

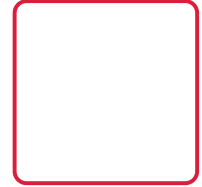
# Smart Tools





# Belt tools

## SKF Belt Frequency Meter PHL FM 10/400



### Most accurate belt tension measurement instrument

Correct belt tension is crucial for the whole belt drive, its service life and the service life of associated bearings. Therefore, it is important to get accurate and reliable results when it comes to belt tension measurement.

The SKF Belt Frequency Meter is one of the most accurate tools available for measuring the belt tension on a belt drive. Results are quickly achieved, reliable and - most importantly - repeatable. The tool is also extremely easy-to-use, while minimizing the risk for human errors. Thus, the SKF Belt Frequency Meter is ideal for measuring the belt tension.

### Wide range of applications

The two component system, consisting of a hand-held meter attached to an optical sensor, offers contact-free belt tension measurement for most of the following belt types - even in a noisy environment:

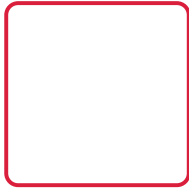
- V-Belts (wrapped, cogged raw edge, ribbed)
- Banded V-Belts
- Timing belts

The SKF Belt Frequency Meter is capable of measuring belt vibration frequencies from 10 to 400 Hz. Based upon the measured belt frequency the SKF Belt Frequency Meter calculates belt tensions up to 9 900 N (2 200 lbs.)

### Easy and quick to use:

- Simply key in the span length and mass data. Data can also be saved and recalled for repeated use, if necessary
- Aim sensor at centre of selected belt span and pluck or tap the belt
- The display will show the measured frequency which can be toggled to either newton or pounds values
- Readjust the belt tension, if necessary and take another measurement





# Belt tools

## SKF Belt Tension System

- ▶ ..... Belts
- ▶ ..... Chains
- ▶ ..... Couplings
- ▶ ..... Bushings and Hubs
- ▶ ..... Sprockets
- ▶ ..... Pulleys
- ▶ ..... Smart tools

### High quality belt drive maintenance – with reduced time and effort

The SKF Belt Tension System offers an innovative solution for belt drives by facilitating belt maintenance and replacement, while offering a higher efficiency. Only by connecting a hand-held hydraulic pump the cylinders of the SKF Belt Tension System are moved up and downwards. This enables a controlled moving of the motor axis which is directly related to the belt tension and the pressure in the cylinders. This unique function allows for quick and easy belt tension checks as well as belt replacements.

Additional required and recommended tools:

Only a hammer and a hand-held hydraulic pump, such as the SKF THPT1, are required for using the SKF Belt Tension System. Additionally, it is recommended to use a laser alignment tool, e.g. the SKF Belt Alignment Tool TMEB 2, and the SKF Belt Frequency Meter for checking the tension of the belt when the SKF Belt Tension System is initially installed.

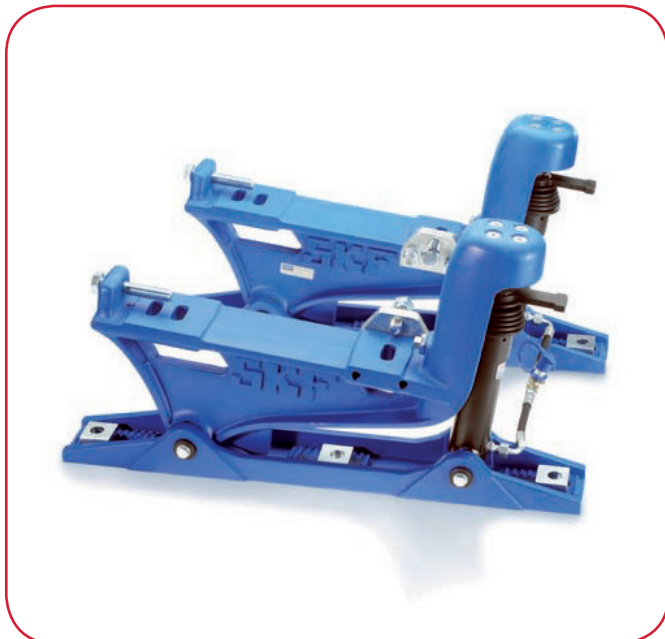
### Selection guide for the SKF Belt Tension System:

Designation	IEC Motor class
PHL 160/180 H1	160 and 180
PHL 200/225 H1	200 and 225
PHL 250/280 H1	250 and 280
PHL 315 H1	315
PHL 355 H1	355
PHL 400 H1	400

In addition several NEMA standard motors can be mounted on the SKF Belt Tension System. In this case, please contact SKF for additional information.

### Various benefits for the belt drive are achieved:

- Alignment is necessary only once, independent from number of belt replacements
- Safe, simple and fast belt replacement
- Reduced costs due to prolonged belt life
- Higher uptime of the whole system due to less time-consuming breakdowns
- Less vibrations and therefore also higher efficiency
- Quick and reliable tension checks
- Easy preventive maintenance
- Assured repeatable maintenance quality





# Belt tools

## SKF Belt Alignment Tool TMEB 2



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

The SKF Belt Alignment Tool, TMEB 2, aligns the pulleys where it counts most – in the grooves. V-guides and powerful magnets allow the TMEB 2 to be fitted in the grooves of the pulley. With only two components, a laser-emitting unit and a receiver unit, the TMEB 2 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. Armed with this precise information, the operator can easily make the appropriate adjustments until the laser line corresponds with the reference line on the receiver unit.

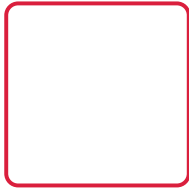
### Pinpoint accuracy with laser technology:

- Aligns grooves of the pulley rather than its face, allowing the alignment of pulleys of unequal width or with dissimilar faces – even fits applications where the pulley face cannot be used as a reference
- No trial and error. The laser position indicates the nature of misalignment allowing easy and accurate adjustment

### Versatile and user-friendly:

- Powerful magnets allow fast and easy attachment
- Easy-to-use, requires no special training to operate
- 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
- Special side adaptor allowing alignment of multi-ribbed and timing belt pulleys as well as chain sprockets is available as accessory
- A maximum operating distance of 6 meters (20 ft) makes it suitable for use in various applications
- Sturdy aluminium housings provide great assembly stability and accuracy





# Shaft alignment tools

TMEA Series

- ▶ ..... Belts
- ▶ ..... Chains
- ▶ ..... Couplings
- ▶ ..... Bushings and Hubs
- ▶ ..... Sprockets
- ▶ ..... Pulleys
- ▶ ..... Smart tools

## Pinpoint accurate alignment simply achieved

The SKF Shaft alignment tools TMEA Series offer you simplicity with a high degree of accuracy. These highly innovative tools feature a three-step process for correcting alignment: Measuring, Aligning and Documenting. First, Measure the machinery's current alignment status.

Then Align the machine vertically and horizontally. Finally, Document and keep track of the alignment activities. These three simple steps allow you to easily and effectively align shafts using laser technology.

- Easy-to-use, three-step process: Measure-Align-Document
- Compact, lightweight design
- Spirit levels allow easy and fast positioning of the measuring units
- Selectable mm or inch reading of measurement facilitates worldwide use
- Supplied in sturdy, lightweight carrying cases for portability
- Supplied with high precision SKF pre-cut shims for accurate alignment

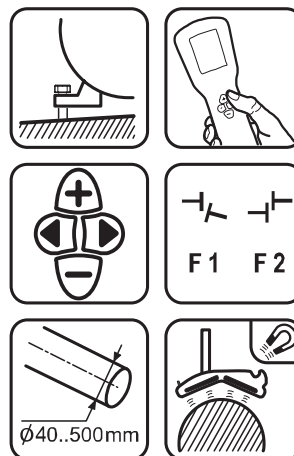


## TMEA 2

### Easy, quick and affordable shaft alignment

The TMEA 2 is an easy-to-use shaft alignment tool, which requires no special training to operate. The two measuring units can be easily attached to the shafts using magnetic brackets or chains. Each measuring unit emits a laser line, which is projected on the detector of the other unit.

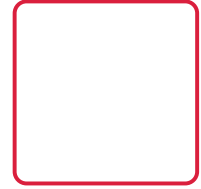
- Display unit simultaneously provides clear 'real-time' coupling and feet values during alignment process making rechecking of the alignment unnecessary
- The laser and scale lines facilitate easy pre-alignment
- "Soft foot" feature easily guides the operator through this function
- Display unit can be held using one hand, freeing the operator to perform the alignment
- Magnetic brackets allow easy fixture of the measuring units onto the shaft
- A set of blank alignment reports to help you keep record of your alignment jobs
- Maximum distance of 0,85 m (2.8 ft) between the measuring units brackets





# Shaft alignment tools

TMEA Series



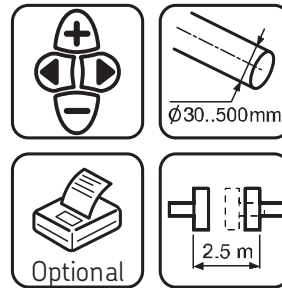
## Shaft alignment tool with printer capability TMEA 1P/2,5

### Record alignment activities using an optional printer

The TMEA 1P/2,5 offers you the advantage of keeping record of the alignment activities. It is equipped with a printer port to which the optional thermal printer TMEA P1 can be connected. The printer provides a clear and complete

alignment report, which can be used to document alignment activities. This user-friendly printer is operated with the touch of a single button on the display unit of the TMEA 1P/2,5.

- Optional printer facilitates recording of alignment activities
- Maximum distance of 2,5 m (8.2 ft) between the measuring units makes it suitable for aligning variety of applications
- Display unit provides clear 'real-time' values during the alignment process making rechecking alignment unnecessary
- User-friendly display unit with only four buttons for operation
- Supplied with blank alignment reports for recording alignment activities in case the printer is not purchased



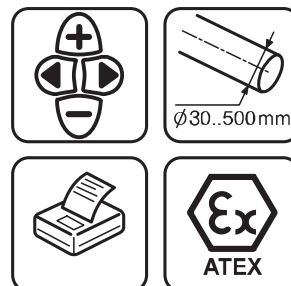
## Intrinsically Safe Shaft Alignment Tool TMEA 1PEX

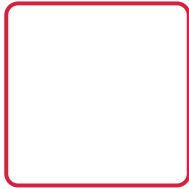
### Accurate alignment in explosive hazardous areas

The TMEA 1PEX is an intrinsically safe (Ex) shaft alignment tool, especially designed for use in potentially explosive hazardous areas. It has been tested and certified according to the latest ATEX standards in intrinsic safety

zones generally found in industries such as the petrochemical, gas and pharmaceutical among others. The TMEA 1PEX is supplied standard with a thermal printer for recording alignment activities.

- Intrinsically safe classification ATEX code: II 2 G, EEx ib IIC T4, at ambient temperature range of 0 to 40 °C (32 to 104 °F) EC Type Examination Certificate Nemko03ATEX101X
- Standard printer facilitates recording of alignment activities
- Maximum distance of 1 m (3 ft) between the measuring units makes it suitable for aligning a variety of applications
- Display unit provides clear 'real-time' values during the alignment process making rechecking alignment unnecessary
- User-friendly display unit with only five buttons for operation





# Shaft alignment tools

TMEA Series

- ▶ ..... Belts
- ▶ ..... Chains
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## Thermal printer TMEA 1P

### Keep track of alignment jobs

This compact thermal printer helps you to document your alignment jobs. A clear and complete printout of the measurement data shows that the machine has been properly aligned within the allowed tolerances.

- Compact easy-to-use printer
- Clear easy-to-read printout
- Pre-alignment and post-alignment reports possible
- Battery is rechargeable
- Continental European adaptor included
- Printer uses standard thermal paper roll (120 mm x 20 m) / (4.4 in x 65 ft)
- Can be used in combination with TMEA 1P/2,5 and TMEA 1PEX only

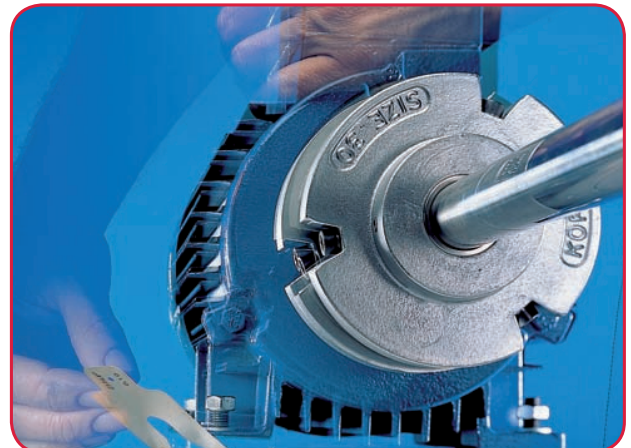


## Machinery Shims TMAS series

### For accurate vertical machinery alignment

Accurate machine adjustment is an essential element of any alignment process. SKF single slot pre-cut shims are available in five different dimensions and in ten different thicknesses.

- 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





# Shaft alignment tools

TMAS shim kits

## Contents TMAS Shim Kits

### TMAS 340

Thickness (mm)	0.05	0.10	0.20	0.25	0.40	0.50	0.70	1.00	2.00
<b>Size (mm)</b>	<b>Quantities:</b>								
100x100	20	20	20	20	20	20	20	20	10
125x125	20	20	20	20	20	20	20	20	10

### TMAS 360

Thickness (mm)	0.05	0.10	0.25	0.5	1.00	2.00
<b>Size (mm)</b>	<b>Quantities:</b>					
50x50	20	20	20	20	20	20
75x75	20	20	20	20	20	20
100x100	20	20	20	20	20	20

### TMAS 510

Thickness (mm)	0.05	0.10	0.20	0.25	0.40	0.50	0.70	1.00	2.00
<b>Size (mm)</b>	<b>Quantities:</b>								
50x50	20	20	20	20	20	20	20	20	10
75x75	20	20	20	20	20	20	20	20	10
100x100	20	20	20	20	20	20	20	20	10

### TMAS 720

Thickness (mm)	0.05	0.10	0.20	0.25	0.40	0.50	0.70	1.00	2.00
<b>Size (mm)</b>	<b>Quantities:</b>								
50x50	20	20	20	20	20	20	20	20	20
75x75	20	20	20	20	20	20	20	20	20
100x100	20	20	20	20	20	20	20	20	20
125x125	20	20	20	20	20	20	20	20	20



TMAS 340



TMAS 360

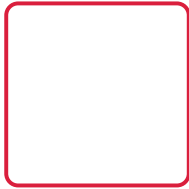


TMAS 510



TMAS 720





# Inspection tool

## Stroboscope TMRS 1

- ▶ ..... Belts
- ▶ ..... Chains
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### Easy, cost effective inspection in a flash

The SKF TMRS 1 is a portable, easy-to-use stroboscope that allows the motion of rotating or reciprocating machinery to appear frozen, facilitating inspection without stopping the machine. Equipped with a phase shift feature that allows the user to advance or retard the flash timing without changing the flash rate, the motion can be 'frozen' at the position required for inspection.

- The bright flash allows better illumination of the application at a distance, giving a wider viewing area.
- Flash rates of up to 12,500 flashes per minute (FPM) cover a wide range of applications
- Flash rate is quick and easy to adjust using the variable dial rate. Allowing the required speed to be reached within a matter of seconds
- Phase shift mode for optimum inspection of gears, rolls, fans, pulleys. The feature of interest can be rotated to the correct position for inspection
- x2, 1/2 buttons for quick adjustment of FPM
- Easy to read LCD display
- Compact design, one-hand operated instrument
- Battery powered with long running time per charge (up to 2.5 hrs)
- Includes universal AC adaptor that can be used worldwide
- Extra flashtube supplied to minimise downtime of unit
- Supplied in carrying case for protection and portability
- Mounting thread on the underside allows mounting on a tripod for stability and ease of use



### Technical data

Designation	TMRS 1
Flash rate range	40-12,500 flashes per minute (FPM)
Flash rate accuracy	+/- 0.5 FPM or +/- 0.01% of reading, whichever is greater
Flash setting resolution	100 to 9999 FPM - 0.1FPM, 10,000 to 12,500 FPM -1FPM
Tachometer range	40 - 59,000 RPM
Tachometer accuracy	+/- 0.5 RPM or +/- 0.01% of reading, whichever is greater
Flash tube	Xenon, 10W, TMRS 1-BULB
Flash tube life	100 million flashes
Flash duration	9-15 sec
Light power	154 mJ per flash
Battery type	NiMH, rechargeable, removable
Battery capacity	2.6 AmpHr
Battery charge time	2-4 hours, using supplied AC adaptor
Run time per charge	2.5 hours at 1600 FPM, 1.25 hours at 3200 FPM
Battery charger AC input	100-240 VAC, 50/60 Hz
Display	8 character by 2 line LCD, alphanumeric
Display update	continuous
Display resolution	100 to 9999 FPM - 0.1FPM, 10,000 to 12,500 FPM -1FPM
Time base	Crystal oscillator, 100 ppm accuracy
Controls	Power, x 2, x1/2, phase shift, external trigger
External trigger input	0-5V TTL type via stereo phono jack
EXTL. trigger to flash delay	5 sec maximum
Clock output 0-5V TTL	Type signal via stereo phono jack
Colour	Grey
Housing	Impact & oil resistant polycarbonate
Weight	650 g / 1 lb, 4 oz.
Operating temperature	10 °C to 40 °C (50 °F to 104 °F)
Storage temperature	-20 °C to 45 °C (-4 °F to 113 °F)



# The knowledge



© Airbus – photo: exm company, H. Goussé

From the company that invented the selfaligning ball bearing 100 years ago, SKF has evolved into a knowledge engineering company that is able to draw on five platforms to create unique solutions for its customers. These platforms include bearings, bearing units and seals, of course, but extend to other areas including: lubricants and lubrication systems, critical for long bearing life in many applications; mechatronics that combine mechanical and electronics knowledge into systems for more effective linear motion and sensorized solutions; and a full range of services, from design and logistics support to conditioning monitoring and reliability systems. Though the scope has broadened, SKF continues to maintain the world's leadership in the design, manufacture and marketing of rolling bearings, as well as complementary products such as radial seals. SKF also holds an increasingly important position in the market for linear motion products, high-precision aerospace bearings, machine tool spindles and plant maintenance services.

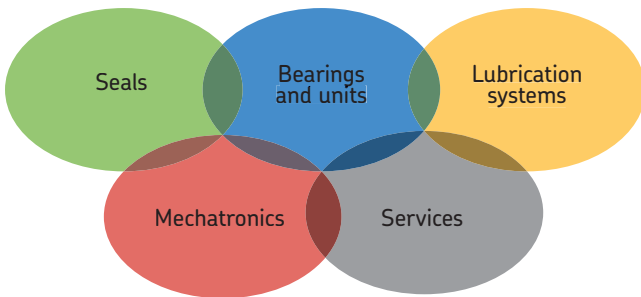
The SKF Group has global ISO 14001 environmental certification. Individual divisions have been approved for quality certification in accordance with either ISO 9000 or QS 9000. With some 100 manufacturing sites worldwide and sales companies in 70 countries, SKF is a truly international corporation. In addition, our distributors and dealers in some 15 000 locations around the world, an ebusiness marketplace and a global distribution system put SKF close to customers for the supply of both products and services. In essence, SKF solutions are available wherever and whenever customers need them. Overall, the SKF brand and the corporation are stronger than ever. As the knowledge engineering company, we stand ready to serve you with worldclass product competencies, intellectual resources, and the vision to help you succeed.

## ***Evolving by-wire technology***

*SKF has a unique expertise in fast-growing by-wire technology, from fly-by-wire, to drive-by-wire, to work-by-wire. SKF pioneered practical fly-by-wire technology and is a close working partner with all aerospace industry leaders. As an example, virtually all aircraft of the Airbus design use SKF by-wire systems for cockpit flight control.*

*SKF is also a leader in automotive by-wire technology, and has partnered with automotive engineers to develop two concept cars, which employ SKF mechatronics for steering and braking.*

*Further by-wire development has led SKF to produce an allelectric forklift truck, which uses mechatronics rather than hydraulics for all controls.*



# engineering company



## **Harnessing wind power**

The growing industry of wind-generated electric power provides a source of clean, green electricity. SKF is working closely with global industry leaders to develop efficient and trouble-free turbines, providing a wide range of large, highly specialized bearings and condition monitoring systems to extend equipment life of wind farms located in even the most remote and inhospitable environments



## **Working in extreme environments**

In frigid winters, especially in northern countries, extreme sub-zero temperatures can cause bearings in railway axleboxes to seize due to lubrication starvation. SKF created a new family of synthetic lubricants formulated to retain their lubrication viscosity even at these extreme temperatures. SKF knowledge enables manufacturers and end user customers to overcome the performance issues resulting from extreme temperatures, whether hot or cold. For example, SKF products are at work in diverse environments such as baking ovens and instant freezing in food processing plants.



## **Developing a cleaner cleaner**

The electric motor and its bearings are the heart of many household appliances. SKF works closely with appliance manufacturers to improve their products' performance, cut costs, reduce weight, and reduce energy consumption. A recent example of this cooperation is a new generation of vacuum cleaners with substantially more suction. SKF knowledge in the area of small bearing technology is also applied to manufacturers of power tools and office equipment.



## **Maintaining a 350 km/h R&D lab**

In addition to SKF's renowned research and development facilities in Europe and the United States, Formula One car racing provides a unique environment for SKF to push the limits of bearing technology. For over 50 years, SKF products, engineering and knowledge have helped make Scuderia Ferrari a formidable force in F1 racing.

(The average racing Ferrari utilizes more than 150 SKF components.)

Lessons learned here are applied to the products we provide to automakers and the aftermarket worldwide.



## **Delivering Asset Efficiency Optimization**

Through SKF Reliability Systems, SKF provides a comprehensive range of asset efficiency products and services, from condition monitoring hardware and software to maintenance strategies, engineering assistance and machine reliability programmes. To optimize efficiency and boost productivity, some industrial facilities opt for an Integrated Maintenance Solution, in which SKF delivers all services under one fixed-fee, performance-based contract.



## **Planning for sustainable growth**

By their very nature, bearings make a positive contribution to the natural environment, enabling machinery to operate more efficiently, consume less power, and require less lubrication. By raising the performance bar for our own products, SKF is enabling a new generation of high-efficiency products and equipment. With an eye to the future and the world we will leave to our children, the SKF Group policy on environment, health and safety, as well as the manufacturing techniques, are planned and implemented to help protect and preserve the earth's limited natural resources. We remain committed to sustainable, environmentally responsible growth.