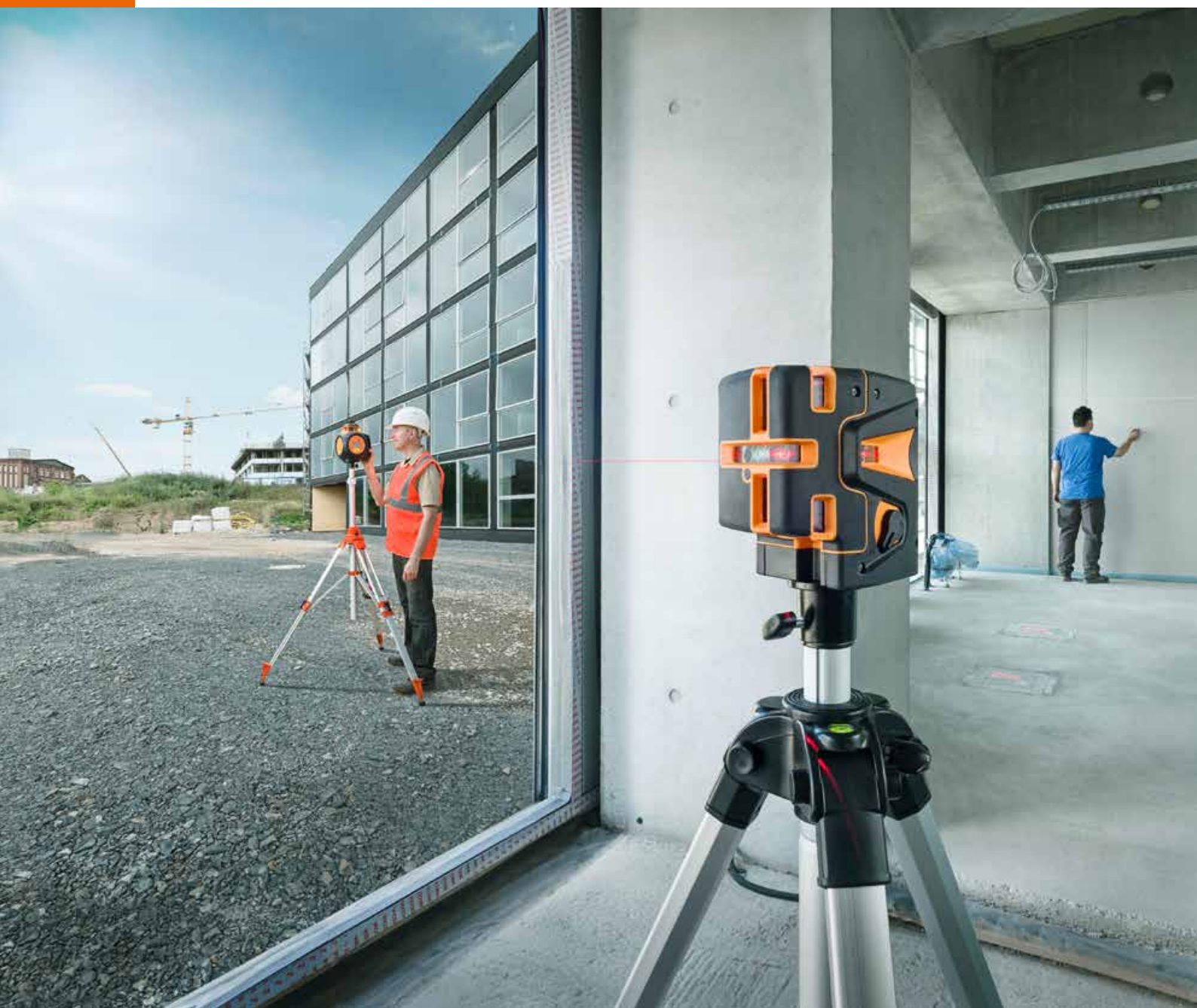


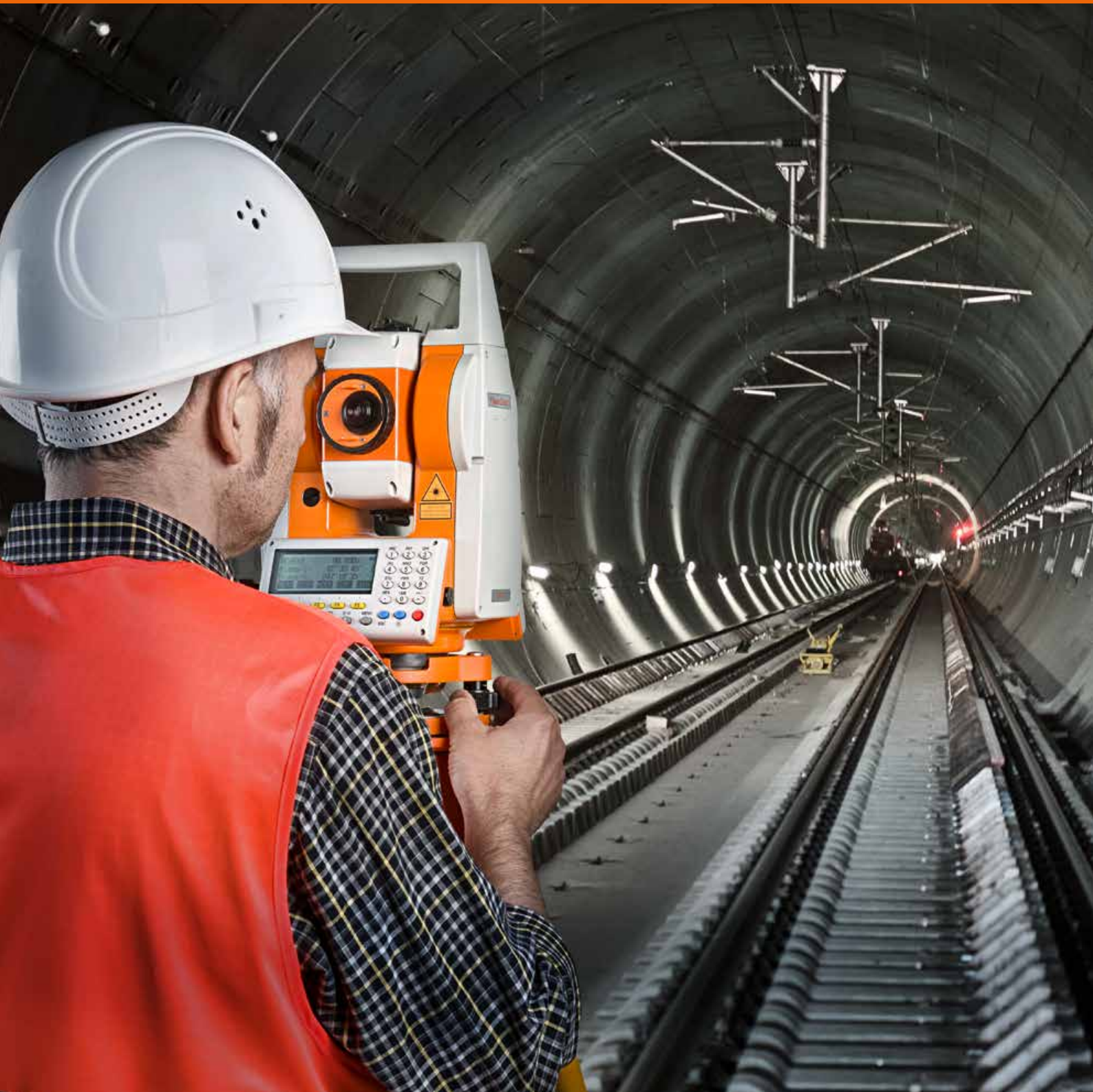


Catalogue  
**2016**

Laser Measuring Tools  
Surveying Equipment  
Environmental Measuring Instruments



## **Benchmark for measuring.** Laser measuring tools and surveying equipment supplied by geo-FENNEL.







## geo-FENNEL – a valued name in the world of surveying.

- » Located in Hesse, Germany we are a mid-sized company which has gained a good reputation as a supplier for laser measuring technology and surveying equipment. Today we are in the front row when users ask for laser measuring devices. Our products are recognised all over the world and we currently deliver them to more than 70 countries worldwide. Our indispensable company philosophy is to provide our customers with innovative, precise and reliable products and to offer first class service. High quality, a good and fair price-performance ratio as well as fast delivery count among our principles. Our cooperative partnership with our customers is essential for us and our international orientation is a main strategy.

**Our extensive experience has convinced customers, for many years.**

## Our product range

- » Our product range includes:

Laser Surveying Instruments

- Rotating Lasers
- Cross and Line Lasers
- Pipe Lasers
- Laser Distance Meters

Classic Surveying Instruments

- Automatic Levels
- Theodolites
- Total stations
- GPS Systems

Ancillary Products

Measuring Instruments

Environmental Measuring Equipment

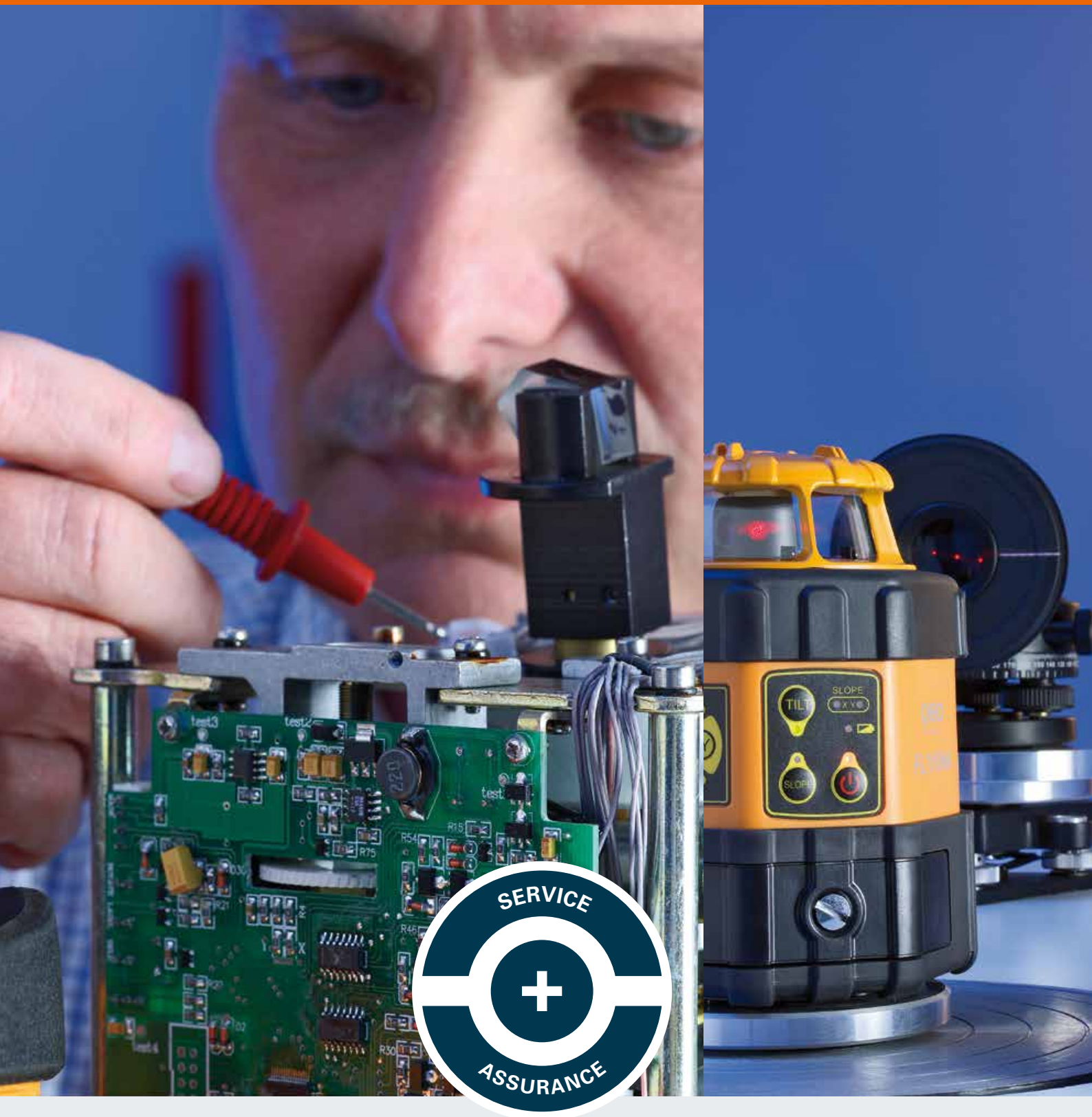
## Our quality standard

- » geo-FENNEL instruments are tested and calibrated using tools and equipment traceable through DKD\* accreditation back to national standards. These test procedures conform to DIN ISO standards.

\*DKD = German Calibration Office

**DKD**

**Quality that is measurable.**  
Enhanced by our commitment  
to service and support.







## Service is our pledge.

- » Many can sell but only a few can back this up with professional advice and extensive service facilities. At geo-FENNEL, our products and services are available at all times, home and abroad and our fully trained personnel are ready to support you with advice at any time. Whether you have questions concerning application, technology or sales we are committed to provide the assistance you require.

State-of-the-art manufacturing technology, the care and continuous training of our employees and our efficient work ethic guarantee you a consistent high level of after sales service. Should a repair become necessary, our repair and spare part departments are ready to help – this applies to our complete product range.

## Guaranteed First Class.

- » We strive to provide the user measuring instruments that offer all the advantages which characterize geo-FENNEL products: easy-to-use, cost effective, accurate measuring performance under almost all conditions with the highest reliability. We offer 2 years guarantee on all products.

However, in the unlikely event that a problem should occur, simply contact your dealer. He will ensure that the product is quickly restored to full working order, or will replace it with a new one.

Quick and easy.

# Tasks

















## Outline of products

» Here you will find fields of application of the instruments for various trades. This outline will give you support to find the ideal tool for your task. These are examples only. Of course, there are many additional fields of application for many other professional groups.

# Tasks

## Outline of products

» Here you will find fields of application of the instruments for various trades. This outline will give you support to find the ideal tool for your task. These are examples only. Of course, there are many additional fields of application for many other professional groups.

TRADE	TASK														
		Excavation	Floor covering	Electrical			Floor laying	Tiling		Windows, doors	Pre-fabricated construction	Ground works	Glazing	Landscape gardening	
Line Laser			■	■				■							
Point Laser					■										
Point and Line Laser			■	■	■			■		■			■		
Line Laser horizontal				■			■						■	■	
Cross Laser Starter			■	■			■	■		■			■		
Cross Laser Professional			■	■	■		■	■		■			■		
Cross Laser with receiver			■	■	■		■	■		■			■		
Horizontal Laser		■					■			■	■			■	
Dual Grade Laser horizontal		■									■			■	
Dual Grade Laser horizontal / vertical		■								■	■			■	
Horizontal and Vertical Laser				■	■		■	■		■	■	■	■	■	
Pipe Laser												■			
Theodolite											■	■			
Automatic Level		■									■	■			
Laser Distance Meter			■			■	■		■	■			■		
Inclinometers			■	■		■		■	■	■			■		



[illegible]





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THE SUBTLE DIFFERENCE:

# SOMETIMES YOU DON'T NOTICE IT.

Continuous innovation and precision, geo-FENNEL offers a measurably high quality product for all applications. Whether on a construction site or in a residential development, exterior or interior – you can always rely on our latest measuring technology to achieve precise results. To that end, we continue to develop our products. Straight from the start you are aware of the quality and innovation integral to geo-FENNEL products.







ALWAYS IN MOTION:

## THE CROSS LINE LASER THAT ROTATES.

The FL 80Tracking SP from the Selection PRO series is very convincing with its unique performance characteristics. With its tracking function for automatic axis alignment it is significantly superior when compared to other devices within its comparable category. During alignment, the nearest vertical line is automatically centred onto the zero-point of the receiver. Eliminating the tedious and inaccurate manual alignment process which is finally a thing of the past. You can now concentrate on what is essential: the measurement result.





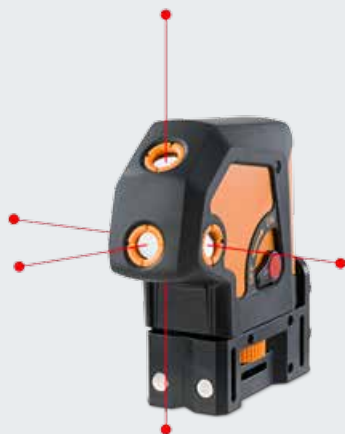


## Geo3P 3-Point Laser Plumb up and down

- » **Self-levelling laser plummet for easy plumbing from floor to ceiling. 3 Laser points at right angles.**
- » Compact and handy size.  
Shock-resistant design suitable for robust use on construction sites.

TECHNICAL DATA	GEO3P	FEATURES	SUPPLIED WITH
			ART.-NO. 555030
Self-levelling range	± 3.5°	· 3 laser dots (up, down, forward)	· Multi-functional mount
Accuracy	± 2 mm / 10 m	· Out-of-level alarm	· Magnetic target
Working range	30 m*	· Multi-functional mount with	· 3 x AA Alkaline battery
Laser diode / laser class	635 nm / 2	· strong magnets for optimal use	· Padded carrying bag
Power supply	3 x AA Alkaline	· at drywall construction rails	
Operating time	20 h	· can be fixed to a wall (magnetic	
Temperature range	-10 °C – +50 °C	or screw hanging)	
Dust / water protection	IP 54	· strap attachment	
Weight (instrument only)	0.5 kg	· Transport lock	
		· 1/4" and 5/8" tripod thread	

\* depending on room illumination

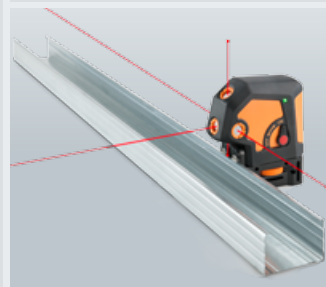


## Geo5P 5-Point Laser Five directions

- » **5 self-levelling laser dots at right angles to each other: up, down, forward, left, right. For plumbing, alignments, levelling, transfer of points and many more applications.**
- » Compact and handy size.  
Shock-resistant design suitable for robust use on construction sites.

TECHNICAL DATA	GEO5P	FEATURES	SUPPLIED WITH
			ART.-NO. 555050
Self-levelling range	± 3.5°	· 5 laser dots (up, down, forward, left, right)	· Multi-functional mount
Accuracy	± 2 mm / 10 m	· Out-of-level alarm	· Magnetic target
Working range	30 m*	· Multi-functional mount with	· 3 x AA Alkaline battery
Laser diode / laser class	635 nm / 2	· strong magnets for optimal use	· Padded carrying bag
Power supply	3 x AA Alkaline	· at drywall construction rails	
Operating time	20 h	· can be fixed to a wall (magnetic	
Temperature range	-10 °C – +50 °C	or screw hanging)	
Dust / water protection	IP 54	· strap attachment	
Weight (instrument only)	0.5 kg	· Transport lock	
		· 1/4" and 5/8" tripod thread	

\* depending on room illumination





## Torpedo Straight line and level

- » The universal laser spirit level that incorporates a beam splitter to generate a laser dot or a laser line.

TECHNICAL DATA	TORPEDO	FEATURES	SUPPLIED WITH
			ART.-NO. 560000
Accuracy	± 3 mm / 10 m	<ul style="list-style-type: none"> <li>· Switchable laser dot or laser line</li> <li>· Stepless rotation of laser line plus 90° lock intervals</li> <li>· 45°, 90° and 180° vials</li> <li>· Magnetic base</li> <li>· 1/4" thread for tripod</li> </ul>	<ul style="list-style-type: none"> <li>· Batteries</li> <li>· Case</li> </ul>
Working range	max. 30 m*		
Laser diodes	1 x 635 nm		
Laser class	2		
Power supply	2 x AAA Alkaline		
Operating time	30 h		
Temperature range	0 °C – +40 °C		

\* depending on room illumination



## Square Liner II At the right angle

- » The angle template generates two laser lines at 90° to each other. Ideal for use on floor and all tiling!



TECHNICAL DATA	SQUARE LINER II	FEATURES	SUPPLIED WITH
			ART.-NO. 551000
Accuracy	± 3 mm / 10 m	<ul style="list-style-type: none"> <li>· Fine and clear visible laser lines</li> <li>· 0° to 90° graduation for setting out 90°, 45° or any required angles to floor, wall or ceiling</li> <li>· Built-in circular and tubular vials for horizontal and vertical alignment</li> </ul>	<ul style="list-style-type: none"> <li>· Batteries</li> <li>· Magnetic target</li> <li>· Case</li> </ul>
Working range	max. 30 m*		
Laser diodes	2 x 635 nm		
Laser class	2		
Power supply	2 x AA Alkaline		
Operating time	48 h		
Temperature range	0 °C – +40 °C		

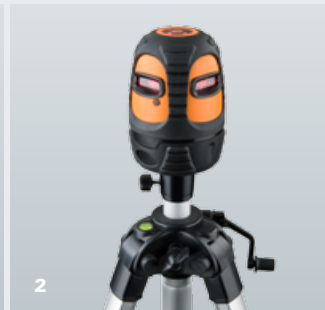
\* depending on room illumination

## 360° LinerPoint HP

Unique – 360° line  
with 4 laser points



- 1 Supplied with kit
- 2 Operation with tripod
- 3 Multi-functional wall / tripod bracket
  - screw attachment
  - magnetic attachment
  - strap attachment

[illegible]

\* depending on room illumination





# FL 40-Pocket II HP High-Power Version



- » Robust and handy laser cross level.  
Horizontal and vertical levelling and aligning.
- » High specification diodes for optimum visibility  
of laser lines.



TECHNICAL DATA		FL 40-POCKET II HP	FEATURES	SUPPLIED WITH
			<ul style="list-style-type: none"><li>· Laser cross</li><li>· Multi-functional mount<ul style="list-style-type: none"><li>· for wall-hanging</li><li>· for magnetic attachment</li><li>· for tripod fixing with 5/8" or 1/4" thread</li></ul></li><li>· Locking device for safe transport</li><li>· Visual and audible alarm when out of level</li><li>· Pulse function for use with receiver FR 55 / FR 55-M (optional) to extend the working range up to 60 m (HP)</li></ul>	ART.-NO. 541100
Self-levelling range (left / right)	± 4°			<ul style="list-style-type: none"><li>· Multi-functional mount</li><li>· Set of batteries</li><li>· Magnetic target</li><li>· Padded carrying bag</li></ul>
Accuracy	± 3 mm / 10 m			
Working range without receiver	20 m*			
Working range with receiver	60 m			
Operating time	48 h			
Power supply	3 x AA Alkaline			
Laser diodes / Laser class	2			
Dust / water protection	IP 54			
Weight	0.8 kg			

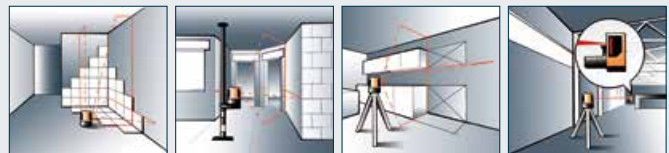
\* depending on room illumination

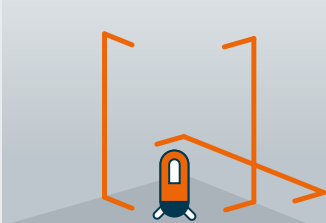


## FL 40-3Liner HP

### The Best-Seller

- » The ideal measuring tool for interior works! Versatile and efficient. The laser line at 90° is ideally suitable for floor covering tasks (carpet, wood, hard tiles) as well as for wall tiles. Can be used on the floor as the laser lines start directly from the instrument.
- » High specification diodes for optimum visibility of laser lines.



TECHNICAL DATA		FL 40-3LINER HP	FEATURES	SUPPLIED WITH
			<ul style="list-style-type: none"><li>· Laser cross</li><li>· Vertical laser line at 90° to laser cross</li><li>· 3 clearly visible laser lines</li><li>· Locking device for safe transport</li><li>· Visual and audible alarm when out of level</li><li>· Pulse function for use with receiver FR 55 / FR 55-M (optional) to extend the working range up to 60 m (HP)</li></ul>	ART.-NO. 530100
Self-levelling range	± 3,5°			<ul style="list-style-type: none"><li>· Wall / tripod mount</li><li>· Set of batteries</li><li>· Magnetic target</li><li>· Laser intensive glasses</li><li>· Padded carrying case</li></ul>
Accuracy	± 3 mm / 10 m			
Working range without receiver	20 m*			
Working range with receiver	60 m			
Operating time	15 h			
Power supply	3 x AA Alkaline			
Laser diodes / Laser class	635 nm / 2			
Dust / water protection	IP 53			
Weight	0.86 kg			
OPTIONAL				
FR 55				
ART.-NO. 500510				
OPTIONAL				
FR 55-M				
ART.-NO. 500520				

\* depending on room illumination



# Geo3X HP

## Small but powerful



» **The ideal instrument for numerous alignment, measurement and levelling tasks. Projecting 3 high powered laser crosses at 90° to each other.**

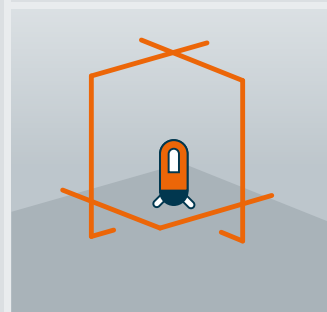
- » · The versatile multi-functional mount offers a variety of mounting options to increase flexibility and productivity
- 3 laser crosses
- Compact, handy size
- Shock-resistant design suitable for robust use on construction sites
- Self-levelling function can be switched off for manual use

1 Keypad



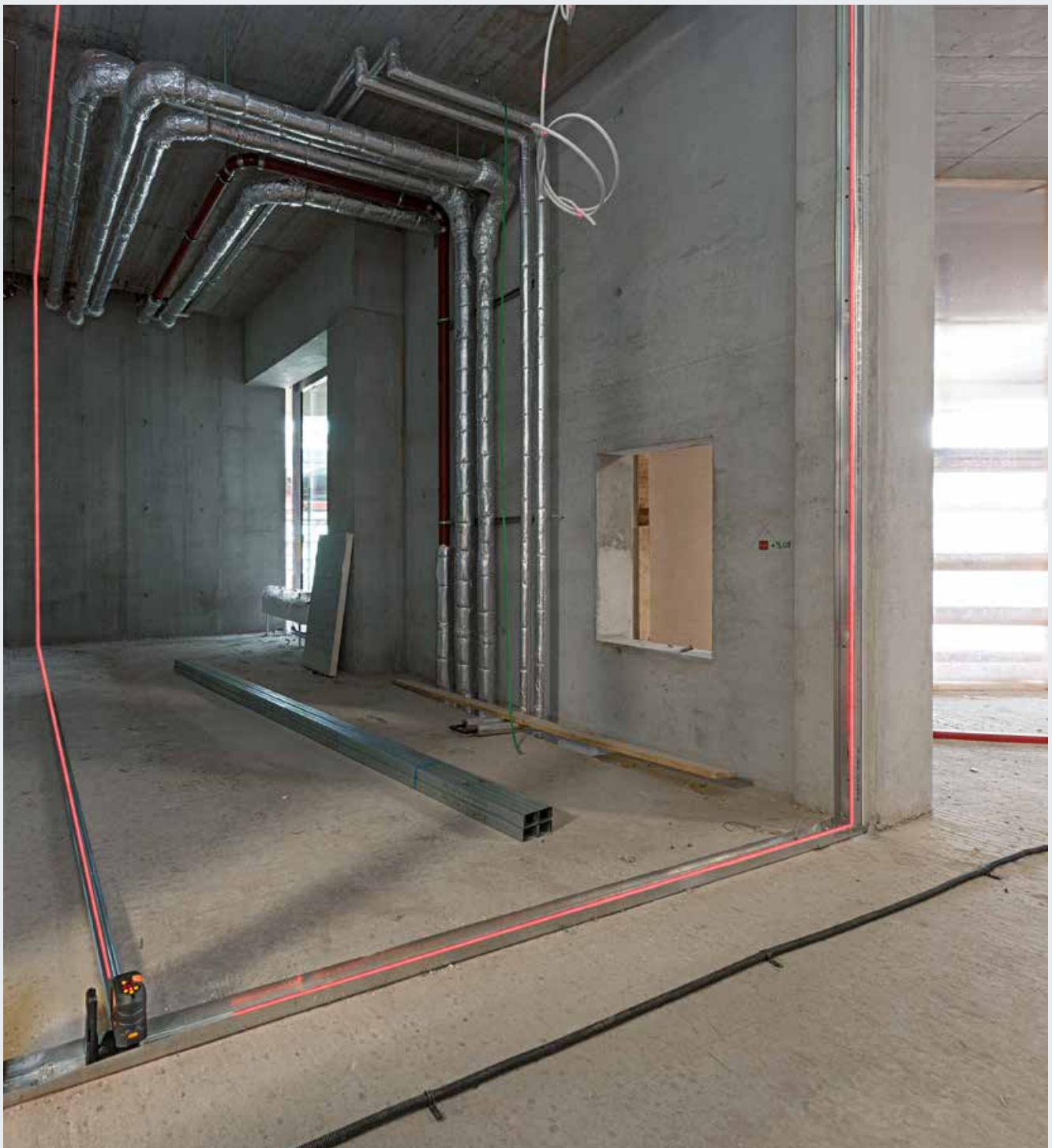
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TECHNICAL DATA	GEO3X HP	FEATURES	SUPPLIED WITH
			ART.-NO. 520600
Self-levelling range	± 3°	· 2 laser crosses at 90° to each other	· Multi-functional mount
Accuracy	± 3 mm / 10 m	· Laser cross to the ceiling	· 3 x AA Alkaline battery
Working range without receiver	20 m*	· Individually selectable laser lines	· Padded carrying bag
Working range with receiver (optional)	60 m	· Self-levelling function can be switched off for manual use	
Power supply	3 x AA Alkaline	· Visual and audible alarm when out of level	
Operating time (all lines switched on)	12 h	· Multi-functional mount with	
Dust / water protection	IP 54	· strong magnets on the back face	
Laser diode / class	635 nm / 2	· can be fixed to a wall	
Temperature range	-10 °C – +45 °C	· strap attachment	
Weight (instrument with batteries)	0.8 kg	· height adjustable	
		· 1/4" and 5/8" tripod thread	
		· Pulse function for use with receiver (optional) to extend working range up to 60 m	
		· 1/4" thread on the instruments base	



\* depending on room illumination

1 Use in dry-construction frames



# Geo5X-L360 HP

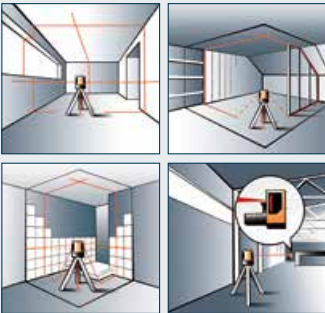
## The new all-rounder



- 1 Keypad
- 2 What's in the kit
- 3 Multi-functional mount







\* d



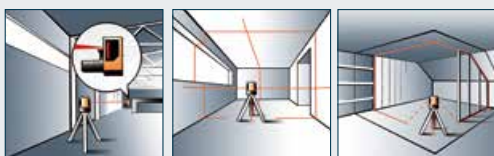
# FL 55 PLUS HP

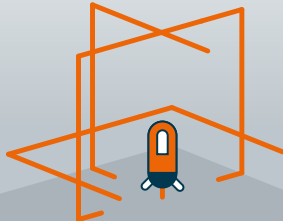
## The Multi-Liner for professionals

» Universal, robust, versatile, accurate – the ultimate tool for the professional! High-power laser diodes ensure optimum line visibility. High accuracy, dust / water protection as well as many other important features for professional use.

1 With receiver FR 55

2 View of keypad and battery case



TECHNICAL DATA		FL 55 PLUS HP	FEATURES	SUPPLIED WITH
				ART.-NO. 500550
Self-levelling range	± 3,5°		<ul style="list-style-type: none"><li>· Dust / water protection to IP 54</li><li>· Rubberized housing</li><li>· 4 laser crosses at 90° to each other</li><li>· Laser cross to the ceiling</li><li>· Self-levelling function can be switched off for manual use</li><li>· Use with receiver FR 55 (standard outfit) to extend working range up to 60 m</li><li>· Use with floor tripod (standard outfit)</li><li>· Use with builder's tripod (optional)</li><li>· Adjustable 360° circle with slow motion screw for perfect alignment</li><li>· Audible and visible alarm when out of level</li></ul>	<ul style="list-style-type: none"><li>· Receiver FR 55 with clamp</li><li>· Floor tripod</li><li>· Magnetic target</li><li>· Laser intensive glasses</li><li>· Set of batteries</li><li>· Charger</li><li>· Battery case for alkaline batteries</li><li>· Container</li></ul>
Accuracy	± 3 mm / 10 m			
with adjusted vial	± 2 mm / 10 m			
Working range without receiver	20 m*			
Working range with receiver	60 m			
Operating time	12 h			
Power supply	NiMH / Alkaline (optional)			
Charger can be used as a				
power supply	yes			
Visible laser diodes	6 x 635 nm			
Laser class	2			
Weight	1.6 kg			
OPTIONAL				
FL 55 PLUS HP W/O FR 55				
ART.-NO. 500450				

\* depending on room illumination





- » The main advantage of the FL 69 HP is the laser dots on the laser lines. On contrary to laser lines the laser dots have a much better visibility on longer distances and under unfavourable (e. g. very bright) light conditions. Therefore, it is easy to work under these circumstances and the laser dots are clearly visible for up to 30 m. When connecting the dots the vertical and horizontal lines as well as the 90° angles can be formed.





## The new class geo-FENNEL responding to our customers' needs.



» Benefiting from our many years of experience in the field of laser measuring technology, our technical expertise as well as listening to our customers' requirements we have developed a new class of lasers for the professional user. Selection PRO is a new range of line laser products that are characterized by the following features:

- Advanced laser diode / prism systems for outstanding visibility of the laser lines
- Lithium-Ion battery technology for permanent full power
- Selected accessories included
- 3 year warranty!\*

Convince yourself of the special efficiency of our Selection PRO products!  
The working ranges of all our line lasers are now categorized as follows:

TYPE	EXAMPLE	WORKING RANGE W/O RECEIVER (RADIUS)	WORKING RANGE WITH RECEIVER (RADIUS)
Standard	FL 40-3Liner	10 m	40 m
HP (High Power)	FL 40-3Liner HP	20 m	60 m
SP (Selection PRO)	FL 70 Premium Liner SP	30 m	80 m
SP (Selection PRO) – Green	FLG 40-PowerCross Green SP	40 m	–

\* You can extend the warranty of all Selection PRO products from 2 years to 3 years. Simply register at [www.geo-fennel.de/Produktregistrierung](http://www.geo-fennel.de/Produktregistrierung) within 6 weeks of purchase to benefit from this extra cover.



## Selection PRO



Our new Selection PRO range includes:

### » FL 40-PowerCross SP

- Outstanding visibility of the laser lines
- Very long vertical line with 150° fan angle (beyond zenith)
- Manual use
- Extremely rugged design for rough use at construction site

### » FLG 40-PowerCross GREEN SP

- The new Selection PRO GREENLASER-Technology – the ne plus ultra!
- Outstanding visibility of the laser line up to 40 m
- A clear narrow laser line

### » FL 66-Xtreme SP

- Rugged technical design: Stable internal components ensure reliability and accuracy
- Perfect sealing assures dust and water protection according to IP 65
- Battery problems? Not with FL-66 Xtreme with the advantages of Li-Ion battery technology
- Outstanding visibility of the laser lines up to 30 m

### » FLG 66-Xtreme GREEN SP

- The new Selection PRO GREENLASER-Technology – the ne plus ultra!
- Outstanding visibility of the laser line up to 40 m
- A clear narrow laser line

### » CrossPointer5 SP

- Combination of a 5 point and cross line laser
- Projects 6 reference points and 2 reference lines
- Outstanding visibility of the laser lines

### » FL 70 Premium-Liner SP

- 360° horizontal line, 4 vertical lines, plumb down beam, laser cross to the ceiling = simply the best!
- Motorized self-levelling – quick and precise
- Outstanding visibility of the laser lines
- High accuracy
- Li-Ion battery

### » FL 80 Tracking Liner SP

- Locate on-grade position of the receiver at the target point
- Press the “Auto” button on the receiver, then press an arrow button
- The nearest vertical laser line automatically tracks to coincide with the on-grade position of the receiver

## Selection PRO

# FL 40-PowerCross SP

## Convincing on the whole line



» **FL 40-PowerCross SP is a Selection PRO product with special features.**

- » Outstanding visibility of the laser lines
- » Very long vertical line with 150° fan angle (beyond zenith)
- » Self-levelling function can be switched off for manual use
- » Extremely rugged design suitable for use on the most demanding construction site – drop tested to 1 m. The sturdy technical design makes a transport lock needless

1 In manual mode

2 Easy to use – one button keypad



TECHNICAL DATA	FL 40-POWERCROSS SP	FLG 40-POWERCROSS GREEN SP
ART.-NO.	541500	541550
Self-levelling range	± 3°	± 3°
Accuracy	± 3 mm / 10 m	± 3 mm / 10 m
Working range	30 m* (radius)	40 m* (radius)
Fan angle horizontal	135°	135°
Fan angle vertical	150°	150°
Power supply	3 x AA Alkaline	3 x AA Alkaline
Operating time (all lines switched on)	40 h	9 h
Dust / water protection	IP 54	IP 54
Laser class	2	2
Temperature range	-10 °C – +45 °C	0 °C – +40 °C
Weight (instrument with battery)	0.4 kg	0.4 kg
<b>SUPPLIED WITH</b>		
<ul style="list-style-type: none"> <li>· Multi-functional mount</li> <li>· 3 x AA Alkaline battery</li> <li>· Padded bag</li> </ul>		



\* depending on room illumination



## Selection PRO

# FLG 40-PowerCross GREEN SP

## Convincing on the whole line – more than ever in green



» **FLG 40-PowerCross GREEN SP is a Selection PRO product with special features.**

- » · The new Selection PRO GREENLASER-Technology – the ne plus ultra!
  - Outstanding visibility of the laser line up to 40 m
  - A clear narrow laser line
  - Very long vertical line with 150° fan angle (beyond zenith)
  - Self-levelling function can be switched off for manual use
  - Extremely rugged design suitable for use on the most demanding construction site – drop tested to 1 m.
- The sturdy technical design makes a transport lock needless

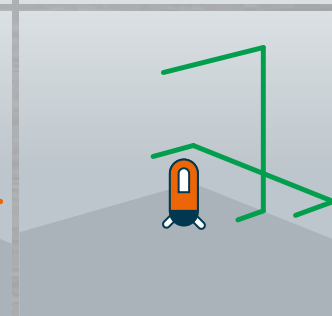
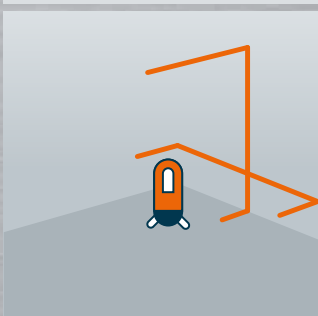


### FEATURES FL 40-POWERCROSS SP

- 1 Laser cross
- Laser lines switchable separately
- TILT function for manual use
- Visual alarm when out of level
- Multi-functional mount
  - height adjustable
  - for wall-hanging with screw
  - strap attachment
  - strong magnet on back side
  - for tripod fixing with 5/8" or 1/4" thread

### FEATURES FLG 40-POWERCROSS GREEN SP

- 1 Laser cross green
- Laser lines switchable separately
- TILT function for manual use
- Visual alarm when out of level
- Multi-functional mount
  - height adjustable
  - for wall-hanging with screw
  - strap attachment
  - strong magnet on back side
  - for tripod fixing with 5/8" or 1/4" thread





## Selection PRO

# FL 66-Xtreme SP

## The toughest

- » **FL 66-Xtreme is a Selection PRO product with special features.**
- » This new generation of cross line laser withstand adverse conditions and rough handling on construction sites.
- »
  - Rugged technical design: Stable internal components assure function and accuracy
  - Perfect sealing assures dust and water protection according to IP 65
  - Batteries are a thing of the past as the FL 66-Xtreme SP utilizes the latest Li-Ion battery technology
  - Outstanding visibility of the laser lines up to 30 m



1 Keypad FL 66-Xtreme SP

2 What's in the kit FL 66-Xtreme SP

1



2



TECHNICAL DATA	FL 66-XTREME SP	FLG 66-XTREME GREEN SP
ART.-NO.	580500	580550
Self-levelling range	± 2°	± 2°
Accuracy	± 2 mm / 10 m	± 2 mm / 10 m
Working range		
without receiver	30 m* (radius)	40 m* (radius)
with receiver (optional)	80 m (radius)	–
Laser class	2	2
Operating time (all lines switched on)	15 h	15 h
Power supply	Li-Ion	Li-Ion
	Alkaline batteries (optional)	Alkaline batteries (optional)
Dust / water protection	IP 65	IP 65
Temperature range	-10 °C – +45 °C	0 °C – +40 °C
Weight (instrument with battery)	1.4 kg	1.4 kg
<b>SUPPLIED WITH</b>		
<ul style="list-style-type: none"> <li>· Li-Ion batteries</li> <li>· Charger</li> <li>· Alkaline battery box</li> </ul>	<ul style="list-style-type: none"> <li>· Laser intensive glasses</li> <li>· Magnetic target</li> <li>· Container</li> </ul>	



\* depending on room illumination

## Selection PRO

# FLG 66-Xtreme GREEN SP

## The toughest – red or green, your decision

» **FLG 66-Xtreme GREEN SP is a Selection PRO product with special features.**

» The new Selection PRO GREENLASER-Technology – the ne plus ultra!

- Outstanding visibility of the laser line up to 40 m
- A clear narrow laser line

» This new generation of cross laser withstand adverse conditions and rough handling on construction sites.

- Rugged technical design: Stable internal components assure function and accuracy
- Perfect sealing assures dust and water protection according to IP 65
- Batteries are a thing of the past as the FLG 66-Xtreme GREEN SP utilizes the latest Li-Ion battery technology



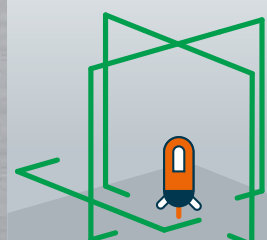
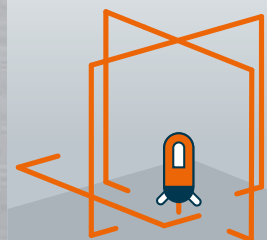
1 What's in the kit  
FLG 66-Xtreme GREEN SP

1



### FEATURES

- 4 vertical lines at 90° to each other
- 1 horizontal line 130°
- Plumb down beam (red)
- Laser lines switchable separately
- Plumbing function
- Self-levelling function can be locked for manual use (inclined applications)
- Audible and visual alarm when out of level
- Integrated floor tripod
- Slow motion screw for horizontal alignment
- For tripod fixing with 5/8" thread
- Use with receiver (optional) (FL 66-Xtreme SP)





# CrossPointer5 SP

## 6 reference points plus a laser cross

» CrossPointer5 SP is a Selection PRO product with special features.

- » Outstanding visibility of the laser lines
- » Combination of a 5 point and cross line laser
- » 6 reference points at 90° to each other
- » Horizontal and vertical lines at 90° to each other

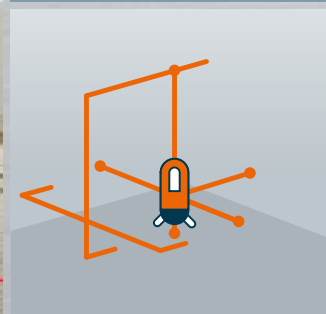
1 5 laser points

2 Intuitive keypad

3 Universal mount



TECHNICAL DATA	CROSSPOINTER5 SP	FEATURES	SUPPLIED WITH
Self-levelling range	± 4°	<ul style="list-style-type: none"> <li>· 2 laser lines form a laser cross</li> <li>· 5 laser points: back, left, right, ceiling, floor</li> <li>· Plumbing function</li> <li>· Multi-functional mount</li> <li>· Strong magnets on the base</li> <li>· Strap attachment, rotatable</li> <li>· Use with receiver (optional)</li> <li>· Self-levelling function can be locked for manual use</li> </ul>	ART.-NO. 531500
Accuracy	± 3 mm / 10 m		<ul style="list-style-type: none"> <li>· Universal mount</li> <li>· Laser glasses</li> <li>· Magnetic target</li> <li>· Set of batteries</li> <li>· Container</li> </ul>
<b>Line laser function</b>	1 laser cross: front		
Working range w/o receiver	30 m*		
Working range with receiver	80 m (optional)		
Sector angle Hz-line	155°		
Sector angle V-line	160°		OPTIONAL FR 55
<b>Point laser function</b>	5 laser dots: back, left, right, up, down		
Working range w/o receiver	30 m		OPTIONAL FR 55-M
Power supply / Operating time	Alkaline / 7 h		
Dust / water protection	IP 54		ART.-NO. 500520
Laser diode / Laser class	635 nm / 2		
Temperature range	-10 °C – +45 °C		
Size	115 x 70 x 115 mm		



\* depending on room illumination



Selection PRO

# FL 70 Premium-Liner SP

## Technology at its best



» FL 70 SP is a Selection PRO product with special features.

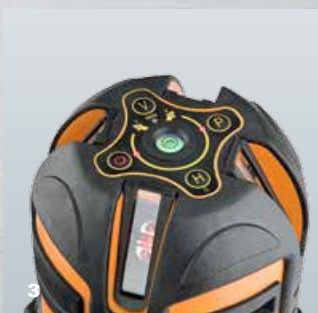
- » Outstanding visibility of the laser line
- » Li-Ion battery technology
- » High accuracy of  $\pm 1 \text{ mm} / 10 \text{ m}$
- » Motorized self-levelling cross line laser
- » 4 vertical lines at  $90^\circ$  to each other,  $360^\circ$  horizontal line, plumb up cross, plumb down beam
- » Quick self-levelling and extremely stable performance
- » Slope function: Laserplane can be tilted by using the remote control

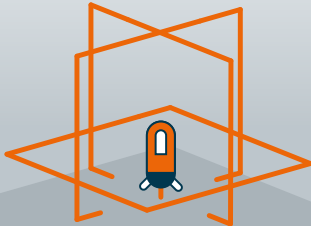
1 Receiver FR 55 to extend the working range up to 80 m

2 Remote control for setting slopes

3 Circular bubble vial for optimal positioning

4 What's in the kit



TECHNICAL DATA		FL 70 PREMIUM-LINER SP	FEATURES	SUPPLIED WITH
				ART.-NO. 582000
Self-levelling range		$\pm 3^\circ$	<ul style="list-style-type: none"> <li>· 5 laser crosses</li> <li>· 4 vertical lines at <math>90^\circ</math> to each other</li> <li>· <math>360^\circ</math> horizontal line</li> <li>· Laser cross to the ceiling</li> <li>· Plumb down beam</li> <li>· Self-levelling function can be switched off</li> <li>· Use with receiver FR 55 to extend working range up to 80 m</li> <li>· Remote control for setting slopes</li> <li>· Adjustable <math>360^\circ</math> circle</li> <li>· Slow motion screw</li> <li>· Audible and visible alarm when out of level</li> <li>· Integrated floor tripod</li> <li>· 5/8" thread for use with standard tripod</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 55 with clamp</li> <li>· Integrated floor tripod</li> <li>· Remote control</li> <li>· Li-Ion batteries and battery charger</li> <li>· Magnetic target</li> <li>· Laser glasses</li> <li>· Adapter for tripod connection</li> <li>· Compartment for alkaline batteries</li> <li>· Container</li> </ul>
Accuracy		$\pm 1 \text{ mm} / 10 \text{ m}$		
Working range w/o receiver		30 m*		
Working range with receiver		200 m		
Power supply		Li-Ion		
Operating time		6–14 h		
		depending on number of laser lines switched on		
Dust / water protection		IP 54		
Laser diode		635 nm		
Laser class		2		
Temperature range		$-10^\circ \text{C} - +45^\circ \text{C}$		
				FL 70 PREMIUM LINER SP WITHOUT RECEIVER FR 55
				ARTIKEL-NR. 582010
				



\* depending on room illumination

# FL 80 Tracking Liner SP with automatic target tracking

» The new FL 80Tracking Liner SP is the latest product in our Selection PRO range which redefines innovation and ease of use.

» Due to its tracking function it is unique when compared to all other products in its category. The vertical laser line automatically aligns with the on-grade position of the receiver. This self-alignment of the instrument eliminates arduous manual alignment.



- 1 Intuitive keypad
- 2 Receiver FR 57-TR to extend working range up to 80 m and to use at tracking function
- 3 What's in the kit



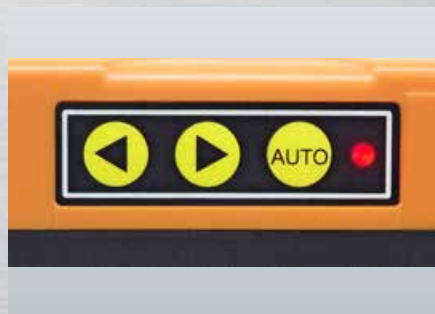
TECHNICAL DATA		FL 80TRACKING LINER SP	FEATURES	SUPPLIED WITH
				ART-NO. 583000
Self-levelling range		± 3°	<ul style="list-style-type: none"> <li>· 4 vertical lines at 90° to each other</li> <li>· 1 horizontal line with a 130° arc</li> <li>· Laser cross to the ceiling</li> <li>· Plumb down beam</li> <li>· Self-levelling compensator with magnetic damping</li> <li>· Tracking function up to 30 m</li> <li>· 360° horizontal orientation in either motorized or manual mode</li> <li>· Use with FR 57-TR receiver (incl.) to extend the working range up to 80 m (w/o tracking)</li> <li>· Self-levelling function can be switched off for manual use</li> <li>· Slow motion screw for fine adjustment</li> <li>· Audible and visible alarm when instrument is out of level</li> </ul>	<ul style="list-style-type: none"> <li>· FR 57-TR receiver</li> <li>· Floor tripod</li> <li>· Magnetic target</li> <li>· Li-Ion battery pack with charger</li> <li>· Battery case for the optional use of Alkaline batteries</li> <li>· 5/8" tripod adapter</li> <li>· Container</li> </ul>
Accuracy		± 2 mm / 10 m		
Working range		30 m		
· with receiver		80 m		
· with tracking function		30 m		
Centering accuracy Tracking		± 1 mm / 10 m		
Power supply		Li-Ion		
Operating time Laser		8 h Li-Ion		
Operating time Tribrach		15 h Alkaline		
Protection class		IP 54		
Laser diode		635 nm		
Laser class		2		
Temperature range		-10 °C – +45 °C		

\* depending on room illumination

### » Perfect alignment – the easy way!

» The automatic tracking function of the FL 80 Tracking Liner SP saves you time and money eliminating the need for manual alignment. The alignment is done automatically via the receiver.

- Activate the tribrach motor
- Locate on-grade position of the receiver at the target point
- Press the "Auto" button on the receiver then press an arrow button
- The nearest vertical laser line automatically tracks to coincide the on-grade position of the receiver







## FL 66-XTREME SP

A laser resistant to extreme conditions: rain, dust, cold – no problem. Li-Ion battery, highly visible lines – this laser benefits from the latest technologies developed by geo-FENNEL.



## FPL L Positioning Line Laser

» Positioning lasers are especially suited for use in manufacturing industry and in trade for marking and positioning.

TECHNICAL DATA	FPL L-5	FPL L-10	FPL L-20	FEATURES
	ART.-NO. 519005	ART.-NO. 519010	ART.-NO. 519020	
Visible laser line	red	red	red	<ul style="list-style-type: none"> <li>· Projects a clearly visible laser line</li> <li>· Power supply 220 V with switch and plug</li> <li>· Multi-functional mount (rotatable and swivelling)</li> </ul>
Laser wave length	635 nm	635 nm	635 nm	
Integrated laser diode	5 mW	10 mW	20 mW	
Laser output power	< 1 mW	< 1 mW	< 5 mW	
Laser class	2	2	3R	
Focusing	0–10 m focusable	0–10 m focusable	0–10 m focusable	
Fan angle	84°	84°	84°	
Temperature range	-10 °C – +40 °C	-10 °C – +40 °C	-10 °C – +40 °C	
Dust / water protection	IP 41	IP 41	IP 41	
Dimensions (without mount)	Ø 22,5 x 89 mm	Ø 22,5 x 89 mm	Ø 22,5 x 89 mm	



## FPL C Positioning Cross Laser

TECHNICAL DATA	FPL C-5	FPL C-10	FPL C-20	FEATURES
	ART.-NO. 519105	ART.-NO. 519110	ART.-NO. 519120	
Visible laser cross	red	red	red	<ul style="list-style-type: none"> <li>· Projects a clearly visible laser cross</li> <li>· Power supply 220 V with switch and plug</li> <li>· Multi-functional mount (rotatable and swivelling)</li> </ul>
Laser wave length	635 nm	635 nm	635 nm	
Integrated laser diode	5 mW	10 mW	20 mW	
Laser output power	< 1 mW	< 5 mW	< 5 mW	
Laser class	2	2	3R	
Focusing	10 m	10 m	10 m	
Fan angle	120°	120°	120°	
Temperature range	-10 °C – +40 °C	-10 °C – +40 °C	-10 °C – +40 °C	
Dust / water protection	IP 43	IP 43	IP 43	
Dimensions (without mount)	Ø 41 x 55 mm	Ø 41 x 55 mm	Ø 41 x 55 mm	



# Line and Cross Lasers

## Outline

			Laser class	Scheme of projected lines	Vertical lines	Horizontal laser range / angle	Laser points
510000	360° LINERPOINT HP		2		–	360°	4
531000	DUOCROSSPOINTER3 HP		2		1	110°	3
541100	FL 40-POCKET II HP		2		1	130°	–
530100	FL 40-3LINER HP		2		2	110°	–
520600	GEO3X HP		2		2	150°	–
533000	GEO5X-L360 HP		2		3	360°	–
500550	FL 55 PLUS HP		2		3	220°	–
581500	FL 69 HP		2		4	360°	8
541500	FL 40-POWERCROSS SP		2		1	135°	–
541550	FLG 40-POWERCROSS GREEN SP						
580500	FL 66-XTREME SP		2		4	130°	–
580550	FLG 66-XTREME GREEN SP						
531500	CROSSPOINTER5 SP		2		1	155°	5
582000	FL 70 PREMIUM-LINER SP		2		4	360°	–
583000	FL 80 TRACKING LINER SP		2		4	130°	–
585020	FL 1000 HP		2		4	360° (Rotation)	–



Plumb down beam	Accuracy / 10 m	Dust / water protection	Shock protected	Working range w/o receiver (radius)	Working range with receiver (radius)	Power supply	Receiver	PAGES
–	± 3 mm	IP 54	–	20 m	60 m	Alkaline	optional	16
yes	± 3 mm	IP 54	–	20 m	–	Alkaline	–	17
–	± 3 mm	IP 54	–	20 m	60 m	Alkaline	optional	18
–	± 3 mm	IP 53	–	20 m	60 m	Alkaline	optional	19
–	± 3 mm	IP 54	yes	20 m	60 m	Alkaline	optional	20
yes	± 2 mm	IP 54	–	20 m	60 m	Li-Ion	optional	22
yes	± 2 mm	IP 54	–	20 m	60 m	NiMH	inclusive	24
yes	± 2 mm	IP 54	–	20 m	60 m	Li-Ion	inclusive	27
–	± 3 mm	IP 54	yes	30 m 40 m	–	Alkaline	–	30 31
yes	± 2 mm	IP 65	yes	30 m 40 m	80 m –	Li-Ion	optional	32 33
yes	± 3 mm	IP 54	–	30 m	80 m	Alkaline	optional	34
yes	± 1 mm	IP 54	–	30 m	200 m	Li-Ion	inclusive	35
yes	± 2 mm	IP 54	–	30 m	80 m	Li-Ion	inclusive	36
yes	± 2 mm	IP 54	–	20 m	60 m	NiMH	inclusive	25



MORE PRECISELY:

EASY TO USE, ACCURATE,  
ROBUST AND RELIABLE.

Efficient, flexible and reliable – some of the characteristics that define all geo-FENNEL rotating lasers. Whether used for interior applications or on the most demanding outdoor construction sites, in the rain, wind, cold or hot conditions: Our robust, water and dust protected laser measuring instruments provide the precise measuring results, even under unfavourable weather conditions.







## FL 30 SET

### For horizontal and vertical use

- » A robust manual laser, quick set-up with two vials and easy to operate. For horizontal and vertical measurements. Scanning, laser point mode and permanent 90° beam to zenith. The ideal laser for indoor applications, suitable for simple outdoor jobs.
- » **FL 30 with all the necessary accessories to start working immediately!**
- » Consists of: Elevating tripod, wall mount, magnetic target, laser glasses for better visibility of the laser beam, 2.45 m levelling staff and a receiver that all fit neatly into the handy carrying case.

- 1 Vertical use
- 2 Receiver and clamp
- 3 Wall mount, tripod, levelling staff
- 4 What's in the kit



TECHNICAL DATA	FL 30	FEATURES	SUPPLIED WITH FL 30 SET
			ART-NO. 271500
Accuracy	± 2 mm / 10 m	<ul style="list-style-type: none"> <li>· For horizontal and vertical measurements</li> <li>· Manual levelling</li> <li>· Easy horizontal setting with 2 vials</li> <li>· Stepless rotating speed</li> <li>· Scanning function (2 step) and laser point mode</li> <li>· Multi-stage rotating beam</li> <li>· Permanent 90° beam to zenith</li> </ul>	<ul style="list-style-type: none"> <li>· Container</li> <li>· Floor / tripod mount</li> <li>· Set of batteries</li> <li>· 2.45 m levelling staff</li> <li>· Elevating tripod with max. height of 1.58 m</li> <li>· Receiver with clamp</li> <li>· Magnetic target</li> <li>· Laser glasses</li> <li>· Height adjustable wall mount</li> </ul>
Working range without receiver Ø	30 m*		
Working range with receiver Ø	120 m		
Rotating speed	150 – 300 rpm stepless		
Laser diodes / Laser class	635 nm / 2		
Scan angle	0°, 5°, 10°		
Temperature range	-10 °C – +45 °C		
Dust / water protection	IP 54		
Dimensions w/o mount	90 x 90 x 120 mm		
Weight	0.74 kg		
Power supply	4 x AA Alkaline		

\* depending on room illumination

# FL 210A

## Instant self-levelling



» Horizontal and vertical laser for interior and exterior applications. This instrument is characterized by its versatility, instant self-levelling, stability and a robust technical construction. Instant self-levelling makes it ideal when applications necessitate frequent positional changes, i. e. floor construction.

Scanning functions, permanent 90° beam to zenith, automatic shut-off when misaligned and a comprehensive set of accessories make these models ideal for the all-rounder.

1 Vertical application



TECHNICAL DATA	FL 210A	FEATURES	SUPPLIED WITH
			ART.-NO. 291500
Self-levelling range	± 3.5°	· Instant self-levelling	· Receiver FR 45 with clamp
Accuracy horizontal	± 1 mm / 10 m	· Horizontal self-levelling with automatic shut-off and audible alarm when out of tolerance	· Remote control
Accuracy vertical	± 1.5 mm / 10 m	· Easy vertical set-up with one foot screw	· Rechargeable batteries and charger
Working range with receiver Ø	400 m	· Variable rotating speed	· Floor / wall mount
Rotating speed	150, 200, 250, 300 rpm	· Scanning and laser dot mode	· Magnetic target
Laser diodes / Laser class	635 nm / 2	· Permanent 90° beam to zenith	· Laser glasses
Scan angle	0°, 20°, 40°	· NiMH batteries	· Carrying case
Temperature range	-10 °C – +50 °C	· Can be used with alkaline batteries	
Dust / water protection	IP 66	· Dust / water protection IP 66	
Dimensions	180 x 162 x 202 mm		
Weight (instrument only)	2.8 kg		
Power supply	4 x C NiMH*		

\* with 6.4 V intelligent charger, battery can be charged externally, alkaline batteries can be used alternatively



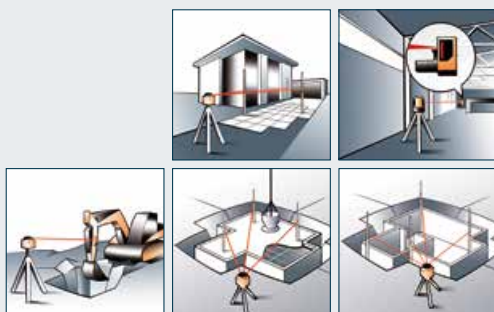
## FL 100HA Junior

### Quick and easy to use

- » Self-levelling rotating laser for horizontal applications
- » 3 buttons for user-friendly functionality
- » Robust and efficient

1 With receiver FR 45

2 Supplied with kit



1



2



TECHNICAL DATA	FL 100HA JUNIOR	FEATURES	SUPPLIED WITH
Self-levelling range	± 5°	<ul style="list-style-type: none"> <li>Auto shut-off when out of self-levelling range</li> <li>TILT alarm function</li> <li>VWS function</li> <li>Powerful rechargeable battery</li> <li>Dust / water protection IP 65</li> </ul>	ART.-NO. 212000
Accuracy	± 1 mm / 10 m		<ul style="list-style-type: none"> <li>Receiver FR 45 with clamp for levelling staff</li> <li>Rechargeable battery and charger</li> <li>Battery compartment for alkaline batteries</li> <li>Container</li> </ul>
Working range with receiver FR 45 Ø	600 m		<b>SUPPLIED WITH</b> <b>FL 100HA JUNIOR WITH FR 77-MM</b> ART.-NO. 212077
receiver FR 77-MM Ø	300 m		
Rotating speed	600 rpm		<ul style="list-style-type: none"> <li>Receiver FR 77-MM</li> <li>Rechargeable battery and charger</li> <li>Battery compartment for alkaline batteries</li> <li>Container</li> </ul>
Power supply / Operating time	NiMH / 24 h		
	Alkaline / 36 h		
Temperature range	-20 °C – +50 °C		
Laser diode / Laser class	635 nm / 2		
Dust / water protection	IP 65		
Weight	2.4 kg		





# FL 110HA

## The standard for horizontal laser levels

- » The FL 110HA is a real professional in its business: Compact and robust with a rubberized housing and metal cover for effective site protection. Easy and intuitive operation.
- » High performance: Li-Ion technology for continuous operation, VWS function (Vibration-Wind-Security), automatic TILT function, zonal control, large working range, high accuracy – the FL 110HA does not lack anything.

1 With receiver FR 45

2 Supplied with kit



TECHNICAL DATA		FL 110HA	FEATURES	SUPPLIED WITH
				ART.-NO. 211000
Self-levelling range		± 5°	<ul style="list-style-type: none"> <li>· Zonal control with electronic beam screen avoids spurious measurements caused by crossing laser planes and reflections – increases site safety</li> <li>· Robust and dust / water protected housing to IP 66, rubberized protection and metal top</li> <li>· Large working range and high accuracy</li> <li>· Automatic shut-off when out of self-levelling range</li> <li>· Manual slope setting of X and Y axes up to ± 5°</li> <li>· 360° reception range of remote control</li> <li>· VWS function</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 45 with clamp</li> <li>· Li-Ion rechargeable battery with charger</li> <li>· Battery case for alkaline batteries</li> <li>· Remote control</li> <li>· Container</li> </ul>
Accuracy		± 0.75 mm / 10 m		
Working range with receiver FR 45 Ø		800 m		
receiver FR 77-MM Ø		400 m		
Slope setting in X and Y axis		± 5° (9 %)		
Rotating speed		800 rpm		
Power supply / Operating time		Li-Ion / 40 h 6 x AA Alkaline / 40 h		
Temperature range		-10 °C – +45 °C		
Laser diode / Laser class		635 nm / 2		
Weight		2.1 kg		
Dust / water protection		IP 66		
				SUPPLIED WITH
				FL 110HA WITH FR 77-MM
				ART.-NO. 211077
				<ul style="list-style-type: none"> <li>· Receiver FR 77-MM</li> <li>· Li-Ion rechargeable battery with charger</li> <li>· Battery case for alkaline batteries</li> <li>· Remote control</li> <li>· Container</li> </ul>



# FL 150H-G

## Horizontal dual grade laser

» **FL 150H-G combines high performance and easy operation.**

» **High performance**

- Advanced technology at usage of mechanical parts, temperature stability and grade technology
- High accuracy of  $\pm 0.5 \text{ mm} / 10 \text{ m}$
- Grade setting of X and Y axis up to  $\pm 10 \%$  (monitored)
- TILT and VWS function
- Li-Ion battery technology
- 2-Way RF remote control

**Easy operation**

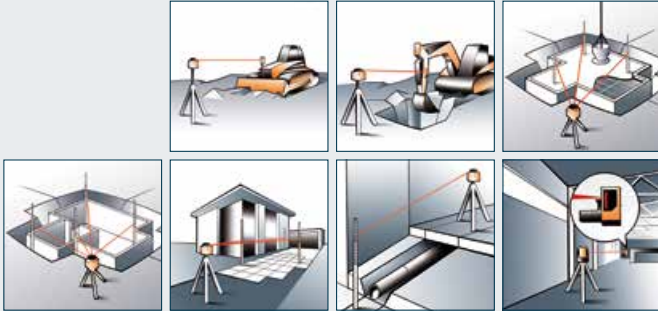
- Digital setting of grade values
- Monitored grade
- Reduced number of buttons at instrument



TECHNICAL DATA	FL 150H-G LASER CLASS 2	FL 150H-G LASER CLASS 3R	FEATURES
Self-levelling range	$\pm 6^\circ$	$\pm 6^\circ$	<ul style="list-style-type: none"> <li>· Dual Grade Laser</li> <li>· Horizontal</li> <li>· Digital grade adjustment</li> <li>· Monitored grade</li> <li>· Automatic TILT function</li> <li>· VWS function combined with TILT function</li> <li>· Permanent <math>90^\circ</math> beam to zenith</li> <li>· Illuminated display</li> <li>· 2-Way RF remote control</li> <li>· Remote control screen</li> <li>· Li-Ion battery technology</li> <li>· International charger with adapter for car cigarette lighter socket</li> </ul>
Accuracy	$\pm 0.5 \text{ mm} / 10 \text{ m}$	$\pm 0.5 \text{ mm} / 10 \text{ m}$	
Working range with receiver FR 45 Ø	800 m	1200 m	
receiver FR 77-MM (optional) Ø	400 m	600 m	
Laser class	2	3R	
Horizontal slope setting			
X-Axis	$-10 \% - +10 \%$	$-10 \% - +10 \%$	
Y-Axis	$-10 \% - +10 \%$	$-10 \% - +10 \%$	
X and Y-Axis	$\Sigma \pm 14 \%$	$\Sigma \pm 14 \%$	
Rotating speed	600 rpm	600 rpm	
Operating time	30 h	30 h	
Power supply	Li-Ion	Li-Ion	
	Alkaline batteries (optional)	Alkaline batteries (optional)	
RF Remote control range	80 m	80 m	
Temperature range	$-20^\circ\text{C} - +50^\circ\text{C}$	$-20^\circ\text{C} - +50^\circ\text{C}$	
Dust / water protection	IP 65	IP 65	
Weight (instrument only)	2.2 kg	2.2 kg	

SUPPLIED WITH FL 150H-G LASER CLASS 2	SUPPLIED WITH FL 150H-G LASER CLASS 2	SUPPLIED WITH FL 150H-G LASER CLASS 3R	SUPPLIED WITH FL 150H-G LASER CLASS 3R
ART-NO. 213020	ART-NO. 213097	ART-NO. 213000	ART-NO. 213077
<ul style="list-style-type: none"> <li>· Receiver FR 45 with clamp for levelling staff</li> <li>· 2-Way RF remote control</li> <li>· Li-Ion battery</li> <li>· International charger</li> <li>· Battery compartment for alkaline batteries</li> <li>· Carrying case</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 77-MM with clamp for levelling staff</li> <li>· 2-Way RF remote control</li> <li>· Li-Ion battery</li> <li>· International charger</li> <li>· Battery compartment for alkaline batteries</li> <li>· Carrying case</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 45 with clamp for levelling staff</li> <li>· 2-Way RF remote control</li> <li>· Li-Ion battery</li> <li>· International charger</li> <li>· Battery compartment for alkaline batteries</li> <li>· Carrying case</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 77-MM with clamp for levelling staff</li> <li>· 2-Way RF remote control</li> <li>· Li-Ion battery</li> <li>· International charger</li> <li>· Battery compartment for alkaline batteries</li> <li>· Carrying case</li> </ul>

1 Supplied with kit



2 Remote control range up to 80 m







## FL 240HV

### The all-rounder

» Versatile and easy to use. Fully automatic self-levelling in horizontal and vertical. A feature packed laser designed for the interior professional with a dust and water protection making it also suitable for outdoor use. Variable scanning and laser point mode for optimum beam visibility.



TECHNICAL DATA	FL 240HV	FL 240HV	FLG 240HV-GREEN
	ART-NO. 244020	ART-NO. 244000	ART-NO. 244500
Self-levelling range	± 5°	± 5°	± 5°
Accuracy horizontal	± 1 mm / 10 m	± 1 mm / 10 m	± 1 mm / 10 m
Accuracy vertical	± 1.5 mm / 10 m	± 1.5 mm / 10 m	± 1.5 mm / 10 m
Working range with receiver Ø	500 m	700 m	1000 m
Scanning w/o receiver	40 m*	60 m*	40 m*
Rotating w/o receiver Ø	40 m*	60 m*	60 m*
Scanning modes	2 stage	2 stage	2 stage
Slope setting in X and Y axis	± 5° (± 9 %)	± 5° (± 9 %)	± 5° (± 9 %)
Rotating speed rpm	200, 500	200, 500	200, 500
Operating time / Power supply	24 h (NiMH)	24 h (NiMH)	24 h (NiMH)
	40 h (Alkaline)	40 h (Alkaline)	40 h (Alkaline)
Temperature range	-10 °C – +50 °C	-10 °C – +50 °C	-20 °C – +50 °C
Laser diode / Laser class	2	3R	2
Dust / water protection	IP 54	IP 54	IP 54
Weight (instrument only)	1.95 kg	1.95 kg	1.95 kg

#### FEATURES

- Visible laser beam
- 2 rotating speeds
- Variable scanning mode
- Laser dot mode
- Manual slope setting up to ± 5° (± 9 %) in X and Y axis
- Permanent 90° plumb beam
- Automatic TILT function
- Remote control screen (on / off)
- Closed top cover housing offers excellent protection against dust and water

\* depending on room illumination

# FLG 240HV-Green

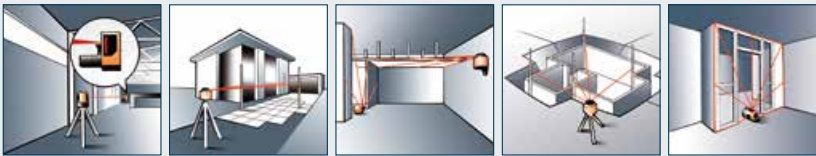
## The all-rounder in green

» The new generation: Now with laser class 2 and enhanced visibility of the laser line. Additionally the temperature range was increased to -20 °C to +50 °C.

» Horizontal and vertical laser for interior applications. Similar functions to the FL 240HV but incorporating a green laser diode for improved visibility under difficult measuring conditions such as bright surroundings and long distances.



1 Supplied with kit



### SUPPLIED WITH FL 240HV

- Receiver FR 45 with clamp
- Remote control
- Rechargeable battery (NiMH)
- Intelligent charger
- Battery case for alkaline batteries
- Adjustable wall and ceiling mount
- Laser glasses
- Magnetic target
- Container

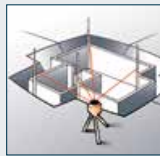
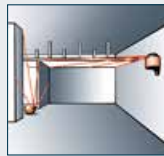
### SUPPLIED WITH FLG 240HV GREEN

- Receiver FRG 45 with clamp
- Remote control
- Rechargeable battery (NiMH)
- Intelligent charger
- Battery case for alkaline batteries
- Adjustable wall and ceiling mount
- Laser glasses
- Magnetic target
- Container

### FLG 240HV GREEN WITHOUT RECEIVER FRG 45-GREEN

ART.-NO. 244550





## FL 260VA Best in class

- » Fully automatic horizontal and vertical self-levelling. Compact ergonomic design and intuitive operation. The ultimate multi-functional laser for interior and exterior applications.
- »
  - High accuracy of  $\pm 0.5 \text{ mm} / 10 \text{ m}$
  - Dust / water protection to IP 66 as well as especially protected housing
  - Li-Ion battery technology
  - Enhanced scanning functions with small increments and a large range of  $180^\circ$
  - Permanent  $90^\circ$  plumb beam up / down for right angles
  - Automatic TILT function
  - VWS function (Vibration-Wind-Security) – rotation will not be stopped due to light ground and wind vibrations
  - Slope functions:
    - Manual slope setting in X and Y axis or
    - One axis manual slope, second axis self-levelled
  - On / Off remote control function: to avoid interference with other remote controls, mobile phones or other electronic devices on site
  - Integrated floor mount with centring mark

### FEATURES

- Visible laser beam
- Adjusted slope setting (manual) up to  $\pm 5^\circ$  ( $\pm 9\%$ ) in X and Y axis
- Single slope setting up to  $\pm 5^\circ$  ( $\pm 9\%$ )
- 2 rotating speeds
- Variable scanning and laser point mode
- Permanent  $90^\circ$  beam to zenith
- VWS function combined with TILT function
- Automatic TILT function
- Remote control screen
- Use with rechargeable batteries; alkaline batteries alternatively
- Li-Ion battery technology / intelligent charger
- Dust / water protection IP 66

### SUPPLIED WITH FL 260VA

- Receiver FR 45 or FR 77-MM with clamp
- Remote control
- Rechargeable batteries and charger
- Floor mount
- Magnetic target
- Laser glasses
- Carrying case

### SUPPLIED WITH FLG 260VA-GREEN

- Receiver FRG 45-Green or FR 77-MM with clamp
- Remote control
- Rechargeable batteries and charger
- Floor mount
- Magnetic target
- Laser glasses
- Carrying case



# FLG 260VA-Green

## The best in green



- » **The new generation: Now with laser class 2 and enhanced visibility of the laser line. Additionally the temperature range was increased to -20 °C to +50 °C.**
- » Same features like FL 260VA combined with superior visibility of the green laser beam; for interior application.

TECHNICAL DATA	FL 260VA LASER CLASS 2	FL 260VA LASER CLASS 3R	FLG 260VA-GREEN
WITHOUT RECEIVER			ART.-NO. 242550
WITH RECEIVER FR 45	ART.-NO. 242020	ART.-NO. 242000	ART.-NO. 242500 (FRG 45-GREEN)
WITH RECEIVER FR 77-MM	ART.-NO. 242097	ART.-NO. 242077	ART.-NO. 242577
Self-levelling range	± 5°	± 5°	± 5°
Accuracy horizontal	± 0.5 mm / 10 m	± 0.5 mm / 10 m	± 0.5 mm / 10 m
Accuracy vertical	± 1.0 mm / 10 m	± 1.0 mm / 10 m	± 1.0 mm / 10 m
Working range with receiver FR 45 Ø	800 m	1000 m	–
receiver FR 77-MM Ø	400 m	600 m	1000 m
receiver FRG 45-Green Ø	–	–	1200 m
Scanning w/o receiver	40 m*	60 m*	40 m*
Rotating w/o receiver Ø	40 m*	60 m*	60 m*
Rotating speed	800, 300 rpm	800, 300 rpm	800, 300 rpm
Laser diode / Laser class	2	3R	2
Scan angle	0°, 10°, 45°, 90°, 180°	0°, 10°, 45°, 90°, 180°	0°, 10°, 45°, 90°, 180°
Manual slope setting X and Y axis	± 5° (± 9 %)	± 5° (± 9 %)	± 5° (± 9 %)
Single slope	One axis manual slope, second axis self-levelled		
Power supply	3.6 V Li-Ion battery	3.6 V Li-Ion battery	3.6 V Li-Ion battery
Operating time Li-Ion battery	50 h	50 h	25 h
Temperature range	-10 °C – +50 °C	-10 °C – +50 °C	-20 °C – +50 °C
Dust / water protection	IP 66	IP 66	IP 66
Weight	2.6 kg	2.6 kg	2.6 kg

\* depending on room illumination

# FL 270VA-Tracking

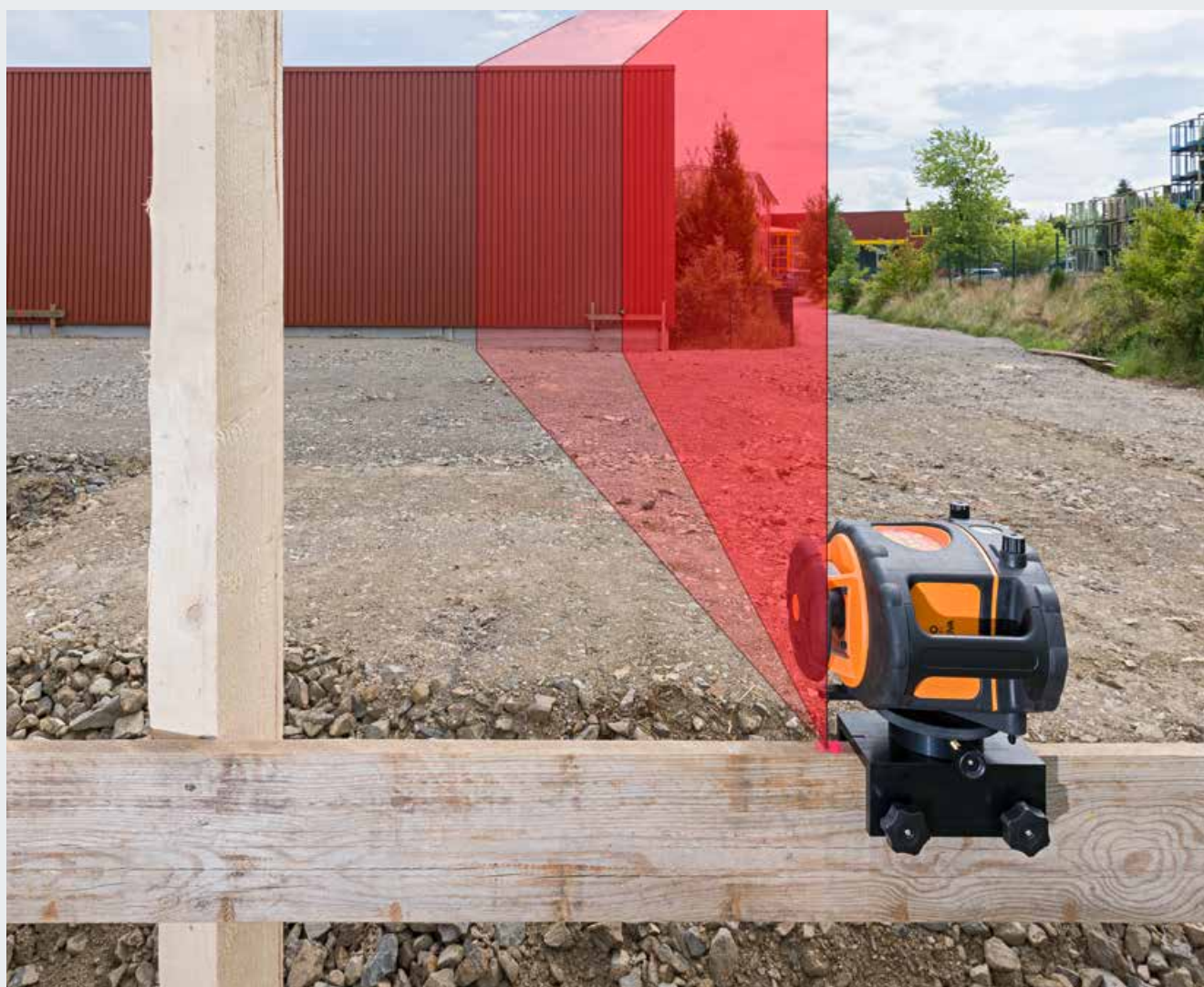
## The alignment pro



- 1 Complete with receiver  
FR 77-MM Tracking
- 2 Laser beam aligns with the  
On-Grade-Position
- 3 Quick and precise alignment

[illegible]

- » **NEW** – Tracking function for automatic axis alignment.  
Including receiver FR 77-MM Tracking with mm-indication.
- » **Tracking functions:**
  - The laser plane is automatically centred to the receiver “on-grade”
  - Vertical: in both X and Y axis
  - Horizontal: one axis X or Y, other axis horizontal self-levelled
- »
  - Fully automatic horizontal and vertical self-levelling. Compact ergonomic design and intuitive operation
  - High accuracy of  $\pm 0.5 \text{ mm} / 10 \text{ m}$
  - Enhanced scanning functions with small increments and a large range of  $180^\circ$
  - Permanent  $90^\circ$  plumb beam up / down for right angles
  - Automatic TILT function
  - VWS function (Vibration-Wind-Security) – rotation will not be stopped due to light ground and wind vibrations
  - Slope functions:
    - Manual slope setting in X and Y axis or
    - One axis manual slope, second axis self-levelled
  - Li-Ion battery technology
  - On / Off remote control function: to avoid interference with other electronic devices
  - Integrated floor mount with centring mark





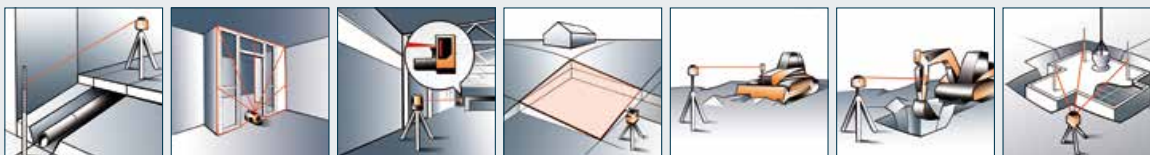
# FL 500HV-G

## The versatile grade laser for interiors and exteriors



» **Advanced second generation with many improvements.**

- » · New and improved mechanical parts ensuring temperature stability and enhancing sloping ability.
- Fully automatic self-levelling in horizontal, vertical and grade
- Slope functions:
  - Horizontal:
    - Digital grade setting of X and Y axis up to  $\pm 10\%$
    - Manual slope setting of X and Y axis
  - Vertical:
    - Direction of X axis can be set up to  $\pm 10\%$  with Y axis self-levelled
    - Direction of X and Z axis can be set manually
- Automatic TILT function
- VWS function (Vibration-Wind-Security)
  - Rotation will not be stopped due to light ground and wind vibrations (combined with TILT function)
- Fully functional 9-channel 2-way RF remote control
- Li-Ion battery technology
- 4-step scanning function



FEATURES	SUPPLIED WITH FL 500HV-G
<ul style="list-style-type: none"> <li>· Dual Axis Laser</li> <li>· Horizontal and vertical</li> <li>· Digital grade adjustment</li> <li>· Monitored grade</li> <li>· TILT function</li> <li>· VWS function</li> <li>· 90° beam to zenith</li> <li>· Illuminated display</li> <li>· 2-way RF remote control</li> <li>· Manual function</li> <li>· 4-step scanning function</li> <li>· Operation with rechargeable Li-Ion or alkaline batteries</li> <li>· Dust / water protection IP 66</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 45 or FR 77-MM with clamp</li> <li>· 2-way RF remote control</li> <li>· Li-Ion batteries and charger</li> <li>· Vertical mount</li> <li>· Telescopic viewfinder</li> <li>· 360° horizontal fine adjustment bracket</li> <li>· Container</li> </ul>





1 With receiver



2 With 360° horizontal fine adjustment bracket

3 With 9-channel 2-way RF remote control

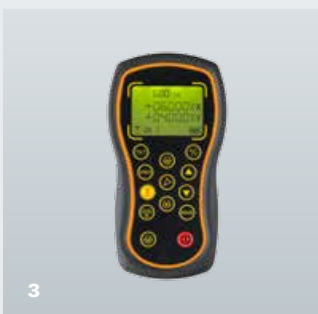
4 Complete kit supplied in container



1



2



3



4

TECHNICAL DATA	FL 500HV-G	FL 500HV-G
RECEIVER FR 45	ART.-NO. 231020	ART.-NO. 231000
RECEIVER FR 77-MM	ART.-NO. 231097	ART.-NO. 231077
Self-levelling range	± 8°	± 8°
Accuracy horizontal	± 0.5 mm / 10 m	± 0.5 mm / 10 m
Accuracy vertical	± 1 mm / 10 m	± 1 mm / 10 m
Working range with		
receiver Ø FR 45	900 m	1200 m
receiver Ø FR 77-MM	400 m	800 m
Scanning w/o receiver	40 m*	60 m*
Rotating w/o receiver Ø	40 m*	60 m*
Laser diode / Laser class	2	3R
Scanning ranges	0°, 10°, 45°, 90°, 180°	0°, 10°, 45°, 90°, 180°
Horizontal slope setting		
X axis	± 10.000 %	± 10.000 %
Y axis	± 10.000 %	± 10.000 %
X and Y axis	Σ ± 14 %	Σ ± 14 %
Vertical slope setting		
X axis	± 10.000 %	± 10.000 %
Y(Z) axis	horizontal self-levelled	horizontal self-levelled
Rotating speed	300 / 600 / 1100 rpm	300 / 600 / 1100 rpm
Operating time	40 h	40 h
Power supply	intelligent / Li-Ion	intelligent / Li-Ion
	Alkaline batteries (optional)	Alkaline batteries (optional)
Remote control range	150 m	150 m
Remote control channels	9	9
Temperature range	-10 °C – +50 °C	-10 °C – +50 °C
Dust / water protection	IP 66	IP 66
Weight (instrument only)	3.85 kg	3.85 kg

# FL 510HV-G Tracking

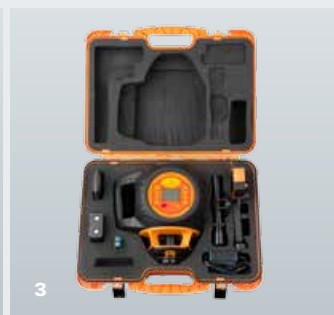
## The ideal outdoor laser


### » Advanced second generation with many improvements.

- New and improved mechanical parts ensuring temperature stability and enhancing sloping ability.



- 1 Receiver FR 77-MM Tracking included
- 2 Remote control range up to 100 m
- 3 Complete kit supplied in container



TECHNICAL DATA		FL 510HV-G TRACKING	FEATURES	SUPPLIED WITH
				ART.-NO. 231700
Self-levelling range		± 8°	<ul style="list-style-type: none"> <li>· Dual Axis Laser</li> <li>· Horizontal and vertical</li> <li>· Digital grade adjustment</li> <li>· Monitored grade (also in tracking mode)</li> <li>· TILT function</li> <li>· VWS function</li> <li>· Tracking function horizontal and vertical</li> <li>· Zonal control</li> <li>· 90° beam to zenith</li> <li>· Illuminated display</li> <li>· 2-way RF remote control</li> <li>· Manual function</li> <li>· Operation with rechargeable Li-Ion or alkaline batteries</li> <li>· Dust / water protection IP 66</li> </ul>	<ul style="list-style-type: none"> <li>· Receiver FR 77-MM Tracking with clamps for levelling staff and scaffold</li> <li>· 2-way RF remote control</li> <li>· Li-Ion batteries and charger</li> <li>· Vertical mount</li> <li>· Telescopic viewfinder</li> <li>· 360° horizontal fine adjustment bracket</li> <li>· Container</li> </ul>
Accuracy horizontal		± 0.5 mm / 10 m		
Accuracy vertical		± 1 mm / 10 m		
Working range with receiver		400 m*		
FR 77-MM Tracking Ø				
Laser diode / Laser class		2		
Horizontal slope setting				
X axis		± 10.000 %		
Y axis		± 10.000 %		
X and Y axis		Σ ± 14 %		
Vertical slope setting				
X axis		± 10.000 %		
Y(Z) axis		horizontal self-levelled		
Working range tracking function		90 m*		
Rotating speed		300, 600, 1100 rpm		
Operating time		40 h		
Power supply		intelligent / Li-Ion		
		Alkaline batteries (optional)		
Remote control range		100 m		<b>RECEIVER</b> <b>FR 77-MM TRACKING</b> ART.-NO. 257150 Technical data for FR 77-MM Tracking same as FR 77-MM (see page 73). Additional RF module to operate the tracking function.
Remote control channels		8		
Temperature range		-10 °C – +50 °C		
Dust / water protection		IP 66		
Weight (instrument only)		3.85 kg		

\* depending on environmental conditions



- » Including receiver FR 77-MM Tracking with mm-indication

» **Tracking functions:**

- The laser plane is automatically centred to the receiver "on-grade"
- Vertical: in both X and Y axis
- Horizontal: one axis X or Y, other axis horizontal self-levelled
- Indication of grade value in % after completion of tracking process shown on the instrument and remote control display. Zonal control with electronic beam screen avoids spurious measurements caused by crossing laser planes and reflections – increases site safety

- Fully automatic self-levelling in horizontal, vertical and grade

· **Slope functions:**

· **Horizontal:**

- Digital grade setting of X and Y axis up to  $\pm 10\%$
- Manual slope setting of X and Y axis

· **Vertical:**

- Direction of X axis can be set up to  $\pm 10\%$  with Y axis self-levelled
- Direction of X and Z axis can be set manually

- Automatic TILT function
- VWS function (Vibration-Wind-Security)  
Rotation will not be stopped due to light ground and wind vibrations (combined with TILT function)
- Zonal control with electronic beam screen (masking)
- Fully functional 8-channel 2-way RF remote control
- Li-Ion battery technology



## FL 550H-G

For steep grades



» **This dual grade laser can be used for grades up to 25 %.**

- » A rugged high performance fully automatic self-levelling dual grade laser. Designed for excavation, ground works and use with machine control systems for ultimate grade control.

- »
- Horizontally fully automatic self-levelling
  - Digital grade setting of X and Y axis
  - Steep grade setting in Y axis up to 25 % (using steep grade adapter)
  - Manual grade setting of X and Y axis
  - VWS function (Vibration-Wind-Security); rotation will not be stopped due to light ground and wind vibrations (VWS function is combined with TILT function)
  - Fully functional 9-channel 2-way RF remote control
  - Li-Ion battery technology
  - Zonal control with electronic beam screen (masking)

**1** Fully functional 9-channel 2-way RF remote control

**3** Remote control range up to 100 m

**2** 360° horizontal fine adjustment bracket for optimum alignment on long distances

**4** Complete kit supplied in container



TECHNICAL DATA	FL 550H-G	FEATURES	SUPPLIED WITH
Self-levelling range	± 8°	· Dual Axis Laser	ART-NO. 232020
Accuracy horizontal	± 0,5 mm / 10 m	· Steep grade laser	· Receiver FR 45 with clamp
Accuracy grade	± 1 mm / 10 m	· Digital grade adjustment	· 2-way RF remote control
Working range with receiver Ø	900 m	· Monitored grade	· Li-Ion batteries and charger
Working range w/o receiver Ø	40	· TILT function	· Telescopic viewfinder
Laser diode / Laser class	635 nm / 2	· VWS function	· Steep grade adapter
Slope setting		· Illuminated display	· 360° horizontal fine adjustment bracket
X axis	± 10.000 %	· 2-way RF remote control	· Container
Y axis	-1.000 % – +25.000 %	· Manual function	
X and Y axis	Σ ± 20 %	· Operation with rechargeable Li-Ion or alkaline batteries	
Rotating speed	600, 1100 rpm	· Dust / water protection IP 66	
Operating time	40 h		
Power supply	intelligent / Li-Ion Alkaline batteries (optional)		
Remote control range	150 m		
Remote control channels	9		
Temperature range	-10 °C – +50 °C		
Dust / water protection	IP 66		
Weight (instrument only)	3.85 kg		



# Rotating Lasers Outline

			Laser class	Horizontal levelling	Vertical levelling	Accuracy / 10 m	Dust / water protection	Working range w/o receiver Q	
271500	FL 30-SET		2	manual	manual	± 2 mm	IP 54	30 m	120 m
212000	FL 100HA JUNIOR		2	fully automatic	–	± 1 mm	IP 65	40 m	600 m
211000	FL 110HA		2	fully automatic	–	± 0.75 mm	IP 66	40 m	800 m
291500	FL 210A		2	fully automatic	manual	H ± 1 mm	IP 66	40 m	400 m
213020	FL 150H-G		2	fully automatic	–	± 0,5mm	IP 65	40 m	800 m
213000	FL 150H-G		3R					60 m	1200 m
244020	FL 240HV		2	fully automatic	fully automatic	± 1 mm	IP 54	40 m	500 m
244000	FL 240HV		3R					60 m	700 m
244500	FLG 240HV-GREEN		2	fully automatic	fully automatic	± 1 mm	IP 54	60 m	1000 m
242020	FL 260VA		2	fully automatic	fully automatic	H ± 0.5 mm	IP 66	40 m	800 m
242000	FL 260VA		3R					60 m	1000 m
242700	FL 270VA-TRACKING		2	fully automatic	fully automatic	H ± 0.5 mm	IP 66	40 m	–
242500	FLG 260VA-GREEN		2	fully automatic	fully automatic	H ± 0.5 mm	IP 66	60 m	1200 m
231020	FL 500HV-G		2	fully automatic	fully automatic	H ± 0.5 mm	IP 66	40 m	900 m
231000	FL 500HV-G		3R					60 m	1200 m
231700	FL 510HV-G TRACKING		2	fully automatic	fully automatic	H ± 0.5 mm	IP 66	60 m	–
232020	FL 550H-G		2	fully automatic	–	± 0.5 mm	IP 66	40 m	900 m
582020	FL 1000 HP		2	fully automatic	–	± 1 mm	IP 54	40 m	400 m

Working range with receiver FR 45 Ø		Working range with receiver FR 77-MM Ø		rpm	Tracking function		TILT function		VWS function		Slope function of both axis X and Y		Slope setting		Plumb up / down beam		Power supply		Receiver, remote control, rechargeable battery, charger	
–	150 – 300	–	–	–	–	–	–	–	–	–	–	–	yes	Alkaline	optional/-/-/-	PAGES		44		
300 m	600	–	yes	yes	–	–	–	–	–	–	–	–	–	NiMH	inclusive			45		
400 m	800	–	yes	yes	± 5° (9 %)	manual	–	–	Li-Ion	inclusive			46							
											47									
–	150 – 300	–	–	–	–	–	–	yes	NiMH	inclusive			48							
400 m 600 m	600	–	yes	yes	± 10 %	digital	–	–	Li-Ion	inclusive			48							
– –	200 / 500	–	yes	–	± 5° (9 %)	manual	yes	NiMH	inclusive			49								
–	200 / 500	–	yes	–	± 5° (9 %)	manual	yes	NiMH	inclusive			50								
400 m 600 m	300 / 800	–	yes	yes	± 5° (9 %)	manual	yes	Li-Ion	inclusive			52								
400 m	300 / 800	yes	yes	yes	± 5° (9 %)	manual	yes	Li-Ion	inclusive			50								
											51									
1000 m	300 / 800	–	yes	yes	± 5° (9 %)	manual	yes	Li-Ion	inclusive			54								
400 m 800 m	300 / 600 / 1100	–	yes	yes	± 10 %	digital	yes	Li-Ion	inclusive			54								
400 m	300 / 600 / 1100	yes	yes	yes	± 10 %	digital	yes	Li-Ion	inclusive			56								
–	600 / 1100	–	yes	yes	X ± 10 % Y -1 % – +25 %	digital	–	–	Li-Ion	inclusive			58							
–	200 / 500	–	yes	–	± 5° (9 %)	manual	yes	NiMH	inclusive			25								

# FKL-55 and FKL-55 Green

## Straight and advanced

» Our newest generation of pipe lasers with advanced technologies and improvements.

- » Advanced technology of mechanical parts, temperature stability and grade technology
- » Extremely good visibility of OLED-Display with large figures
- » Long-range IR remote control with 100 m working range
- » Laser spot direction setting: Quick shifting by continued pressing respective button at both laser or remote control

» Rugged, waterproof, powerful, easy operation and comprehensive range of standard accessories.

» To the human eye a green laser dot is much better visible than a red dot.  
New generation of green laser technology with increased temperature range to -20 °C.



» FKL-55



» FKL-55 Green

FEATURES	SUPPLIED WITH
<ul style="list-style-type: none"> <li>· Robust aluminium housing</li> <li>· Easy intuitive operation</li> <li>· Fully automatic self-levelling</li> <li>· Automatic beam centering</li> <li>· Laser start point indication</li> <li>· Clear easy-to-read OLED-Display</li> <li>· IR remote control with long working range</li> <li>· Integrated rechargeable batteries</li> </ul>	<ul style="list-style-type: none"> <li>· Target frame with target DN 150–300</li> <li>· Container</li> <li>· Pipe Laser</li> <li>· IR remote control</li> <li>· Leg set DN 500</li> <li>· Leg set DN 400</li> <li>· Leg set DN 300</li> <li>· Leg set DN 250</li> <li>· Leg set DN 200</li> <li>· Adapter for 3-leg set up</li> <li>· Charger</li> <li>· Battery case for alkaline batteries</li> <li>· Target DN 400–500</li> </ul>





# Universal Mount for FKL-55 / FKL-55 Green



## UNIVERSAL MOUNT

ART.-NO. 455100

- Levelling base with height adjustable mount for use
- in manhole
- in or in front of pipes with large diameter
- With 5/8" female thread for tripod connection

## SUPPLIED WITH

### Fittings

- 1 Target frame with target DN 150–300
- 2 Container
- 3 Pipe Laser
- 4 IR remote control
- 5 Leg set DN 500
- 6 Leg set DN 400
- 7 Leg set DN 300
- 8 Leg set DN 250
- 9 Leg set DN 200
- 10 Adapter for 3-leg set up
- 11 Charger
- 12 Battery case for alkaline batteries
- 13 Target DN 400–500

Application in pipes DN 150 w/o legs



TECHNICAL DATA	FKL 55	FKL 55	FKL 55-GREEN
ART.-NO.	455500	455520	456500
Laser class	3R	2	3R
Laser diode	red	red	green
Beam diameter	10 mm	10 mm	10 mm
Working range	up to 200 m	up to 120 m	up to 300 m
Grade range	-20 % – +30 %	-20 % – +30 %	-20 % – +30 %
Self-levelling range	± 5°	± 5°	± 5°
Minimum display reading	0.000 %	0.000 %	0.000 %
Horizontal accuracy	± 5 mm / 100 m	± 5 mm / 100 m	± 5 mm / 100 m
Left / right scanning	± 4°	± 4°	± 4°
Operating time	24 h (NiMH)	24 h (NiMH)	24 h (NiMH)
Power supply	4 x D 8000 mAh NiMH (optional 4 x D Alkaline)	4 x D 8000 mAh NiMH (optional 4 x D Alkaline)	4 x D 8000 mAh NiMH (optional 4 x D Alkaline)
IR remote control range			
front / back	100 m / 50 m	100 m / 50 m	100 m / 50 m
Temperature range	-20 °C – +50 °C	-20 °C – +50 °C	-20 °C – +40 °C
Dust / water protection	IP 68	IP 68	IP 68
Dimensions	Ø 132 mm, length 380 mm	Ø 132 mm, length 380 mm	Ø 132 mm, length 380 mm
Weight (laser only)	6 kg	6 kg	6 kg

## geo-FENNEL knowledge base – useful information about laser measuring technology

- » As specialists in the field of laser measuring equipment we would like our customers to benefit from our many years of experience, providing you with useful explanations relating to various topics in the field of laser technology. This will make using our instruments easier, safer and a more profitable experience.

### IP Protection class according to DIN EN 60529

- » The degree of protection of an instrument's housing is defined by the indicator "IP" (Ingress Protection) followed by a two-digit code.

- First digit: Protection against solid particles
- Second digit: Protection against water

# IP

# 5

Protected against dust that would interfere with the operation of the equipment

# 4

Protected against splashed water from any direction.

FIRST DIGIT – PROTECTION AGAINST SOLID PARTICLES	SECOND DIGIT – PROTECTION AGAINST WATER
0 No protection	0 No protection
1 Protected against solid particles with a diameter greater than 50 mm	1 Protected against dripping water
2 Protected against solid particles with diameter greater than 12 mm	2 Protected against dripping water, when the housing is tilted at an angle of up to 15°
3 Protected against solid particles with diameter greater than 2.5 mm	3 Protected against sprayed water up to an angle of 60°
4 Protected against solid particles with diameter greater than 1 mm	4 Protected against splashed water from any direction
5 Protected against dust that would interfere with the operation of the equipment	5 Protected against water projected from a nozzle
6 Dust tight	6 Protected against water projected from powerful jets from any direction
	7 Protected against temporary immersion
	8 Protected against permanent submersion in water

## geo-FENNEL F6 Two-way Radio

- » The F6 is a PMR 446 channel (Private Mobile Radio) licence free Two-way Radio and works between the frequency band 446–446.1 MHz.  
The PMR (Private Mobile Radio) 446 service has been introduced following the adoption by the CEPT/ERC1 of the Decisions ERC/DEC/(98) 25, 26 and 27.
- » This type of radio can be used by anyone anywhere in the EU registration area totally fee free. They can have a maximum RF Output power of 500 mW and have an approx. maximum range of 5 km.

**SET ASIDE THE BAND 446.0 - 446.1 MHZ FOR A PMR 446 SERVICE, WITH A CHANNEL PLAN BASED ON 12,5 KHZ SPACING:**

Channel 1 = 446,00625 MHz  
Channel 2 = 446,01875 MHz  
Channel 3 = 446,03125 MHz  
Channel 4 = 446,04375 MHz

Channel 5 = 446,05625 MHz  
Channel 6 = 446,06875 MHz  
Channel 7 = 446,08125 MHz  
Channel 8 = 446,09375 MHz

## geo-FENNEL – Product functions

» geo-FENNEL lasers have many features which help to carry out safe and comfortable work on construction sites. Some of these features are explained below.



### » Automatic TILT Function

This is a measurement safety function. If the level of the instrument is disturbed it will re-level itself (within the self-levelling range of 5°). If the level is disturbed at a large range (for example if a tripod leg has moved) a height offset can be caused. This will be avoided by the TILT function. The instrument will shut off even within the self-levelling range. This function is activated automatically after the self-levelling procedure is completed.



### » Vibration-Wind-Security (VWS)

This is also a measurement safety function. It allows continuous operation during periods of vibration and wind. If a significant movement occurs the laser stops rotating and the laser beam is flashing. The VWS-Mode is combined with the automatic TILT Function.



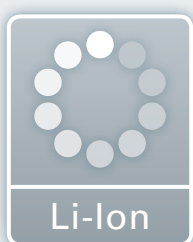
### » Remote control function

The remote control function can be switched off to avoid interference from other instruments that are being used on the same construction site.



### » Zonal control

Zonal control with electronic beam screen avoids spurious measurements caused by crossing laser planes and reflections. Furthermore it greatly increases site safety.



### » Li-Ion battery technology

This technology has great advantages when compared against alkaline and NiMH rechargeable batteries:

- 100 % power until fully discharged
- Top-up charging possible as no memory effect will occur
- Low self discharge then not in use

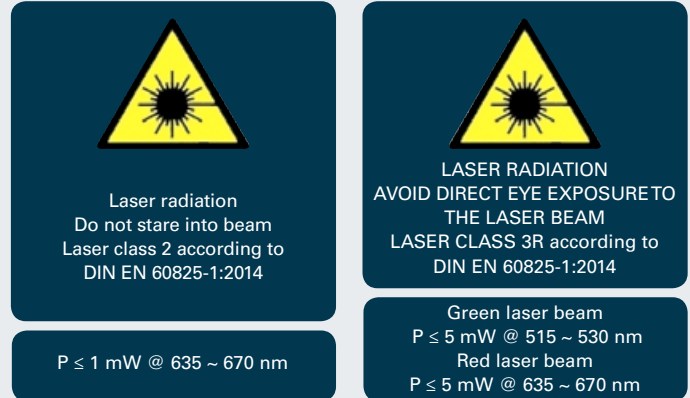


## Laser classification according to DIN EN 60825-1:2014

- » geo-FENNEL laser products are classified into either laser class 2 or 3R.

Their laser class is specified in our technical data.

Please refer to the latest version.



### » Instruments with laser class 2

The laser product can be used without further safety precautions (the relevant safety instructions are described in our user manuals). The eye is protected by the normal human aversion response and the blinking reflex of the human eye to a bright radiant source.

#### GEO-FENNEL CROSS LINE LASERS

The complete range is classified in laser class 2 and offered in 4 visibility classes:

Standard	e. g. FL 40-Pocket II	Working range visibility 10 m
HP (High Power)	e. g. FL 40-Pocket II HP	Working range visibility 20 m
SP (Selection PRO)	e. g. FL 40-PowerCross SP	Working range visibility 30 m
SP (Selection PRO) – Green	e. g. FLG 55-Green SP	Working range visibility 40 m

#### GEO-FENNEL ROTATING LASERS

Our complete range is available within the laser class 2 classification.

#### GEO-FENNEL PIPE LASERS

The FKL 55 (Art.-No. 455520) and FKL 80 Pipe Laser are classified in laser class 2.

### » Instruments with laser class 3R

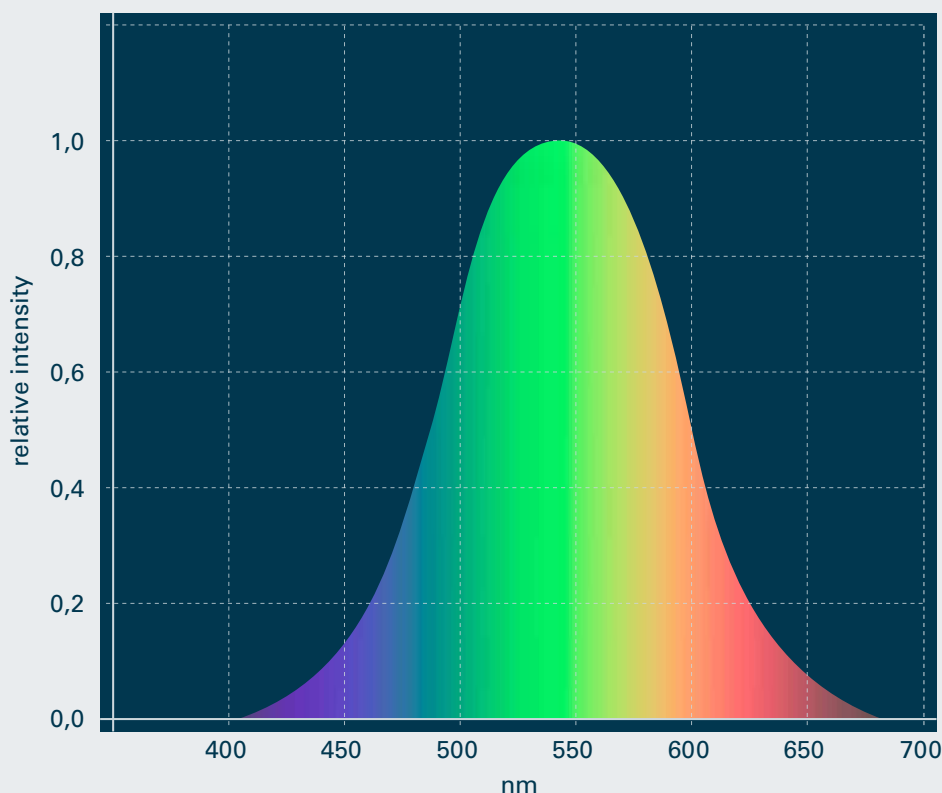
The legal requirement for using laser class 3R products varies from country to country. The user is responsible for compliance to the national standards and regulations. The use of laser class 3R products may require registration with a local authority and the appointment of a health and safety operative.

Special protection measures may be necessary as laser class 3R products have a higher laser output power. The positive effect of this is to increase the performance of the products for long range reception with receivers and improved visibility when using without a receiver.

geo-FENNEL offers various rotating and pipe lasers with laser class 3R.

## Lasers with red or green laser diode

- » The human eye can see the different wavelengths (measuring unit 'nm') of the visible colour spectrum in different intensities. The optimum is at 555 nm. Green light is situated in the middle of this range and can be perceived much higher compared to red light.



- » Therefore green lasers have benefits when used without a receiver. The visibility is much better when working in a bright environment, over long distances or on dark surfaces.

Previously the disadvantages of green lasers were a limited temperature range, shorter battery life, the laser class classification, as well as the significantly higher price.

geo-FENNEL have now introduced an innovation in the field of rotating lasers:

The rotating lasers FLG 240HV-Green and FLG 260VA-Green are equipped with advanced laser diode technology offering the following advantages:

- Fully usable temperature range of -20 °C to +50 °C (the same as red laser diode)
  - Classification in laser class 2 due to special control electronics
  - Equal or slightly better visibility compared to the previous laser class 3R version.
- Due to the laser class 2 classification the laser can be used without any regulatory complications on all construction sites.

OVERCOME DISTANCES:

# WITHOUT LOSING THE DETAIL.

To quickly and easily implement the widest variety of measuring tasks, it is sometimes vital to have the appropriate solution available. Whether you are looking for laser intensive glasses, magnetic targets or the correct adapter – the versatile accessory range from geo-FENNEL makes your work noticeably more efficient.







## Laser EasyFix 5 m Telescopic Rule



### LASER EASYFIX 5 M

ART.-NO. 452

- Telescopic rule with incorporated measuring tape
- Each section can be clamped
- Universal adapter for laser receiver. Receiver can be fixed with on-level mark on top of the rule. The height of the receiver (on-level mark) can be easily read at measuring display
- Maximum length 500 cm
- Retracted length 121.5 cm
- Incorporated circular bubble
- Weight 2.7 kg
- Incl. case

## Floor-to-Ceiling Pillar KS 3



### FLOOR-TO-CEILING PILLAR KS 3

ART.-NO. 520100

- Floor-to-ceiling pillar (1-leg tripod) to be fixed between floor and ceiling
- Solid construction
- 5 sections with metal thread
- Maximal length 3.40 m
- 5/8" and 1/4" adapter
- Supplied with carrying bag
- The individual poles are equipped with 5/8" threads. This enables them to be screwed onto tripods, if no ceiling surface is available

## WH 1 / WH 2 Wall and Ceiling Mount

- » Reinforced version with large metal platform suitable for all geo-FENNEL lasers.



» WH 1



» WH 2



1 Example of use

### WH 1

ART.-NO. 290600

- Robust mount for use on walls and ceilings
- Ideal for use indoors e. g. setting out suspended ceilings
- cm / inch graduation
- Precise adjustment / alignment with large slow motion wheel
- Incl. bag

### WH 2

ART.-NO. 290610

- Same as WH 1 but all metal.
- Especially solid
- Platform size 150 x 95 mm for fixing larger instruments
- Suitable for all geo-FENNEL-lasers

## Grade Mount



### GRADE MOUNT

ART.-NO. 290700

- For rotating and line lasers with manual function
- For setting slopes between 0° and 90° for laser levels in manual mode
- Robust construction
- Graduated slow motion screw
- Fits any tripod with 5/8" thread
- With bubble

## Adapter for S-Digit mini +



### ADAPTER FOR S-DIGIT MINI +

ART.-NO. 290750

- » Adapter for connecting S-Digit mini + (see page 116) to the Grade Mount. Allows higher accuracy to be achieved.



1 Example of use

## 360° Fine adjustment bracket Just set



- » Allows a smooth 360° rotation and fine adjustment for rotating and line lasers. Final position can be clamped. Aperture for instruments with plumb down beam.

### UNIVERSAL MOUNT

ART.-NO. 290760

- 5/8" threads (bottom female, top male)

## Adapter 5814



### ADAPTER 5814

ART.-NO. 290550

- Adapter 5/8" to 1/4"
- Converts a standard 5/8" tripod into a 1/4" fitting

## Wall track adapter WS 1



### WALL TRACK ADAPTER WS 1

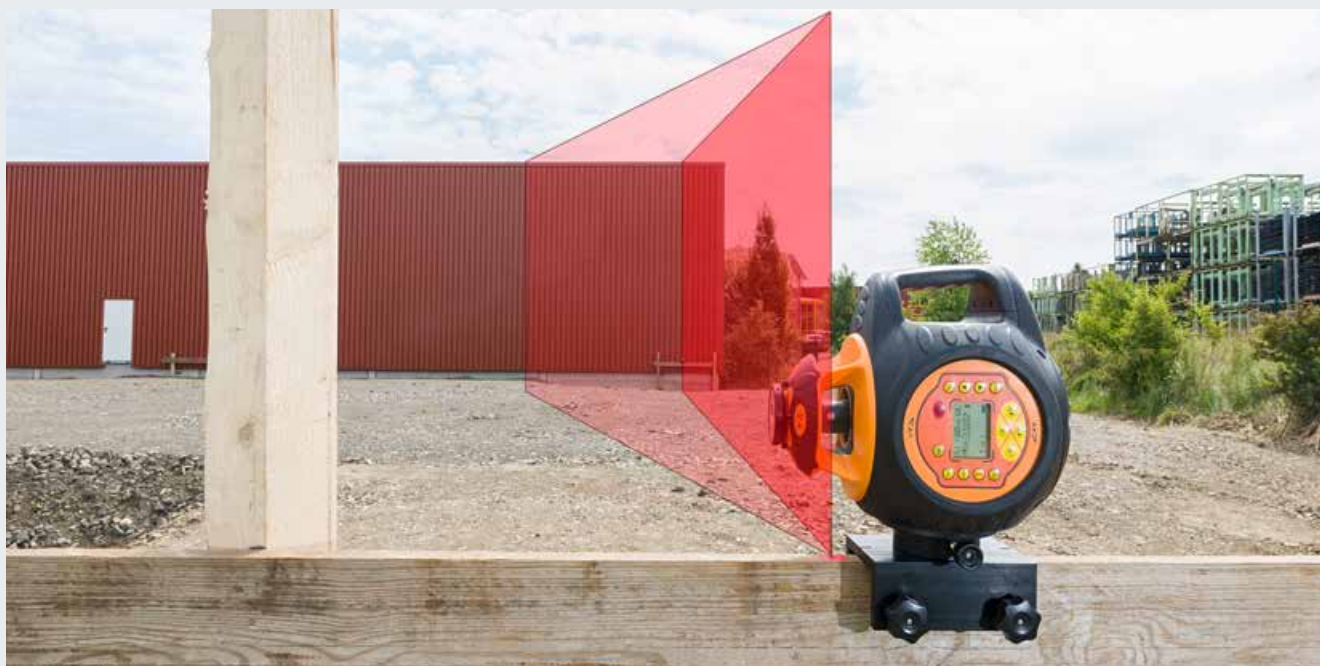
ART.-NO. 290560

- Adapter for clamp connection at wall track for dropped ceiling installation
- Metal surface to connect with magnetic mount of line lasers
- Line laser can be moved up and down for correct height positioning





## Scaffold Clamp Holder



### SCAFFOLD CLAMP HOLDER

ART.-NO. 320600

- For quick centring over the linchpin
- To connect with rotating laser levels, automatic levels, theodolites
- Span approx. 60 mm
- Weight 1.5 kg



## Laser Intensive Glasses



### LASER GLASSES RED

ART.-NO. 253000



### LASER GLASSES GREEN

ART.-NO. 253001

- Laser intensive glasses for better visibility of laser beam

## Magnetic Target LS 307



### TARGET RED

### TARGET GREEN

ART.-NO. 290501

- Magnetic target with cm / inch graduation

## FCA Adapter

### » Adapters to carry out facade construction work with Rotating Lasers.

- » Adapters FCA-L for rotating lasers and FCA-E for receivers are fixed on the wall. Rotating laser plane and receiver on-grade mark are to be set up at same distance to the wall by means of integrated cm/mm-graduation at both adapters.

Like this structural facings can be mounted exactly parallel.

Dedicated for use with FL 270VA-Tracking and FL 510HV-G Tracking in combination with receiver FR 77-MM Tracking.



» FCA-L



» FCA-E

FCA-L FOR LASER

ART.-NO. 290820

FCA-E FOR RECEIVER

ART.-NO. 290830



## FR 55 Receiver for Line Lasers

- » Height indication by LEDs and LCD.



### FR 55

ART.-NO. 500510

- Height indication by 3 LEDs which are situated on the front side and top and with a large display on the front
- With clamp
- Shut-off tone
- Automatic shut-off
- Built-in vials

## FR 55-M Receiver for Line Lasers

- » Height indication by LEDs.



### FR 55-M

ART.-NO. 500520

- Height indication by 3 LEDs which are situated on the front, side and back
- With clamp
- Shut-off tone
- 2-step accuracy
- Automatic shut-off
- Supplied in case
- Built-in magnet on top

## FR 45 and FRG 45-Green Receiver for Rotating Lasers

- » With dual display and clamp for levelling staff, shut-off tone, automatic shut-off, illumination, built-in magnetic strips and vial. Rubberized housing for effective site protection.



- » FR 45 for rotating lasers with read beam



- » FRG 45-Green for rotating lasers with green beam

TECHNICAL DATA	FR 45	FRG 45-GREEN
	ART.-NO. 252000	ART.-NO. 252300
Suitable for laser diode	red	green
Indication	2 x LCD	2 x LCD
3-step accuracy	± 10 mm, ± 4 mm, ± 2 mm	± 10 mm, ± 4 mm, ± 2 mm
Power supply	1 x 9 V	1 x 9 V
Signal tones	3	3
Tone can be switched off	yes	yes
Automatic shut-off	yes	yes
Illumination	yes	yes
Weight	0.2 kg	0.2 kg
Dust / water protection	IP 66	IP 66



# FR 77-MM Laser Receiver



» **NEW: Universal use for rotating laser with red and green laser beam!**

» With digital level indication in millimeters.



- Extra long receiving window
- mm-Indication of difference between laserplane and "0" level
- "0" position can be defined (Offset)

- 1 Illuminated display
- 2 Detail Offset
- 3 Special mount for divers connection e. g. at the scaffold



TECHNICAL DATA	FR 77-MM	FEATURES	SUPPLIED WITH
3-step accuracy	2 / 5 / 9 mm	<ul style="list-style-type: none"> <li>· For rotating lasers using a red or green laser beam</li> <li>· Extra-long receiving window</li> <li>· mm-Indication of difference between laserplane and "0" level</li> <li>· Segments of display indication increase / decrease proportionally</li> <li>· "0"-Position can be defined (Offset)</li> <li>· Display illumination</li> <li>· Robust clamp</li> <li>· Special mount for divers connection e. g. at the scaffold</li> </ul>	<b>ART.-NO. 257100</b>
Accuracy mm-indication	± 1 mm		· 4 x AA Alkaline
Working range class 2-Laser*	150 – 500 m		· Clamp for levelling staff
Working range class 3R-Laser*	300 – 500 m		· Bracket for scaffold
Length receiving window	125 mm		
Length receiving area mm-indication	100 mm		
Offset range (OSET) from base line	± 20 mm		
Measuring units	mm, cm, in, fraction of in		
Signal tones	3		
Display indication	front, back		
LED indication	front, side, back		
Power supply / Operating time	Alkaline / 110 h		
Temperature range	-10 °C – +50 °C		
Display illumination	yes		
Magnets	top, side		
Vials	top, side		
Dust / water protection	IP 67		
Dimensions	170 x 77 x 32 mm		
Weight	0.5 kg		

\* depending on the laser source



## FR 66-MM Receiver for Rotating Lasers

» With digital level indication in millimeters.

TECHNICAL DATA	FR 66-MM	FEATURES
	ART-NO. 258000	
Indication	2 x LCD – 3 x LED on front	· Difference between laser plane and "0" level is shown on the display in mm
5-step accuracy	0.5 / 1 / 2 / 5 / 10 mm	· Segments of display indication increase / decrease proportionally
Measuring units	mm, cm, ft, inch	· Extremely robust and shock-proof
Power supply	2 x AA Alkaline	· Large receiving window (12 cm)
Operating time	60+ h	· 5-step accuracy from 0.5 to 10 mm
Signal tones	3 (65, 95, 100 dBA)	· Two "0" positions can be set (automatic recognition through re-set of receiver clamp)
Tone can be switched off	yes	· HOLD function – reading on display can be held
Automatic shut-off	yes (30 min. 24 h)	· Dust / water protection IP 67
Weight	0.54 kg	

## FMR 600 Receiver for Rotating Lasers



» Heavy duty laser receiver, ideal for mounting onto construction machines. Strong built-in magnets for connection to machines and a clamp for levelling staffs. Large receiving window (125 mm) and clear height indication (audible and visible). Ideal for use with smaller excavators.

TECHNICAL DATA	FMR 600	SUPPLIED WITH FMR 600
		ART-NO. 265000
Accuracy fine	± 5 mm	· Batteries
Accuracy coarse	± 12,5 mm	· Container
Working range	200 m	· Clamp for levelling staff
Receiving window	125 mm long	· Attachment to levelling staff by use of clamp or directly to the machine with built-in magnets
Reception angle	240°	· LCD, LEDs and 3 different tones indicate heights
Power supply	4 x AA Alkaline	· Memory function of last received data
Operating time	50 h	· Water / dust resistant
Temperature range	-20 °C – +50 °C	
Dimensions	170 x 100 x 42 mm	
Dust / water protection	IP 66	
Weight	0.96 kg	

# FMR 700-M/C

## Machine Control Receiver Set

» A machine control receiver to improve the operating accuracy of your construction machinery. Used for permanent level control the FMR 700 receiver has a 360° reception range.



» Magnet



» Clamp



» FRP 707

TECHNICAL DATA	FMR 700-M/C AND 706-M/C	FEATURES	SUPPLIED WITH
Accuracy fine	± 2 mm – ± 10 mm	<ul style="list-style-type: none"> <li>Length of receiving window: 25 cm</li> <li>Connect to the machine with screw clamps or with strong magnets (both supplied in the kit)</li> <li>Detects beam from rotating laser levels of any brand</li> <li>Remote display</li> </ul>	Machine control receiver, built-in rechargeable battery, charger, 12/24V-battery cable, remote display with connection cable, hard case  Also supplied separately: <ul style="list-style-type: none"> <li>Machine control receiver FMR 706-M/C, built-in battery, charger, 12/24V-battery cable, hard case</li> <li>Remote display with connection cable</li> </ul>
Accuracy coarse	± 5 mm – ± 23 mm		
Rechargeable batteries	7.2 V NiMH		
	2500 mAh		
Operating time	40 h		
Charging time	15 h		
Dust / water protection	IP 66		
Temperature range	-20 °C – +50 °C		
Dimensions	376 x 180 x 49 mm		
Weight	3.1 kg		
ART.-NO. SET FMR 700-M/C (MAGNET AND CLAMP)		260500	
ART.-NO. FMR 706-M/C (MAGNET AND CLAMP)		260550	
ART.-NO. FRP 707		263000	

## Magnetic Support for Machine Control Receiver

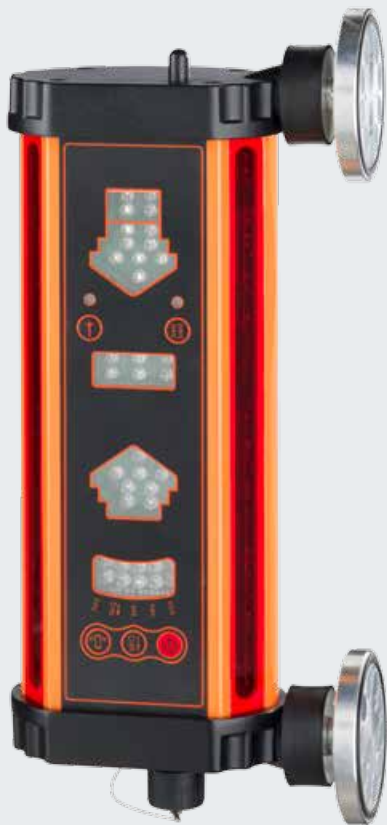


» For connection to construction machinery. Allows the receiver to be easily aligned to the laser plane. Strong magnets ensure non-slip grip onto the machine. Quick release lever allows the magnetic support to be detached easily. Suitable for all brands of machine receivers using a clamp fixing system.

MAGNETIC SUPPORT  
FOR MACHINE CONTROL RECEIVER

ART.-NO. 290810





## FMR 800-M/C SET Machine Control Receiver

» **Machine control receiver used with construction machinery to increase accuracy and boost productivity. For continuous tilt and height control.**

- Bulldozer: Blade tilt and height control
- Excavator: Bucket tilt and height control
- RF Communication link to the remote display



1 Clamp

TECHNICAL DATA		FMR 800-M/C	MACHINE CONNECTION	FEATURES
Beam Reception angle	360°		<ul style="list-style-type: none"><li>· Magnetic connection directly to the machine</li><li>· Clamp connection to the machine mast</li><li>· Mast diameter 40–50 mm</li></ul>	<ul style="list-style-type: none"><li>· Length of receiving window 27 cm</li><li>· Will detect the beam from any brand of rotating laser (red)</li><li>· Dust / water protected metal housing</li><li>· Wireless remote display with suction pad and integrated magnets</li></ul>
Detectable rotating laser speeds rpm	300 - 1200			
Working range class 2-Laser	250 m			
Working range class 3R-Laser	350 m			
Battery recharging time	4 -5h			
Automatic Power-off, after	60 min.			
Dust / water protection	IP 66			
Operating temperature	-10°C - +50°C			
Dimensions	370 x 132 x 92mm			
Weight (receiver only)	3,95 kg			
BULLDOZER MODE			EXCAVATOR MODE	
<b>Blade tilt</b>			<b>Bucket tilt</b>	
(Receiver movement left / right tilted)			(Receiver movement in longitudinal direction forward / backward tilted)	
Accuracy	fine / standard / coarse		Accuracy	fine / standard / coarse
	± 0.5° / ± 1.5° / ± 2.5°			± 0.5° / ± 1.5° / ± 2.5°
Indication LED (left / right sideways)	5		Indication LED, grouped	3
			3 signals: rapid/slow flashing, permanent light	
<b>Height indication</b>			<b>Height indication</b>	
(Receiver movement up / down)			(Receiver movement up / down)	
Accuracy	fine / standard / coarse		Accuracy	fine / standard / coarse
	± 2 / ± 5 / ± 15 mm			± 2 / ± 5 / ± 15 mm
Indication LED (up / down)	3		Indication LED, (up / down) grouped	4
			Extended upper LED for bucket dipping motion	

# FRD 807

## Remote Display



TECHNICAL DATA	FRD 807	SUPPLIED WITH REMOTE DISPLAY FRD 807
		ART.-NO. 264540
Wireless (RF) communication range	10 m	<ul style="list-style-type: none"> <li>Remote display FRD 807</li> <li>Suction pad</li> <li>Batteries</li> </ul>
Communication channels	3	
Machine connection:	<ul style="list-style-type: none"> <li>integrated magnetic pads</li> <li>strong suction pad for cabin windscreen</li> </ul>	
Power supply	4 x AA alkaline	
Dimensions	170 x 100 x 42 mm	
Weight	1.1 kg	

1 Suction pad attachment

### SUPPLIED WITH FMR 800-M/C SET

ART.-NO. 264550

- SET Machine receiver FMR 800-M/C with built-in rechargeable battery
- Charger
- Remote display FRD 807 with suction pad and batteries
- Hard carrying case

### SUPPLIED WITH FMR 800-M/C

ART.-NO. 264500

- Machine receiver FRM 800-M/C with built-in rechargeable battery
- Charger
- Hard carrying case

### OPTIONAL MAGNETIC SUPPORT

ART.-NO. 290810

- For connecting receiver to excavator bucket
- To be used with FMR 800 fitted with clamps







AT OUR CORE:

# PRECISION AND INNOVATION.

Decades of experience – an important factor in the quality of our instruments. You can depend on geo-FENNEL surveying instruments to provide precise reliable results under all working conditions. Whether electronic or optical – our construction and engineering instruments are characterized by their intuitive ease of use, innovation and high accuracy.





## FN 24 / FN 32 Automatic Level



- » Practical high performance combined with a modern design – the new auto levels FN 24 and FN 32.

Automatic Levels suitable for all construction sites for levelling and alignment.

TECHNICAL DATA	FN 24	FN 32	FEATURES
ART.-NO. 400 GON	220424	220432	<ul style="list-style-type: none"> <li>· Metal housing</li> <li>· Bubble reading mirror</li> <li>· Target device (Optical sight) for quick alignment to a target or levelling staff</li> <li>· Modern design</li> <li>· Dust / water protection IP 54</li> </ul>
ART.-NO. 360°	220324	220332	
Mean error for 1 km double levelling	± 2 mm	± 1 mm	
Telescope magnification	24 x	32 x	
Objective diameter	35 mm	35 mm	
Shortest focusing distance	0.3 m	0.3 m	
Working range of compensator	± 12'	± 12'	
Levelling accuracy	± 0,5"	± 0,5"	
Circular bubble	8' / 2 mm	8' / 2 mm	
Horizontal circle	400 gon / 360°	400 gon / 360°	
Dust / water protection	IP 54	IP 54	
Weight (instrument only)	1.2 kg	1.2 kg	



## FAL Automatic Level

- » Rugged design for site use. Precision optics in a metal housing and a large range to suit all applications. Also available as set with tripod and levelling staff.

TECHNICAL DATA	FAL 24	FAL 32	FEATURES
ART.-NO. 400 GON	234400	232400	<ul style="list-style-type: none"> <li>· Metal housing</li> <li>· Mirror for easy reading of bubble</li> <li>· Suitable for both flat and domed head tripods</li> </ul>
ART.-NO. 360°	234360	232360	
Mean error for 1 km double levelling	2.0 mm	1.0 mm	
Telescope magnification	24 x	32 x	
Objective diameter	38 mm	38 mm	
Shortest focusing distance	0.3 m	0.3 m	
Working range of compensator	± 15'	± 15'	
Levelling accuracy	± 0.5"	± 0.5"	
Circular bubble	8' / 2 mm	8' / 2 mm	
Horizontal circle	400 gon / 360°	400 gon / 360°	
Dust / water protection	IP 54	IP 54	
Weight	1.5 kg	1.5 kg	



## FLP 100 Laser Zenith Plummets

- » A precise laser plummet incorporating a coaxial telescope for both laser and optical observations.



TECHNICAL DATA		FLP 100	FEATURES	SUPPLIED WITH
				ART.-NO. 310000
Magnification	26 x	<ul style="list-style-type: none"><li>· Easy to use with two laser plummets (up and down)</li><li>· Laser dot visible up to <math>\geq 120</math> m</li><li>· High accuracy for precision work</li></ul>	<ul style="list-style-type: none"><li>· Set of alkaline batteries</li><li>· Target plate</li><li>· Container</li></ul>	
Clear objective aperture	36 mm			
Shortest focusing distance	0.4 m			
Laser Pointer				
Laser class / Wave length	2M / 635 nm			
Spot size Ø	3 mm / 80 m			
Max. visible distance (day)	$\geq 120$ m			
Max. visible distance (night)	$\geq 250$ m			
Deviation to optical axis	$\leq 3''$			
Accuracy	$\pm 2,5$ mm / 100 m			
Optical plummet				
Laser class / Wave length	1 / 650 nm			
Accuracy	$\pm 1$ mm / 1,5 m			
Plate level	20" / 2 mm			
Power supply	2 x AA Alkaline			
Temperature range	-10 °C – +50 °C			
Dust / water protection	IP 54			
Weight	2.8 kg			

## FEN 132 Engineers' Automatic Level



- » A high quality engineers' automatic level with the most robust compensator available on the market. Brilliant optical system for clear view at all conditions.

- 1 By mirroring an index mark into the eyepiece (swing position of the compensator) measurements can be carried out with high accuracy
- 2 Extremely robust compensator

TECHNICAL DATA	FEN 132	FEATURES	SUPPLIED WITH
			ART.-NO. 210233
Magnification	32 x	<ul style="list-style-type: none"> <li>· Robust and temperature insensitive</li> <li>· Highly accurate and free moving vertical axis</li> <li>· Separate horizontal clamp</li> <li>· Accurate tangent screw movement and focusing drive without backlash</li> <li>· Optical sighting device</li> <li>· Excellent image quality</li> <li>· Service-friendly due to simple construction</li> </ul>	<ul style="list-style-type: none"> <li>· Container</li> <li>· Adjustment pin</li> <li>· Screw driver</li> <li>· Dust brush</li> <li>· Plumb bob</li> </ul>
Clear objective aperture	45 mm		
Field of view	1°		
Shortest focusing distance	2 m		
Mean error per 1 km double levelling using index mark	$< 1$ mm		 
Without using index mark	$\pm 2$ mm		
Multiplication constant	100		
Working range of compensator	$\pm 15'$		
Levelling accuracy compensator	2"		
Circular bubble	8' / 2 mm		
Horizontal circle	360°		
Dust / water protection	IP 54		
Weight	3.4 kg		
Dimensions	280 x 160 x 140 mm		
Temperature range	-25 °C – +50 °C		



# FET 500

## Construction Theodolite

» The versatile starter model for many applications.



» FET 500

# FET 200

## Engineers'/ Construction Theodolite

» High accuracy and clear scale reading.  
Robust and easy to use.



FET 200

[illegible]

## FET 402K-L With Two-Axis Compensator and Laser Pointer

» Coaxial, focusable laser beam integrated to the telescope.

## FET 405K / FET 420K With Two-Axis Compensator



» FET 402K-L



» FET 405K and FET 420K

TECHNICAL DATA	FET 402K-L	FET 405K	FET 420K	OPTIONAL 90° EYEPIECE
ART.-NO.	316000	315000	314000	ART.-NO. 314500
Magnification	30 x	30 x	30 x	<b>FEATURES</b> <ul style="list-style-type: none"> <li>• 2 large easy-to-read LCDs</li> <li>• Simultaneous reading of horizontal and vertical circle</li> <li>• Illumination of display and field of view</li> <li>• Clockwise / anti-clockwise horizontal angle reading</li> <li>• "0" set or hold of horizontal circle at any desired position</li> <li>• "V" circle reading in gon / degrees or % of slope</li> </ul>
Clear objective aperture	45 mm	45 mm	45 mm	
Shortest focusing distance	1.4 m	1.4 m	1.4 m	
Angle measurement	incremental	incremental	incremental	
Accuracy	0.6 mgon (2")	1 mgon (5")	4 mgon (20")	
Minimum reading	0.2 mgon (1")	1 mgon (5")	2 mgon (10")	
Compensator	Dual axis	Dual axis	Dual axis	
Measuring units	400 gon / 360° / mil	400 gon / 360° / mil	400 gon / 360° / mil	
Target	focusable	–	–	
Laser class	3R	–	–	
Beam diameter	5 mm / 100 m	–	–	
Maximum visibility	180 m	–	–	
Deviation	5"	–	–	
Laser plummet	yes	–	–	
Optical plummet	–	3 x	3 x	
Focusing range	–	0.5 – ∞	0.5 – ∞	
Plate level	30" / 2 mm	30" / 2 mm	30" / 2 mm	
Circular level	8' / 2 mm	8' / 2 mm	8' / 2 mm	
Operating time / Power supply	35 h NiMH / 40 h Alkaline	35 h NiMH / 40 h Alkaline	35 h NiMH / 40 h Alkaline	
Theodolite and laser	24 h NiMH / 30 h Alkaline	–	–	
Temperature range	-20 °C – +45 °C	-20 °C – +50 °C	-20 °C – +50 °C	
Dust / water protection	IP 54	IP 54	IP 54	
Tribrach	detachable	detachable	detachable	
Weight	4.5 kg	4 kg	4 kg	

# TheoDist® FTD 05 / FTD 02

## Reflectorless Total stations



» FTD 05



» FTD 02

» The geo-FENNEL TheoDist® is designed to be user-friendly and quick to set up on any construction site. Easy to handle, robust, exact and reliable.

» The main features of the geo-FENNEL TheoDist® are:

- Measuring programs that provide efficient and easy solution for setting out
- Three-dimensional measurement of coordinates
- Menu driven software with intuitive structure to maximise productivity
- A visible laser pointer to improve targeting accuracy and allowing measurements to be taken without looking through the telescope
- Data can be uploaded and downloaded to a PC via the RS-232 connection or SD-Card (FTD 02)
- Measuring range of up to 300m (FTD 05: 200m) without reflector
- Quick and easy set-up with the integrated laser plummet

» The geo-FENNEL TheoDist® Series is equipped with a variety of programs from simple distance and angle measurement up to precise three-dimensional setting out.

- Missing Line
- Offset
- Remote elevation measurement
- Resection
- Integrated application programs for setting out office generated designs.
- Area

» The communication software supplied with the geo-FENNEL TheoDist® allows the user to save the data in various formats. The data files can be converted into DXF format making them suitable to be uploaded into CAD Software such as AutoCAD®.





1



2



3



4



5



6

TECHNICAL DATA	FTD 05	FTD 02
	ART.-NO. 700000	ART.-NO. 700200
<b>Telescope</b>		
Image	Erect	Erect
Objective aperture	45 mm	45 mm
Magnification	30 x	30 x
Field of view	1° 30'	1° 30'
Resolving power	4"	4"
Shortest focus distance	1.5 m	1.5 m
<b>Distance measurement</b>		
Reflectorless	200 m	300 m
Reflective tape target	600 m	600 m
Single standard Prism	600 m	5.000 m
Accuracy	3 mm + 2 ppm	2 mm + 2 ppm
Offset	"0"	variable
<b>Measuring time</b>		
Fine / Rapid / Tracking	1.5 s / 0.9 s / 0.3 s	1.8 s / 0.9 s / 0.3 s
Minimum reading	1 mm	1 mm
Distance units	m / ft	m / ft
<b>Angle measurement</b>		
Minimum reading resolution	1" / 5" / 10"	1" / 5" / 10"
Angle accuracy	5"	2"
Angle units	100 % / 360° / 400 gon	100 % / 360° / 400 gon
<b>Compensator</b>		
Type	electronic	electronic
Range	± 3°	± 3°
<b>Laser pointer</b>		
Laser classification	3R	3R
<b>Laser plummet</b>		
Accuracy	± 1 mm / 1,5 m	± 1 mm / 1,5 m
Laser classification	2	2
<b>Display</b>		
Dual LCD	4 Lines, 24 Characters	8 Lines, 18 Characters
<b>Power</b>		
Rechargeable battery type	7.2 V DC NiMH	7.2 V DC NiMH
Operating time	5 h	5 h
Charger	100 / 240 V	100 / 240 V
<b>Vial sensitivity</b>		
Plate level vial	30" / 2 mm	30" / 2 mm
Circular vial	8' / 2 mm	8' / 2 mm
<b>General specs</b>		
Internal memory	50.000 Points	50.000 Points
External memory	-/-	SD-Card
Weight	6.0 kg	6.5 kg
Operating temperature	-20 °C – +50 °C	-20 °C – +50 °C
IP-Class	IPX4	IPX4
I/O-Port	RS-232	RS-232

FEATURES		FEATURES	
1	Clearly visible display with all functions FTD 05	· Coordinate measuring	· Coordinate measuring
2	RS-232 data connection for universal use of FTD 05	· Setting out points	· Setting out points
3	Complete kit supplied FTD 05	· Resection	· Resection
4	Clearly visible display with all functions FTD 02	· Missing line measurement	· Missing line measurement
5	SD Card FTD 02	· Offset point	· Offset point
6	Complete kit supplied FTD 02	· Remote elevation measurement	· Remote elevation measurement
		· Area calculation	· Area calculation
		· Angle repetition	· Angle repetition
		· Set out line	· Set out line
		· Set out curve	· Set out curve
		· Set out road	· Set out road
SUPPLIED WITH		SUPPLIED WITH	
	Charger, 2 rechargeable batteries, serialcable, software, RS 96 Stake Out Aid, container		Charger, 2 rechargeable batteries, serialcable, software, RS 96 Stake Out Aid, SD-Card, container

# Total Station FTS 102

## Compact and robust

» The geo-FENNEL Total Station FTS 102 is smart in its design and really easy to handle. It comes with the Windows CE based application software MicroSurvey FieldGenius or Carlson SurvCE optionally.



- 1 Easy handling
- 2 Touch pen quickly accessible



» Its touchscreen display greatly improves the workflow of accessing menus and software modes quickly and reliably. The FTS 102 features a full alphanumeric keypad as well as a “pop-up” keyboard which both ensure fast and accurate entering of data.

In addition to the already supplied applications the FTS 102's software package also supports road planing, volume calculation and simple CAD options to make the work in the field much easier. Measurements can be easily transferred into different formats to or from existing softwares like AutoCAD and similar. Due to its usability it is easily possible to measure and check points, stake-out lines, single points as well as setting up the instrument fastly and accurately.

All features are smartly integrated in a compact and well designed instrument: Fast and long range EDM allows for measurements up to 3.500 m with standard prism and reflectorless up to 500 m. An integrated laser plummet allows a quick and accurate setup over measuring points also under difficult conditions. All total stations are equipped with the RS 96 stake out-aid from RS-Systems for fast and secure stake-outs. The FTS 102 measurements can be transferred by standard RS-232 cable but also by Bluetooth® or USB stick. Its two rechargeable Li-Ion batteries allow the use of the FTS 102 for even longer than one working day. All its connectors are well protected against dust and water which results in IP 55.



TECHNICAL DATA		FTS 102		TECHNICAL DATA		FTS 102	
Objective				Laser plummet			
Telescope				Accuracy		± 0.5 mm / 1.5 m	
Image	Erect			Laser class		2	
Objective aperture	45 mm						
Magnification	30 x			Power supply			
Field of view	1° 30'			Li-Ion battery		4400 mAh	
Resolving power	3"			Operating time		8 h	
Shortest focus distance	1.0 m						
Operation				Display			
Reflectorless	1 – 500 m			Dual TFT		3.5" colour display	
Reflective tape target	1 – 800 m			Backlight		yes	
Mini Prism	1 – 1200 m			Keyboard		26 Keys	
Single standard prism	1 – 3500 m			Data process			
Accuracy	± 2 mm + 2 ppm			CPU / clock frequency		2 GB / 528 MHz	
Angle measurement				OS		Windows CE 5.0	
Minimum reading resolution	1" / 5"			Application software		SurvCE / FieldGenius	
Angle accuracy	2"			I/F		RS-232C, Bluetooth®, USB	
Angle units	100 % / 360° / 400 gon			Other			
Compensator				IP class		IP 55	
Axis	2 axis			Operating temperature		- 20 °C – 50 °C	
Range	± 3°			Dimensions		183 x 342 x 167 mm	
Vial sensitivity				Weight		5.4 kg	
Plate level vial	30" / 2 mm						
Circular vial	8' / 2 mm						
FEATURES				SUPPLIED WITH			
				ART.-NO. 710000			
· Easy-to-use on-board software · Easy-to-read display also in direct sunlight · Fast import and export of different data formats without an additional software		· Fast and accurate measurements · Intensity of the laser plummet can be changed gradually · Compact and smart design		· Desktop charger · 2 x Li-Ion battery · Data cable · Container · Stake-out aid RS 96		3 Protected connection ports 4 What's in the kit 5 Clear display 6 Simple system set up	



## FGS 1

### Unique GPS Set for multi-purpose applications



» The geo-FENNEL FGS 1 is a robust receiver designed for challenging environments integrated into a compact device that is lightweight and highly portable.

» The FGS 1 can track all current working GNSS constellations. By using a unique algorithm it can operate in RTK mode combining all GNSS constellation signals or by using a single GNSS constellation signal such as GLONASS, GALILEO or BEIDOU. The strong anti-interference ability of the receiver makes it possible to work in any environment. The FGS 1 integrates a cutting edge GNSS board, Bluetooth®, optional UHF (Rx & Tx) into a compact system. The smart design positions the FGS 1 among the lightest and most compact receivers currently available. The system is open to third party applications and supported by MicroSurvey FieldGenius and Carlson SurvCE field applications.



TECHNICAL DATA	FGS 1	FEATURES
<b>Signal tracking</b>		<ul style="list-style-type: none"> <li>· High-speed processing</li> <li>· Support for both post-processing and kinematic</li> <li>· Processing ability separate or to be combined with GPS, GLONASS, GALILEO and BEIDOU</li> <li>· Supports downloads &amp; use of precise ephemeris</li> <li>· Generation of various reports</li> <li>· User-friendly</li> </ul>
256 channels with simultaneously tracked satellite signals:		
GPS	L1 C/A, L1/L2P, L5	
GLONASS	L1/L2	
BEIDOU	B1, B2, B3	
GALILEO	Yes, but not activated	
SBAS	WAAS, EGNOS, MSAS	
<b>Performance specifications</b>		
Cold start	< 50 s	
Warm start	< 30 s	
Initialization time typically	< 10 s	
Initialization reliability typically	> 99.9 %	
Signal reacquisition	< 2 s	
<b>Positioning specifications</b>		
Post processing static		
horizontal	2.5 mm + 0.5 ppm RMS	
vertical	5.0 mm + 0.5 ppm RMS	
Real time kinematic		
horizontal	10 mm + 0.5 ppm RMS	
vertical	20 mm + 0.5 ppm RMS	
E-RTK (< 100 km)		
horizontal	0.20 m + 1 ppm RMS	
vertical	0.40 m + 1 ppm RMS	
Code differential GNSS positioning		
horizontal	0.25 m + 1 ppm RMS	
vertical	0.50 m + 1 ppm RMS	
SBAS typically	< 1 m 3D RMS	 1
Stand-alone	< 1.5 m RMS	
<b>Communication</b>		
1 serial port (7 Pin Lemo), Baud rates up to 921,600 bps		
Radio modem (optional)	Tx/Rx with full frequency range from 410 – 4702 MHz	
Transmit power	0.5 – 2 W adjustable	
Integrated GSM	3G UMTS modem	
Positioning update rate	1 Hz, 2 Hz, 5 Hz, 10 Hz	
5 LED indicating lights	Power, satellite tracking, differential data and data recording	
Bluetooth®; V 2.X protocol, work compatible with Windows 7®, Windows mobile® and Android®		
<b>Data format</b>		 2
Data inputs / outputs		
Correction data I/O	RTCM 2.x, 3.x, CMR & CMR+ (GPS only)	
Position data outputs		
ASCII	NMEA-0183 GSV, RMC, HDT, VHD, GGA, GSA, ZDA, VTG, GST, PJK, PTNL	
geo-FENNEL Binary update to 20 Hz		
<b>Physical</b>		
Size (W x H)	15.8 x 7.5 cm	
Weight	0.95 kg (including battery)	
<b>Environmental</b>		 2
Operating temperature	-40 °C – +65 °C (40 °F – 149 °F)	
Storage temperature	-40 °C – +85 °C (40 °F – 185 °F)	
Humidity resistance	100 % condensation	
Dust and water protection	IP 67 (withstands 1 m submersion)	
Shock and vibration proof	Yes (survives a 2 m pole drop)	
<b>Electrical</b>		
Input voltage	5 – 27 VDC	
Power consumption	2.85 W (3 constellations)	
Power supply	Li-Ion 1800 mAh	
Operating time	8 hours	 2 1 Small and compact 2 Clear keypad 3 Hot swap battery design
Memory	256 MB	
External memory extension slot	mini SD (up to 16 GB)	

## DC5

### Modern field controller



» A reliable and feature-packed data collector, at an astounding price. The DC5 provides a fast processor, a 9-pin serial port, and much storage space.

» The DC5 strikes an unprecedented value when it comes to a rugged handheld data collector. This feature-packed device is a simple yet powerful solution to your biggest field data challenges.



1



2

TECHNICAL DATA	DC5	FEATURES	SUPPLIED WITH
Operating temperature	-20 °C – +60 °C (-4 °F – 140 °F)	<ul style="list-style-type: none"><li>· Microsoft Windows Mobile® 6.5</li><li>· 806 MHz Marvell PXA-310 Xscale CPU</li><li>· Integrated Bluetooth® V2.1+EDR and Wi-Fi and GSM/GPRS modem</li><li>· Integrated 3.1 megapixel camera</li><li>· 256 MB RAM and 4 GB TF internal storage</li><li>· Supports up to 32 GB TF memory</li><li>· VGA color display, TFT color, LED backlight</li><li>· Speaker and microphone</li><li>· TWO 1500 mAh Li-Ion batteries (12 hours of operation)</li><li>· Drop: 1.5 m (5 ft) height onto a concrete floor</li><li>· Display: 3.7" VGA TFT color</li><li>· Waterproof mini-USB port</li><li>· Wi-Fi 802.11 b/g</li><li>· GSM/GPRS Modem 850/900/1800/1900 Global Four Frequency Support</li></ul>	<ul style="list-style-type: none"><li>· Li-Ion battery</li><li>· Stylus pen and tether</li><li>· Hand strap</li><li>· USB data / charging cable</li><li>· USB wall charger / adapter</li></ul>
Storage temperature	-30 °C – +70 °C (-22 °F – 158 °F)		
Waterproof	IP 65		
Size	177 mm (7") x 91 mm (3.6") x 33 mm (1.3")		
Weight	453 g (16 oz)		
Active viewing area	480 x 640 portrait		
GPS receiver			
U-blox6 single frequency GPS receiver (GPS, SBAS)			
50 channels			
Accuracy	1–3 meter		
Time to first fix	32 seconds		
	NMEA-0183, RTCM/CMR, CORS (VRS/NRS)		
Supported languages	English, German, Czech, French, Greek, Hungarian, Italian, Spanish, Portuguese, Russian, Slovak, Turkish, Korean, Polish, Swedish		



# geo-FENNEL GRU Software and Post-Processing Solution

## » GRU-Software

The geo-FENNEL Utility Software is an easy-to-use tool for setting up the configuration of the FGS 1 GPS Antenna. It also provides the option to load recordings from the internal memory and convert into RINEX.

### TECHNICAL DATA

Software	
Supplied software	MicroSurvey FieldGenius 7

## » geo-FENNEL Post-Processing Solution

The geo-FENNEL PPS is a fully functioned post-processing software which is developed independently. This software package adopts a brand new data processing engine which can process mixed data of GPS, GLONASS and BEIDOU. The main functions are including static baseline processing, ephemeris forecast, project management, closure search, network adjustment, result export, coordinate system management and coordinate transformation.

This software can process geo-FENNEL FGS 1 static GNSS data and RINEX standard format. This way it can import data from various brands of GNSS receivers available on the market. It can freely process GPS, GLONASS and BEIDOU combined or separate data. It supports the operation modes of static, rapid static and post processing kinematic (PPK). The software has a user-friendly interface.

## FGS 1 Sets



### SUPPLIED WITH GPS SYSTEM FGS 1 COMPLETE SET

#### ART.-NO. 751000

- 2 x GNSS Antenna FGS 1
- 1 x MicroSurvey FieldGenius Software
- 1 x Field controller DC5
- 1 x Post-processing Software
- 2 x USB cable for FGS 1
- 2 x RS-232 cable for FGS 1
- 1 x Measuring Tape 3 m
- 1 x Tribrach AJ 10 black
- 1 x Tribrach Adaptor AL 11-D black with optical plummet
- 1 x Container
- 1 x User manual

### SUPPLIED WITH GPS SYSTEM FGS 1 NETWORK SET

#### ART.-NO. 750100

- 1 x GNSS Antenna FGS 1
- 1 x MicroSurvey FieldGenius Software
- 1 x Field controller DC5
- 1 x Post-processing Software
- 1 x USB cable for FGS 1
- 1 x RS-232 cable for FGS 1
- 1 x Measuring Tape 3 m
- 1 x Container
- 1 x User manual





THE DEGREE OF PROFESSIONALISM:  
**EXTREMELY HIGH.**

Suitable for a wide range of applications including electrical, food preparation, automotive, maintenance, construction, health and safety – the environmental measurement devices from geo-FENNEL are reliable partners wherever physical values such as temperature and humidity must be precisely determined. They are characterized by their ease of use and intuitive operation – taking precise measurement to achieve visible and tangible results.



# FVE 100

## Video Borescope



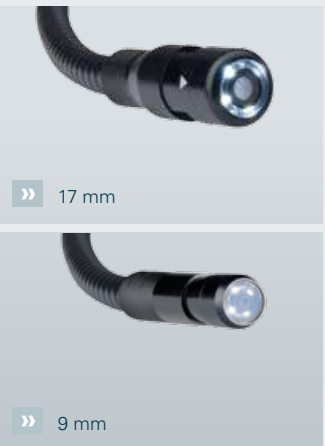
» Video borescope for inspection and survey of inaccessible areas.

» **Trades and tasks:** Sanitary, heating and ventilation, car industry, workshops, renovation.

### » OPTIONAL FOR FVE 100 AND FVE 150

Optional accessories: Gooseneck probes of 1 m and 2 m length with standard camera head of 17 mm and with 9 mm only.

Reference	Gooseneck length	Camera head diameter	Art.-No.
P 1-17	1 m	17 mm	800750
P 2-17	2 m	17 mm	800751
P 4-17	4 m	17 mm	800754
P 1-9	1 m	9 mm	800752
P 2-9	2 m	9 mm	800753
P 4-9	4 m	9 mm	800755



» 17 mm

» 9 mm

TECHNICAL DATA	FVE 100	FEATURES	SUPPLIED WITH FVE 100
			<b>ART.-NO. 800700</b>
<b>Camera head</b>		<ul style="list-style-type: none"> <li>Water proof camera head and probe</li> <li>1 m long flexible gooseneck probe with camera head for the optical inspection of inaccessible areas</li> <li>Camera head with LED lighting</li> <li>Immediate transfer of the colour image to the large LCD display</li> <li>180° image rotation at the press of a button</li> <li>Direct transfer of image to television or notebook</li> <li>Accessories: <ul style="list-style-type: none"> <li>Hook and magnet attachments for object retrieval</li> <li>Angle mirror attachment to "view around corners"</li> </ul> </li> <li>Powerful Li-Ion battery with charger</li> </ul>	<ul style="list-style-type: none"> <li>Video borescope</li> <li>1 m flexible gooseneck probe</li> <li>TV cable</li> <li>USB cable</li> <li>Charger</li> <li>Magnet</li> <li>Hook</li> <li>Mirror</li> <li>Container</li> </ul>
Viewable angle	0° and 180°		
Focal length	6–7 cm		
Viewable distance	5–15 cm		
Diameter of camera head	17 mm		
Light source	LED		
<b>Display</b>			
Display size	3"		
Resolution	960 x 240 pixel		
Image transmission to LCD	Flexible gooseneck		
CMOS Image sensor	300.000 pixel		
Video output (to TV)	PAL / NTSC		
<b>Various</b>			
Probe length	100 cm		
Bend radius of probe	6 cm		
Dust / water protection probe and camera	IP 67		
Power supply	3.7 V / 2000 mAH Li-Ion		
Operating time	4 h		
Temperature range	-10 °C – + 50 °C		
Humidity range	15 % – 85 % RH		
Dimensions	240 x 160 x 100 mm		
Weight with probe	0.584 kg		

## FVE 150 Video Borescope



» Video borescope for inspection and survey of inaccessible areas. Photos and videos can be memorized for documentation purposes.

» **Trades and tasks:** Sanitary, heating and ventilation, car industry, workshops, renovation.

1 With SD-card for fast transmission of the data to PC



TECHNICAL DATA	FVE 150	FEATURES	SUPPLIED WITH FVE 150
			ART-NO. 800710
<b>Camera head</b>		<ul style="list-style-type: none"> <li>Water proof camera head and probe</li> <li>1 m long flexible gooseneck probe with camera head for the optical inspection of inaccessible areas</li> <li>Camera head with LED lighting</li> </ul>	<ul style="list-style-type: none"> <li>Video borescope</li> <li>1 m flexible gooseneck probe</li> <li>TV cable</li> <li>USB cable</li> </ul>
Viewable angle	0° and 180°		
Focal length	6–7 cm		
Viewable distance	5–15 cm		
Diameter of camera head	17 mm		
Light source	LED		
<b>Display</b>		<ul style="list-style-type: none"> <li>Immediate transfer of the colour image to the large LCD display</li> <li>180° image rotation at the press of a button</li> </ul>	<ul style="list-style-type: none"> <li>Charger</li> <li>Magnet</li> <li>Hook</li> <li>Mirror</li> <li>4 GB SD-card</li> <li>Container</li> </ul>
Display size	3.2"		
Resolution	320 x 240 pixel		
Image transmission to LCD	Flexible gooseneck		
CMOS Image sensor	300.000 pixel		
Video output (to TV)	PAL / NTSC		
Picture / video formats	JPG / 3 GP		
Resolution picture / video	320 x 240 Pixel		
<b>Various</b>		<ul style="list-style-type: none"> <li>Internal memory or SD-card to store images and video sequences</li> <li>4 GB SD-card included (supports up to 8 GB)</li> <li>Date and time indication on the display</li> <li>Transmission of video clips / images onto television or PC for editing or documentation</li> <li>Multi-language menu (DE, EN, FR, ES, IT, FI)</li> <li>Accessories: see FVE 100</li> </ul>	
Internal memory	70 MB		
Additional memory	4 GB SD-card		
	supports up to 8 GB (optional)		
Operation languages	EN, FR, DE, ES, IT, FI		
Probe length	100 cm		
Bend radius of probe	6 cm		
Dust / water protection probe / camera	IP 67		
Power supply	3.7 V / 2000 mAh Li-Ion		
Operating time	4 h		
Temperature range	-10 °C – + 50 °C		
Humidity range	15 % – 85 % RH		
Dimensions	240 x 160 x 100 mm		
Weight with probe	0.584 kg		

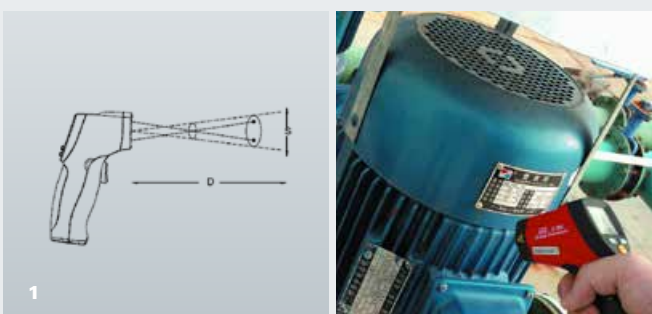
# FIRT 550-Pocket and FIRT 800-Pocket Infrared Thermometer



1 The dual laser dot to focus the target

» Small and handy infrared thermometer, easy to operate, for versatile applications. Particular feature: Measurement with dual laser to focus the target.

» **Trades and tasks:** Heating, ventilation and refrigeration systems, food industry, car industry, construction, building construction, fire inspection, injection molding industry, ship maintenance, isolation (heat loss), drying facility.



TECHNICAL DATA	FIRT 550-POCKET	FIRT 800-POCKET	FEATURES
D(distance):S(pot)	12:1	10:1	For non-contact measurement with laser dot. Quick measurements for: <ul style="list-style-type: none"> <li>· Surfaces which are difficult to reach</li> <li>· Moving or rotating objects</li> <li>· Electrified parts</li> <li>· Chemicals</li> <li>· Hot objects</li> </ul>
Temperature range	-50 °C – +550 °C	-35 °C – +800 °C	
Ø measuring spot at 100 cm	80 mm	100 mm	
Emissivity	adjustable 0.1 – 1.0	adjustable 0.1 – 1.0	
Laser pointer	yes, dual	yes, dual	
Auto data HOLD	yes	yes	
Illuminated display	yes	yes	
Max, Min	Max only	yes	
High and low alarm	yes	yes	
Power supply	9 V battery	9 V battery	
Response time	< 1 sec	< 1 sec	
Resolution display	0.1 °C	0.1 °C	
Accuracy	± 1 %	± 1 %	
Laser class	2	2	
Weight	0.178 kg	0.178 kg	
Dimensions	146 x 104 x 43 mm	160 x 82 x 42 mm	
			<b>SUPPLIED WITH FIRT 550-POCKET</b> ART.-NO. 800001
			· Case and battery
			<b>SUPPLIED WITH FIRT 800-POCKET</b> ART.-NO. 800002
			· Case and battery



# FIRT 1000 DataVision Infrared Thermometer



» Infrared thermometer with a large temperature range and integrated 2.2" TFT colour LC display for monitoring and evaluation of monitored data.

» **Trades and tasks:** Old-building renovation, heating, ventilation construction, building construction, food control, drying facility, isolation (heat loss).

- 1 Display with simultaneous indication of:
- Date / time
  - Ambient temperature
  - Dewpoint temperature
  - Temperature of the object measured
  - Minimum temperature
  - Maximum temperature
  - Temperature difference
  - Average temperature
  - Wet bulb temperature
  - Ambient humidity
  - Emissivity
  - Battery status indicator

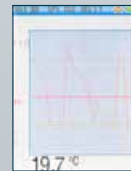
- 2 Video camera function
- 3 Data log function
- 4 Digital camera function
- 5 Dewpoint temperature function



1



2



3



4



5

TECHNICAL DATA	FIRT 1000 DATAVISION	FEATURES	SUPPLIED WITH
D(istance):S(pot)	50:1	<ul style="list-style-type: none"> <li>· For non-contact temperature measurement with laser dot</li> <li>· Short response time of 150 ms and an accuracy of <math>\pm 1.0\%</math></li> <li>· 2.2" TFT colour LC display</li> <li>· Dual laser pointer for better targeting</li> <li>· Permanent measuring</li> <li>· Compatible with all standard connector Type-K thermocouples</li> <li>· Easy transmission of measurements to PC via USB</li> <li>· Memory socket for Micro-SD Cards</li> <li>· Integrated camera for images (JPEG) and video (AVI)</li> <li>· Date / Time function</li> <li>· Measurement of air humidity and ambient temperature</li> <li>· Determination of dewpoint</li> </ul>	<b>ART.-NO. 800030</b> <ul style="list-style-type: none"> <li>· Battery</li> <li>· USB cable</li> <li>· Mini tripod</li> <li>· Type-K temperature probe</li> <li>· Case</li> </ul>
Temperature range	-50 °C – +1000 °C		
Ø measuring spot at 100 cm	20 mm		
Emissivity	adjustable 0.10 – 1.0		
Laser pointer	yes, dual		
Auto data HOLD	yes		
Illuminated display	yes		
Max, Min, DIF, AVG record	yes		
High and low alarm	yes		
Power supply	3.7 V Li-Ion battery		
Response time	< 150 ms		
Resolution	0.1 °C – 1000 °C		
	1 °C over 1000 °C		
Temperature range Type-K probe	-50 °C – +1370 °C		
Accuracy (IR) (+20 °C – +400 °C)	$\pm 1.0\% \pm 1\text{ °C}$		
Accuracy (TK) (-50 °C – +1370 °C)	$\pm 0.5\% \pm 1.5\text{ °C}$		
Laser class	2		
Weight	0.45 kg		
Dimensions	205 x 62 x 155 mm		



## FIRT 1600 Data Infrared Thermometer

- » For very high temperature measurements.
- » With integrated memory for monitoring and analysis.
- » **Trades and tasks:** Foundry, monitoring of: brake drums, discs, electric motors, exhaust systems.

TECHNICAL DATA	FIRT 1600 DATA	FEATURES	SUPPLIED WITH
			ART.-NO. 800020
D(distance):S(pot)	50:1	<ul style="list-style-type: none"> <li>For non-contact temperature measurement with laser dot</li> <li>150 ms fast sampling with 1 % accuracy</li> <li>High temperature range</li> <li>Built-in dual laser pointers for accurate targeting</li> <li>Permanent measuring</li> <li>Compatible with all standard connector Type-K thermocouples</li> <li>USB interface</li> <li>Memory for 99 measurements</li> <li>Easy transmission of data to PC via USB interface</li> </ul>	<ul style="list-style-type: none"> <li>Battery</li> <li>USB cable</li> <li>Mini tripod</li> <li>Type-K temperature probe</li> <li>Case</li> </ul>
Temperature range	-50 °C – +1600 °C		
Ø measuring spot at 100 cm	20 mm		
Emissivity	adjustable 0.10 – 1.0		
Laser pointer	yes, dual		
Auto data HOLD	yes		
Illuminated display	yes		
Max, Min, DIF, AVG record	yes		
Power supply	9 V battery		
Response time	Less than 150 ms		
Resolution	0.1 °C – 1000 °C		
	1 °C over 1000 °C		
Temperature range Type-K probe	-50 °C – +1370 °C		
Accuracy (IR) (+20 °C – +400 °C)	± 1.0 % ± 1 °C		
Accuracy (TK) (-50 °C – +1370 °C)	± 1.5 % of reading + 3 °C		
Laser class	2		
Weight	0.3 kg		
Dimensions	204 x 155 x 52 mm		



## FHT 70 DataLog Temperature and Humidity Data Logger

- » Data logger for recording temperatures and air humidity over a longer period for check-up and analysis.
- » **Trades and tasks:** Cold storage house, drying, gallery, food industry.

TECHNICAL DATA	FHT 70 DATALOG	FEATURES
<b>Function</b>	<b>Range</b>	<b>Basic accuracy</b>
Relative humidity	0 % – 100 % RH	± 3.0 %
Temperature	-40 °C – 70 °C	± 1 °C
		<b>Resolution</b>
		0.1 % RH
		± 0.1 °C
Logging rate	Select sampling interval from 1 sec to 24 h	<b>SUPPLIED WITH</b>  ART.-NO. 800120  · 3.6 V lithium battery · Software · Clamshell
Operating temperature	-35 °C – +80 °C	
Power supply	3.6 V Lithium	
Size	132 x 66 x 37	
Weight	180 g	

- Measures temperature and air humidity
- Internal memory for 32.700 readings (3 x 10.900)
- Selectable measurement cycle from 1 sec to 24 h
- LCD with date, time, temperature, humidity, limit value
- Software for analysis

# FT 1300-1 / FT 1300-2

## Professional K-Type Thermometers with single and dual input



» **Trades and tasks:** Temperature measurements of liquid construction materials like asphalt, isolation checks, measurements in the HVAC branch, energy supply, industrial and laboratory application.

TECHNICAL DATA	FT 1300-1	FT 1300-2	FEATURES
ART.-NO.	800400	800410	
Scanfunction	1 measurement	2 measurements simultaneously or temperature difference	<ul style="list-style-type: none"> <li>· Indication of maximum value (MAX)</li> <li>· Data HOLD function</li> <li>· Large display (45 mm) with illumination</li> </ul>
Sampling rate	2.5 x per second	2.5 x per second	
Accuracy	± 0,5 % / ± 1 °C	± 0,5 % / ± 1 °C	
Display resolution	0.1 °C / 1 °C	0.1 °C / 1 °C	
Temperature range	-50 °C – +1300 °C	-50 °C – +1300 °C	<b>SUPPLIED WITH</b> <ul style="list-style-type: none"> <li>· Flexible wire probe TP-300</li> <li>· Set of batteries</li> <li>· Case</li> </ul>
Measuring units	°C / °F / K	°C / °F / K	
Dimensions	162 x 76 x 39 mm	162 x 76 x 39 mm	
Weight	0.21 kg	0.21 kg	
Power supply	Alkaline batteries	Alkaline batteries	

# FT 1000-Pocket

## Digital Thermometer



» **Trades and tasks:** Temperature measurement of liquids and soft materials.

TECHNICAL DATA	FT 1000-POCKET	FEATURES	SUPPLIED WITH
Temperature range	-20 °C – +1000 °C	<ul style="list-style-type: none"> <li>· Handy thermometer with immersion probe</li> <li>· Pocket-size, light weight, easy to operate</li> </ul>	ART.-NO. 800420
Accuracy	± 3 %		<ul style="list-style-type: none"> <li>· Set of batteries</li> <li>· Incorporated all-purpose probe</li> </ul>
HOLD function	yes		
Automatic shut-off	yes		
Battery status indicator	yes		
Dimensions	117 x 65 x 24 mm		
Weight	0.16 kg		
Power supply	Alkaline batteries		



# FHT 60 and FHT 100

## Humidity and Temperature Meter

» **Trades and tasks:** Environmental monitoring, warehouses, production facilities, greenhouses (floristics), ventilating and air-conditioning, civil engineering, construction physics, expert report.



» FHT 60



» FHT 100

TECHNICAL DATA	FHT 60	FHT 100	FEATURES
ART.-NO.	800100	800110	
Temperature range	-20 °C – +60 °C	-30 °C – +100 °C	· Fast measurement of relative humidity and temperature  <b>FHT 100</b> · Dewpoint temperature measurement for recognition of mold building up and wet bulb temperature measurement (evaporation temperature)
Humidity range	0 % – 100 % RH	0 % – 100 % RH	
Fast response time	yes	yes	
Illuminated display	yes	yes	
Max HOLD	yes	yes	
Data HOLD	yes	yes	
Dewpoint temperature	no	-30 °C – +100 °C	
Wet bulb temperature	no	0 °C – +80 °C	
Accuracies:			
Humidity	± 3.5 % RH	± 2 % RH	
Temperature	± 2 °C	± 0.5 °C	<b>SUPPLIED WITH</b>  · Case · Battery
Dewpoint	–	± 0.5 °C	
Wet bulb	–	± 0.5 °C	



## FHM 10 Moisture Meter

» Pocket-size moisture meter for fast and convenient measurement of moisture content.

» **Trades and tasks:** Building and construction: plaster, gypsum, concrete and mortar; wood construction: sawn timber; general: firewood, wood, cardboard, paper.

TECHNICAL DATA	FHM 10	FEATURES	SUPPLIED WITH
Measuring range wood	6 % – 44 %	<ul style="list-style-type: none"> <li>· Measurement principle: electrical resistance</li> <li>· Dual display for wood and construction materials</li> <li>· Replaceable 8 mm measuring pins</li> <li>· Protective cap with integrated function and battery check</li> <li>· Automatic power-off</li> <li>· Impact resistant housing</li> </ul>	ART.-NO. 800310
Accuracy wood	± 1 % *		<ul style="list-style-type: none"> <li>· CR2032 batteries</li> </ul>
Measuring range other materials	0.2 % – 2 %		
Accuracy other materials	± 0,05 %		
Power supply	3 x CR2032 batteries		
Dimensions	130 x 40 x 25 mm		
Weight	102 g		

\* Average adjustment for European wood based on wood temperature of 20 °C



## FHM 20 Moisture Meter


» Moisture meter for wood and building materials.

Wood: Calibrated to 170 wood types in 8 groups.

**Building materials:** Gypsum, plaster, concrete, concrete screeds, mortar, cardboard, paper.

Measurement of humidity permeation, surface humidity, determination of dry and humid areas.

1 Moisture and temperature probe

TECHNICAL DATA	FHM 20	FEATURES	SUPPLIED WITH
Measuring principle	Electrical resistance	<ul style="list-style-type: none"> <li>· External moisture measurement probe</li> <li>· External temperature probe: at measurement with moisture and temperature probe the moisture measurement is carried out with automatic temperature compensation. This leads to a higher accuracy</li> <li>· 8 mm measuring pins (replaceable)</li> <li>· Protective cap with integrated calibration check</li> <li>· Battery indicator</li> <li>· Automatic power-off (adjustable time)</li> </ul>	ART.-NO. 800320
Measuring range wood	6 – 99,9 %		<ul style="list-style-type: none"> <li>· Moisture and temperature probe</li> <li>· Padded bag</li> <li>· 2 x spare measuring pins</li> <li>· 2 x AAA Batteries</li> </ul>
Accuracy wood	± 1 % *		
Measuring range building materials	3–33 %		
Accuracy building materials	± 1 %		
Range temperature measurement	0 °C – +60 °C		
Dimensions	180 mm x 50 mm x 31 mm		<p>1</p>
Weight	175 g		

\* Average adjustment for European wood at 20 °C



## FFM 100 Moisture Detector

- » Quick non-destructive measurement of surface humidity up to 40 mm measuring depth.
- » **Trades and tasks:** Building materials, concrete floors, walls, ceilings.

TECHNICAL DATA	FFM 100	FEATURES	SUPPLIED WITH
			<b>ART.-NO. 800650</b>
Measuring depth	20 – 40 mm	Quick measurement of humidity in building materials without destruction of the surface <ul style="list-style-type: none"> <li>· Indication of minimum / maximum values</li> <li>· Sensor type: metal spheroid</li> </ul>	· Set of batteries
Measuring range	0 – 100 digits		
Resolution	1 digit		
HOLD function	yes		
Display illumination	yes		
Automatic shut-off	yes		
Battery status indication	yes		
Dimensions	80 x 45 x 45 mm		
Weight	0.18 kg		
Power supply	Alkaline batteries		



## FTA 1 Thermometer-Anemometer

- » A professional remote vane thermo-anemometer for measuring air velocity, air flow and temperature.
- » **Trades and tasks:** Ventilation and air-conditioning: installation of ventilation systems, measurements of air flow and temperature; agriculture: crop spraying, ventilation surveys and crop storage; environmental monitoring.

TECHNICAL DATA	FTA 1	FEATURES
<b>Air velocity</b>	<b>Measuring range</b>	<ul style="list-style-type: none"> <li>· Simultaneous display of air flow or air velocity and ambient temperature</li> <li>· Large easy-to-read LCD with switchable backlight</li> <li>· Maximum / minimum function</li> <li>· 20 average readings for air flow and air velocity</li> <li>· Data HOLD function</li> <li>· 16 memory locations for area (8 CMM, 8 CFM)</li> <li>· Remote vane with low-friction bearing (65 mm diameter) for accurate results</li> </ul>
m/s	0.40 – 30.00	
ft/min	80 – 5900	
km/h	1.4 – 108.0	
mph	0.9 – 67.0	
knots	0.8 – 58.0	
<b>Air flow</b>	<b>Measuring range</b>	
CMM (m³/min)	0 – 999,900	
CFM (ft³/min)	0 – 999,900	
<b>Air temperature</b>	<b>Measuring range</b>	<b>SUPPLIED WITH</b>  <b>ART.-NO. 800450</b> <ul style="list-style-type: none"> <li>· Sensor with 120 cm cable</li> <li>· 9 V alkaline battery</li> <li>· Container</li> </ul>
°C	-10 °C – +60 °C	
°F	14 °F – 140 °F	
<b>Various</b>		
Power supply	1 x 9 V	
Operating time	80 h	
Dimensions	75 x 203 x 50 mm	
Weight	280 g	





## FSM 130+ Sound Level Meter

» **Trades and tasks:** Industry, health and safety, school, public works, environmental measurements.

TECHNICAL DATA	FSM 130+	FEATURES	SUPPLIED WITH
			ART.-NO. 800210
Low range (Lo)	35–100 dB	<ul style="list-style-type: none"> <li>For quick check of sound level</li> <li>Standard IEC 651 type 2</li> </ul>	<ul style="list-style-type: none"> <li>Case</li> <li>Battery</li> </ul>
High range (Hi)	65–130 dB		
Frequency weighting A, C	Lo 35–100 dB		
	Hi 65–130 dB		
Max HOLD	yes		
Data HOLD	yes		
Analogue AC/DC output to analyzer or recorder	yes		
IEC 651 Type 2 standard	yes		
Built-in calibration check	yes		
Accuracy at 94 dB	1.5 dB		
Operation temperature	0 °C – +40 °C		
Operation humidity	< 80 % RH		



## FMM 5 5-in-1 Digital Multimeter



» **Trades and tasks:** Universal measuring device for DC and AC voltage, DC current resistance, transistor hFE diode and continuity test, light (luminosity), sound, humidity, temperature overload protection.

TECHNICAL DATA	FMM 5	SUPPLIED WITH
		ART.-NO. 800600
<b>Multimeter</b>	<b>Max. Range</b>	<b>Resolution</b>
Voltage DC	600 V	0.1 mV
Voltage AC	600 V	100 mV
Current DC	10 A	0.1 µA
Resistance	20 MΩ	0.1 Ω
		<b>Accuracy</b>
		± 0.5 % ± 2*
		± 1.2 % ± 10*
		± 1.0 % ± 2*
		± 0.8 % ± 2*
<b>Environment</b>	<b>Max. Range</b>	<b>Resolution</b>
Light (luminosity)	20,000 Lux	0.1 Lux
Sound	100 dB	0.1 dB
Humidity	95 % RH	0.1 % RH
Temperature	-20 °C – +200 °C	0.1 °C
	-20 °C – +1300 °C	0.1 °C
		<b>Accuracy</b>
		± 0.5 % ± 10*
		± 3.5 dB
		± 5.0 % RH
		± 3.0 % ± 1*
		± 3.0 % ± 5*

\* Digits



## FGD 1 Gas Leak Detector

- » Easy-to-use gas leak detector for locating gas leaks from a safe position.
- » Detects following gas types: Natural gas, propane, butane, methane, acetone, alcohol, gasoline, jet fuel, carbon monoxide, ammonia, steam, hydrogen sulfide, smoke, industrial solvents, lacquer thinner, naphta.
- » **Trades and tasks:** Gas industry, chemical industry, laboratory, car repair shops.

TECHNICAL DATA	FGD 1	FEATURES	SUPPLIED WITH
Sensitivity	50 ppm	<ul style="list-style-type: none"> <li>· 40 cm gooseneck detector</li> <li>· Visual leak detection by LED indicators</li> <li>· Precision sensor detects even the smallest leaks</li> <li>· Fast response of less than two seconds</li> <li>· Includes earphone jack</li> </ul>	<b>ART.-NO. 800470</b>
Sensor type	Low power semi-conductor		<ul style="list-style-type: none"> <li>· Batteries</li> </ul>
Warm-up time	approx. 60 sec		
Response time	< 2 sec		
Duty cycle	continuous		
Probe length	40 cm		
Power supply	3 x C Alkaline		
Operating time	8 h		
Alarm	visible and audible		
Size	221 x 72 x 46 mm		
Weight	498 g		



## FLM 400 Data Luxmeter

- » Luxmeter for professional indoor measuring and monitoring of light insolation.
- » **Trades and tasks:** Building construction, indoor construction, censor.

TECHNICAL DATA	FLM 400 DATA	FEATURES	SUPPLIED WITH
Maximum measuring range	400,000 Lux	<ul style="list-style-type: none"> <li>· Measuring range 0 to 400,000 Lux</li> <li>· Sampling rage 1.5 times / sec</li> <li>· Large LC display</li> <li>· Measuring range 4,000 digits</li> <li>· 41 analogue bargraph indication</li> <li>· 99 values in memory for direct reading on the meter</li> <li>· 16,000 values can be stored in data logger</li> <li>· Max / Min function</li> <li>· High accuracy and short response time</li> <li>· USB-interface</li> </ul>	<b>ART.-NO. 800510</b>
Accuracy	± 5 % ± 10 d (< 10,000 Lux)		<ul style="list-style-type: none"> <li>· 9 V battery</li> <li>· Photo detector</li> <li>· USB cable</li> <li>· Software</li> <li>· Carrying case</li> </ul>
	± 10 % ± 10 d (> 10,000 Lux)		
Resolution	0.1 Lux		
Sampling rate	1.5 times / sec		
Data HOLD function	yes		
Automatic power-off	yes		
Output	USB		
Power supply	9 V NiMh		
Size photo detector	115 x 60 x 27 mm		
Size instrument	203 x 75 x 50 mm		
Weight	390 g		



## FCT 1 Data Coating Thickness Tester

» Coating Thickness Tester for fast testing and measuring of non-magnetic coatings on steel or non-ferrous metals.

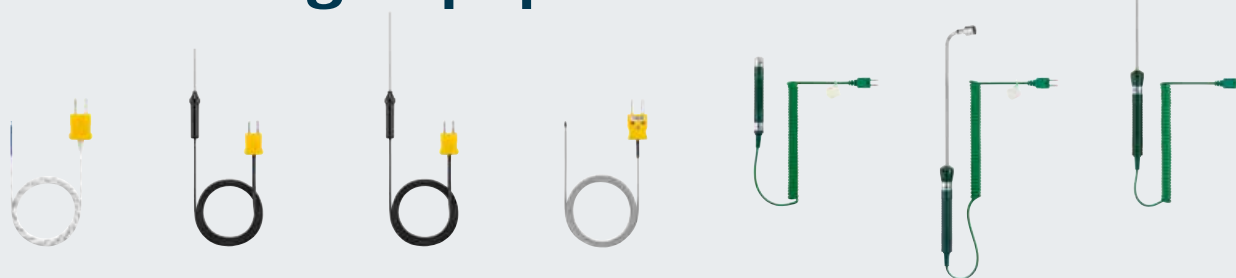
» **Trades and tasks:** Paint shops, car industry, construction.

» Accessories for calibration



TECHNICAL DATA	FCT 1 DATA		FEATURES	SUPPLIED WITH
	<b>Probe F</b>	<b>Probe N</b>		<b>ART.-NO. 800460</b>
Working principle	Magnetic induction	Eddy current principle	<ul style="list-style-type: none"> <li>Internal memory for 80 readings per group</li> <li>Easy data transfer to PC by USB</li> <li>PC software</li> <li>Measures insulating coatings on non-ferrous metals</li> <li>Automatic recognition of the material (Fe / NFe)</li> <li>Sensor with V-groove for measurements of round objects</li> <li>Magnetic induction and eddy current measuring principle</li> <li>Single and permanent measurement</li> <li>AVG / Max / Min function</li> <li>Alarm function</li> </ul>	<ul style="list-style-type: none"> <li>2 x AAA batteries</li> <li>USB cable</li> <li>Software</li> <li>Calibration accessories</li> <li>Case</li> </ul>
Measuring range	0 – 1250 µm 0 – 49.21 mils	0 – 1250 µm 0 – 49.21 mils		
Guaranteed tolerance (of reading)	0 – 850 µm (± 3 % +1 µm) 0 – 33.46 mils (± 3 % +0.039 mils)	0 – 850 µm (± 3 % +1.5 µm) 0 – 33.46 mils (± 3 % +0.059 mils)		
	850 – 1250 µm (± 5 %) 33.46 – 49.21 mils (± 5 %)	850 – 1250 µm (± 5 %) 33.46 – 49.21 mils (± 5 %)		
Resolution 0 – 50 µm	0.1 µm	0.1 µm		
Resolution 0 – 1.968 mils	0.001 mils	0.001 mils		
Diameter of minimum area	7 mm	5 mm		
Basic thickness of material	0.5 mm	0.3 mm		
Working temperature	0 °C – +40 °C	0 °C – +40 °C		
Working relative humidity	20 % ~ 90 %	20 % ~ 90 %		
Power supply	2 x AAA Alkaline	2 x AAA Alkaline		
Size	113.5 x 54 x 27 mm	113.5 x 54 x 27 mm		
Weight	110 g	110 g		

## Accessories for Environmental Measuring Equipment



» TP-300

» TP-500

» TP-550

» NR-88B

» NR-31B

» NR-33

» NR-38

### OUTLINE

Accessories	Function	Length	Temperature range	suitable for	ART.-NO.
TP-300	Flexible wire probe	100 cm	-50 °C – +300 °C	FT1300-1, -2, FMM5	800900
TP-500	All-purpose probe (metal tip length 7 mm)	85 cm	-50 °C – +900 °C	FT1300-1, -2, FMM5	800901
TP-550	All-purpose probe (metal tip length 15.5 cm)	94 cm	-50 °C – +900 °C	FT1300-1, -2, FMM5	800906
NR-88B	Flexible steel probe	100 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800902
NR-31B	Surface temperature probe	12 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800903
NR-33	Right angle surface temperature probe	34 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800904
NR-38	Air temperature probe	21 cm	-50 °C – +800 °C	FT1300-1, -2, FMM5	800905







WITH AN EYE TO THE FUTURE:

# PRECISION MEETS INNOVATION.

No matter how difficult the conditions you encounter on a construction site – with our products, easy and efficient measurement is possible in every situation. Whether you want to measure angles, inclines or distances: the decision to use electronic measuring instruments from geo-FENNEL is the correct choice. They set standards for measurement results and provide a high level of quality through the combination of the most modern production technologies with the care and attention provided by our technical experts.



# EcoDist Pro<sup>®</sup>

## Laser Distance Meter

» The perfect starter model with professional features.



TECHNICAL DATA	ECODIST PRO	FEATURES	SUPPLIED WITH
			ART.-NO. D 1760
Distance typically	40 m	· Plus / minus	· Holster · Batteries  <i>Range and accuracy test according to DIN ISO 16331-1</i>
Distance with target plate	50 m	· Area / volumes	
Accuracy	± 2.0 mm	· Permanent measurement	
Dust / water protection	IP 40	· Pythagoras functions	
Weight	110 g	· Reference front / rear	
Laser class	2	· mm, ft, inch	



# GeoDist® 40

## Laser Distance Meter



» **Easy to use, quick and precise. Measure distances of up to 40 m at the touch of a button.**  
**Compact, lightweight and so much more:**

- Distance, area and volumes
- Height measurement using Pythagoras function
- Addition and subtraction of measurements
- Maximum / minimum / permanent measurement
- Illuminated display



1 Clear LCD display



TECHNICAL DATA	GEODIST® 40	FEATURES	SUPPLIED WITH
			ART.-NO. 300040
Accuracy	± 2.0 mm	· Minimum / maximum (and difference) · Permanent measurement · Plus / minus · Area / volumes · Pythagoras functions · Point of reference: front, rear · Self-timer, adjustable · Illumination of display · mm, ft, inch · Acoustic signal confirming the measurement	· Holster · Batteries
Measuring distance	40 m		
Laser class	2		
Dust / water protection	IP 54		
Dimensions	114 x 45 x 25 mm		
Weight (with batteries)	98 g		



## DISTO D110



- » World's smallest laser distance meter with integrated Bluetooth® Smart technology. Makes it possible to easily create floor plans and sketches using precise measurements from the Leica DISTO™ D110 quickly by connecting it with the Leica DISTO™ sketch app on your smartphone or tablet.

TECHNICAL DATA	DISTO D110	FEATURES	SUPPLIED WITH
			ART.-NO. 300010
Accuracy	± 1.5 mm	· Permanent measurement	· Holster · Batteries  <i>Range and accuracy test according to DIN ISO 16331-1</i>
Measuring distance	0.2 – 60 m	· Area	
Laser class	2	· Bluetooth® Smart	
Dust / water protection	IP 54	· Leica Disto™ sketch app	
Dimensions	120 x 37 x 23 mm	· Illumination of display	
Weight (with batteries)	92 g	· mm, ft, inch	
		· Acoustic signal confirming the measurement	



## DISTO D210



- » Easy to use and just right and functional.

TECHNICAL DATA	DISTO D210	FEATURES	SUPPLIED WITH
			ART.-NO. 300011
Distance	0.05 – 80 m	· Minimum / maximum	· Holster · Batteries  <i>Range and accuracy test according to DIN ISO 16331-1</i>
Accuracy	± 1.0 mm	· Permanent measurement	
Dust / water protection	IP 54	· Plus / minus	
Weight	126 g	· Area / volume	
Laser class	2	· Height measurement (Pythagoras)	
		· Measurement despite obstructions	
		· Stake-out function	
		· mm, ft, inch	
		· Multi-functional endpiece	



## DISTO X310



- » Solid and versatile, protected against water jets and dust-tight.

TECHNICAL DATA	DISTO X310	FEATURES	SUPPLIED WITH
			ART.-NO. 300012
Distance	0.05 – 80 m	· Minimum / maximum	· Holster · Hand loop · Batteries  <i>Range and accuracy test according to DIN ISO 16331-1</i>
Accuracy	± 1.0 mm	· Permanent measurement	
Dust / water protection	IP 65	· Plus / minus	
Weight	155 g	· Area / volume	
Laser class	2	· Room function summary	
		· Height measurement (Pythagoras)	
		· Measurement despite obstructions	
		· Stake-out function	
		· 360° TILT sensor	
		· mm, ft, inch	
		· Multi-functional endpiece	



## DISTO D410

» Colour display, digital pointfinder, TILT sensor: The little brother of the D510.



TECHNICAL DATA	DISTO D410	FEATURES	SUPPLIED WITH
			ART.-NO. 822822
Distance	0.05 – 150 m	· Minimum / maximum	· Holster
Accuracy	± 1 mm	· Permanent measurement	· Hand loop
Laser class	2	· Plus / minus	· Batteries
Dust / water protection	IP 65	· Area / volume	
Dimensions	143 x 58 x 29 mm	· mm, ft, inch	
Weight	198 g	· Indirect height	
		· Room function summary	
		· Measurement despite obstructions	
		· 360° TILT sensor	
		· Bluetooth® smart	
		· Multi-functional endpiece	

Range and accuracy test according to DIN ISO 16331-1



## DISTO D510

» Colour display, digital pointfinder, TILT sensor: Reliable outdoor applications.



TECHNICAL DATA	DISTO D510	FEATURES	SUPPLIED WITH
			ART.-NO. 300007
Distance	0.05 – 200 m	· Minimum / maximum	· Holster
Accuracy	± 1.0 mm	· Permanent measurement	· Hand loop
Dust / water protection	IP 65	· Plus / minus	· Batteries
Weight	198 g	· Area / volume	
Laser class	2	· Room function summary	
		· Indirect height measurement (Pythagoras)	
		· Measurement despite obstructions	
		· Measurement of facade areas	
		· 360° TILT sensor	
		· Bluetooth® smart	

Range and accuracy test according to DIN ISO 16331-1



## DISTO D810 touch

» Large touchscreen for intuitive use, camera function, measurements inside a picture, Bluetooth® smart.



TECHNICAL DATA	DISTO D810	FEATURES	SUPPLIED WITH
			ART.-NO. 300009
Distance	0.05 – 200 m	· Minimum / Maximum	· Holster
Accuracy	± 1.0 mm	· Permanent measurement	· Hand loop
Dust / water protection	IP 54	· Plus / minus	· Batteries
Weight	238 g	· Area / volume	
Laser class	2	· Room function summary	
		· Indirect height measurement (Pythagoras)	
		· Measurements despite obstructions	
		· Measurement of facade areas	
		· Bluetooth®	
		· 360° TILT sensor for measurement of any slope (even overhead)	

Range and accuracy test according to DIN ISO 16331-1



# Electronic Slope Measurers

» Our latest generation of inclinometers with a new enhanced TILT sensor, that offers the following:

- Fast reaction time
- A stable display for improved accuracy
- Improved thermal stability
- Zero position re-set at any position
- Illuminated display

## S-Digit mini +

» Electronic inclinometer. Handy-size and accurate. This ensures easy measurement even in the most difficult situations.



TECHNICAL DATA	S-DIGIT MINI +	FEATURES	SUPPLIED WITH
Working range	4 x 90°	<ul style="list-style-type: none"> <li>· Different signal tones when approaching 0° / 90° and continuous tone at 0° / 90°</li> <li>· Inclination direction indication</li> <li>· Zero position re-set at any position</li> <li>· Automatic digit inversion for overhead measurements</li> <li>· HOLD function to freeze measurement</li> <li>· Illuminated display</li> <li>· Magnetic housing</li> <li>· 1/4" thread for camera tripod</li> </ul>	ART.-NO. 610010
Resolution	0.1° / 0.1 %		<ul style="list-style-type: none"> <li>· Padded bag</li> <li>· Batteries</li> </ul>
Accuracy	± 0.1°		
Measuring units	°, %, mm/m, in/ft		
Power supply	3 x AA Alkaline		
Operating time	600 h		
Temperature range	-10 °C – +45 °C		
Weight (incl. Batteries)	0.37 kg		
Size	164 x 60 x 32 mm		

## S-Digit multi +

» Electronic inclinometer with a rotatable display for easy reading in many positions.



- 1 Easy reading even from above    2 Integrated laser beam

TECHNICAL DATA	S-DIGIT MULTI +	FEATURES	SUPPLIED WITH
Working range	4 x 90°	<ul style="list-style-type: none"> <li>· Different signal tones when approaching 0° / 90° and continuous tone at 0° / 90°</li> <li>· Inclination direction indication</li> <li>· Zero position re-set at any position</li> <li>· Automatic digit inversion for overhead measurements</li> <li>· 180° rotatable display</li> <li>· Visible laser beam to extend working range</li> <li>· HOLD function to freeze measurement</li> <li>· Illuminated display</li> <li>· Magnetic housing</li> <li>· 1/4" thread for camera tripod</li> </ul>	ART.-NO. 630010
Resolution	0.1° / 0.1 %		<ul style="list-style-type: none"> <li>· Padded bag</li> <li>· Batteries</li> </ul>
Accuracy	± 0.1°		
Measuring units	°, %, mm/m, in/ft		
Working range laser	20 m		
Accuracy laser	± 0.5 mm / 1 m		
Wave length / laser class	650 nm / 2		
Power supply	3 x AA Alkaline		
Operating time	w/o laser 50 h with laser 20 h		
Temperature range	-10 °C – +45 °C		
Weight (incl. Batteries)	0.67 kg		
Size	305 x 60 x 32 mm		



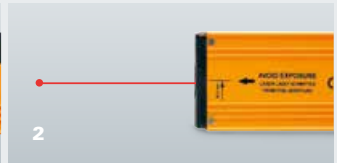


## S-Digit 60 +

- » Robust slope measurer. Length 60 cm.  
Incorporated laser beam.

- » NEW: Magnetic bottom.

- 1 Clearly visible display – standard or “overhead”
- 2 With laser beam to extend working range



TECHNICAL DATA	S-DIGIT 60 +	FEATURES	SUPPLIED WITH
Working range	4 x 90°	<ul style="list-style-type: none"> <li>· Different signal tones when approaching 0° / 90° and continuous tone at 0° / 90°</li> <li>· Inclination direction indication</li> <li>· Zero position re-set at any position</li> <li>· Automatic digit inversion for overhead measurements</li> <li>· Visible laser beam to extend working range</li> <li>· HOLD function to freeze measurement</li> <li>· Illuminated display</li> <li>· 1/4" thread for camera tripod</li> </ul>	ART.-NO. 620010
Resolution	0.1° / 0.1 %		· Padded bag
Accuracy 0° and 90°	± 0.1°		· Batteries
Accuracy 1° – 89°	± 0.2°		
Measuring units	°, %, mm/m, in/ft		
Working range laser	20 m		
Accuracy laser	± 0.5 mm / 1 m		
Wave length / laser class	650 nm / 2		
Power supply	3 x AA Alkaline		
Operating time	w/o laser 50 h with laser 20 h		
Temperature range	-10 °C – +45 °C		
Weight (incl. Batteries)	0.86 kg		
Size	600 x 60 x 32 mm		



## S-Digit 60WL + and S-Digit 120WL +

- » Electronic inclinometers for everyday use.



TECHNICAL DATA	S-DIGIT 60WL +	S-DIGIT 120WL +	SUPPLIED WITH
ART.-NO.	640010	640110	
Working range	4 x 90°	4 x 90°	<ul style="list-style-type: none"> <li>· Padded bag</li> <li>· Batteries</li> </ul>
Resolution	0.1° / 0.1 %	0.1° / 0.1 %	
Accuracy	0° and 90° = ± 0.1° 1°–89° = ± 0.2°	0° and 90° = ± 0.1° 1°–89° = ± 0.2°	<b>FEATURES</b> <ul style="list-style-type: none"> <li>· Different signal tones when approaching 0° / 90° and continuous tone at 0° / 90°</li> <li>· Inclination direction indication</li> <li>· Zero position re-set at any position</li> <li>· Automatic digit inversion for overhead measurements</li> <li>· 180° rotatable display</li> <li>· HOLD function to freeze measurement</li> <li>· Illuminated display</li> <li>· 1 or 2 recessed hand grips for ergonomic use</li> </ul>
Measuring units / Display	°, %, mm/m, in, ft	°, %, mm/m, in, ft	
Power supply	3 x AAA Alkaline	3 x AAA Alkaline	
Operating time	60 h	60 h	
Temperature range	-10 °C – +45 °C	-10 °C – +45 °C	
Weight	0.93 kg	1.2 kg	
Dimensions	600 x 61 x 28 mm	1200 x 61 x 28 mm	

# Multi-Digit Pro + All-in-one

» Electronic angle measurer, electronic slope measurer and laser spirit level. Easy and accurate. For measuring angles, inclinations, sloped and plane surfaces.



TECHNICAL DATA		MULTI-DIGIT PRO +	FEATURES	FEATURES
			<ul style="list-style-type: none"><li>· Displays angle and inclination simultaneously</li><li>· Different signal tones when approaching 0° / 90° and continuous tone at 0° / 90°</li><li>· Inclination direction indication</li><li>· Zero position re-set at any position</li><li>· Automatic digit inversion for overhead measurements</li><li>· Visible laser beam to extend working range</li><li>· HOLD function to freeze measurement</li><li>· Illuminated display</li><li>· Magnetic base</li><li>· 1/4" thread for camera tripod</li></ul>	<ul style="list-style-type: none"><li>· 180° lock to extend the unit to 1 m length</li><li>· Arm can be locked in any position</li></ul>
Working range inclination	4 x 90°			
Resolution	0.1° / 0.1 %			
Accuracy inclination 0° and 90°	± 0.1°			
Accuracy inclination 1° – 89°	± 0.2°			
Measuring units	°, %, mm/m, in/ft			
Working range angle	0° – 180°			
Resolution	0.1° / 0.1 %			
Accuracy angle	± 0.1°			
Working range laser	20 m			
Accuracy laser	± 0.5 mm / 1 m			
Wave length / laser class	650 nm / 2			
Power supply	3 x AA Alkaline			
Operating time	w/o laser 48 h with laser 20 h			
Temperature range	-10 °C – +45 °C			
Weight (incl. Batteries)	1.3 kg			
Size	520 x 63 x 30 mm			
Unfolded length	1000 mm			
				SUPPLIED WITH
				ART.-NO. 600010
				<ul style="list-style-type: none"><li>· Padded bag</li><li>· Batteries</li></ul>

## A-Digit 50 and 75

» Robust electronic angle measurer made of anodized aluminium.



TECHNICAL DATA		A-DIGIT 50 AND 75	FEATURES	A-DIGIT 50
			<ul style="list-style-type: none"><li>· Angle measurement</li><li>· Supplement angle</li><li>· Easy mitre angle</li><li>· Compound angle mode</li><li>· Available in length of 50 cm and 75 cm</li></ul>	ART.-NO. 650050
Measuring range	0° – 225°			<ul style="list-style-type: none"><li>· Padded bag</li><li>· Batteries</li></ul>
Digital angle accuracy	± 0,1°			
Resolution	0.05°			
Accuracy of vials	0.057° (1 mm / m)			
Operation temperature	-10 °C – + 50 °C			A-DIGIT 75
Power supply	2 x AAA batteries			
Operation time	100 h			
Length unfolded A-Digit 50	991 mm			
Length unfolded A-Digit 75	1410 mm			
Weight A-Digit 50 (A-Digit 75)	0.9 kg (1.1 kg)		ART.-NO. 650075	
			<ul style="list-style-type: none"><li>· Padded bag</li><li>· Batteries</li></ul>	

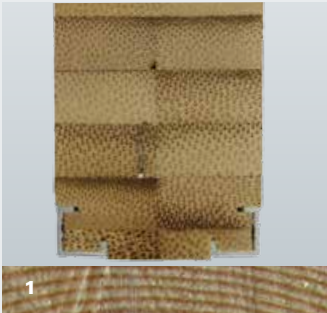
# Spirit Level M-Level ECO

## Bamboo spirit level – strong, durable, tough and sustainable

- » · Particularly suitable for sensitive surfaces such as window sills, marble, granite, wood, etc.
- Despite being categorized as a “Wood Level”, bamboo is actually grass, not wood
- Bamboo is the fastest growing plant on earth, with a tensile strength comparable to steel



- 1 Measurements are done via contact of Bamboo surface to measurement area. Metallic rails are only stabilizing the spirit level and do not get in contact with the measurement area.



TECHNICAL DATA		M-LEVEL ECO	FEATURES	ART.-NO. M-LEVEL ECO		
Profile (cross-section)		62 x 30 mm	<ul style="list-style-type: none"><li>· Strong, durable, laminated bamboo frame</li><li>· Flush mounted protective metal buildings</li><li>· Solid block acrylic vials won't fog, leak or break</li><li>· Top-read window maximizes readability</li><li>· 2 frame openings for optimized handling</li><li>· Shock absorbing rubber end caps protect frame</li><li>· Lifetime accuracy warranty</li></ul>	M-Level 60 ECO	60 cm	660000
Accuracy		≤ 1 mm / m		M-Level 120 ECO	120 cm	660010
Vial(s) horizontal		1				
Vial(s) vertical		2				

# Spirit Level M-Level ALU

## Extremely robust aluminium spirit level for professionals

- » Precision milled measuring surfaces assure high frame accuracy
- » Ergonomic handling
- » For all areas of the craft



TECHNICAL DATA	M-LEVEL ALU	FEATURES	ART.-NO. M-LEVEL ALU
		<ul style="list-style-type: none"><li>Robust aluminium profile with reinforcing ribs</li><li>Powder-coated profile, 2 milled measuring surfaces</li><li>Solid block acrylic vials won't fog, leak or break</li><li>Top-read window maximizes readability</li><li>2 rubberized frame openings for optimized handling</li><li>Shock absorbing rubber end caps protect frame</li><li>Lifetime accuracy warranty</li><li>M-Version with 2 rare-earth magnets at bottom measuring surface</li></ul>	M-Level 40 ALU 40 cm 660100
Profile (cross-section)	58 x 28 mm		M-Level 60 ALU 60 cm 660105
Accuracy			M-Level 80 ALU 80 cm 660110
Normal position	0.75 mm / m		M-Level 100 ALU 100 cm 660115
Other positions	0.75 mm / m		M-Level 120 ALU 120 cm 660120
Vial(s) horizontal	1		M-Level 150 ALU 150 cm 660125
Vial(s) vertical	2		M-Level 200 ALU 200 cm 660130
ART.-NO. M-LEVEL ALU MAGNETIC			
			M-Level 40 M ALU 40 cm 660135
			M-Level 60 M ALU 60 cm 660140
			M-Level 100 M ALU 100 cm 660145



# Spirit Level M-Level TPZ

## Aluminium die-cast spirit level

- » · High torsional stiffness, very robust
- Trapezium shape
- For all areas of the craft



TECHNICAL DATA	M-LEVEL TPZ	FEATURES	ART.-NO. M-LEVEL TPZ
Accuracy		· High-quality aluminium die-cast profile, powder-coated · 1 milled measuring surface · Solid block acrylic vials won't fog, leak or break	M-Level 40TPZ 40 cm 660200
Normal position	0.75 mm / m		M-Level 60TPZ 60 cm 660205
Other positions	0.75 mm / m		M-Level 80TPZ 80 cm 660210
Vial(s) horizontal	1		M-Level 100TPZ 100 cm 660215
Vial(s) vertical	2		







OUR INVITATION:

# ALWAYS NEW CHALLENGES TO CONQUER.

The versatility of measuring instruments from geo-FENNEL can be increased significantly by using our wide range of precisely coordinated surveying accessories. Regardless of the profession or application, the know-how from many decades of experience in the field of measurement technology and surveying resides in our products.

» Elevating tripods with adjustable range – ideal for all rotating and line lasers.

## FS 10 Elevating Tripod



## FS 12 Elevating Tripod



FS 10	FS 12
ART.-NO. 302000	ART.-NO. 303000
<ul style="list-style-type: none"> <li>· Rotating head</li> <li>· 67–188 cm (incl. 30 cm centre column)</li> <li>· 2.3 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Rotating head</li> <li>· 73–244 cm (incl. 30 cm centre column)</li> <li>· 2.65 kg</li> </ul>
<ul style="list-style-type: none"> <li>· Lightweight elevating tripod made of aluminium for instruments with 5/8" thread</li> <li>· Incorporated circular bubble</li> <li>· Incl. bag</li> </ul>	<ul style="list-style-type: none"> <li>· Lightweight elevating tripod made of aluminium for instruments with 5/8" thread</li> <li>· Incorporated circular bubble</li> <li>· Incl. bag</li> </ul>

## FS 30-XS Elevating Tripod



## FS 30-S Elevating Tripod



FS 30-XS	FS 30-S
ART.-NO. 165	ART.-NO. 155
<ul style="list-style-type: none"> <li>· Column / Flat head</li> <li>· 101–300 cm</li> <li>· 5.7 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Column / Flat head</li> <li>· 68–138 cm</li> <li>· 4.2 kg</li> </ul>
<ul style="list-style-type: none"> <li>· Adjustable range of centre column 36 cm</li> <li>· Fine crank drive for exact adjustment</li> <li>· Upper column length 43 cm</li> <li>· Quick clamp system, shoulder carrying strap</li> <li>· Struts between tripod legs</li> <li>· Integrated retractable rubber pads for non-slip use on hard surfaces</li> <li>· Retracted length 1.1 m for convenient transport</li> <li>· Built-in circular bubble</li> </ul>	<ul style="list-style-type: none"> <li>· Short tripod ideal for cutting checks</li> <li>· Adjustable range of centre column 35 cm</li> <li>· Quick clamp system, shoulder carrying strap</li> <li>· Robust chains between tripod legs</li> <li>· Integrated retractable rubber pads for non-slip use on hard surfaces</li> <li>· Continuous opening for instruments with plumb down facility</li> <li>· Built-in circular bubble</li> </ul>



## FS 13 Elevating Tripod



## FS 14 Camera Tripod



FS 13	FS 14
ART.-NO. 304000	ART.-NO. 301000
<ul style="list-style-type: none"> <li>· Rotating head</li> <li>· 89–295 cm (incl. 120 cm centre column)</li> <li>· 2.9 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Rotating head</li> <li>· 57–161 cm</li> <li>· 1.4 kg</li> </ul>
<ul style="list-style-type: none"> <li>· Lightweight elevating tripod made of aluminium for instruments with 5/8" thread</li> <li>· Wide working range for setting out 1 m datum mark and working at heights of about 3 m</li> <li>· Adjustable range of elevating column 54 cm and of sliding column 59 cm</li> <li>· Carrying handle</li> <li>· Incorporated bubble</li> <li>· Incl. bag</li> </ul>	<ul style="list-style-type: none"> <li>· Lightweight elevating tripod made of aluminium for instruments with 1/4" thread</li> <li>· Ideal as accessory for laser distance meter</li> <li>· Incl. bag</li> </ul>

## FS 30-M Elevating Tripod



## FS 30-L Elevating Tripod



FS 30-M	FS 30-L
ART.-NO. 158	ART.-NO. 156
<ul style="list-style-type: none"> <li>· Column / Flat head</li> <li>· 80–200 cm</li> <li>· 5.2 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Column / Flat head</li> <li>· 95–285 cm</li> <li>· 8.2 kg</li> </ul>
<ul style="list-style-type: none"> <li>· Adjustable range of centre column 39 cm</li> <li>· Quick clamp system, shoulder carrying strap</li> <li>· Robust chains between tripod legs</li> <li>· Integrated retractable rubber pads for non-slip use on hard surfaces</li> <li>· Continuous opening for instruments with plumb down facility</li> <li>· Built-in circular bubble</li> </ul>	<ul style="list-style-type: none"> <li>· Adjustable range of centre column 40 cm</li> <li>· Quick clamp system, shoulder carrying strap</li> <li>· Robust chains between tripod legs</li> <li>· Integrated retractable rubber pads for non-slip use on hard surfaces</li> <li>· Built-in circular bubble</li> <li>· Continuous opening for instruments with plumb down facility</li> </ul>

## FS 50-M Elevating Tripod

- » High quality elevating tripods designed to be compact and durable – a stable platform for any rotating laser, even in adverse weather conditions.



TECHNICAL DATA	FS 50-M	FEATURES
		ART-NO. 164
Column / Flat head		
Working range	80–220 cm	· Adjustable range of centre column 108 cm
Weight	7.2 kg	· Struts between tripod legs for increased stability
		· Central clamping of the struts
		· Integrated retractable rubber pads for non-slip use on hard surfaces
		· Continuous opening for instruments with plumb down facility
		· Built-in circular bubble

## FS 50-L Elevating Tripod



TECHNICAL DATA	FS 50-L	FEATURES
		ART-NO. 166
Column / Flat head		
Working range	114–290 cm	· Adjustable range of centre column 108 cm
Weight	8.6 kg	· Struts between tripod legs for increased stability
		· Central clamping of the struts
		· Integrated retractable rubber pads for non-slip use on hard surfaces
		· Continuous opening for instruments with plumb down facility
		· Side wheel for comfortable connection of instruments with 5/8" thread
		· Built-in circular bubble

## Builders Tripod BT Aluminium tripod

## FS 20 FS 20-D Aluminium Tripod

## FS 23 FS 23-D FS 23 W/S Aluminium Tripod

» Aluminium and wooden tripods for measuring instruments. Strong, durable and reliable.



BUILDERS TRIPOD BT	FS 20	FS 23
ART.-NO. 161	ART.-NO. 151	ART.-NO. 152
<ul style="list-style-type: none"> <li>· Flat head</li> <li>· 92–147 cm</li> <li>· 3.2 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Flat head</li> <li>· 105–165 cm</li> <li>· 3.5 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Flat head</li> <li>· 105–170 cm</li> <li>· 5.1 kg</li> </ul>
	FS 20-D	FS 23-D
	ART.-NO. 157	ART.-NO. 153
	<ul style="list-style-type: none"> <li>· Domed head</li> <li>· 105–165 cm</li> <li>· 3.5 kg</li> </ul>	<ul style="list-style-type: none"> <li>· Domed head</li> <li>· 105–170 cm</li> <li>· 5.1 kg</li> </ul>
		FS 23 W/S
		ART.-NO. 152 W/S
		<ul style="list-style-type: none"> <li>· Flat head</li> <li>· 105–170 cm</li> <li>· 5.1 kg</li> </ul>
<ul style="list-style-type: none"> <li>· For automatic levels</li> <li>· Quick clamp system</li> <li>· Flat head</li> <li>· Shoulder carrying strap</li> </ul>	<p><b>Aluminium Tripod FS 20</b></p> <ul style="list-style-type: none"> <li>· For light measuring instruments such as automatic levels</li> <li>· Quick clamp system</li> <li>· Flat head</li> <li>· Shoulder carrying strap</li> <li>· Diameter of tripod head 123 mm</li> </ul> <p><b>Aluminium Tripod FS 20-D</b></p> <ul style="list-style-type: none"> <li>· Same as FS 20 tripod, however, with domed head</li> </ul>	<p><b>Aluminium Tripods FS 23</b></p> <ul style="list-style-type: none"> <li>· Ideal for all measuring instruments</li> <li>· Quick clamp system</li> <li>· Flat head</li> <li>· Shoulder carrying strap</li> <li>· Diameter of tripod head 143 mm</li> </ul> <p><b>Aluminium Tripod FS 23-D</b></p> <ul style="list-style-type: none"> <li>· Same as FS 23 tripod, however, with domed head</li> </ul> <p><b>Aluminiumstativ FS 23 W/S</b></p> <ul style="list-style-type: none"> <li>· Same as FS 23 tripod, however, with screw clamp system</li> </ul>





## FS 30-XL Elevating Tripod

### FEATURES

### FS 30-XL

#### ART.-NO. 159

- Column / Flat head
- 166–380 cm
- 15.6 kg

- Adjustable range of centre column 104 cm
- Load up to 20.0 kg
- Combined quick and screw clamp system for extra stability
- Struts between tripod legs
- Retracted length 1.79 m for comfortable transport
- Made of aluminium (centre column) and fibre glass (tripod)
- Built-in circular bubble

## FS 40 Aluminium Tripod



### FS 40

#### ART.-NO. 150

- Column / Flat head
- 95–186 cm (incl. 30 cm centre column)
- 3.2 kg
- Adjustable range of centre column 30 cm
- Quick clamp system
- Incl. shoulder carrying strap

## FS 24 FS 24 W/S Wooden Tripod



### TECHNICAL DATA

### FS 24

#### ART.-NO. 154

- Flat head
- 105–170 cm
- 6.5 kg

- Robust wooden tripod for theodolites and total stations
- Quick clamp system
- Flat head
- Shoulder carrying strap
- Diameter of tripod head 140 mm

#### FS 24 W/S

#### ART.-NO. 154 W/S

- Same as FS 24 tripod, however, with screw clamp system

## TN 14/15 Telescopic Levelling Staff



### TN 14

ART.-NO. TN 14, 4 m	484
ART.-NO. TN 15, 5 m	485

- A high quality levelling staff made of strong aluminium tubes available in 4 m and 5 m
- Silver anodised finish
- Front face cm-E graduation throughout total length
- Rear face graduation in mm for height measurements
- Slit to fix LR 7 Rod level
- Secure snap-in at each meter

### OPTIONAL

Nylon case with shoulder carrying strap, rod level LR 7

## TN 15-0 Telescopic Levelling Staff



### TN 15-0

ART.-NO. 486

High quality levelling staff similar to TN 15, except:

- Rear face graduated in mm with "0" beginning at the bottom

### OPTIONAL

Nylon case with shoulder carrying strap, rod level LR 7



### OPTIONAL

ART.-NO. 370

- Rod Level LR7
- For TN 14, 15, BS 15-0
- Adjustable

### OPTIONAL

ART.-NO. 480

- Nylon case with shoulder carrying strap (w/o picture)

## TN 20-Kombi Telescopic Levelling Staff



### TN 20-KOMBI

ART.-NO. 482

- Made of strong aluminium tubes
- Graduation in mm
- Length 2.40 m
- Lower part adjustable in height for zero setting
- Including circular bubble and carrying case
- Including adjustable clamp for receiver
- Weight 0.9 kg
- Ideal for use with rotating laser levels
- Correct sign reading

## BS 15-0 Telescopic Levelling Staff



### BS 15-0

ART.-NO. 486-BS

A quality levelling staff for laser levels

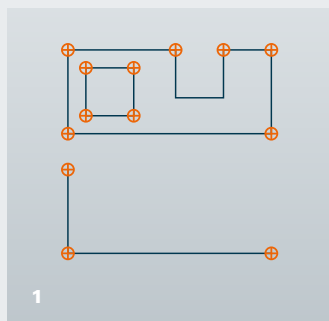
- Front face cm-E graduation
- Rear face graduated in mm with "0" beginning at the bottom

## Scale Master Pro XE



- » Professional digital plan measurer. 91 architectural, engineering, map and metric blueprint scales. Perform instant linear, rectangular area and volume take-offs. Reads your measurement in feet / inches or metric. Subtract, constant and counter.

### 1 Example



#### SUPPLIED WITH SCALE MASTER PRO XE

ART.-NO. 6135

- Scale Master Pro XE with case
- Batteries
- Manual

#### OPTIONAL

ART.-NO. 5001B

- USB cable for data transfer to PC

## M 10 Precision Measuring Wheel



M 10

ART.-NO. 110

- Wheel circumference 1 m
- Clamp for wheel
- Robust support allows M 10 to stand upright
- Dirt remover
- Precision counter with "0" reset
- Sturdy spokes offer low resistance to wind ensuring ease of use
- The highly visible colour of the wheel aids operator safety during use on roads
- Weight 2.7 kg

## MS 10S Precision Measuring Wheel



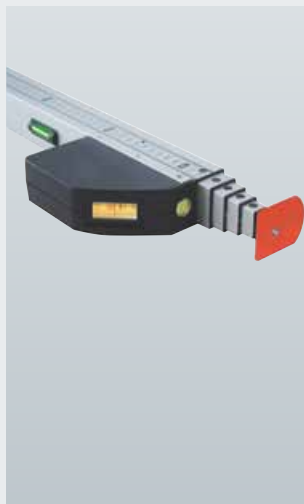
M 10S

ART.-NO. 141

Same as M 10, however:

- Heavy model with double-disk wheel made of metal
- Weight 3.4 kg

## EasyFix 5 m Telescopic Rule



EASYFIX 5 M

ART.-NO. 451

- Threaded pins for top and bottom plate for measuring to corners and edges
- Carrying case
- Easy reading of measuring display
- Auto-lock on each section when fully extended
- Incorporates two vials
- cm/mm-graduation on bottom section
- Retracted length 104 cm,
- Max. length 5 m
- Weight 2 kg

## M 10K and M 10T Case and Bag



M 10K CASE

M 10T BAG

ART.-NO. 011

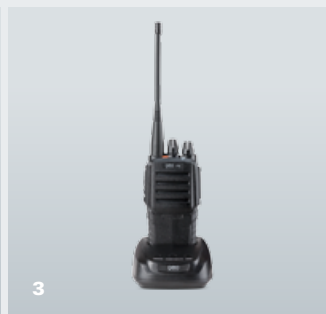
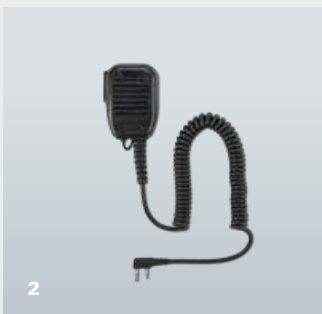
ART.-NO. 010

Sturdy case for M 10 and M 10S made from high-quality materials


Bag for M 10 and M 10S made from high-quality materials

## A black Motorola radio with a long antenna, shown vertically. The radio has a speaker grille and several buttons on the side. The Motorola logo is visible on the front.

### 3 Charger



## A person wearing a high-visibility yellow vest and dark clothing is using a metal detector on a dirt surface. In the background, there are large stacks of wooden planks or formwork.



1



## Marking Spray



» For permanent wall / floor marking.

» Professional marking for building and road construction, civil engineering, construction sites, surveying jobs.

1 Patented one-hand safety cap with easy-touch release



1



### MARKING SPRAY

- For fast, clean and precise marking of asphalt, concrete, masonry, plaster, wood, earth and many other substrates
- Markings remain strongly visible up to 9 months
- Marking and sticking to any surface even if it is wet
- Reliable even at sub-zero temperatures (up to -20 °C)
- Patented one-hand safety cap with easy-touch release
- Guaranteed marking without painted fingers
- Colour coordinated cap
- Also easy to apply with gloves
- Self-cleaning system, can be 100 % emptied by spraying
- Environmentally friendly and non-hazardous to health

### COLOURS

ART.-NO. fluo orange	901
ART.-NO. fluo red	902
ART.-NO. fluo blue	903
ART.-NO. fluo yellow	904
ART.-NO. fluo green	905
ART.-NO. fluo pink	906
ART.-NO. red	911
ART.-NO. yellow	913
ART.-NO. white	915

- Content 500 ml
- Sales packing 12 cans per carton



## Marking Wheel

» Marking Wheel for comfortable marking with GEO-MARKER Marking Spray.

» No need to remove safety cap for use with marking wheel.

### MARKING WHEEL

ART.-NO. 940

- Length 83 cm
- Weight 0.6 kg

## Rubber Tape

- » Standard measuring tape. Blister packed in presentation display. Conforms to CE class II.



### RUBBER TAPE

ART.-NO. 3 m x 16 mm	M345012
ART.-NO. 5 m x 25 mm	M345014
ART.-NO. 8 m x 25 mm	M345015



## Fast Speed Tape

- » **4 x speed rewind.**
- » Nylon coated steel tape. Abrasion resistant and virtually unbreakable. Ergonomically designed to be comfortable and easy to use.



### FAST SPEED TAPE

ART.-NO. 30 m	M313030
ART.-NO. 50 m	M313050

- Tape width: 12.5 mm
- Graduation in mm
- Easy to grip
- Accuracy: CE class II



## RPT 1 Ranging Pole Tripod

### RPT 1

ART.-NO. 820

- Extendable tripod legs 77–128 cm, with secure clamps
- Weight 1.25 kg
- Clamp with adjustable ball-and-socket joint
- Supplied with carrying case



## RP 2 Metal Ranging Pole

### RP 2

ART.-NO. 800

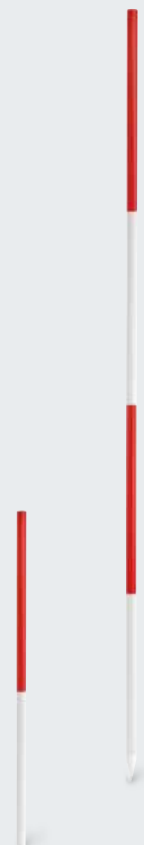
- Each pole consists of 2 sections of 1 m length screwed together to make one pole of 2 m
- Universal 5/8" fitting
- White / red sections
- Metal tip
- Supplied as a set of 6 poles in a carrying bag

## 1 m Extension

### 1 M

ART.-NO. 810

- 1 m section for extending the ranging pole as required
- White / red colour
- 5/8" thread



## Mixer FM 1010 1010 W




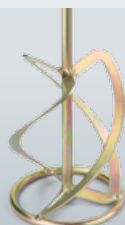
» Our mixers – suitable for all applications. Ergonomic design, strong performance. Powerful mixers for colour, mortar, concrete, etc. Ideally suited for construction sites.

TECHNICAL DATA		SUPPLIED WITH PADDLE H2-120 MM
		ART.-NO. M800500
Power	1010 W	<ul style="list-style-type: none"> <li>· e. g. for mortar, concrete, paint</li> <li>· paddle diameter 120 mm x length 600 mm</li> <li>· stirring capacity 10–25 kg</li> </ul>
Over-voltage protection	yes	
Weight	6 kg	
Speed adjustable	150–500 rpm	

## Mixer FM 1800 1800 W



TECHNICAL DATA		SUPPLIED WITH PADDLE H2-140 MM
		ART.-NO. M800507
Power	1800 W	<ul style="list-style-type: none"><li>· e. g. for mortar, concrete</li><li>· paddle diameter 140 mm x length 600 mm</li><li>· stirring capacity 30–50 kg</li></ul>
Over-voltage protection	yes	
Weight	6 kg	
Speed adjustable	150–300 and 300–650 rpm	
		INCL. PADDLE H3-160 MM
		<ul style="list-style-type: none"><li>· e. g. for mortar, concrete, paint, plaster, etc.</li><li>· paddle diameter 160 mm x length 600 mm</li><li>· stirring capacity 25–40 kg</li></ul>
		



# Paddles for mixers

## FM 1010 und FM 1800



- » For sticky and viscous materials: tile adhesive, bonding mortar, joint compound, ready-mixed plaster, floor screed, cement compounds, fillers, etc.

PADDLE H2	CAPACITY	DIAMETER	LENGTH AGITATOR	THREAD	
H2 120G	15 – 25 kg	120 mm	600 mm	M14	ART.-NO. M800590
H2 140G	25 – 35 kg	140 mm	600 mm	M14	ART.-NO. M800591
H2 160G	35 – 60 kg	160 mm	600 mm	M14	ART.-NO. M800592



- » For liquid, very viscous and fibrous materials in large quantities: wall paint, varnish, glaze, joint sealing compound, cements, lime, plaster, concrete, filler, floor screed, etc.

PADDLE H3	CAPACITY	DIAMETER	LENGTH AGITATOR	THREAD	
H3 L120G	15 – 25 kg	120 mm	600 mm	M14	ART.-NO. M800597
H3 L140G	25 – 35 kg	140 mm	600 mm	M14	ART.-NO. M800596



- » For liquid materials: wall paint, emulsion paint, tile adhesive, glue, wallpaper paste, etc.

PADDLE H4	CAPACITY	DIAMETER	LENGTH AGITATOR	THREAD	
H4 114G	15 – 40 kg	120 mm	600 mm	M14	ART.-NO. M800598



- » For liquid materials: wall paint, emulsion paint, paste varnish, bitumen, sludge, joint sealing compound, filler, bonding agent, etc.

PADDLE H7	CAPACITY	DIAMETER	LENGTH AGITATOR	THREAD	
H7 100G	15 – 25 kg	100 mm	600 mm	M14	ART.-NO. M800594
H7 120G	20 – 30 kg	120 mm	600 mm	M14	ART.-NO. M800595



- » For thin-bed adhesives and for larger volumes of liquid materials.

PADDLE DD 140	CAPACITY	DIAMETER	LENGTH AGITATOR	THREAD	
DD 140	20 – 40 kg	140 mm	600 mm	M14	ART.-NO. M800593



## L 23, L 25, L 50 Prism Poles



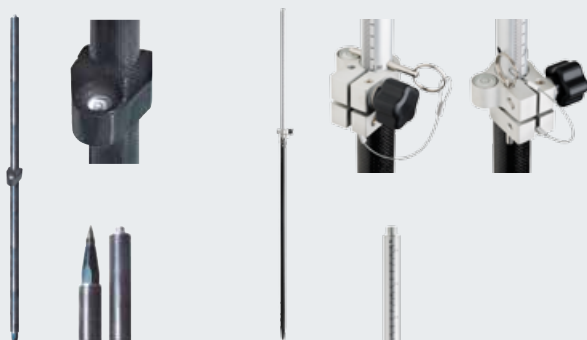
## B 18 Bipod

» For GPS Rods  
and Prism Poles



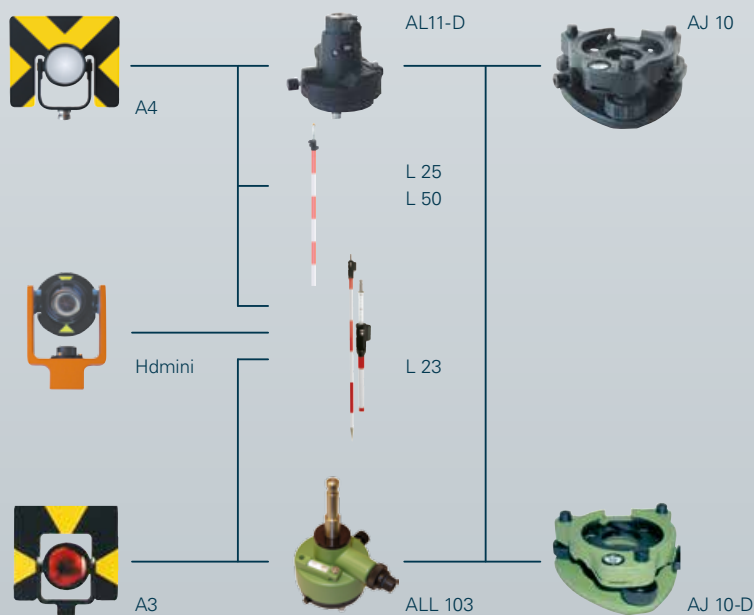
TECHNICAL DATA	L 23	L 25	L 50	B 18
ART.-NO.	223-S01, 223-S02, 223-S03	225	228	ART.-NO. 640
Length	122 – 208 cm	134 – 250 cm	160 – 500 cm	
Adapters		5/8"	5/8"	
223-S01:	optical square (Ø 10 mm)			
223-S02:	5/8"			
223-S03:	Leica pin			
Adapter height adjustable	no	yes	no	
Clamp type	Quick release clamp	Quick clamp	Quick clamp	
Circular bubble	yes	yes	yes	
Case	yes	yes	yes	
Weight	0.9 kg	1.5 kg	2.35 kg	
				<ul style="list-style-type: none"> <li>· Made of aluminium</li> <li>· Working range of legs 1.10 m to 1.80 m</li> <li>· Quick release clamping mechanism for legs</li> <li>· Possible rod diameters 19 to 38 mm</li> <li>· Staffs and poles secured with thumb screw</li> <li>· Weight 2 kg</li> <li>· Supplied with: leg clip and nylon case</li> </ul>

## G 20, G 25 GPS Antenna Poles



TECHNICAL DATA	G 20	G 25
ART.-NO.	630	635
Length	200 cm	136 – 248 cm
Adapter	5/8"	5/8"
Material lower tube	Carbon fibre	Carbon fibre
Material upper tube	Carbon fibre	Aluminium
Connection	Fixed	Telescopic
Clamp type	–	Screw clamp
Circular bubble	yes	yes
Case	yes	yes
Weight	0.6 kg	1.1 kg
Remark	lightweight	Steel locking pin can be inserted at 1.80, 2.00, 2.20 m to guarantee no slipping

### » Combination options



## Prism Set A3 (Leica Style)

ART.-NO. 401700

- Tilting prism holder made of plastic, yellow / black target made of metal
- Including bag
- Single prism Ø 62.5 mm
- Accuracy  $\pm 2''$
- Offset -34 mm
- Axis height 84 mm



## FP 50 Flat Prism

ART.-NO. 403400

- Tilting flat prism with one-sided reflective film, with padded bag
- Diameter 48 mm
- Offset 0 mm
- Axis height 88 / 112 mm (depending on adapter)
- Supplied with Leica, 5/8" and M 17 x 1,25 adapters
- Weight 130 g



## Prism Set A4

ART.-NO. 401800

- Tilting prism holder made of metal, yellow / black target made of metal
- Including bag
- Single prism Ø 62.5 mm
- Accuracy  $\pm 2''$
- Offset 0 / -30 mm
- Axis height 97 mm



## AL11-D Tribrach Adapter

ART.-NO. 400203

- AL11-D**
- Optical plummet
  - Height adjustable
  - Tubular vial
  - Available in black



## Mini Prism Pin Pole Set ADS 103

ART.-NO. 403100

- The pin pole has 3 sections that screw together to form a height of 0.6, 1.2 or 1.8 m.
- The adjustable 25 mm prism can be locked anywhere along its length.
- 0 mm offset
- Many accessories



## ALL 103 Tribrach Adapter

ART.-NO. 400205

- ALL 103**
- Leica adapter
  - Optical plummet
  - Tubular vial
  - Available in green



## Mini Prism Set Hdmini

ART.-NO. 403000

- With circular levelling vial, padded bag, 5/8" female base, hook for plumb bob
- Single prism Ø 25 mm
- Accuracy  $\pm 2''$
- Offset 0 / -30 mm
- Axis height 70 mm



## AJ 10 and AJ 10-D Tribrachs

ART.-NO. BLACK	400103
ART.-NO. GREEN	400101

- AJ 10**
- Without optical plummet
  - Available in black and green

ART.-NO. BLACK	400003
ART.-NO. GREEN	400001

- AJ 10-D**
- With optical plummet
  - Available in black and green



## Rod Levels

» For holding, fixing or suspending to ranging poles and levelling rods.



» LR 1

» LR 34

» LR 39

» LR 5

ROD LEVELS	
ART.-NO. LR 39, plastic	390
ART.-NO. LR 39, metal	391
ART.-NO. LR 1, metal, adjustable	310
ART.-NO. LR 34, metal, adjustable	330
ART.-NO. LR 5, wood	35w
LR 39 plastic	not adjustable
LR 39 metal	not adjustable
LR 34 + LR1 metal	adjustable
LR 5 wood	adjustable

## F1, F2, J2, F10, C1, F8 Optical Squares

» For staking out right angles or alignments in a straight line.



» F1 / F10

» J2

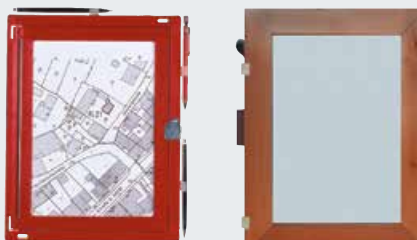
» C1

» F8

OPTICAL SQUARES		
Optical Square F1/1'		210
Optical Square F1/1', with metal housing		211
Optical Square F2/1'		220
Optical Square F2/1', with metal housing		222
Optical square J2		242
Optical Square F10		250
Optical Square F10 with metal housing		251
Optical Square F8 without case		280
Optical Square C1 with case		230
Zip case FE 1A		012
Press stud case FE 1B		013
Range pole adapter L1		277
Type	Housing	Accuracy
F1	metal or plastic	> 1'
F2	metal or plastic	> 1'
J2	plastic	> 2'
F10	metal or plastic	> 2'
C1	metal	> 3'
F8	plastic	> 1'

## Surveyors' Folding Frames

» Including carrying strap.



SURVEYORS' FOLDING FRAMES	
DIN A4, wood	541
DIN A4, plastic (red)	542
DIN A4, plexiglas (transparent)	543
DIN A3, wood	531

## Surveyors' Folding Rules



SURVEYORS' FOLDING RULES	
Surveyors' folding rule, 3 m, erect	410
Surveyors' folding rule, 2 m, erect	412
T1 Surveyors' field bag	601
<ul style="list-style-type: none"> <li>Made from the finest quality wood with strong joint springs</li> <li>Front side: Levelling graduations (E reading) 1 m black, 1 m red</li> <li>Reverse side: mm graduation in black</li> <li>Available in 2 m and 3 m lengths</li> </ul>	



## maxi Sales Display

### MAXI

ART.-NO. 111000

#### Dimensions

· Width	100 cm
· Depth	50 cm
· Height	200 cm

- Made of metal with a large glass door
- Wooden presentation area for 6 products, which can be secured underneath with a 5/8" tripod screw
- 1 small glass display (left), lockable
- 1 shelf in the bottom cabinet which is also lockable
- On left and right side tripods, levelling rods and floor-to-ceiling pillar KS 3 can be positioned



## mini Sales Display

### MINI

ART.-NO. 110000

#### Dimensions

· Width	50 cm
· Depth	40 cm
· Height	50 cm

- Metal Housing
- On wooden presentation area 3 products can be fixed with 5/8" tripod screw
- Display with slideable glass door for arrangement of further products
- Lockable for security against thievery
- Can be integrated in existing Tegometall shelving system

» geo-FENNEL laser instruments are classified to laser class 2 and 3R.

» The laser class may be seen from technical data.

» Whichever is the latest version.



Laser radiation  
Do not stare into beam  
Laser class 2 according to  
DIN EN 60825-1:2014

$P \leq 1 \text{ mW}$  @ 635 ~ 670 nm



LASER RADIATION  
AVOID DIRECT EYE EXPOSURE TO  
THE LASER BEAM  
LASER CLASS 3R according to  
DIN EN 60825-1:2014

Green laser beam  
 $P \leq 5 \text{ mW}$  @ 515 ~ 530 nm  
Red laser beam  
 $P \leq 5 \text{ mW}$  @ 635 ~ 670 nm



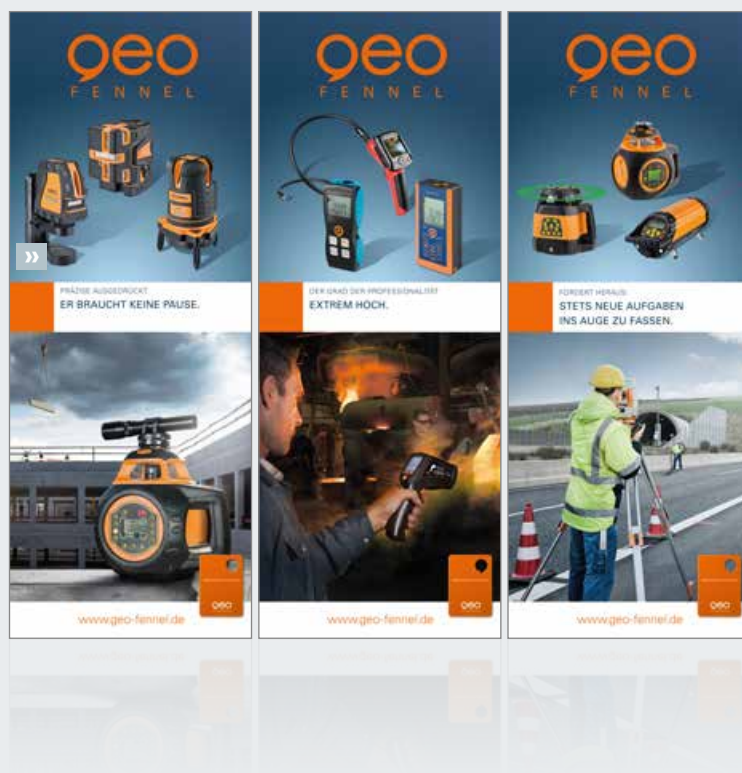
## Precision in measuring. Presence at exhibitions.

» Professional in presentation – geo-FENNEL also supplies posters and wall charts for exhibitions or various labels for sales displays and authorized dealers: Help to reach your customers with the marketing material from geo-FENNEL.

» Banners (roll-up) for exhibitions  
Size: 850 x 2,220 mm each



» Poster DIN A1



» Label for authorized dealers  
Size: 150 x 108 mm



» Car sticker  
Size: 100 x 114 mm

## Tailor-made information.

- » You know best which special requirements you have for our surveying equipment. For further details, data concerning our products, catalogue downloads and all the latest news and information, please visit our website.



Further information is available @

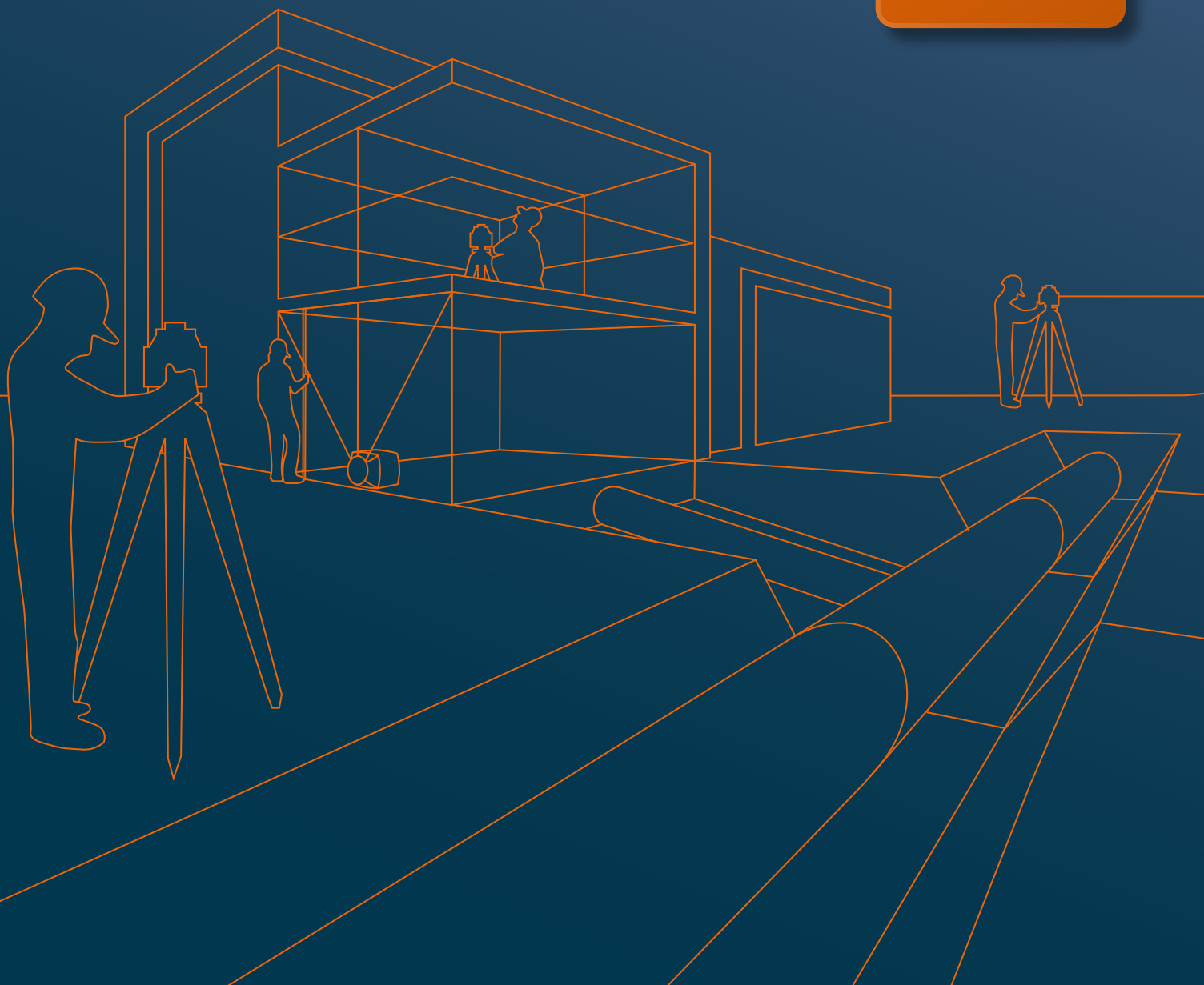
[www.geo-fennel.com](http://www.geo-fennel.com)





Precision by tradition

geo  
FENNEL



VISIT US @

[www.geo-fennel.com](http://www.geo-fennel.com)



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