

FAG Alignment Tools Top-Laser: SMARTY · INLINE · SHIMS

Technical Information

Top-Laser SMARTY

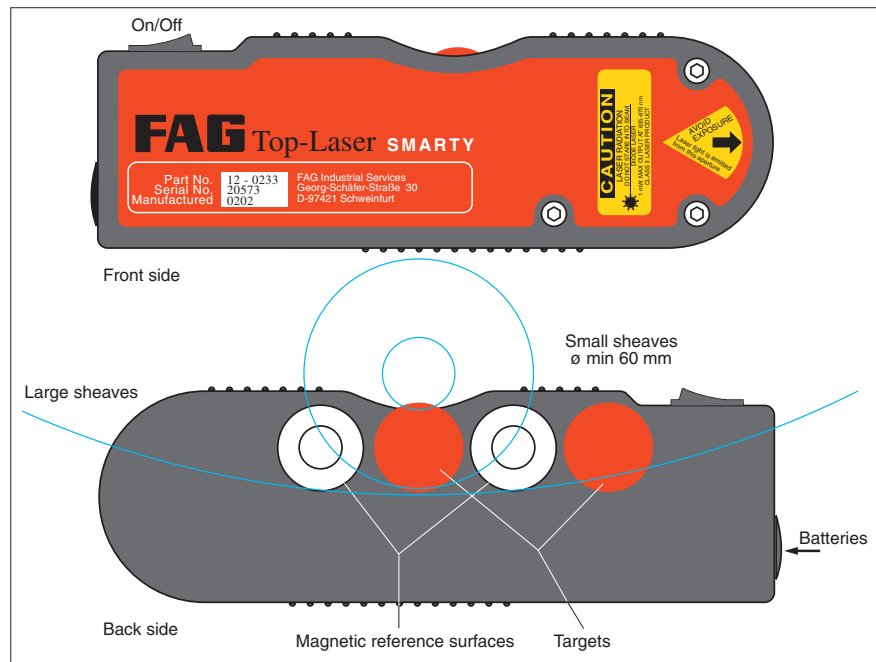
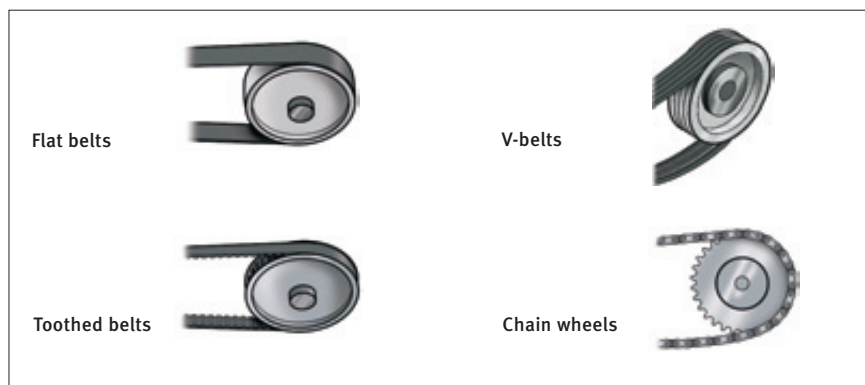
Features and advantages · Main applications · Types of misalignment

Top-laser SMARTY is a cost effective measuring instrument for aligning belt pulleys and chain wheels. SMARTY can make your preventive maintenance far easier. Alignment with SMARTY means “good vibrations” since their levels are low and wear suffered by belts, belt pulleys, bearings and seals is far less. This means a longer service life and greater reliability of machines and plants, lower energy cost and, all in all, greater cost effectiveness.

Features and advantages

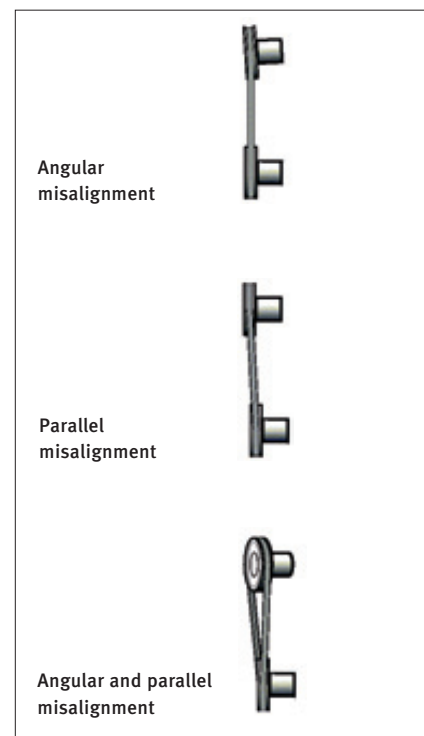
- Shows parallel and angular misalignment between the two pulleys.
- Works considerably faster and more accurately than other, conventional methods.
- Suitable both for horizontally and vertically mounted machines.
- Alignment can be done by a single operator.
- System is also suitable for non-magnetic wheels or pulleys.

Main applications



Instrument layout

Types of misalignment



Top-Laser SMARTY

Easy to use

Easy to use

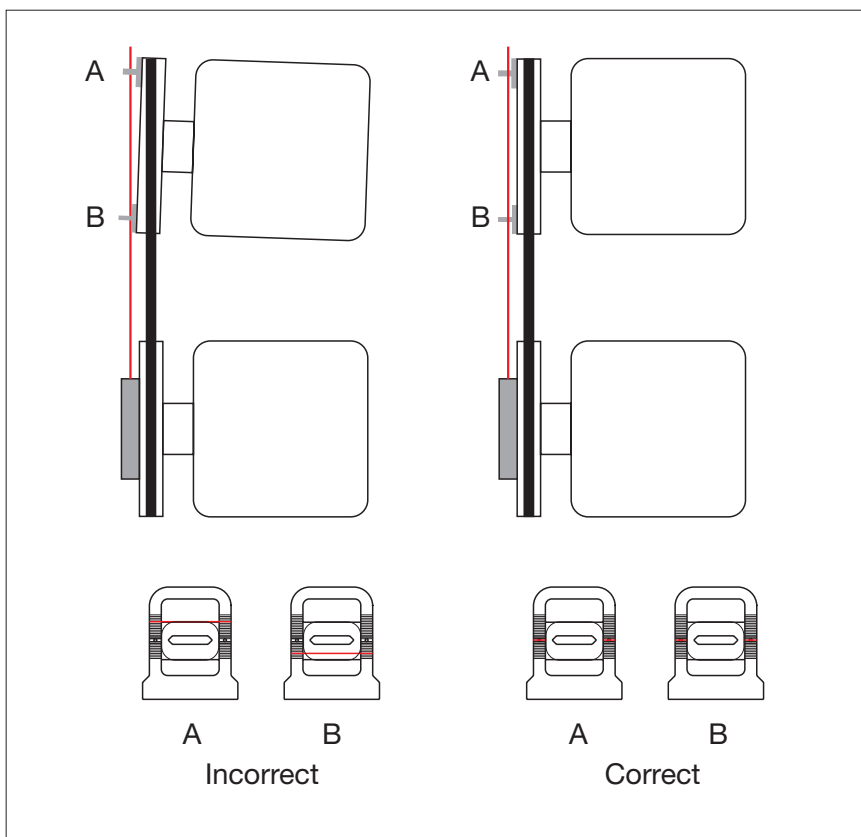
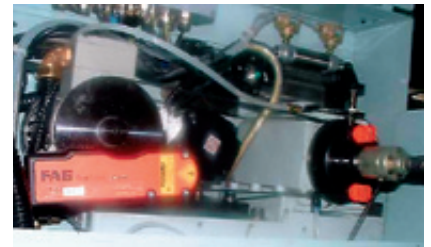
The measuring instrument can be mounted in a few seconds. The laser line can be seen clearly on the targets. Your machine is correctly aligned when the laser line is adjusted to match the slots in the targets. It couldn't be easier!

Aluminium disks

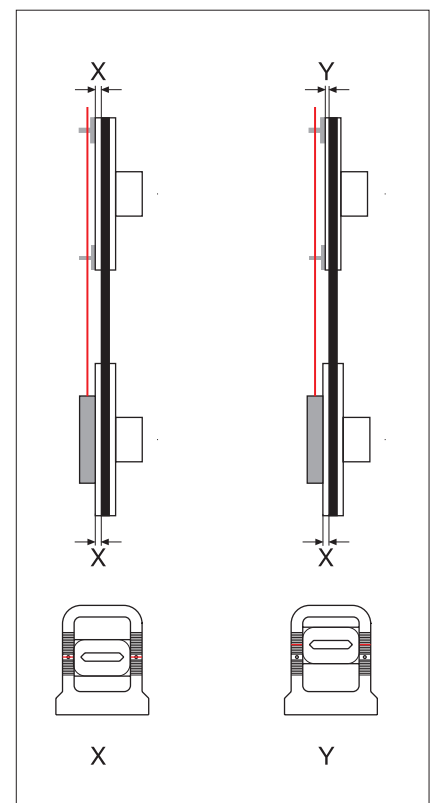
The measuring instrument weighs so little that the emitter and the targets can be attached to nonmagnetic drive pulleys with a strong, double-sided adhesive tape.

Laser beam adjustment

The laser beam emitted by the measuring instrument is adjusted parallel to the measuring instrument's attachment magnets. If any deviation is detected, the operator on site can check on a level surface and readjust if necessary.



Example: alignment of a belt drive



When aligning pulleys of different widths, adjust the marks in the targets

Top-Laser SMARTY

Technical data · Order designation · Spare part

Technical data

Laser emitter

Pulleys	diameters of 60 or more
Laser beam angle	78°
Laser class	2
Measuring distance	10 m
Batteries	2xR6 (AA) 1.5 V
Battery operation	24 h continuous
Output power	<1 mW
Laser wavelength	635...670 nm
Housing	ABS plastic
Dimensions	
WxHxD	188 x 60 x 28 mm
Mass	0.3 kg

Targets 2 magnetic targets

Measuring accuracy better than 0.5 mm or 0.2° *)

*) As a general rule, the deviation (depending on the belt type) should be less than 0.25° [4.4 mm/m]

Spare part

1 magnetic target
LASER.SMARTY.TARGET



Order designation

Laser measuring instrument, complete, including 2 targets, 2 batteries and operating manual, in a padded case

LASER.SMARTY

Caution

Do not look into the laser beam. Do not direct the laser beam into other persons' eyes.



Top-Laser INLINE

Advantages · Application · Scope of delivery · Order designation

Top-laser INLINE

More than half of all unplanned shutdowns are due to misalignment and imbalance. These problems can also arise with flexible couplings. The new PC-based shaft alignment system FAG Top-Laser INLINE enables you to align coupled shafts accurately, significantly increasing your machine availability.

Advantages

- easy to mount
- yields correct results - even if used by untrained personnel - due to an automatic measuring and positioning method
- more accurate alignment than with conventional methods (e.g. dial gauge and straight edge)
- fast measurement using the "continuous sweep" method (continuous rotary motion/patented method); a 70° rotation is sufficient to perform a measurement (any position and sense of rotation)
- optimised measurements using "single beam technology" (laser beam is reflected)
- helps reduce vibration and friction losses
- increases your productivity due to longer machine running times
- significantly reduced energy consumption
- can be used on any modern laptop
- can be used in combination with an FAG Bearing Analyser

Application

FAG Top-Laser INLINE is suitable for aligning coupled shafts in

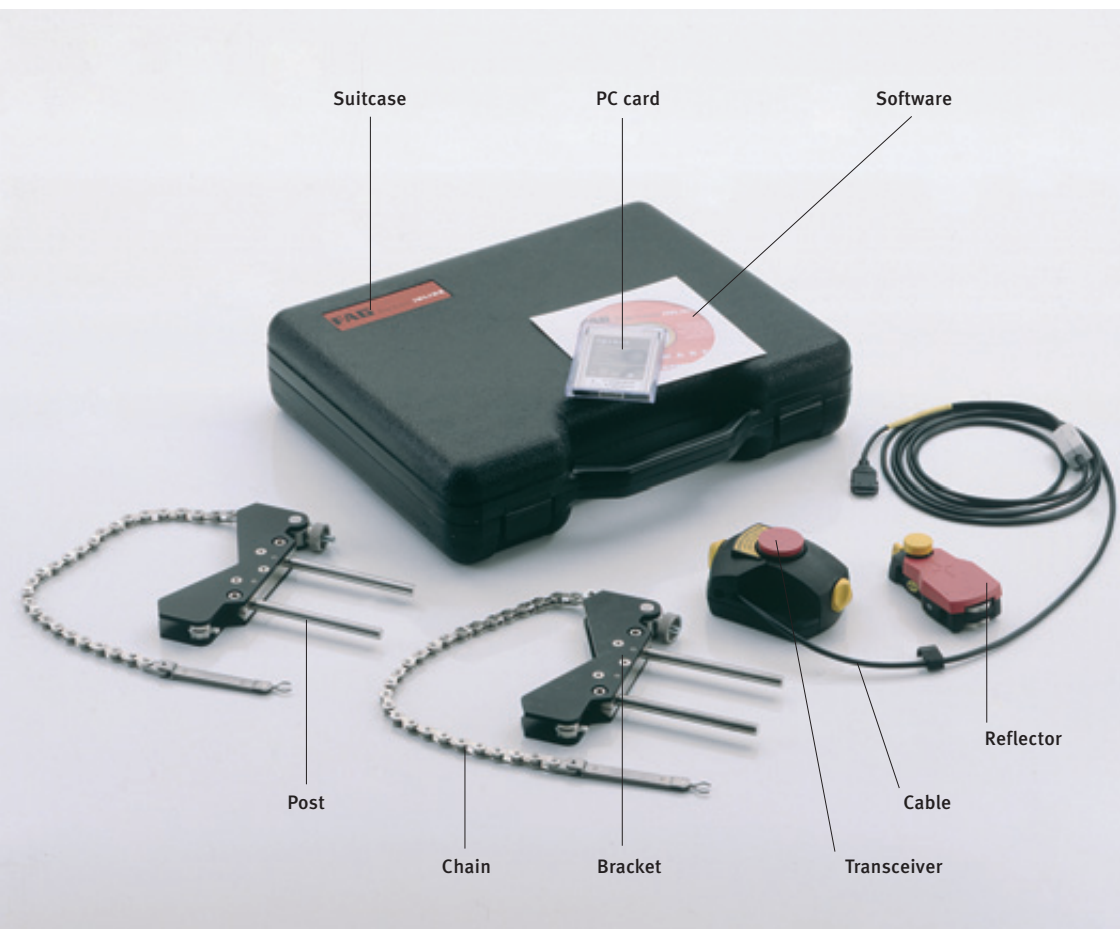
- motors
- pumps
- fans
- gear boxes (with rolling bearings)

Scope of delivery

- 1 transceiver (incl. a 3-meter cable)
- 1 reflector
- 2 brackets
- 2 chains (300 mm)
- 4 posts (115 mm)
- 1 software (manual, help CD)
- 1 case
- 1 serial PC card

Order designation

(Top-Laser INLINE, complete):
LASER.INLINE



Top-Laser INLINE

Accessories

Accessories

The extensive range of accessories increases the range of application of the basic LASER.INLINE device. The accessories can be ordered both as a set in a handy, sturdy suitcase and individually.

Accessories		
Accessories for LASER.INLINE devices	Scope of delivery	Order designation
Accessories set, complete	1 pc.	LASER.INLINE.ACCESS.SET
Chain, 600 mm long	2 pcs.	LASER.INLINE.CHAIN600
Chain, 1500 mm long	2 pcs.	LASER.INLINE.CHAIN1500
Post, 150 mm long	4 pcs.	LASER.INLINE.POST150
Post, 200 mm long	4 pcs.	LASER.INLINE.POST200
Post, 250 mm long	4 pcs.	LASER.INLINE.POST250
Post, 300 mm long	4 pcs.	LASER.INLINE.POST300
Magnetic fixing devices	2 pcs.	LASER.INLINE.MAGNET
Accessories suitcase, empty	1 pc.	LASER.INLINE.ACCESS.SUITCASE

Chains

For mounting the brackets on shafts

- 600 mm long for shaft diameters of up to 200 mm
- 1500 mm long for shaft diameters of up to 500 mm



Posts

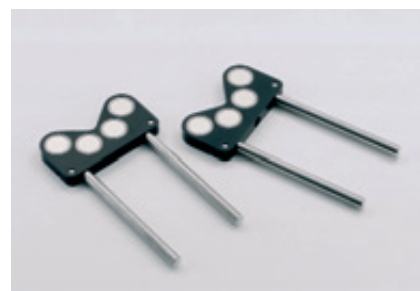
For mounting components of the measuring system onto the tensioning system

- 150 mm long
- 200 mm long
- 250 mm long
- 300 mm long



Magnetic fixing devices

For fast mounting and fine adjustment of the components of the measuring system at narrow coupling flanges



Top-Laser INLINE

Spare parts

Transceiver

Compact, robust transmitter/receiver unit for a visible laser beam (red)

Order designation:
LASER.INLINE.TRANS

Cable

For supplying power to the transceiver and exchanging data with the control unit

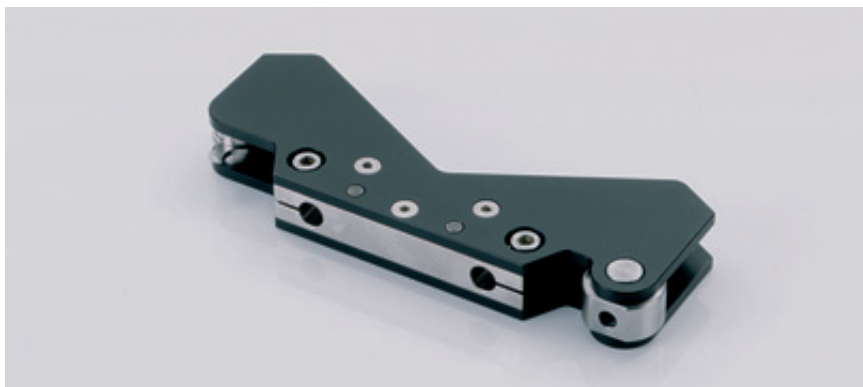
Order designation:
LASER.INLINE.CABLE



Reflector

Roof prism with a compact housing, can be mounted onto the tensioning system by actuating its lever

Order designation:
LASER.INLINE.REFL



Brackets

Base element of the compact chain tensioning system

Order designation:
LASER.INLINE.BRACKET

2 chains, 300 mm long

for shaft diameters of up to 100 mm
for mounting the brackets on shafts

Order designation:
LASER.INLINE.CHAIN300



Top-Laser INLINE

Spare parts

4 posts, 115 mm long

for mounting components of the measuring system onto the tensioning system

Order designation:
LASER.INLINE.POST115



Software

Windows compatible PC program for saving machine dimensions and alignment conditions, for analysing and printing the results.

Order designation:
LASER.INLINE.SOFTWARE



Suitcase

Black plastic suitcase with a foam insert that protects the device from shocks during transport

Order designation:
LASER.INLINE.SUITCASE



PC Card (type II)

is inserted into the PC to connect the Top-Laser INLINE

Order designation:
LASER.INLINE.PCCARD

Top-Laser INLINE

Easy to use

Easy to use

Mount the chain tensioning system at the same angle on both sides of the shaft coupling.

Attach transceiver on the side of the shaft coupling that was defined as stationary (pump, fan).

Mount reflector on the side of the shaft coupling that was defined as mobile (motor).

Connect transceiver to the PC card, insert card into the laptop. The Top-Laser INLINE software will start automatically.

DIM – Enter three machine dimensions, see example “Entering the coupling data”.

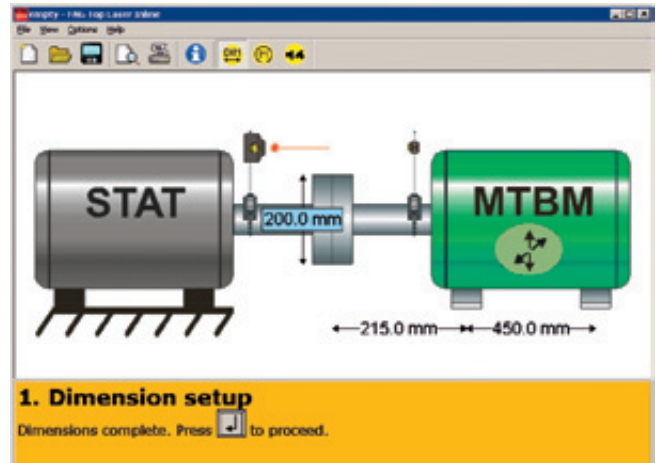
M – Enter the position of transceiver and reflector relative to the coupling.

The laser beam will be focused on the screen in accordance with instructions, see example “Scan”.

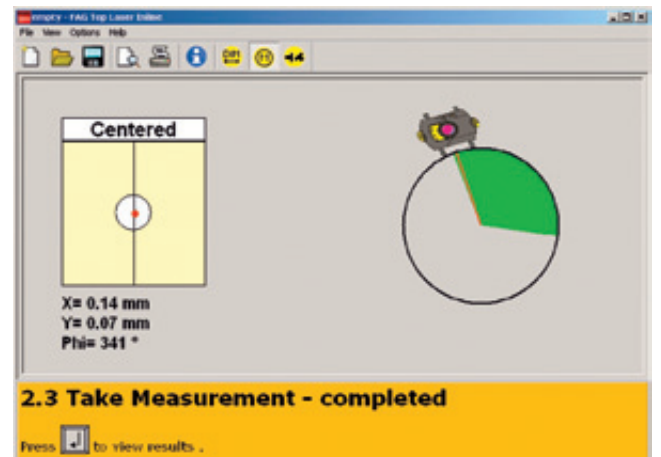
The deviations in the horizontal and vertical direction are measured by rotating the coupled shaft by at least 70° (any direction).

Erg – The system then shows the amounts in mm (inch) by which the front or rear feet must be adjusted upward or downward (by inserting or removing Top-Laser SHIMS, see page 10). The shaft can be aligned horizontally by moving the feet (animation).

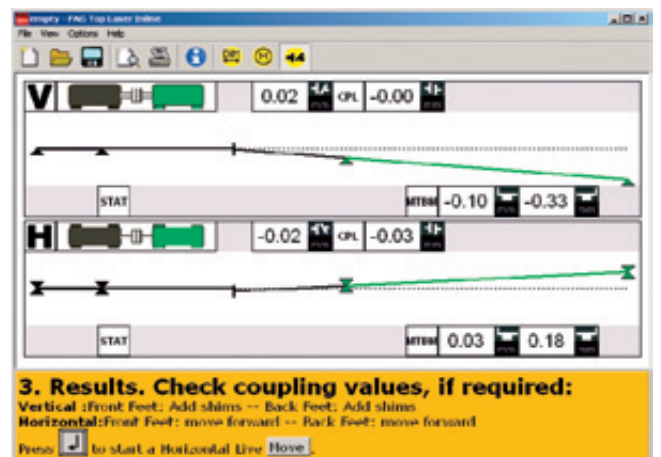
Finally, the correct alignment is checked by means of a check measurement.



Entering the coupling data



Scan



Measuring results

Top-Laser INLINE

Technical data

Technical data

Transceiver

Measurement method:	coaxial, reflected laser beam	
System of protection:	IP67 (dustproof, waterproof – temporary immersion)	
Protection from ambient light:	yes	
Storage temperature:	-20 to +80°C	-4 to +176°F
Operating temperature:	0 to 55°C	32 to 131°F
Dimensions (W x H x D)	ca. 107 x 70 x 49 mm	ca. 4.213 x 2.756 x 1.929 in
Mass:	ca. 177 g	ca. 0.39 lbs

Laser (Ga-Al-As semiconductor laser)

Wavelength (typical):	670 nm (red, visible)
Laser class:	2; FDA 21CFR 1000 & 1040
Radiation power:	<1 mW
Safety precautions:	Do not look into the laser beam!
Interface:	Serial I/O PCMCIA card, type II

Detector

Measurement range:	±4 mm	±0.157 in
Resolution:	1 µm	
Accuracy:	better than 2%	

Inclinometer

Measurement range:	0 to 360°
Resolution	>1°

Reflector

Type:	90° roof prism	
System of protection:	IP67 (dustproof, waterproof – temporary immersion)	
Accuracy:	better than 1%	
Storage temperature:	-20 to +80°C	-4 to +176°F
Operating temperature:	-20 to +60°C	-4 to +140°F
Dimensions (WxHxD):	ca. 100 x 41 x 35 mm	ca. 3.937 x 1.614 x 1.378 in
Mass:	ca. 65 g	ca. 0.143 lbs

Carrying case

Material:	Standard ABS, black, drop tested (2m)	
Dimensions (W x H x D):	ca. 470 x 400 x 195 mm	ca. 18.503 x 15.748 x 7.677 in
Mass (incl. standard components):	ca. 6.8 kg	ca. 15 lbs

Range of application

Shaft diameters:	min. 12 mm; max. (incl. accessories) 500 mm min. 0.472 in; max. 19.685 in	
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Top-Laser SHIMS

Shims for correcting misalignments

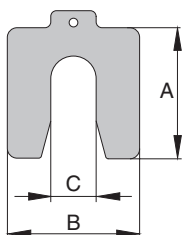
Top-Laser SHIMS

Vertical misalignments detected with the FAG Top-Laser devices can be corrected by means of FAG Top-Laser SHIMS. These shims are available in six thicknesses (0.05; 0.10; 0.20; 0.50; 0.70; 1.00 mm) and three sizes (C = 15, 23 or 32 mm).

Scope of delivery (one set)

- Complete case containing **20** shims each in 3 sizes and 6 thicknesses, i.e. a total of **360** shims plus an extraction hook.

Order designation:
LASER.SHIMS.SET



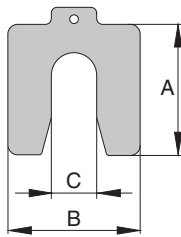
Top-Laser SHIMS set

Order designation Set FAG	Dimensions			Total number of shims	Mass kg
	A mm	B	C		
LASER.SHIMS.SET (20 shims each in 3 sizes and 6 thick- nesses, in a case)	55	50	15	360	6.7
	75	70	23		
	90	80	32		

Top-Laser SHIMS

Spare parts · Accessories

Spare parts



Order example (spare parts)

10 shims, C = 15 mm, 0.20 mm thick:
LASER.SHIMS15.0,20

Top-Laser SHIMS spare parts						
Order designation	Dimensions			Total number of shims	Mass of shims	g
	A	B	C			
FAG	mm					
LASER.SHIMS15.0,05	55	50	15	10		11
LASER.SHIMS15.0,10	55	50	15	10		22
LASER.SHIMS15.0,20	55	50	15	10		44
LASER.SHIMS15.0,50	55	50	15	10		110
LASER.SHIMS15.0,70	55	50	15	10		155
LASER.SHIMS15.1,00	55	50	15	10		220
(optionally, LASER.SHIMS15.2,00)						
LASER.SHIMS23.0,05	75	70	23	10		21
LASER.SHIMS23.0,10	75	70	23	10		42
LASER.SHIMS23.0,20	75	70	23	10		84
LASER.SHIMS23.0,50	75	70	23	10		210
LASER.SHIMS23.0,70	75	70	23	10		295
LASER.SHIMS23.1,00	75	70	23	10		420
(optionally, LASER.SHIMS23.2,00)						
LASER.SHIMS32.0,05	90	80	32	10		29
LASER.SHIMS32.0,10	90	80	32	10		58
LASER.SHIMS32.0,20	90	80	32	10		115
LASER.SHIMS32.0,50	90	80	32	10		290
LASER.SHIMS32.0,70	90	80	32	10		410
LASER.SHIMS32.1,00	90	80	32	10		580
(optionally, LASER.SHIMS32.2,00)						

Accessories

Order example (accessories)

10 shims, C = 44 mm, 0.10 mm thick:
LASER.SHIMS44.0,10

Top-Laser SHIMS accessories						
Order designation	Dimensions			Total number of shims	Mass of shims	g
	A	B	C			
FAG	mm					
LASER.SHIMS44.0,05	125	105	44	10		53
LASER.SHIMS44.0,10	125	105	44	10		105
LASER.SHIMS44.0,20	125	105	44	10		210
LASER.SHIMS44.0,50	125	105	44	10		530
LASER.SHIMS44.0,70	125	105	44	10		740
LASER.SHIMS44.1,00	125	105	44	10		1050
(optionally, LASER.SHIMS44.2,00)						

Notes

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