings help ensure assembly stability and accuracy during the alignment process



Highly accurate tool for V-belt pulley alignment

TKBA 40

The SKF TKBA 40 aligns V-belt pulleys in the grooves. V-guides and powerful magnets allow the TKBA 40 to be fitted in the grooves of the pulley. With only two components, a laser-emitting unit and a receiver unit, the belt alignment tool is easy and fast to attach. The three-dimensional target area on the receiver unit allows the easy detection of misalignment as well as its nature; whether it is horizontal, vertical, parallel or a combination of all three.

- Powerful magnets allow fast and easy attachment
- Three-dimensional target area simplifies the alignment process
- Facilitates simultaneous adjustment of tension and alignment
- V-guides facilitate the alignment of a wide range of V-belt pulleys
- Aligns grooves of a V-belt pulley rather than its face, allowing optimum alignment of pulleys of unequal width or with dissimilar faces
- A maximum operating distance of 6 m (20 ft) accommodates many applications
- Special side adaptor allowing alignment of multi-ribbed and timing belt pulleys as well as sprockets is available as accessory



TKBA 10



TKBA 20

SKF TKBA 20 utilises a highly visible green laser and can be used for distances up to 6 m (20 ft). It can even be used outdoors in sunny conditions

Technical data

Designation	TKBA 10	TKBA 20	TKBA 40
Type of laser	Red laser diode	Green laser diode	Red laser diode
Laser	1 × Built-in class 2 laser, <1 mW, 635 nm	1 × Built-in class 2 laser, <1 mW, 532 nm	1 × Built-in class 2 laser, <1 mW, 632 nm
Laser line length	2 m at 2 m (6.6 ft at 6.6 ft)	2 m at 2 m (6.6 ft at 6.6 ft)	3 m at 2 m (9.8 ft at 6.6 ft)
Measurement accuracy angular	Better than 0,02° at 2 m (6.6 ft)	Better than 0,02° at 2 m (6.6 ft)	Better than 0,2°
Measurement accuracy offset	Better than 0,5 mm (0.02 in.)	Better than 0,5 mm (0.02 in.)	Better than 0,5 mm (0.02 in.)
Measurement distance	50 mm to 3 000 mm (2 in. to 10 ft)	50 mm to 6 000 mm (2 in. to 20 ft)	50 mm to 6 000 mm (2 in. to 20 ft)
Control	Laser on/off rocker switch	Laser on/off rocker switch	Laser on/off switch
Housing material	Aluminum, powder coat finish	Aluminum, powder coat finish	Extruded aluminium
Dimensions			
Transmitter unit	169 × 51 × 37 mm (6.65 × 2.0 × 1.5 in.)	169 × 51 × 37 mm (6.65 × 2.0 × 1.5 in.)	70 × 74 × 61 mm (2.8 × 2.9 × 2.4 in.)
Receiver unit	169 × 51 × 37 mm (6.5 × 2.0 × 1.5 in.)	169 × 51 × 37 mm (6.5 × 2.0 × 1.5 in.)	96 × 74 × 61 mm (3.8 × 2.9 × 2.4 in.)
Reflector dimensions	22 × 32 mm (0.9 × 1.3 in.)	22 × 32 mm (0.9 × 1.3 in.)	N/A
Weight			
Transmitter unit	365 g (0.8 lb)	365 g (0.8 lb)	320 g (0.7 lb)
Receiver unit	340 g (0.7 lb)	340 g (0.7 lb)	270 g (0.6 lb)
Mounting	Magnetic, side mounted	Magnetic, side mounted	Magnetic, groove mounted (optional side adapter TMEB A2)
V-guides	N/A	N/A	Size 1: 22 mm, short rods (3× pairs) Size 2: 22 mm, long rods (3× pairs) Size 3: 40 mm, short rods (3× pairs) Size 4: 40 mm, long rods (3× pairs)
Battery	2× AAA Alkaline type IEC LR03	2× AAA Alkaline type IEC LR03	2× AAA Alkaline type IEC LR03
Operation time	25 hours continuous operation	8 hours continuous operation	20 hours continuous operation
Carrying case dimensions	260 × 85 × 180 mm (10.2 × 3.3 × 7.1 in.)	260 × 85 × 180 mm (10.2 × 3.3 × 7.1 in.)	260 × 85 × 180 mm (10.2 × 3.3 × 7.1 in.)
Total weight (incl. case)	1,3 kg (2.9 lb)	1,3 kg (2.9 lb)	1,2 kg (2.7 lb)
Operating temperature	0 to 40 °C (32 to 104 °F)	0 to 40 °C (32 to 104 °F)	0 to 40 °C (32 to 104 °F)
Storage temperature	-20 to +60 °C (-4 to +140 °F)	-20 to +60 °C (-4 to +140 °F)	-20 to +65 °C (-4 to +150 °F)
Relative humidity	10 to 90% RH non-condensing	10 to 90% RH non-condensing	10 to 90% RH non-condensing
IP rating	IP 40	IP 40	IP 40
Calibration certificate	Valid for two years	Valid for two years	Valid for two years
Case contents	1 × TKBA 10 transmitter unit 1 × TKBA 10 receiver unit 2 × AAA batteries 1 × Printed instructions for use 1 × Calibration certificate	1 × TKBA 20 transmitter unit 1 × TKBA 20 receiver unit 2 × AAA batteries 1 × Printed instructions for use 1 × Calibration certificate	1 × TKBA 40 transmitter unit 1 × TKBA 40 receiver unit 2 × AA batteries 4 × sizes of V-guides, 3 × of each size 1 × Printed instructions for use 1 × Calibration certificate

Basic condition monitoring

To help ensure long bearing service life, it is important to determine the condition of machinery and bearings while in operation. Good predictive maintenance will help reduce machine downtime and decrease overall maintenance costs. To help you achieve the maximum service life from your bearings, SKF has developed a wide range of instruments for analysing the critical environmental conditions which have an impact on bearing and machine performance.

Maintenance concepts

Run to failure

Run to failure occurs when repair action is not taken until a problem results in machine failure. Run to failure problems often cause costly secondary damage along with unplanned downtime and maintenance costs.

Preventive maintenance

Preventive maintenance implies that a machine, or parts of a machine, are overhauled on a regular basis regardless of the condition of the parts. While preferable to run to failure maintenance, preventive maintenance is costly because of excessive downtime from unnecessary overhauls and the cost of replacing good parts along with worn parts.

Predictive maintenance

Condition monitoring/predictive maintenance is the process of determining the condition of machinery while in operation. This enables the repair of problem components prior to failure. Condition monitoring not only helps plant personnel reduce the possibility of catastrophic failure, but also allows them to order parts in advance, schedule manpower, and plan other repairs during the downtime. With condition monitoring, machinery analysis takes two overlapping forms: predictive and diagnostic.



Maintenance cost comparisons.

A calendar for the month of August. The dates are arranged in a grid. The date 22 is circled in blue. A large red 'X' is placed to the right of the calendar.

August						
1	2	3	4	5	6	
7	8	9	10	11	12	
13	14	15	16	17	18	
19	20	21	22	23	24	
25	26	27	28	29	30	

Preventive maintenance is similar to the regular service of a car. Often, unnecessary maintenance is performed.



Condition based maintenance means repairs are only carried out when required.

SKF has developed a comprehensive range of basic condition monitoring tools suitable for Operator Driven Reliability (ODR) and maintenance technicians. Under ODR, some maintenance practices are owned, managed, and performed by operators. Often, the operators are the best persons equipped for basic inspection activities, as they know their part of the plant very well. They are often sensitive to minor changes in sounds and vibrations that may not be apparent to someone lacking their front-line experience.

Subsequently, minor defects can be corrected quickly, as the operator can undertake simple adjustment and repair tasks. Maintenance technicians also have need for basic condition monitoring tools. If, for example, abnormal vibrations are detected or if an operator reports an abnormal running condition, then the technician can often use some basic condition monitoring tools to detect the root cause for further evaluation.

SKF basic condition monitoring tools can be used to check a number of properties:

Temperature

Since the dawn of the industrial age, operators and technicians know that abnormal temperatures often indicate that something is wrong with the machine. Thermometers can help find and then measure these hotspots, allowing further analysis to be conducted.



Speed

Machines are usually designed to run at a given speed. If the speed is too slow or too fast, then the overall process can be compromised. Using a hand-held tachometer enables a quick and easy assessment of the machine's running speed.



Visual

Visual inspection of a machine's condition can sometimes be difficult when it's running or when there is a need to inspect the machine internally. A stroboscope can be used to visually freeze the motion of a machine to allow such things as fan blades, couplings and belt drives to be inspected while running. To inspect the internal parts of a machine often requires disassembly. By using an endoscope, it is possible to access the area of interest with minimal disassembly, saving time and money.



Sound

Abnormal sounds from machines often indicate that something is wrong. A stethoscope can be used to help pinpoint the source of the sound and can aid the technician in identifying the problem. Leaks in compressed air systems are costly, not only in energy costs but also due to extra costs in air compressor maintenance. Ultrasonic leak detectors can help detect leaks efficiently, allowing the necessary repairs to be made. Excessive noise can cause worker fatigue, increased accidents and loss of hearing. A sound pressure meter can measure the sound level, allowing corrective measures to be made.



Electrical discharge currents

Electrical discharges are a result of motor shaft voltages discharging to earth through the bearing, causing electrical erosion, lubricant degradation and ultimately bearing failure. An electrical discharge detector can help detect the presence of electrical discharge currents, allowing remedial action to be taken.



Vibration

Abnormal vibrations are often the first indication of a potential machine failure. These vibrations can be caused by such conditions as unbalance, misalignment, looseness of parts, rolling element bearing and gear damage. Vibration analysis instruments and systems, can help detect many serious problems at an early stage, allowing remedial work to be undertaken in a timely manner.



Lubricant condition

To maintain the optimum condition of rolling element bearings, it is essential that the lubricant is in good condition. Checking the oil or grease condition at regular intervals can reduce downtime and greatly prolong the life of rolling element bearings.





Accurate temperature measurement with dual channel capability

SKF Thermometer TKDT 10

The SKF TKDT 10 is suitable for a wide range of applications and has the ability to have two SKF temperature probes connected. A large back-lit LCD display helps ensure that the temperatures can be easily read in almost all lighting conditions.

- Large back-lit LCD display
- Supplied with temperature probe TMDT 2-30 (max. 900 °C / (1 652 °F)); suitable for many direct contact applications.
- Can be used with an optional second SKF temperature probe enabling either probe temperature, or the temperature difference between the probes, to be displayed.
- Temperature display can be frozen for ease of reading.
- User selectable auto power off function increases battery life.



Technical data

Designation	TKDT 10
Display	Large back-lit LCD
Displayed resolution	0,1 ° up to 1 000 °, otherwise 1°
Measurement modes	Min, max, average, differential, dual temperature reading
Measurement units	°C, °F, K
Temperature using probe	-200 to +1 372 °C (-328 to +2 501 °F)
Accuracy	>-100 °C (>-148 °F): ±0.5% of reading ±1 °C (1.8 °F)
Probe compatibility	2 × Type-K connectors
Probe supplied	TMDT 2-30, suitable for use up to 900 °C (1 650 °F)
Battery	3 × AAA Alkaline type IEC LR03
Operation time	18 hours typical use (backlight on)
Product dimensions	160 × 63 × 30 mm (6.3 × 2.5 × 1.2 in.)
Carrying case dimensions	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in.)
Product weight	200 g (0.4 lb)

Dual temperature measurement



Temperature difference between the probes



Infrared thermometers are portable, lightweight instruments for safely measuring temperature at a distance

SKF Infrared thermometers

They are extremely user-friendly; simply aim and pull the trigger and the temperature is shown on the display. These robust instruments are equipped with a back-lit display and laser sighting. They are fitted with a bright LED illuminator to allow the application object to be seen even in poorly lit environments.



TKTL 10

An infrared thermometer that's an essential tool for every technician

- Maximum temperature always shown; helps identify the real hotspots
- Auto shut off feature; helps optimise battery life
- Colour display with temperature trend indication



TKTL 20

An infrared and contact thermometer offering versatile temperature measurement options

- Supplied with temperature probe TMDT 2-30 (max. 900 °C (1 652 °F)); suitable for many direct contact applications
- Can be used with any SKF temperature probe
- User selectable, multiple temperature measurement modes including: maximum, minimum, average, differential and probe/infrared dual display, scan function
- User selectable high and low alarm levels with audible warning signal
- Mode dependant auto shut off feature optimises battery life
- Colour display with temperature trend indication



TKTL 30

An infrared and contact temperature thermometer with a wide measurement range and dual laser sighting

- Dual laser sighting feature defines the diameter of the area being measured; helps the user to precisely pin-point the temperature measurement area
- Supplied with temperature probe TMDT 2-30 (max. 900 °C (1 652 °F)); suitable for many direct contact applications
- Can be used with any SKF temperature probe
- User selectable, multiple temperature measurement modes including: maximum, minimum, average, differential and probe/infrared dual display, scan function
- User selectable high and level alarm levels with audible warning signal
- Mode dependant auto shut off feature optimises battery life



TKTL 40

An infrared and contact temperature thermometer with video and data logging capabilities

- Built-in camera allows pictures and videos, with all measurement information to be taken, stored, recalled and exported to PC
- Environmental properties such as ambient, dew point and wet-bulb temperatures, as well as relative humidity, can be displayed and stored
- Dual laser sighting defines the temperature measurement area



When used in non-contact mode, the thermometer senses the thermal energy radiated from an object with an infrared detector. When pointed at an object, the infrared detector collects energy, producing a signal that the microprocessor translates as a reading on the backlit display. As the trigger is squeezed, the object temperature is continuously measured by the infrared detector. This allows for fast and accurate realtime readings.

- Supplied with temperature probe TMDT 2-30 (max. 900 °C (1 652 °F)) for direct contact applications. Can also be used with any other SKF temperature probe
- User selectable, multiple temperature measurement modes including: maximum, minimum, average, differential and probe/infrared dual display
- Data logging function can be used to visualise temperature changes over time
- User selectable high and low alarm levels with audible warning signal
- User selectable auto shut off feature optimises the rechargeable battery life

	TKTL 10	TKTL 20	TKTL 30	TKTL 40
Temperature range using infrared	-60 to +625 °C (-76 to +1 157 °F)	-60 to +625 °C (-76 to +1 157 °F)	-60 to +1 000 °C (-76 to +1 832 °F)	-50 to +1 000 °C (-58 to +1 832 °F)
Temperature range using probe	-	-64 to +1 400 °C (-83 to +1 999 °F)	-64 to +1 400 °C (-83 to +1 999 °F)	-50 to +1 370 °C (-58 to +2 498 °F)
Distance to spot size	16:1	16:1	50:1	50:1
Emissivity	Pre-set 0,95	0,1-1,0	0,1-1,0	0,1-1,0

Technical data

Designation	TKTL 10	TKTL 20	TKTL 30	TKTL 40
Probe supplied	–	TMDT 2-30, suitable for use up to 900 °C (1 650 °F)	TMDT 2-30, suitable for use up to 900 °C (1 650 °F)	TMDT 2-30, suitable for use up to 900 °C (1 650 °F)
Full range accuracy	$T_{obj} = 0$ to 625 °C $\pm 2\%$ of reading or 2 °C (4 °F) whichever is greater	$T_{obj} = 0$ to 635 °C $\pm 2\%$ of reading or 2 °C (4 °F) whichever is greater	$\pm 2\%$ of reading or 2 °C (4 °F) whichever is greater	20 to 500 °C: $\pm 1\%$ of reading or 1 °C (1.8 °F) whichever is greater 500 to 1 000 °C: $\pm 1.5\%$ of reading –50 to +20 °C: ± 3.5 °C (6.3 °F)
Environmental limits	Operation 0 to 50 °C (32 to 122 °F) 10 to 95% relative humidity Storage –20 to +65 °C (–4 to +149 °F) 10 to 95% relative humidity	Operation 0 to 50 °C (32 to 122 °F) 10 to 95% relative humidity Storage –20 to +65 °C (–4 to +149 °F) 10 to 95% relative humidity	Operation 0 to 50 °C (32 to 122 °F) 10 to 95% relative humidity Storage –20 to +65 °C (–4 to +149 °F) 10 to 95% relative humidity	Operation 0 to 50 °C (32 to 122 °F) 10 to 95% relative humidity Storage –10 to +60 °C (14 to 150 °F) 10 to 95% relative humidity
Response time (90%)	<1 000 ms	<1 000 ms	<1 000 ms	<300 ms
LCD display resolution	0,1 °C/F from –9,9 to –199,9 otherwise 1 °C/F	0,1 °C/F from –9,9 to –199,9 otherwise 1 °C/F	0,1 °C/F from –9,9 to –199,9 otherwise 1 °C/F	0,1 ° up to 1 000 °, otherwise 1 °
Spectral response	8–14 µm	8–14 µm	8–14 µm	8–14 µm
User selectable backlit display	No, permanently on	On/Off	On/Off	No, permanently on
User selectable laser pointer	No, permanently on	On/Off	On/Off	On/Off
Measurement modes	Max temperature	Max, min, average, differential, probe/IR dual temperature modes	Max, min, average, differential, probe/IR dual temperature modes	Max, min, average, differential, probe/IR dual temperature modes
Alarm modes	–	High and low level alarm level with warning bleep	High and low level alarm level with warning bleep	High and low level alarm level with audible alarm
Laser	Class 2	Class 2	Class 2	Class 2
Dimensions	195 × 70 × 48 mm (7.7 × 2.7 × 1.9 in.)	195 × 70 × 48 mm (7.7 × 2.7 × 1.9 in.)	203 × 197 × 47 mm (8.0 × 7.7 × 1.8 in.)	205 × 155 × 62 mm (8.1 × 6.1 × 2.4 in.)
Packaging	Carton box	Sturdy carrying case	Sturdy carrying case	Sturdy carrying case
Carrying case dimensions	–	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in.)	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in.)	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in.)
Weight	230 g (0.5 lb)	Total: 1 100 g (2.4 lb) TKTL 20: 230 g (0.50 lb)	Total: 1 300 g (2.9 lb) TKTL 30: 370 g (0.815 lb)	Total: 1 600 g (2.53 lb) TKTL 40: 600 g (1.32 lb)
Battery	2 × AAA Alkaline type IEC LR03	2 × AAA Alkaline type IEC LR03	2 × AAA Alkaline type IEC LR03	1 × Rechargeable Li-ion Battery
Battery lifetime	18 hours	18 hours	140 hours with laser and backlight off Otherwise 18 hours	4 hours continuous use
Auto switch off	Yes	User selectable	User selectable	User selectable
HVAC functionalities	–	–	–	Wet bulb, dew point, humidity, air temperature
Photo and video mode	–	–	–	640 × 480 camera, images (JPEG) and video (3 GP)
Memory/PC connection	–	–	–	310 MB internal memory. Expandable using micro SD memory card (8 GB max.) / mini USB cable


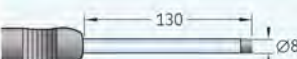
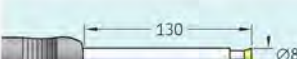


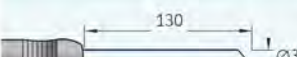
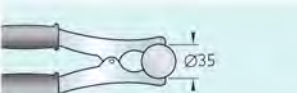

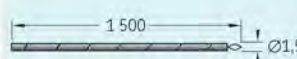




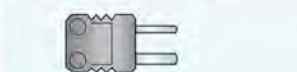



Technical data – Thermocouple probes

Probe type	K-type thermocouple (NiCr/NiAl) acc. IEC 584 Class 1
Accuracy	± 1.5 °C (2.7 °F) up to 375 °C (707 °F) $\pm 0.4\%$ of reading above 375 °C (707 °F)
Handle	110 mm (4.3 in.) long
Cable	1 000 mm (39.4 in.) spiral cable (excl. TMDT 2-31, –38, –39, 41)
Plug	K-type mini-plug (1 260-K)

For use with SKF Thermometers TKDT 10, TKTL 20, TKTL 30 and TKTL 40

SKF K-type Thermocouple Probes TMDT 2 series

Dimensions (mm)	Designation	Description	Max. temp	Response time
	TMDT 2-30	Standard surface probe For hard surfaces such as bearings, bearing housings, engine blocks, oven shields, etc.	900 °C (1 650 °F)	2,3 s
	TMDT 2-43	Heavy duty surface probe Same as TMDT 2-30, but with a silicone encapsulated tip for heavy duty applications.	300 °C (570 °F)	3,0 s
	TMDT 2-32	Insulated surface probe For hard surfaces where electrical wiring might cause short circuiting, e.g. electric motors, transformers, etc.	200 °C (390 °F)	2,3 s
	TMDT 2-33	Right angle surface probe For hard surfaces in heavy-duty applications, e.g. machine components, engines, etc.	450 °C (840 °F)	8,0 s
	TMDT 2-31	Magnetic surface probe For hard, magnetic surfaces; the integral heat sink design and low mass minimise thermal inertia and provide an accurate temperature measurement.	240 °C (460 °F)	7,0 s
	TMDT 2-35	Probe with sharp tip Can be easily inserted into semi-solid materials like food-stuffs, meat, plastic, asphalt, deep-frozen products, etc.	600 °C (1 110 °F)	12,0 s
	TMDT 2-36	Pipe clamp probe For temperature measuring on pipes, cables, etc. Diameter up to Ø 35 mm (1.4 in.).	200 °C (390 °F)	8,0 s
	TMDT 2-38	Wire probe Thin, lightweight, very fast response, fibreglass insulated.	300 °C (570 °F)	5,0 s
	TMDT 2-39	High temperature wire probe Thin, light weight, very fast response, ceramic insulation.	1 350 °C (2 460 °F)	6,0 s
	TMDT 2-34	Gas and liquid probe Flexible shank made of stainless steel for liquids, oils, acids, etc. and for use with high temperatures, e.g. open fire (not for molten metals).	1 100 °C (2 010 °F)	12,0 s
	TMDT 2-34/1.5	Gas and liquid probe Same as TMDT 2-34 but with thin shank and faster response time. Very flexible, especially suitable for measuring temperature of gases.	900 °C (1 650 °F)	6,0 s
	TMDT 2-40	Rotating probe For moving or rotating smooth surfaces. Four roller bearings provide suitable contact with the surfaces. Max. velocity 500 m/min.	200 °C (390 °F)	0,6 s
	TMDT 2-41	Non-ferrous foundry probe Holder including dip-element for molten, non-ferrous metals. Highly resistant to corrosion and oxidation at high temperatures.	1 260 °C (2 300 °F)	30,0 s
	TMDT 2-42	Ambient temperature probe For measurement of ambient temperature.		
	TMDT 2-37	Extension cable For use with all K-type probes. Special lengths are available on request.		

All probes can be used with the SKF digital thermometers TKDT 10, TKTL 20, TKTL 30 and TKTL 40 without recalibration.

Pinpoint accuracy combined with measurement versatility

SKF Tachometer Series

The SKF Tachometers are fast and accurate instruments utilizing laser or contact to measure rotational and linear speeds. Equipped with a laser and a range of contact adapters, they are versatile instruments that suit a wide range of applications. Having a compact design, they can be operated with just one hand and are supplied in a sturdy carrying case.



TKRT 10

- Wide speed measurement range: up to 99 999 r/min for laser measurement and 20 000 r/min using contact adapters
- Measurement modes include; rotational speed, total revolutions, frequency, surface speed and length in both metric and imperial units
- Laser can be used for safe and quick, non-contact rotational speed measurements at distances up to 0,5 m (20 in.)
- Large back-lit LCD display enables easy reading in almost all light conditions
- Angular range of $\pm 45^\circ$ to target helps facilitate easy measuring
- Up to 10 readings can be stored for later reference

TKRT 20

- The user can select the following to measure:
 - rpm, rps, m, ft or yds per minute or second,
 - length or revolution counting, or
 - time interval
- Wide speed range and the various measurement modes make the SKF TKRT 20 suitable for measuring speed in many applications
- Large angular range of $\pm 80^\circ$ to target facilitates easy measuring in areas where straight-line access is difficult
- The laser optical system allows easy and quick measurements at a safe distance from rotating machinery
- The large inverting LCD display facilitates easy reading, even when pointing the unit down into the machinery
- The SKF TKRT 20 can also be equipped with a remote laser sensor, which is optionally available



The laser optical system allows easy and quick measurements at a safe distance from rotating machinery.

Technical data

Designation	TKRT 10	TKRT 20
Display	5 digit LCD backlit display	Inverting vertical 5 digit LCD
Memory	10 readings memories	Last reading held for 1 minute
Measurement		
Optical modes	r/min, hertz	r/min and r/s (also count and time interval)
Contact modes	r/min, metres, inches, yards, feet, per min, hertz	r/min and r/s, metres, yards, feet, per min and per sec
Count modes	total revs, metres, feet, yards	total revs, metres, feet, yards
Sampling time	0,5 seconds (over 120 r/min)	0,8 seconds or time between pulses 0,1 seconds auto-selection in max or min capture mode
Linear speed	0,2 to 1 500 metres/min (4 500 ft/min)	0,3 to 1 500 metres/min (4 500 ft/min) or equivalent in seconds
Optical measurement		
Rotational speed range	3 to 99 999 r/min	3 to 99 999 r/min
Accuracy	±0,05% of reading ±1 digit	±0,01% of reading ±1 digit
Measuring distance	50 to 500 mm (1.9 to 19.7 in.)	50 to 2 000 mm (1.9 to 78.7 in.)
Angle of operation	±45°	±80°
Laser sensor	1 × built-in class 2 laser	1 × built-in class 2 laser
Remote laser sensor	N/A	Optional TMRT 1-56
Contact measurement		
Rotational speed range	2 to 20 000 r/min	Max. 50 000 r/min for 10 sec
Accuracy	±1% of reading ±1 digit	±1% of reading ±1 digit
Contact adaptors	Included with conical tip, conical recess and wheel	Included with r/min cone and removable metric wheel assembly
Battery	1 × 9V alkaline type IEC 6F22	4 × AAA alkaline type IEC LR03
Operation time	12 hours continuous use	24 hours continuous use
Product dimensions	160 × 60 × 42 mm (6.3 × 2.4 × 1.7 in.)	213 × 40 × 39 mm (8.3 × 1.5 × 1.5 in.)
Product weight	160 g (0.35 lb)	170 g (0.37 lb)
Carrying case dimensions	260 × 85 × 180 mm (10.3 × 3.4 × 7.0 in.)	260 × 85 × 180 mm (10.3 × 3.4 × 7.0 in.)
Operating temperature	0 to 50 °C (32 to 122 °F)	0 to 40 °C (32 to 104 °F)
Storage temperature	-10 to +50 °C (14 to 122 °F)	-10 to +50 °C (14 to 122 °F)
Relative humidity	10 to 90% RH non-condensing	10 to 90% RH non-condensing
IP rating	IP 40	IP 40

High-performance, hand-held stroboscopes for visual inspection

SKF Stroboscopes

SKF offers a wide range of portable TKRS stroboscopes for visual inspection of running machines in challenging industrial environments. These portable tools provide early detection of abnormalities to help schedule maintenance tasks and reduce additional loads on rotating equipment in order to reach planned performance levels. Designed for ease of use, the four TKRS models offer from 3 to 118 ultra-bright LEDs. Each stroboscope features a large screen and multifunctional selector switch to help you quickly navigate to the correct menu. Brightness and performance levels are adjustable.

TKRS 11

- Quick speed selection with rotary button
- Black and white LCD display
- Three ultra-bright LEDs



TKRS 21

- High luminescence with seven ultra-bright LEDs
- Multi-line backlit TFT



TKRS 31

- Built-in laser tachometer with flash synchronization
- Pro-mode with additional features like slow motion phase shift
- Trigger input and output with signal modification



TKRS 41

- Extreme luminescence with 118 ultra-bright LEDs
- Portable operation with built-in rechargeable battery
- Continuous operation for long term inspection with power adapter
- Flash synchronization from laser tachometer or trigger input



General benefits of TKRS series:

- Intuitive operation for fast and easy inspection jobs
- Ergonomic and robust design for portable usage in industrial environments
- Bright LEDs with long lifetime and continuous operation
- Tripod mount for stationary inspection

Applications and industries:

- **General industry** – Inspection of fans, gears, belts, chains, couplings, shafts, etc.
- **Paper** – Quality control
- **Textile** – Setup/Inspection of production processes, especially spindles and weaving patterns
- **Printing** – Quality control
- **Test equipment** – Analysis of materials and components during fast movements, including component behavior under vibration or resonance frequency tests

Technical data

Designation	TKRS 11	TKRS 21	TKRS 31	TKRS 41
Light Power	>2 000 Lux at 3° flash duration and 0,3 m (12 in.) distance	>6 200 Lux for at 3° flash duration and 0,3 m (12 in.) distance	>5 600 Lux at 3° flash duration and 0,3 m (12 in.) distance	8 000 lux at 1° flash duration and 0,3 m (12 in.) distance
Brightness (flash duration)	adjustable, 0,2°–5,0°	adjustable, 0,2°–5,0°	adjustable, 0,2°–5,0°	adjustable, 0,025° – 3,0°
Accuracy	±0,02% (±1 digit / ±0,025 µs) whichever is greater	±0,02% (±1 digit / ±0,025 µs) whichever is greater	±0,02% (±1 digit / ±0,025 µs) whichever is greater	±0,02% (±1 digit / ±0,025 µs) whichever is greater
Laser speed measurement	No	No	Yes	Yes
Phase shift	Yes	Yes	Yes with slow motion function	Yes with slow motion function
Run time ca.	ca. 5:30 h @ 1° (100% display brightness) ca. 7:45 h @ 0,2° (20% display brightness)	ca. 3:00 h @ 1° (100% display brightness) ca. 6:45 h @ 0,2° (20% display brightness)	ca. 3:45 h @ 1° (100% display brightness) ca. 8:15 h @ 0,2° (20% display brightness)	ca. 2:30 h @ 0,50° (~4000 lux) ca. 5:00 h @ 0,25° (~2000 lux)
Display	Black and White LCD	Multi-line backlight TFT	Multi-line backlight TFT	Multi-line backlight LCD
Power source	3 x AA batteries (included)	3 x AA batteries (included)	3 x AA batteries (included)	internal Li-ion battery (rechargeable); continuous operation with power adapter (included)
Power adapter and charger	N/A	N/A	N/A	110–230 V, 50/60 Hz, EU/US/UK/AUS plugs
External trigger range	N/A	N/A	30 to 300 000 f/min	0 to 300 000 f/min
External trigger connection	N/A	N/A	Plug: 3,5 mm TRS plug (included) Input: 3 – 30 V / max. 5 mA (NPN) Output: up to 30V / max 50 mA (NPN)	Plug: 5-pin plug DIN 41524 (included) Input: 3 – 30 V / max. 5 mA (potentialfree optocoupler)
Signal modification	N/A	N/A	Edge selection, Multiplier, Divider, Delay	Edge selection, Multiplier, Divider, Delay
Instrument dimensions	225 x 78 x 50 mm (8.9 x 3 x 2 in.)	225 x 78 x 50 mm (8.9 x 3 x 2 in.)	225 x 78 x 50 mm (8.9 x 3 x 2 in.)	Without rubber protection 150 x 130 x 112 mm (6.0 x 5.1 x 4.4 in.)
Instrument weight (incl. batteries)	0,29 kg (0.64 lb)	0,29 kg (0.64 lb)	0,3 kg (0.65 lb)	1,15 kg (2.53 lb)
Case dimensions	260 x 180 x 85 mm (10.2 x 7.1 x 3.3 in.)	260 x 180 x 85 mm (10.2 x 7.1 x 3.3 in.)	260 x 180 x 85 mm (10.2 x 7.1 x 3.3 in.)	345 x 165 x 270 mm (13.6 x 6.5 x 10.6 in.)
Total weight (case + instrument)	0,78 kg (1.7 lb)	0,78 kg (1.7 lb)	0,79 kg (1.7 lb)	2,4 kg (5.3 lb)



Fast and easy inspection with video function

SKF Endoscopes TKES 10 series

SKF Endoscopes are first line inspection tools that can be used for internal inspection of machinery. They help minimise the need to disassemble machinery for inspection, saving time and money. The compact display unit, with 3.5" backlit screen, allows images and video to be saved and recalled, or to be downloaded and shared with others. Three different models cater to most needs and are equipped with powerful variable LED lighting allowing inspections in dark locations.

- High resolution miniature camera, with up to 2× digital zoom, gives a clear and sharp full screen image
- Available with a 1 metre (3.3 ft) insertion tube in three different variants; flexible, semi-rigid or with an articulating tip
- Small tip diameter of 5,8 mm (0.23 in.), with a wide field of view, allows easy access to most applications
- Supplied with a side view adapter allowing inspection of applications such as pipe walls
- Powerful magnets, and a tripod mount on the back of the display unit, allow the display unit to be used "hands free"
- Up to 50 000 photos or 120 minutes of video can be stored on the SD memory card supplied
- Longer flexible and semi-rigid insertion tubes are available as accessories
- Supplied in a sturdy carrying case complete with all necessary cables, universal mains charger and cleaning kit





Photos and videos can be transferred to PC using the USB cable provided.

Technical data



Designation	TKES 10F	TKES 10S	TKES 10A
Insertion tube and light source	Flexible tube	Semi-rigid tube	Tube with an articulating tip
Image sensor	CMOS image sensor	CMOS image sensor	CMOS image sensor
Resolution (H x V)			
Still image (static)	640 x 480 pixels	640 x 480 pixels	320 x 240 pixels
Video (dynamic)	320 x 240 pixels	320 x 240 pixels	320 x 240 pixels
Size tip (insertion tube) diameter	5,8 mm (0.23 in.)	5,8 mm (0.23 in.)	5,8 mm (0.23 in.)
Tube length	1 m (39.4 in.)	1 m (39.4 in.)	1 m (39.4 in.)
Field of view	67°	67°	55°
Depth of field	1,5–6 cm (0.6–2.4 in.)	1,5–6 cm (0.6–2.4 in.)	2–6 cm (0.8–2.4 in.)
Light source	4 White adjustable LED (0–275 Lux/4 cm)	4 White adjustable LED (0–275 Lux/4 cm)	4 White adjustable LED (0–275 Lux/4 cm)
Probe working temperature	–20 to +60 °C (–4 to +140 °F)	–20 to +60 °C (–4 to +140 °F)	–20 to +60 °C (–4 to +140 °F)
Ingress protection level	IP 67	IP 67	IP 67



Technical data

Display Unit

Power	5 V DC
Display	3.5" TFT LCD monitor 320 x 240 pixels
Interface	Mini USB 1.1 / AV out / AV in/
Battery (not user serviceable)	Rechargeable Li-Polymer battery (3.7 V). Typically 4 hours operation after a 2 hour charge.
Video out format	NTSC & PAL
Recording medium	SD card 2 GB supplied – storage capacity ±50 000 photos, or 120 minutes video. (SD/SDHC cards up to 32 GB can be used)
Output resolution (H x V)	
Still image (JPEG)	640 x 480 pixels
Video recording format (ASF)	320 x 240 pixels
Temperature range	
Working and storage	–20 to +60 °C (–4 to +140 °F)
Battery charging temperature range	0 to 40 °C (32 to 104 °F)
Functions	Snapshot, video recording, picture & video review on LCD screen, TV Out, transfer of picture & video from SD card to PC

Easily pinpoints bearing and machine noise

SKF Electronic Stethoscope TMST 3

The SKF TMST 3 is a high quality instrument enabling the determination of troublesome machine parts by the detection of machine noises. TMST 3 includes a headset, two different length probes (70 and 300 mm) and a pre-recorded audio CD demonstrating the most common encountered troublesome machine noises, all supplied complete in a sturdy carrying case.



- User friendly and easy to operate, no special training required
- Lightweight ergonomic design makes it easy to operate with one hand
- Excellent sound quality helps to reliably identify the possible cause of the noise
- Excellent quality headset for optimum sound quality even in very high-noise environments
- Pre-recorded demonstration CD and output for analogue recording help facilitate analysis and comparison
- Supplied with two probes, 70 and 300 mm (2.8 and 11.8 in.) long
- Adjustable digital volume control up to 32 levels to reach desired volume



Technical data

Designation	TMST 3		
Frequency range	30 Hz–15 kHz	Battery lifetime	30 hours (continuous use)
Operating temperature	–10 to +45 °C (14 to 113 °F)	Dimensions handset	220 × 40 × 40 mm (8.6 × 1.6 × 1.6 in.)
Output volume	Adjustable in 32 levels	Probe length	70 and 300 mm (2.8 and 11.8 in.)
Led indicator	Power on Sound volume Battery low	Carrying case dimensions	360 × 110 × 260 mm (14.2 × 4.3 × 10.2 in.)
Maximum recorder output	250 mV	Weight	
Headset	48 ohm (with ear defender)	Total weight	1 600 g (3.5 lb)
Auto switch off	Yes, after 2 min.	Instrument	162 g (0.35 lb)
Battery	4 × AAA Alkaline type IEC LR03 (included)	Headset	250 g (0.55 lb)

Easy noise level measurement

SKF Sound Pressure Meter TMSP 1

The SKF TMSP 1 is a high quality, handheld instrument for measuring the sound level in decibels. The environmental noise is picked up by the microphone and then processed by the handset. The noise can be monitored both quantitatively and qualitatively. The SKF Sound Pressure Meter is supplied in a carrying case complete with windshield, calibration screwdriver, jack for external outputs and an alkaline battery.



- User friendly and easy to operate, no special training required
- dBA and dBC scale weightings for both general sound level and low frequency noise measurements
- Fast and slow time weighting enables either normal measurements or the average level of fluctuating noise
- Four different measurement scales to suit almost all situations
- User selectable backlight for use in environments with poor lighting
- Four digit LCD panel with both digital and bar graph display
- Max and min function for peak measurements and alarm function to indicate when the noise level is too low or too high
- Tripod mounting thread for use when the instrument must remain in the same position for a prolonged period



Technical data

Designation	TMSP 1		
Frequency range	31,5 Hz to 8 KHz	Power supply	9 V Alkaline type IEC 6LR61
Measuring level range	30 to 130 dB	Power life	50 hours (with alkaline battery)
Display	LCD	Operation temperature	0 to 40 °C (32 to 104 °F)
Digital display	4 digits, Resolution: 0,1 dB, Display update: 0,5 s	Operation humidity	10 to 90% relative humidity
Analogue display	50 segments bar-graph Resolution: 1 dB Display update: 100 ms	Operation altitude	Up to 2 000 m (6 560 ft) above sea level
Time weighting	Fast (125 ms), Slow (1 s)	Dimensions	275 × 64 × 30 mm (10.8 × 2.5 × 1.2 in.)
Level ranges	Lo = 30-80 dB, Med = 50-100 dB, Hi = 80-130 dB, Auto = 30-130 dB	Carrying case dimensions	530 × 85 × 180 mm (20.9 × 3.4 × 7.0 in.)
Accuracy	±1,5 dB (ref 94 dB at 1 KHz)	Weight	285 g (0.76 lb) including battery
Conformity	Fulfills IEC651 type 2, ANSI S1.4 type 2 for sound level meters	Total weight (incl.case)	1 100 g (2.4 lb)
Dynamic range	50 dB		

Quick and easy detection of air leaks

SKF Ultrasonic Leak Detector TKSU 10

The SKF TKSU 10 is an ultrasonic leak detector that helps users to quickly find leakages in compressed air or vacuum systems. The instrument is very simple to use and features adjustable sensitivity and intuitive guidance for superior leak detection results. Any compressed air system can experience leaks, which amplify the load on compressors and increase costs.



Sensor bandwidth
35 to 42 kHz

The TKSU 10 helps users to easily find leaks from a distance, even in noisy industrial environments, via its ultrasound measurement sensor. The built-in LED display assists the user in adjusting sensitivity and shows the measured ultrasound noise from leaking air, allowing the quantification of leaks and prioritization of repairs.

- Easy to use; no training required
- Leak detection from a distance in noisy industrial environments
- Color LED display assists in adjusting sensitivity settings and shows measurement values
- Reduces energy and maintenance costs via leak identification and repair
- Lightweight, handheld device with industrial headset included
- Independently adjustable sensor sensitivity and headset volume
- Flexible probe helps find leaks in difficult-to-access locations

The TKSU 10 is designed for use in all industries utilizing compressed air, and it is particularly recommended for paper and chemical industries, as well as workshops with air-driven power tools.



Headset features neck-band design to wear with protective helmet



Technical data

Designation	TKSU 10
Keyboard	5 function keys
Measuring range	-6 to 99,9 dBμV (reference 0 dB = 1 μV)
Resolution	0,1 dBμV
Amplification	5 adjustable positions in steps of 6 dB
Maximum output	+83 dB SPL with supplied headset
Headset	25 dB NRR Peltor HQ headset
Battery	2 AA batteries
Battery life	7 hours
Operating temperature	-10 to +50 °C (14 to 122 °F)
IP rating	IP42
Flexible rod length	445 mm (17.51 in.)
Carrying case dimensions	530 x 110 x 360 mm (20.9 x 4.3 x 14.2 in.)
Total weight (incl. case)	3 kg (6.6 lbs)

Unique, reliable and safe method to detect electrical discharges in electric motor bearings

SKF Electrical Discharge Detector Pen TKED 1

The SKF TKED 1 (EDD Pen) is a simple to use hand-held instrument for detecting electrical discharges in electric motor bearings. Electrical discharges are a result of motor shaft voltages discharging to earth through the bearing, causing electrical erosion, lubricant degradation and ultimately bearing failure.



Electric motors are more vulnerable to suffer electrical erosion in bearings when controlled by a Variable Frequency Drive. When incorporated into a predictive maintenance programme, the EDD Pen can help detect bearings more susceptible to failure, and to a significant degree, prevent unplanned machine downtime.

- Unique remote solution allows operation at a distance from the motors. This helps protect the user from touching machinery in motion
- SKF developed technology¹⁾
- No special training required
- Capable of detecting electrical discharges on a time base of 10 seconds, 30 seconds or infinite
- LED backlit screen, allows use in dark environments
- IP 55 can be used in most industrial environments
- Supplied standard with batteries, a spare antenna and language-free instructions for use in a carrying case



Lubricant degradation caused by electrical discharge currents



Fluting marks characteristic of electrical erosion in bearings

¹⁾Patent applied for



Technical data

Designation	TKED 1
Power supply	4,5 V 3 x AAA Alkaline type IEC LR03
Time control	
pre-sets	10 or 30 seconds
default	indefinite
Operational and storage temperature	0 to 50 °C (32 to 122 °F) -20 to +70 °C (-4 to +158 °F)
Ingress protection level	IP 55
Display	LCD counter range: 0 to 99 999 discharges. User selectable backlight and low battery warning
Carrying case dimensions	260 x 85 x 180 mm (10.3 x 3.4 x 7.0 in.)
Total case and contents weight	0,4 kg (0.88 lb)

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