BOHNENSTINGL

Surveying Tools & Accessories



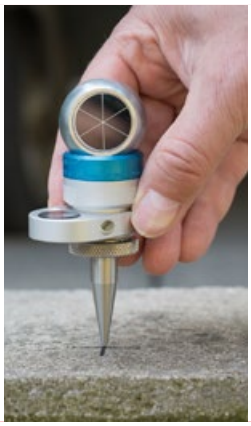


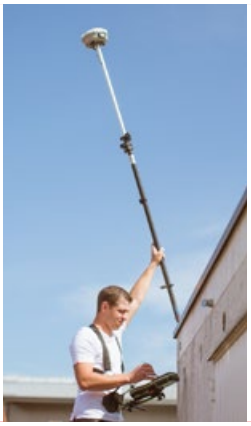
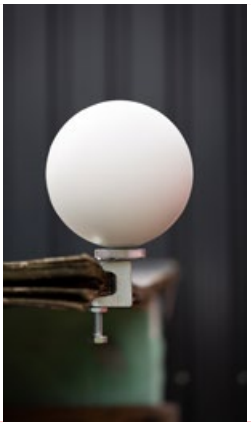











2027

Product Catalog - English

Version 260914

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Navigator

We offer a **fully linked digital catalogue** as an alternative to print, best used with Adobe Acrobat Reader DC.

Click on any turquoise **page number** to jump directly to related content or accessories. Use the "**JUMP**" icon to return to your starting point, allowing easy access to brief information without losing context. Additional **icons** at the bottom of each page further assist with navigation.

JUMP | BACK NEXT | JUMP | HOME | PRINT

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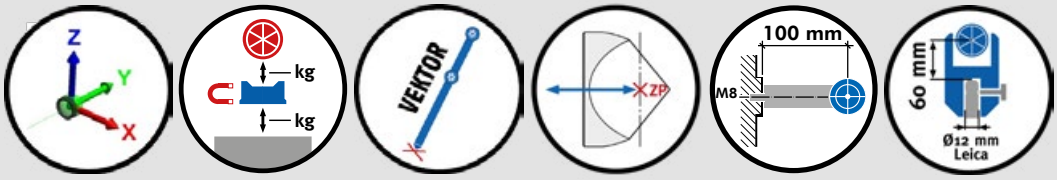


- Computer holders are found in a separate catalog: **https://bohnenstingl.de/bohnenstingl-katalog/?lang=en**



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Surveying includes official standards and commonly used basics that have become quasi-standards over time. Product descriptions feature logos linking to explanations of these standards. Use the "**JUMP**" icon to return to your starting point, allowing quick reference without losing context.



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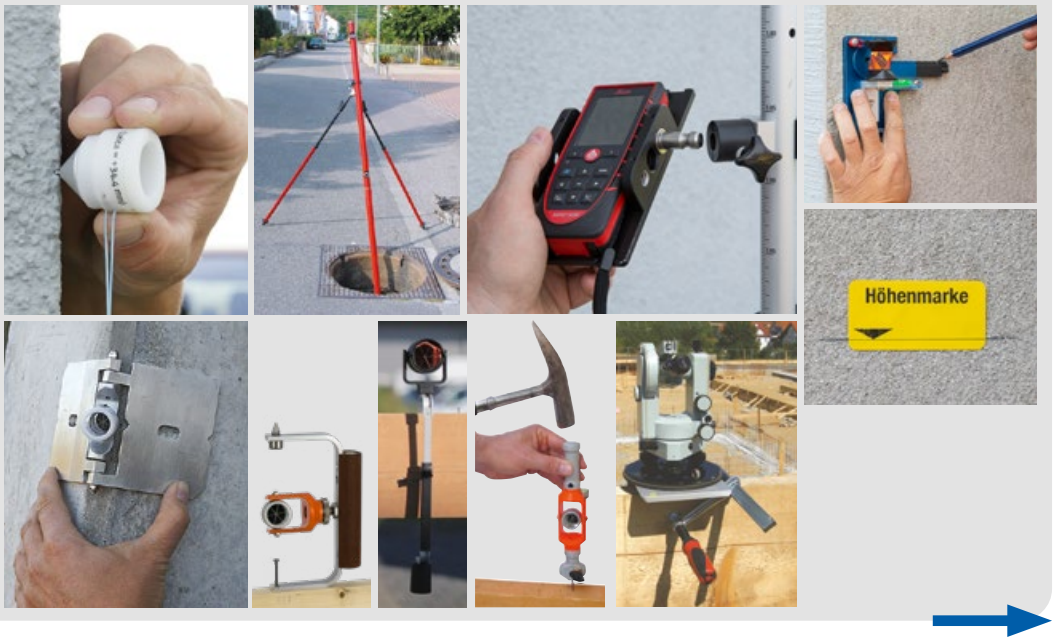
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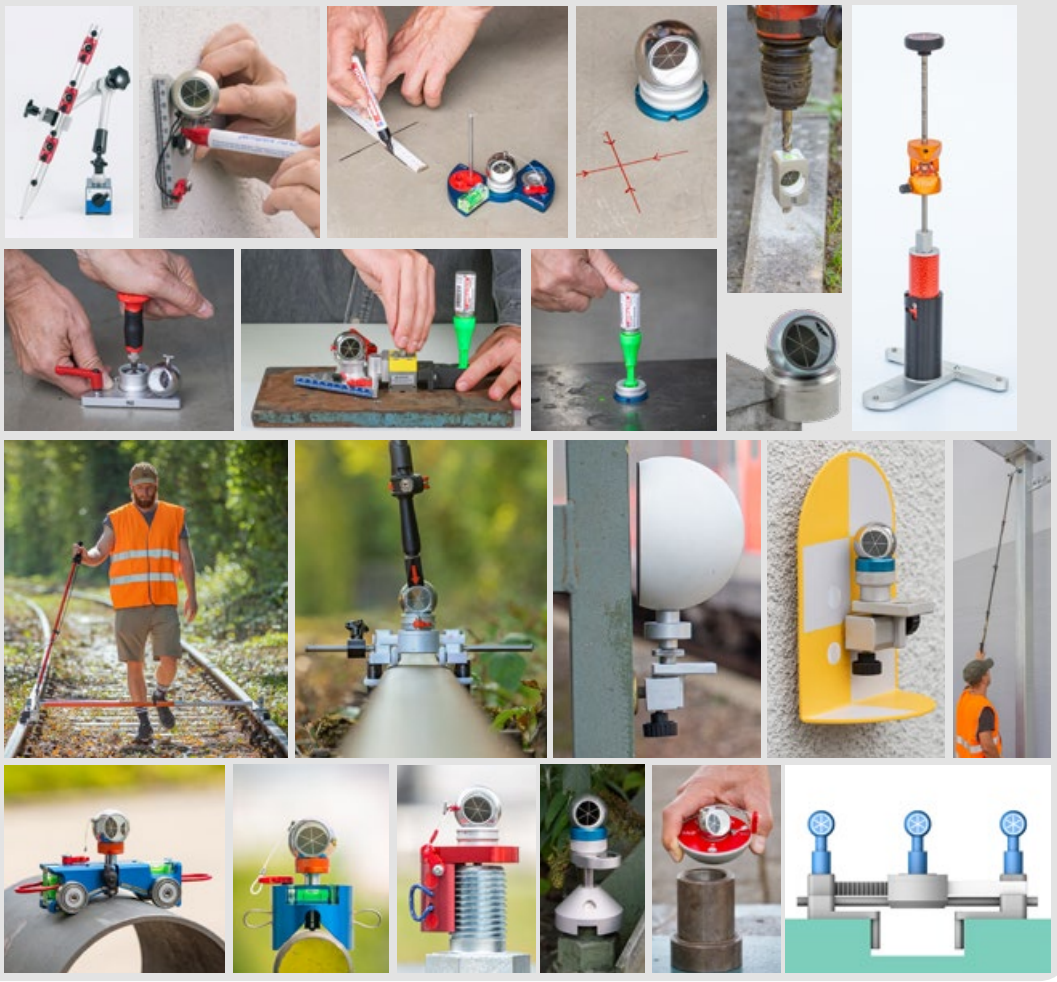
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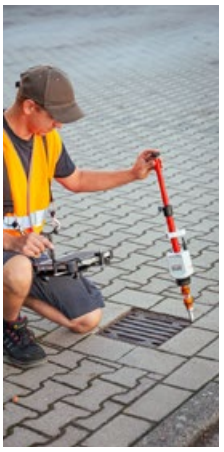
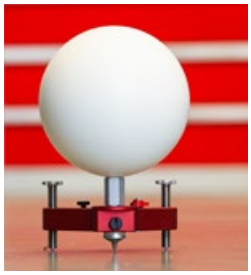


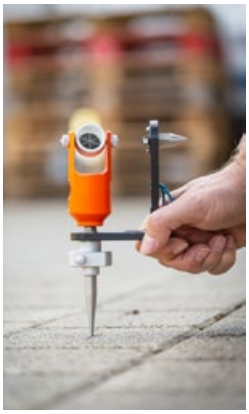
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360° Prisms & Accessories 1/1

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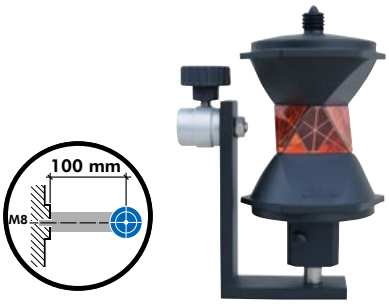
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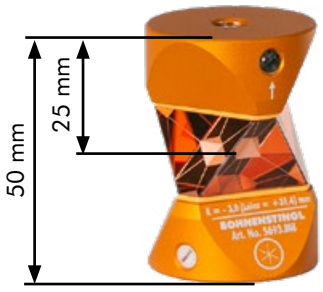


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MHC 360-M8

360° Prisma HARDCore

Robust, universal 360° prism with stainless steel axis

- Prism ring with 6 triple prisms, copper-coated on the back
- Prism constant: –3.0 mm (Leica +31.4 mm)
- Centering accuracy with automatic target recognition: 2 mm
- Available in two versions: M8 + 5/8“


MHC 360-58
Page 11

MHC 360–M8



Continuous stainless-steel sleeve for use with a Ø6 mm centering rod

360° HARDCore Prism MHC 360-M8	⚖	№	€
2x M8 Inner Thread, Prism Constant: -3,0 (Leica + 31,4) mm	87 g	**5693.M8**	520,-

Accessories for MHC 360-M8



Protective Sleeve MHC-SH	⚖	№	€
Ø40 x 37,5 mm, including knurled fastening screw	12 g	**5695**	15,-
INFO	The sleeve can be adjusted up or down using two mounting options.		




Monitoring Accessories for MHC 360-M8	⚖	№	€
L-bracket for 360° prism MHC 360-M8 with fastening material	54 g	**5697.M8**	48,-
Magnetic base Ø 33 mm with M8 external thread and nut	57 g	**1206.40**	29,-



Stake-out point accessories	🗋	⚖	№	€
Circular bubble level with M8 external thread, sensitivity 30‘	-	22 g	**6672**	27,-
Stake-out point with M8 inner thread (0374.015 required)	**20**	-	**1863.XX**	-
Adapter M8a - M8a, Ø25 x 15 mm, anodized aluminum	-	29 g	**0374.015**	19,-




Adapter for MHC 360° HARDCore	⚖	№	€
Adapter 5/8“a - M8a, Ø25 x 10 mm, anodized aluminum	21 g	**0384.010**	17,-
Adapter: Leica mount to M8 external thread	100 g	**0302.035**	34,-








Further application possibilities on the next page

Continuation of application possibilities MHC 360-M8





With centering rod and mini tripod, see below



As a rail marking prism 182



For height marking with PtW 117



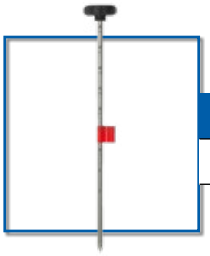
With marking tool “Pointer” and flat tripod 152

Centering Rod & Accessories

The rod is inserted into the axial Ø6 mm bore. The rod has notches every 25 mm, which are engaged by a spring mechanism, along with a corresponding scale. Once locked in place, the distance from the tip to the prism center can be read on the centering rod at the top of the prism housing.

- Clamping option for the prism at any height using a knurled screw
- Stainless steel, hardened. Length: 300 mm, 25 mm indexing with scale from 50 to 250 mm
- Detachable holding knob





Centering Rod MHC-Z300 Ø6 x 300 mm - stainless steel, hardend	⚖	№	€
Length: 300 mm, 25 mm indexing of 50 to 250 mm	71 g	**5694.300**	72,-



Circular bubble level for centering rod Ø6 mm	⚖	№	€
See-through circular bubble level made of glass, sensitivity 30‘	19 g	**5696**	48,-

- Can be mounted at any height on the centering rod using a knurled screw
- Mounting options in 2 positions, depending on the application





Telescopic bipod tripod for centering rod Ø6 mm	🗋	⚖	№	€
Bipod tripod with telescopic spreader bar	**45**	238 g	**6640**	205,-
Reducing sleeve for centering rod Ø6 mm	**45**	5 g	**6641.3006**	3,-











Carrying case for 360° MHC prisms	⚖	№	€
-	550 g	**1467.53**	66,-



Combination of centering pole and telescopic extension

Precice and handy

- Prism close to the object point: high precision with minimized influence from the circular level when plumbing
- With the telescopic pole extended, working without bending over is possible; retractable in tight spaces
- Prism adjustable with target heights from 50 to 250 mm, screw for fixing the height
- Prism can be locked in place every 25 mm, with the target height readable at each position
- Adjustable 30' glass circular level in an aluminum holder
- Total length extended: 1.0 m, retracted: 0.72 m
- Telescopic extension made of GRP/CFRP in red signal color



Description	Order-No.	Euro
Compact pole for 360° prism MHC-M8 (without prism)	**5700**	118,-









No.	3008.30
€	59,-
	256



No.	3008.3226
€	11,-
	256



No.	3642.060
€	26,-
	9



No.	5694.300
€	72,-
	9



No.	5693.M8
€	520,-
	8



No.	5695
€	15,-
	8



MHC 360-58

Use as 360° prism with HIP accessories or on prism pole / with GNSS antenna

- Continuous stainless steel axis for absorbing high leverage forces when used with a prism pole or a GNSS antenna
- Two surrounding rubber rings for additional protection of the prism

The MHC 360-58 has the same dimensions and connection threads as the HIP prism series 2×5/8“. For that reason **all HIP prism accessories** (30) is compatible. When submillimeter targeting accuracy is not required, the MHC 360-58 offers decisive advantages: automatic target tracking without prism alignment, versatile application possibilities, and extremely robust design.



360° HARDCore Prism MHC 360-58	⚖	№	€
2x 5/8“ Connection, Prism Constant: -3,0 (Leica + 31,4) mm	174 g	**5693.58**	610,-

Accessories for MHC 360-58





Circular bubble level 30‘ - not adjustable	🗋	⚖	№	€
5/8“ to screw on (top of prism)	**31**	35 g	**1585.30**	41,-
Side-mounted bubble level for attaching to mm collar Ø27	**89**	24 g	**1466.B**	38,-
INFO	Other 5/8“ levels 🗋 **31**.			





Stake-out point 5/8“, effective length = 50 mm	🗋	⚖	№	€
5/8“ external thread, stainless steel, target height Z = 100 mm	**32**	61 g	**1859.100**	34,-



PRO-Leica-Adapter PLA 5/8“	⚖	№	€
Leica stud mount Ø12 mm and 5/8“ external thread (aluminum)	70 g	**0690**	50,-
INFO	More Adapters 🗋 35.		





Protective Sleeve MHC-SH	⚖	№	€
For MHC 360° HARDCore Prism	12 g	**5695**	15,-
INFO	To use the protective sleeve with 5693.58, one of the rubber rings must be removed beforehand. The knurled fastening screw is included. The sleeve can be adjusted up or down using two mounting options.		



Transport Case	⚖	№	€
for 360°-MHC-Prisms	550 g	**1467.53**	66,-













360° prism MHC 360-58 in use with LEICA AP20



The MHC 360-58 is ideally suited for use with the LEICA AP20 Autopole due to its robust design and slim shape.

With Leica Prism Pole GLS51 1

The MHC 360-58 is attached to the GLS51 using adapter No. 0690.
The AP20 automatically detects the correct target height.

INFO	Instead of the original Leica tip CRP10 (L = 170 mm), a prism MHC 360-58 (L = 100 mm) plus tip (70 mm) can also be used. This allows ground-level measurements to the lower prism using the circular level, without having to rotate the pole. The prism/target height in this case is 120 mm. Correct automatic target height detection of the upper prism is retained. Using protective sleeve No. 5695 prevents measurements to the wrong prism during automatic target recognition (ATR).

Leica Prism Pole GLS51 – Upside Down 2

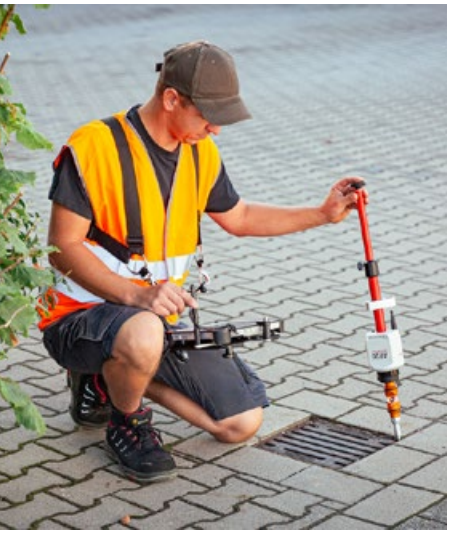
The GLS51 can also be used upside down with the AP20 for ground-level measurements. For this, a tip with an effective length of 70 mm is screwed onto the MHC 360-58.

- Taget height from ground:
  120 mm = 70 mm (tip length) + 50 mm (MHC 360-58)

See the system overview on the next page.

1 2





With short prism pole KS-58

For working in tight spaces with the AP20 upside down.

- Telescopic from 33 to 62 cm: extended, working without bending over is also possible
- Made of GRP/CFRP with red signal coating
- Mount for LEICA AP20
- Bottom: 5/8" external thread for MHC 360-58; top: retaining knob
- Target heights: 120 mm with tip No. 5701, 220 mm with LEICA tip CRP10
- Optional: adjustable circular level for plumb working (reducer sleeve required)
- Optional: protective sleeve to cover the 360° prism

See the system overview on the next page.





Description	Order-No.	Euro
Short Prism Pole KS-58	**5700**	118,-



Spitze

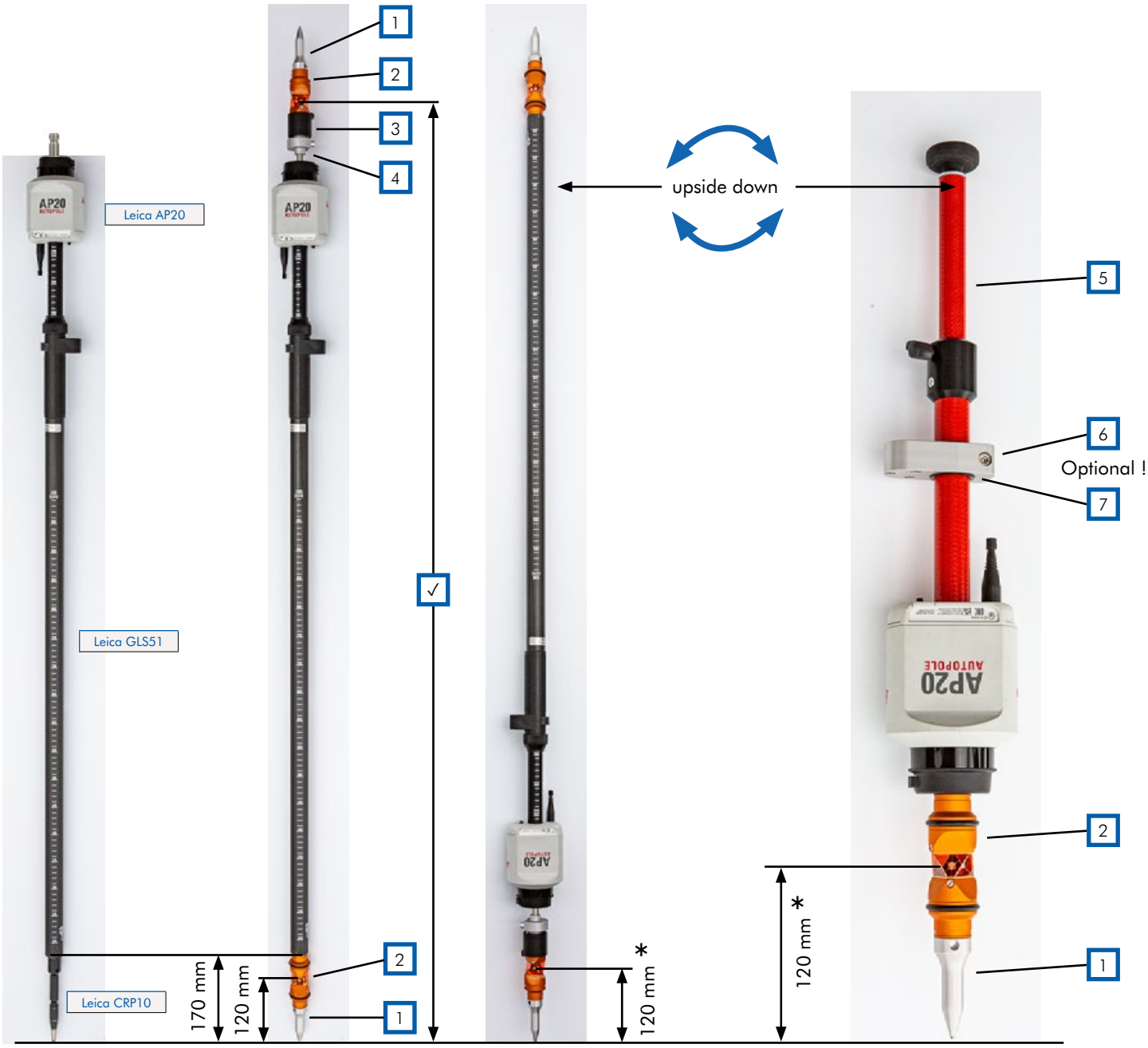
- Turned aluminum part with hardened tip
- Cross-hole for screw-in assistance
- Effective length: 70 mm (excluding 5/8" thread)

Description	Order-No.	Euro
Tip with 5/8" external thread (effective length 70 mm)	**5701**	37,-

360° Prism MHC 360-58 with Leica AP20

Leica Prism Pole GLS51

Short Pole KS-58



* When using the standard tip CRP10, the target height is 220 mm.



1

No.	5701
€	37,-
🗋	12



3

No.	5695
€	15,-
🗋	8



5

No.	5700
€	118,-
🗋	12



2

No.	5693.58
€	610,-
🗋	11



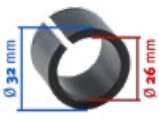
4

No.	0690
€	50,-
🗋	35



6

No.	3008.30
€	59,-
🗋	256



7

No.	3008.3226
€	11,-
🗋	256



360° / 540° Prisma Bo Medium Format



- Prism constant K = -6,0 (Leica = +28,4) mm
- Good compromise between size and max. range (depending on tachymeter/weather conditions)
- Ø 40,5 x 52 mm - Weight: 110 g (90 g without end cap)
- 6 triple prism, copper-coated on the back side
- Centering accuracy with automatic targeting = 1.5 mm

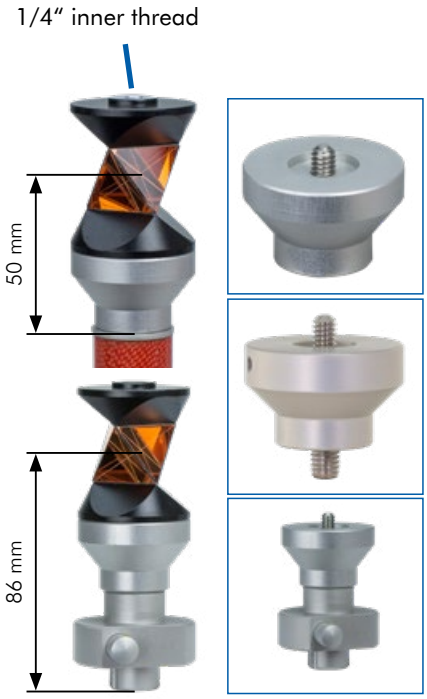
360° / 540° Medium Format Prisma	⚖	№	€
360°-Prisma Bo Mittelformat	90 g	**5670**	336,-

INFO

The 360° prism does not have a continuous steel core. It is therefore not suitable for screwing on heavy accessories and devices (e.g. GNSS antennas). The bonding of the individual prisms does not withstand the resulting leverage.
Tip: Use the **sturdy protective CAGE adapter** 17



540° prism provides more targeting angles/possibilities 15



Accessories

Adapter

Description	Order-No.	Euro
5/8"-Adapter for 360°-Prism Bo Medium Format	**5676**	37,-
M8 Inner thread adapter for 360°-Prism Bo Medium Format	**5674**	33,-
M8 Outer thread Adapter for 360°-Prism Bo Medium Format	**5674.A**	35,-

Description	Order-No.	Euro
Leica quick change adapter for 360°-Prism Bo Medium format	**5673.LS**	79,-



Stake-Out spikes



Stake-Out spikes M8 connection 20



Stake-Out spikes Ø12 mm Leica connection 34



Stake-Out spikes 5/8" threads 32



Stainless Steel Tip

Description	Order-No.	Euro
Ø 12 x 50 mm, stainless steel spike tip Ø12 x 50 mm, 1/4" ext. thread	**5670.S**	13,-





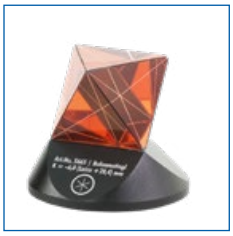
540° Prism Bo Medium Format

Versatile 360° prism with maximum sighting range

Monitoring on walls or ceilings: visible 360° all-round and across a 180° vertical angle from all directions. On the prism pole: extremely steep sightlines possible, e.g. into a deep excavation pit.

- 7 triple prisms, copper-coated on the back
- Lower section with ¼" internal thread; identical target height to the 360° prism Bo mid-size allows use of the entire range of accessories (16)
- Prism constant K = -6.0 mm (Leica = +28.4 mm)
- Centering accuracy with automatic target recognition = 2 mm





360° / 540° Medium Format Prism	⚖	№	€
540°-Prism Bo Medium Format (with transport protective cap)	52 g	**5665**	390,-





Use on prism pole, pendulum holder, etc.

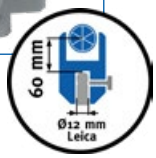
With 5/8"- Outer thread

Description	Oder-No.	Euro
Adapter with 5/8" inner thread - 1/4"- outer thread	**5676**	37,-



With Leica Bolt

Description	Oder-No.	Euro
Adapter for Leica spigot with quick connection	**5673.LS**	79,-



Use with wall bolts M8



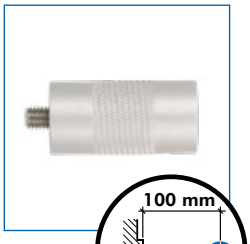


With M8- Adapter

- Screwed axially into a wall bolt
- Target height/wall distance: 50 mm

Description	Oder-No.	Euro
Adapter mit M8-Außengew. - 1/4"- Außengewinde	**5674.A**	35,-





With M8- Adapter **+ M8 extension 50 mm**

- Anodized aluminum, M8 internal thread – M8 external thread
- Target height/wall distance: 100 mm

Description	Oder-No.	Euro
M8 extension Ø25 x 50 mm	**0373.50**	34,-



INFO The 540° prism can be used with all L-holders of the 360° prism Bo mid-size. 18





Central circular level with 1/4“ outer thread

- Big glass level Ø 20 mm, pre-adjusted to the screw-in surface

Description	Order-No.	Euro
Circular level, 1/4" outer thread, sensitivity 30'	**5672**	47,-

INFO | For measurements with large target heights, a circular level attached to the prism pole should be used.





Circular Level for Ø12 mm poles

For screwing onto poles and staking-out tips with Ø12 mm 32.

Description	Order-No.	Euro
Levle, glass, 30', adjustable, to be screwed onto diameters: 12 mm	**1583.30**	46,-





Protective cover for Bo 360° Prism

When is a protective sleeve useful:

- When transporting between two jobs
- When the 360° prism is fixed to a point for a longer period of time, but measurements have to be taken only very rarely
- When the 360° prism is used near busy roads or even railroad lines
- If you do not want the prism to be detected when using automatic target detection (ATR, Auto-search)

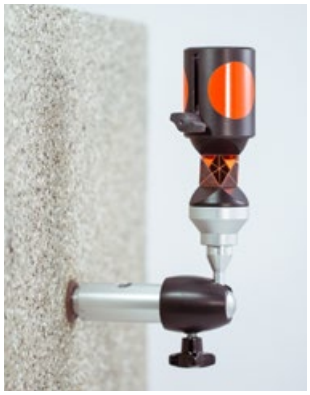
The plastic sleeve protects the prism: In case of light stone chips (pebbles, gravel, etc.), From transport damage, From rain/dust/dirt

Description	Order-No.	Euro
Protective cover for Bo 360° prism (with screw)	**5669**	40,-

INFO | Since April 2023 the 360° prism is sold including an end cap. This end cap includes the possibility to screw on the protective cover 5669 without having to purchase 5672 or 5676.

















Protective cage CAGE for 360° prism Bo Medium Format and ball prism

To expand the application possibilities of the prisms

The 360° Bo Medium Format Prism is an affordable prism with good performance and targeting accuracy. However, adapters are required for use with standard 5/8" connections. Additionally, it lacks a continuous steel core, making it unsuitable for tasks involving high leverage forces, such as use under GNSS antennas.

The Cage eliminates these issues: the prism is secured centrally in a robust holder with 5/8" threads on the top and bottom using its ¼" thread.

The Ø1.5" ball prism can also be used in the Cage. A special magnetic base is attached to the holder with a ¼" screw, ensuring the prism center is precisely aligned along the vertical axis. The ball prism is ideal for applications requiring high targeting accuracy rather than simultaneous observation from all directions. Like the 360° / 540° prism, the two 5/8" threads significantly expand its range of applications.

- Top and bottom made of aluminum, 2 stainless steel connecting rods
- Top and bottom 5/8" inner thread, height 100 mm
- Construction identical with HIP prism 2 x 5/8", thus all accessories can be used
- Aiming accuracy: ± 1.5 mm with 360° prism, ± 0.2 mm with ball prism
- Weight: 200 g



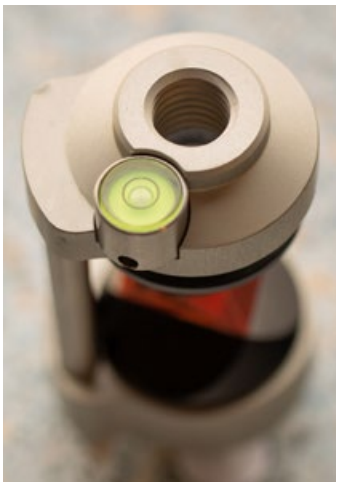


Description	Order-No.	Euro
Prism holder Cage for 360° prism Bo medium format, GRZ101 and ball prism	**5668**	154,-

Note: When used with 360° / 540° prism Bo medium format:
Virtually no restrictions due to the two connection-rods, both for automatic target finding and for distance measurement.













Adapter for Leica GRZ101 and Ball Prism

Description	Order-No.	Euro
Adapter CAGE: For Leica GRZ101	**5666**	28,-



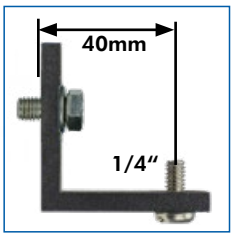


Description	Order-No.	Euro
Special base CAGE for ball prisms Ø38.1mm	**5667**	46,-

Use of ball prism with CAGE s. 78

L-Holder for 360° Prism Bo Medium Format





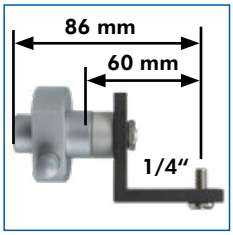
With M8 screw

- Minimum distance to the wall. Target height (distance to wall bolt) 40 mm
- L-Holder made of aluminium with M8 hexagon head screw and washer

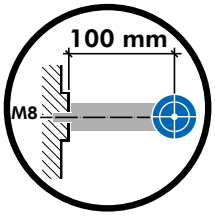
Description	Order-No.	Euro
L-Holder with M8 screw, 1/4" thread, target height = 40 mm	**5677.M8**	54,-







With Leica push-button socket



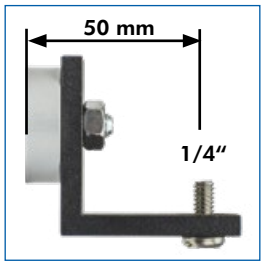
- L-Holder made of aluminium with Leica socket Ø 12 mm
- Push button for quick change and securing on the bolt
- 1/4“ outer thread for screwing on the 360° prism
- **Distance to wall bolt = 100 mm** (when using the wall adapter WA Leica)
- Target height = 86 mm

Description	Order-No.	Euro
L-Holder, Leica socket, 1/4" thread, target height 86 mm	**5677.LS**	79,-



L-Holder with magentic base Ø 33 / Ø 40 mm

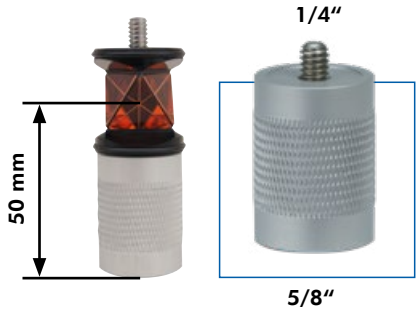
- L-Holder made of aluminium
- For centering plates with Ø 33 / Ø 40 mm
- For quick application / removal of the prism in seconds
- Centering accuracy in connection with centering plates: ± 0.05 mm



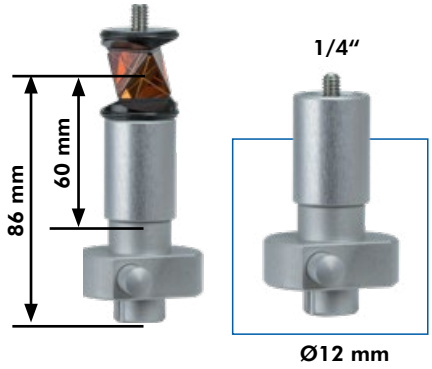
Distance to centering plate: 50 mm

Description	Order-No.	Euro
L-Holder with magnetic base Ø 33 mm, target height 50 mm	**5671.M33**	65,-
L-Holder with magnetic base Ø 40 mm, target height 50 mm	**5671.M40**	65,-

Accessories for Leica 360° Prism GRZ101



Description	Order-No.	Euro
5/8"-Adapter for Leica 360° Mini Prism GRZ101	**5686**	29,-



Leica-Adapter with Push-Botton



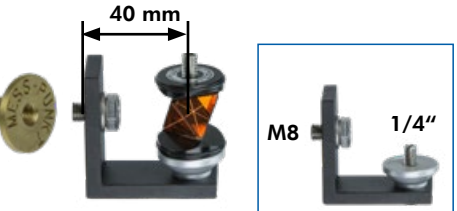
- Bottom: Socket connection for all Leica spigots Ø 12 mm
- Target height (to prism center): 86 mm
- Anodised aluminium
- Push button for quick change and securing on Leica spigot

Description	Order-No.	Euro
Leica-Adapter for Leica GRZ101, Leica quick connection	**5683.LS**	68,-



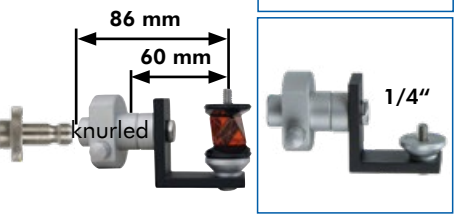
- Aluminium casing Ø 26 x 20 mm
- Plastic circular level Ø 15 mm, adjusted to the screw-in surface
- For measurements with large target heights, use a prism pole circular level

Description	Order-No.	Euro
Circular level, 1/4" **inner** thread, sensitivity 50'	**5682.Ki**	29,-
Circular level, 1/4“ **outer** thread, sensitivity 50‘	**5682**	32,-



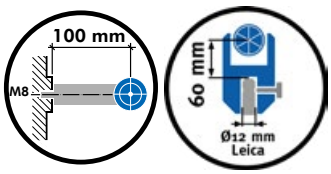
- Minimum distance to wall
- Aluminium L-holder with M8 hexagon head screw and washer

Description	Order-No.	Euro
L-holder w. M8 screw, 1/4" thread, target height 40 mm	**5687.M8**	62,-

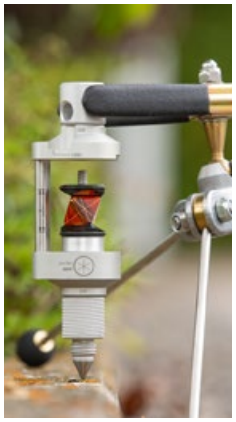


- Target height = 86 mm
- Distance from wall bolt = 100 mm (when using the WA Leica adapter)

Description	Order-No.	Euro
L-holder, Leica push button scocket, 1/4" thread, target height 86 mm	**5687.LS**	87,-



GRZ101 with protective frame CAGE







Enables the use of 5/8“ standard connections. By screwing in the prism with the ¼“ thread via the 5666 adapter, it sits exactly in the center of a very robust prism holder and can therefore also be subjected to high leverage forces, e.g. as a 360° prism under a GNSS antenna.

More information about protective frame CAGE 17

Description	Order-No.	Euro
Prism holder Cage for 360° prism Bo medium format and ball prism	**5668**	154,-

Description	Order-No.	Euro
Height adapter CAGE for Leica GRZ101 to be used with 5668	**5666**	28,-



Stainless steel tip for Leica GRZ101

For positioning and capturing points. Various lengths for variable use. An adapter is required to connect GRZ101 and the stainless steel tips.

Adapter 1/4“ - M8

Serves as an adapter between the 1/4“ inner thread of the GRZ101 prism and the stainless steel tips (M8 inner thread)

- Aluminum, Effective height: 15 mm
- Stainless steel external threads



Description	Order-No.	Euro
Adapter: 1/4“ thread, M8 thread, Ø25 x 15 mm	**5689.015**	22,-

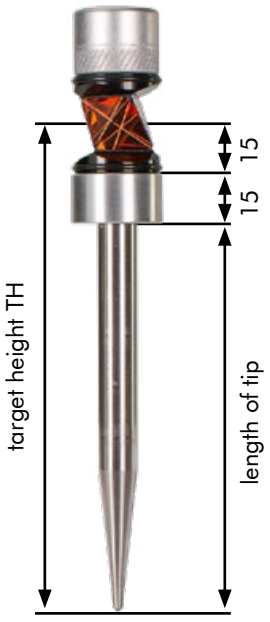
M8 Stainless steel spike/tip

- Varying tip finish, depending on the length
- Material: Ø12 mm stainless steel
- M8 inner thread



Description	Length	Target height (TH)	Order-No.	Euro
Stainless steel tip with **M8 inner thread**	20 mm	**50 mm**	**1863.020**	14,-
	43 mm	73 mm	**1863.043**	15,-
	70 mm	**100 mm**	**1863.070**	16,-
	93 mm	123 mm	**1863.093**	17,-
	120 mm	**150 mm**	**1863.120**	18,-
	143 mm	173 mm	**1863.143**	19,-
	170 mm	**200 mm**	**1863.170**	20,-

Setup



Accessories



Screw-on Circular level

19



Circular level for poles with Ø12 mm

Usable from length 70 mm

16



Joint arm

44





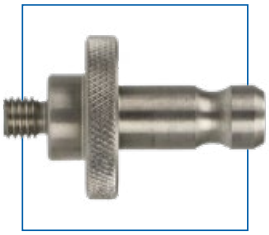
Accessories: Leica 360°- Prisma GRZ 4, 121, 122

L-Holder



- Sturdy aluminium L-holder with Leica socket Ø 12 mm
- Large horizontal screw with star grip for securing to the spigot
- Leica spigot Ø 12 x 40 mm to mount 360° prism
- Axis of the socket runs through the centre of the prism
- Cardanic mounting
- Aluminium black coated
- **Distance to wall bolt = 100 mm (when using WA Leica wall adapter)**

Description	Order-No.	Euro
L-holder, Leica socket with securing screw, Leica spigot Ø 12 x 40 mm	**5690**	152,-



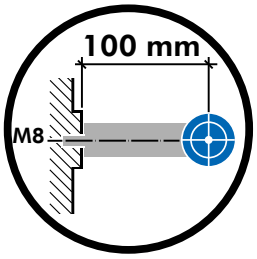
Wall Adapter WA Leica (stainless steel) 36

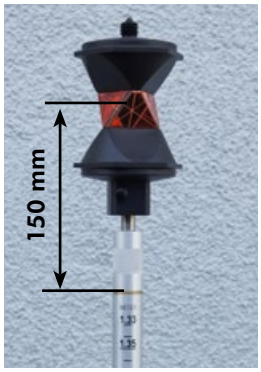
- Leica spigot Ø 12 x 27 mm, M8 outer thread
- Total length 40 mm (without M8 thread)

Description	Order-No.	Euro
Wall adapter WA Leica, spigot- Ø 12 x 27 mm, M8 thread	**0830**	18,-



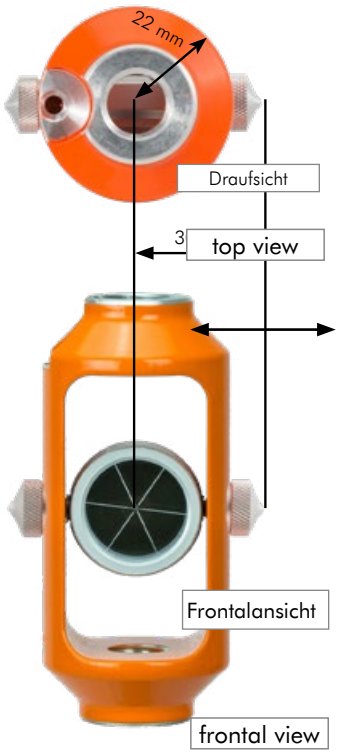




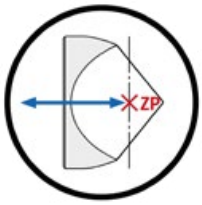




INFO	To reach the target height of 150 mm we offer a suitable adapter for the prism pole. Adapter 0378.90 you will find on 254



Prism Series HIP



The Prism HIP (Highly-Integrated-Prism) is characterised as follows:

- Adjustable tilting resistance of the prism
- Low space requirement of the prism carrier (radius only 22 mm)
- Glass Ø = 25 mm, except with prism constant K = -11,3 mm: glass Ø = 17,5 mm
- Distance measurement range up to more than 1000 m depending on device and weather conditions
- Mirrored reflective surfaces; no „tarnishing“ of the prism in the housing
- Highest precision due to complete CNC machining (no mould)
- The prism holder is standardly equipped with tilt axis caps (lateral axis center 30 mm), which can be unscrewed to adjust the tilt resistance or to mount longer tilt axis pins (see below)

INFO	The tilting and standing axis runs exactly through the target center: at K = 0 through the centre of the printed target sign, at all other constants through the visible prism center (centrally symmetrical point).

Options



Tilting axis covers / pins



- To screw on
- For use as horizontal offset excenter (50 mm)
- For better targeting / visibility

Description	Order-No.	Euro
Tilting axis covers / pins for HIP prisms (2 pieces)	**1615.2**	26,-



Red marked prism center

For a better manual targeting with the tachymeter we deliver the series HIP optionally with a red marked prism center. Additional charge:
10,50 € / prism
Please contact us for this option.



Circular Level

Various circular levels are available on 31.





Weather Protection Cap

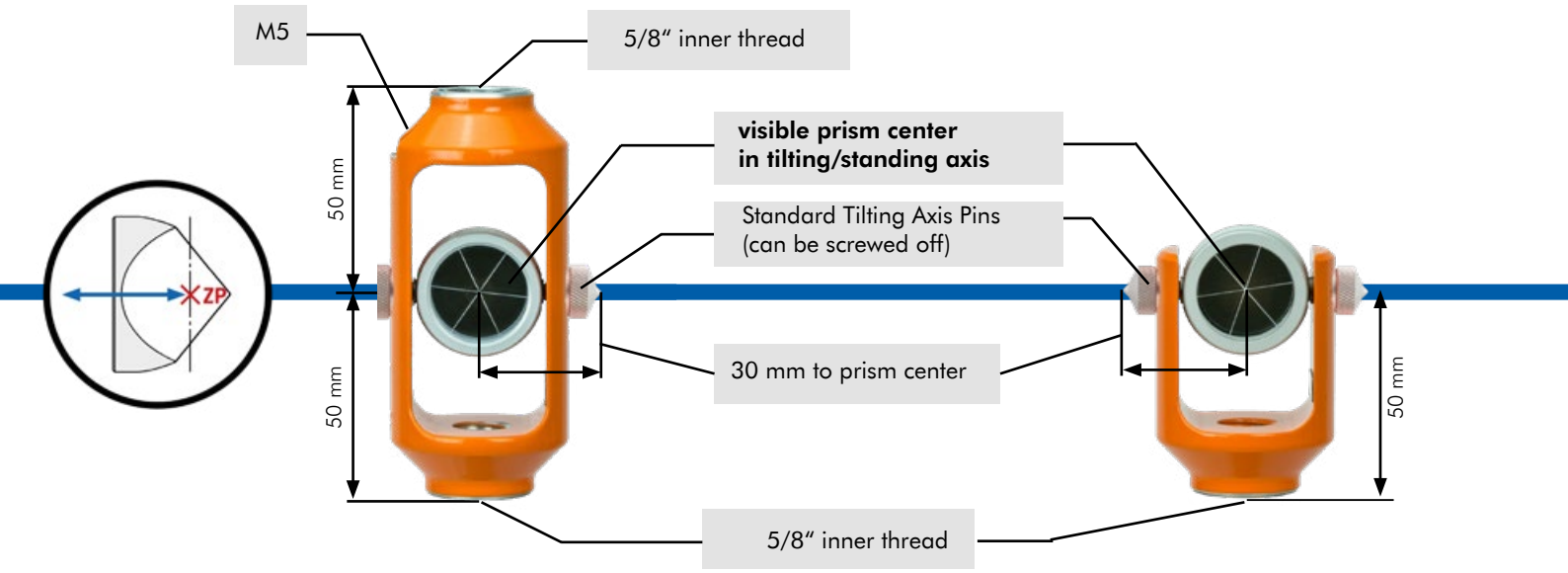
Helps protect the glass prism from rain 25



DB-GV-Target-compliant

For using with laser scan targets for track bolt marking 182 .

Prism with 5/8" thread connection



Prism HIP 2 x 5/8“			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1) mm	**1610.11**	221,-
25 mm	**-16,9** (Leica = +17,5) mm	**1610.17**	231,-
25 mm	**-30** (Leica = +4,4) mm	**1610.30**	252,-
25 mm	**-34,4** (Leica = +0) mm	**1610.34**	272,-
25 mm	**-35,0** (Leica = -0,6) mm	**1610.35**	272,-

Prism HIP-U 5/8“			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1) mm	**1620.11**	168,-
25 mm	**-16,9** (Leica = +17,5) mm	**1620.17**	178,-
25 mm	**-30** (Leica = +4,4) mm	**1620.30**	215,-
25 mm	**-34,4** (Leica = +0) mm	**1620.34**	230,-
25 mm	**-35,0** (Leica = -0,6) mm	**1620.35**	230,-

Information on prism constants can be found at 267



Description	prism constant K	Order-No.	Euro
Holder HIP, 2 x 5/8" with reflective foil	**0** (Leica = +34,4 mm)	**1615.0**	139,-
Holder HIP-U 5/8" with reflective foil	**0** (Leica = +34,4 mm)	**1625.0**	99,-

MORE OPTIONS



Protective cap
25



Red marked prism center
22



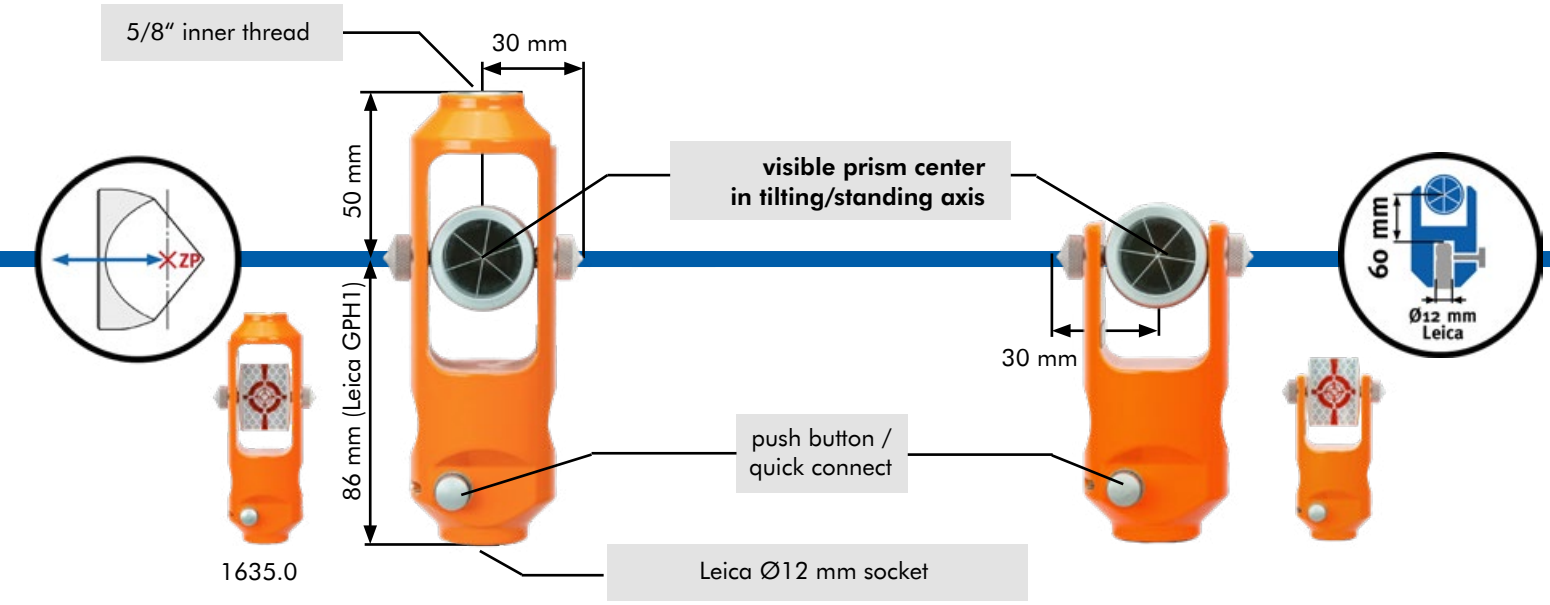
Circular Level
31



Tilting axis pins
22

Offset spikes
25

Prism HIP with Leica socket



Prism HIP: Leica - 5/8"			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1) mm	**1630.11**	242,-
25 mm	**-16,9** (Leica = +17,5) mm	**1630.17**	252,-
25 mm	**-30** (Leica = +4,4) mm	**1630.30**	288,-
25 mm	**-34,4** (Leica = +0) mm	**1630.34**	304,-
25 mm	**-35,0** (Leica = -0,6) mm	**1630.35**	304,-
Reflect. foil	**0** (Leica = +34,4 mm)	**1635.0**	166,-

Prism HIP-U: Leica			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1) mm	**1640.11**	194,-
25 mm	**-16,9** (Leica = +17,5) mm	**1640.17**	204,-
25 mm	**-30** (Leica = +4,4) mm	**1640.30**	241,-
25 mm	**-34,4** (Leica = +0) mm	**1640.34**	256,-
25 mm	**-35,0** (Leica = -0,6) mm	**1640.35**	256,-
Reflect. foil	**0** (Leica = +34,4 mm)	**1645.0**	126,-

Information on prism constants: 267



1630.34.DB

DB compliant track prism

The installation of GV targets (laser scan targets for track marking bolts) is carried out according to the guidelines of Deutsche Bahn (Ril 883.3000A2, Ril 883.3000A03). Accordingly, a usable length of at least 25 mm must remain for the mast bolts, among other requirements. The design is without tilt axis pin covers and with shortened axle bearings. The prism can rotate 360 degrees.

Description	prism constant K	Order-No.	Euro
Prism HIP Leica-5/8": DB compliant	**-34,4** (Leica = +0) mm	**1630.34.DB**	304,-

MORE OPTIONS



Protective cap

25



Red marked prism center

22



Circular Level

31



Tilting axis pins

22

Offset spikes

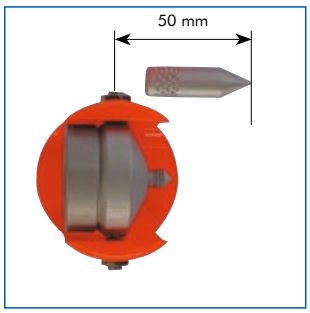
25



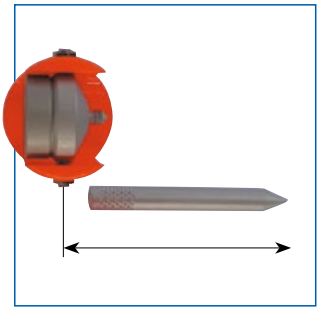
Offset spikes

For HIP prisms with glass prism

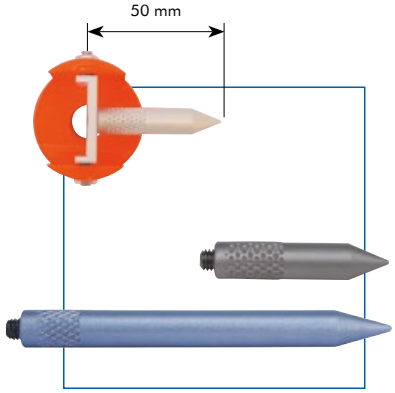
HD 50 and HD 100 for measuring vertical points, e.g. building facades, etc.
Can be screwed onto the rear thread of the prism housing.
Available for each system constant to achieve a round distance (= longitudinal eccentricity) to the mandrel tip (object point).



Longitudinal eccentricity/improvement **+50 mm**				
Description	Inner thread	prism constant set on the tachymeter	Order-No.	Euro
Offset spike / tip HD50/11	M8	**-11,3** (Leica = +23,1) mm	**1650.39**	8,-
Offset spike / tip HD50/16	M6	**-16,9** (Leica = +17,5) mm	**1415.34**	8,50
Offset spike / tip HD50/30	M6	**-30,0** (Leica = +4,4) mm	**1650.20**	8,-
Offset spike / tip HD50/34	M6	**-34,4** (Leica = 0) mm	**1650.16**	8,-
Offset spike / tip HD50/35	M6	**-35,0** (Leica = -0,6) mm	**1650.15**	8,-



Longitudinal eccentricity/improvement **+100 mm**				
Description	Inner thread	prism constant set on the tachymeter	Order-No.	Euro
Offset spike / tip HD100/11	M8	**-11,3** (Leica = +23,1) mm	**1650.89**	8,50
Offset spike / tip HD100/16	M6	**-16,9** (Leica = +17,5) mm	**1415.84**	9,-
Offset spike / tip HD100/30	M6	**-30,0** (Leica = +4,4) mm	**1650.70**	8,50
Offset spike / tip HD100/34	M6	**-34,4** (Leica = 0) mm	**1650.66**	8,50
Offset spike / tip HD100/35	M6	**-35,0** (Leica = -0,6) mm	**1650.65**	8,50



For holder HIP with reflective foil

The offset spike is screwed into the back of the tiltable target mark carrier.
When measuring a point with the offset spike, a **longitudinal eccentricity (improvment) of +50 mm / + 100 mm** is to be considered.
With M6 outer thread.

Description	Order-No.	Euro
Offset spike / tip RD 50, Longitudinal eccent. + 50 mm	**1029.50**	10,-
Offset spike / tip RD 100, Longitudinal eccent. + 100 mm	**1029.100**	10,-



Protective Cap for HIP Prisms

To protect the triple prism from weather conditions such as rain, snow, dust, etc. A protective cap can be mounted on all prisms of the HIP series. Secure hold in wind and weather.

- Aluminum sleeve Ø 35 x 50 mm
- Optimized light incidence through bright anodization / Good water drainage during rain
- For assemly of the cap a slotted screwdriver can be helpful





Description	Order-No.	Euro
Protective cap / visor for HIP prisms	**1003**	15,-

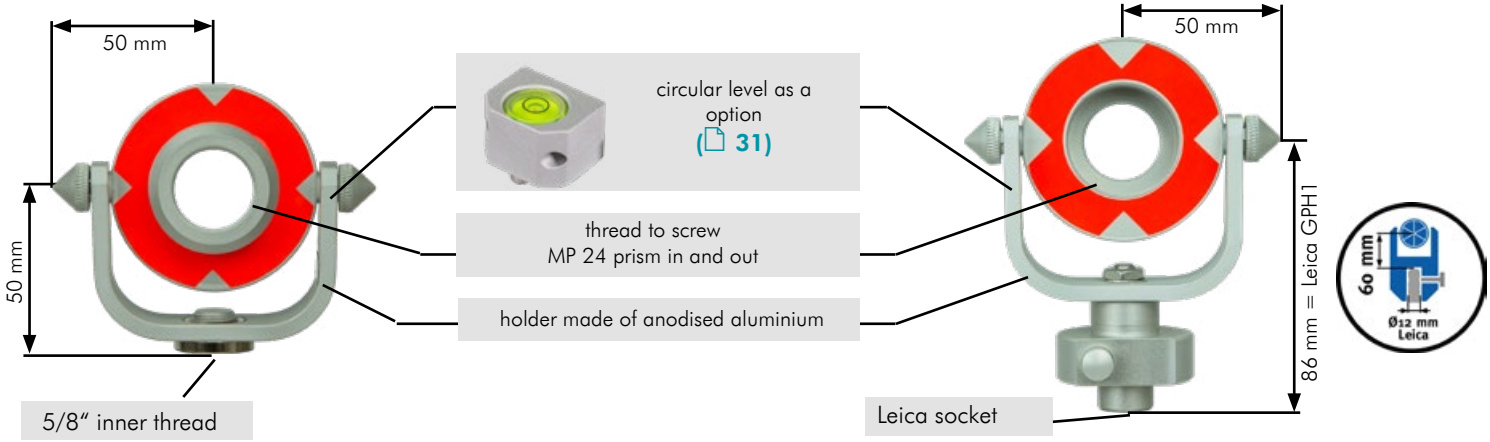


Mini Prism MP 24 & Holder

- With Ø 25 mm glass prism (grinding accuracy 2", reflective surfaces silvered)
- Distance measurement range: up to over 1000 m (depending on device and weather)
- Shockproof & waterproof, Weight: 30 g



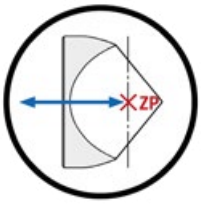
Description	Order-No.	Euro
Mini Prism MP 24	**1400**	58,-

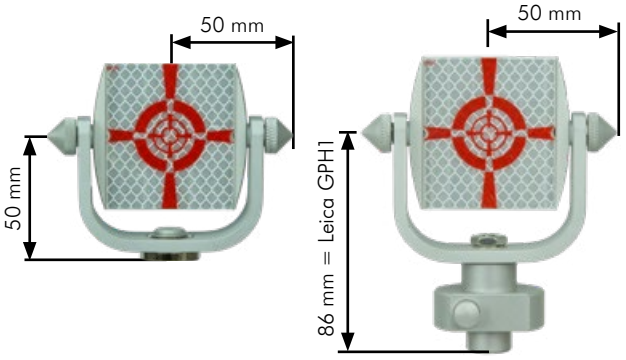


Description	prism constant K	Order-No.	Euro
Holder ONRT 50, for MP 24 prism (**without prism**)	**0** (Leica = +34,4 mm)	**0625.0**	98,-
	-11,3 (Leica = +23,1) mm	**0625.11**	98,-
	-16,9 (Leica = +17,5) mm	**0625.17**	98,-
	-30,0 (Leica = +4,4) mm	**0625.30**	98,-
	-34,4 (Leica = 0) mm	**0625.34**	98,-
	-35,0 (Leica = -0,6) mm	**0625.35**	98,-

Description	prism constant K	Order-No.	Euro
Holder ONRT L, for prism MP 24 (**without prism**)	**0** (Leica = +34,4 mm)	**0655.0**	127,-
	-11,3 (Leica = +23,1) mm	**0655.11**	127,-
	-16,9 (Leica = +17,5) mm	**0655.17**	127,-
	-30,0 (Leica = +4,4) mm	**0655.30**	127,-
	-34,4 (Leica = 0) mm	**0655.34**	127,-
	-35,0 (Leica = -0,6) mm	**0655.35**	127,-

INFO The tilting and standing axis runs through the visible prism centre (central symmetrical point) only when choosing prism constant **K = -16.9 mm**.





With reflective foil 52 x 60 mm

Integrated target plate with bright red target ring and target wedges optimized in standing and tilting axis. This minimizes targeting errors even when the prism is misaligned.

Description	prism constant K	Order-No.	Euro
Reflect. Foil Holder ONRT 50 **5/8"**	**0** (Leica = +34,4 mm)	**0628**	92,-
Reflect. Foil Holder ONRT L **Leica**	**0** (Leica = +34,4 mm)	**0658**	118,-





Accessories for series Type ONRT

Offset spikes for prism MP24

For measuring vertical points, e.g. building facades, etc.
The offset spike can be screwed onto the rear M6 distance mandrel of the MP24.
Available for each system constant to achieve a round distance (= longitudinal eccentricity) to the mandrel tip (object point).

INFO	When measuring points directly with the mandrel tip of the MP24 (without extension), the prism constant must be set to K=0 or a positive longitudinal eccentricity at the level of the set (negative) prism constant must be taken into account.





Longitudinal eccentricity/improvement: **+50 mm**			
Description	prism constant K	Order-No.	Euro
Offset spike MPV50/0	**0** (Leica = +34,4) mm	**1415.50**	8,50
Offset spike MPV50/11	**-11,3** (Leica = +23,1) mm	**1415.39**	8,50
Offset spike MPV50/16	**-16,9** (Leica = +17,5) mm	**1415.34**	8,50
Offset spike MPV50/30	**-30,0** (Leica = +4,4) mm	**1415.20**	8,50
Offset spike MPV50/34	**-34,4** (Leica = 0) mm	**1415.16**	8,50
Offset spike MPV50/35	**-35,0** (Leica = -0,6) mm	**1415.15**	8,50





Longitudinal eccentricity/improvement: **+100 mm**			
Description	prism constant K	Order-No.	Euro
Offset spike MPV100/0	**0** (Leica = +34,4) mm	**1415.100**	9,-
Offset spike MPV100/11	**-11,3** (Leica = +23,1) mm	**1415.89**	9,-
Offset spike MPV100/16	**-16,9** (Leica = +17,5) mm	**1415.84**	9,-
Offset spike MPV100/30	**-30,0** (Leica = +4,4) mm	**1415.70**	9,-
Offset spike MPV100/34	**-34,4** (Leica = 0) mm	**1415.66**	9,-
Offset spike MPV100/35	**-35,0** (Leica = -0,6) mm	**1415.65**	9,-





For holder with reflective foil

The offset spike is screwed into the back of the tiltable target mark carrier.
When measuring a point with the offset spike, a **longitudinal eccentricity (improvment) of +50 mm / + 100 mm** is to be considered.

Description	Order-No.	Euro
Offset spike RD 50, Longitudinal eccentricity +50 mm	**1029.50**	10,-
Offset spike RD 100, Longitudinal eccentricity +100 mm	**1029.100**	10,-





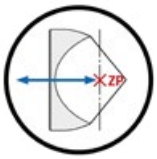
Cylinder Prism ZP11

- Aluminium cylinder Ø25 x 50 mm, red anodized. Or, on request: Grey anodized
- Prism constant K= -11,3 (Leica = +23,1) mm, prism Ø17,5 mm,
- Grinding accuracy 2'', Reflective surfaces silver mirrored on rear side
- Shockproof and waterproof
- Range Distance measurement: Up to and over 500 m (device and weather dependent)
- Mounting of the visible prism center in cylinder axis ±0,1 mm
- Quick connection system with bolt B1216 (Ø12x16 mm)



Combination: Mini-Vektor
127







Cylinder Prism ZP11	⚖	№	€
ZP11 B, socket + bolt B1216	70 g	**6611**	158,-
ZP11 M, socket B1216 + M6 inner thread	53 g	**6611.M6**	142,-
INFO	Remaining stocks in grey (anodized) are also available at a reduced price.		





Sector Cap for Cylinder Prism ZP11

To prevent measurement errors when using multiple stacked prisms:

The ZP11, with its centrally symmetric prism center, is ideal for precision measurements. For single measurements, it is aligned with the total station. For monitoring from multiple total station positions, several ZP11 prisms can be stacked and individually aligned. If total stations are positioned close enough that two prism centers are visible simultaneously, automatic target recognition (Autolock, ATR) may cause errors.

- The sector adapter effectively reduces the horizontally visible area of the prism center without limiting vertical targeting or prism performance.
- Red plastic adapter with a rear knurled screw for automatic alignment. Can be rotated fully in front of the prism for protection or to avoid unintended targeting. [1]



[1]



Cylinder Prism ZP11 Accessory:	⚖	№	€
Sector Cap for Zylinder Prism ZP11	11 g	**6612**	9,-





Protective cap for cylinder prism ZP11

Alternative to sector attachment. Allows covering individual prisms by rotating the shield.

Cylinder Prism ZP11 Accessory:	⚖	№	€
Protective cap for cylinder prism ZP11 (black plastic)	5 g	**6613**	4,-

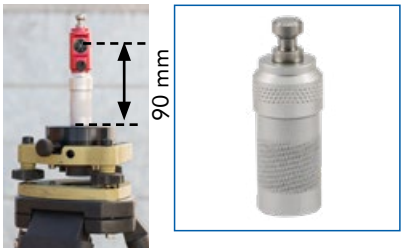
Accessories for ZP11 prisms



Adapter for prism poles with Leica bolt and target height 86 mm

- Bottom: Leica socket Ø12 mm with quick connection to attach to prism pole
- Top: Bolt B1216 stainless steel
- Effective adapter length: 30 mm, Nominal size adapter + ZP11: 86 mm

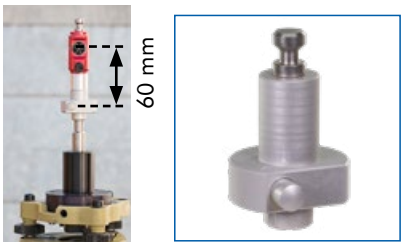
Description	Order-No.	Euro
Adapter Leica socket to bolt B1216	**0697**	63,-



Adapter tribrach inserts with 5/8" outer thread

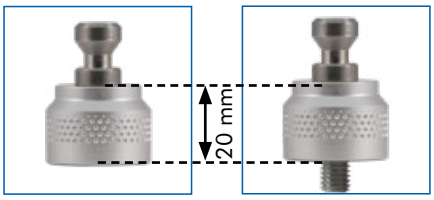
- Bottom: 5/8" inner thread to screw onto into tribrach insert
- Top: Bolt B1216 stainless steel
- Effective adapter length: 60 mm
- Overall height to prism centre ZP11 (without tribrach height): 90 mm

Description	Order-No.	Euro
Adapter 5/8" inner thread to bolt B1216, Ø25x60 mm	**6621**	34,-



Adapter for tribrach inserts with Leica bolt

Description	Order-No.	Euro
Adapter Leica socket to bolt B1216	**0697**	63,-



M8 Adapter - B1216 Bolt

Description	Order-No.	Euro
Adapter M8 **inner** thread to B1216 bolt	**6620**	24,-
Adapter M8 **outer** thread to B1216 bolt	**6620.A**	26,-

More Accessories



Circular level for Cylinder Prism ZP11 127



Stakeout spikes for Cylinder Prism ZP11 127

Prism Accessories 1/1

A.5.1. Circular Level, Staking Out Spikes 31

- Circula Bubble Level 31
- Staking Out Spikes 32



A.5.2. Adapter 5/8" / Leica bolt mounts for prisms HIP, TOP, ONRT, CAGE 35

- M8 - 5/8" Adapter - turnable
- M8 - Ø12 mm Leica Adapter
- 5/8" - Ø12 mm Leica Adapter
- Leica Quick Release (Bolt Mount)
- Hand Grip 5/8"
- Protective Caps:
  - Glass Prism Protection
  - Bolt Protection Caps
  - 5/8" outer thread protective cap



A.5.3. Edge / Corner Adapter for Prisms 39

- Edge / Corner Adapter
- Inner Corner Adapter
- M8 Edge Adapter



A.5.4. Mini / Joint / Telescopic / Triangel - Tripods and Short Prism Pole UNI 42

- Mini Tripod 43
- Joint Tripod 44
- Telescopic Tripod 45
- Triangle Ground Tripod 46
- Short Prism Pole UNI 49



Circular Levels

Circular Level Integral (for Series HIP and TOP)

Can be screwed to the side of the prism holder at the top.
Thus free availability of the 5/8" connection for further applications.
(Cannot replace the circular level of a prism pole).



- Level Ø 14 mm in metal casing, Sensitivity 50'
- Adjusted in stainless steel housing (no adjusting screws)
- Horizontal drilling as screw-on and screw-off support
- Dimensions: Ø 16,5 mm, Height 13 mm, M5 outer thread



Description	Order-No.	Euro
Circular Level Integral	**1580**	24,-

Circular Level Central - 5/8"





- High-quality glass level Ø 20 mm in aluminium casing
- Delivered adjusted, without further adjustment options
- Dimensions: Ø 27 mm, Height (without thread): 25 mm
- Horizontal drilling or knurling as screw-on and screw-off support



Description	Order-No.	Euro
Circular level, not adjustable, 5/8" inner thread, sensitivity 30'	**1584**	33,-
Circular level, not adjustable, 5/8" outer thread, sensitivity 30'	**1585.30**	41,-

Adjustable



- Circular level can be adjusted with Allen key (2.5 mm)
- Dimensions: Ø 30 mm, Heihgt (without thread): 43 mm
- Supplied with Allen key



Description	Order-No.	Euro
Circular level, adjustable, sensitivity 30'	**1587.30**	53,-
Circular level, adjustable, sensitivity 10'	**1587.10**	58,-

Circular level for Prism Type ONRT



- Adjustable
- Sensitivity: 25'
- Circular level Ø 14 mm in aluminium casing
- Comes with 2 mounting screws



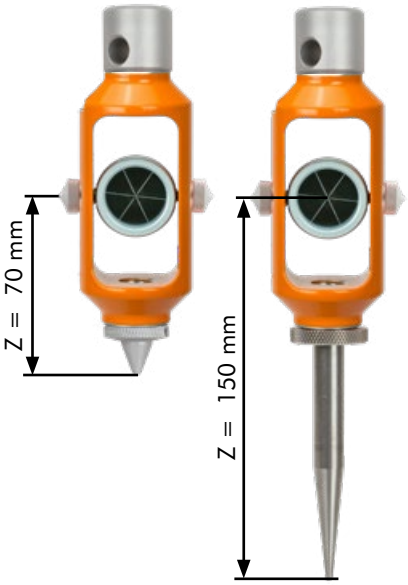
Description	Order-No.	Euro
Circular level JDL 14	**1850**	41,-

Circular level for tips and poles with Ø12 mm



- Can be inserted from the side and locked at any position
- High-quality glass vial, Ø20 mm, in a metal housing
- Adjustable with a hex key (2.5 mm) – included

Description	Order-No.	Euro
Circular level for tips/poles, adjustable, sensitivity 30'	**1583.30**	46,-

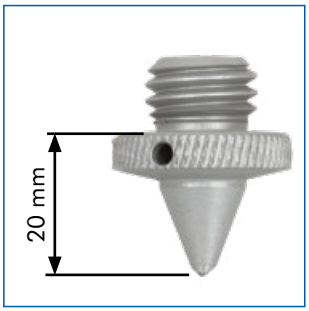


Stakeout spikes

For all reflector holders with 5/8" inner thread or Leica spigot. Due to the small distance between prism center and stakeout tip, points (in conjunction with a circular level) can be staked out or measured with great accuracy.

The long, slim tips in stainless steel design are excellently suited for precise piercing in soil.

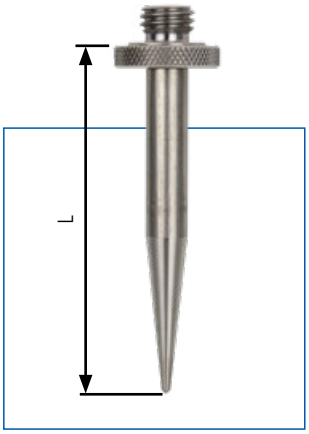
Stakeout spikes 5/8"



The shortest tip

Knurled grip made of aluminium and conical tip with hardened steel insert.

Description	Order-No.	Euro
Stakeout tip 5/8", L = 20 mm	**1852**	24,-



Spikes made of stainless steel

5/8" outer thread and cylindrical tip Ø 12 mm made of stainless steel. Also ideal for precise insertion into soil.

When using 5/8" reflector holders with tilting axis height = 50 mm, the target heights Z from the centre of the prism to the tip of the staking out point given in the table are obtained.

Description	Z	Order-No.	Euro
Stakeout spike 5/8", steel, L = 50 mm	100 mm	**1859.100**	34,-
Stakeout spike 5/8", steel, L = 100 mm	150 mm	**1859.150**	37,-
Stakeout spike 5/8", steel, L = 150 mm	200 mm	**1859.200**	42,-



Circular level for tips and poles with Ø12 mm

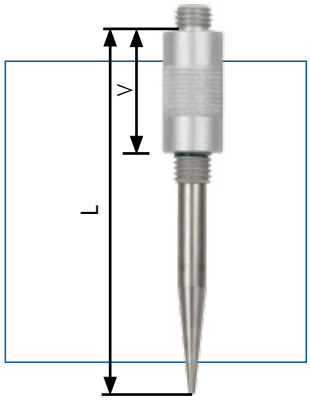


- Can be inserted from the side and locked at any position
- High-quality glass vial, Ø20 mm, in a metal housing
- Adjustable with a hex key (2.5 mm) – included

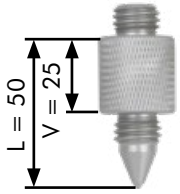
Description	Order-No.	Euro
Circular level for tips/poles, adjustable, sensitivity 30'	**1583.30**	46,-

With additional 5/8" outer thread

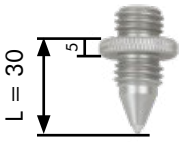
Additional 5/8“ external thread on the tip side for screwing the insertion tip into extensions or prism poles with 5/8“ internal thread (tip protected and always at hand). All extensions are made of aluminium. The lengths up to 50 mm have a conical tip with hardened steel insert. From 75 mm they have a long slender stainless steel tip. When using 5/8“ reflector carriers with tilting axis height = 50 mm (e.g. series HIP, HIP-U, TOP and ONRT 50), the target heights Z from prism centre to stake-out tip given in the table are obtained.



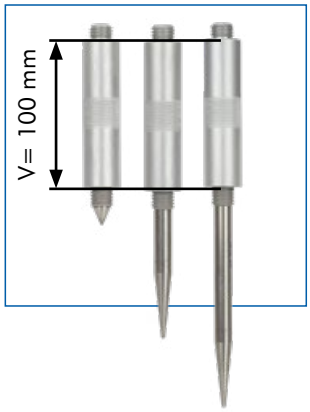
Description	Extension V	Z (KA = 50 mm)	Order-No.	Euro
Stakeout spike 5/8", L = 30 mm	5 mm	80 mm	**1853.2**	25,-
Stakeout spike 5/8", L = 40 mm	15 mm	90 mm	**1854.2**	26,-
Stakeout spike 5/8", L = 50 mm	25 mm	100 mm	**1855.2**	27,-
Stakeout spike 5/8", L = 75 mm	50 mm	125 mm	**1856.75**	32,-
Stakeout spike 5/8", L = 150 mm	50 mm	200 mm	**1856.150**	42,-
Stakeout spike 5/8", L = 200 mm	50 mm	250 mm	**1856.200**	47,-



No. 1855.2

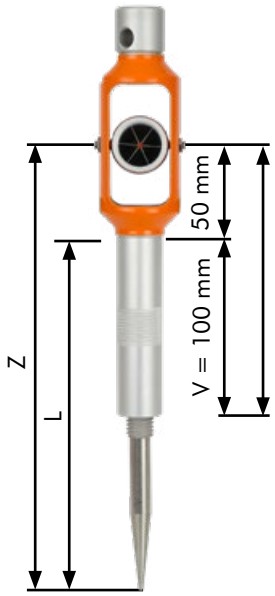


No. 1853.2



Matched to prism poles with 150 mm target height

Description	extension V	Z (KA = 50mm)	Order-No.	Euro
Stakeout spike 5/8", L = 125 mm	100 mm	175 mm	**1851.125**	47,-
Stakeout spike 5/8", L = 200 mm	100 mm	250 mm	**1851.200**	53,-
Stakeout spike 5/8", L = 250 mm	100 mm	300 mm	**1851.250**	58,-

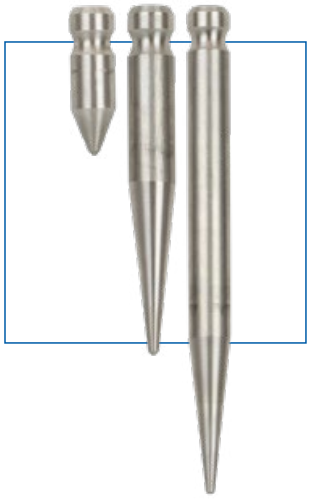






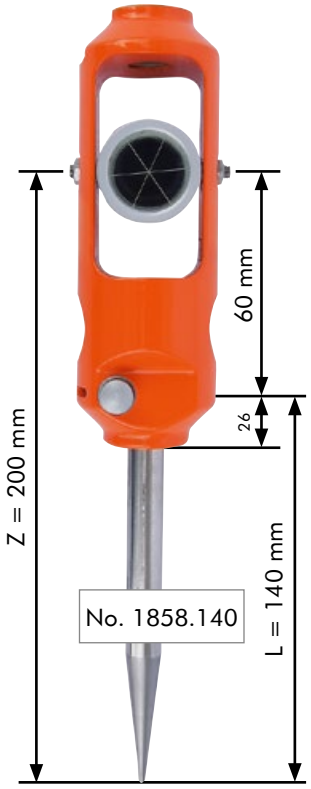


Stakeout spike Leica Ø 12 mm



All lengths are made of stainless steel. The tip of No. 1857.2H has a hardened steel insert. When using reflector holders with Leica spigot mounting and 86 mm tilting axis height (Leica GPH 1, our reflector holders of the series HIP, HIP-U, TOP, ONRT L and RUNDUM 6 x 60°), the following target heights Z from prism center to stake-out tip result:

Description	Z bei KA = 86 mm	Order-No.	Euro
Stakeout spike Leica, L = 40 mm, hardend	100 mm	**1857.2H**	29,-
Stakeout spike Leica, L = 50 mm	110 mm	**1858.050**	36,-
Stakeout spike Leica, L = 90 mm	150 mm	**1858.090**	38,-
Stakeout spike Leica, L = 140 mm	200 mm	**1858.140**	40,-
Stakeout spike Leica, L = 190 mm	250 mm	**1858.190**	45,-











Circular level for tips and poles with Ø12 mm

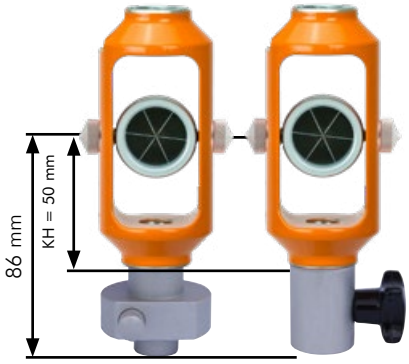
- Can be inserted from the side and locked at any position
- High-quality glass vial, Ø20 mm, in a metal housing
- Adjustable with a hex key (2.5 mm) – included

Bezeichnung	Bestell-Nr.	Euro
Dosenlibelle für Spitzen/Stäbe, justierbar, Empfindlichkeit 30'	**1583.30**	46,-





Adapter Leica auf 5/8"



By screwing the Leica-5/8" adapters into the 5/8" thread of a holder with 50 mm tilting axis height (e.g. our series HIP, HIP-U, TOP and ONRT 50) results in the same tilting axis height as the Leica GPH1 reflector.

This makes it ideal for use on Leica prism poles and with our WA Leica wall adapter 36.





PRO-Leica-Adapter

- Push button for attaching the prism within seconds
- Can be rotated around spigots with slight resistance
- Secured against falling out
- **For all Leica spigots Ø 12 mm**

Description	Top thread	KH	Order-No.	Euro
PRO-Leica-Adapter PLA 5/8"	5/8"	50 mm	**0690**	50,-



Simple adapter Leica - 5/8"

- Fixing by tightening a locking screw
- When using prism holders with 5/8" thread and 50 mm tilting axis height, the same possibilities arise as with the PRO-Leica adapter PLA 5/8"

Description	Order-No.	Euro
Adapter Leica St 27 - 5/8" (for 27 and 40 mm spigot)	**0291.10**	29,-
Adapter Leica St 40 - 5/8" (**only for 40 mm spigots**)	**0306.10**	30,-





Adapter 5/8" - Leica

Connection between 5/8" inner and outer threads to Leica spigots

- Precisely manufactured stainless steel construction
- Milling surfaces for fork wrench (SW 22) as screw-in and screw-out support

with 5/8"- **inner thread**

Description	Lenght Leica spigot Ø 12 mm	effective total length	Order-No.	Euro
Adapter 5/8"-Leica	27 mm	47 mm	**0377.27**	30,-
	40 mm	60 mm	**0377.40**	33,-

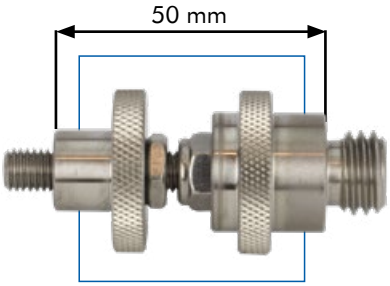


with 5/8"- **outer thread**

Description	Lenght Leica spigot Ø 12 mm	effective total length	Order-No.	Euro
Adapter 5/8"-Leica	27 mm	40 mm	**0378.27**	30,-
	40 mm	60 mm	**0378.40**	33,-

Adapter M8 – 5/8"

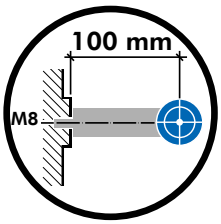
- Side 1: 5/8" outer thread to connect prism holders
- Side 2: M8 outer thread to screw in common wall bolts
- One common axis -> independently rotatable around this axis
- Rotation resistance can be adjusted with self-locking hexagon nut (SW 13)
- Large knurls for safe insertion without tools
- Screwing-in can be supported with a fork wrench (SW 13)
- Stainless steel



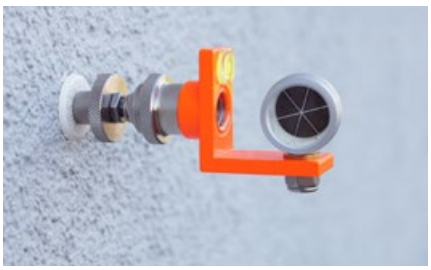
Length 50 mm

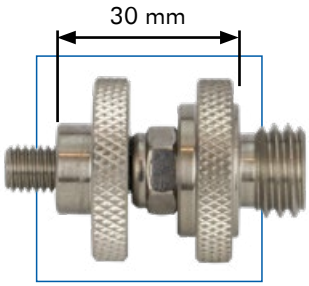
Description	Order-No.	Euro
Adapter WA 50, M8 - 5/8", L = 50 mm	**0810**	43,-

Examples
When using a prism with a tilting axis height of 50 mm, a wall distance of 100 mm results (for example our prism series HIP or ONRT).




Series HIP-U 5/8" 23





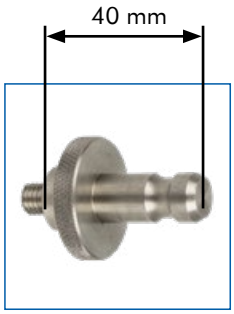
Length 30 mm

Description	Order-No.	Euro
Adapter WA 30, M8 - 5/8", L = 30 mm	**0820**	43,-



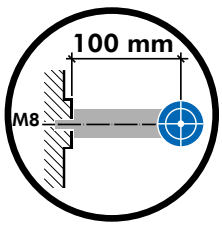
Adapter M8 – Leica Ø 12 mm

For tiltable reflector holders with Leica spigot Ø 12 mm.



- Distance to wall bolt = 100 mm when using prism holders with tilting axis height 86 mm (= Leica GPH1)
- Knurl Ø 30 mm for easy screwing into wall bolts
- Spigot Ø 12 x 27 mm, total length (without M8 thread): 40 mm
- Stainless steel

Description	Order-No.	Euro
Adapter WA Leica, M8 – Leica Ø 12 x 27 mm	**0830**	18,-




Series HIP-U Leica 24


L-holder Leica 87



Handgrip

With 5/8" outer thread, length approx. 130 mm. For use on the upper 5/8" thread of the HIP, TOP and RUNDUM 6x60° series prism holders.

Description	Order-No.	Euro
Handgrip 5/8"	**0700**	43,-

INFO

Any 5/8" extensions can be screwed between the handgrip and the prism. Extensions 263.



Protective Caps for Prisms, Bolt and Outer Threads

For protection during transport / storage.

- Made of black plastic
- With Ø1.5 mm eyelet for optionally threading a cord/loss protection
- The optimal fit of the sleeve is only ensured when used with the matching counterpart from the Bohnenstingl range. Fit on third-party products not guaranteed.

Protective Caps for Glass Prisms



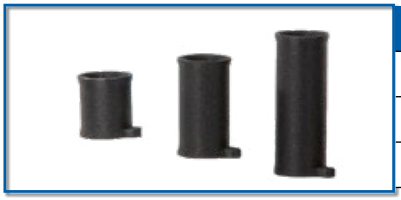
Cover for the glass front surface of prisms	⚖	№	€
Protective Prism Cap for 16XX.11, 3004.11	2 g	**1301**	1,80
Protective Prism Cap for MP24 1400	3 g	**1401**	2,50
Protective Prism Cap for 16XX.17. 16XX.30, 16XX.34, 3004.17 etc.	3 g	**1660.25**	2,80








Protective sleeve for Ø12 mm bolt



Protective sleeve for Ø12 mm bolt	⚖	№	€
Protective Sleeve for Ø12x16 mm (B1216) bolts of the ZP11 series	2 g	**6609**	1,80
Protective Sleeve for Ø12x27 mm Leica bolts	3 g	**0179.27**	2,-
Protective Sleeve for Ø12x40 mm Leica bolts	3 g	**0179.40**	2,50








Protective Cap for 5/8“ outer threads



Item Description	⚖	№	€
Plastic protective sleeve for 5/8“ external thread	2 g	**0177.58**	1,80






Protective Cap for Ø12 mm stake out spikes



Protective sleeve/cap for Ø12 mm bolt	⚖	№	€
Plastic protective cap for stake-out spikes (minimum length 40 mm)	3 g	**1858.S**	2,80

Corner and Edge adapter M8

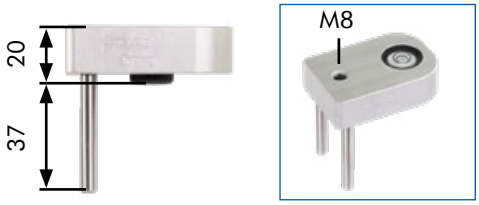




For track support plates, walls, ledges, platform edges, precast concrete parts, etc.

An adapter with a corresponding M8 outer thread is screwed into the M8 thread. Then all prisms can be used that have a 5/8“ inner thread or a Leica mount.

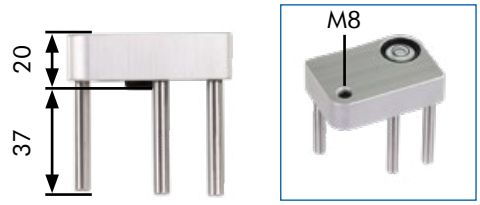
- Effective leg length: 37 mm, Height offset 20 mm (including rubber support)
- M8 inner thread for screwing in the adapter
- Rubber support for easier alignment by means of circular bubble
- Integrated circular bubble: Sensitivity 30‘



Edge adapter

- Two cylindrical pins L = 40 mm as stop
- Weight: 130 g

Description	Order-No.	Euro
Edge adapter for chamfered concrete parts, walls, etc.	**1755**	89,-



Corner adapter

- Three cylindrical pins L = 40 mm as stop
- Weight: 142 g

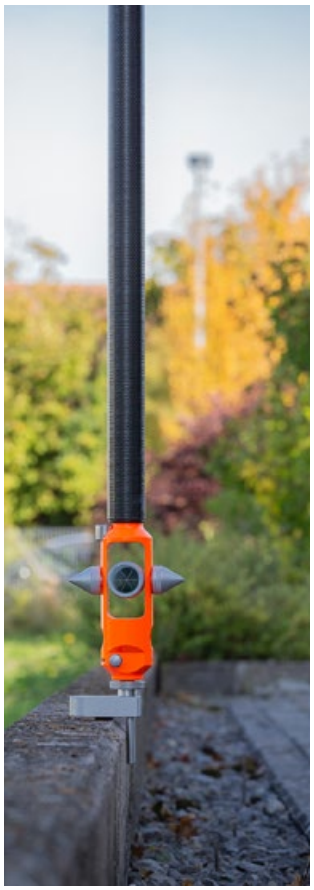
Description	Order-No.	Euro
Corner adapter for chamfered concrete parts, walls, etc.	**1754**	94,-



Inner Corner adapter

- Three cylindrical pins L = 40 mm as stop
- Weight: 200 g

Description	Order-No.	Euro
Inner Corner adapter for chamfered concrete parts, walls, etc.	**1756**	124,-















common prism/GNSS pole

No.	0700
€	43,-
	37

No.	5455
€	105,-
	263



5/8"



No.	5693.58
€	610,-
	8



HIP prisms, 5/8"
various prism constants
23







HIP prisms, Leica
various prism constants
24

Original Leica

100 mm

30 mm



No.	0820
€	43,-
	36

120 mm

40 mm



No.	0830
€	18,-
	36



60 mm



No.	5693.M8
€	520,-
	8

No.	0374.015
€	19,-
	259

70 mm



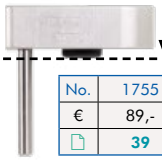
Ball prisms 1.5"
various designs
62



No.	1466.08a
€	54,-
	70

M8

20 mm



No.	1755
€	89,-
	39

20 mm



No.	1754
€	94,-
	39

20 mm



No.	1756
€	124,-
	39



M8 Edge / Chamfer / Wall Adapter

For wall edges, also chamfered concrete parts

An adapter with a corresponding M8 external thread is screwed into the M8 thread. Then all prisms can be used that have a 5/8" internal thread or a Leica mount as well as an **integrated circular bubble.**

- Angle length 30 mm for chamfers up to 25 mm width
- M8 inner thread to screw in the adapter
- Height: 10 mm
- Notch for the reliable positioning of a line marking on the object
- Weight: 44 g



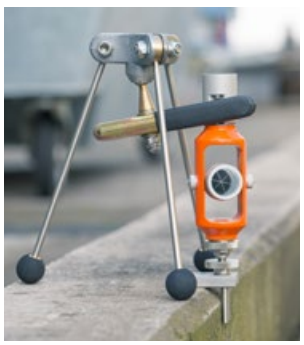
Description	Order-No.	Euro
M8 edge adapter for wall chamfers	**6810**	37,-





Examples

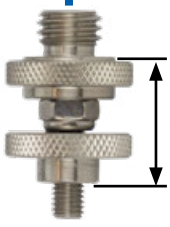




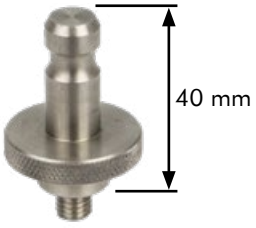


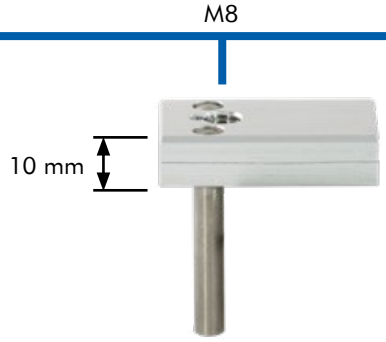


No.	0820
€	43,-
	36



No.	0830
€	18,-
	36





A.5.4.1. Mini Tripod, Joint Tripod, Telescopic Tripod 43

- Mini Tripod 43
- Joint Tripod 44
- Telescopic Tripod 45



A.5.4.2. Triangle Ground Tripod 46



A.5.4.3. Short Prism Pole UNI 49



Mini tripod with pole clamp



For simple and stable assembly of short prism poles

- High-quality materials and workmanship
- Tripod legs can be folded out individually and remain in the selected position, adjustable resistance
- Interchangeable balls as tripod feet for secure standing and low sinking on soft surfaces

- Ball head with freely adjustable position
- Pole clamp with straight legs for rods up to Ø 38 mm, clamping length 80 mm
- Height of pole clamp with tripod legs folded in: 28 cm
- Weight: 750 g (with stainless steel balls), 600 g (with rubber balls)

Description	Order-No.	Euro
Mini tripod with pole clamp and stainless steel balls	**6270**	118,-
Mini tripod with pole clamp and rubber balls	**6272**	118,-

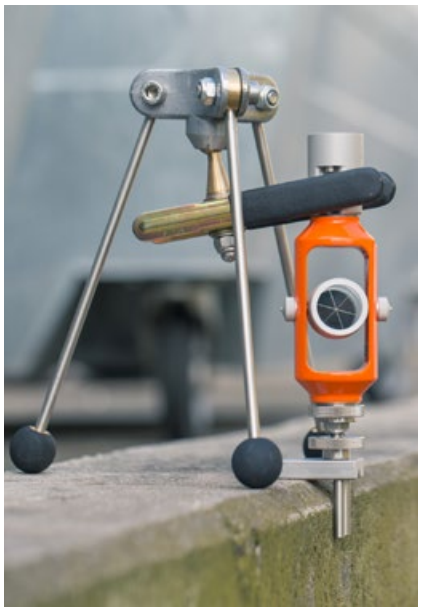








The pole clamp can be aligned downwards for lower positions.



Articulated tripod with pole clamp

For universal positioning of prisms on short pole close to the object point

Depending on the surface, various tripod feet are available, into which the joint tripod is screwed via an M8 thread.



Joint tripod
- One central star grip screw clamps all moving parts of the joint tripod
- Articulated arms made of anodised aluminium
- Action radius: 270 mm
- Tilting and rotating ball head

Pole clamp:
- Spring clamp with straight legs for poles up to Ø 38 mm, clamping length 80 mm
- Total weight: 350 g

Description	Order-No.	Euro
Joint tripod with pole clamp	**6280**	158,-



Tripod bases

Depending on the application, the joint tripod can be screwed onto different bases using an M8 thread:

Description		Order-No.	Euro
Universal sturdy clamp for joint tripod	**133**	**6884**	79,-
Claw clamp for joint tripod	**133**	**5934**	78,-
Steel ring for joint tripod	**131**	**5932**	37,-
Magnetic base for joint tripod	**132**	**5929.M8**	74,-
Suction holder, without vacuum indicator	**134**	**5936**	48,-
Suction holder, with vacuum indicator	**134**	**5938**	80,-











Bipod tripod for MVT

Used for setting up short prism rods

For precision measurements or longer lasting measurements on one point, a tripod is helpful. Especially when determining hidden points with the program „sewer pole / hidden points“, the mini-vector must not be changed during the measurements.
The bipod was developed especially for the mini-vector and offers some completely new features. Among other things, the mini-vector can be set perpendicular in a matter of seconds.

Bipod attributes

- Telescopic leg made of composite material with stainless steel extension and rubber feet
- Leg length adjustable from 150 to 250 mm
- The leg can be spread in any direction by means of a ball-and-socket joint. The selected position remains fixed by a compression spring
- The telescopic length can be changed by simply pulling out the lower part. Here, too, the set length remains fixed by a spring-based pressure piece - again without tightening a clamping screw or the like
- Flush folding of the tripod legs: For quick manual handling of the mini-vector without the bipod and for transportation





Telescopic bipod mini tripod	⚖	№	€
With Ø30 mm clamp (e.g. for MVT Mini Vector)	232 g	**6640**	205,-





Reducing sleeves for bipod tripod clamp Ø30 mm	🗋	⚖	№	€
Ø25 mm (HIP extensions) [1]	**8**	5 g	**6641.3006**	3,-
Ø22,5 mm, ZP11 extensions [2]	**28**	3 g	**6641.3012**	3,-
Ø28 mm, Mini-Vector and Circular Level 1585.X [3]	**28**	4 g	**6641.3022**	3,-
Ø6 mm, Centering Rod MHC-Z300 [4]	**259**	4 g	**6641.3025**	3,-
INFO Adjustable circular levels 1587.10/1587.30 can be combined directly with the bipod [5]	**28**	2 g	**6641.3028**	3,-

[1]





[2]



[3]



[4]



[5]





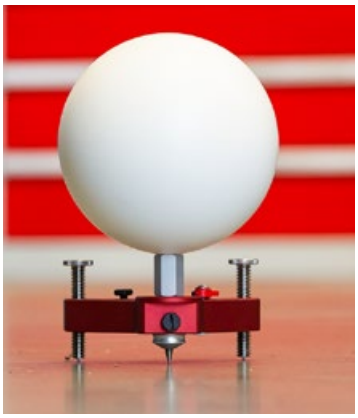










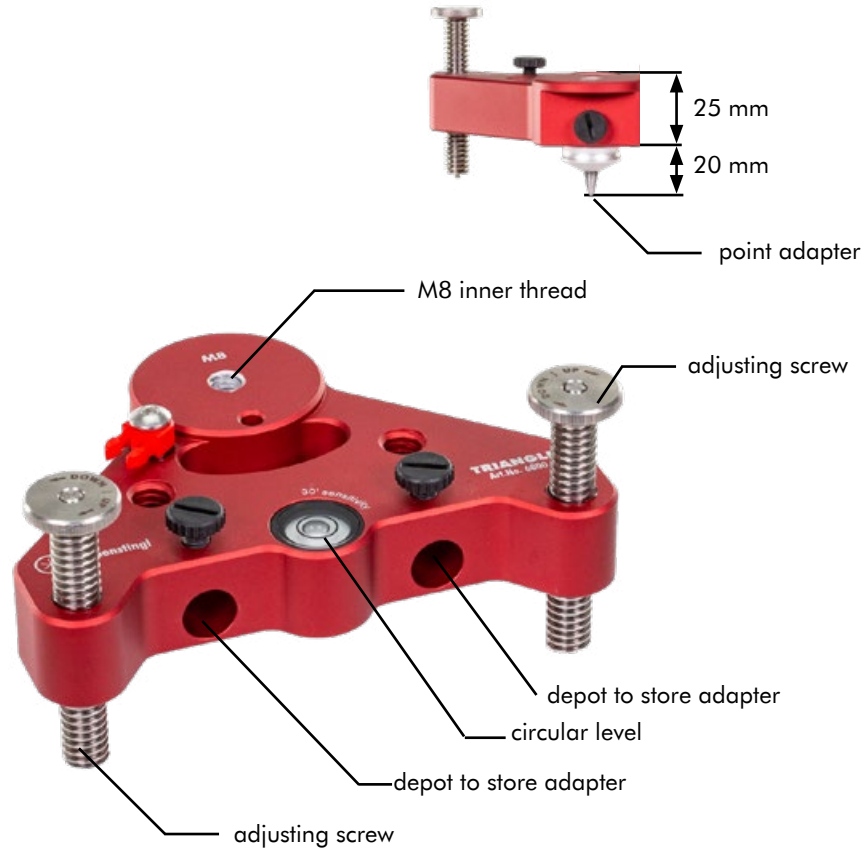




Ground tripod „triangle“ for ground level point measurements

Exact and fast vertical positioning of prisms and aiming marks on points

- Sturdy construction made of anodised aluminium
- 2 adjusting screws for quick levelling of the ground tripod
- Stainless steel adjusting screws with knurled head and hardened contact points. If space is limited at the object point, they can also be screwed in closer to the centre
- Fixed level glass bubble, sensitivity 30‘
- M8 internal thread for adaptation of any prisms and targets
- B1216 socket for quick change of point adapters for different measuring tasks
- 2 depots for storing point adapters when not in use (see pictures below)
- Effective height (without point adapter): 25 mm
- Weight: 450 g



Description	Order-No.	Euro
Ground tripod „triangle“, M8 thread, without point adapters	**6800**	273,-



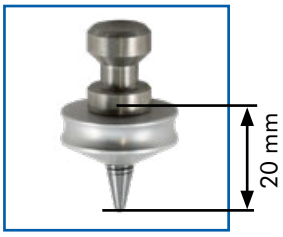


Point adapters



Centering tip





- **For line crosses or measuring points with centering etc.**
- Slender tip with hardened mandrel
- Results in total height from mandrel tip to screw-in surface M8 thread: 45 mm

Description	Order-No.	Euro
Centering tip for ground tripod, hardened mandrel, B1216 bolt	**6804**	29,-

Cone







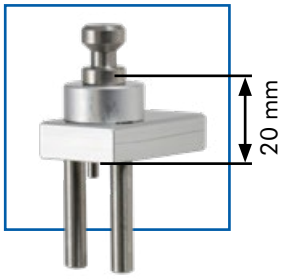
- **For bolts with round head**
- Centering of the bolt head through conical intake
- Effective length of 20 mm for bolts with head Ø 18-20 mm
- Results in total height from bolt top edge to screw-in surface M8 thread: 45 mm

Description	Order-No.	Euro
Cone for ground tripod, B1216 bolt	**6806**	29,-



Angular stop





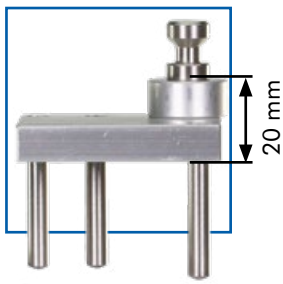
- **For wall edges, also chamfered concrete parts**
- Angle length 30 mm for chamfers up to 25 mm width
- Results in total height of bearing surface angle stop up to screw-in surface M8 thread: 45 mm

Description	Order-No.	Euro
Angular stop for ground tripod triangle, B1216 bolt	**6808**	44,-



Corner stop adapter





- **For wall corners, also chamfered concrete parts**
- Angle length 30 mm for chamfers up to 25 mm wide
- Total height from surface of corner stop to screw-in surface M8 thread: 45 mm
- Attention: Only compatible with triangle tripod shipped after Sept. 2024

Description	Order-No.	Euro
Corner stop for ground tripod triangle, B1216 bolt	**6812**	66,-

Transport case





- **For storage and transport of 1x ground stand and prism**
- Made of red plastic with 2 click fasteners . Outer dimensions: 275 x 230 x 80 mm
- Upper and lower part are foam inlays. Weight: approx. 420 g

Description	Order-No.	Euro
Transport case for ground tripod „triangle“	**1468.2**	34,-

M8 adapter for triangle tripod to prisms and targets



No.	5693.58
€	610,-
	8



5/8" HIP prisms
23

other prisms with Leica connection



Leica HIP prisms
24



Pocket Targets
216



Ø270 mm in U-Beam
218



Laserscanning tagets
217



No.	6172.M40
€	143,-
	219



Ø1.5" ball prisms
62

horizontal use for fly-overs



Laserscanning tagets
217



No.	6002
€	150,-
	211



No.	0384.010
€	17,-



No.	0820
€	43,-
	36



No.	0830
€	18,-
	36



No.	1466.08a
€	54,-
	70



No.	1557.M8a
€	39,-
	67



No.	6005
€	16,-
	211



No.	6800
€	273,-
	46



No.	6808
€	44,-
	47



No.	6806
€	29,-
	47



No.	6804
€	29,-
	47



No.	6812
€	66,-
	47







Universal Mini Prism Pole

For measruing points close to the ground and building corners with longitudinal or latitudinal eccentricity

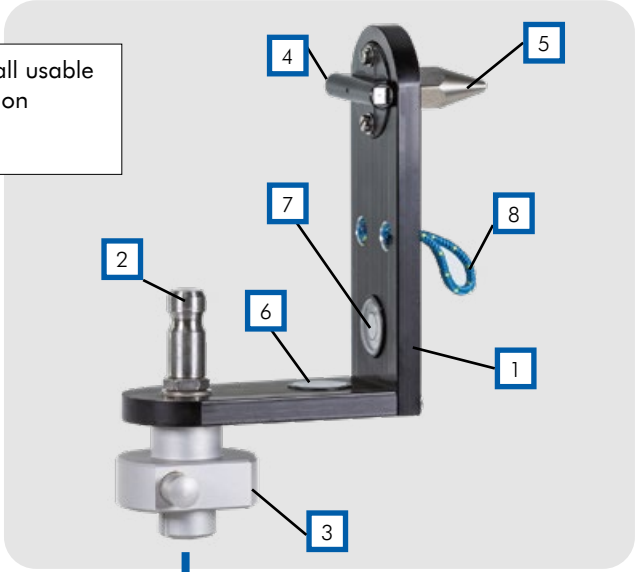
Features of the prism pole

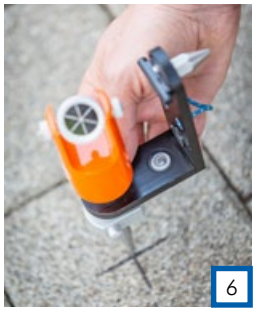
- **L-profile** (1) made of sturdy aluminum
- **Stud bolt Ø12 mm** (2) for attaching commercially available prisms and reflectors (for selection, see 51)
- **Leica quick connector** (3) for attaching stainless steel tips of different lengths or corner adapter No. 5801 for eccentric mounting of building corners.
- **Target collimator** (4) for exact right-angled alignment of the prism to the total station when measuring with transverse eccenter
- **Tilting axis mandrel** (5) made of stainless steel with exact distance 100 mm from mandrel tip to prism center
- **1. circular level** (6), sensitivity 30', for plumb alignment when used with interchangeable stainless steel tips. Glued in adjusted position.
- **2. circular level** (7), sensitivity 30', for plumb adjustment when measuring a ground point with tilt axis mandrel (target height 100 mm). Glued in adjusted position.
- **Transport strap** (8) for hanging the mini prism pole on the belt.

Description	Order No.	Euro
Universal Mini Prism Pole	**5801**	195,-

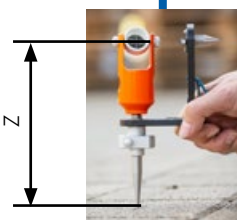
INFO

You can find an overview of all usable prisms with Leica connection on 51.





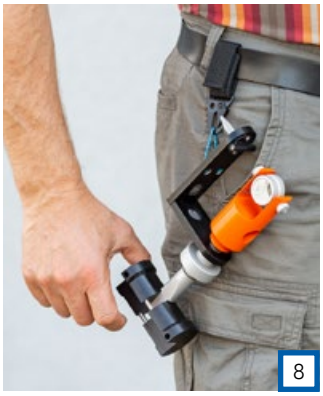




Stainless steel tip
50



Building corner eccentric
50





Belt holder with snap hook

- For quick hooking of the short prism pole
- Attachment to belts up to 5 cm wide with sturdy Velcro fastener

Description	Order No.	Euro
Belt holder with snap hook, see [8]	**5809**	9,-

Stainless steel tips for mini prism pole





Ø12 mm for insertion into the Leica quick connector.
Available in 4 lengths:

Description	Target height Z	Order No.	Euro
Stainless steel tip Leica, L = 40 mm	150 mm	**1857.2H**	29,-
Stainless steel tip Leica, L = 90 mm	200 mm	**1858.90**	38,-
Stainless steel tip Leica, L = 140 mm	250 mm	**1858.140**	40,-
Stainless steel tip Leica, L = 190 mm	300 mm	**1858.190**	45,-

Outer corner adapter





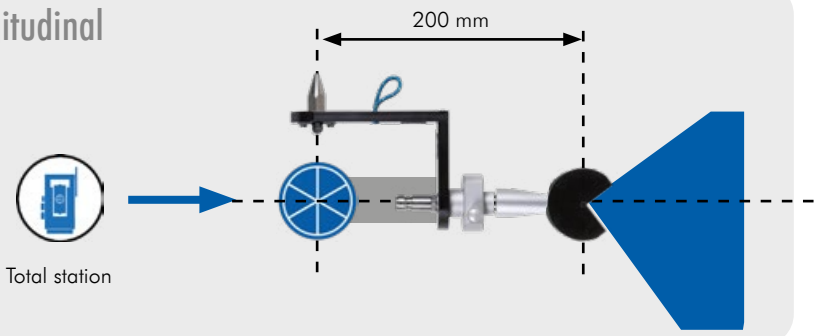
Right-angled stop for measuring building corners by means of longitudinal and latitudinal eccentrics with a distance dimension of 20 cm.
When measuring lateral eccentrics, the large contact surfaces enable wobble-free stopping at the building corner and safe setting of the right angle to the total station with the target collimator.

With Ø 12 mm stainless steel bolt for insertion into the Leica quick connector.

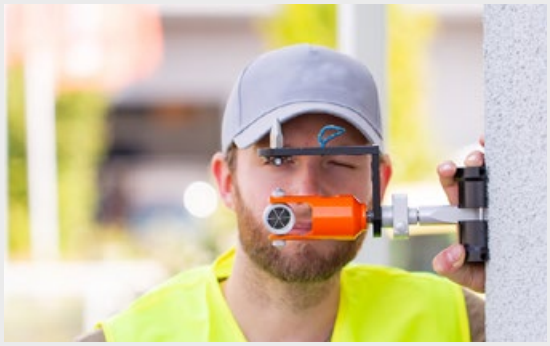
Description	Order No.	Euro
Corner adapter for eccentrics distance 200 mm	**5810**	89,-

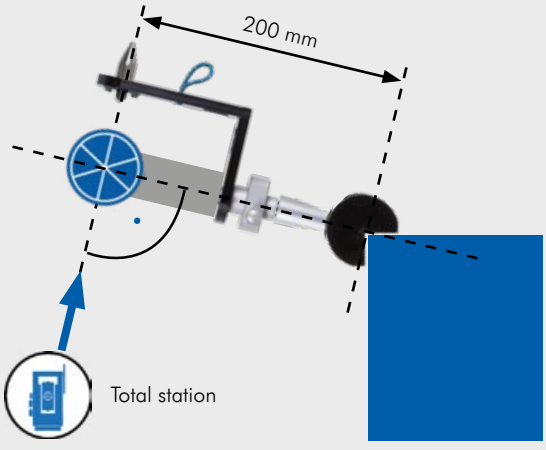
Longitudinal





Latitudinal









Mini Tripod

For easy and stable setup of the mini prism pole

Description	Order No.	Euro
Mini tripod with clamp and rubber feet 43	**6272**	118,-

Prism types and adapters for mini prism pole

Leica GRZ122 *
Leica GPH1
Leica GMP101
Bo 360 *
Leica GRZ101 *
Bo 360
Bo 540
Leica GRZ101
BO HARDCore
Bo 360 *



24 | 26 | 14 | 14 | 14 | 23 | 26 | 14 | 64 | 62



No.	5683.LS
€	68,-
	19

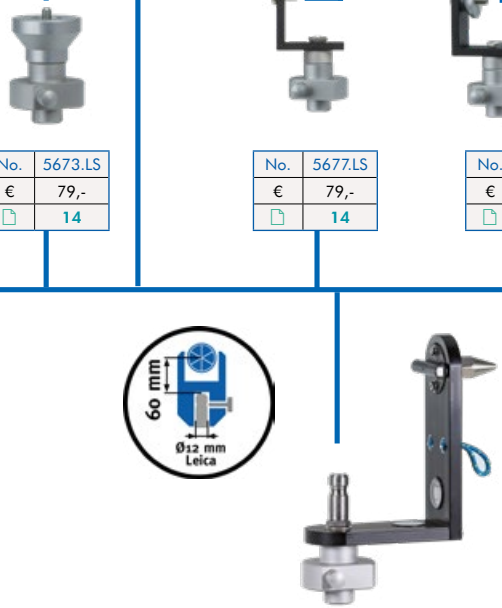
No.	0302.035
€	34,-



No.	5676
€	37,-
	14

No.	1465.258
€	49,-
	70

No.	1558.58
€	51,-
	70



No.	5673.LS
€	79,-
	14

No.	5677.LS
€	79,-
	14

No.	5687.LS
€	87,-
	19



No.	0690
€	50,-
	35

No.	5801
€	195,-
	43

* Measurement of longitudinal excenters not possible!

INFO The measurement of longitudinal eccentricities is only possible with 360° prisms if an L-beam is used (e.g. Art. **5677.LS** or Art. **5687.LS**).

Monitoring / Tunneling

1/2

B.1. General information about our Monitoring Systems 54

- Advantages of the individual systems
- Prism Stacking





B.2. Ball Prism - Monitoring System 56

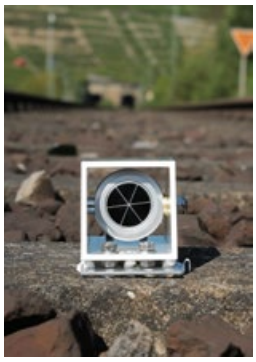
- Bohnenstingl Ball Prism System 56
- Ø1.5" Ball Prism 62
- Ø30 mm Ball Prism 64
- Magnet Bases 67
- Centering Plates 72
- Accessories 74
- Bunker Prism 82





B.3. Rugged MoniPro System 84

- MoniPro Series
- Mounting Plattforms
- Magnet bases & Protective Cap

B.4. L-Bar Prisms 87

- M8 Connection
- Leica Bolt Mounts




Monitoring / Tunneling 2/2

B.5. Twin-Prism-System (two prisms) 88




B.6. Perpendicular over measuring point - 1 or more prisms 89







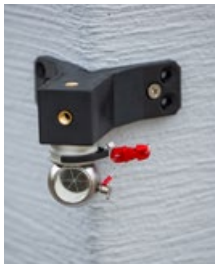

B.7. M8 wall bolts as surveying points 91

- M8 wall bolts as surveying points
- Beam Clamp M8
- Fix Point Plattform with M8 thread
- Precision Wall Bolts VA





B.8. Building corner bracket M8 for monitoring prisms 93



Monitoring Systems in comparison



Ball Prism System

- High-precision and inexpensive
- Ball prism can also be used alternatively for numerous other applications: e.g. Klimax system, 3D stainless steel bases, on pendulum holders, etc.
- Available with two prism constants
- Cost-effective solutions possible by mounting several survey points (magnet bases/ centering plates), but using only one ball prism
- System can be put together project-based and then extended with time



Bunker prism / Bunker base

- For long-term observations and harsh environments: Robust, durable, accurate
- Sturdy bunker housing and spherical prism made from high-quality, non-magnetic V4A stainless steel
- Prism can be aligned to any point in the hemisphere
- Attachment to the object by screwing or gluing
- Theft of the ball prism is not possible without tools, i.e. “in passing”



L-Bar Prisms

- Attachment to object with M8 thread or via Leica wall bolt
- Advantage over the competition: Choose from 6 commercially available prism constants
- Turning and tilting resistance adjustable via wrench



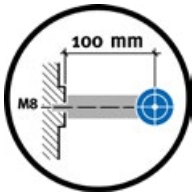
MoniPro System

- Designed for extreme conditions (full metal carrier)
- Tilt and rotation resistance adjustable via wrench
- Prisms can be glued or screwed to the object



Perpendicular above wall bolt

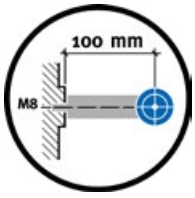
- Use of already existing prisms possible
- Several prisms can be combined on top of each other for
- simultaneous observation from different tachymeter positions
- Wall offset: 100 mm





Twin-Systems

- For monitoring points from two different tachymeter positions
- Use our ball prisms or cylindrical prisms
- Available with two prism constants
- Attachment to object with M8 thread or via Leica wall bolt
- Wall offset: 100 mm

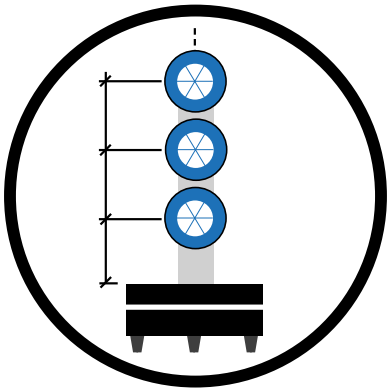




Stacking

- For monitoring points from different tachymeter positions
- Use our ball prisms, HIP prisms or cylindrical prisms
- Available with several prism constants
- Can be mounted hanging or standing

Prism Stacking (Prism Towers)



For simultaneous observation of one point from several total station positions

On a 360° prism, measurement is basically possible from any direction. However, if these prisms do not meet the accuracy requirements, a single prism must be used. The disadvantage is that the prism must be aligned in the respective direction of the total station for each measurement.
Below are some examples of how this problem can be solved by stacking several prisms of the same type on top of each other. The prisms can be **rotated independently** of each other and can thus be aligned to different total stations. The „tower" is levelled by means of the tribrach. The position of the prisms is (X, Y) identical for all measurements. The heights (Z) differ by the distance between the prism centers. If an adjustment calculation requires a height for all prisms, the height offset in the target height must be taken into account in the measurement.

In all examples the standing axis runs exactly through the prism centers.
The result: higher targeting accuracy than with a 360° prism.



Tower of Cylinder Prisms ZP11

- Use of cylindrical prisms with constant -11.3 mm 28
- Very slim, space-saving, yet stable construction
- Prisms are individually rotatable by 360°
- Cylinder prisms can also be used for other versatile applications
- Tightening screws for fixing the selected direction
- Theoretically any number of prisms possible



L-Carrier with Ball Prisms

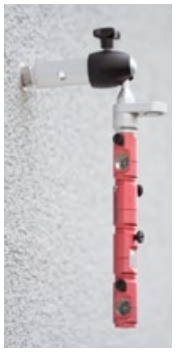
- Use of thread bases with ball prisms with constants -11.3 mm or -16,9 mm 70
- Protective visor for ball prisms available (as rain/weather protection and to avoid influence on measurement of reflections from other prisms)
- Up to three prisms in a space-saving space
- Maximum coverage (depending on use and orientation): Approx. 300° horizontal and 180° vertical

INFO The shown L-Carrier with three M8 threads is available on request.



Stacking of HIP prisms

- Use of all HIP prisms 2x5/8" possible (5 different constants) 23
- Connecting elements between the prisms allow individual 360° rotation 259
- A U-prism can be selected as the top prism, so that it can be aligned up to the zenith
- Weather protection visor/alignment aid available 25
- Adapters can be fixed and thus secured against inadvertent rotation
- Theoretically any number of prisms possible

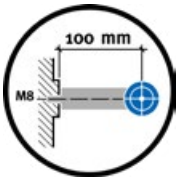




Hanging variants

All examples shown above can also be used as hanging versions. Instead of the tribrach a ball head and a circular bubble level are required.

If you are interested, we will be happy to advise you.



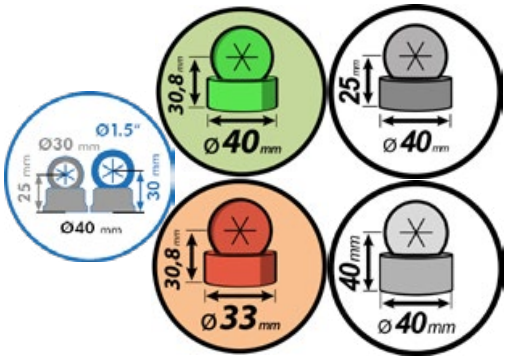


Ball Prism System 1/2

B.2.1. Information / Ball Prism 58

- Info: Ball Prism 58
- Info: Magnet Bases / Nests 59
- Info: Centering Plates 60
- Ball Prism Ø1.5" 62
- Ball Prism Ø30 mm 64
- Fall protection, service kit, fall protection clamp for bases 65
- Overview: Monitoring with ball prisms 66





B.2.2. Magnet base / nest / thread base 67

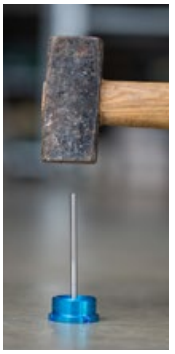
- NEW: Monitoring Bases v2.0 **67**
- Other magnet bases **68**
- Stainless Base & Centering Pin **69**
- Nut Sheel Adapter **79**
- Thread Bases (M8, 1/4", 5/8") **70**
- Extension to 100 mm, Prism Height Offset 86 mm, Remover Tool **71**











B.2.3. Centering Plate 72

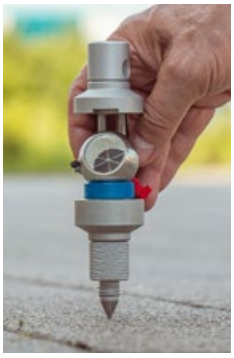
- Centering Plate Ø33 mm **72**
- Centering Plate Ø40 mm, Protective Plates for cent. plates **73**



B.2.4. Adhesive, transport case, protective caps and other accessories 74

- Assembly Adhesive, Circular Level for thead bases **74**
- Protective Cap for ball prisms, Twist/theft protection **75**
- Protective covers for bases **76**
- Covers for magnetic bases, handle/alignment aid for ball base **77**
- Protection CAGE for ball prism **78**
- Levelling adapter Ø1.5" **80**
- Transport Case **81**









Ball Prism System 2/2

B.2.5. Bunker base and bunker prism 82



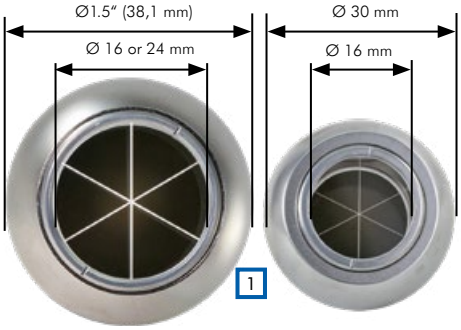




Monitoring: With Ball Prisms

Tachymetric monitoring of buildings, structures, bridges, tunnels, railway tracks, etc. with the Bohnenstingl Monitoring System

- Economic monitoring of points using automated target acquisition
- Very high repeatability through forced centering
- Cost-effective solutions by using a combination of ball prism, magnetic base, and centering plate



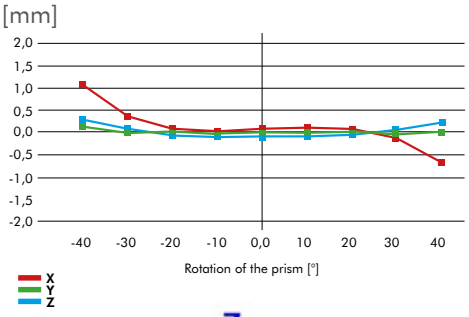
Ball Prism [1]

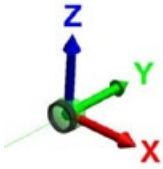
Ball-Ø1.5“ (38,1 mm)

- Widely used ball diameter also in the laser tracker sector
- Available with glass prisms Ø17.5 mm (visible: Ø16) and Ø25 mm (visible Ø24)
- Thus choice between two prism constants: K = -11.3 mm or K = -16.9 mm

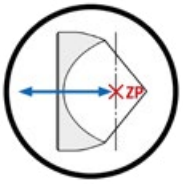
Ball-Ø30 mm

- Compact, cost-effective, and space-saving
- Available with glass prism Ø17.5 mm: prism constant K = -11.3 mm





Technical Specifications



- Steel ball with triple prism mounted at the ball center
- Ball diameter: manufacturing tolerance of ±0.03 mm
- Geometries such as prism position, height offset, and centering fits: Accuracy of ±0.1 to ±0.2 mm
- Central-symmetric mounting of the triple prism ensures that the visible prism center lies exactly at the midpoint of the ball, resulting in only minimal measurement errors even with imprecise alignment

Upgrade from September 2025 (ball prism v.3.0)

- Introduction of stainless steel housings for further improved weather resistance and magnetic properties
- Screwed prism mounts
- Ball prisms v.3.0 feature a lateral M3 thread for attaching fall protection, sight, handle, etc. 63
- Remaining stock of galvanized steel housings is temporarily available



Ball prisms with inspection certificate

Each triple prism is individually measured and precisely mounted into the steel ball. To verify the accuracy of the prism constant and the position of the central reflection point, ball prisms from the ongoing series are tested by the **Karlsruhe Institute of Technology (KIT)**. The prism constant K is determined through comparative measurements with a high-precision reference prism. These tested prisms are also available for sale.

- Ball prisms are provided with a serial number and measured by KIT
- An inspection certificate is issued for each tested prism with its serial number

Testing of 300 ball prisms Ø1.5“, v.3.0 (No. 1448) in August 2025:

- Eccentricity of the prism center: 80% of the specimens: ±0.1 mm, 20%: ±0.2 mm
- Additive constant: 100% of the specimens: -16.9 mm ± max. 0.1 mm

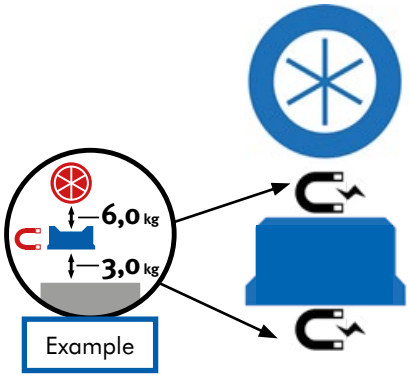


Ball Base with integrated permanent magnet [2]

Our magnetic bases offer a reliable and flexible solution for mounting and aligning ball prisms in a wide range of applications. The magnetic bases can either be placed directly on magnetic surfaces or used with centering plates (72) or directly glued or screwed onto the object.

Precise Alignment

- The ball prism is force-centered on the cylindrical base with a conical top. Maximum repeatability is ensured.
- Freely adjustable over 180° in all directions.
- The visible prism center lies exactly on the central axis of the base.



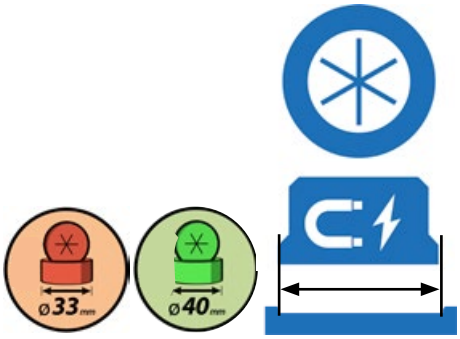
Additional features and variations

Weak Magnets

Ideal for applications with frequent replacement of the ball prism.
Suitable for short-term measurements with minimal risk of prism rotation.

Strong Magnets

Recommended for long-term monitoring. Reliably prevents prism rotation under vibrations, e.g. on tracks where oscillations are caused by trains.



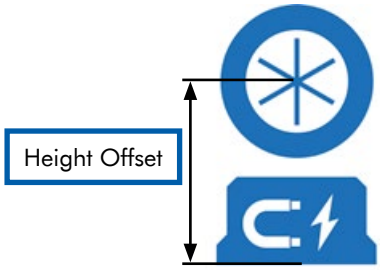
Centering: Ø33 mm

Space-saving version.
Compatible with three different centering plates.

Centering: Ø40 mm

Usable with a universal centering plate.
Standard size, compatible with established laser scanning products.

Height Offsets

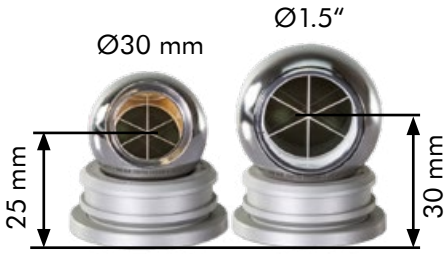


- Stainless steel base: 25 mm
- Standard base: 30.8 mm
- Monitoring bases v.2.0: ball Ø1.5“: 30 mm, ball Ø30 mm: 25 mm
- With threaded bases, defined wall distances of 50 mm and 100 mm (AdV version) can be achieved by screwing into a wall bolt

Monitoring Magnet Bases v.2.0

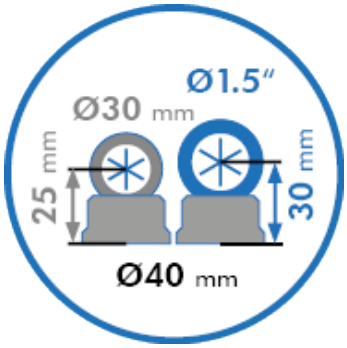


In 2025, a new series of magnetic bases was added to the product range.



The following differences and advantages:

- Magnets are completely enclosed by an aluminum housing, preventing the neodymium magnet from being affected by environmental factors (exceptions: 1557.33.S, 1557.40.S).
- Relevant information is engraved on the top of the base.
  The same base can accommodate both the small and the large ball prism, achieving practical height offsets (see left).
- The bases of the new series (1557.33, 1557.40) can be directly fastened with a countersunk screw (metric M8 or dowel).
- Each base of the v.2.0 series has a retaining groove for attaching a clip-on fall protection, allowing ball prisms to be used with safety retention.
- Previously, magnetic bases were supplied with a cover plate. Since this was only used by a small number of users, it will in the future only be available separately. Alternatively, plastic covers are now also available. 77



Of course, the previous bases with HO = 30.8 mm (v.1.0) will remain available, so that existing projects can be retrofitted if required. Gradually, the magnetic bases of the standard series will also be manufactured with a retaining groove (and accordingly marked as v.1.1). This will then allow the standard bases to be equipped with fall protection as well.



3

Centering Plate [3]

The combination of ball base and ball prism theoretically allows use without additional accessories. The unit can either adhere directly to smooth, magnetic metal surfaces or be fixed to an object using mounting adhesive. Magnetic bases v.2.0 can additionally be mounted with a countersunk screw (metric or dowel). While the ball is removable, the base remains permanently attached.

For monitoring tasks where permanent prism installations are not required, the centering plate offers an ideal solution. Before the zero measurement, only the plate is mounted. During the measurement, the ball prism with magnetic base or an L-prism with magnetic foot is then placed into the centering plate – precise, fast, and reliable.



Centering plates can be either screwed onto the object or bonded non-destructively. Through force-centering, **they enable highly precise placement of the magnetic base with an accuracy of ±0.1 mm. This allows exact repeat measurements even over long periods of time.**

Improved material properties

Since October 2025, we have been manufacturing our centering plates exclusively from magnetic stainless steel. Galvanized centering plates have been removed from the product range.







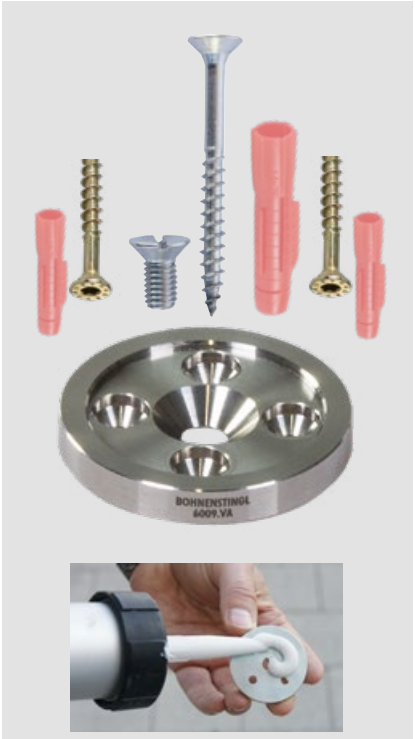






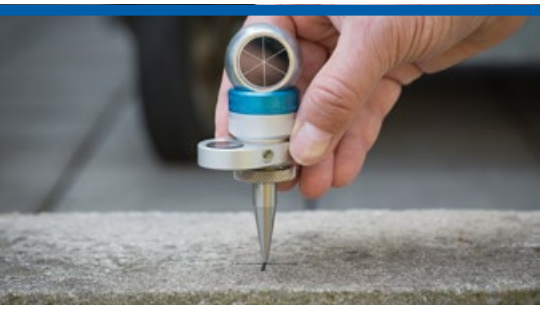




Application examples: Ball prism

With stake-out tip and level



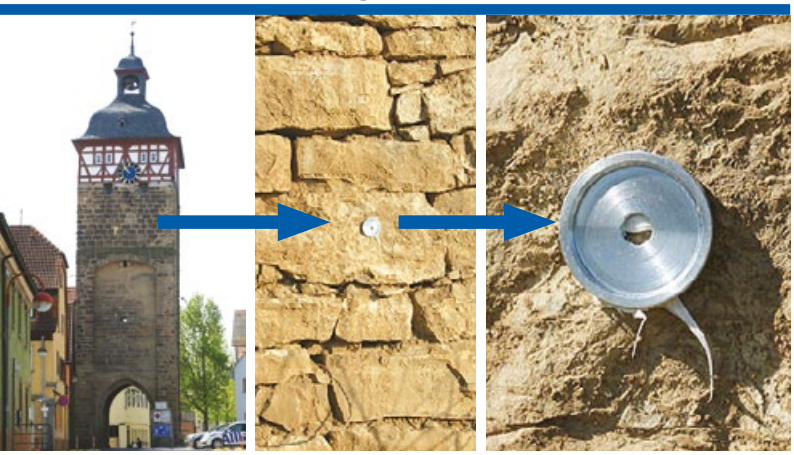
Holding directly on surfaces



Marking Points



Structure monitoring



Floodgate Monitoring



Rail Track Monitoring



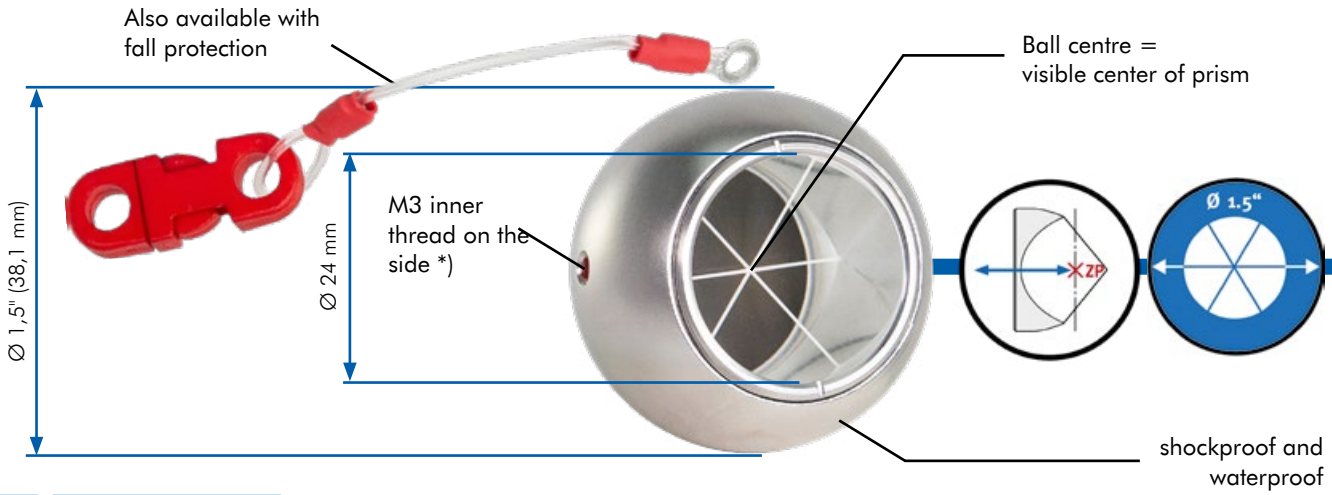
More possibilities







The Ball Prism Ø 1.5" (38,1 mm) – v3.0




1444


1448

Ball Prism v3.0, Ø1.5" K = -16,9 (Leica = +17,5) mm	⚖	№	€
Magnetic Stainless Steel (hardend), M3 inner thread *)	160 g	**1448**	156,-
Magnetic Stainless Steel (hardend) **- with Fall Protection**	165 g	**1444**	174,-

In tachymetric monitoring, our ball prism has established itself as the standard thanks to its outstanding price-performance ratio.
In 2024, we introduced further improvements and also modified and standardized the design of the ball prism with triple prism Ø 25 mm:

- Ball housing available exclusively in magnetic stainless steel
- Screwed mount of the triple prism
- No Ø 2 mm borehole on the back side anymore
- Back engraving with prism constant and manufacturer information
- With the new No. 1448, the order numbers 1445, 1445.S, and 1445.SP are discontinued
  *) Lateral M3 thread for optional attachment of accessories (no functional limitation when used with Bohnenstingl magnetic bases)



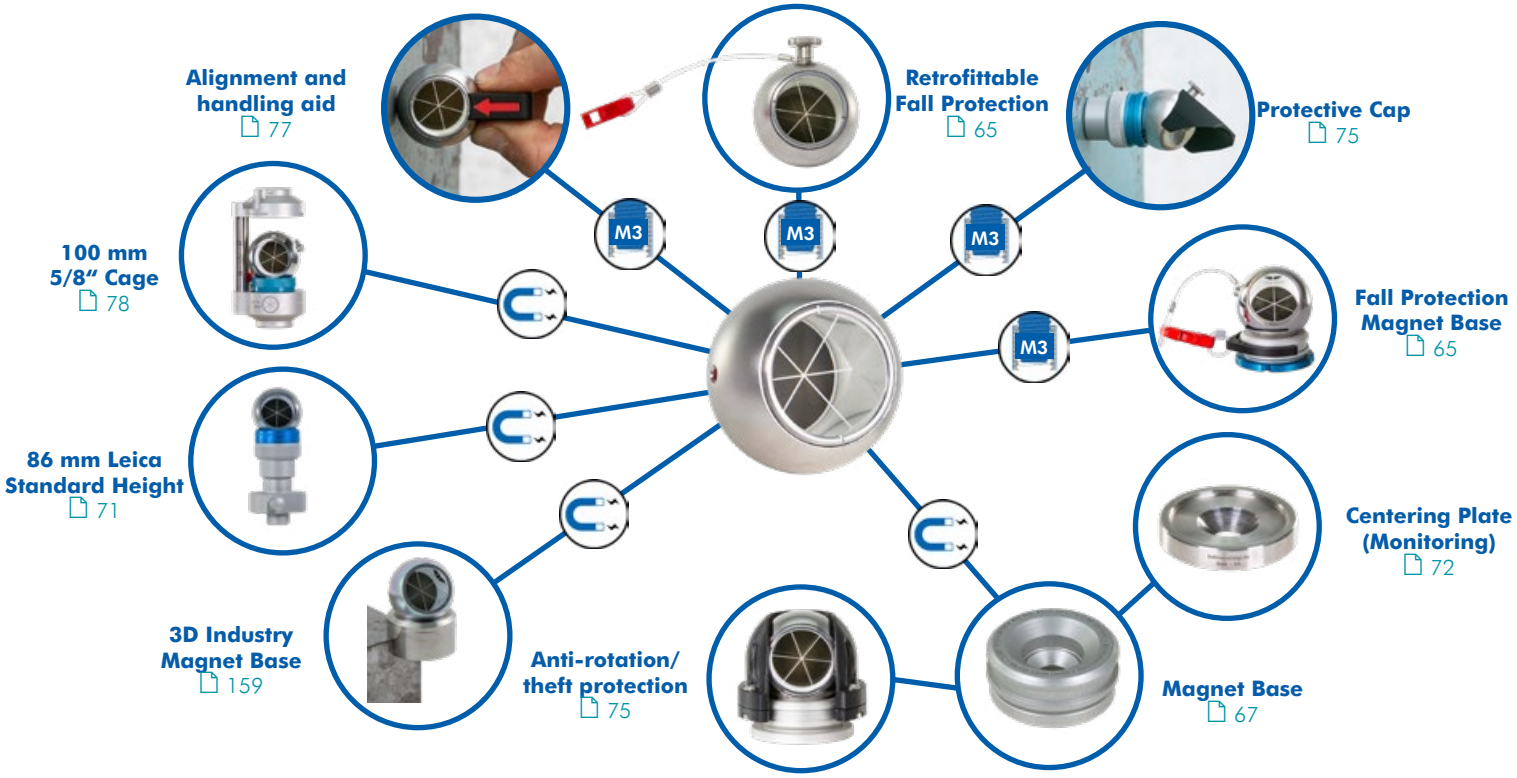


Attributes:

- Ball material: magnetic stainless steel (Ø 38.1 mm ± 0.03 mm)
- Surface: hardened, matte polished
- Prism constant: K = -16.9 (Leica = +17.5) mm (±0.1 mm)
- Reflective surfaces: rear-silvered triple prism (Ø 25 mm)
- Triple prism grinding accuracy: 2"
- Eccentricity of the prism center: ±0.1 to max. ±0.2 mm
- Distance measurement range: 500 to 1000 m (device- and weather-dependent)

Other Ø1.5" ball prisms, see next page (63).





More Ball Prisms Ø1.5“

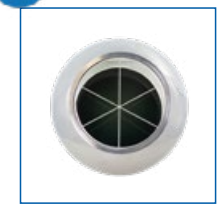
With Test Certificate



Further information regarding the tested ball prisms 60

Description	Order-No.	Euro
Ball Prism Ø 1.5“, hardend, **with test certificate**	**1445.SN**	247,-

Bunker Prism made of stainless steel V4A



Further information regarding the bunker prism 82

Description	Order-No.	Euro
Bunker Prism Ø1.5“ (38,1 mm), **non-magnetic**, K= -16,9 mm	**1322**	189,-

Ball Target Ø 1.5“ with reflective foil



For measurements over short distances and without automatic target recognition. Target mark precisely centered.

Description	Order-No.	Euro
Ball Target Ø 1.5“, stainless steel, **K = 0** (Leica = +34,4) mm	**1447.S**	121,-

Prism Constant: K= -11,3 (Leica = +23,1) mm

- Tripel Prism made of glass Ø 17,5 mm
- Distance: 300 up until over 500 m (Device- and weather-dependent)
- Weight: 180 g

1454



1453.S

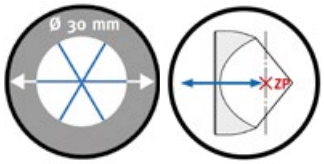


1453.SN

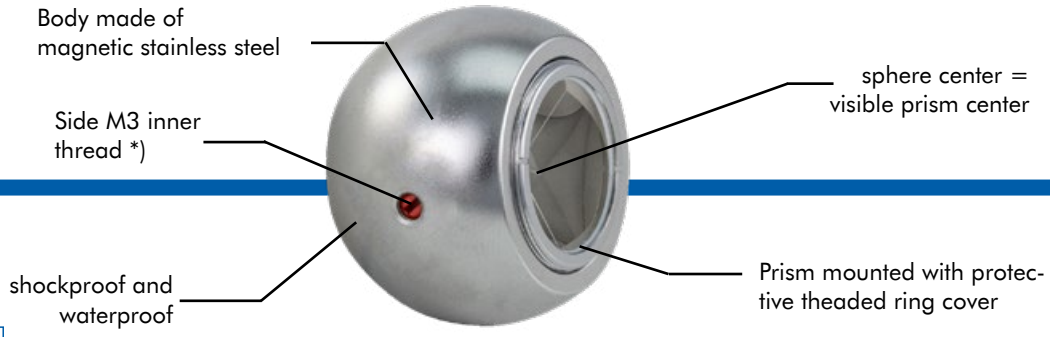
Description	Material	Attribute	Order-No.	Euro
Ball Prism Ø 1.5“, **K = -11,3** (Leica = +23,1) mm	Stainless steel	-	**1453.S**	168,-
	galvanized steel	Test Certificate	**1453.SN**	247,-
	Stainless steel	Fall Protection	**1454**	174,-

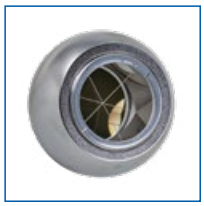


Ball Prism Ø 30 mm

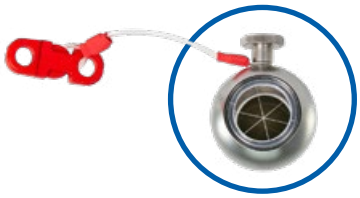


- Ball housing: Ø 30 mm ± 0,05 mm
- Glas prism: Ø 17,5 mm (Grinding Accuracy: 2")
- Reflection Surfaces: Silver-coated on the back
- Prism Mounting Accuracy: ± 0.1 mm
- Distance Measurement Range: Up to over 500 m (device and weather dependent)
- *) Side M3 Thread: For optional attachment of accessories (otherwise non-functional and without restriction when used with Bohnenstingl magnetic bases)
- Rear Engraving: Indicates prism constant and manufacturer information





Description	Material	Order-No.	Euro
Ball Prism BBP-3011: Ø30 mm Prism Constant: -11,3 (Leica = +23,1) mm	Hardend stainless steel	**1436**	132,-



Retrofittable Fall Protection 65



86 mm Leica Standard Height 71



Protective Cap 75



Rotation / Theft Protection 75



Fall Protection Magnet Base 65

Ball Prism with Test Certificate

More information regarding tested ball prisms 60

Decsription	Side Thread	Order-No.	Euro
Ball Prism Ø30 mm, galvanized steel, **with test certificate**	none	**1450.SN**	224,-

Ball Target Ø 30 mm with reflective foil



- Prism Constant: K = 0 (Leica = +34.4) mm
- Outer Diameter of Reflective Foil: 20 mm
- Target Mark exactly in the Center of the sphere for highly accurate angle measurement
- Outer Diameter of Target Mark for Angle Measurement: 5 mm
- Inner Diameter of Target Mark for Angle Measurement: 0.5 mm
(other configurations available upon request)

Description	Material	Order-No.	Euro
Ball target Ø 30 mm, reflective foil, **K = 0** (Leica = +34,4) mm	polished stainless steel (magnetic)	**1455.SP**	92,-



Fall Protection for Ball Prisms v.3.0, Ø30 mm/Ø1.5“

While holding the ball prism, accidental slipping from the fingers cannot be completely ruled out. The fall protection system prevents the prism from falling or being lost. For example, the prism can be worn around the neck on a lanyard or clipped onto a variety of our products – such as Klimax, Triangel, HEMI, and others.

Description	Order-No.	Euro
Fall protection (retrofit): knurled safety screw, short industrial cord	**1506**	18,-

Description	Order-No.	Euro
Lanyard, red	**1390.R**	5,50

Option #1



Removing the red threaded insert (non-functional, serves only to protect the internal thread) – Tool: Small flathead screwdriver



Option 1: Attach the fall protection using the supplied knurled screw. Tighten the screw until the eyelet can still be rotated with slight resistance.



Advantages:
- Tool-free manual installation
- The knurled screw can also be used as a handle to help align the prism
- If fall protection is only needed temporarily, it can be quickly removed again

Option #2



Option 2: Attach the fall protection using the supplied pan head screw (2 mm hex socket). The screw can be tightened fully until it stops and then hand-tightened.



Advantages:
- Ideal solution when the spherical prism is to be permanently equipped with fall protection
- Space-saving design thanks to the compact pan head screw

Ball Prism Service Set

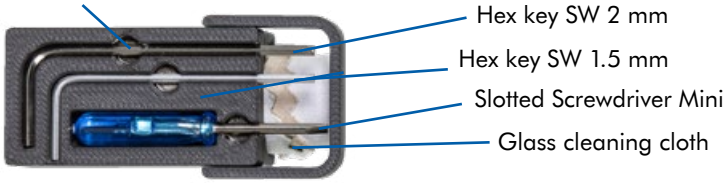


Used for installing various ball prism accessories, such as fall protection (1506) and anti-rotation guard (1507.38).

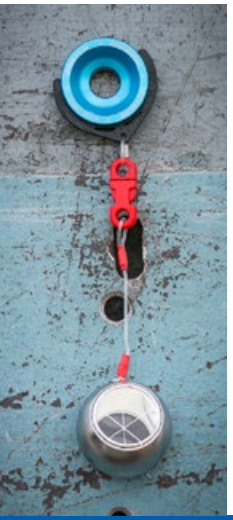
Description	Order-No.	Euro
Ball Prism Service Set	**1508**	12,-

Integrated magnet ensures tools are held in place

Dimensions
Plastic Casing:
60 x 30 x 25 mm











Fall protection clip for magnetic bases (v.2.0)

All magnet bases of the series v2.0 (see page 67) as well as the most recent batches of the classic ball bases (see page 68) include a ring groove. It is used for sliding or clipping on the fall protection clip 1533.

The fall protection clip allows a ball prism with fall protection to be securely attached.
In monitoring applications where magnetic bases are installed vertically or upside down, the prism can be secured not only magnetically but also with a safety lanyard.
This provides reliable protection against accidental drops.

Description	Order-No.	Euro
Fall protection clip for magnetic bases	**1533**	7,-

Ball Prism Ø30 mm



Ball Prism Ø1.5“



Magnet Base with Threads



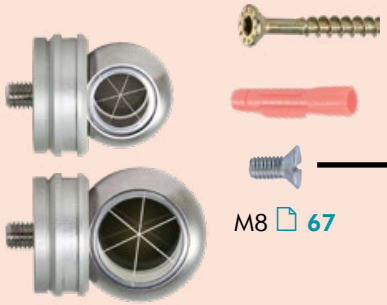
70

Magnet Base with Threads



70

Magnet Base Ø33 mm

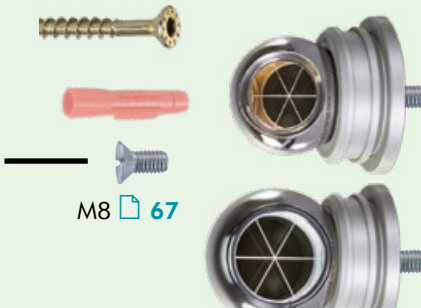


M8 67



Magnet Base Ø40 mm





M8 67

Centering Plate Ø33 mm

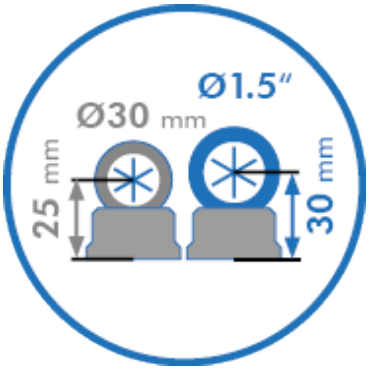


To glue on or to screw on 72

Centering Plate Ø40 mm



To glue on or to screw on 73

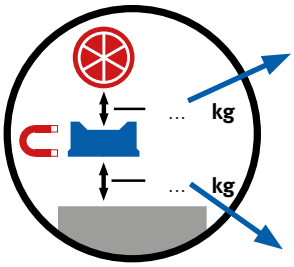


Magnet Base MB v.2.0 for Ball Prisms

- Turned part made of anodized aluminum with integrated permanent magnet (magnet fully enclosed in the housing – except for models 1557.33.S and 1557.40.S)
- Bases are compatible with both Ø30 mm and Ø1.5" ball prisms
- Key specifications are engraved on the top surface
- Machined retaining groove allows attachment of optional accessories (see below)
- Direct mounting via adhesive bonding or screwing (except for 1557.33.S, 1557.40.S), or use in combination with centering plates (72).



- Please note: The magnetic holding force is approximately 20% weaker when using Ø30 mm balls.



Holding Force A (Example: 2 kg)

Example: 2 / 3 kg

Holding Force (Example: 3 kg)



1557.33.S



Magnet Base MB33-8, Centering Ø33 mm	⚖	№	€
Countersunk screw hole (M8 / wall plug), magnetic holding force 7/9 kg	47 g	**1557.33**	32,-
Ø5 mm, Use of counters. screws not possible, magnetic force 10/13 kg	52 g	**1557.33.S**	36,-



1557.40.S



Magnet Base MB40-8, Centering Ø40 mm	⚖	№	€
Countersunk screw hole (M8 / wall plug), magnetic holding force 7/9 kg	51 g	**1557.40**	34,-
Ø5 mm, Use of counters. screws not possible, magnetic force 10/13 kg	56 g	**1557.40.S**	38,-





Countersunk screw 1557.30 / 1557.40	⚖	№	€
DIN 965, M8 x 16 mm, Stainless steel (cross recess)		**D0965A0816**	0,40
Wood / wall plug screw, 6,0 x 60 mm		**7010.60**	0,40





Magnet Bases with Thread Connections	⚖	№	€
M8 inner thread, holding force 7 / 9 kg	47 g	**1557.M8**	39,-
M8 **outer** thread, holding force 7 / - kg	52 g	**1557.M8a**	41,-
1/4" inner thread, holding force 7 / 9 kg	48 g	**1557.14**	41,-
1/4" **outer** thread, holding force 7 / - kg	51 g	**1557.14a**	43,-

Ball prism drop safety clip for magnetic bases



Plastic cap to cover magnetic bases MB v.2.0



Cover plate: For ball bases with integrated magnet



Centering pin/ locator 1557.33.S and 1557.40.S



Protective dome



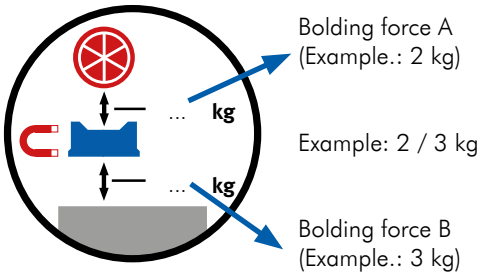
Remover-Tool for strong magnetic bases






Magnet Bases v.1.0 / v.1.1 for Ball Prisms

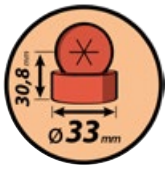
- Turned part made of anodized aluminum with integrated permanent magnet
- For attachment to magnetic surfaces such as railway tracks, machines, vehicles, and centering plates, or for gluing onto non-magnetic surfaces
- Vibrations can be transmitted to the magnetic bases and the ball prism. For track monitoring, we therefore recommend the strongest magnet (1460.S2)
- Centering accuracy of the base underside in centering plates (Bohnenstingl): ±0.1 mm
- From version v.1.1 onwards, the magnetic bases are equipped with a retaining groove





For Ball Prism-Ø 1.5" (38,1 mm)





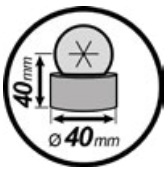


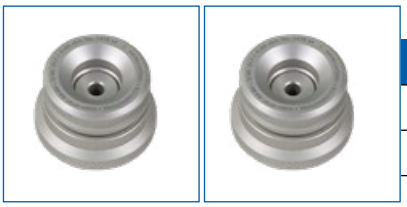
Magnet Base v.1.1 Ø 33 mm for ball prisms with Ø 1.5“	⚖	№	€
Magnetic holding force around: 2,0/3,0 kg	45 g	**1457.S**	36,-
Magnetic holding force around: 6,0/15,0 kg	65 g	**1457.S2**	39,-





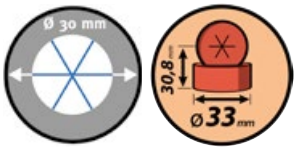
Magnet Base v.1.0 Ø 40 mm for ball prisms with Ø 1.5“	⚖	№	€
Magnetic holding force around: 2,0/3,0 kg	50 g	**1458.S**	36,-
Magnetic holding force around: 6,0/15,0 kg	68 g	**1458.S2**	39,-

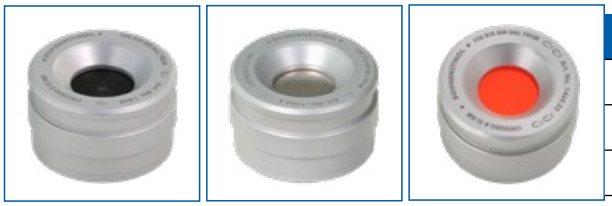




Magnet Base v.1.1 Ø 40 mm for ball prisms with Ø 1.5“	⚖	№	€
Height Offset: 40 mm, holding force around 1,5/8 kg	81 g	**1458.44**	48,-
Height Offset: 40 mm, holding force around 6,5/11,5 kg	86 g	**1458.44.S**	52,-

For Ball Prism-Ø 30 mm





Magnet Base v2.0 Ø 33 mm for ball prisms Ø 30 mm	⚖	№	€
Magnetic holding force around: 1,0/ 1,5 kg [v.1.0]	55 g	**1460**	31,-
Magnetic holding force around: 6,0/3,0 kg [v.1.1]	80 g	**1460.S**	36,-
Magnetic holding force around: 12,0/20,0 kg [v.1.0]	100 g	**1460.S2**	40,-



INFO Due to the very high holding force of the strong magnets of bases 1457.S2, 1458.S2, and 1460.S2, the use of a pull-off tool is recommended. More at 71.

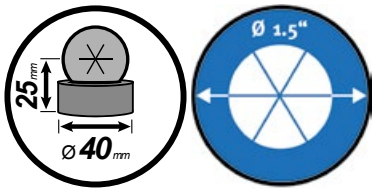


Stainless steel base for ball-Ø 1.5" (38,1 mm)

Design and function of the stainless steel ball base corresponds to that of the aluminium ball bases.

With permanent magnet

The integrated permanent magnet allows the ball base to be attached to all magnetic surfaces, e.g. railway rails, machines, vehicles and centering plates. 73.

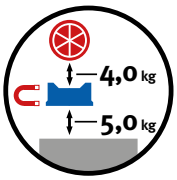


Special features:

- Casing made of stainless steel (V2A)
- Integrated ring magnet with centric bore Ø 14 mm
- Height-Offset HO of prism center to bottom surface of base: 25 ± 0,1 mm
- Bottom surface-diameter of base: Ø40 ± 0,01 mm
- Fits to centering plate No. 6009 73
- Ring marking with engraved ball Ø and height offset HO 25 mm



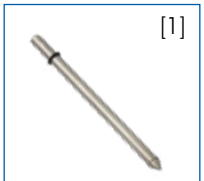
If there is no ball prism on the base, it can be covered with a protective plate made of galvanised sheet steel. This has a Ø of 40 mm, is also held by the base magnet and protects the base from dirt and weather influences (see picture).





Description	Order-No.	Euro
Stainless steel base Ø 40 mm for ball prisms Ø 1.5", **with magnet (holding force approx. 4,0/5,0 kg)**, with cover plate	**1430**	61,-
Stainless steel base Ø 40 mm for ball prism Ø 1.5" (38,1 mm), **without magnet**	**1431**	49,-







Centering pin / center punch for base 1430 and 1431

For staking out, registering and controlling points.

For detailed information on the features and the application of the centering pin and bearing insert, see 144.

Description	Order-No.	Euro
Centering pin with hardend tip [1]	**1498.S**	23,-
Bearing-insert for centering pin, for base C and CM [2]	**1498**	29,-



PLEASE NOTE	Please also note our special bases made of stainless steel for industrial 3-D measurements 159

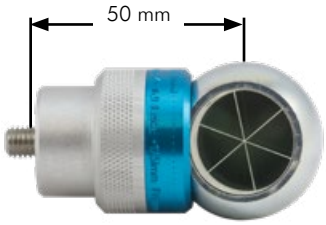


Example: Mounted to a wall bolt

Ball base with magnet and thread connections

- The distance of the ball center from the base underside to the center of the prism is always exactly 50 ± 0,1 mm (without thread)
- All bases are shipped including cover plate for protection against dirt (68)
- On request many of the bases are also available with weaker or stronger magnets













For ball prism Ø 1.5" (38,1 mm)

With **inner thread**					
Description	thread con.	magn. force	series	Order-No.	Euro
Base for ball prism Ø 1.5", inner thread	1/4"	approx. 3 kg	v.1.0	**1466.14**	52,-
	M8	approx. 3 kg	v.1.1 - groove ring	**1466.08**	51,-
	5/8"	approx. 3 kg	v.1.1 - groove ring	**1466.58**	53,-
	5/8“	approx. 7 kg	v.2.0	**1558.58**	51,-

With **outer thread**					
Description	thread con.	magn. force	series	Order-No.	Euro
Base for ball prism Ø1.5“, outer thread	1/4" x 8 mm	approx. 3 kg	v.1.0	**1466.14a**	55,-
	M8 x 8 mm	approx. 1 kg	v.1.1 - groove ring	**1466.08aL**	48,-
		approx. 3 kg	v.1.1 - groove ring	**1466.08a**	54,-
	5/8" x 11 mm	approx. 3 kg	v.1.1 - groove ring	**1466.58a**	56,-
	5/8“ x 11 mm	approx. 7 kg	v.2.0	**1558.58A**	54,-





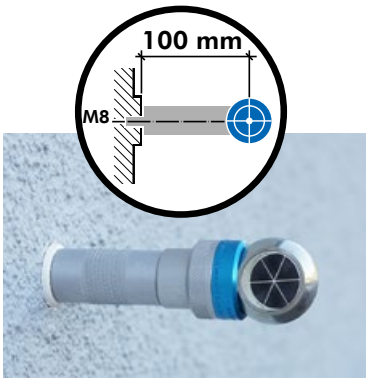




For ball prism Ø 30 mm

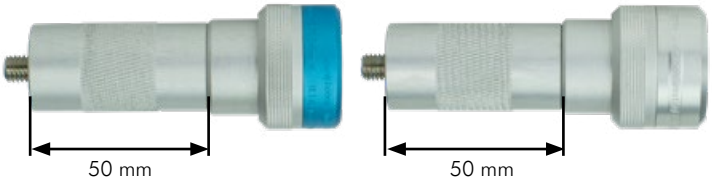
With **inner thread**					
Description	thread con.	magn. force	series	Order-No.	Euro
Base for ball prism Ø 30 mm, oinner thread	1/4"	approx. 4,5 kg	v.1.0	**1465.214**	51,-
	M8	approx. 4,5 kg	v.1.1 - groove ring	**1465.208**	51,-
	5/8"	approx. 4,5 kg	v.1.0	**1465.258**	53,-

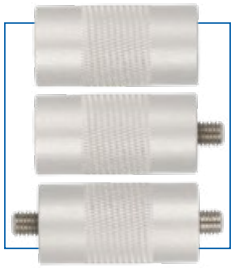
With **outer thread**					
Description	thread con.	magn. force	series	Order-No.	Euro
Base for ball prism Ø 30 mm, outer thread	1/4" x 8 mm	approx. 4,5 kg	v.1.0	**1465.214a**	54,-
	M8 x 8 mm	approx. 0,5 kg	v.1.0	**1465.08a**	48,-
		approx. 4,5 kg	v.1.1 - groove ring	**1465.208a**	54,-
	5/8" x 11 mm	approx. 4,5 kg	v.1.1 - groove ring	**1465.258a**	56,-



Extension for thread bases - Wall offset 100 mm

With the following adapters, the ball bases with M8 thread (70) can be extended to the wall offset of 100 mm (AdV version, German norm).





Description	Thread 1st side	Thread 2nd side	Order-No.	Euro
Extension, Aluminium, Ø 25 x 50 mm	M8 inner thread	M8 inner thread	**0372.050**	24,-
	M8 outer thread	M8 inner thread	**0373.050**	25,-
	M8 outer thread	M8 outer thread	**0374.050**	26,-

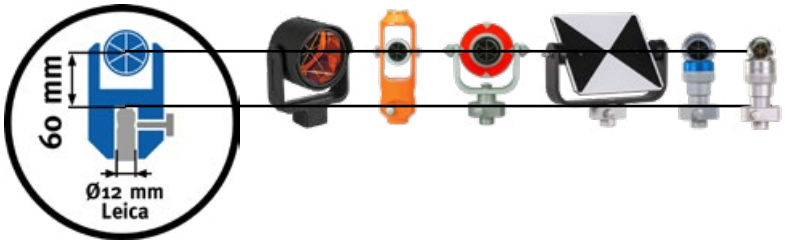
NOTE	We can supply the ball base and adapter „glued" together so that an exclusive use of 100 mm distance is possible.

Ball base with bolt adapter (height offset = 60 mm)



In order to be able to attach a circular level (see 89), the adapter is shipped screwed but not glued. However, we can also deliver the screw connection glued on request. Magnetic holding force in the direction of the ball: approx. 3 kg

Description	Order-No.	Euro
Ball base Ø1.5" with Leica adapter (tilting axis height = 60 mm)	**1440.060**	89,-
Ball base Ø30 mm with Leica adapter (tilting axis h. = 60 mm)	**1441.060**	89,-



Remover Tool

Bases with strong magnets (1457.S2, 1458.S2, 1460.S2) cannot easily be pulled off „by hand" due to their very high magnetic holding force. It is therefore recommended to use a remover-tool.

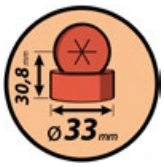


- Sturdy, break-proof plastic
- Suitable for all ball bases (**not for stainless steel bases**)
- With carrying strap
- Dimensions: Ø 45 x 100 mm
- Weight: ca. 120 g



Description	Order-No.	Euro
Remover tool with carrying strap	**1460.Z**	28,-

Centering plate for Ø 33 mm



To use with adhesive











- Magnetic stainless steel plate Ø 40 x 4 mm
- To use with **assembly adhesive** (74)
- Accuracy of centering fit Ø 33 mm: ± 0,1 mm
- Bore hole Ø 8 mm in center for exact fixation of the plate during gluing

Description	Order-No.	Euro
Centering plate (use with adhesive), centering Ø 33 mm, stainless steel	**1461.VA**	8,-

To use with adhesive and / or to screw on



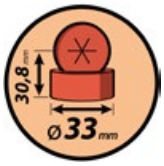




- Magnetic stainless steel plate Ø 40 x 7 mm
- Accuracy of centering fit: Ø 33 ± 0,1 mm

Mounting options:

- To use with **assembly adhesive** (74)
- Center bore hole Ø 8 mm for countersunk screws



Description	Order-No.	Euro
Centering plate Ø 33 mm, ountersunk bore 8 mm, stain. steel	**1464.VA**	11,-

To screw on and / or nail to object











- Magnetic stainless steel plate Ø 60 x 4 mm, with 4 bore holes Ø 4,5 mm
- For screwing onto a wide variety of surfaces
- Accuracy of centering fit: Ø33 ± 0,1 mm
- Center bore hole Ø 8 mm for exact positioning of the plate when screwing on

Description	Order-No.	Euro
Centering plate Ø 33 mm to screw on object, center bore hole Ø 8 mm + 4 x Ø 4,5 mm eccentric bore hole, stainless steel	**1463.VA**	9,50



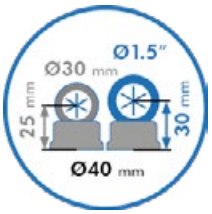


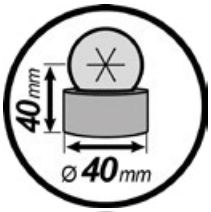
Universal centering plate for base Ø 40 mm

To use with adhesive and / or to screw on

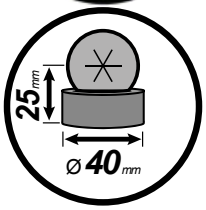
- Magnetic stainless steel plate Ø 50 x 7 mm
- Accuracy of centering fit: Ø40 ± 0,1 mm
- Effective height to centering level: 5,5 mm

- To use with assemly adhesive 74
- Center borehole Ø 8 mm for a countersunk screw
- Eccentric holes Ø 5 mm for 2 to 4 countersunk screws







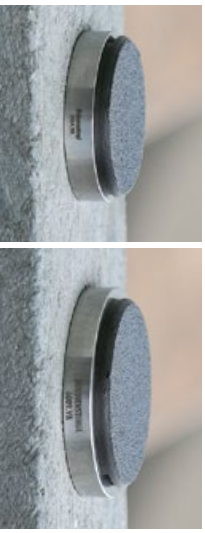




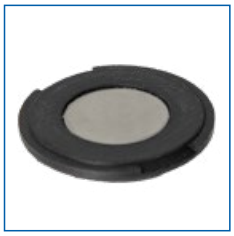


Description	Order-No.	Euro
Centering plate for base Ø 40 mm, to use with adhesive or to screw onto object, magnetic stainless steel	**6009.VA**	12,-

Protective Plate for Centering Plate Ø33 or Ø40 mm







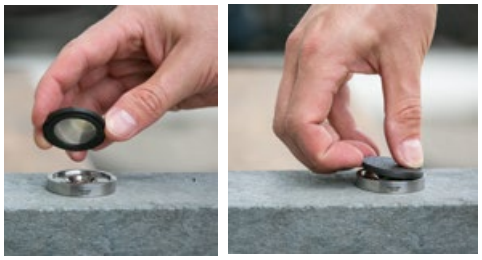
- For protecting the centering plate against dust and weather
- Made of weather-resistant plastic
- Step designed to fit precisely into the Ø33 mm or Ø40 mm centering of the plate
- A built-in magnet ensures the cover disc stays securely in place
- Discreet black design
- Can be removed by hand (with a fingernail) or, if needed, using a flathead screwdriver

Description	Order-No.	Euro
Protective Plate for centering plate Ø33 mm, with permanent magnet	**1429.33**	4,80
Protective Plate for centering plate Ø40 mm, with permanent magnet	**1429.40**	4,80

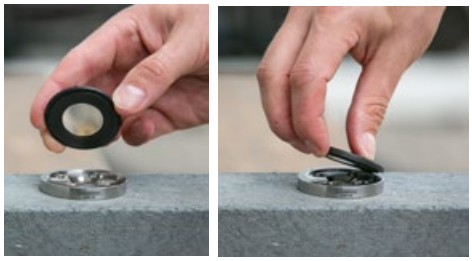
INFO	Not always suitable for centering plate No. 1463 (screw head size).



Ø33 mm



Ø40 mm







Assembly Adhesive

For non-destructive attachment of the ball base or the centering plates to the object over a prolonged period of time.

- Bonding of metals, wood, plastic with and to each other (stone, concrete, natural stone, gypsum, polycarbonate, PSPU, PVC, plastic, copper, aluminium, steel, wood, glass)
- Very high initial adhesion
- Bonding of heavy parts, also in vertical places
- Odourless and solvent-free, Fungus-inhibiting
- Resistant to weathering, UV radiation, water, chlorine, etc.
- Processing temperature: +5/+40°C
- For use with commercially available hand cartridge guns



Application

The parts to be bonded must be clean and free of oil and grease. Apply adhesive on one side, position parts and press them firmly on. The adhesion is immediate.
If the ball base is used on magnetic iron parts (e.g. tracks), the adhesion of the adhesive is additionally supported by the permanent magnet until it hardens.

Description	Order-No.	Euro
Assembly adhesive, white, 1 cartridge à 290 ml	**1462**	16,50













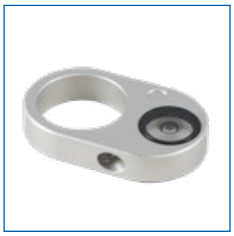
Levels for Monitoring Magnet Bases



Circular Level for Monitoring Magnet Bases

- Transparent glass vial, sensitivity 30'. Also visible from below.
- Can be attached to Monitoring Magnet Bases V.2 (1457.X, 1460.X, 1557.X)

Description	Order-No.	Euro
Circular sight-through level for magnet bases, sensitivity 30'	**1557.B**	38,-



Circular level for thread base

- Transparent glass bubble, sensitivity 30'. Also visible from below
- Can be attached to all our ball bases with **thread connection** (1465.X and 1466.X)

Description	Order-No.	Euro
See-through circular level (glass) for thread base, sensitivity 30'	**1466.B**	38,-









Protective caps for ball prisms

To use with ball prisms (1448 [v.3.0] and 1436).

- For screwing onto the lateral M3 thread
- Made of durable black plastic
- Cap protects the prism from dust, rain, and snow
- Due to the "tunnel effect," more precise alignment with the total station is required when using the cap. The prism center must remain visible.
- Optionally mountable with knurled screw or flat-head screw (both included in delivery)




Description	Order-No.	Euro
Screw on protective cap for Ø1.5" ball prism 1448	**1501.38**	13,-
Screw on protective cap for Ø30 mm ball prism 1436	**1501.30**	9,-







Anti-Rotation / Tamper Resistance Dome





For use with ball prisms 1436 and 1448 and magnetic bases v.2.0 or magnetic bases from the v.1.1 series.

- Consisting of lower part (ring clamp), upper part (dome) and 3 hexagon socket screws
- Ball prism adjustable over 180° all around
- Once the ball prism has been aligned and the screws tightened, accidental falling out, twisting, or misalignment is impossible
- When the magnetic base is glued or screwed on, unintentional removal or unauthorized removal of the entire unit is no longer possible without considerable force
- Dome top and bottom made of durable black plastic




Description	Order-No.	Euro
Anti-Rotation / Tamper Resistance Dome for Ø1.5" ball	**1507.38**	32,-
Anti-Rotation / Tamper Resistance Dome for Ø30 mm ball	**1507.30**	27,-




Clip the ring onto the magnetic base




Put on ball prism





Loosely connect the dome and ring clamp with 3 hexagon socket screws, align the ball prism with the tachymeter, and tighten the screws. Recommended tool: Ball prism service set (65)

Next page: Further protection options for ball prisms



Protective roof for magnetic bases

To protect bases with or without prism from weather conditions such as rain, snow, dust, dew, etc.

For plugging onto bases on vertical walls



- Made of anodized aluminum
- Suitable for all bases
- Roof is secured to base with a knurled screw
- Weight: 47 g

Description	Order-No.	Euro
Protective roof for plugging onto vertically mounted bases	**1503**	22,-



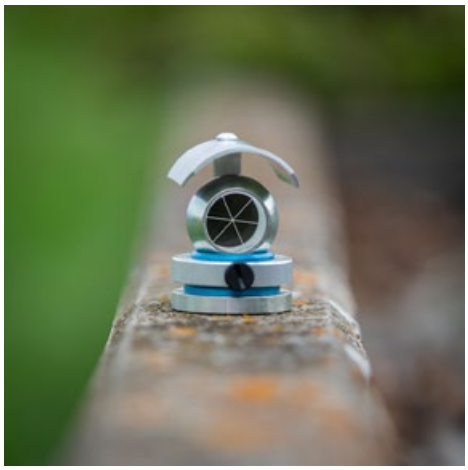
For plugging onto bases on horizontal surfaces



- Made of anodized aluminum
- Suitable for all bases
- Roof is secured to base with a knurled screw
- Weight: 63 g

Description	Order-No.	Euro
Protective roof to be attached to horizontally mounted bases	**1504**	26,-











Protective Caps for Magnet Bases



Plastic cap for covering magnetic bases (Clip-On)

- For attachment to magnetic bases (without ball prism)
- Suitable for all magnetic bases (v.1.1 and v.2.0) except 1430

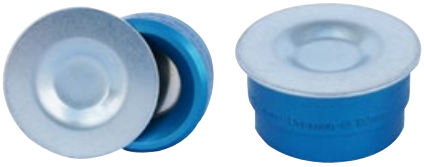
Plastic cap for covering magnetic bases	⚖	№	€
Cap Ø40 x 7 mm, PLA, gray (other colors available on request)	2 g	**1530.G**	2,80



Cover plate Ø 40 mm for magnetic base

- Suitable for all Bohnenstingl ball prism magnetic bases
- Held in place by the magnet integrated into the base

Cover plate Ø 40 mm for ball base	⚖	№	€
Curved shape, galvanized (magnetic)	10 g	**1460.40**	0,90





Handle / alignment aid for ball prism Ø1.5“

- As an alignment aid and handle for easier handling
- Example of use: for scanning surfaces/contours in tracking mode
- Exclusively usable with ball prisms v.3.0
- Screwed onto the lateral M3 thread of the steel ball



Handle / alignment aid for ball prism Ø1.5“	⚖	№	€
Exclusively usable with ball prisms v.3.0	7 g	**1505.38**	14,-

M8





Protective CAGE for ball prism Ø1.5“

To extend the application possibilities of the ball prism

The Ø1.5“ ball prism can be inserted into the CAGE. A special base with integrated magnet is attached to the prism carrier using the ¼“ screw. When the Ø1.5“ ball prism is placed on the base, the prism center is positioned exactly in the center of the standing axis in the carrier. The spherical prism is always used when high aiming accuracy is required rather than simultaneous observation from all directions.

As with the 360° prism (17), the two 5/8“ threads increase the application possibilities enormously.

- Top and bottom made of aluminum, 2 stainless steel connecting rods
- Top and bottom 5/8“ inner thread, height 100 mm
- Construction identical with HIP prism 2 x 5/8“, thus all accessories can be used
- Aiming accuracy: ± 1.5 mm with 360° prism, ± 0.2 mm with ball prism
- Comes with 1/4“ screw, to connect 360° prism
- Weight: 200 g



Description	Order-No.	Euro
CAGE prism carrier for 360° prism Bo medium format and ball prism	**5668**	154,-



Special base CAGE for 1.5“ ball prisms

- Anodized base with integrated magnets
- Comes with clip connector to use with ball prisms with fall protection
- ¼“ screw for mounting the base in the CAGE included in delivery



Description	Order-No.	Euro
Special base CAGE for ball prisms Ø38.1mm	**5667**	43,-



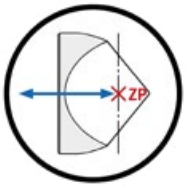








Nutshell Adapter: Ø30 mm to Ø1.5“



Ball prisms are available with outer Ø 30 mm and Ø1.5“.
With the nutshell adapter, the small Ø30 mm balls can now also be inserted into the „large“ bases for Ø1.5“ balls:

- **Standard bases for 1.5“ balls** with base-Ø 33 and 40 mm 68
- Bases / nests with various **bases with threads** 70
- **Magnetic quick change system** for force-centered switching between ball prisms and laser scanning/lasertracker targets, e.g. for registration and georeferencing 227

With Ø1.5“, ball reflectors from other areas of surveying are also offered, including SMR angle mirrors for laser trackers used in industrial surveying.
To ensure compatibility between the various surveying disciplines, we have developed bases/nests which have since only been used in combination with Ø1.5“ spheres.
Now these applications are also possible with the 30 mm balls:

- **3D stainless steel base** (for edges, corners, bore holes etc.)
- **System Klimax:** Measuring and finding points on walls and floors



The outside of the adapter is spherical with Ø1.5“. After inserting the Ø30 mm ball on the conical inner part, the ball centre (= visible prism centre) is at the same height as the centre of a directly inserted Ø1.5“ ball. On stainless steel bases the height is therefore 25 mm (see picture 1) and on blue bases 38.1 mm (see picture 2).

Description	Order-No.	Euro
Nutshell adapter: Ø30 mm to Ø1.5“	**1437**	39,-

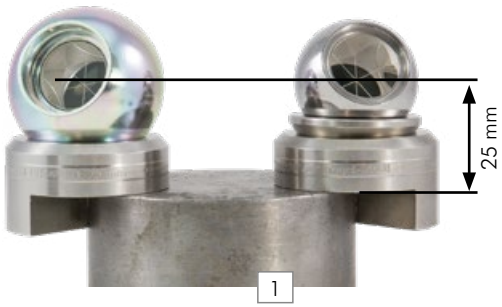


Properties of the nut shell adapter:

- Made of non-magnetic stainless steel
- Since the magnetic holding force of the base is weakened due to the greater distance to the magnetic ball, we recommend using bases with higher holding force
- A central bore Ø5 mm makes the use of the centering pin No. 1458.ZS possible (150)
- Even if the adapter is placed on the base at a slight angle, there will be no inaccuracies. The ball centre maintains the same 3D position x, y, z

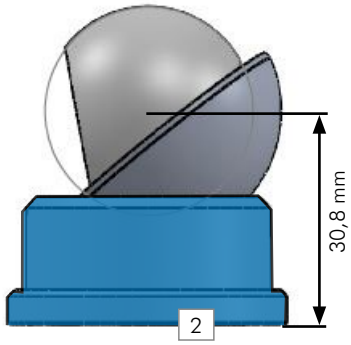


Insertable balls Ø30 mm
1450 **s. page 64**
1450.S **s. page 64**
1451.SP **s. page 64**

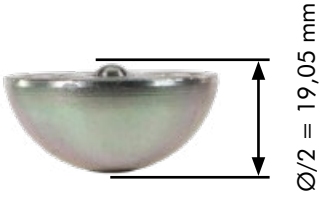


1

Now usable Ø1.5“ bases
Standard Ø1.5“ bases 68
3D stainless steel bases 159
Klimax-Bases 138
Bases with threads 70



2



Levelling-Adapter Ø1.5“ (38,1 mm)

For combining levelitic height measurement with tachymetric 3D measurement

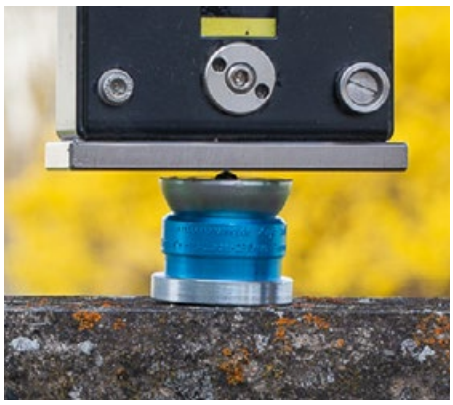
The adapter is inserted on a horizontally mounted base for ball Ø1.5‘‘. The contact point of the levelling staff on the adapter is exactly at the same height as the center of an inserted ball prism Ø1.5‘‘ (38.1 mm).

- Hemisphere Ø38.1 mm made of magnetic stainless steel
- Center made of stainless steel for placing the leveling rod on top
- Adapter height = Ø/2 = 19.05 mm



Description	Order-No.	Euro
Levelling-Adapter Ø1.5“ (38,1 mm), H=19,05 mm	**6155.41**	37,-









INFO

The leveling staff can also be placed directly on a ball prism. Then the radius (19.05 mm) must be taken into account mathematically.



Transport case

- Outer dimensions: ca. 275 x 230 x 80 mm
- Weight: 450 g
- Made of red plastic
- 2 Click fasteners
- Hard foam in the lid





For base with standard magents

- In the lower part hard foam with 15 separate compartments
- For bases with holding force 1.5 to 4 kg

Description	Order-No.	Euro
Transport case, monitoring, 15 compartments	**1468.15**	44,-





For bases with strong magnets

- In the lower part hard foam with 15 separate compartments
- For bases with holding force 15 kg to 20 kg

Description	Order-No.	Euro
Transport case for strong magnets, monitoring, 6 compartments	**1468.6**	42,-



Bunker Prism

The fixed point even for harsh environments: robust, durable, precise

In traditional monitoring, target markers are installed on the object and measured at regular intervals using the measuring instrument (typically a total station).
With the obtained 3D coordinates, positional shifts of the object point between measurements. Alternatively, they are used as fixed points for the stationing of the total station.
Our ball prisms with magnetic bases have proven to be very effective as target markers (62), and they have been further developed with the bunker prism for long-term observations and harsh environments.

Application and advantages of the bunker prism

- Sturdy bunker base made of high-quality, non-magnetic V4A stainless steel
- Special ball prism, prism mount also made of non-magnetic V4A, particularly waterproof and shock-resistant
- Alternatively, all of our other ball prisms with a diameter of 1.5'' can also be used
- Instead of a magnet, a screw-on head clip ensures secure fixation of the ball prism in the bunker housing after insertion and alignment. Accidental rotation is prevented
- Very high centering (targeting) accuracy of ±0.1 – 0.2 mm
- In automatic target finding by the total station, the optimally mounted glass body ensures precise automatic centering on the centrally symmetric point of the prism (visible center).
- Prism adjustable to any point on the hemisphere
- In the event of damage to the glass body, the ball prism can be easily replaced. The precise positional identity of the reference point remains intact
- Stealing the ball prism is not possible without tools, meaning it cannot be done „on the go"
- Attachment to the object by screwing or gluing (see mounting adhesive) 74)
- Set screw for additional securing of the bunker base against rotation
- Optional: A sturdy protective cover can be attached between measurements, providing additional protection for the bunker prism against weather and vandalism
- The height offset between the bottom of the housing and the center of the prism is only 25 mm.



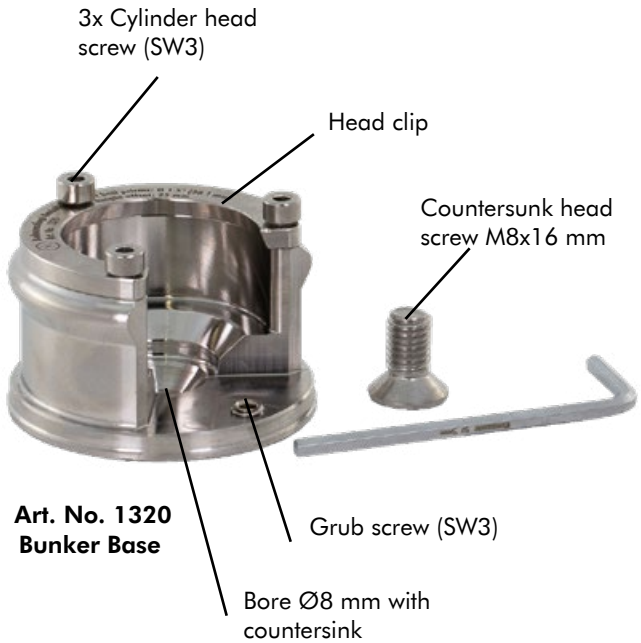








Art. No. 1322
Bunker Prism



Art. No. 1320
Bunker Base

Bunker Base





- Material: V4A stainless steel, non-magnetic, Ø55x33 mm
- Incl. M8x16 mm countersunk screw for attachment to the object
- Head clamp made of V4A, includes 3 pieces of M4 x 10 mm cylinder head screw (hex 3 mm)
- M6 Grub screw (hex 3 mm) in the lower part of the bunker housing
- Weight: 260 g

Description	Order-No.	Euro
Bunker Base, incl. M8-countersunk head screw	**1320**	148,-

INFO As an alternative to screwing into an M8-thread, the bunker base can also be anchored using a suitably sized countersunk head screw.

Ball Prism for Bunker Base

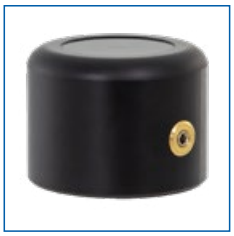


- Ø1.5'' (38,1 mm) ± 0,03 mm,
- Material: V4A stainless steel, **non-magnetic**
- Screwed socket - waterproof and shockproof
- Prism constant K = -16,9 (Leica = +17,5) mm
- Weight: 158 g

Description	Order-No.	Euro
Ball Prism for Bunker Base made of V4A, K = -16.9 mm (Leica=+17,5)mm	**1322**	189,-

INFO Bunker Base can be used also with the all other ball prisms Ø1.5''

Protective cover for bunker prism



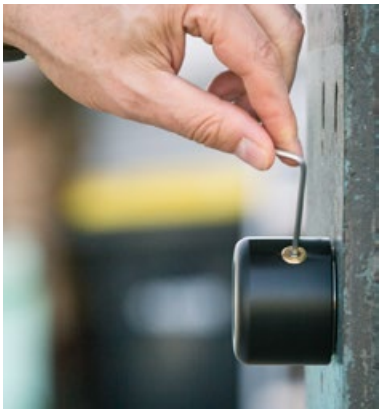
For protection against weather and vandalism

The protective cover is placed over the bunker prism/bunker base and then secured with a screw. If good visibility or labeling is desired, the front panel can be fitted with an appropriate sticker (please inquire!)

- Material: POM black, Ø60 x 48 mm
- Locking screw SW 3 mm
- Weight: 86 g

Description	Order-No.	Euro
Protective cover vor bunker prism / bunker base	**1321**	36,-







Monitoring Prism Series MoniPro

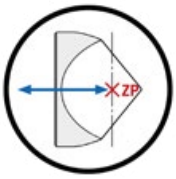
Prism in U-Frame or protective frame

- Prism Ø 25 mm in aluminium casing, **K= -16,9** (Leica = +17,5) mm, 2-side mount
- Tilting resistance adjustable with key (SW10) up to unchangeable fixation (picture)
- Prism mounted in central symmetric point
- Shockproof, Waterproof and dustproof
- Full metal version (anodized alumium)



- L80 x B50 x H50 mm
- Max. height angle 45°, prism can be turned 180° within frame
- Conical frame made of anodised aluminium
- 6 boreholes Ø 5 mm on underside

VOLLMETALL





- L60 x W50 x H50 mm
- Aligns to any tachymeter position when attached
- Conical frame made of anodised aluminium
- Can be equipped with weather protection cap 86
- 1 center borehole Ø 8 mm, 4 eccentric boreholes Ø 5 mm

Monitoring Prism Type MoniPro	⚖	№	€
Prism in protective frame,	160 g	**1202**	152,-
Prism in U-Frame	150 g	**1204**	152,-

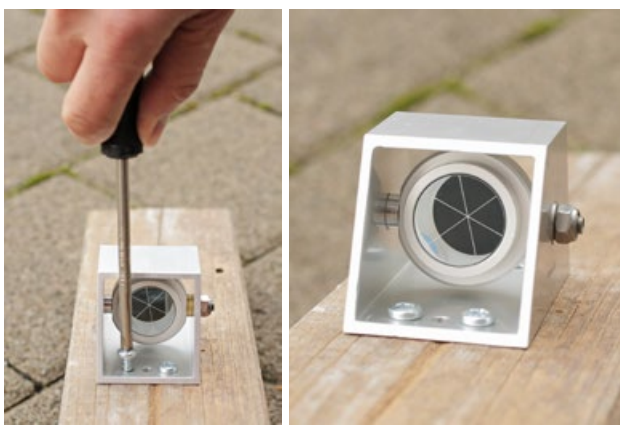
Non-destructive fixing with mounting adhesive



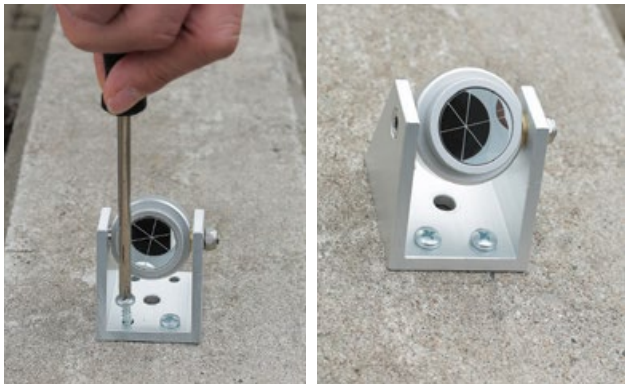
Screwed directly to the object with the 4 eccentric boreholes Ø 5 mm



To screw onto object



Non-destructive fixing: Assembly adhesive





Screwing onto the object with centric hole Ø 8 mm

The Ø 8 mm hole is located exactly in the vertical axis of the prism. A centering accuracy of ± 0.2 mm is given when removing and reattaching the support or when changing the orientation of the prism towards different tachymeter positions.





Fastening platform for prism in U-Frame

The perforated plate platform is mounted on the object without a prism. The U-Frame is then stuck onto the M8 stainless steel thread of the cylindrical support and, after aligning the prism, screwed onto the total station using a hexagon nut.
The centering accuracy is ± 0.2 mm.



- Platform made of perforated sheet metal, hole Ø 5 mm, hole spacing 10 mm
- Cylindrical support Ø 30 x 13 mm with stainless steel thread M8 x 12 mm
- Dimensions perforated plate: L70 x W70 x H2 mm
- Is shipped with stainless steel hexagon nut (SW 13 mm)
- Weight: 60 g

Description	Order-No.	Euro
M8 mounting platform for prism in U-Frame	**1210.7070**	21,-

The hole pattern of the platform offers a variety of mounting options on the object to be observed (on walls and on the ground):

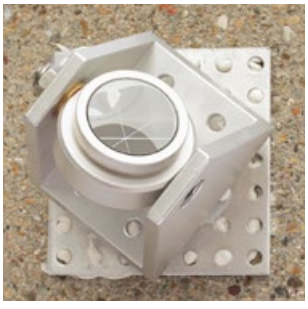


Screw / nail directly to object





Non-destructive fixing with mounting adhesive











On tracks (for steep views)



Magnetic base for Prism in U-Frame

The cylindrical magnetic base is screwed to the central bore of the U-Frame with a M8 hexagon nut. The prism can then be used reliably on any magnetic metal surface and with our centering plates.

- Distance from underside of magnetic base to prism center: 50 mm
- Centering accuracy of the M8 thread in the U-Frame: ± 0.2 mm
- Holding force of the magnet: approx. 5 kg
- Weight: 50 g

VOLLMETALL



Description	Ø	Order-No.	Euro
Magnetic base with M8 outer thread, incl. V2A hexagon nut	Ø 33 mm	**1206.33**	29,-
	Ø 40 mm	**1206.40**	29,-



Our centering plates are particularly suitable for monitoring tasks with precise repeat measurements (72)





Weather protection cap for prism in U-Frame

To protect the triple prism from weather influences such as rain, snow, dust, dew, etc. Can be attached to the tiltable prism in the U-beam. Secure hold in wind and weather.

- Anodised aluminium sleeve Ø 35 x 50 mm
- Optimized light exposure due to bright silver anodizing
- Very good water drainage in case of rain
- Weight: 20 g

VOLLMETALL



Description	Order-No.	Euro
Weather protection cap for prism in U-Frame Series MoniPro	**1201**	13,-





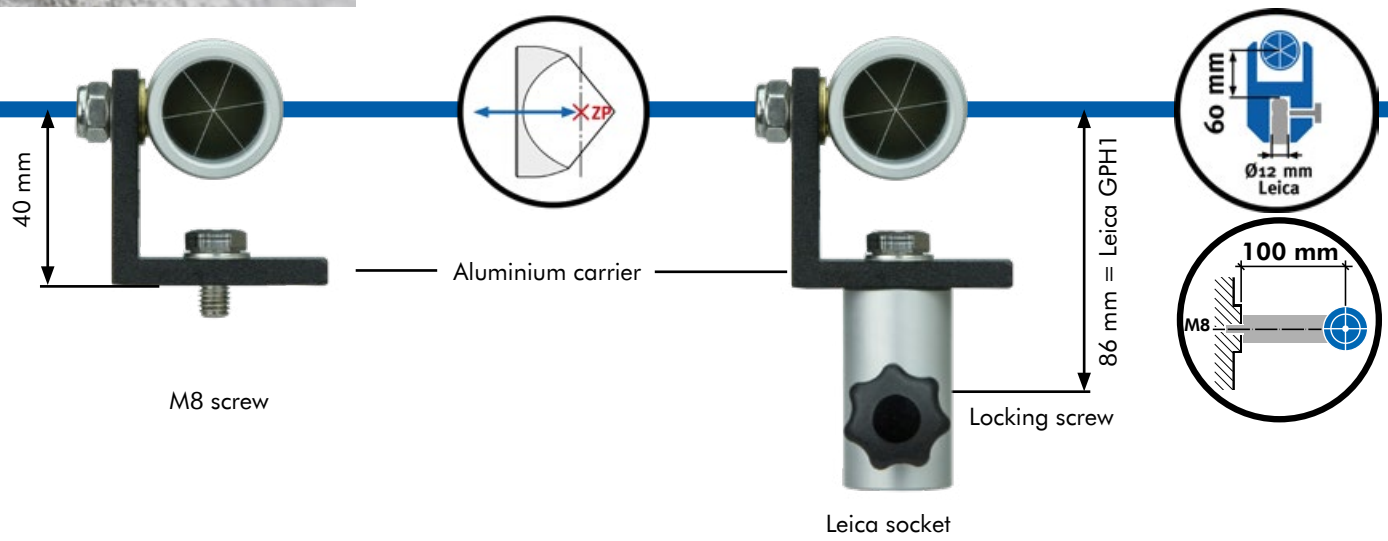




Prism on L-Carrier

- The tilting resistance can be adjusted with an open-end wrench (SW13)
- Durable, robust attachment to the structure. The bracket is made from solid metal
- Can be aligned in any direction thanks to gimbal mounting option

INFO	With all prism constants, the tilting and standing axis runs exactly through the visible prism centre / target foil (central symmetrical point).



L-Carrier Prism with M8 Screw			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1 mm	**1005.11**	110,-
25 mm	**-16,9** (Leica = +17,5) mm	**1005.17**	113,-
25 mm	**-34,4** (Leica = +0) mm	**1005.34**	170,-

L-Carrier Prism with Leica socket			
Ø glass prism	prism constant K	Order-No.	Euro
17,5 mm	**-11,3** (Leica = +23,1) mm	**1002.11**	120,-
25 mm	**-16,9** (Leica = +17,5) mm	**1002.17**	123,-
25 mm	**-34,4** (Leica = +0) mm	**1002.34**	180,-

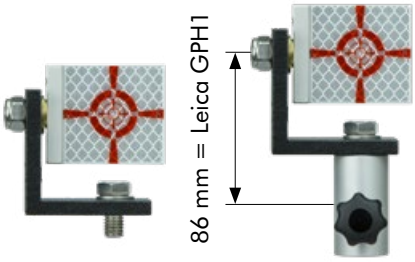
Weather protection cap

s. 25



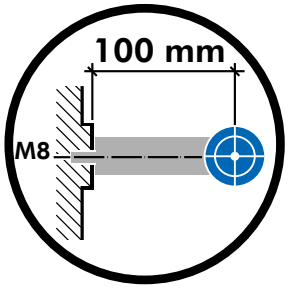






With reflective foil

Description	Order-No.	Euro
L-Bar with Leica connection and reflective foil (40 x 40 mm)	**1022.0**	65,-
L-Bar with reflective foil with M8 screw	**1025.0**	55,-



Twin-System

Simultaneous observation of an object point from several Tachymeter positions

In the AdV version, the nominal point P0 of an M8 wall bolt is located 100 mm in front of its surface along the thread axis.
If measurements are not taken simultaneously, a single prism can be used and aligned sequentially. For simultaneous measurements, 360° prisms would be ideal, but they do not provide the required accuracy.

The „Twin System“ consists of a holder with two precisely mounted glass triple prisms, which can be aligned individually. Their centers are exactly 100 mm apart, ensuring that the midpoint of their connecting line is precisely at P0.

By averaging the measurements of both prisms, the coordinates of P0 are determined with high precision. This allows P0 to be treated as a single point in a monitoring task or included in an adjustment.





Holder with M8 outer thread

- Flexible alignment of each ball prism to different tachymeters
- Distance between ball centres 100 mm
- M8 outer thread for direct screwing in of the holder in M8 wall bolts
- Horizontal drilling to help with screwing-in and screwing-out
- Prism traverse rotatable mounted in point P0 = Center of the two prism centers
- Fixing with Allen key SW 5 (see picture)

TIPP	If the two prisms are aligned and fixed horizontally with a spirit level (see picture), the same Z-coordinates should result during the measurement.



Compatible ball prisms Ø1.5“ 62

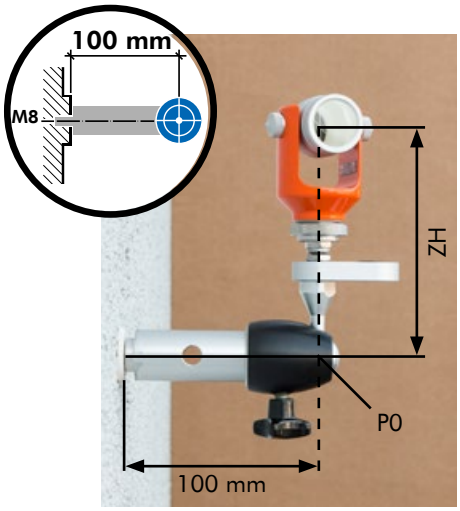
Option: Retrofittable Fall Protection for Ball Prism 65

Option: Fall Protection Clip for Magnet base 65





Description	Order-No.	Euro
Twin holder with M8 thread, with 2 magnetic bases for ball prisms Ø1.5“, M8 connection (without ball prism, without safety clip)	**6721**	138,-
Twin holder with M8 thread, with 2 magnetic bases for ball prisms Ø1.5“, Leica bolt mount (without ball prism, without safety clip)	**6722**	143,-



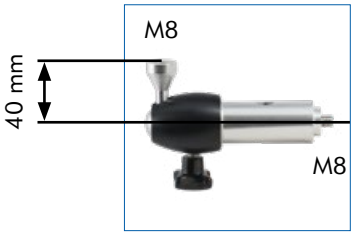
Prism holder with ball head for M8 wall bolts

Use of any prisms perpendicular or below to the nominal point P0, according to AdV version (German norm) 100 mm in front of the front face of the wall bolt

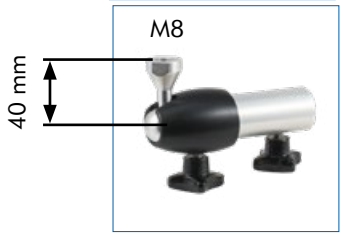
We offer prisms and reflectors which are force-centered at the set point after screwing them into the wall bolt.

This is not possible with many other prisms and targets due to their design or size. With the help of our prism holder with ball joint they can still be used. After screwing into the M8 wall bolt, the prism centre can be positioned vertically or below the target point using a circular bubble. The corresponding target height ZH must then be taken into account during the measurement.

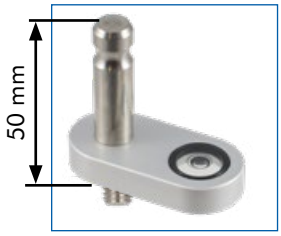
- The centre of the ball joint is located at the nominal point P0
- Quick and easy vertical positioning of the prism. After loosening the large star grip screw on the ball head, the prism holder is vertically positioned and fixed with the aid of a circular bubble.



Description	Order-No.	Euro
Ball head for M8 wall bolt, M8 outer thread	**6676.M**	84,-

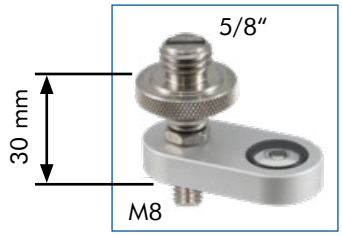


Description	Order-No.	Euro
Ball head for Leica spigot, with Leica socket	**6676.L**	84,-



- Screwed-on prism can be rotated freely without changing height
- Integrated transparent bubble made of glass, sensitivity 30'. Also visible from below

Description	Order-No.	Euro
Adapter M8 thread - Leica spigot Ø12x40 mm, see-through level 30'	**6677.L**	36,-



Description	Order-No.	Euro
Adapter M8 outer thread - 5/8" outer thread, circular level 30'	**6677.58**	50,-



Description	Order-No.	Euro
Adapter M8 outer thread - bolt B1216, transp. circular level 30'	**6677.ZP**	42,-



BALL PRISMS



Various ball prism designs
62

Ø1.5“



No. 1466.B
€ 38,-
74



No. 6611
€ 158,-
28

B1216

LEICA GRZ101



1/4“



No. 5682.Ki
€ 29,-
19



No. 6672
€ 27,-
8

MHC-M8



No. 5693.M8
€ 520,-
8

M8



No. 5672
€ 47,-
16



No. 5670
€ 336,-
14

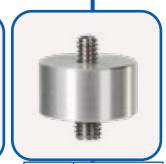
1/4“



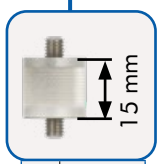
No. 1466.08a
€ 54,-
70



No. 6677.ZP
€ 42,-
89



No. 5689.015
€ 22,-



No. 0374.015
€ 19,-



No. 5674.A
€ 35,-
14

MHC-58



No. 5693.58
€ 610,-
8

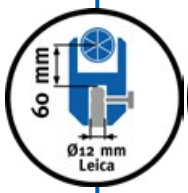
HIP PRISMS



Various prisms constants
23

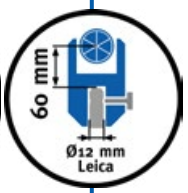


Various prisms constants
24



LEICA GMP101











211

LEICA GMP111



Track/Rail Prism

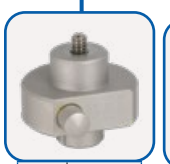


M8



No. 0690
€ 50,-
35

1/4“



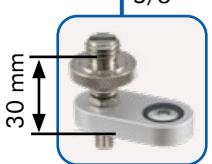
No. 0692
€ 50,-
35

Ø10 x 20 mm

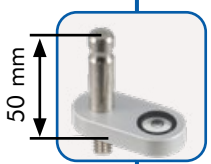


No. 0856.40
€ 36,-

5/8“

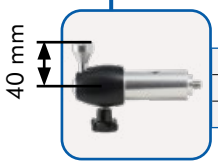


No. 6677.58
€ 50,-
89



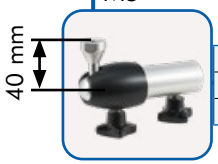
No. 6677.L
€ 36,-
89

M8

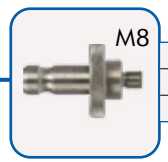


No. 6676.M
€ 84,-
89

M8



No. 6676.L
€ 84,-
89



No. 0830
€ 18,-
35



M8 Wall Bolt as measuring point

Application

- The bolts have an M8 internal thread and are installed on buildings using the dowel or mortar method
- Marking of survey points in the wall instead of ground points
- As connection points in cadastral and engineering surveying
- For building control measurement/monitoring
- In terrestrial laser scanning (TLS) for georeferencing









Standard Wall Bolts with M8 inner thread

Wall bolt forged from brass, inscription „Messpunkt“, installation in mortar process.

Description	Order-No.	Euro
Mortar wall bolt, length 45 mm	**0891**	2,85

Wall bolt made of plastic with continuous brass core, which is spread by a threaded pin. Inscription „Messpunkt“. For spreading of the shaft an Allen key is required.

Description	Order-No.	Euro
Dowel wall bolt, white, length 30 mm	**0893**	1,15
Dowel wall bolt, white, length 40 mm	**0895**	1,20
Dowel wall bolt, brown, length 40 mm	**0897**	1,20

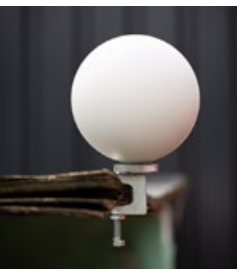
NOTE	No minimum order quantity for our wall bolts. We can also supply you with a suitable Allen key.



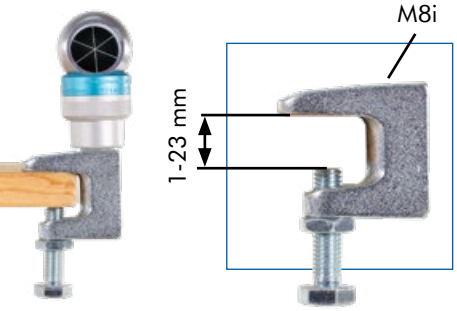
Special step drill for standard wall bolts

12 mm drill bit with integrated countersink for wall or ground installation of the wall bolt series

Description	Order-No.	Euro
Special step drill for standard wall bolts	**0890**	59,-







Beam clamp M8

Compact, sturdy, quick-fit metal clamp. M8 inner thread offers possibility to screw on prisms and scanning targets (directly or via adapter).

- M8 inner thread
- Clamping range: 1 - 23 mm
- Screw plug M10 with wrench size SW17
- Additional nut for securing (SW17)

Attachment examples: Overhead line masts/catenary masts, Steel beams (T-beams, H-beams, etc.), Table tops, balconies, ledges, steel plates etc.

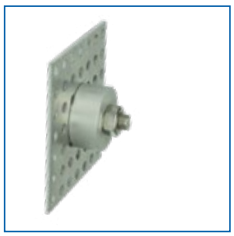
Description	Order-No.	Euro
Beam clamp M8, clamping range: 1 - 23 mm	**6886**	5,60

Fixed Point with M8 thread

Non-destructive mounting with adhesive

An M8 thread opens up a wide range of possibilities. Target markers can be screwed in, or a surveying instrument can be attached to it. By drilling a hole into the wall, a standard M8 wall bolt (with dowel or mortar) can be installed.
However, problems arise when the structure must not be drilled into or otherwise damaged.
With the "Fixpunkt" platform, an M8 thread can also be realized non-destructively!
For this purpose, a steel cylinder with an internal M8 thread, firmly screwed to a perforated plate, is mounted onto the object using adhesive (74).







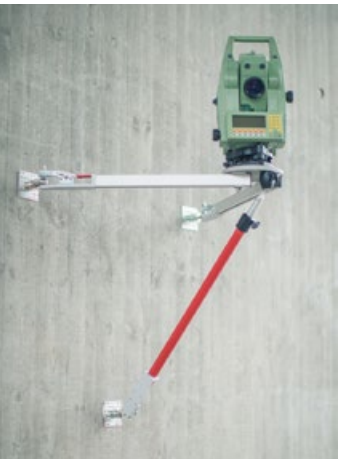
- Dimensions: L70 x W70 x H2 mm, aluminum plate with Ø5 mm holes spaced 10 mm apart
- Holding force on concrete (dry, grease- and dust-free): ≤ 50 kg

- 6862 with round-head screw with hex socket (SW 5) for protection of the M8 thread

Description	Order-No.	Euro
Perforated plate "Fixpunkt" with M8 internal thread	**6862**	24,-

- Cylindrical support pad Ø 30 x 13 mm with stainless steel threaded pin M8 x 12 mm
- Supplied with M8 stainless steel nut (SW 13 mm)

Description	Order-No.	Euro
Mounting platform M8 for prism in U-beam	**1210.7070**	21,-



wall tripod 251

The hole pattern of the platform offers a wide range of mounting options on the object to be monitored, as well as on walls and floors:

Screwing / nailing directly onto the object









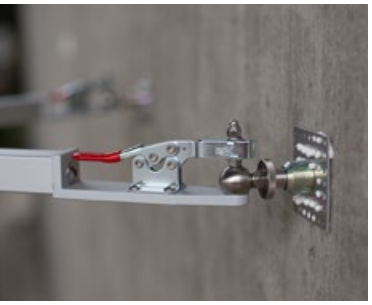
Non-destructive fastening with adhesive

















Using a multifunction tool with a scraper, the fixed point can be removed effortlessly and almost without residue.









with protective screw











Precision wall bolts with M8 internal thread

Precision-turned, plane surface exactly perpendicular to the M8 inner thread, hexagon head made of stainless steel.

Bolt for mounting by mortar

- Shaft with threaded grooves
- For bore holes Ø ≥ 14 mm

Description	Order-No.	Euro
Wall bolt Ø12 x **50**, M8 inner thread, hexagon head, stain. steel	**0892.50**	5,50
Wall bolt Ø12 x **60**, M8 inner thread, hexagon head, stain. steel	**0892.60**	6,-

Screw for mounting with dowel (size Ø14 mm)

- For concrete and stone
- Screw into dowel with open-end wrench (SW19) until stop
- Supplied with round head screw with hexagon socket (SW 5) for protection of the M8 thread

Description	Order-No.	Euro
Wall screw Ø12x70, M8 inner thread, hexagon head, stain. steel	**0898**	6,-

NOTE The wall screw with dowel is not recommended for masonry made of brick or hollow block bricks etc.! Modern injection mortars on a 2-component basis have proven to be particularly effective for heavy-duty fastening.

Accessories

Description	Order-No.	Euro
Dowel Ø14x75, for screw-Ø 10-12 mm	**0898.D**	0,84
Allen key SW 5, straight, with plastic handle	**0899.5**	5,-
Masonry drill SDS-Plus Ø14 x 160/100 mm	**0898.B**	11,-

Corner Extension with M8 Inner Threads

Creates a monitoring point clearly visible from all directions

Heat-resistant, sturdy plastic angle bracket for mounting on building corners, rectangular columns, machines, etc.

- 6 holes, Ø6 mm, for screwing on the bracket; can alternatively be mounted with assembly adhesive
- 3 M8 inner threads (top, bottom, front face) for attaching a prism or adapter





Description	Order-No.	Euro
Corner Extension with M8 Inner Threads	**1701**	16,-

INFO Highest precision when used with ball prisms (centering accuracy 0.1 mm); widest sighting range without prism alignment when used with the 540° prism (centering accuracy 2 mm)









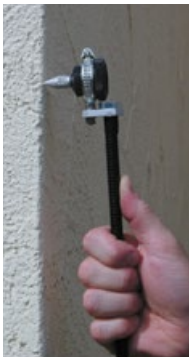


Cadastral & Construction Surveying

C.1. Construction Surveying 96

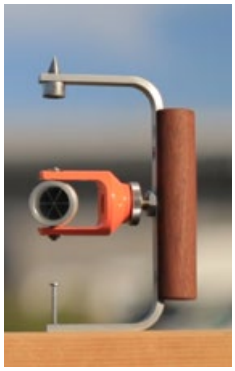
- Precision Prism 17.5 97
- Flex Angle Prism 98
- Prism Goose Neck 99

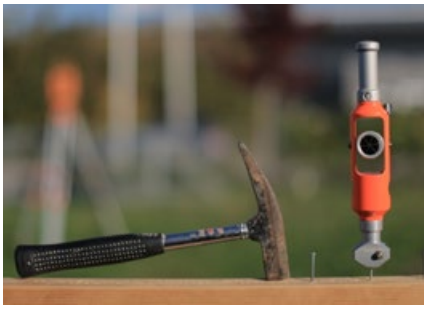




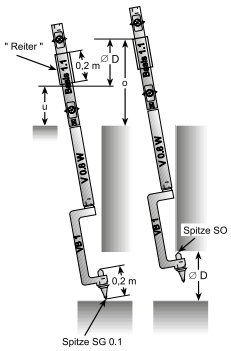

C.2. Batter Boards Tools 100

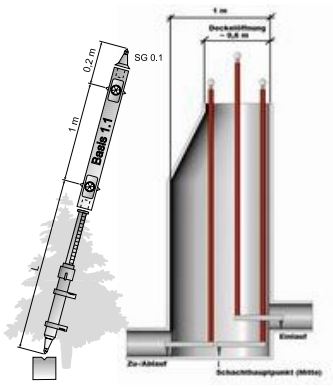
- Pendulum Holder 100
- Prism Nail Holder HIT 101
- Man. Prism Holder 102
- Instrument Holder 103






C.3. Sewer / Manhole Surveying 104








C.4. Height Marker 117





Cadastral & Construction Surveying

C.5. Laser distance meter holder (building lengths) 120



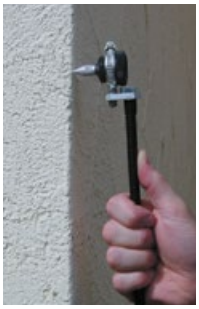
Building / Structure Surveying 1/1

A.8.1. Precision Prism 17.5 & Chamfer Prism Angle 97





A.8.2. Flexible Prism Holder „gooseneck“ 99





A.8.3. Measurements of Building Dimensions 120





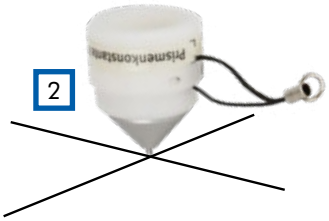

Precision Prism 17.5

For the survey and staking out of points on walls/buildings

Facade points are usually measured without reflectors (laser / direct reflex). If this is not possible or too imprecise (e.g. abrasive cuts), the PP 17.5 can be used. The point to be measured is positioned with the mandrel tip, whereby the distance from the mandrel tip to the visible prism center is only 11 mm. This means that not only measurements in two-person operation can be carried out very precisely. Even in one-person operation, errors due to inaccurate alignment with the total station remain in the millimeter range.

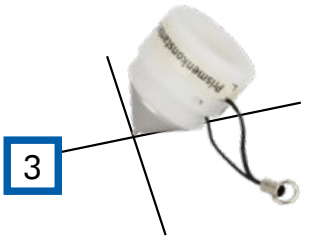
Features of the PP17.5

- Glass prism: Ø 17,5 mm (Grinding accuracy: 2")
- Reflection surfaces: silver mirrored at the back
- Casing: Outer-Ø 22 mm made of anodized aluminium
- The distance from the visible prism center to the mandrel tip is only 11.3 mm
- Range distance measure. Up to over 500 m (depending on device / weather conditions)
- Hardened steel pin as end-piece (no wear ergo no change in length)
- Prism can be inclined by 45° in any direction after being placed vertically on a flat surface and thus aligned to the tachymeter (Figs. 2 and 3)
- **Prism constant K = 0 (Leica = +34,4) mm** (when using the steel tip



Visor and protective cap

- It serves for exact alignment of the prism to the tachymeter.
- If the cap is not exactly aligned with the total station, it covers part of the prism (Fig. 5). If the prism is exactly aligned, the circular front side of the prism is completely visible, and thus points exactly to the tachymeter (Fig. 6)
- Prism can be gripped more securely over the cap (Fig. 1) and is protected against damage and weather influences
- Can be removed to clean the prism (Fig. 4)

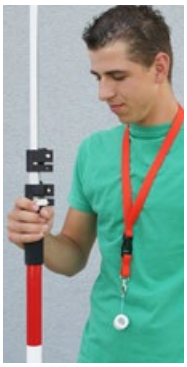








Description	Order-No.	Euro
Precision Prism PP 17.5 – with steel tip, mit visor/protective cap	**1470**	142,-





Carrying strap

Description	Order-No.	Euro
Carrying strap, red	**1390.R**	5,50



Surveying of concrete components and chamfers

Concrete construction elements usually have a chamfer for structural and aesthetic reasons. Their measurement with the tachymeter is often not quite easy, since the constructive edge of the component (intersection of the 2 planes - without chamfer) cannot be stopped exactly with a standard prism.

For these cases we developed the special **holder for concrete components with chamfers SBF.** It can be used for all components with a chamfer width of 20 mm or more and is ideally suited for the positioning of precast concrete elements as well as for the inspection of elements concreted on site.

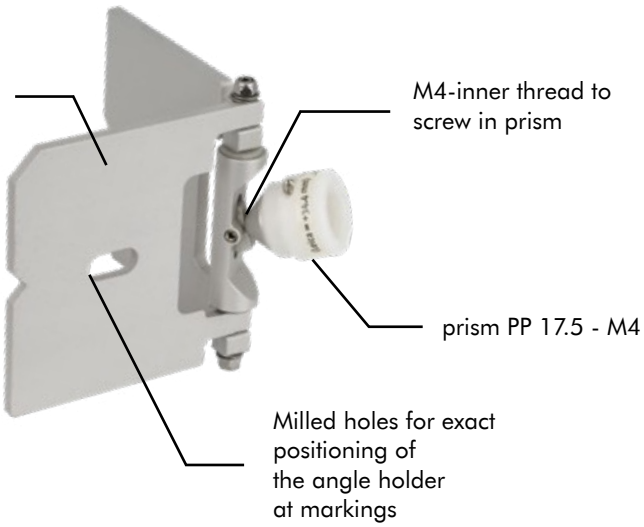


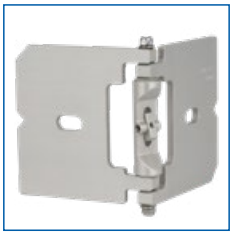
SBF Flexible Prism Holder for Edges

- Two flat aluminium plates, connected by a hinge joint
- Angle holder can be used on all components with a chamfer from 20 mm and adapts to the angle of the component
- The hinge axis lies exactly in the intersection line of the two bearing surfaces
- The precision prism PP 17.5 is screwed into the center of the hinge via an M4 inner thread
- The prism can be rotated in all directions in the carrier, independent of the flex angle, and aligned over a range of 180° to the total station
- Inclination resistance is adjustable
- Weight (without prism): around 250 g



Alignment limits of prism





Description	Order-No.	Euro
SBF Flexible prism holder for concrete chamfers (**without prism**)	**1485**	247,-

Precision Prism PP 17.5 – M4



- Backside: M4 outer thread (stainless steel)
- **Prism constant** if used with SBF flex prism holder: **K = 0 (Leica = +34,4) mm**

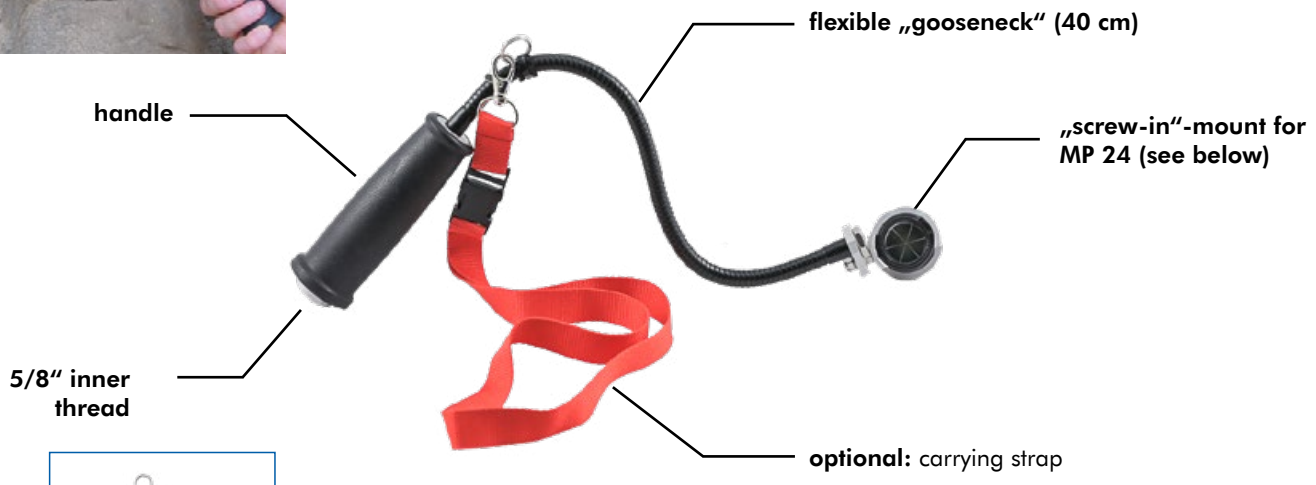
Description	Order-No.	Euro
Precision Prism PP 17.5 – M4 with visor and protective cap	**1474**	142,-

General information about the prism PP17.5 and its protective cap can be found on 97



Flexible Prism Holder „gooseneck“

- Direct measurements of points: Wall surfaces, inner and outer corners
- Flexible gooseneck makes it possible to measure unfavorably located points
- No obstruction of view to the reflector, unlike when holding the prism just between the fingers
- Measurement without application of cross eccentricities / offsets
- Possible use of mandrel extensions





Description	Order-No.	Euro
Flexible prism holder „gooseneck“ (**without prism**)	**0741**	118,-





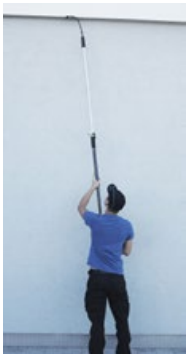
Accessories

Description	Order-No.	Euro
Mini Prism MP24 (26)	**1400**	58,-

Description	Order-No.	Euro
carrying strap, red	**1390.R**	5,50



INFO	Special equipment: Mandrel extensions 27.



Extension

With the 5/8“ internal thread on the bottom of the handle, all poles with 5/8“ external threads can be used as extensions.
With a simple „ProLeica“ adapter, the use of poles with Leica stud connection is also possible (35).

Pendulum Prism Holder (patented)

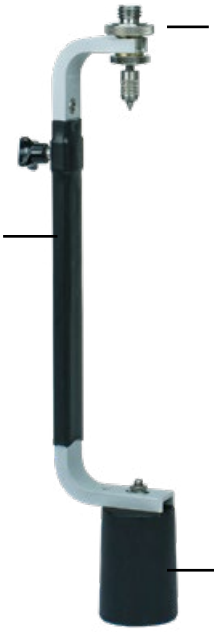
product video

- Suitable for common prisms and reflectors
- Sets itself perpendicular due to its design, after putting it onto the batter boards (directly or mounted on board nail)
- No uncertainties and sources of error of manual holding
- Batter boards stakeout possible without measuring assistant



2

circular level to attach (sold separately)



pendulum head: reflector mount+ marking pin and standing point + integrated nail-bit-shell

- nail-bit-shell is connected to the marking pin and adjustable to hang pendulum holder also safley onto a nail, after a point has been staked out (Fig. 2)
- pendulum head can be removed within seconds from boom to use it separately to hold reflector manually (Fig. 3+4)

pendulum boom
telescopically extendable (20-40 cm), with handle

pendulum weight
1500 g, makes pendulum holder stand up perpendicular



Description	Order-No.	Euro
Pendulum Holder with 5/8“ thread	**0427**	186,-
Pendulum Holder with Leica spigot, Ø 12 x 27 mm	**0437**	186,-



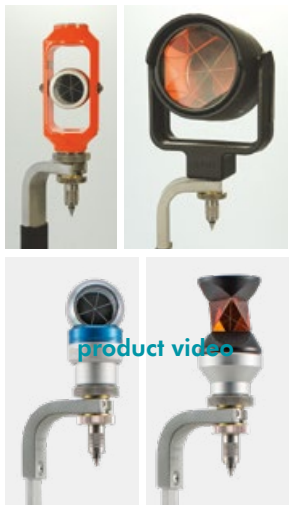


Circular Level

- To mount onto detached pendulum head
- To hold reflectors, which do not have an integrated level already
- When not used level can be stored at pendulum weight (see image)

Description	Order-No.	Euro
Circular Level for pendulum holder / pendulum head	**0140**	21,-

APPLICATION EXAMPLES



Combine: Pendulum Head and Circular Level

- Ideal for measuring up points on the batter boards or on the ground
- For all prisms with 5/8" internal thread or Leica spigot connection
- Ideal for prism holders that have no integrated circular level
- Circular Level can be turned in every direction. Guaranteed optimal visibility of the level even in difficult measuring situations



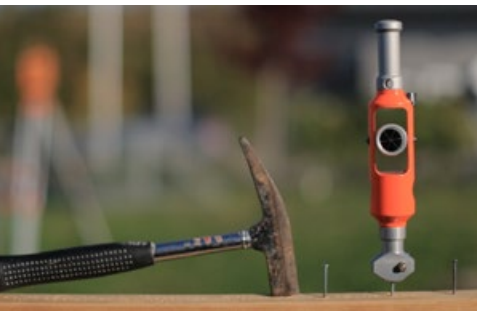
2



3



4



Nail Holder Prism HIT

- Can be used on all batter boards, even when mounted without ground clearance
- Batter boards can be measured without assistant
- The nail to be measured immediately serves as a stakeout point. After correct measurement, the holder is removed – the nail itself remains unchanged at the measured position. A possible identity error is excluded, a further controll measurement unnecessary. After an approximation or auxiliary measurement, the nail can be pulled out of the board at any time together with the prism nail holder and placed elsewhere. Prism can be rotated together with the holder around nail axis and aligned with tachymeter (Fig. 1)
- Since nail and holder HIT form a solid unit during the measurement, the nail is perpendicular to the board even after removing the holder (Fig. 5)
- The nail holder HIT can also be clamped on nails already hammered. Therefore the nail has to have a visible length of at least 25 mm
- Use all nails with a common head from a length of 50 mm up and a Ø of 3,0 mm
- The tilting and standing axes run exactly through the center of the printed target mark or the visible prism center (center-symmetrical point).













- **Hitting-Bolt:** The nail is hammered into the board until the Nail Holder Prism stands by itself (Fig. 3)
- **Circular Level:** Holder is aligned perpendicular with the integrated level (Fig. 4)
- After removing the holder (Fig. 5) the nail is hammered into the board to the desired length, without having to hit directly onto the HIT holder
- **Twist Lock**: The nail is securely fixed exactly in the vertical axis of the prism

Produktvideo

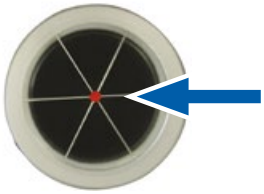
Description	Prism	Prism Constant	Order-No.	Euro
Nail Holder Prism HIT **5/8“**	glass Ø 17,5 mm	**-11,3** (Leica = +23,1) mm	**4610.11**	357,-
	glass Ø 25 mm	**-16,9** (Leica = +17,5) mm	**4610.17**	357,-
	glass Ø 25 mm	**-30** (Leica = +4,4) mm	**4610.30**	383,-
	glass Ø 25 mm	**-34,4** (Leica = 0) mm	**4610.34**	399,-
	glass Ø 25 mm	**-35** (Leica = -0,6) mm	**4610.35**	399,-



Prism constant K = 0 (with reflective foil)

Description	Prism Constant	Order-No.	Euro	Euro
HIT, with reflective foil 26 x 26 mm, **5/8“**	**0** (Leica = +34,4) mm	**4615.0**	267,-	267,-

MORE OPTIONS N

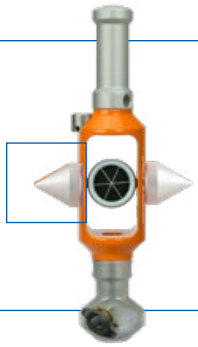


Tilting axis cones

- see s. page 22

Red marked prism center

- see s. page 22





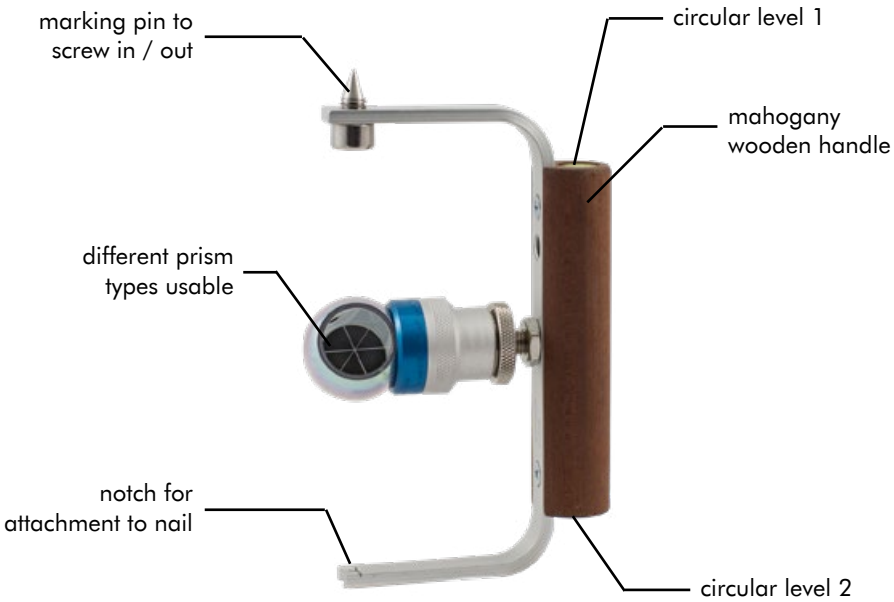




Manual Prism Holder

product video

- **One** holder to stakeout (Fig. 1 and 2) **and** control (Fig. 3) the batter board nails
- Interchangable marking pin
- Compact and lightweight design
- You are able to use **prism constants of your choice**
- Cardan suspension of prism: After putting the reflector holder onto the batter board, the prism can be aligned to any instrument standpoint without having to also rotate the support shaft





Type T

Special holder for prism / holders with 5/8"internal thread and 50 mm tilting axis height. For example:

- HIP-U with integrated mini prism/reflective foil (23)
- ONRT 50 with mini prism MP24 or reflective foil (26)
- Ball prism base 5/8" (70) + ball prism (62)

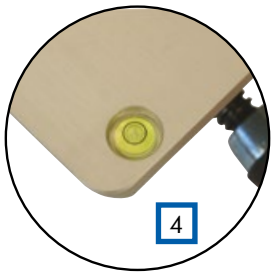


Description	Order-No.	Euro
Manual Prism Holder Type T (without prism), 5/8"	**0530**	108,-

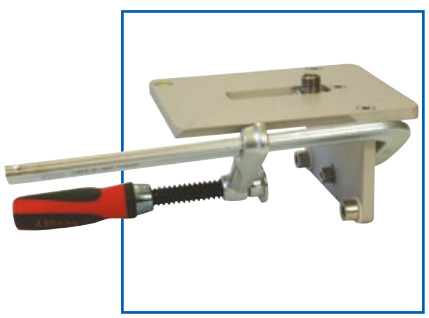












Instrument Holder

With automatic centering over the axis nail.

With the holder, any measuring instrument with 5/8" thread can be fixed quickly and stably on the batter board.

The holder consists of a base plate for the instrument and a clamping device. Both are screwed to each other and form a unit.

With the clamping device, a high-performance screw clamp, the holder can be attached to planks, boards or battens - extremely **fast and stable**.
When installing the holder over a vertical axle nail, an automatic centering takes place due to its design.
Of course clamping can be done on the batter boards without an axis nail. Due to the large span of the screw clamp of up to 190 mm, the surveying possibilities are almost unlimited.





Handling

- Open screw clamp
- Mount holder on axis nail. By doing so the cross slide with the central bore of the 5/8" thread is slipped over the axis nail (Fig. 1+2)
- Tighten screw clamp. A circular level in the base plate allows a rough pre-horizontal alignment of the holder (Fig. 3+4). Since the cross slide can „move freely" along a long-hole, no force is exerted on the axis nail when tightening the clamp.
  Screw the instrument tribrach onto the 5/8" thread of the holder (Fig. 5). For devices without a separate tribrach they are screwed on directly
- Leveling the surveying instrument
- The instrument sits ready to measure, stable and nicely centered over the axis nail
- When dismounting, proceed in reverse order: First unscrew the instrument, then release the screw clamp and then remove the holder.
  If a separate tribrach is used, it does not have to be unscrewed completely from the holder, but a slight release of the tribrach screw connection is necessary before the screw clamp is opened

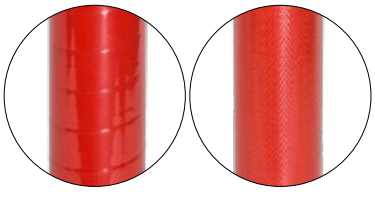
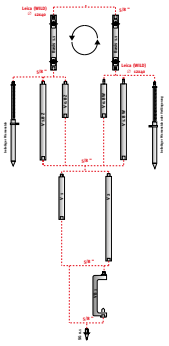
Technical Data

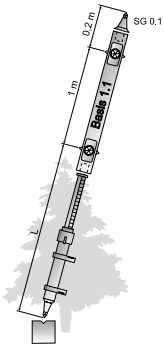
- 5/8" external thread centeres over the axis nail on planks, battens and squared timbers etc. over a range of 60 mm width
- To use with nails with max. head-Ø 9,5 mm
- Dimensions: 300 x 180 x 100 mm (incl. screw clamp)
- Total weight of the holder No. 805: around. 2,1 kg

Description	Order-No.	Euro
Instrument Holder (5/8"), max. span: **190 mm**	**0805**	205,-

V.1. Vektor System Information 105

- Description and application possibilities
- System overview
- Material differences and accessories



V.2. Base with integrated prisms and extensions 110

- Base with integrated prisms
- Extensions
- Tip




V.3. Accessories for Vektor System 112

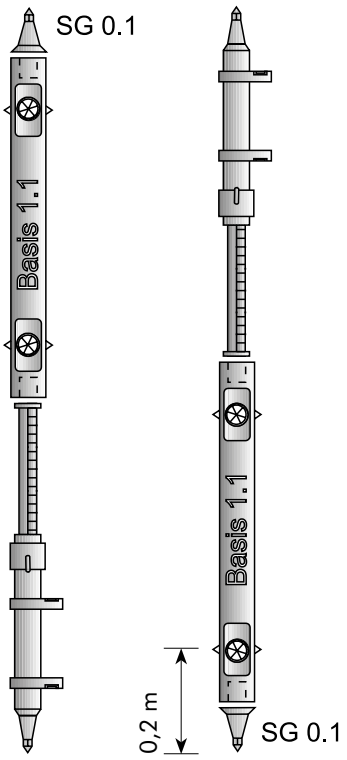
- Transport bag
- Measuring bracket
- Bipod
- Circular level
- Rider
- Base extension (3rd prism)



V.4. Accessory: Boom (eccentric) 115

- General
- Height determination of manhole points
- Determination of pipe diameters





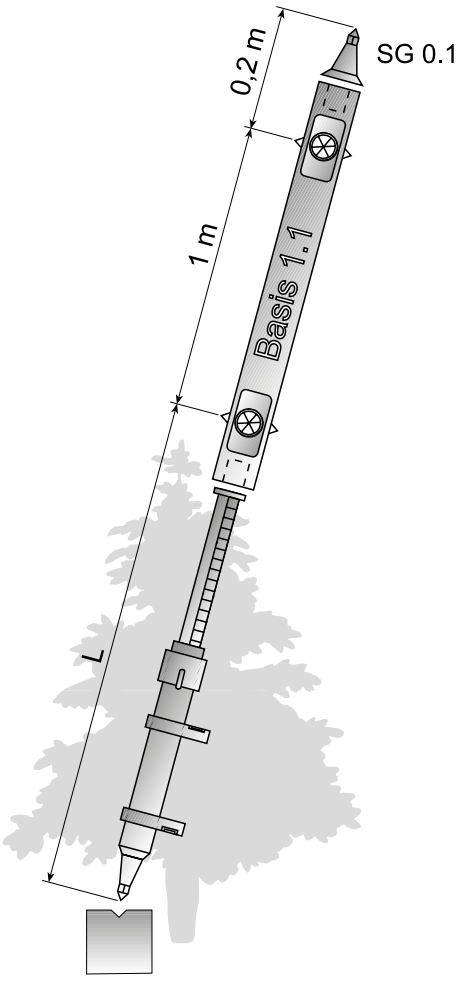
Lage I **Lage II**

Vektor Base as attachment for standard prism pole

The **1.1 base** can be used on standard prism poles with 5/8" thread. In some cases, an adapter is necessary so the scaling on the prism pole indicates the correct height up to the lower prism („Lage I"). For the height of the upper prism 1.00 m has to be added.

Without an adapter, the **1.1. base** can be used on prism poles with Leica spigots Ø12 x 40 mm.

For targets close to the ground, the combination is rotated „up-side-down" 180° („Lage II"). Then the base must be equipped with a tip SG0.1 and the prism pole with a double level. The lower prism has a target height of 0.20 m and the upper one of 1.20 m.



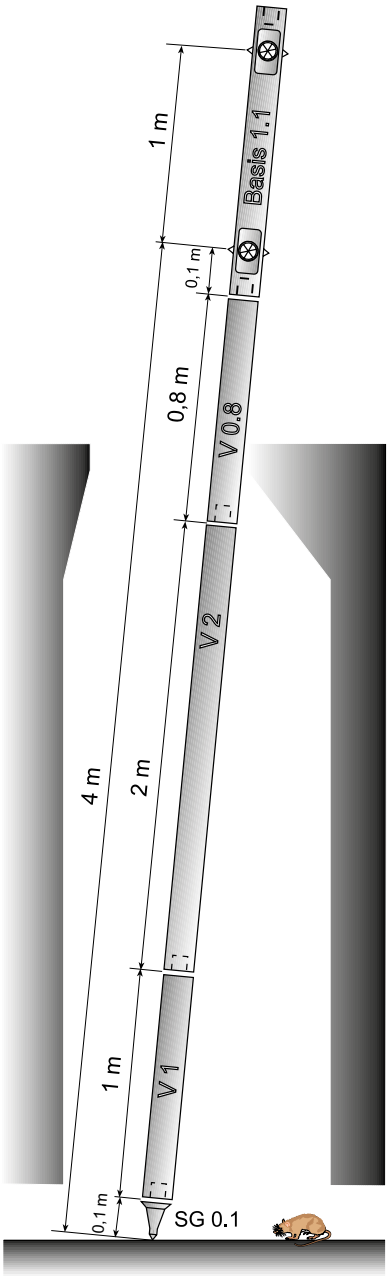
Vektor Base with prism pole for measuring hidden points

The combination vector base + standard prism pole is also ideally suited for measuring hidden points.

The coordinates X, Y, Z of prisms 1 and 2 are determined tachymetrically. With the target height L (reading at the scale of the standard prism pole) the 3-D coordinates of the hidden point can be calculated. The prism pole can be inclined at any angle. Only the tip must lie on the object point P and the two prisms must be aligned with the tachymeter. Of course, the position of the prism pole must not be changed between the measurement of prism 1 and 2.

This makes the use of a tripod mandatory **(tripod s. page 114).**

They can be used wherever points are difficult to access or a prism cannot be held upright, e.g. object points hidden by obstacles, inside corners of rooms, eaves heights, etc.
The point to be measured can be targeted both in „Lage I" and in „Lage II", whereby „Lage II" in particular allows very precise coordination due to the short length of L = 0.2 m.



Vektor System as manhole and sewer pole

The principle of the operation is the same as for the measurement of hidden points. But when measuring „manhole depth points“ (channel bottoms, inlets, etc.), the use of normal prism poles as extensions is no longer sufficient.

Commercially available telescopic prism poles with several pull-outs have the following disadvantages:

- High weight
- Length often not sufficient
- Unstable (sag too large)
- Clamping between the individual telescopic parts too unsafe
- Scale too inaccurate
- No possibility to determine pipe diameters

All these disadvantages do not occur with the **extensions V of the Vektor system**. Due to the outstanding characteristics of the carbon fibre pole, an extension up to more than 6 m is easily possible.

Basically all system parts are connected with 5/8“ threads.

Only the connection of the base to the first extension V0.8 W or V1.8 W takes place on the side with the Leica socket Ø12 x 40 mm.
It is required when using the measuring bracket (see next page); all other sections are again screwed together with 5/8“ threads.

The combination base 1.1 + extension V0.8 + tip SG 0.1 has a usable length of 1 m (= distance lower prism to pole tip). With the V1 and V2 extensions, it can be extended **in full 1 m or 2 m steps as required.**

EXAMPLES

Base 1.1 + 4 m extension Carbon (V08Z, V2, V1, SG 0.1):
Weight around 2,8 kg

Base 1.1 + 4 m extension hybrid material -Carbon/GFK- (V08Z, V2, V1, SG 0.1):
Weight around 3,1 kg



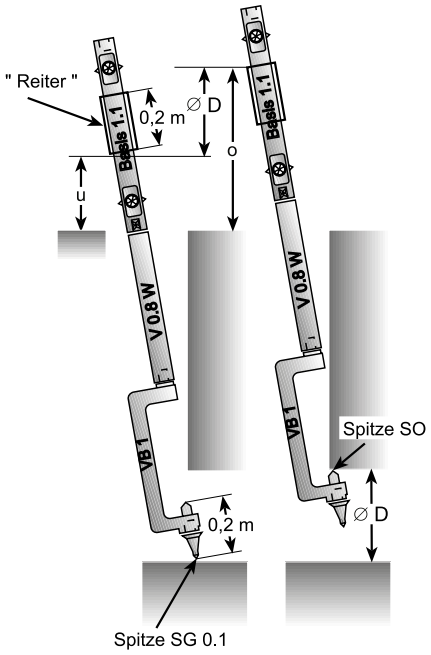
Additional determination of pipe diameters with the use of a measuring bracket VB1

Often all channel data could be measured without going down the manhole if the determination of the nominal diameters of the sewer and the inlets would be possible from above.

This problem is solved by the measuring bracket VB1:

- Can be screwed onto extensions V0.8, V1 or V2 with 5/8" thread
- Extremely light and rigid due to carbon fibre construction and aluminium profile
- Additional tips SO for measuring pipe apexes

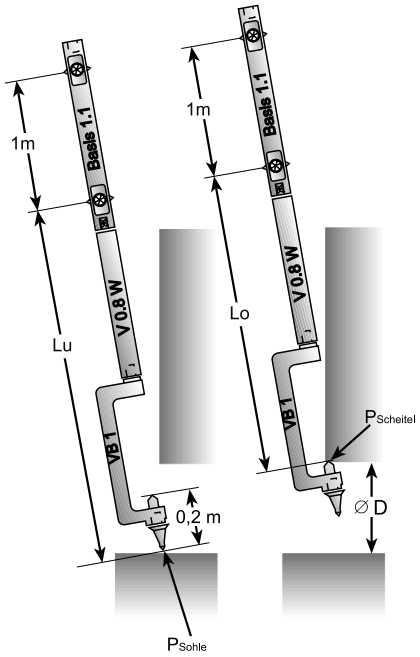
The internal diameter D can be determined for pipes with **D > 0.2 m**.
This is possible in 2 ways:



1. Measurement of pipe diameter D on site

(The base 1.1 W is equipped with a „slide", a 20 cm long plastic sleeve that can be moved between the two prisms).

a.) Placing the canal measuring pole on the pipe bottom with tip **SG 0.1**.
---> Reading the vertical distance **u** of Slider **bottom** edge up to reference level (street) with pocket rule or tape measure. To do this, the Slider is moved to a „round" dimension for easier calculation. (for example 0.9 m).
b.) Mount the sewer measuring pole with **tip SO** at the apex of the pipe.
---> Reading the vertical distance **o** of Slider **top** edge up to reference level (for example 1.3 m).
c.) pipe diameters **D = o-u** (for example D = 1.3 m - 0.9 m = 0.4 m).



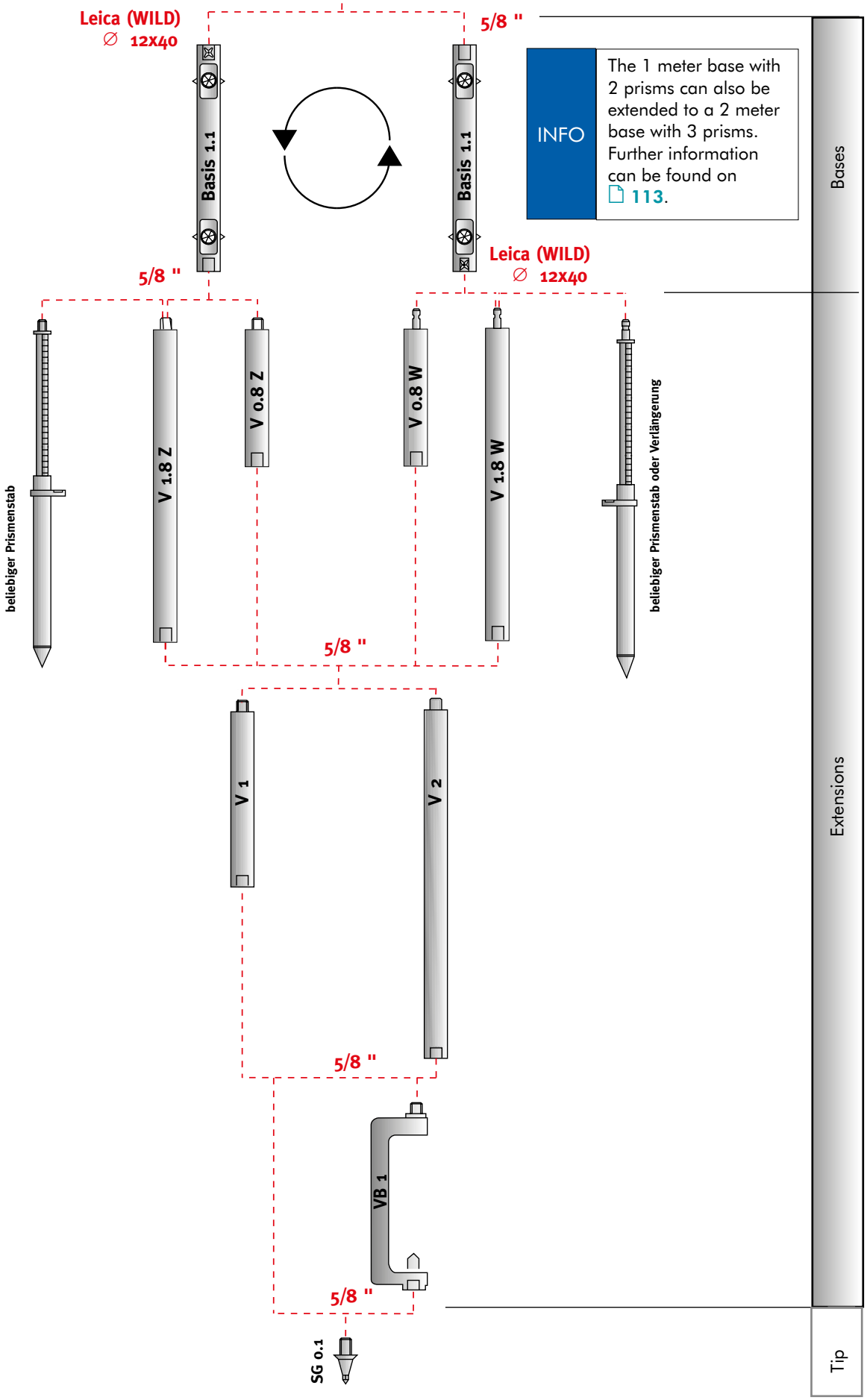
2. Determination with tachymeter

a.) Mount the sewer measuring pole with **tip SG 0.1** at the apex of the pipe.
---> Calculation of coordinates X, Y, **Z** of point P_{Sohle} by measuring prism 1 and 2 and input of the extension dimension L_u (z. B. L_u = 2 m).
b.) Mount the sewer measuring pole with So at the apex of the pipe.
---> Calculation of coordinates X, Y, **Z** of point $P_{Scheitel}$ analog point P_{Sohle} by input of the extension dimension of $L_o = L_u$-0,2 m (example: L_o = 1.8 m).
c.) Pipe diameter **D = $ZP_{(Scheitel)}$ - $ZP_{(Sohle)}$**

In order to align the base with the synchronously tiltable prisms independently of the VB1 measuring bracket on the total station, a sensible use of the measuring bracket is only possible in combination with the base 1.1 W + V0.8 W or V1.8W (Leica spigot).

Between the extension V0.8 W / V1.8W and the measuring bracket VB1 any extensions V1 and V2 can be added (5/8"-thread).

System Overview





Material and Characteristics

The bases and extensions of the Vektor system are available in two different materials. Vektor bases (element with two integrated prisms) will be available only in carbon/glass fibre hybrid material from mid-2024 on.

Composite: 100 % carbon fiber (carbon, CFK)

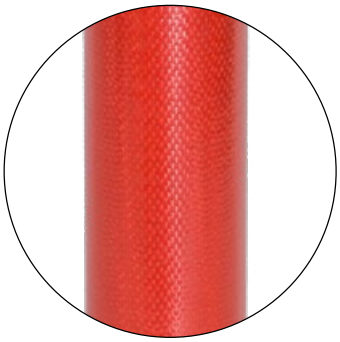
- Outer-Ø 44 mm, Inner-Ø 40 mm
- Unrivalled light (around 40% lighter than aluminium)
- High bending stiffness
- Not permanently deformable (100% resetting to original shape even after extreme stress)
- Around 100 times lower coefficient of expansion than aluminium (temperature)
- No corrosion
- Pleasant handling even in cool weather conditions
- New since 2017: impact-resistant, wrapped cover, signal red
- All extensions are waterproof
- Thread and thread inserts made of stainless steel
- 100% Carbon as base material



Hybrid: Carbon-/Glass fibre (CFK/GFK)

Properties of the hybrid material same as the poles which are made of 100% carbon, but:

- Slightly higher weight (nevertheless approx. 15% lighter than aluminium)
- Red outer layer
- Lower material price



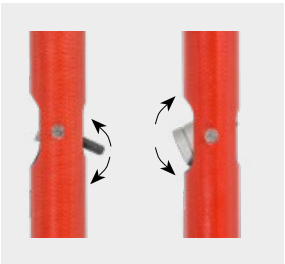
INFO	As of (estimated) mid-2024, Vector bases will only be offered as hybrid carbon/fiber designs. The extensions (2 m, 1.8 m, 1 m, 0.8 m) will continue to be available in full carbon material though.

Special features of the prism base

Synchronous tilting of the two prisms

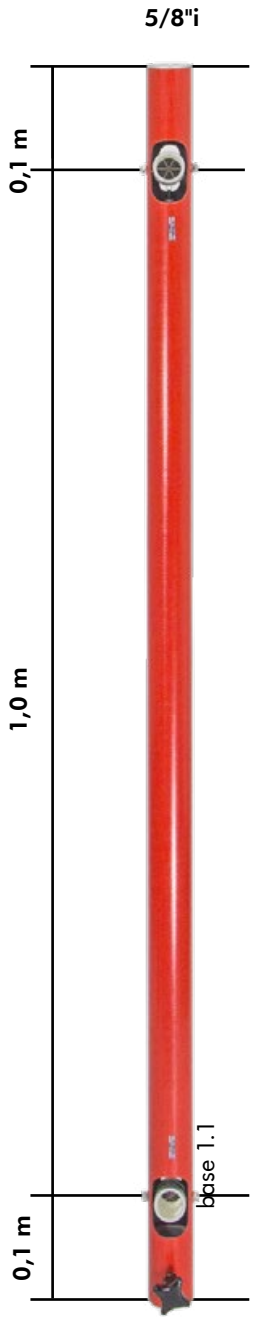
The tilting takes place either:

- With a rocker arm at the back (prism constant K = -11,3 and -16,9 mm)
- Or by using the prism housing (prism constant K = -30, -34,4 and -35 mm)



Red marked prism centers





Leica
Ø12 x 40 mm

Prism base for the Vektor System

- Prism body fully integrated in pole body
- Inserts made of aluminium, internal thread 5/8“ made of stainless steel
- All glass prisms Ø 25 mm (except prism constant -11,3 mm: Ø 17,5 mm)
- Prisms equipped with red marked prism centre (see previous page)

INFO	For all constants, the tilting and vertical axis runs through the red marked visible prism centre (centrally symmetric point).

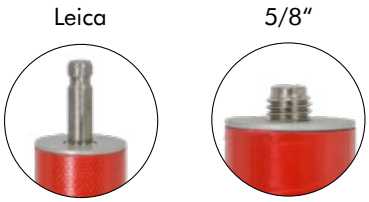
2 connections: Leica socket & 5/8“ inner thread

The base can be put onto the extension V0.8W or V1.8W with the spigot connection. It is secured with a horizontal screw with star grip.
If you turn the base around you alternatively can use the 5/8“ inner thread.

Vektor Base 1.1				
Material	approx. Weight	Prism Constant K	Order-No.	Euro
Hybrid Carbon / GFK	870 g	**-11,3** (Leica = +23,1) mm	**3004.11**	987,-
	870 g	**-16,9** (Leica = +17,5) mm	**3004.17**	987,-
	870 g	**-30** (Leica = +4,4) mm	**3004.30**	1.040,-
	870 g	**-34,4** (Leica = 0) mm **-35,0** (Leica = -0,6) mm	**3004.34**	1.050,-

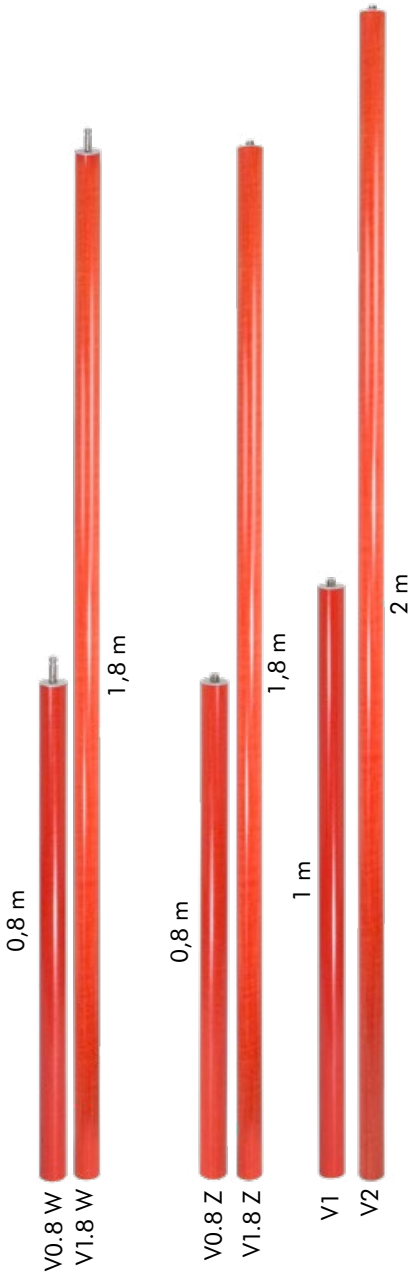
INFO	As of 2024, Vector bases will only be offered as hybrid carbon/fiber designs. The extensions (2 m, 1.8 m, 1 m, 0.8 m) will continue to be available in full carbon material though.





Extensions

All extensions have a 5/8“ stainless steel thread at the top and a 5/8“ female thread with stainless steel insert at the bottom. Exceptions are V0.8 W and V1.8 W, which have a stainless steel spigot Ø 12 x 40 mm at the top.



First extension

The first extension of the base is 0.8 m or 1.8 m long. Together with the 0.1 m at the base and the top (0.1 m) results in a full m-amount.

INFO

All extensions longer than 1 meter are considered as oversized by the carrier. Therefore, the shipping costs are unfortunately € 30 extra. These will be listed on the order confirmation.

When using the Leica socket of the base

Description	Material	Weight	Order-No.	Euro
Extension **V 0.8 W** Length = 0.8 m	Carbon	450 g	**2014**	354,-
	Carbon / GFK	490 g	**3014**	238,-
Extension **V 1.8 W** Length = 1.80 m	Carbon	810 g	**2054**	574,-
	Carbon / GFK	890 g	**3054**	344,-

When using the 5/8" inner thread of the base

Description	Material	Weight	Order-No.	Euro
Extension **V 0.8 Z** Length = 0.80 m	Carbon	450 g	**2012**	354,-
	Carbon / GFK	490 g	**3012**	238,-
Extension **V 1.8 Z** Length = 1.80 m	Carbon	810 g	**2053**	574,-
	Carbon / GFK	890 g	**3053**	344,-

Further extensions in m-steps

Description	Material	Weight	Order-No.	Euro
Extension **V 1** Length = 1,00 m	Carbon	500 g	**2051**	392,-
	Carbon / GFK	600 g	**3051**	254,-
Extension **V 2** Length = 2,00 m	Carbon	940 g	**2052**	619,-
	Carbon / GFK	1020 g	**3052**	361,-



Tip

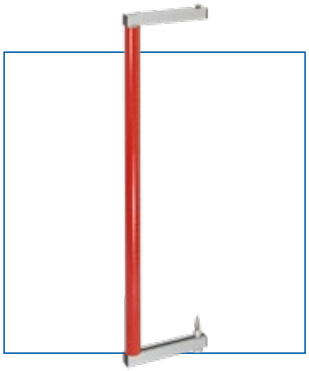
Aluminium turned part with V2A base and hardened tip.
Effective length: 10 cm (without 5/8“ thread).

Description	Order-No.	Euro
Tip **SG 0.1** (around 120 g)	**2050**	43,-

Accessories for System VEKTOR

Measuring bracket VB1

For the determination of pipe diameters



Application description s. page 107.
Bracket arm made of aluminium profile. Additional tip for apex made of aluminium/stainless steel. Length 1.00 m. Including Slider No. 2056 (see belo

Description	Order-No.	Euro
Measuring bracket **VB 1 Carbon** (around 1100 g)	**2055**	537,-
Measuring bracket **VB 1 Hybrid** - Carbon/GFK (around 1250 g)	**3055**	396,-

INFO

When using the VB1 measuring bracket, it is necessary to use a extension 0.8 m or 1.8 m **with Leica connection/spigot** 111



Slider

For use at the base for the determination of pipe diameters s. page 107 Plastic sleeve with Velcro fastener. Length 0.2

Description	Order-No.	Euro
Slider for Vektor base	**2056**	15,-

Transportation bag for Vektor poles

For transport and storage of Vektor equipment; for pole lengths up to 8 m.
Durable synthetic fibre material with 4 separate storage compartments.
Dimensions: 2.20 m x 0.40 m



Description	Order-No.	Euro
Transportation bag TTV	**2010**	92,-



Base-Extension / 3. Prism

Extension of a 1-m-Base with 2 prisms to a 2-m-Base with 3 prisms

The base extension 1.0 W is connected to the standard base 1.1 W with the Leica stud bolt (spigot) connection Ø12x40 mm. The result is a 2-m-base with 3 prisms, with a spacing of 1000 mm between prisms.
The base extension 1.0 W also has a Leica stud mounting socket at the bottom, so that only the V 0.8 W or the V 1.8 W can be used as the 1st extension. All other extensions are then made as usual with a 5/8" thread.

- Top connection: Leica spigot Ø12x40 mm
- Bottom connection: Leica stud mount (socket)
- Manual prism tilting adjustment (**s. page 109**)

Please ensure that identical prism constants of base and extension are used.

Base-Extension 1.0 W				
material	approx. weight	prism constant K	Order-No.	Euro
Mixed material Carbon / GRP	720 g	**-11,3** (Leica = +23,1) mm	**3009.11**	709,-
	730 g	**-16,9** (Leica = +17,5) mm	**3009.17**	709,-
	740 g	**-30** (Leica = +4,4) mm	**3009.30**	735,-
	750 g	**-34,4** (Leica = 0) mm **-35,0** (Leica = -0,6) mm	**3009.34**	740,-

INFO	A 2-m base with 3 prisms can be extended by an additional prism in 1-m increments with further extensions.



Universal strut bipod with quick connector



2-legged stand for:
- Prism poles
- GNSS antenna pole
- Sewer poles (for example Vektor)

Advantages

- Clamping connection for all poles with diameters from 32 to 50 mm
- The strut bipod can be clamped to the pole in seconds
- No complicated and time-consuming „insertion“ of the pole from above
- Telescopic legs and ball head for easy vertical positioning even on uneven ground
- Reliable mounting of inclined poles, e.g. prism pole Vektor when used as sewer measuring pole
- Sturdy lightweight aluminium construction with red warning paint and entry surfaces



Description	Order-No.	Euro
Universal strut stand, 2 telescopic legs, quick connection	**2095**	315,-

INFO	All extensions longer than 1 meter are considered as oversized by the carrier. Therefore, the shipping costs are unfortunately € 30 extra. These will be listed on the order confirmation.

Circular level Vektor System

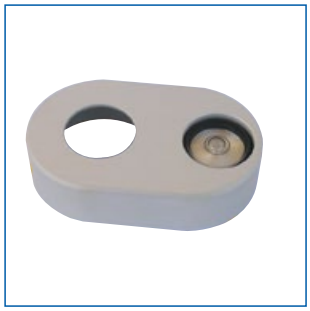


General information:
With the insertion circular level, the universal prism pole Vektor can be used vertically for further applications:
- Prism pole with large reflector heights
- Antenna pole for GPS measurements with high antenna height

The prism base can also be dispensed and only Vektor extensions can be used. The big advantages of the Vektor System, **-light, sturdy, precise-** are also fully effective in this application.

If desired, an extension can be adapted in length to your antenna type, so that the antenna height is always exactly round m values. Reading errors, as they can occur with telescopic slides, are thus ruled out.

Setup:
The circular level is embedded in a stable, adjustable aluminium housing. It can be used between any 5/8“ screw connection of the Vektor system. Large contact surfaces ensure an exact connection to the vector pole.

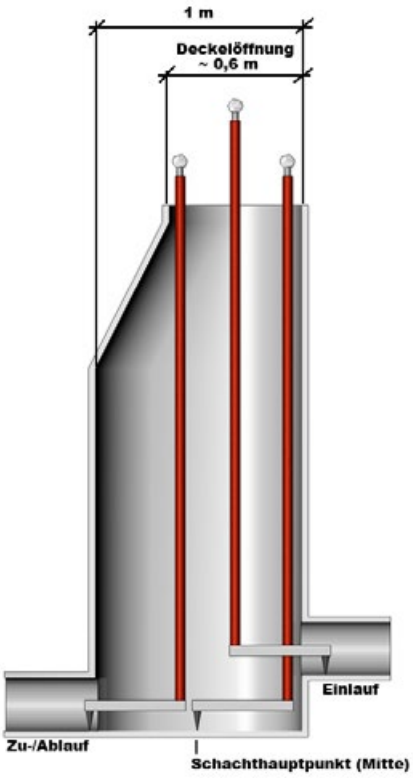


The technical features of the circular level itself:
• Metal casing with 20 mm diameter
• Ground glass with 10‘ accuracy

This allows accurate measurements even with large prism or antenna heights.

Description	Order-No.	Euro
Insertion ciruclar level EDL 10‘	**2040.10**	74,-

Boom (eccentric) for Sewer / Prism poles



The position and height of the shaft points are determined by ordinarily with a sewer pole. When using our Vektor system s. page 110 the pole stands inclined in the shaft, the two prisms of the base are measured and the software calculates the coordinates of the pole tip after entering the extension length.
With the help of the measuring bracket VB1 pipe diameters of outlets and inlets can also be determined.

If the position of the manhole is already known, it may be necessary to determine or check the heights of points in the shaft. The described use of the 2-prism method is not absolutely necessary for this.

Height determination of manhole points with boom

With our boom and the help of vertical poles points in the manhole can be determined in height (not in position though).

For example, with a set boom length of approx. 45 cm, all points of a normed manhole DN 1000 can be measured (see sketch).

The point height itself can be determined in various ways (also depending on the accuracy requirement):

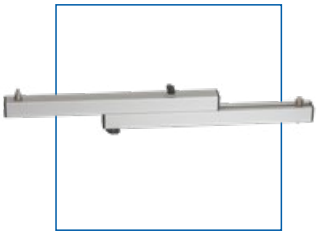
- Reading of the cut-off dimension at the top edge of the lid opening (lid height must be known)
- Measurement of a prism mounted onto the pole by a total station (input of the pole length as reflector height)
- Determination with a GNSS antenna mounted on the pole (taking into account the pole lengt



Can be used on all poles with a removable 5/8" tip

- Poles with 5/8" female thread at bottom and tips with 5/8" male thread, e.g. system Vektor

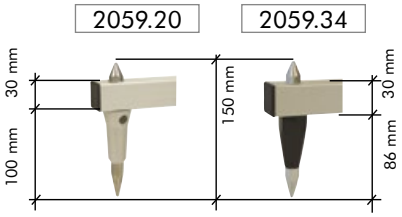
- Poles with 5/8" male thread at bottom and 5/8" female thread tips, e.g. many prism poles

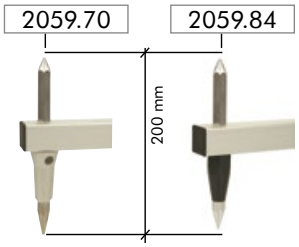


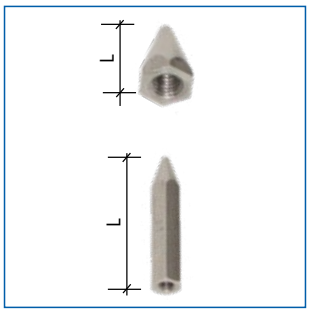
Setup & Features

- Can be used on all poles with removable 5/8" tip
- Sturdy profile made of anodised aluminium
- Telescopic from 0.38 m to 0.60 m, continuously variable (stepless)
- M8 stainless steel male thread centrically above the tip for screwing on the optional upper tip (see next page)
- Weight: 850 g

Description	Order-No.	Euro
Boom (eccentric) for determining the sewer / inlet height, 5/8"	**2058**	146,-







Determination of pipe diameters

Another feature is the determination of pipe diameters (nominal widths) from 15 cm. This requires a 2nd tip pointing upwards, which is available as an option.

Upward Tip

- Stainless steel hexagon, for mounting with wrench SW13
- M8 internal thread for screwing onto the extension arm / boom

Depending on the minimum diameter from which inlets are to be determined, the corresponding length of the **upper tip** must be selected so that a round distance measure between the two tips results.

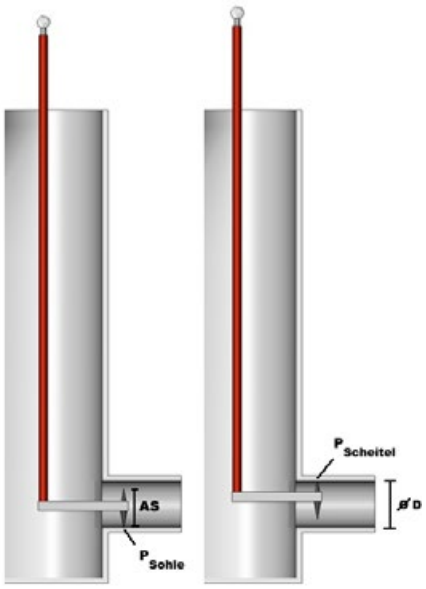
Length of the bottom tip: 50 mm (Order-No. 1859.100)
86 mm with prism pole S10
100 mm with Vektor System poles

Description	when length of the lower tip is	distance AS between upper and bottom tip	Order-No.	Euro
upper tip L = 20 mm	50 mm	100 mm	**2059.20**	14,-
	100 mm	150 mm	**2059.20**	14,-
upper tip L = 34 mm	86 mm	150 mm	**2059.34**	15,-
upper tip L = 70 mm	100 mm	200 mm	**2059.70**	18,-
Obere Spitze L = 84 mm	86 mm	200 mm	**2059.84**	19,-

The distance AS from lower to upper tip is the smallest measurable tube diameter.

Measurement methods

With vertically standing pole



1. Determination of the difference via the two measured points $\mathbf{P}_{Sohle}$ and $\mathbf{P}_{Scheitel}$

D = measurment point P_{Sohle} - measurment point $P_{Scheitel}$ + distance AS

2. Determination of the heights (Z-coordinates) of point $\mathbf{P}_{Sohle}$ and $\mathbf{P}_{Scheitel}$ with the tachymeter by means of a prism attached to the pole.

3. Determination of the heights (Z-coordinates) of point $\mathbf{P}_{Sohle}$ und $\mathbf{P}_{Scheitel}$ with the help of a GNSS antenna mounted on the pole.

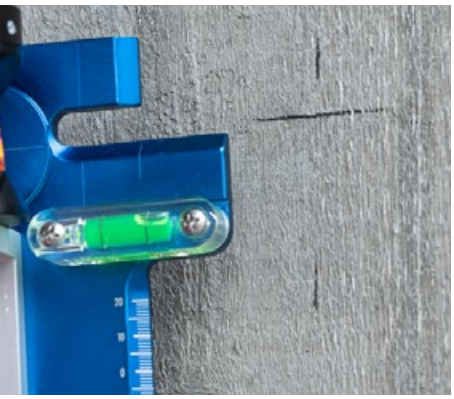
Please note for 2. and 3.: The target height of the measurement $\mathbf{P}_{Scheitel}$ is different from the measurement $\mathbf{P}_{Sohle}$ and the distance of **AS** lower.

The pipe diameter D is then calculated according to the following formula:
D = height $\mathbf{P}_{Scheitel}$ - height $\mathbf{P}_{Sohle}$

D = height P_{Sohle} - height $P_{Scheitel}$

















Marker PtW for tachymetric height transfer

For marking the reflector height on vertical objects (walls, luminaire masts, etc.)

Height information in engineering surveys (e.g., meter marks) can be carried out using leveling or tacheometry.Tachymeters with automatic target tracking enable one-person operation (tracking mode).

With our Klimax 140, very precise height measurements using tacheometry are possible (e.g., meter marks). A disadvantage of the Klimax solution is the relatively small point used to mark the height. Drawing a horizontal line through the point must be done in an additional step. Additionally, the Klimax can only be used with the ball prism and not with prisms that the customer already has in their inventory.

Precision

With the PtW (Prism to Wall), the heights of almost any prisms can be easily transferred to vertical objects. There are differences in the accuracy and in the targeting option of the prisms. Single prisms with storage at the central symmetrical point, such as our ball and HIP prisms, exhibit centering and aiming accuracies of less than 0.5 mm. A disadvantage of these single prisms is that when measuring with tracking total stations, the prism must always remain aligned with the instrument.
For RUNDUM or 360° prisms, this is inherently provided due to their design. However, they only have a centering or aiming accuracy of up to 2-3 mm.

Due to the short distance of the prism, it is not necessary to plumb the PtW perpendicular to the wall. The same way if used on streetlight poles.
Inaccuracies that may occur due to slightly conical poles can generally be disregarded, as lower precision is required in this case..

Application of Height Marker Tool

- For tachymeters with automatic targeting/tracking (AutoLock, ATR, etc.), targeting is always performed on the visible prism center. To get a correct result, set target height set ‚zero'.
- In tracking mode (one-person operation), continue moving until the prism is at target height.
- Adjust the Tube level to the height with a line on the horizontal edge.
- From September 2026, a screw-on edge extension will be included as standard. This allows a scribe line long enough that standard measuring marks can be aligned on both sides of it. (Older versions cannot be retrofitted.)

Structure and Advantages

- Basic construction 120x100x9 mm made of anodized aluminium.
- Tube level for horizontal alignment of the marker on the wall. Horizontal edge for marking the height with a line on the wall/at the pole. Possibly a line on the vertical edge for additional identification of the height marking.
- M8-internal thread for screwing in an M8-ball base or a centering plate.
  Since the horizontal edge runs through the axis of the M8 thread, using a ball prism is the most precise method.
- Easy mounting option of adapter for using of holder with many other commercially available single and 360° prisms (Leica connection, ¼'', 5/8'')".
  The prism centers are always aligned with the height of the axis of the M8 thread or the horizontal edge due to the design.

Description	Order-No.	Euro
PtW: Height Marker Tool, M8 internal thread, with extension piece	**2822**	192,-



adapter for
Standard prisms
see the next Page





PtW Adapter for Prisms





- For all prisms with Leica-socket (System height 60 / 86 mm)
- Leica bolt Ø12x40 mm optionally mountable with a distance of 40 or 60 mm from the prism's vertical axis to the PtW.
- A cross screwdriver is required for mounting on the PtW and for changing the Leica bolt



Description	Order-No	Euro
PtW-Adapter Leica	**2823.L**	48,- €





- For all prisms with 5/8'' - Internal thread and Center height 50 mm
- 5/8'' - Knurled screw without height adjustment rotatable around the axis, adjustable Rotation resistance
- Optionally mountable with a distance 40 or 50 mm from vertical axis prism to PtW or mounting on the PtW and for changing of 5/8'' - A cross screwdriver is required for the position of the knurled screws

Description	Order-No.	Euro
PtW-Adapter 5/8''	**2823.58**	48,- €





- ¼''-External thread for screwing on the 360° prism BO medium format
- With an adapter, also usable with the Leica 360° mini prism GRZ101 (see below)
- Distance 30 mm from vertical axis prism to PtW
- A cross screwdriver is required for mounting on the PtW

Description	Order-No.	Euro
PtW-Adapter 1/4''	**2823.14**	38,- €





- For maintaining the correct height when using the PtW adapter ¼'' No. 2823.14
- Incl. Screw ¼'' x 19 mm, which must be used instead of the ¼'' standard screw For mounting on the PtW is required on cross screwdriver , for changing the ¼''-screws a slotted screwdriver

Description	Order-No.	Euro
PtW-Adapter 1/4'' for Leica GZR101	**5666**	28,- €





- For HARDCore prisms with M8 - Internal thread and Center height 25 mm
- A cross screwdriver is required to screw on L-carrier

Description	Order-No.	Euro
PtW-Adapter 5/8''	**2823.58**	48,- €











Using of PtW with different prisms

PRISMS



Different Prism const. | 62



Different Prism const. | 26



Different Prism const. | 23



No. 5693.58 | € 610,- | 8



LEICA MPR122



No. 5670 | € 336,- | 14



5665 | 390,- | 14



LEICA GRZ101



No. 5693.M8 | € 520,- | 8



Different Prism const. | 26



Different Prism const. | 24



LEICA PRISMEN
With tilt axis height = 86 mm



LEICA PRISM
With tilting axis height = 50 mm

ADAPTER



No. 1433.M8 | € 132,- | 160



No. 1443 | € 44,- | 162



No. 1466.08A | € 54,- | 70



No. 1558.58 | € 51,- | 70



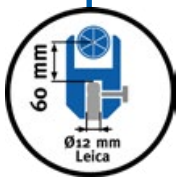
No. 5676 | € 37,- | 14



No. 5668 | € 154,- | 17



No. 5666 | € 28,- | 17





No. 0692 | € 50,- | 39

L-ADAPTER



No. 2823.58 | € 48,- | 118



No. 2823.14 | € 38,- | 118



No. 2823.M8 | € 48,- | 118



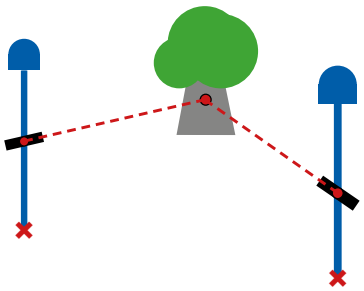
No. 2823.L | € 48,- | 118

PtW



No. 2822 | € 192,- | 117







Holder KiLas-Geo

The KiLas-Geo requires a 1/4“ internal thread on the underside of the laser odometer and the possibility to set an offset of -65 mm from the rear edge of the device.

- Suitable for laser distance meters of various manufacturers and generations
- Precise results because the tilting axis of the holder is perpendicular to the axis of the laser beam
- Ergonomic handling: Setting of the target point while the thumb/finger is already on the button to trigger the measurement
- Sturdy aluminium construction with 1/4“ knurled screw for mounting the laser distance meter
- Bolt Ø 12 mm for insertion into the pole adapter. Can be mounted on the left or right side of the KiLas-Geo
- M8 internal thread on both sides to screw in the optional GFK/CFK pole for building measurements **s. page 121**
- Weight: 240 g



Description	Order-No.	Euro
Holder **KiLas-Geo** (without laser distance meter)	**2800**	142,-

The following laser distance meters can be used with the KiLas-Geo:
Leica DISTO D410, D5, D510, D8, D810 touch, S910 and more.

INFO	With the KiLas-Geo other laser distance meters can also be used. Please contact us.







Pole Adapter

To use the KiLas-Geo holder with cylindrical poles of all kinds

The 12 mm bolt of the KiLas-Geo tilting mount is inserted into the plastic bearing on the pole adapter. A star grip screw secures the adapter and adjusts the tipping resistance. With all pole adapters, the tilting axis runs through the pole axis at right angles due to the design. This ensures correct measurement results.

- Weight approx. 150 g

Description	Order-No.	Euro
Pole clamp for poles **Ø 18-32 mm**, with bolt socket Ø 12 mm	**2810**	68,-
Pole clamp for poles **Ø 30-45 mm**, with bolt socket Ø 12 mm	**2811**	68,-
Pole clamp for poles **Ø 32 mm**, with bolt socket Ø 12 mm	**2812**	68,-

Laser odometer without inclination sensor



- Offsets of -65 mm with measuring plane adjustment from trailing edge
- Horizontal distances: Set the tube level horizontally and secure the tilting device

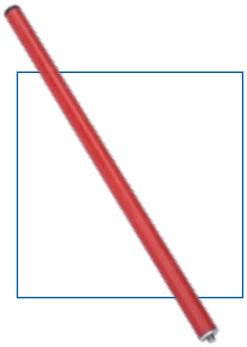


Description	Order-No.	Euro
Tube level for KiLas Geo with 2 fixing screws	**2808**	8,50



Pole to extend building lines

A 40 cm long pole is screwed into the KiLas-Geo (possible on both sides). By placing the pole against the building wall, the building alignment is constructively extended so that it runs through the defined reference point of the distance measurement; even when the support is tilted.
The laser distance meter is aligned on a target plate that extends the opposite building alignment. It can be stopped at a distance of up to 30 cm from the corner of the building and can also be tilted (see picture).



INFO	By using the extension pole in conjunction with the building target panel, building lengths can be measured exactly at a parallel distance of up to 30 cm. Thus the KiLas-Geo can also be used on building sides, which could not be measured since then due to obstacles, e.g. down pipes of gutters etc.

- Pole-Ø 20 mm, made of GFK/CFK, red
- M8 outer thread made of stainless steel
- Weight: 90 g

Description	Order-No.	Euro
Extension pole for KiLas-Geo, Ø 20 x 400 mm (GFK/CFK, red)	**2806**	44,-

Target-Plate for poles

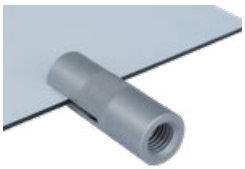


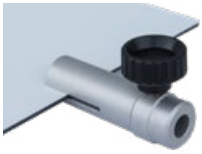
For distance measurement, the target plate is placed vertically on the ground point.

- Composite panel with white surface: DIN A4-sized (21 x 30 cm)
- Front of the panel is in the axis of the connecting thread / the pole axis
- Weight: 360 g

Description	Order-No.	Euro
Target-Plate ZA4, white, 21 x 30 cm, **5/8" internal thread**	**6062**	50,-
Target-Plate LA4, white, 21 x 30 cm, **Leica socket Ø12 mm**	**6064**	56,-







Industrial Surveying 1/2

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- Telescop MVT 128
- Accessories 131





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- Marking Base 1557.A 150

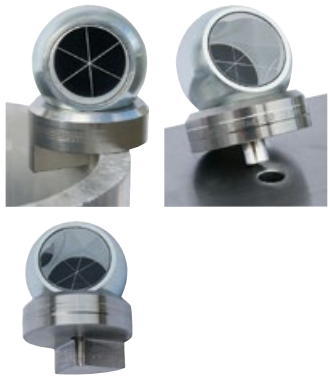






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Precision Measurements 2/2

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- APEX 186
- BOAXE 191
- CONE 193
- HEMI 200
- HUG UNI 163



Mini vectors for tachymetric precision measurements

For the determination of hidden points (computational extension of a base).

The 2-prism method „Vector" can be used for all points which cannot be measured exactly with the tachymeter in the classic way; i.e. neither electro-optically with a prism with a vertically positioned prism pole, nor reflectorless by means of a laser range finder.

With the „vector" method, object points can be recorded with high accuracy.

Our product range includes three different types of mini-vectors:

Classic

- Prism spacing 100 mm
- „Rigid" design of the two prisms ensures highest possible accuracy
- Small and compact
- Tip available with Leica connection or M6 thread



Mini-Vector
page 125

Modular

- Next to a two-prism setup, a setup with three or more ZP11 prisms is also possible
- Individually adjustable prism spacing and tip lengths
- Cylinder prisms ZP11 can also be used for other purposes



Modular Mini-Vector
page 126

Telescopic

- Prism spacing 200 mm
- Obstacles that prevent or impair visibility can be avoided by simply changing the prism height



Mini-Vector Teleskop (MVT)
page 128

Accessories overview



Joint tripod M8
Art.-No. **5920**
page 131



joint tripod M8, heavy design
Art.-No. **5921**
page 131



Bipod mini tripod
Art.-No. **6640**
45



Switchable magnet
page 132



Suction holder M8
page 134



steel ring M8
Art.-No. **5932**
page 131





Lever clamp M8
Art.-No. **5934**
page 133



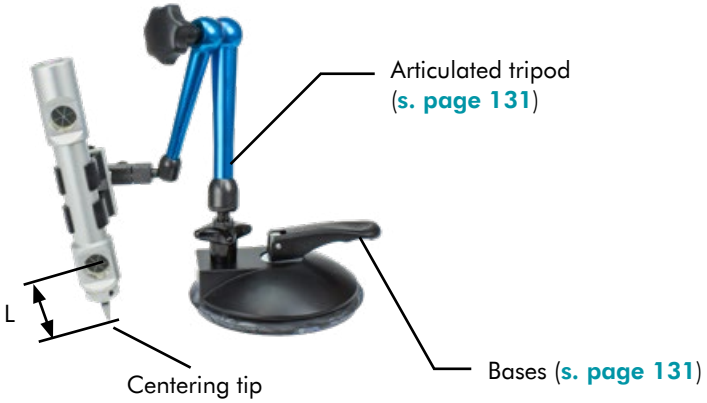
Strong screw clamp
Art.-No. **5934**
page 133

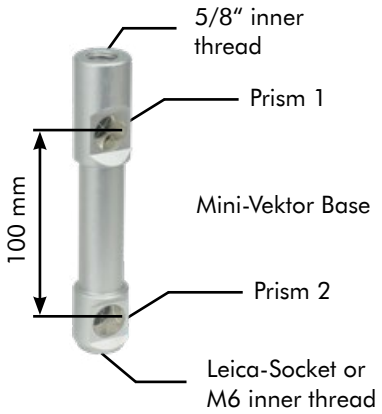
Mini-Vektor as a „rigid“ unit

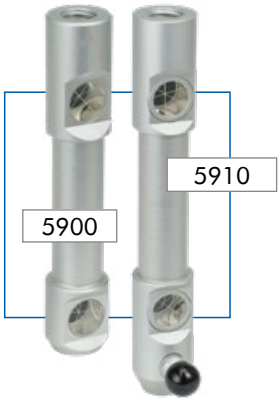
For the measurement of hidden points (mathematical extension of a base where 2 prisms are measured tachymetrically according to X, Y and Z).
The „2-prism method“ can be used very well for all points which cannot be measured or not measured exactly in the classical way, i.e. neither electrooptically with **one** prism or reflector, nor directly with a laser distance meter.

With a base length of 100 mm and the shortest possible extensions, our mini vector achieves very high centering accuracies at the object point.

Usually already existing programs can be used to calculate hidden points
(s. page <?>).





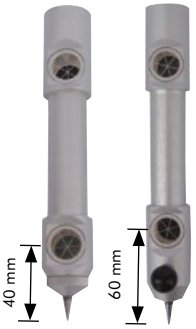


Mini-Vektor available in 2 versions: Connection: M6 female thread or Leica bolt socket.

- Prism constant: K = -11,3 (Leica = +23,1) mm
- Central symmetric point (= visible prism center) lies precisely in vector axis
- Waterproof and shockproof
- Robust construction made of anodised aluminium

Description	Order-No.	Euro
Mini-Vektor, Base, M6 inner thread	**5900**	284,-
Mini-Vektor, Base, Leica bolt socket Ø 12 mm	**5910**	305,-

Extensions with hardend centering tip







With the **M6 extension**, the centring point is integrated in an aluminium ring which has a knurled knob and a horizontal hole as a screw-in aid.
The standard extension is L = 40 mm. Larger extensions are available on request.

Description	Order-No.	Euro
M6 extension, L = 40 mm	**5901**	30,-

The extension with **Leica spigot** is inserted into the Mini-Vektor and locked by a spring lock.
Due to the length of the stud, the shortest possible extension
dimension is L = 60 mm. Longer extensions: s. page 34

Description	Order-No.	Euro
Leica extension, L = 60 mm	**5911**	30,-





Circular Level

Optionally, the vector can also be held vertically above the target point with a circular level.
Then 2 prisms with different heights are available for the tachymeter aiming.

Description	Order-No.	Euro
Circular level „central“, glass bubble, sensitivity 30'	**1585.30**	41,-



Modular Mini-Vektor with ZP11 Cylinder Prisms

By combining several ZP11s with various extensions and a centering tip, individual prism poles with a wide range of applications can be built up. The B1216 connection system, ensures fast and precise connection of the individual components.

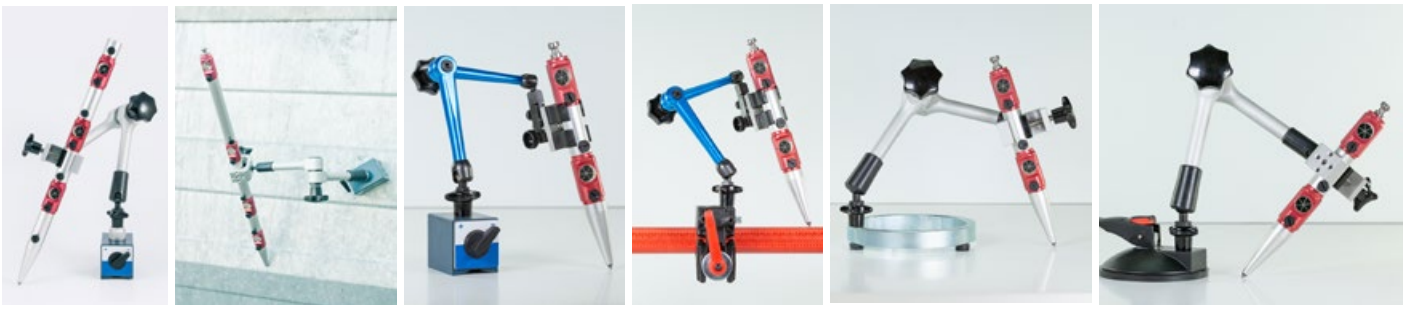
The greatest advantage lies in the flexibility of the system. Thanks to the modular design, the individual elements can be used not only as a mini-vector, but also, for example, as a conventional stake-out prism.

Combinations for a variety of applications



Perpendicular with circular bubble, as setting prism, changeable tip length	Angled, as „classic mini-vector“ with prism spacing 100 mm	Angled, as mini-vector with longer prism spacing and long tip	Tilted, with any number of prisms, prism spacing and tip length interchangeable	Perpendicular with circular bubble, as aiming point from different tachymeter positions

Examples of use



Elements for modular mini vector



Cylinder prism ZP11 s. page 28

- Bottom: Socket for Bolt B1216
- Top: Stainless steel bolt B1216 / M6 inner thread
- Weight: 70 g / 53 g

Description	Order-No.	Euro
Cylinder Prism ZP11 B, socket + **bolt B1216**	**6611**	158,-
Cylinder Prism ZP11 M, socket B1216 + **M6 inner thread**	**6611.M6**	142,-



Extensions / spacers

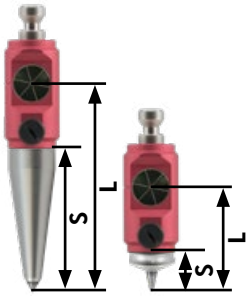
- Cylinder Ø 22 mm made of anodised aluminium
- Quick connection system B1216: V2A bolt Ø12x16 mm at the top, B1216 bolt socket on bottom - accuracy ±0,1 mm
- Allen screw (SW3) for securing the extensions on the bolt B1216

Description	prism distance	Order-No.	Euro
Extension 50 mm with bolt + socket	**100 mm**	**6650**	39,-
Extension 100 mm with bolt + socket	**150 mm**	**6651**	43,-
Extension 150 mm with bolt + socket	**200 mm**	**6653**	47,-



Description	Order-No.	Euro
Adapter M8 internal thread to B1216 bolt	**6620.A**	24,-

Centering tip for Mini-Vektor







- Conical tip in anodised aluminium with hardened mandrel
- B1216 bolt for quick exchange

Available in 2 lengths with accuracy ±0,1 mm:

For distance from tip to centre of prism L = 50 mm:

Description	Order-No.	Euro
Centering tip, length s = 20 mm, hardened mandrel, B1216 bolt	**6804**	29,-

For distance from tip to centre of prism L = 100 mm:

Description	Order-No.	Euro
Centering tip, length s = 70 mm, hardened mandrel, B1216 bolt	**6665**	43,-

Circular level







For vertical positioning of the mini vector

- Cylinder Ø22x25 mm made of anodised aluminium
- Glass level Ø20 mm, accuracy 30'
- Design 1: M6 male thread for screwing onto ZP11 (No. 6611.M6)
- Design 2: B1216 socket for quick mounting on ZP11 (No. 6611)
- Allen screw (SW3) for securing the circular level on the bolt B1216

Description	Order-No.	Euro
Circular level for modul. Mini-Vektor, M6 outer thread	**6670**	27,-
Circular level for modul. Mini-Vektor, B1216 socket	**6671**	30,-



Mini Vector Telescope MVT

Without an upper 2nd prism, the MVT functions like a prism pole for target heights close to the ground. However, the prism does not sit on top of the extension like a „normal" prism pole, but is guided in the milled telescopic tube. The travel distance is 100 mm. Together with the smallest tip and a circular bubble mounted on top, measurements can be made on the prism from a height of only 50 mm to 150 mm. The target/prism height results from the length of the tip used and the extension length T of the telescope.

With the upper 2nd prism ZP11, the MVT can be expanded to a mini-vector. It can then also be used in an inclined position to measure hidden points. The coordination is done with the „vector method" (sewer pole system, see page <?>). Compared to the „Mini-Vector" (see page 125) and the „Modular Mini-Vector" (see page 126), the telescopic extension provides a significant advantage: Obstacles that prevent or impair the view can be avoided by simply changing the prism height in 2 areas.



With the **MVT**, points can thus be determined as follows:

- With vertical vector (with the help of a circular bubble)
- With vector standing in an angle, where the object point coordinates are calculated with the help of the total station software „sewer pole system/hidde point method".

Both methods require the dimension L from the extension tip to the lower prism.
But while with our other mini-vectors the extensions have a fixed dimension, with the MVT this is variably adjustable. A significant increase in flexibility!
Measurements are only in the range between 150 and 250 mm bottom distance not possible.

Use of the MVT as a Mini-Vector:

- Unit of 2 cylinder prisms ZP11 and extension piece, telescopically mounted in carbon tube
- carbon tube outer Ø 30 mm
- prism distance AB = 200 mm
- Constant of prisms A and B: K =-11.3 (Leica = 23.1) mm
- Telescopically adjustable target heights L (when using the smallest tip with V = 50 mm): prism B: 50 to 150 mm, prism A: 250 to 350 mm
- Dimensional scale on intermediate piece for reading the telescope's extension length T
- Interchangeable tips with different lengths (connection system B1216)
- Optional: circular level for perpendicular use of the mini-vector (connection B1216 or M6 thread)
- Optional: Bipod with telescope quick adjustment system

Weight: 255 g



Description	Order-No.	Euro
Mini-Vector Telescope, basic equipment	**6630**	375,-



Accessories (upper prism, tip, circular level, bipod): see next page





Complementary items & accessories



Cylinder prism ZP11 s. page 28

- Bottom: Socket for Bolt B1216
- Top: Stainless steel bolt B1216 / M6 inner thread
- Weight: 70 g / 53 g

Description	Order-No.	Euro
Cylinder Prism ZP11 B, socket + **bolt B1216**	**6611**	158,-
Cylinder Prism ZP11 M, socket B1216 + **M6 inner thread**	**6611.M6**	142,-



Centering tip for Mini-Vektor

- Conical tip in anodised aluminium with hardened mandrel
- B1216 bolt for quick exchange

Available in 2 lengths with accuracy ±0,1 mm:

For distance from tip to centre of prism V = 50 mm:

Description	Order-No.	Euro
Centering tip, length s = 20 mm, hardened mandrel, B1216 bolt	**6804**	29,-

For distance from tip to centre of prism V = 100 mm:

Description	Order-No.	Euro
Centering tip, length s = 70 mm, hardened mandrel, B1216 bolt	**6665**	43,-



Circular level

For vertical positioning of the mini vector

- Cylinder Ø22x25 mm made of anodised aluminium
- Glass level Ø20 mm, accuracy 30'
- Design 1: M6 male thread for screwing onto ZP11 (No. 6611.M6)
- Design 2: B1216 socket for quick mounting on ZP11 (No. 6611)
- Allen screw (SW3) for securing the circular level on the bolt B1216

Description	Order-No.	Euro
Circular level for modul. Mini-Vektor, M6 outer thread	**6670**	27,-
Circular level for modul. Mini-Vektor, B1216 socket	**6671**	30,-



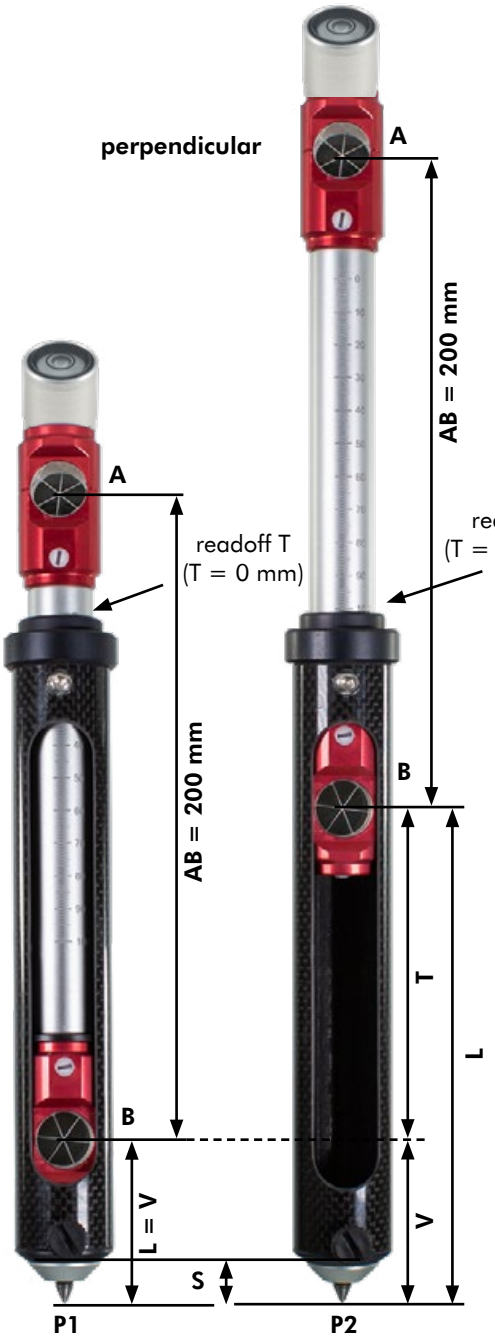
Bipod

When determining hidden points using two prisms, the Mini-Vektor must remain unchanged. The specially designed tripod enables rapid vertical alignment.

Name Info [...] 45	⚖	№	€
Bipod for telescope mini-vector	232 g	**6640**	205,-

The pull-out dimension T is set or read off the scale.

perpendicular



Target height:
$H_B = V + T$
$H_A = V + T + 200$

Telescope fully retracted

Target height H of prisms A and B in the example image:

H_B: 50 + 0 = 50 mm
H_A: 50 + 0 + 200 = 250 mm

Telescope fully extended

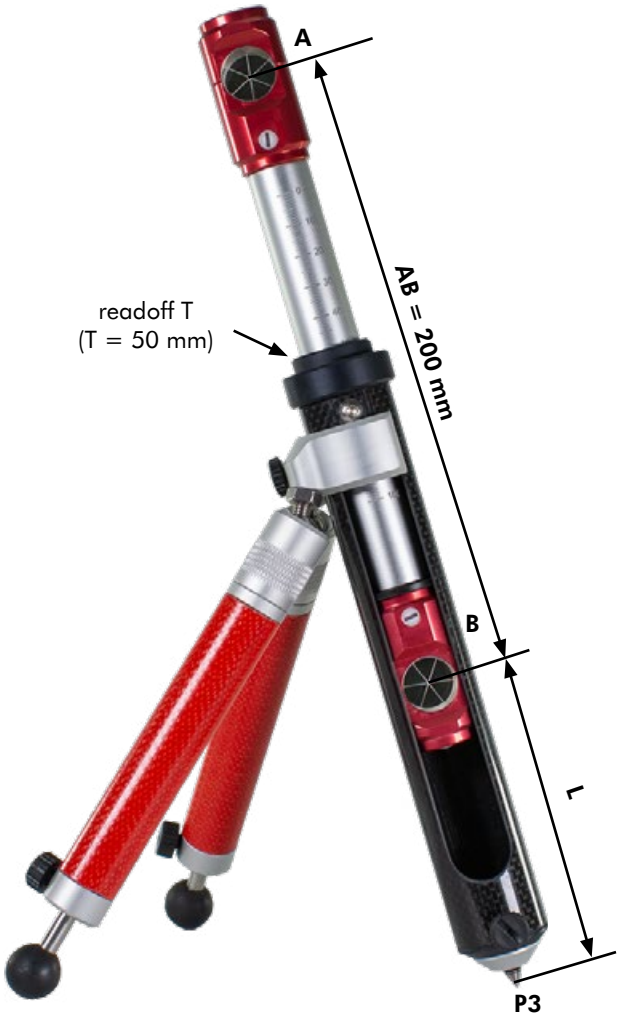
Target height H of prisms A and B in the example image:

H_B: 50 + 100 = 150 mm
H_A: 50 + 100 + 200 = 350 mm

L = V + T

angled

Calculation X, Y, Z of P3 according to the „vector method“ with the program „sewer pole / hidden point“ by entering AB and L.











Description	⚖	№	€
Transport Bag for MVT (with and without tripod)	115 g	**6645**	26,-

Description	⚖	№	€
Universal Transport Case with foam inserts	450 g	**1468.2**	54,-

Accessories for Mini-Vektor





Articulated Tripod

The Mini-Vektors tip can be moved into any desired position with the articulated tripod and fixed for measurement. This is done by tightening a central screw that clamps all moving parts of the articulated tripod.
Depending on the application, the articulated tripod is screwed onto different bases.



- Hydraulic clamping
- Articulated arms made of anodised aluminium

- Double plastic clip for mounting the Mini-Vektor
- radius of action: 270 mm
- Weight: 350 g

Description	Order-No.	Euro
Articulated tripod with M8 outer thread	**5920**	184,-



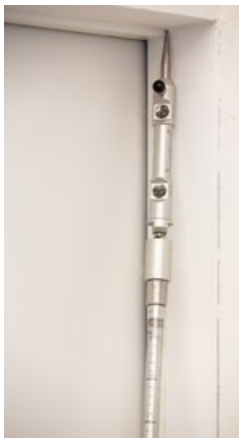


- Screw clamp for mounting of the Mini-Vector
- Action radius: 320 mm
- Weight: 820 g

Description	Order-No.	Euro
Articulated tripod with M8 outer thread, heavy design	**5921**	263,-

TIP	For vector lengths starting from 300 mm we recommend the heavy design of the articulated tripod.





Compression Spring Adapter 5/8“

The mini vector can be moved to any desired position within the action radius using the articulated stand and then fixed in place with the central screw. To ensure that the tip reliably touches the object point after fixing, a compression spring adapter can be screwed onto the top of the mini vector. This allows a constant contact pressure of the tip on the object point to be built up via the articulated stand.



- 5/8“ internal thread, 5/8“ external thread
- Anodized aluminium
- With tightening aid for wrench SW17
- Spring travel approx. 14 mm

Description	Order-No.	Euro
Compression spring adapter 5/8“ for prisms/GNSS poles	**1736**	96,-











Bases for articulated tripod

Depending on the application, the articulated tripod can be screwed onto different bases using the M8 thread.

Magnetic Base

The magnetic base is attached in such a way that the point to be measured lies within the radius of action of the articulated tripod. Due to the arbitrary position of the Mini-Vektor, it is also suitable for such points which could not be measured with previous methods or only with insufficient certainty/accuracy.

- On/Off switch
- M8 inner thread for screwing in the articulated tripod
- Magnetic holding force: About 68 kg
- Weight: 350 g
-

New magnet design since 2027 offers advantages over the previous design:

- Improved build quality and durability
- More compact and lightweight
- More mounting options for adapters and accessories



Description	Order-No.	Euro
Magnetic base M8, switchable	**5929.M8**	74,-







Example images on the left still show old magnet design.



Steel ring

The ring is placed on the ground near the object and the centring tip of the Mini-Vektor is placed on the point to be measured with the help of the central clamp on the articulated arm. The object point can be anywhere within the radius of action of the articulated tripod (see picture examples).











- Galvanized steel ring with M8 inner thread for screwing in the articulated tripod
- 3 rubber feet for secure positioning of the ring
- Diameter: 155 mm
- Weight: 750 g

Description	Order-No.	Euro
Steel ring for articulated tripod	**5932**	37,-





Clamp with M8 thread

For universal attachment of the articulated tripod to spatial objects up to a span of 250 mm: If the clamp is screwed on within the radius of action of the articulated tripod, every object point can be measured with the mini vector.

- Clamping lever made of die-cast magnesium, clamping mechanism made of high quality fibreglass-reinforced plastic
- Force build-up up to 1200 N, easily done with 2 fingers
- Easy to dose, for gentle clamping
- Secure clamping, lightning-fast release
- M8 inner thread for screwing in the articulated tripod
- Weight: 425 g

Description	Order-No.	Euro
Clamp M8 for articulated tripod	**5934**	78,-









Stable universal screw clamp

For fastening to tubes and surfaces, such as scaffolding struts, table tops, steel beams, floorboards, etc.

- Very stable quality clamp made of full metal
- Rubberized clamping surfaces to protect the material
- Clamping range on cylinders Ø and surfaces thickness: 13 - 55 mm
- Two M8 inner threads
- Clamping lever with latching function, i.e. lever direction can still be aligned after tightening
- Insert-piece for flat surfaces (plates, table edges, boards etc.)

Description	Order-No.	Euro
Uni. screw clamp M8, incl. screws and flat-insert-piece	**6884**	79,-







Suction Holder

For using the Mini-Vektor on all surfaces with gas-tight surface such as glass, plastic, metal, coated wood and marble.

- Housing material: Aluminium
- Suction disk: Ø 120 mm
- Load capacity of a suction holder: 15 kg
- M8 inner thread for screwing in the articulated tripod
- The suction effect is achieved by turning the lever
- The suction cup with the rubber disc relaxed must be pressed firmly onto the surface. The resistance of the vacuum must be clearly noticeable when the toggle lever is moved
- Weight: 320 g

Description	Order-No.	Euro
Suction holder M8 for articulated tripod, without vacuum indic.	**5936**	48,-





Suction Holder with vacuum indicator





The vacuum is continuously checked. If the warning rocker switch is recessed in the rocker arm (see Fig. 1), the required holding force has been achieved and the suction cup can be fully loaded. If the rocker over time moves out and the red edge becomes visible, the vacuum decreases. If the edge is clearly visible (see Fig. 2), the suction holder must be detached from the surface and sucked on again.

- Weight: 340 g

Description	Order-No.	Euro
Suction holder M8 for articulated tripod, with vacuum indicator	**5938**	80,-

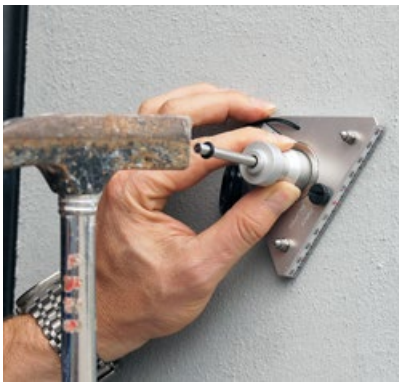






Stake Out & Positioning 1/2

D.2.1. 137





D.2.2. 148





D.2.3. 150






D.2.4. 152

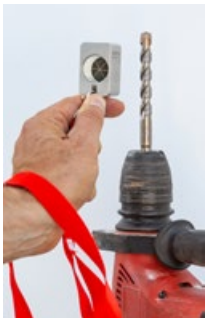


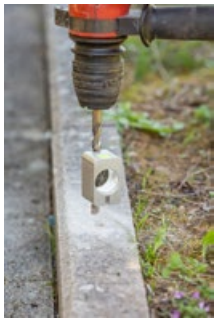


Stake Out & Positioning 2/2

D.2.4. Magnet Prism MPB for stone drill 157

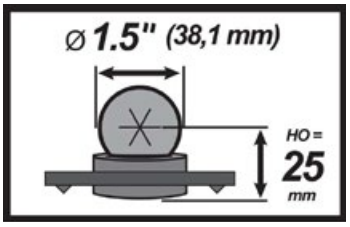








Triangle-Frame „Klimax" for high precision point measurement on floors, ceilings and walls





ball prisms ø 1.5"
129



bases
138



triangle frame
129

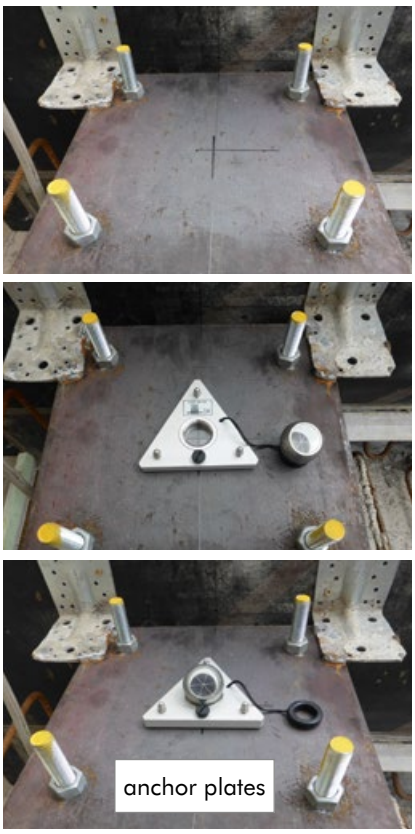
- Economical and fast
- Very accurate position and height measur.
- Reliable marking / identification of to be measured points
- Precise stake-out / control of already marked points on walls / ceiling / floors
- Solid, compact design

Setup

With the Klimax, our ball prism Ø1.5'' can be, regarding the application, equipped with various stainless steel bases. These are movably mounted in the triangular frame.
The centre of the base is exactly below the centre of the ball and directly above the measuring point to stake out or measure.

For measurement, the ball prism is placed on the base and aligned with the total station.





APPLICATION EXAMPLE

Examples in practice













Overview: Klimax Product Series



No.	1444
€	174,-
🗋	140



No.	1498
€	29,-
🗋	144

No.	1498.S
€	23,-
🗋	144



No.	1491.K
€	48,-
🗋	145



No.	3602
€	8,40
🗋	145

										
Name	**Klimax Base B**	**Klimax Base A**	**Klimax Base AM**	**Klimax Base AM2**	**Klimax Base P**	**Klimax Base PM**	**Klimax Base CM**	**Klimax Base CM2**	**Klimax Base C**	**Klimax Base D**
Art.-No.	**1497**	**1495**	**1495.M**	**1495.M2**	**1499.P**	**1499.PM**	**1499.M**	**1499.M2**	**1499**	**1491**
Price	78-€	93,-€	104,-€	100,-€	71,-€	77,-€	72,-€	68,-€	62,-€	81,-€
Magnetic Holding force	-	-	🧲🧲	🧲	-	🧲🧲	🧲🧲	🧲	-	🧲
Marking options	-	Fine felt-tip pen, fineliner, pencil	Fine felt-tip pen, fineliner, pencil	Fine felt-tip pen, fineliner, pencil	Hole Ø 2 mm, can be enlarged **Specify when ordering!**	Pens with Ø2-5 mm (e.g. Edding)	Centering Pin	Centering Pin	Centering Pin	Automatic center punch, marking spray, centering pin
Usage on wall/ ceiling	-	-	suitable	-	-	suitable	suitable	-	-	suitable for walls



No.	1496.M
€	74,-
🗋	145



Klimax

- **Vertical and horizontal use**
- Adjustable handle
- Magnetic ball rest

No.	1492
€	210,-
🗋	139



Klimax PLUS

- Horizontal use
- Compensation of inclinations up to 3° (adjusting screws and circular level)

No.	1493
€	257,-
🗋	141

Triangle Frames

- Triangular frame made of solid metal (aluminium) with edge lengths 120 mm
- Centric bore to put in the stainless steel base
- Screw to secure the inserted base against falling out
- Lateral scale strip (2 x 50 mm) as a help for quick displacementof the target distance while staking out a point
- Lateral horizontal screw (SW4) for measurement on ceilings and walls

Klimax

For floors such as screeds and industrial floors, etc. as well as ceilings and walls

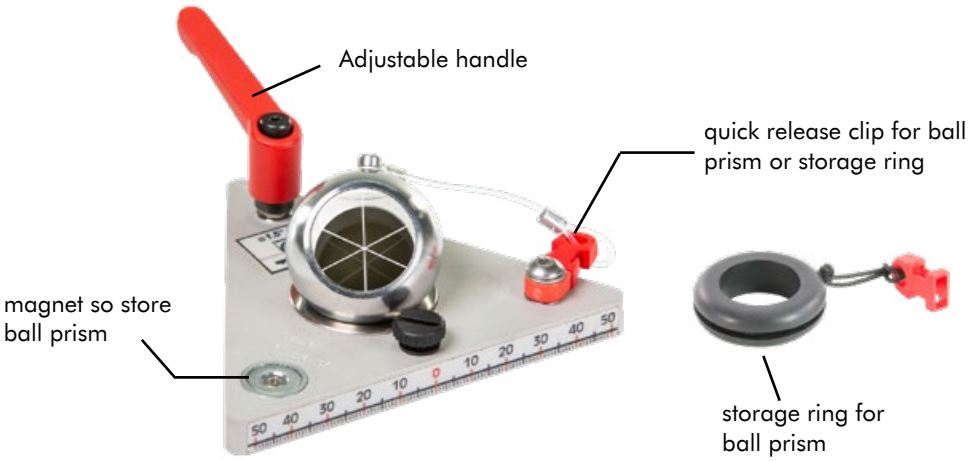
Due to the small height offset (distance of the ball centre from the ground) of 25 mm, slight unevenness of the surface has only very little effect. During test measurements on the mentioned floors, a stronger inclination of the triangular frame than 1° was never measured. This maximum inclination has an effect of 0.4 mm to the position accuracy. Weight: 178 g.

Storage option 1
Prism on rubber ring



Storage option 2
Prism on magnet



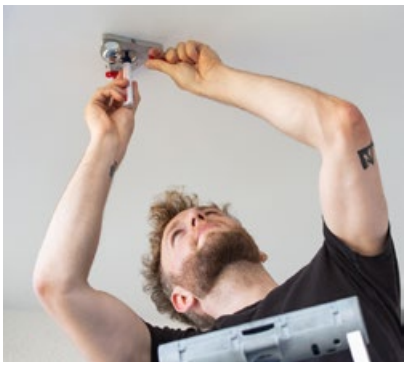


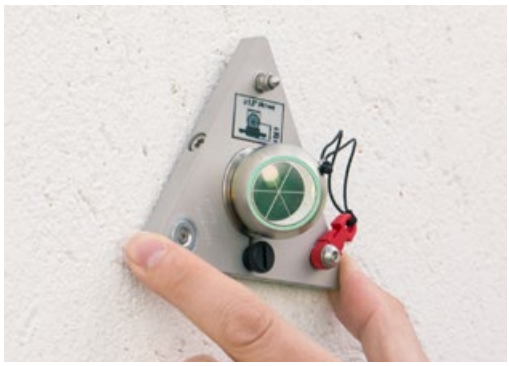


Description	Order-No.	Euro
Triangle frame Klimax (without base / ball prism)	**1492**	210,-

- **3 rubber feet** to protect Klimax to unintentional slip
- One corner of the frame is equipped with a **magnet** on which the ball prism can be „parked“ next to the base
- **Rubber ring** as an additional (non-magnetic) storage option for the ball when working on the floor. It is attached to the frame with a quick release clip
- On the wall and ceiling it is recommended to use a ball prism with fall protection (**s. page 140**). This can be clipped on the frame instead of the storage ring via the quick release

INFO	Also ideal for tachymetric transfer of heights to walls (level marker).













Measurements with the Klimax on ceiling and wall

The Klimax can also be used to stake out and mark new points on the ceiling and wall or to measure existing points on the ceiling and wall.
For these measurements we recommend the Klimax standard frame no. 1492. Bases with an integrated magnet must be used and should be in the frame with the horizontal securing screw (SW 4) so the base underside still has a distance of approx. 0.5 to 1 mm to the wall. This gives the ball centre a constant distance of approx. 25 mm from the wall.

TIP	On the ground and the ceiling, the distance of 25 mm for the position measurement does not cause any problems, as the ball centre lies vertically above the measuring point. For the determination of the point height, the offset of 25 mm can be subtracted directly from the measured Z coordinate. This is not so easy when working on the wall, since the angle between the target direction to the total station and the perpendicular to the wall is not defined for individual measurements. This problem can be solved by calculating the points to be determined or the measured points on a parallel plane with a distance of 25 mm to the starting wall. Then for each measurement with the climax the center of the sphere lies in the measuring plane, without parallaxes. Point measurements on the wall are thus possible with high precision and are also economical for many points to be measured.

Ball prism with drop safety sling

Securing the ball prism when using the climax on the wall or ceiling

For wall measurements, the ball prism must always be removed from the base and reused for the measurement, as is the case for use on the floor.

A base with integrated magnet should be used for working on walls and ceilings. This way, the ball prism is held securely in the base and can be adjusted accordingly.
After removing it from the base, it is „parked“ on the magnet integrated in the corner of the frame. So the ball prism does not have to be held in the hand. The following ball prisms are also available with a fall protection as standard to completely prevent an accidental fall. They are clipped onto the triangular frame with a quick connector.



Description	Order-No.	Euro
Ball prism Ø1.5” (38,1 mm), magnetic stainless steel, K = -16,9 (Leica = +17,5) mm, for fall protection	**1444**	174,-

Description	Order-No.	Euro
Ball prism Ø1.5” (38,1 mm), galvanized steel, K = -11,3 (Leica = +23,1) mm, string with quick connector for fall protection	**1454**	174,-



Option: Ball prism with carrying strap



If you want to have the ball prism with you at all times and not only use it on the Klimax frame, you can also wear the prism around your neck on a lanyard.

Description	Order-No.	Euro
Carrying strap (red)	**1390.R**	5,50

KlimaxPlus

For inclined floors up to 3° inclination

Three adjustment screws allow the triangular frame to be levelled.
This allows very accurate measurements to be made even on slightly inclined surfaces.
(e.g. soils with drainage gradients). Weight: 170 g.



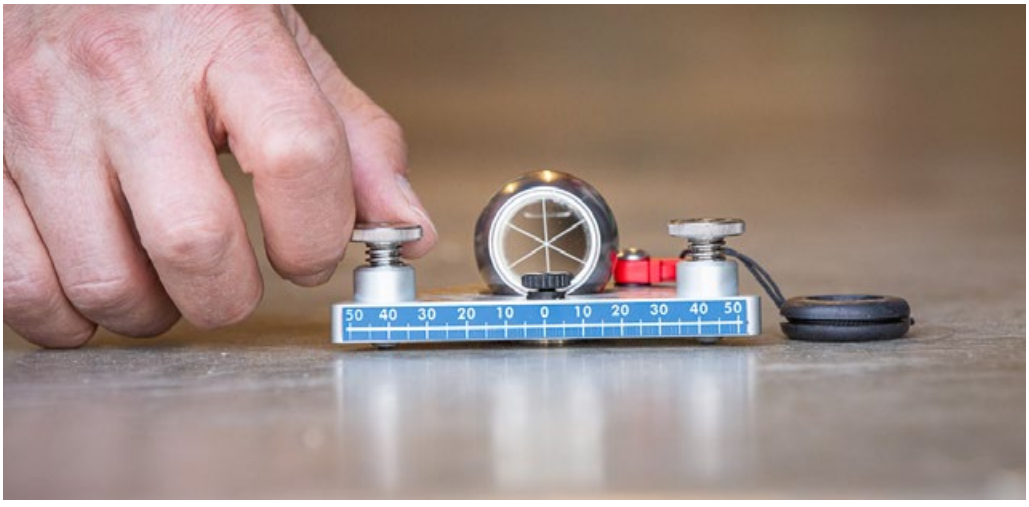






Description	Order-No.	Euro
Triangle frame KlimaxPlus (without base / ball prism)	**1493**	257,-













Choice of bases according to application

For floor measurements, the interchangeable ball base (nest) can be moved up and down in the triangular frame with almost no play; it is therefore always in contact with the ground. The distance HO from the base lower edge/floor to the centre of the prism is exactly 25 mm. Thus, in addition to precise position measurement, very precise height measurements and checks can also be carried out.

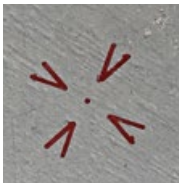
- Cylindrical ring made of stainless steel with outer Ø 36 mm. exchangeable
- Lateral guide pin. It prevents unintentional twisting of the base in the frame and the base falling out of the frame.

Stakeout and control of ground, ceilings and wall points

Tachymetric measurement of the target position of the prism.
One-man method with tracking mode.

- Move the triangle frame with the ball prism until no more differences to the target coordinates are displayed
- Remove ball from base and “store” on tray ring or eccentric magnet
- Use a fineliner / edding or pencil to mark the centre point and 4 eccentric arrows. Hold pen vertically!
- If necessary, do a final control measurement
- Remove the triangular frame. The point to stake out is indicated by the marked centre point and the 4 eccentric arrows very precisely and identity assured

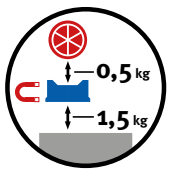
Existing points can be measured or checked with the transparent centre plate with crosshair.

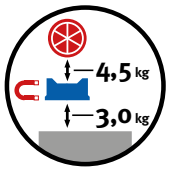




Base A

Description	Order-No.	Euro
Base A for staking out and measuring points on the floor	**1495**	93,-







Base A with magnet

The integrated permanent magnet holds the ball securely in the base. This means that the triangular frame can also be used also on ceilings and walls.
The base can be fixed in the triangular frame with the horizontal screw (Allen screw SW4) in the Klimax (see pictures below).

Description	magnet. holding force	Order-No.	Euro
Base AM for staking out and measuring points, with magnet	around 4,5/ 3,0 kg	**1495.M**	104,-
	around 0,5/ 1,5 kg	**1495.M2**	100,-

Fixing the base in the frame should be done so that the underside of the base is just above the level the 3 rubber feet form. So all measurements are made with a constant distance to the wall.









Base P for rough surfaces

On surfaces which are not smooth it is often not possible to mark points sufficiently with a thin pencil. The base P has a conical recess. This means that thicker markers can also be used and clearly visible markings can be applied to rough and uneven surfaces (stone walls, non-smooth concrete floors, etc.).

Integrated weak magnet to protect ball prism from moving unintentionally (since Mid 2023).



Description	Order-No.	Euro
Base P for markers / pens with tips Ø 2 to 5 mm	**1499.P**	71,-

INFO	The bore hole has a Ø of 2 mm. It can be made wider by drilling by yourself if required. If you want to let us do the drilling of the bore hole please specify the desired Ø when ordering.

Base PM for rough surfaces, with magnet

To use the triangular frame on walls or overhead on the ceiling. The magnet integrated in the base holds the ball prism securely in place.

The base can be fixed in the frame with an Allen screw (SW4).

Description	Order-No.	Euro
Base PM for markers / pens with tips Ø 2 to 5 mm, with magnet	**1499.PM**	77,-

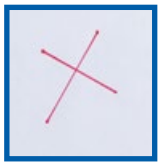
INFO	The hole in the magnet has a Ø of 3 mm. Making it bigger by drilling is not possible.











Measurement / control of points

Base B for measurement / control of marked points

Circular, transparent centre plate with parallax-free crosshairs. The centre of a point marked on the ground, the ceiling or the wall can thus be found and measured very precisely. Weight: 50 g.



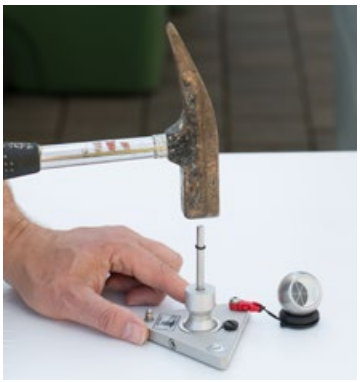
Description	Order-No.	Euro
Base B, for measurement	**1497**	78,-

INFO	The centre plate can be replaced by us in case of damage or wear. Please contact us.



Stakeout with centering pin

The center punch / centring pin is mounted in a cylindrical bearing-insert so it can move precisely in it. After setting out the target coordinates with the triangular frame, the ball prism is removed and the bearing-insert together with the centering pin is put into the base C / CM. The measured point can be marked (punched) on the ground by a light blow with a hammer.



Measure / control with centering pin

With the combination of Base C, bearing-insert and centering pin, the ball prism can also be centered over an already marked point.

- Place the triangle frame over the point
- Push the centering pin several centimetres downwards out of the bearing-insert
- Locate the point with the tip of the centering pin, press the pin onto it
- Insert the bearing-insert into the base and center the triangular frame around the pressed-on pin
- Remove bearing-insert with pin
- Insert and measure the ball prism

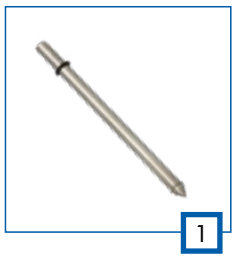


Base C for use with centering pin

- Tolerance-free sliding of the centering pin in the bearing-insert
- Centering accuracy of the bearing-insert in the base ±0,1 mm
- Center-punch/centering pin Ø 6 x 100 mm made of stainless steel (not magnetic)
- Hardened steel tip (magnetic)

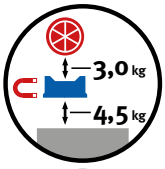


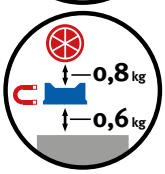
Description	Order-No.	Euro
Centering pin with hardend tip [1]	**1498.S**	23,-
Bearing-insert for centering pin, for base C and CM [2]	**1498**	29,-
Base C for centering-pin / bearing-insert [3]	**1499**	62,-













Base CM with magnet

The integrated permanent magnet holds the ball securely in the base. This means that the triangular frame can also be used on walls and ceilings
The base can be fixed in the frame with an Allen screw (SW4) (see picture).

Description	magnet. holding force	Order-No.	Euro
Base CM for bearing-insert, with magnet	around 4,5 / 3,0 kg	**1499.M**	72,-
	around 0,5 / 1,5 kg	**1499.M2**	68,-











Staking out with autom. center punch / marking spray

Special base D is inserted into the triangular frame and remains there permanently. After staking out the target coordinates, the ball prism is removed and „parked“ on the frame's magnet. A point marking can now be made: the automatic center punch produces a precise, centric punch mark, while the marking spray produces a centric paint dot. When combining both tools, the punch mark can be more easily identified using the paint dot.




1

Base D

- For insertion into the Klimax triangular frame.
- Distance from the base's bottom edge to the ball center: 45 mm
- Can be secured for use on walls or ceilings with a side-mounted hex socket screw.
- Built-in magnet holds the ball prism reliably

Description	Order-No.	Euro
Base D for staking out with automatic center punch and marking spray [1]	**1491**	81,-


3


2

Automatic Center Punch

Pressing down the punch triggers a spring-based impact marking.

- Made in Germany, length approx. 125 mm
- Adjustable impact strength (60–130 N)
- Hardened center punch tip, Ø5 × 50 mm (replaceable)

Description	Order-No.	Euro
Automatic center punch incl. punch tip [2]	**1491.K**	48,-
Center punch tip, spare part [3]	**1491.S**	12,-





Automatic center punch can also be used with marking base „compact“ 150









Marking Spray

Light pressure on the mini spray can produces a clearly visible green paint dot of approx. Ø5 mm. The contents are sufficient for more than 250 points.

Description	Order-No.	Euro
Marking Spray [1]	**3602**	8,40



Tool holder

Automatic center punch and marking spray always at hand.

- Holders Ø5 mm for automatic center punch and Ø15 mm for marking spray
- Thread retrofit not possible for Klimax No. 1493
- Can be screwed on either directly to the Klimax or to the switchable magnet
- Includes M8 × 20 mm screw for mounting on Klimax No. 1492 (see left)
- Includes 2× M5 screws for mounting on the switchable magnet (see below)

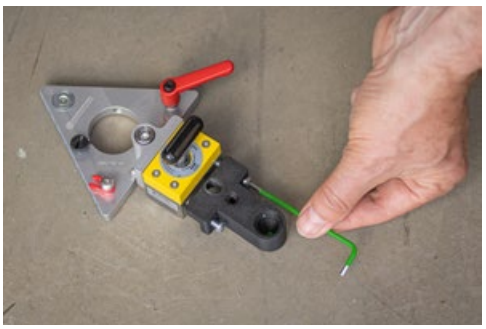
INFO	The M8 thread on the Klimax has been standard only since September 2026. On older Klimax triangular frames, the M8 thread can be retrofitted. In such cases, please contact us.



Screw-on tool holder for marking spray and center punch	⚖	№	€
Holder for automatic center punch and for marking spray	50 g	**1489.A**	19,-









Switchable Magnet

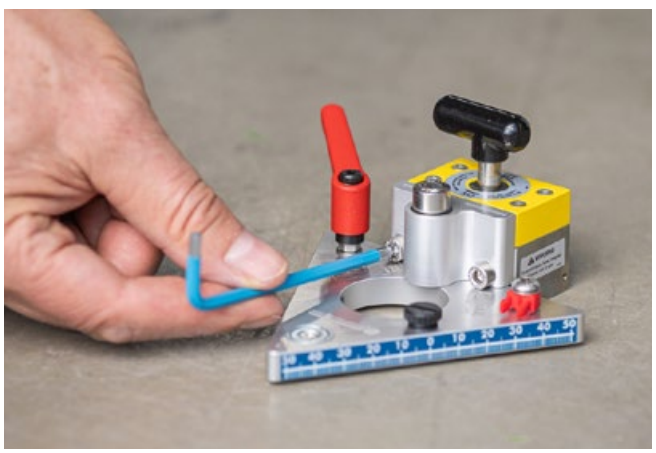
For use on magnetic surfaces.
A switchable magnet is screwed into the M8 thread of the Klimax (see tool holder). Turning the lever activates the magnet, allowing the Klimax/ball prism to be securely fixed at any position on the magnetic object.

- High holding force of approx. 68 kg. No slipping of the Klimax when working with the center punch, marking spray, etc.
- Thread retrofit not possible for Klimax No. 1493.
- Additional mounting option for the tool holder on the back of the magnet.
- Includes M8 × 20 mm screw for mounting on Klimax No. 1492 (from September 2026)

INFO	Das M8-Gewinde am Klimax ist erst ab Sept. 2026 serienmäßig vorhanden. Bei älteren Klimax-Dreieckrahmen kann das M8-Gewinde nachgerüstet werden. Bitte nehmen Sie in diesen Fällen Kontakt mit uns auf.



Switchable Magnet	⚖	№	€
Holding force around 68 kg	370 g	**1496.M**	74,-





Transport-Koffer

For storage and transport of triangular frames Klimax including accessories



- Outer dimensions: 275 x 230 x 80 mm
- Made of red plastic, with 2 click fasteners
- In the lower part hard foam with 7 recesses for
  - 2 x triangle frames
  - 4 x ball prism / bases
  - 1 x pens, centering-pin, etc.
- Hard foam in the lid
- Weight: ca. 470 g

Description	Order-No.	Euro
Transport case, 7 recesses	**1468.7**	46,-









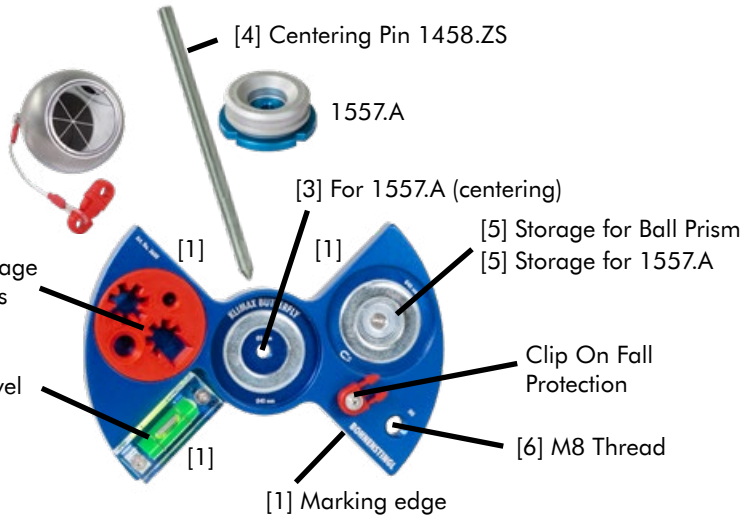

Klimax Butterfly

For staking out and recording points on rough surfaces.

The Klimax staking tool has been part of our standard product range since 2014 (135). Worldwide, it is used daily by surveying technicians for precise fine staking. However, its use is limited on rougher surfaces such as concrete or wood. When accuracies of ±1 mm are sufficient, the Klimax Butterfly is recommended as an alternative. This tool offers similar functionality to the Klimax Standard and is characterized by the following features:

- **Marking options:** The special geometry of the Butterfly allows marking a large cross (approx. 130 x 130 mm) as well as a center point (see figure on the left).
- **Use with spherical prisms**: In combination with the staking magnet base 1557.A, Ø1.5" spherical prisms can be used. Height offset to prism center: 35 mm.
- **Center Punch Function**: Insert the centering tip 1458.ZS into base 1557.A as a punch.
- **Pen holder:** Practical storage with space for the magnet base and common marking pens (e.g., Edding 3000, Edding 400, PICA 150/XX), as well as centering pin 1458.ZS.
- **Tubular level**: Enables height measurements with marking of a horizontal line (based on the principle of the PtW tool). 117 - see image on the left)

Recommended Prism
No. 1444 62







Klimax BUTTERFLY	⚖	№	€
For staking on rough surfaces (without marking base)	175 g	**3600**	218,-




Marking Base MB40-A	🗋	⚖	№	€
Marking Base MB40-A, Centering Ø40 mm, with notches	**150**	50 g	**1557.A**	88,-
Centering Pin (Locator), Stainless Steel, Ø5 x 100 mm, hardend tip	**150**	16 g	**1458.ZS**	19,-
Info: Can also be used without Klimax Butterfly.				



Bore hole marking spray

Can be used directly through the hole in the Klimax Butterfly.

Bore hole marking spray	⚖	№	€
Neon green chalk marking via pump mechanism	30 g	**3602**	8,40



Transport Case Klimax Butterfly	⚖	№	€
Space for: Klimax Standard, Klimax Butterfly, prism, base, pens	470 g	**1468.21**	54,-



Tool Holder

Automatic center punch and marking spray always at hand.

- Holders Ø5 mm for automatic center punch and Ø15 mm for marking spray
- Can be screwed on either directly to the Klimax or to the switchable magnet
- Includes M8 × 20 mm screw for mounting on the Klimax Butterfly (left)
- Includes 2× M5 screws for mounting on the switchable magnet (see below)







Screw-on tool holder for marking spray and center punch	⚖	№	€
Holder for automatic center punch and for marking spray	50 g	**1489.A**	19,-



Switchable Magnet

For use on magnetic surfaces.
A switchable magnet is screwed into the M8 thread of the Klimax (see tool holder). Turning the lever activates the magnet, allowing the Klimax/ball prism to be securely fixed at any position on the magnetic object.

- High holding force of approx. 68 kg. No slipping of the Klimax when working with the center punch, marking spray, etc.
- Additional mounting option for the tool holder on the back of the magnet (see above)
- Includes M8 × 20 mm screw for mounting on the Klimax Butterfly

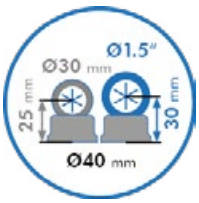


Switchable Magnet	⚖	№	€
Holding force around 68 kg	370 g	**1496.M**	74,-











Centering Base [v2]

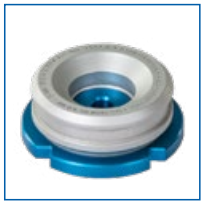
Staking out points

After determining its correct position, the point can be marked in two ways:

- With a deep-hole marker (e.g., Pica Ink), the center is directly marked through the central Ø5 mm borehole.
- The four notches are marked, and the diametrical lines are then connected using a ruler and a pencil, ensuring the intersection point passes through the center. The thickness of the pencil line can be chosen based on the surface and the desired level of accuracy.

Point Surveying

A crosshair is drawn over the point, the centering base is positioned using the notches, and the position of the ball prism is determined. On horizontal surfaces, the base also provides exact heights.





Centering Base	⚖	№	€
Marking Base MB40-A, for deep-hole markers and centering pins	50 g	**1557.A**	88,-
Marking Base MB40-P, for marking spray and pens (up to Ø5 mm tips)	48 g	**1557.P**	85,-

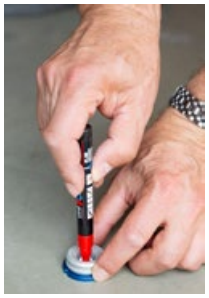


















Borehole marking spray for marking base MB40-P

Round nozzle for precise markings (Ø approx. 5 mm). Non-permanent, water-soluble paint (approx. 250 markings).

Borehole marking spray	⚖	№	€
Neon green chalk marking via pump mechanism	30 g	**3602**	8,40

Centering pin for marking base MB40-A



- **For staking out points.** Once correctly positioned, the ball is removed and the pin inserted into the centric hole. Mark the point to be staked out with a punch mark (if necessary with a light hammer blow).
- **For point pickup:** using the centering pin, the base can be placed on a point already marked on the object (e.g. cross, punch mark).

Description	Order-No.	Euro
Centering pin, Ø5 × 100 mm, stainless steel, **hardened tip**	**1458.ZS**	19,-

Staking Out







Point Pickup









Telescopic pole, M8, for ball prisms

For holding a ball prism against distant object points. With the telescopic pole M8 and the ball head M8–M3, using a ladder, aerial platform, or similar equipment is often not necessary.



Telescopic Pole M8

- 4-section carbon pole with handle
  High-quality cam locks for quick length adjustment
  Length: 0.65–1.60 m
  M8 external thread for attaching the ball head

Telescopic Pole M8	⚖	№	€
Carbon, 0,65 – 1,60 m	320 g	**2913.M8**	89,-



Ball Head M8 – M3

Only usable with 1.5“ ball prisms (No. 1448) featuring a lateral M3 inner thread

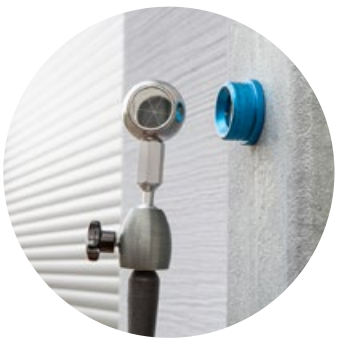
- M8 inner thread for screwing onto the telescopic pole M8
- M3 external thread for screwing in the ball prism
- Ball head with locking screw, holding force: 15 kg

Ball Head M8 – M3	⚖	№	€
For ball prism 1448	67 g	**2914**	52,-



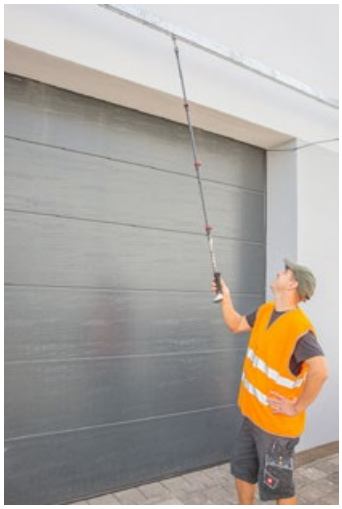








Telescopic pole M8 with HUG ROLL see 173

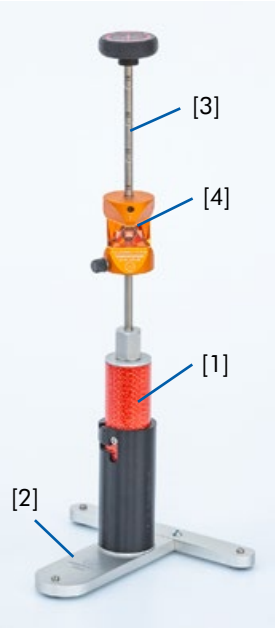


Distant object point





Insert a ball prism into the base, align it with the total station, take the measurement, then immediately remove the ball again



Stakeout and marking of points on ceilings and floors

Setup / Application

The combination of the Point-Marker [1], Ortho-Tripod [2], Centering Rod [3], and 360° Prism MHC-M8 [4] enables efficient point staking on floors and ceilings. With the Ortho-Tripod, the Point-Marker stands freely – no holding, no bubble level required. This also makes overhead staking with a tracking total station possible as a one-person operation. The three-point support ensures a vertical position, and the 360° prism can be adjusted vertically to avoid line-of-sight obstructions. At the target point, the Point-Marker is pressed against the floor or ceiling against spring resistance, producing a paint mark as identification.

- Compact, stable 360° prism
- Adjustable distance to floor or ceiling
- Easy marking of the staked-out point
- No time-consuming adjustment with a bubble level
- Complete lightweight set

Point-Marker

- Bayonet lock for quick insertion of paint or paste markers 155
- Fine thread on lower sleeve for screwing into the Ortho-Tripod
- Includes knurled ring for thread protection when used without Ortho-Tripod
- M8 internal thread in inner sleeve for screwing in the centering rod
- 2 springs: - Light, for use without prism rod
  - Strong, for use with prism rod



Point-Marker	⚖	№	€
Marker holder, knurled ring, 2 springs (without marker)	800 g	**3636**	128,-

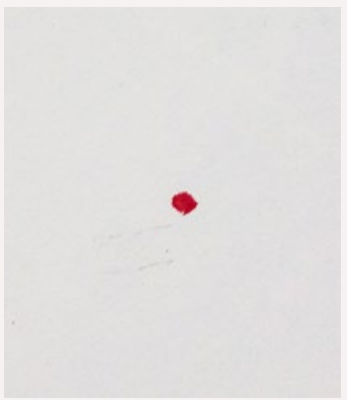
Floor





Ceiling





Ortho-Tripod

For vertical positioning of the Point-Marker on horizontal floors/ceilings

- Fine thread for screwing in the Point-Marker
- 3 plastic support points





Ortho-Tripod for vertical positioning of the Point-Marker	⚖	№	€
3 plastic support points	154 g	**3638**	106,-







Centering rod, bubble level, and 360° prism

Staking out points with the Point-Marker

The 360° Prism MHC360-M8 is slid over the Ø6 mm centering rod, then the hand knob is screwed on at the top. The rod is connected to the Point-Marker via an M8 thread. The rod has notches every 25 mm with corresponding engraved scale markings. After engaging a spring mechanism, the correct distance of the prism center from the ceiling or floor can be read on the centering rod.

Point-Marker with rod at the ceiling with the Ortho-Tripod

Unscrew the hand knob, screw on the M6–M8–5/8" adapter, and connect it with the prism rod. With the Ortho-Tripod placed against the ceiling, move the Point-Marker until the target point is reached. By pressing the Point-Marker against the ceiling, the paint/paste marker leaves a visible color imprint.

Point-Marker with rod at the ceiling without the Ortho-Tripod

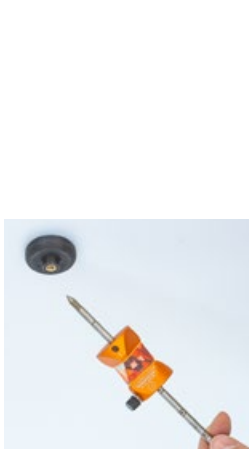
For staking out individual points on (including sloped) ceilings, the Point-Marker can be used without the Ortho-Tripod. In this case, the supplied knurled stainless steel ring is screwed on instead. Then mount the marker with centering rod and 360° prism onto a standard prism/GNSS rod. Using the integrated centering rod bubble level (visible from below), move the Point-Marker until the target point is reached. Again, pressing the Point-Marker against the ceiling produces a color mark.



STÄBE

Vorhandene Prismen-/GNSS-Stäbe











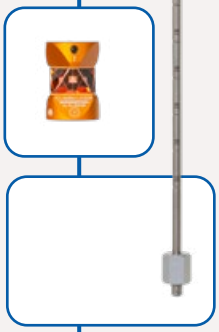








No.	3642.060
€	26,-





No.	3636
€	128,-
🗋	152



No.	3638
€	106,-
🗋	152

Centering Rod

- Centering rod Ø6 × 220 mm made of hardened stainless steel
- Clamping option for the prism at any height using a knurled screw
- Display of the prism center height in 25 mm increments
- Side: Tip for use without knob. Height scale 50–150 mm, M6 thread for screwing the hand knob on and off.
- Side: Hex SW17 with M8 external thread for screwing into the Point-Marker, height scale 195–320 mm



Centering rod Ø6 mm on pointer	⚖	№	€
for height-adjustable use with MHC-M8	67 g	**3639**	72,-

Bubble level for centering rod Ø6 mm

- Tool-free fastening with knurled screw at any height on the centering rod
- Mounting option in 2 positions, depending on application



Bubble level for centering rod Ø6 mm	🗋	⚖	№	€
See-through bubble level made of glass, sensitivity 30'	**9**	19 g	**5696**	48,-

360° Prism HARDCore



360° Prism MHC 360-M8: HARDCore	🗋	⚖	№	€
with steel core, M8 on both sides - Ø6 mm through-hole	**8**	87 g	**5693.M8**	520,-





Recording / checking points with the tip of the centering rod

After unscrewing the hand knob, the rod tip of the centering rod becomes visible. Hold the point on the ceiling or floor with the tip and align the centering rod vertically using the centering rod bubble level. Depending on requirements, this can be screwed onto the centering rod in 2 positions. By vertically shifting the 360° prism, line-of-sight obstructions can also be avoided in this function. The distance from the ceiling/floor to the prism center is read, as with use of the Ortho-Tripod, on a scale on the centering rod with 25 mm increments (50 mm to 150 mm).

By connecting the unit to a prism/GNSS rod, ceiling points at greater heights can also be recorded or staked out, if necessary, without a ladder or lift. Vertical alignment is then carried out using the bubble level attached to the centering rod, which can also be viewed from below for ceiling measurements.

Marking floor points with prism/GNSS rod

Standard rods often have a tip with a 5/8" thread. In its place, the Point-Marker can be screwed on, with or without the Ortho-Tripod, using a 5/8"–M8 adapter. Move the vertical rod on the floor until the target point is reached. By pressing the prism/GNSS rod down against the spring resistance, a clearly visible color mark is created.

For tacheometric applications, in addition to the prism on top of the rod, the 360° Prism MHC-58 can be mounted between the Point-Marker and the prism rod. Due to the small distance of the prism center from the floor, time-consuming precise adjustment with the bubble level is not necessary.

With the strong spring supplied as standard, prism/GNSS antenna rods up to a total weight of 3 kg can be used.















Marking floor points with standard prisms

The Point-Marker can also be used close to the ground without a prism rod with almost any standard prism. For vertical alignment on horizontal floors or ceilings, the Ortho-Tripod can be used. Otherwise, the Point-Marker must be equipped with bubble level no. 3008.30, unless a bubble level is already integrated in the prism holder.
See overview on the next page. 156.















Adapter for paint and paste markers for the Point-Marker

Marking of the staked-out point is carried out with marking pens, either paint- or paste-based. For paint pens, adapter PM1 is required; for paste pens, adapter PM2 and the extension piece PML are needed. Changing the adapters is done within seconds via the bayonet lock.

3640.01



3640.02



For Pen / Marker	Adapter	⚖	№	€
Edding 750, paintmarker	PM1	12 g	**3640.01**	7,-
Schneider Maxx270, Paintmarker				
Molotow ONE4All, ACRYLIC 227HS - paint				
Edding 950, industry painter - Paste	PM2+PML	14 g	**3640.02**	7,-
Sakura Color Products, Solid Marker - Paste				

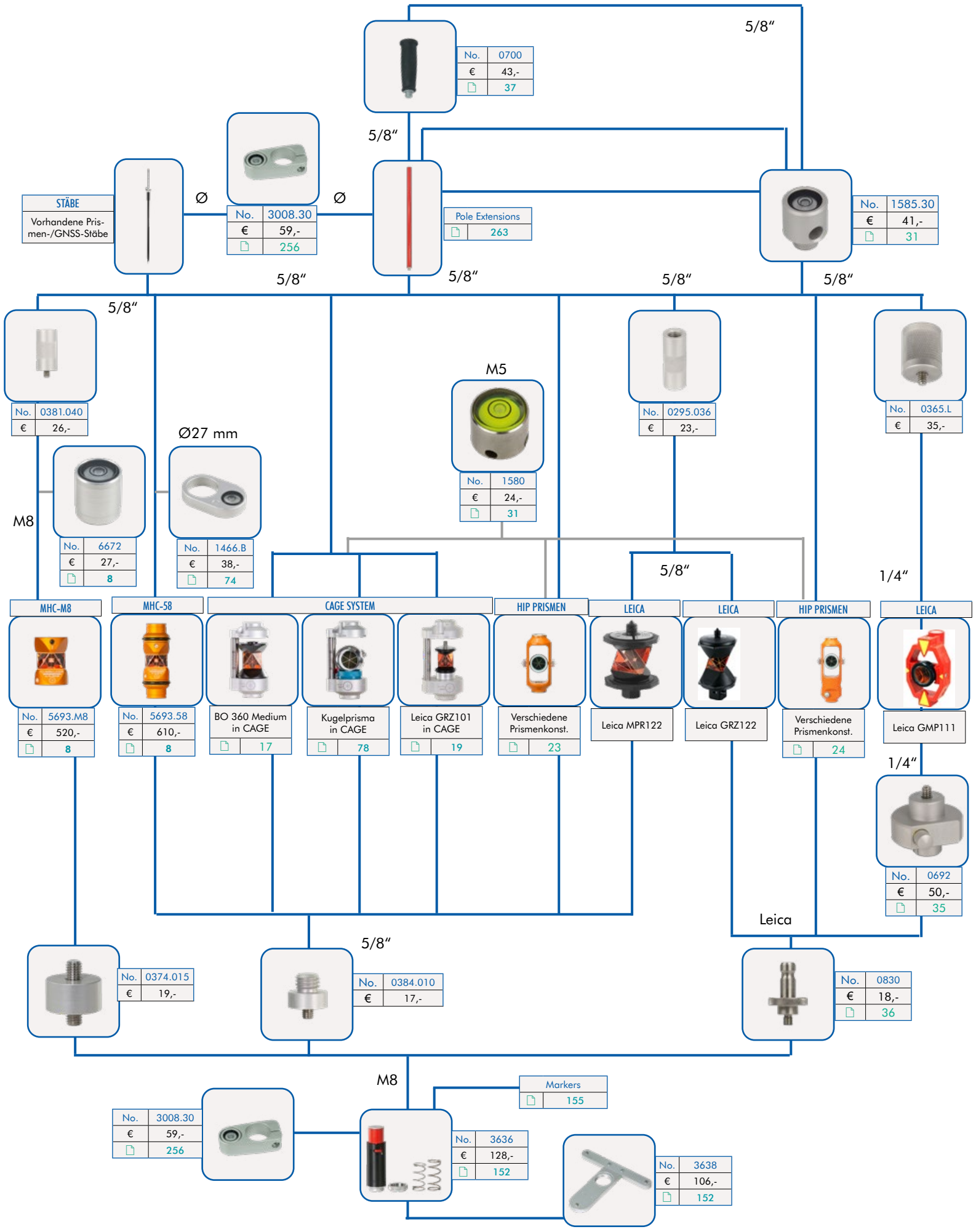
! Paint markers (e.g., Edding paint markers) work best with the tip pointing downward, ensuring proper paint flow. For overhead work, the pump mechanism must be activated beforehand until the tip is filled. The ceiling marking is visible but smaller; occasionally, it is necessary to pump again with the marker held downward.
Paste markers may require readjustment and sharpening after several markings, which can be done quickly thanks to the bayonet lock. Both types of markers should be removed from the Point-Marker after use and secured with a cap to prevent drying out.



Acrylic marker: 4 mm, signal orange (brand Molotow)	⚖	№	€
Silk matte, high opacity, permanent	xxx g	**3637.4o**	6,50



Paste marker: 10 mm, red, permanent	⚖	№	€
Edding 950	xxx g	**3637.10r**	4,50


5/8“
No. 0700
€ 43,-
37
5/8“
Ø
No. 3008.30
€ 59,-
256
Ø
STÄBE
Vorhandene Prismen-/GNSS-Stäbe
Pole Extensions
263
No. 1585.30
€ 41,-
31
5/8“
5/8“
5/8“
5/8“
5/8“
No. 0381.040
€ 26,-
M5
No. 1580
€ 24,-
31
No. 0295.036
€ 23,-
No. 0365.L
€ 35,-
Ø27 mm
M8
No. 6672
€ 27,-
8
No. 1466.B
€ 38,-
74
5/8“
1/4“
MHC-M8
MHC-58
CAGE SYSTEM
HIP PRISMEN
LEICA
LEICA
HIP PRISMEN
LEICA
No. 5693.M8
€ 520,-
8
No. 5693.58
€ 610,-
8
BO 360 Medium in CAGE
17
Kugelprisma in CAGE
78
Leica GRZ101 in CAGE
19
Verschiedene Prismenkonst.
23
Leica MPR122
Leica GRZ122
Verschiedene Prismenkonst.
24
Leica GMP111
1/4“
No. 0692
€ 50,-
35
Leica
No. 0374.015
€ 19,-
5/8“
No. 0384.010
€ 17,-
No. 0830
€ 18,-
36
M8
Markers
155
No. 3008.30
€ 59,-
256
No. 3636
€ 128,-
152
No. 3638
€ 106,-
152




Magnetic prism MPB for stone drills

For staking out/checking boreholes on the floor and ceiling.

- For drill diameters of 6, 8, 10, 12, and 16 mm
- Long range thanks to Ø25 mm glass prism
- Reliable grip of the MPB on the drill via integrated magnets
- The prism constant must be set depending on the drill diameter; it is engraved on the MPB housing
- Circular level, sensitivity 40'. Eyelet for attaching a safety lanyard
- Dimensions: 50 × 33 × 30 mm






Magnet Prism MPB	⚖	№	€
for drill sizes Ø 6, 8, 10 ,12 and 16 mm	110 g	**1486**	115,-

! The circular level can be used for drilling in the floor. When drilling in the ceiling, the drill must be held vertically by eye, with the MPB serving as a right-angled support when positioning. Due to the small distance of the prism from the ceiling, slight tilting has little effect on measurement accuracy.




Lanyard, red	⚖	№	€
40 cm long fabric strap with quick connection	17 g	**1390.R**	5,50

Two ways to account for different drill diameters in distance measurement

1. The set prism constant staying the same.

In that case, a **longitudinal eccentricity** must be entered depending on the prism constant K and the drill diameter.

mm		Prism Constant K				
		0,0	-11,3	-16,9	-30,0	-34,4
		results in longitudinal eccentricity				
Drill Ø	6	-3,0	8,3	13,9	27,0	31,4
	8	-1,5	9,8	15,4	28,5	32,9
	10	0,0	11,3	16,9	30,0	34,4
	12	1,5	12,8	18,4	31,5	35,9
	16	4,5	15,8	21,4	34,5	38,9

Longitudinal eccentricity:
Entered as a horizontal distance (correction) resulting from the geometric conditions.



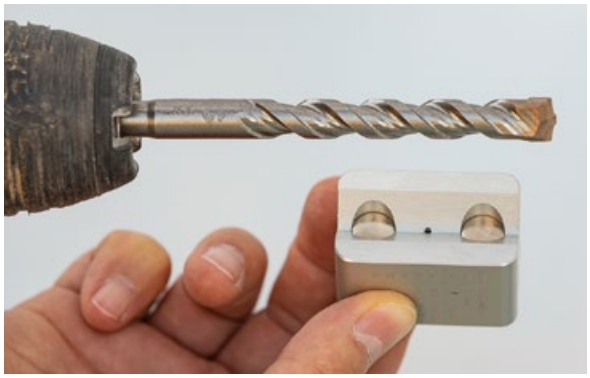
2. Accounting for the drill diameter should be done via the prism constant set on the total station.

The following values result depending on drill diameter (Leica values in parentheses)

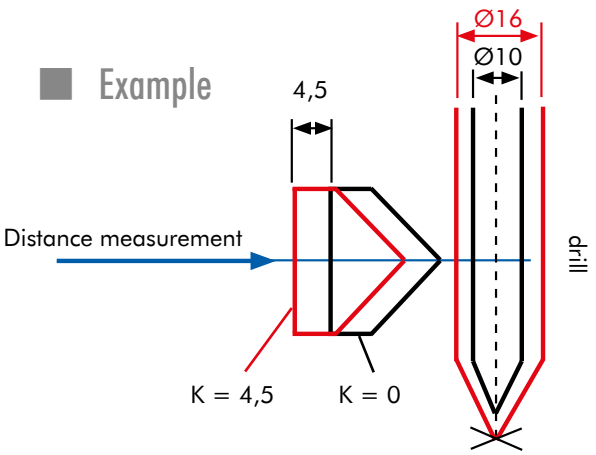
mm		Prism Constant	
		K	(Leica)
Drill Ø	6	-3,0	(37,4)
	8	-1,5	(35,9)
	10	0,0	(34,4)
	12	1,5	(32,9)
	16	4,5	(29,9)

This table is also affixed to the MPB (Art. No. 1486).

Prism Constant:
Applied automatically by the program as a correction to the slope distance with every measurement.

Example



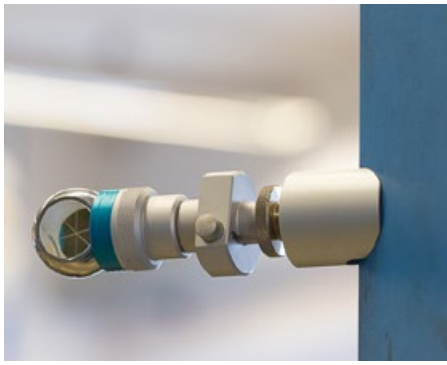
D.1.1. Ball prism bases for industrial 3D measurement 159



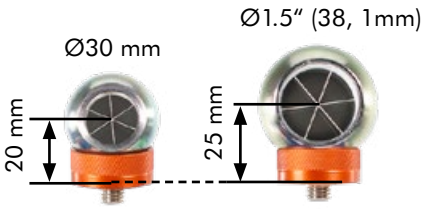


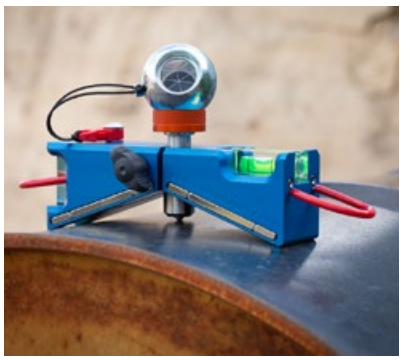

D.1.2. Magnet Base SECTION 161



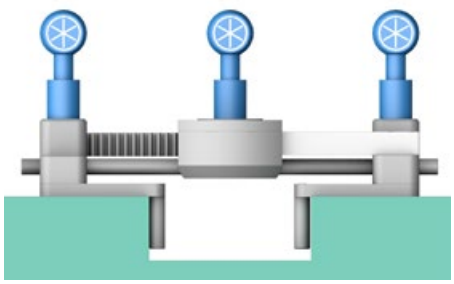
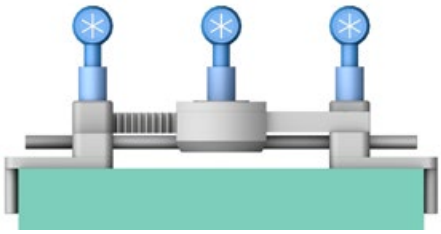


D.1.3. Revolver Base 162

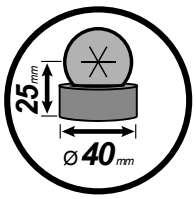




D.1.4. HUG Uni 163





Ball Prism Bases: Industrial 3D-Measurements

For the three-dimensional determination of points and geometries in industrial metrology. To be used with our 1.5" ball prisms 62.

- Base made of stainless steel (V2A) - Ring marking with relevant information
- Integrated permanent magnet (often available with two holding forces)
- Positional accuracy of the ball in the base: ± 0,02 mm
- Height-Offset: 25 ± 0,1 mm (small distance allows very accurate measurements)





Varying magnetic strengths

Some of our bases are available with two different magnetic strengths. Depending on the application, one or the other makes more sense. If you are uncertain about your choice, we will be happy to advise you. Here are the respective advantages:

Weaker magnet:
- The base can be easily moved on the object. The ball can be aligned easily too.

Stronger magnet:
- The base (including the ball prism) sticks to the object by itself (even upside down)
- No additional securing necessary. Hands are free after application of the base

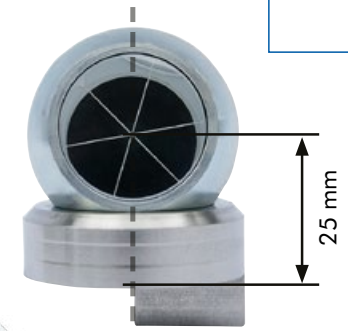


Fall protection ring for clipping onto ball prism

The ring can be slipped over the 3D bases. This makes it possible to clip on a ball prism with fall protection (1448 + 1506 or 1444).



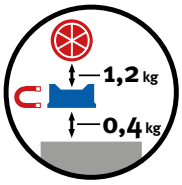
Fall-protection ring for 3D industrial bases with Ø40 mm	⚖	№	€
clip closure to connect to the ball prism's fall protection	10 g	**1534**	9,-

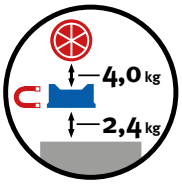


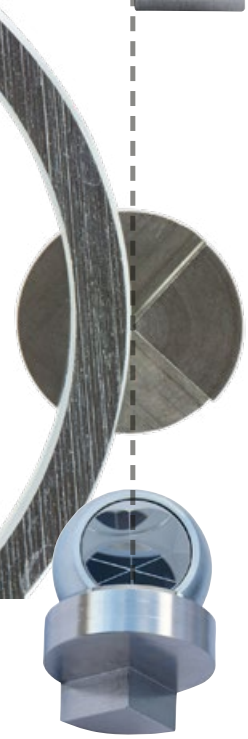
Basis for measuring contours

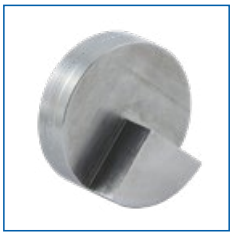
The base is placed onto the object and held with the tip (= base center) against the contour edge. After aligning the ball prism with the tachymeter, the measurement can take place. Due to the permanent magnet built into the base, the ball prism sticks reliably to the base. With the „Contour" base, both straight and curved edges can be measured. Since the tip of the quadrant lies exactly in the center of the base, it can be held at any angle to the edge. Apart from the height offset HO of 25 mm, no further parallel dimension must be taken into account.

- Cylindrical lower part designed as quadrant
- The tip of the quadrant lies exactly in base center
- Positional accuracy of the quadrant tip to the center axis base / prism: ± 0,02 mm









Description	magnet. holding force	Order-No.	Euro
Stainless steel base „**contour**", for ball-Ø 1.5", with magnet	around 1,2 /0,4 kg	**1434.K**	152,-
	around 4,0/2,4 kg	**1434.KS**	158,-

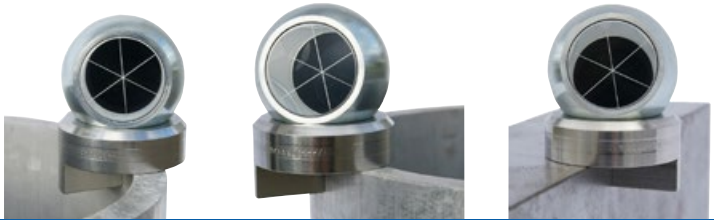
TIPP: To „follow" a contour in tracking mode, we recommend using the base with the weaker magnet (No. 1434.K).



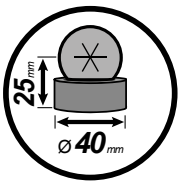
Concave contours

Convex contours

Straight edges

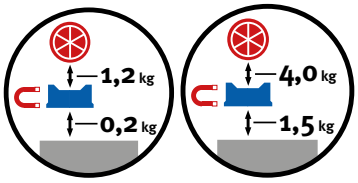




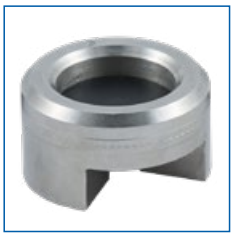


Base for measurement of corners & edges

The base is placed on the edge, and the ball prism is aligned with the tachymeter. On magnetic surfaces, the integrated magnet ensures automatic adhesion. For vertical or overhead measurements, we recommend the strong magnet version.

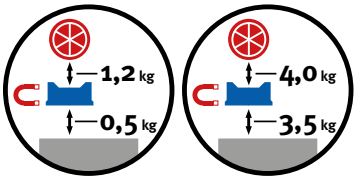






Outer corner

Description	magnet. holding force	Order-No.	Euro
Ball prism base (lower part 270°) **for outer corners** for ball with Ø 1.5", stainless steel	around 1,2 / 0,4 kg	**1434.A**	132,-
	around 4,0 / 2,6 kg	**1434.AS**	138,-

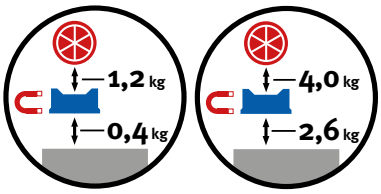






Inner corners

Description	magnet. holding force	Order-No.	Euro
Ball prism base (lower part 90°) **for inner corners** for ball with Ø 1.5", stainless steel	around 1,2 / 0,5 kg	**1434**	132,-
	around 4,0 / 3,5 kg	**1434.S**	138,-

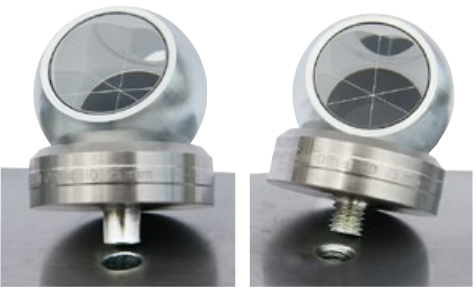






Edges

Description	magnet. holding force	Order-No.	Euro
Ball prism base (Lower part exactly semi-circular) for **edges** for balls with Ø 1.5", stainless steel	around 1,2 / 0,4 kg	**1432**	132,-
	around 4,0 / 2,6 kg	**1432.S**	138,-

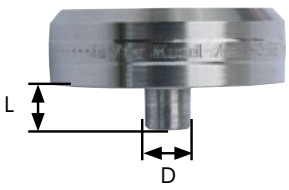






Base to measure bore holes

With this base the 3D coordinates of already existing bore holes of tools, fixtures etc. can be determined. For this purpose, the base is equipped with a concentric stud. The ball centre is located exactly in the stud axis (=bore axis). The bolt diameters are manufactured with „h6 accuracy".



Description	with bolt **D**iameter x **L**ength	magnetic holding force towards ball	Order-No.	Euro
Stainless steel base for ball-Ø 1.5", to measure **bore holes**	Ø 6 x 8 mm	around 2 kg	**1433.06**	132,-
	Ø 8 x 10 mm		**1433.08**	132,-
	Ø 10 x 12 mm		**1433.10**	132,-
	Ø 12 x 14 mm		**1433.12**	132,-
	M8 x 8 mm			

Basis SECTION

For recording horizontal 90° edges

90° edges with the tip pointing towards the zenith can be measured with a single prism; a vector is required for edges with an oblique tip. The 3D coordinates of the 90° tip are determined using the known dimension up to the prism center (see system sketches).

M8



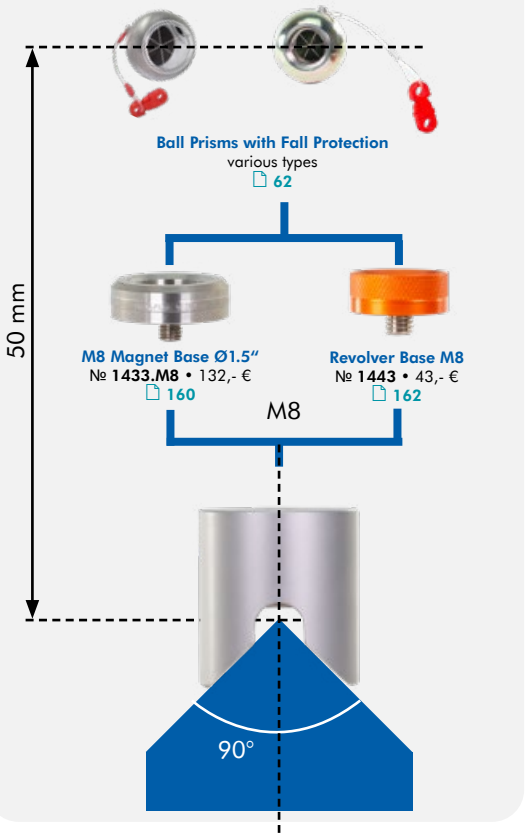
- Anodized aluminium cylinder Ø50 mm with prismatic 90° cut-out
- Integrated magnet
- M8 internal thread for screwing in bases / adapters / centering plates

Description	Weight: 150 g	Order-No.	Euro
Magnetbasis SECTION zur Aufmessung von 90° Kanten		**1740**	88,-

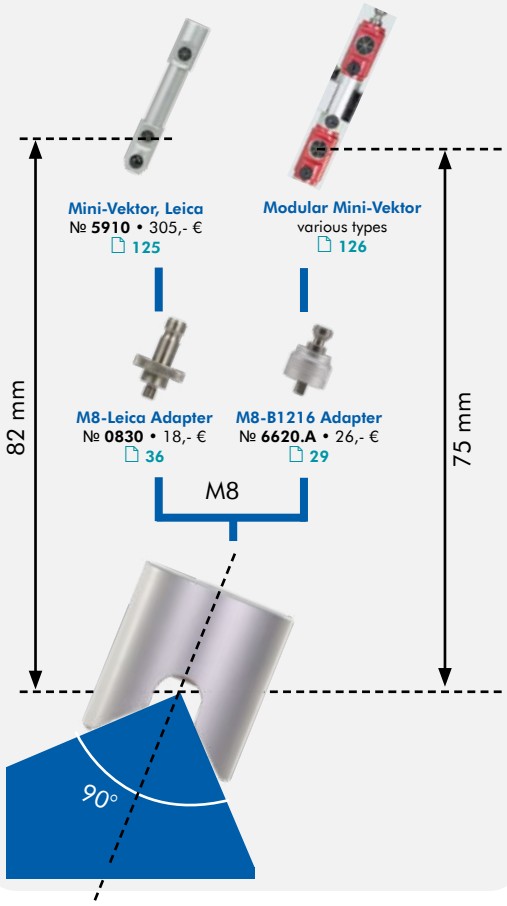




90° edge with tip to the zenith



Slanted 90° edge





SECTION as a reference point for several total station locations

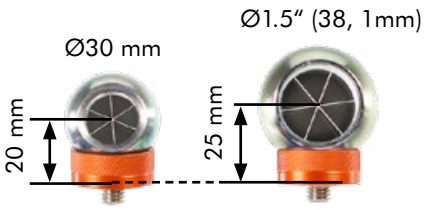
With its integrated magnet, the SECTION adapter can be easily attached to 90° edges made of magnetic material, e.g. a steel door frame. The inclined position of the SECTION adapter in conjunction with the ability to rotate the ball prism in all directions increases its targetability enormously. This means, for example, that the coordinates of the center of the sphere are precisely available in adjacent rooms. By replacing the ball prism with a scan sphere or a scan target, cross-room registration is also possible during scanning (see laser scanning chapter 230).





Alternativ: APEX Mini

TIP	The tubular level built into the APEX-Mini means that horizontal cylinders can also be accommodated. It can also be used on chamfered edges. However, it is not the 3D position of the fictitious intersection point that is determined, but the top of the chamfer using the built-in probe.





„Revolver base“



Revolver Base M8

To use with ball prisms Ø30 mm and Ø1.5“.

The revolver base is universal and compact. Although smaller than our standard bases, the base fits both Ø30 mm and Ø1.5“ (38.1 mm) ball prisms. Built-in magnets (see picture on the left) ensure a reliable hold of the ball prism in the base. The M8 thread allows a wide range of applications together with surveying tools and accessories.

- Base Ø27 x 10 mm made of orange anodized aluminum
- M8 x 6 mm external thread made of stainless steel
- Knurl for safe screwing and unscrewing
- Distance from base bottom to ball/prism center: 20 mm resp. 25 mm ± 0.1 mm
- Use in a centering plate is not possible
- Magnetic holding force (ball direction): approx. 0.5 kg
- Weight: 18 g



Description	Order-No.	Euro
Revolver base M8 for ball prisms Ø30 mm and Ø1.5“ (38,1 mm)	**1443**	43,-

Application examples

The revolver base can be used with all accessories/tools that have a internal M8 thread.

APEX



BOAXE



CONE Adapter





Accessories

If vertical adjustment is necessary, the see-through circular bubble can be attached to the revolver base 74



Description	Order-No.	Euro
Transparent circular bubble for ball bases, sensitivity 30‘	**1466.B**	38,-

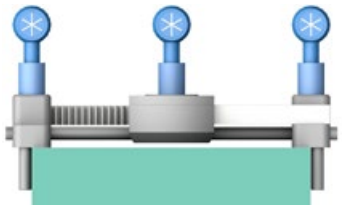
HUG UNI: Universal Measuring Tool

Tacheometric determination of 3D coordinates and distances

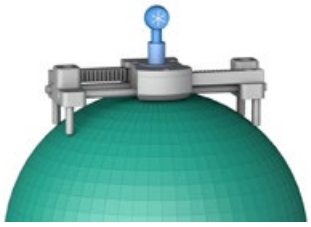
- Two jaws connected by racks move synchronously with identical spacing to the central axis.
- Each jaw has two stop pins screwed in with a length of 20 mm. These can be replaced with 40 mm pins using a pin wrench (SW 3).
- Three M8 threads for screwing in prisms. For example: magnetic base with M8 thread and ball prism

  - One prism on the central part and on both jaws: determination of object points located vertically below the prism centers, taking into account the target height of the prism (for horizontal use of the HUG).
  - One prism on each of the two jaws: computational determination of 3D coordinates of the object points and of distances with arbitrary placement of the HUG in space.

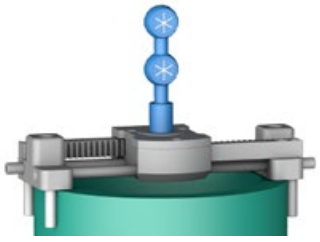
External dimensions 164



APEX Sphere 166



Cylinder Axis 167



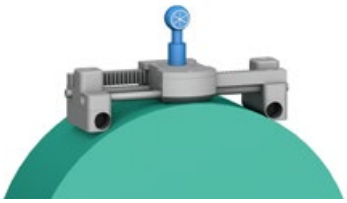
Cylindrical Openings 165



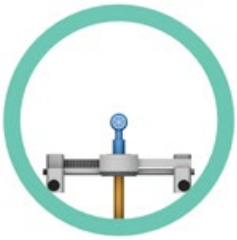
Interal dimensions 164



APEX Cylinder 166



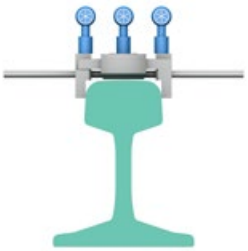
Sole point – in development

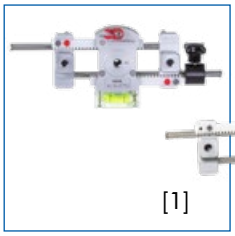


Cylinder, Outer 165

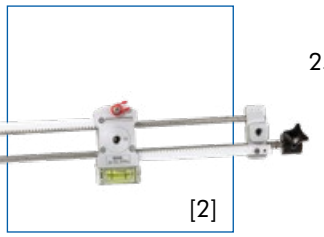


Railway surveying - DB standard
(extra chapter 170)

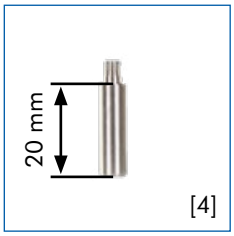




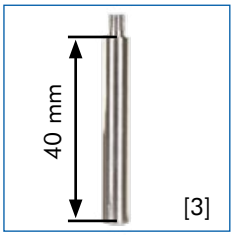
[1]



[2]



[4]



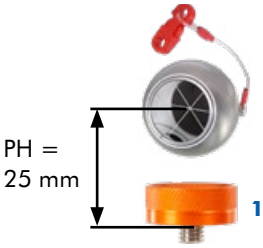
[3]



[5]

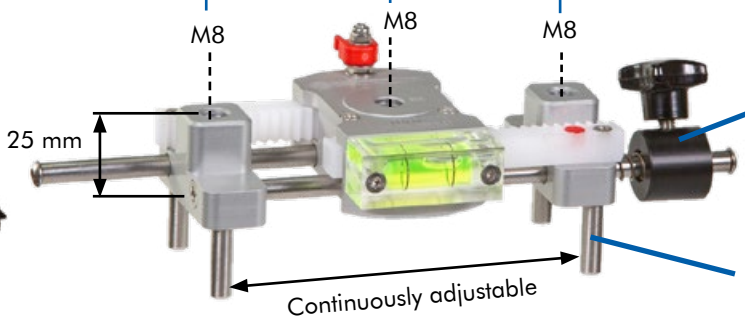


[6]



1444 (ball prism) 62

1443 (magnet base) 162



Maximum limiter. Prevents unintentional sliding of the HUG tool.

4 stop pins (length = 20 mm included in delivery)

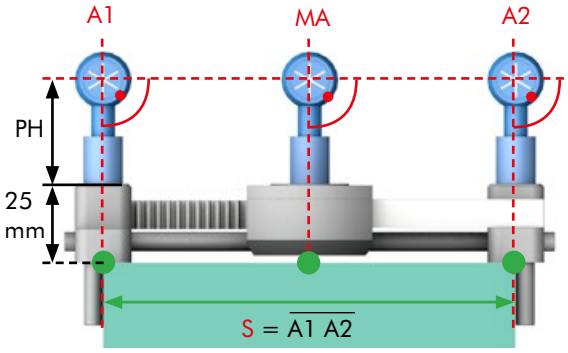
Description	⚖	Order-No.	Euro
[1] HUG UNI, for spans from 60 to 118 mm	260 g	**0799.S**	452,-
[2] HUG UNI XL, for spans from 60 to 285 mm	350 g	**0799.L**	482,-

Description	⚖	Order-No.	Euro
[3] Stop pin Ø6 x 40 mm (1 piece) \[two required per jaw]	8 g	**0799.40**	7,50
[4] Stop pin Ø6 x 20 mm (1 piece) \[two required per jaw]	5 g	**0799.20**	6,-

Description	⚖	Order-No.	Euro
[5] Transport case HUG UNI	440 g	**1468.12**	54,-
[6] Transport case HUG UNI XL (room for both HUG types)	xxx g	**1467.51**	66,-

HUG UNI: Application Descriptions

Depending on the application, the position of the stop pins must be selected. After tacheometric determination of the 3D coordinates of the prisms, the 3D coordinates of the points on the object and the distance S can be calculated.



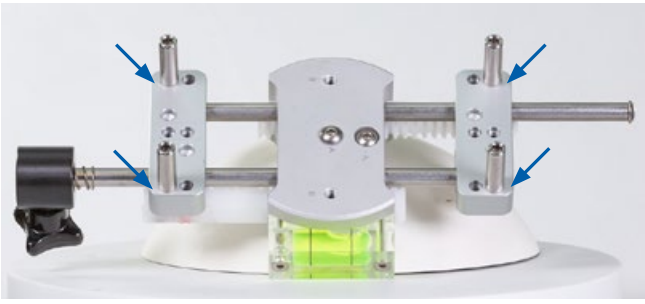
External Dimensions

- Tacheometric determination of the 3D coordinates of the prism center
- Calculated distance A1 A2
- For horizontal use: calculation of the 3D coordinates taking into account the 25 mm offset and the prism height PH, which depends on the prism used.

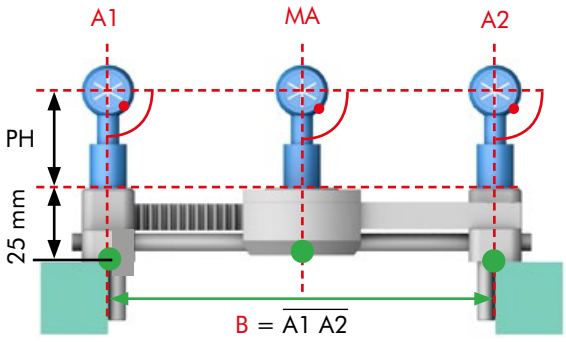
External measurement width **60 - 118 mm**: HUG UNI 163
For widths ≤ smaller than 60 mm: Add „Extend" Jaws: 168

External measurement width **60 - 285 mm**: HUG UNI XL 163
For widths up to 350 mm: HUG UNI XL + Add „Extend" Jaws 168





For external measurements, the pins must be screwed into the outer holes.

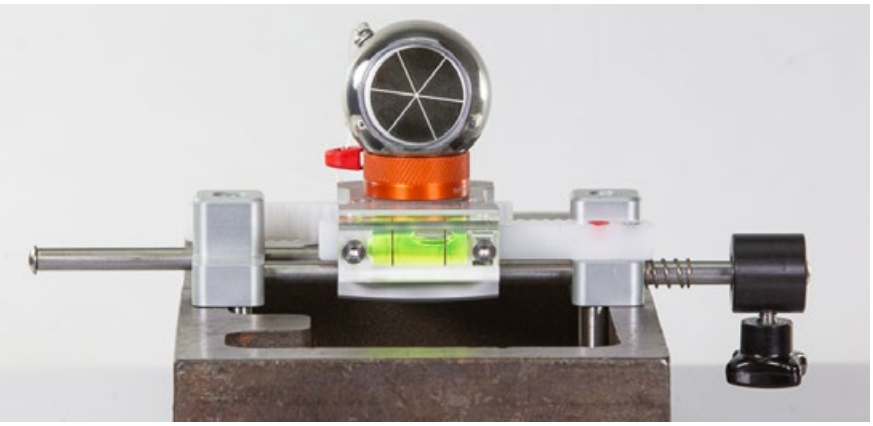


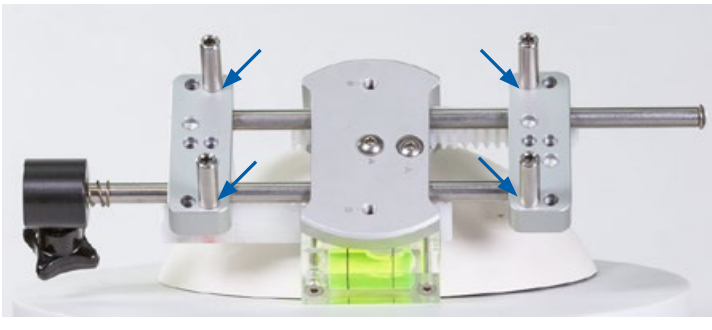
Internal measurement ("clear width")

- Tacheometric determination of the 3D coordinates of the prism center
- Calculated distance A1 A2
- For horizontal use: calculation of the 3D coordinates taking into account the 25 mm offset and the prism height PH, which depends on the prism used.

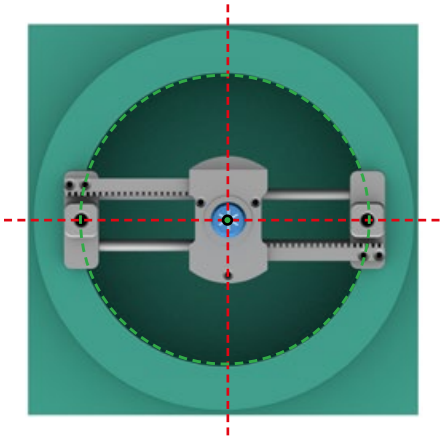
Width of the internal dimension 58 - 116 mm: HUG UNI 163
For widths 13 - 116 mm: Add „Extend" Jaws: 168

Width of the internal dimension 58 - 285 mm: HUG UNI XL





For external measurements, the pins must be screwed into the inner holes.

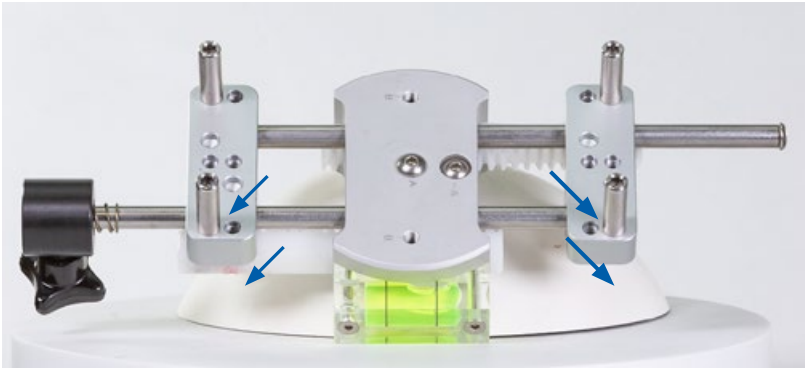


Measurement of circular openings

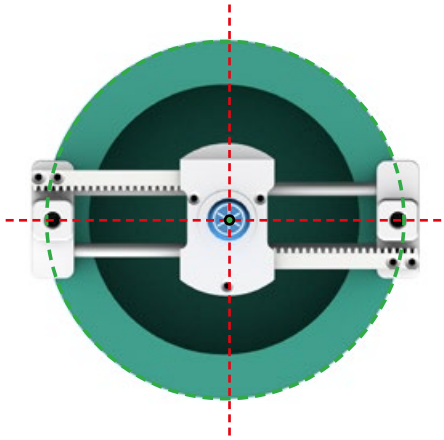
Tacheometric determination of the 3D coordinates of the axis position / center point with an offset of 25 mm + PH from the cylinder.
For vertical use: calculation of the 3D coordinates of the center point at the height of the opening plane, taking into account the 25 mm offset and the prism height PH, which depends on the prism used.

	min.	max.
HUG S	ca. 72 mm	ca. 137 mm
HUG L	ca. 72 mm	ca. 302 mm





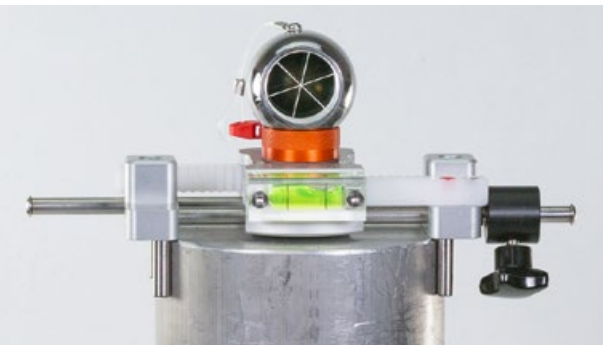
The 4 pins must either all be screwed into the outer holes or all into the inner holes.

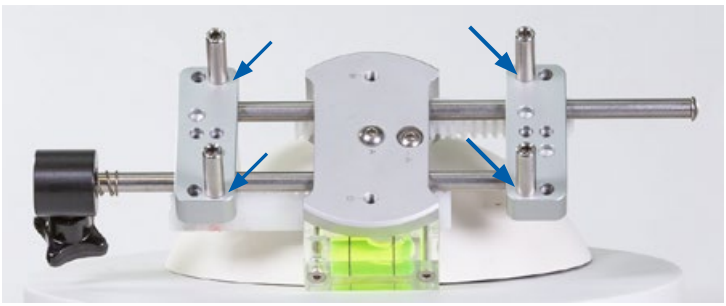


Measurement of cylinder, external

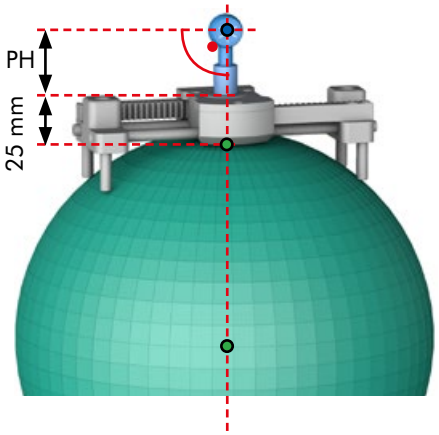
Tacheometric determination of the 3D coordinates of the axis position / center point with an offset of 25 mm + PH from the cylinder.
For vertical use: calculation of the 3D coordinates of the center point at the height of the cylinder start, taking into account the 25 mm offset and the prism height PH, which depends on the prism used.

	min.	max.
HUG S	ca. 60 mm	ca. 120 mm
HUG L	ca. 68 mm	ca. 290 mm





The 4 pins must either all be screwed into the outer holes or all into the inner holes.



Pole measurement of sphere (APEX Sphere)

- Tacheometric determination of the 3D coordinates of the prism center
- Calculation of the 3D coordinates of the pole point taking into account the 25 mm offset and the prism height PH, which depends on the prism used. Calculation of the 3D coordinates of the sphere center with the known sphere radius.

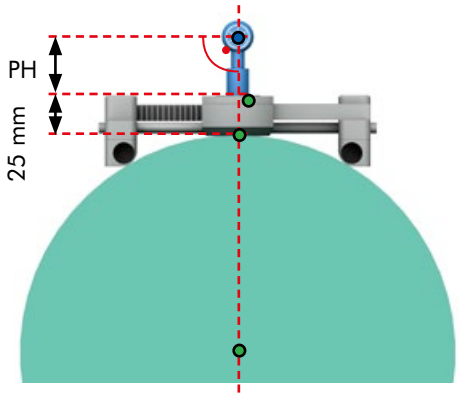
To level the HUG, a circular level must be attached. We recommend the magnetic base 1466.08a (or alternatively 1443) in combination with the level 1466.B.

The 4 pins must all be screwed either into the outer holes or all into the inner holes.

Round jaws for cylinder measurement

Apex measurement of cylinder surface

- With the tubular level in place, tacheometric determination of the 3D coordinates of the prism center and thus of the axis position (without height)
  For horizontal cylinders:
- Calculation of the 3D coordinates of the apex, taking into account the 25 mm offset and the prism height PH, which depends on the prism used. Calculation of the 3D coordinates of the cylinder axis with the known sphere radius.



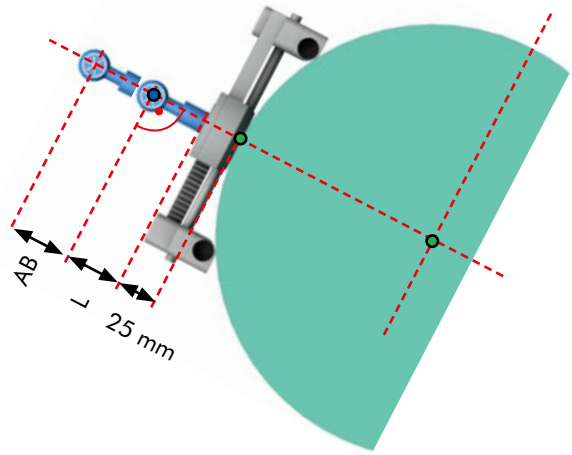
Place the apex on the cylinder using either the two round jaws or the central seating point, and level with the tubular level.

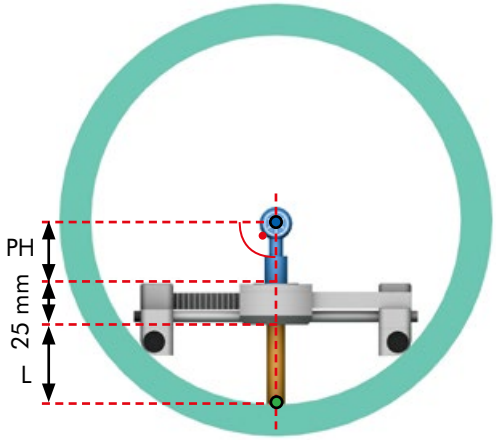
For details, please refer to our comprehensive APEX chapter 186. The functions are more or less identical. However, the HUG UNI does not offer the possibility of using elastic cords for non-magnetic attachment.

The 4 pins must all be screwed either into the outer holes or all into the inner holes.



Cylinder Jaws (2 pieces)	№	€
For use of the HUG on cylinder surfaces	0797	23,-





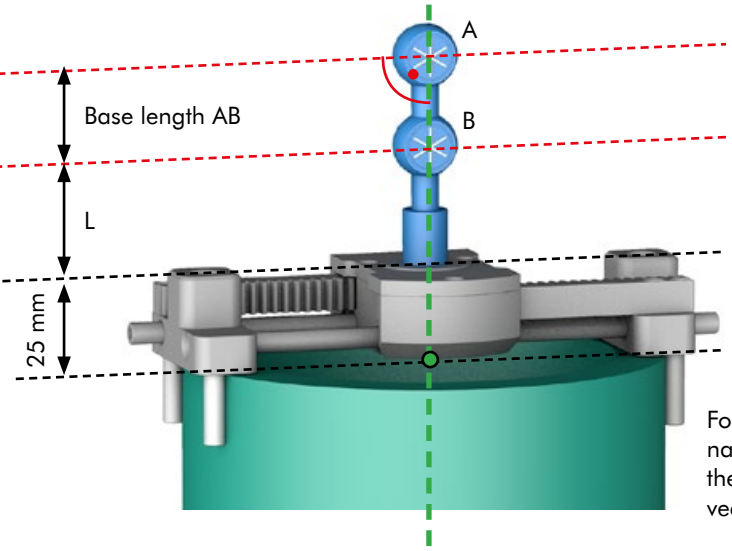
Sole measurement

In development. Please feel free to contact us if interested.



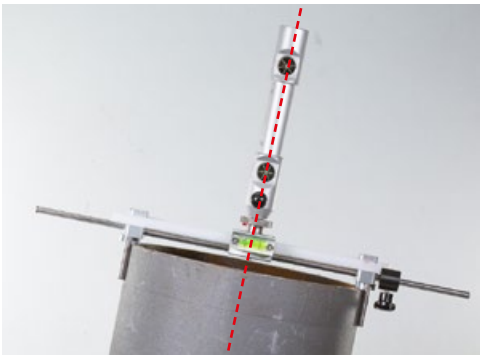
Use of a mini vector for surveying inclined cylinders

To measure the center point or the cylinder axis, a vector must be used. With the two-prism method, the software can create a line (vector) that, when extended, represents the axis of the cylinder or the circular opening.



- Tacheometric determination of the 3D coordinates of the prism centers A and B of the vector, which lies along the axis of the cylinder
- Calculation of the 3D coordinates of the axis position / center point at the cylinder start using appropriate software (e.g., "two-prism method" / "manhole measuring rod" program).

For inclined cylinders: determination of the axis position and the center point \[M] with a mini vector.

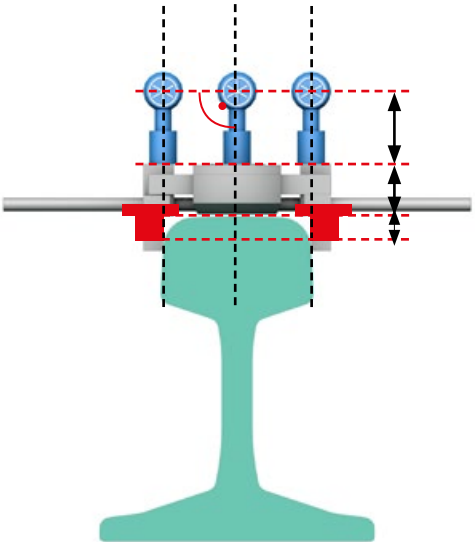




Mini-Vector, Leica Bolt Connection			№	€
Distance between prisms 100 mm	125	220 g	5910	305,-

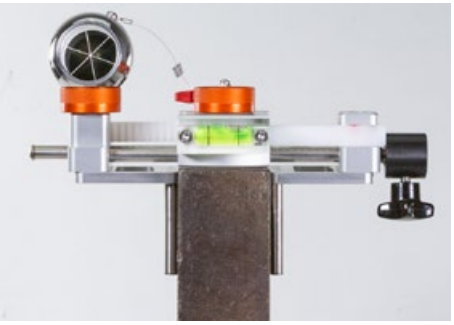


M8-Adapter WA Leica, stainless steel			№	€
Outer thread M8 - Leica bolt Ø12x27 mm	35	70 g	0830	18,-



Ball-bearing support rollers for continous measuring of objects

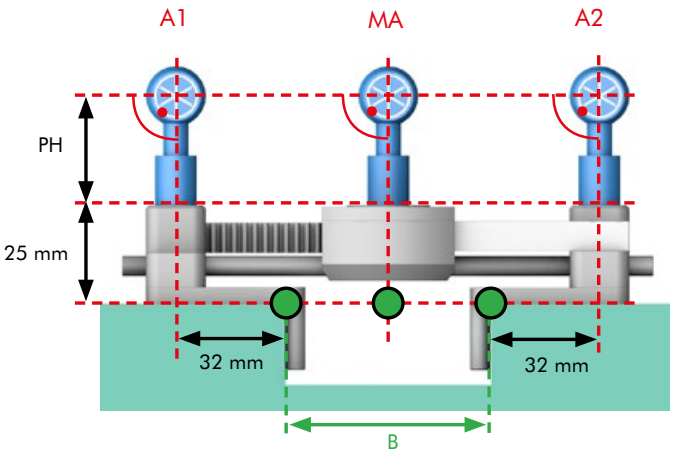
In development. Please feel free to contact us if interested.

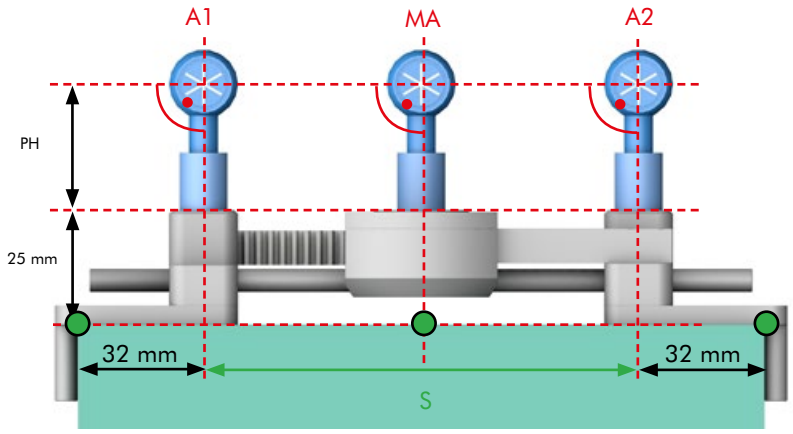


HUG UNI: Extend Jaws

With the extend jaws, the range of application can be expanded: internal dimensions can then be determined with both HUG from 10 mm, external dimensions with the HUG UNI up to 240 mm and with the HUG UNI XL up to 340 mm. For this purpose, the jaws must be mounted facing either inward or outward depending on the application, and a length offset of 2 x 32 = 64 mm must be subtracted or added.

- Tacheometric determination of the 3D coordinates of the prism center
- Calculated distance A1 A2
- For horizontal use: calculation of the 3D coordinates taking into account the 25 mm offset and the prism height PH, which depends on the prism used.







Description	⚖	Order-No.	Euro
Extend Jaws (2 units)	48 g	**0798**	78,-

HUG UNI: Magnets

For objects made of magnetic material, the HUG does not need to be held by hand, even for vertical or overhead applications. For this purpose, magnets can be screwed onto the HUG, either at the support of the central prism or at each of the two jaws.







Description	⚖	Order-No.	Euro
Magnet HUG UNI (1 piece) (effective height: 6 mm)	xxx g	**0796.M**	3,-

Track and Rail Surveying 1/1

F.1. Rail axis and edges with HUG TRACK ROLL & HUG TRACK 170





F.2. Measurement of track position (outer edges) 180





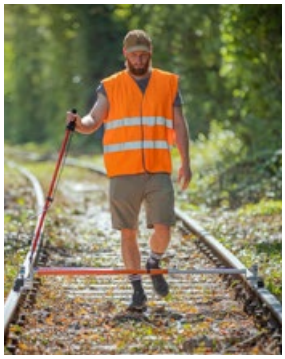

F.3. Surveying of Bolts (Catenary Supports) 182






Ø10 x 20 mm Adapter

F.4. Track Gauge TGS MOVE and TGS FIX 174













HUG TRACK mit Laufrollen, s. Seite 173

Rail Tool HUG

Tachymetric determination of the position and height of railroad and crane rails

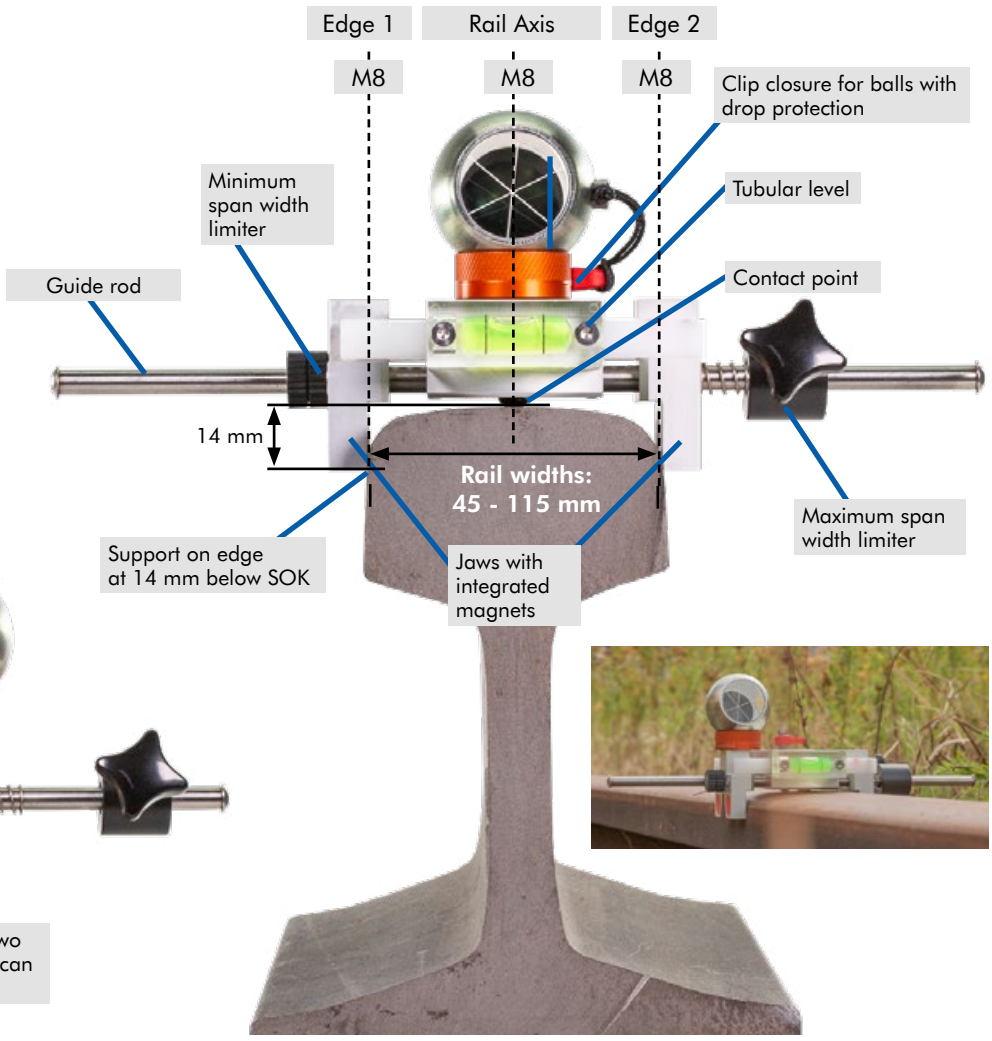
The HUG is a tool that can be used to measure rails universally. After attaching the HUG, not only the **running edge** can be determined, as for example with our rail angle SW PRO, but also the opposite outer edge, as well as the **rail axis.**

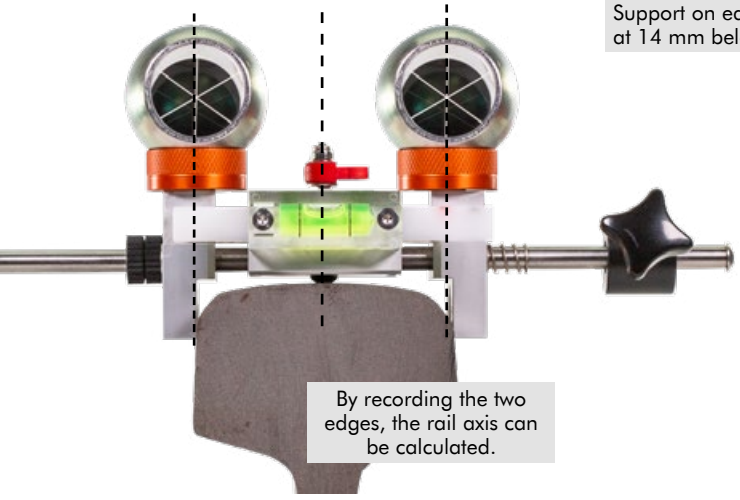
Design and function of the HUG

- Distance of the jaws adjustable to rail widths 45 - 115 mm
- Both jaws always have the same distance to the center of the HUG
- Both edges are held **14 mm below the top edge of the rail** [SOK] or running surface
- Three M8 inner threads for screwing in adapters/prism holders above both edges and rail axis
- Adjustable stops for quick measurement of a rail type
- Magnets in jaws ensure reliable contact with the rail
- Tubular level for horizontal alignment of the HUG transverse to longitudinal axis
- Buckle for clipping in when using the drop guard on the ball prism
- **Distance from wheel contact surface** to top of M8 thread: **25 mm**
- 2 possibilities to align the HUG (171)

Description	Item No.	Euro
Rail tool HUG for both edges as well as the rail axis	**0807**	452,-
Weight: 285 g		









HUG with prism pole

Comfortable recording of many points without bending down or crouching.

The main points on a rail can be determined tachymetrically with the HUG: Edge 1, Edge 2 and rail axis. By using a HIP or Cage prism with the center M8 thread, the HUG can be operated while standing. The prism pole is used to set up the HUG, set it perpendicular and align the prism with the total station.



Two alignment variants

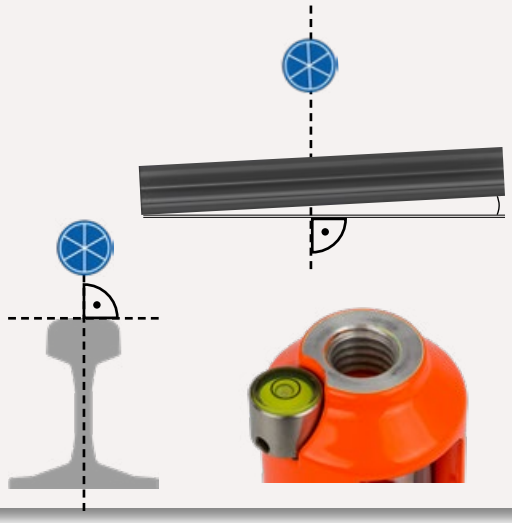
A



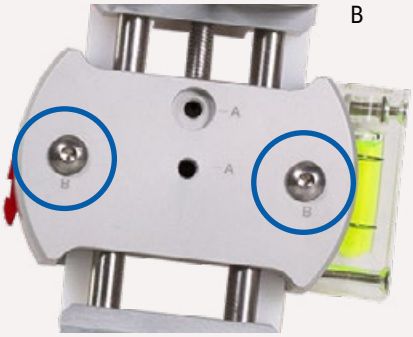
Bottom view

Perpendicular in longitudinal axis / in transverse direction of the rail

- Bottom side of the HUG: One pan head screw is screwed in centrally, the 2nd screw is „parked" in a recessed position (each marked with „**A**")
- The HUG rests on the rail with only one centric point.
- Perpendicular adjustment is performed with a circular level attached to the prism holder or with the circular level on the prism pole, if such a pole is used. The perpendicular adjustment in the transverse direction can be additionally assisted by observing the circular bubble on the HUG.



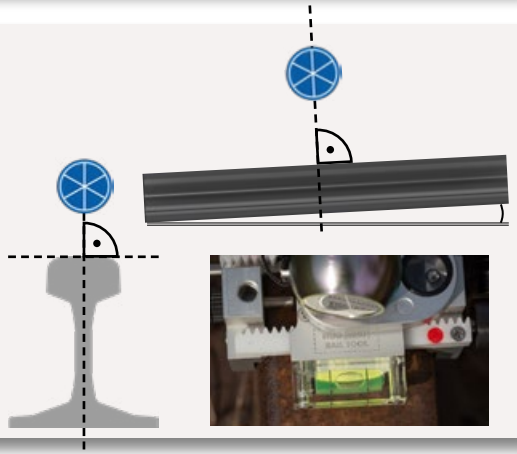
B



Bottom view

Perpendicular to the longitudinal axis / to the transverse direction of the rail

- Bottom side of the HUG: The two raised countersunk head screws are screwed into the threads marked „**B**
- The HUG rests on the rail with 2 points. The prism axis is therefore perpendicular to the longitudinal axis of the rail.
- The perpendicular adjustment in the transverse direction is performed with the tubular level on the HUG.





INFO	For use with the prism pole, we recommend the first variant.

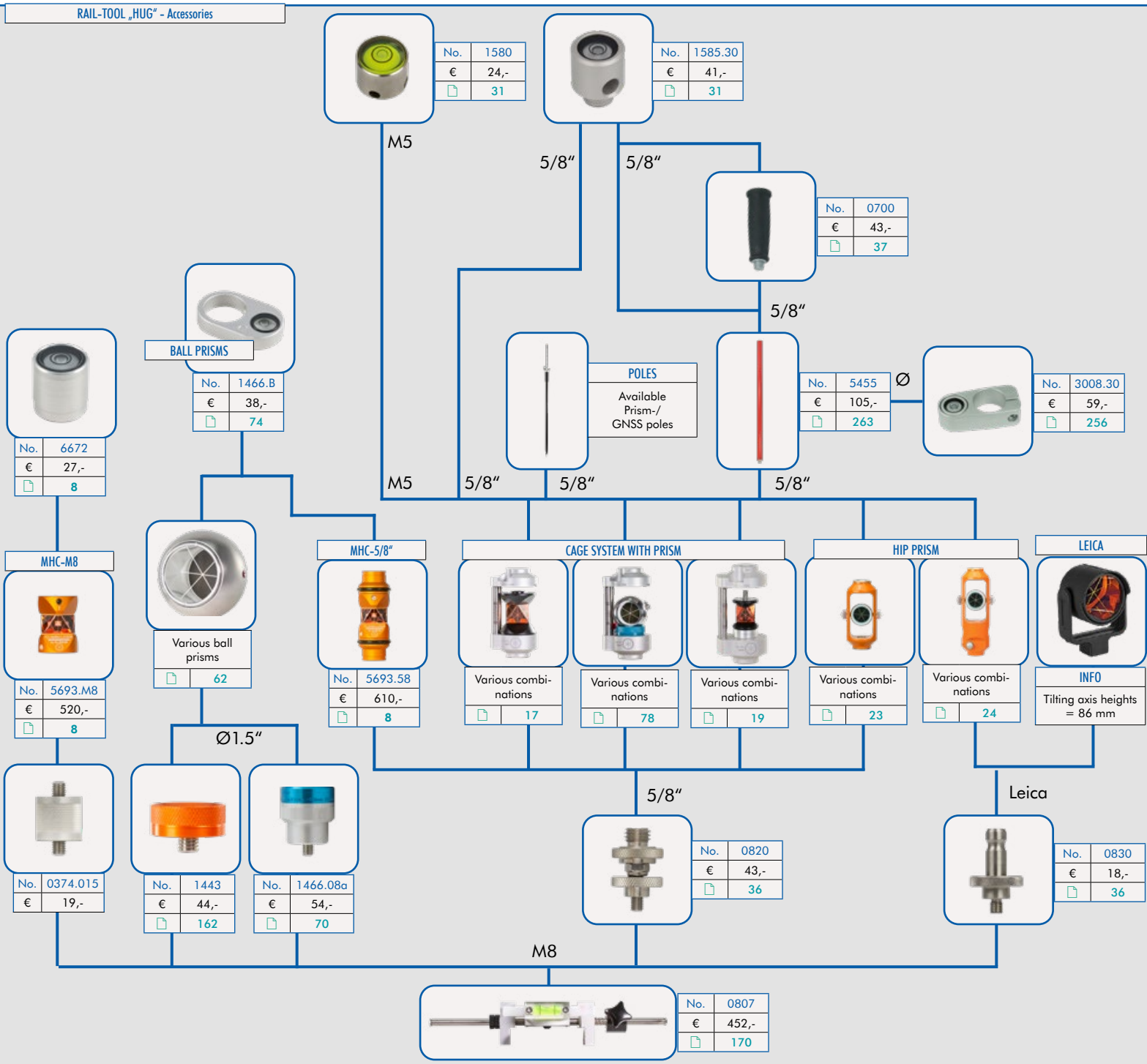
Transport case for HUG tool & accessories

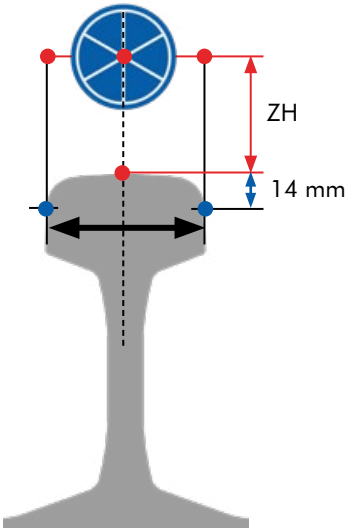
Plastic case for storing and transporting the HUG, as well as accessories. Various recesses in the foam.

Description	Item No.	Euro
Transport case for rail tool HUG	**1468.12**	54,-
Weight: 420 g, Outer dimensions: 275 x 230 x 80 mm		



RAIL-TOOL „HUG“ - Accessories

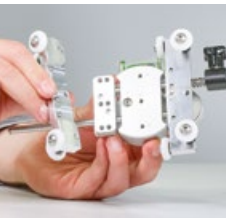




	Adapter	Prism	Height offset	Prism Pole Usage
HUG	0374.015	MHC-M8	65 mm	-
	1433.M8	Ball prism Ø1.5“	50 mm	-
	1466.08a	Ball prism Ø1.5“	75 mm	-
	1433.M8	Ball prism Ø1.5“	50 mm	-
	0820	Cage + Bo 360°	105 mm	✓
	0820	Cage + Ø1.5“	105 mm	✓
	0820	HIP 2 x 5/8“	105 mm	✓
	0820	MHC-58	105 mm	✓
	0830	HIP 5/8“-Leica	125 mm	✓
	0830	Other Leica prisms	125 mm	-

INFO 360° prisms have a maximum targeting accuracy of 1.5 - 2 mm.











Rail Tool HUG-ROLL

Jaws with ball-bearing rollers extending the HUG UNI for efficient rail measurement.

This extension is based on the universal tool HUG UNI. Its basic functions are described on page 163.
A roller extension is screwed from below onto each of the two HUG-UNI jaws using a Phillips screw. Four rollers each rest against the side of the rail at a height of 14 mm, while another four rollers rest on the rail top edge.

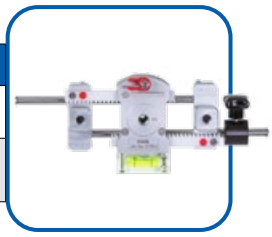
When the HUG ROLL is placed on the rail for the first time, the maximum limiter is set and fixed. An integrated spring exerts constant pressure on the jaws, pushing them together so that the rollers remain permanently in contact with the side of the rail.

This results in a height offset of 35 mm from the rail top edge to the top/mounting surface of the prisms. We recommend using magnet base 1557.M8A and ball prism 1448 – with this combination, the height offset is 65 mm.

Spreader jaws

Two plastic spreader jaws are included in the scope of delivery. Once set to the correct width, they guide the HUG ROLL when placing it onto the rail, allowing it to be „pressed" onto the rail while standing, using the push rod – no manual spreading is required. Additionally integrated magnets further stabilize the tool's grip on the rail. If needed, the spreader jaws can easily be removed using a Phillips screw.

Description	Nr.	Euro
HUG UNI S (Mehr Informationen: 163)	**0799.S**	452,-
Weight: 261 g **INFO**: The tubular level has no function when used with the ROLL contact jaws.		



Description	Nr.	Euro
Jaws with ball-bearing rollers (2 pieces)	**0795**	225,-
Weight: 210 g		



Accessories: Alignment and push rod

The roller jaws give the HUG ROLL good stability, allowing the carriage to glide smoothly along the rail. To avoid pushing in a bent-over position, a ball prism can be attached to a telescopic pole via an adapter. Once the ball is inserted into the base, the pole serves a dual function: the HUG ROLL can be conveniently pushed forward while standing, and the ball prism can be aligned with the current total station position at the same time.

Description	Nr.	Euro
Telescopic pole M8 Carbon, M8 outer thread	**2913.M8**	96,-
Weight: 320 g		



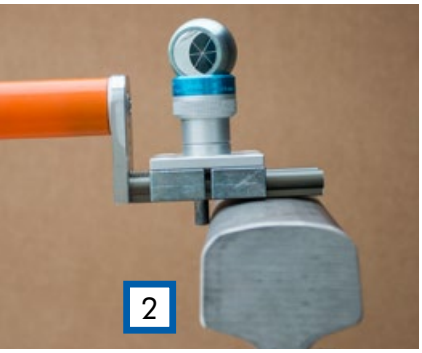
Description	Nr.	Euro
Adapter M3 / M8 / Alignment aid	**1509.M8**	19,-
Weight: 7 g		

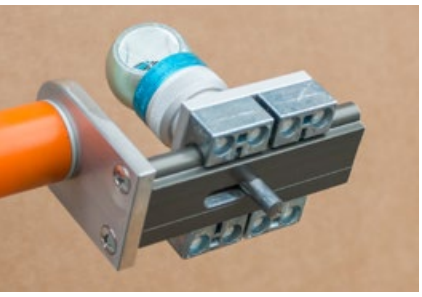


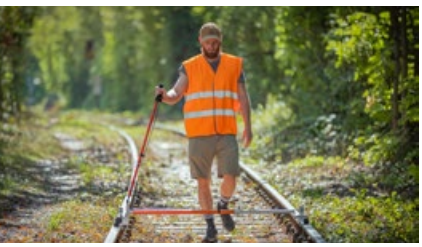












Please also note the sliding variation of the tool TGS MOVE, see page 176

Track Gauge System TGS FIX

Tachymetric determination of track gauges (950 to 1500 mm),superelevation and track axis.

With the track gauge system TGS FIX, 2 prisms are positioned exactly above the running edges of the two rails. After tachymetric determination of the threedimensional coordinates of the prism centers, the following information can be calculated program-controlled:

- **track gauge (width)**
- **lateral inclination (superelevation)**
- **track centre / axis**

If the tachymeter is stationed accordingly, the coordinates of the track axis can be used with country or project systems. More about that: 178

Attributes

- Telescopic pole made of GFK and aluminium
- Quick adjustment of the pole (950 mm to 1500 mm) to the desired track width
- High stability with low weight
- Cylindrical outer pole made of 100% GFK:
  - Easy handling
  - **Electrically non-conductive**
  - Comfortable carrying even at low temperatures
- Measurement of the track gauge 14 mm below the rail top edge (RT), optionally convertible to 10 mm
- 1. Prism on the 1. rail: Fixed stop with double pin **[1]**
  - The large distance of 180 mm between the two stop bolts ensures safe right-angled alignment to the variable stop on the opposite side (2nd rail)
  - Distance between the two bolts can be shortened to 90 mm, e.g. for narrow curve radii for trams
- 2. prism on the 2. rail: movable slide **[2]**
  - A spring with 20 mm spring travel reliably presses the slide with the stop bolt against the reference point on the inside of the rail
  - Backlash-free slide bearing
- M8 thread for screwing on the two prisms via adapters. Basically every typical prism can be used (179)
- Distance from RT (rail top edge) to screw-in surface of the M8 thread: 30 ±0,1 mm
- Approx. 35 mm clear height from RT to underside telescopic pole. Extendable to a clear height of 85 mm (175)

Description	Item No.	Euro
Tachymetrischer Gleismessstab TGS, für Spurweiten von 950 bis 1500 mm	**0802**	1.260,-
Weight: around 2 kg (without prisms)		

INFO	The track gauge system can be converted to measure running edges 10 mm below the top edge of the rail (instead of 14 mm). Please inquire.





















Tracks with obstructions between the rails

Track systems, especially in inner-city areas, often have installations between the rails which protrude above the upper edge of the rail (SO). The standard version of the TGS track gauge system can be used for obstacles up to a height of 40 mm above RT.
For higher superstructures, the bases of the rail supports can be increased so that a clearance height of 85 mm above RT (rail top edge) is available.
A set for upgrading the TGS consists of three support extensions: Two for the side with the fixed stop and one for the side with the movable slide.

- Fasten with M6 Allen screw (SW 4). Key supplied
- Distance from TR to screw-in surface of the M8 thread for prism / adapter: 80 ±0,1 mm
- Clearance height from RT to underside of telescopic pole: approx. 85 mm
- Bolt length 14 mm for stop at reference point
- The support extensions are also available with bolts for measuring running edges 10 mm below the upper edge of the rail. Please inquire.

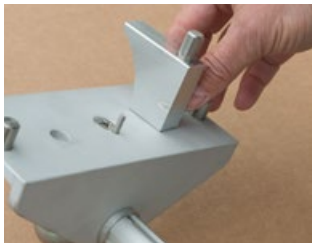
Support extension for fixed stop

- For insertion into bores at the double stop
- Exact axial extension of the standard bolt Ø12 mm

Description	Order No.	Euro
Support extension 50 mm for fixed stop, 1 piece	**0803.D**	74,-
Weight: 140 g		
Info: Two pieces are required. Can only be used with TGS FIX, not „MOVE“		







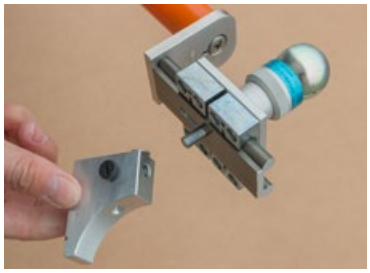


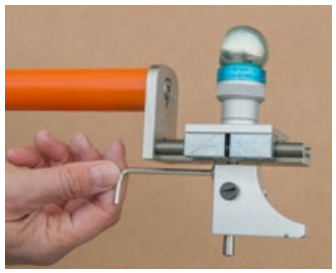
Support extension for movable slide

- To attach to the stop bolt of the slide
- Exact axial extension of the bolt Ø8 mm

Description	Order No.	Euro
Support extension 50 mm for movable slide	**0803.E**	89,-
Weight: 140 g		
Info: Only one piece is required. Can only be used with TGS FIX, not „MOVE“		









Transport case for TGS FIX

Adapters, prisms and any support extensions can also be accommodated, but must be removed from the TGS before closing the case.

- Robust hard shell case with bubble foam in base and lid
- Outer dimensions LxWxH: approx. 118 x 29 x 12 cm, 4 snap locks

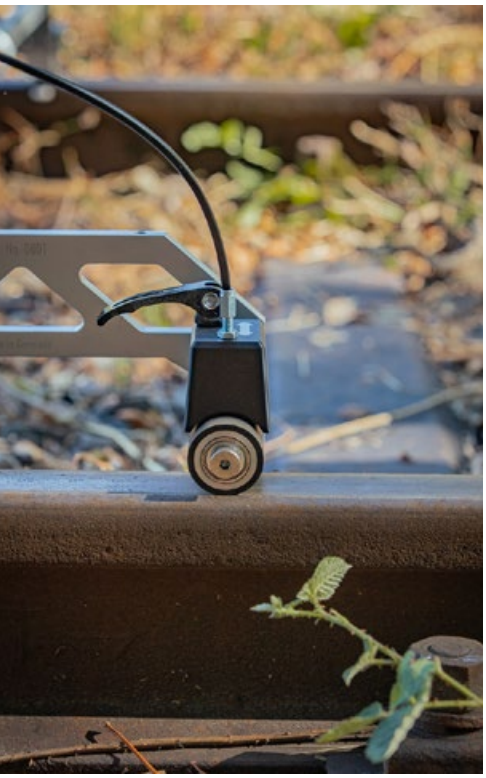
Description	Order No.	Euro
Transport case for TGS FIX	**0802.K**	108,-
Weight: 4,7 kg		













TGS-MOVE: Movable Track Gauge Trolley

For tachymetric determination of track position and track geometry

With the classic track gauge rod TGS FIX (from 174), the track gauge (950–1500 mm), superelevation, and track centerline (track axis) can be measured and calculated very precisely using a total station. The TGS-MOVE achieves the same, but far more conveniently and economically when a large number of stations need to be determined.

As reflectors, virtually all commercially available prisms can be used via corresponding M8 adapters, though for precision measurements the use of our HIP prisms or high-precision ball prisms is recommended (see next page).

Variant 1: At a specific station, the coordinates of the two opposite rail edges are measured for position and height, and the desired values (track gauge, superelevation, track axis) are calculated from them. Unlike the TGS FIX, where the measuring tool is carried to the desired station and set down, the TGS-MOVE is simply pushed there.

Variant 2: The TGS-MOVE is fitted with a reflector on only one side and pushed along the track. Using automatic target recognition, the total station continuously takes measurements to the first rail. After moving the reflector to the other side, or rotating the unit 180°, the TGS-MOVE is pushed back along the same route and the second rail is measured. This provides the trajectory of both rails, allowing the track geometry to be calculated at any given station.

This approach requires only one total station, and measuring from the same setup position achieves the highest accuracy.

In theory, both sides could also be determined simultaneously in a single pass. However, this would require two total stations, whose differing setup positions would introduce additional inaccuracies into the calculations. In addition, there would be issues with automatic target recognition for the two prisms.

Special features of the TGS-MOVE compared to the TGS FIX

- 3 smooth-running wheels for moving along the track, T-shaped 3-point contact arrangement
- Flexible carriages on both sides: with stop rollers that use a spring to apply reliable pressure against the rail edge to be measured (14 mm below the rail top edge SO)
- M8 thread for screwing in reflectors and prisms exactly above the rail edge
- On the side with two wheels: additional M8 thread for screwing in the push rod
- Usable for elevations between the rails of up to XX mm above SO
- An extension of the supports, as with the TGS FIX, is not possible
- Optional: also available with stop rollers 10 mm below SO (others available on request)

Push rod

The TGS-MOVE can be pushed from the center of the track bed using a push rod

- Can be attached at various points on the two-wheel side via a rotatable and tiltable joint
- Handle with integrated dead-man's brake: releasing the handle brakes one wheel, preventing the TGS-MOVE from rolling away on its own

Transport case

The complete system is supplied in a compact transport case. The TGS-MOVE can be disassembled using quick-release fasteners and stored fully, together with adapters and various prisms, in the case.

- Hard-shell case with 4 snap fasteners
- External dimensions L×W×H: 118 × 29 × 12 cm

Description	Nr.	Euro
TGS MOVE with push rod, in transport case	**0801**	3600,-
Weight: 9,5 kg (with case, 4,4 kg without), Info: No discount on this item.		







When using a Ball Prism

Instead of the joint, a ball prism is screwed onto the push rod via an adapter, giving it a dual function: by inserting the ball into an M8 threaded base above the rail edge, the TGS-MOVE can be pushed while simultaneously keeping the prism aligned with the total station.

Adapter M3 - M8

For connecting the push rod to the ball prism
- M3 external thread for screwing into the ball prism
- M8 internal thread for screwing into the push rod in place of the joint

Description	Nr.	Euro
Adapter M3 - M8	**1509.M8**	19,-



Description	Nr.	Euro
Ball Prism v3.0, Ø1.5“	**1448**	152,-
Base for ball-Ø 1.5“, M8 outer thread	**1466.08A**	54,-



With this combination, the prism height is PH = 50 mm, giving a target height (prism center to rail top edge) of TH = 125 mm. More: 179.





When using a HIP-Prism (with close frame)

Instead of the joint, an adapter is used to position a HIP prism 22 and the push rod vertically above the rail edge. This allows the TGS-MOVE to be pushed while simultaneously keeping the prism aligned with the total station.

For connecting the push rod to the HIP prism

- 5/8“ external thread for screwing into the top of the HIP prism
- M8 internal thread for screwing into the push rod in place of the joint

Description	Nr.	Euro
Adapter: 5/8“ outer thread - M8 inner thread	**0385.007**	18,-



To use the TGS MOVE with prism HIP 2 x 5/8“

Target height = 155 mm with prism HIP 2x 5/8“. More: 179.

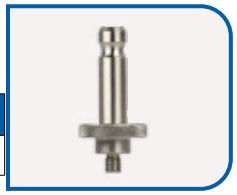
Description	Nr.	Euro
Adapter M8 outer / 5/8‘‘ outer	**0820**	43,-



To use the TGS MOVE with prism HIP Leica-5/8“

Target height = 185 mm with prism HIP 2x 5/8“. More: 179.

Description	Nr.	Euro
Adapter M8 outer thread to Leica bolt 50 mm	**0831**	20,-

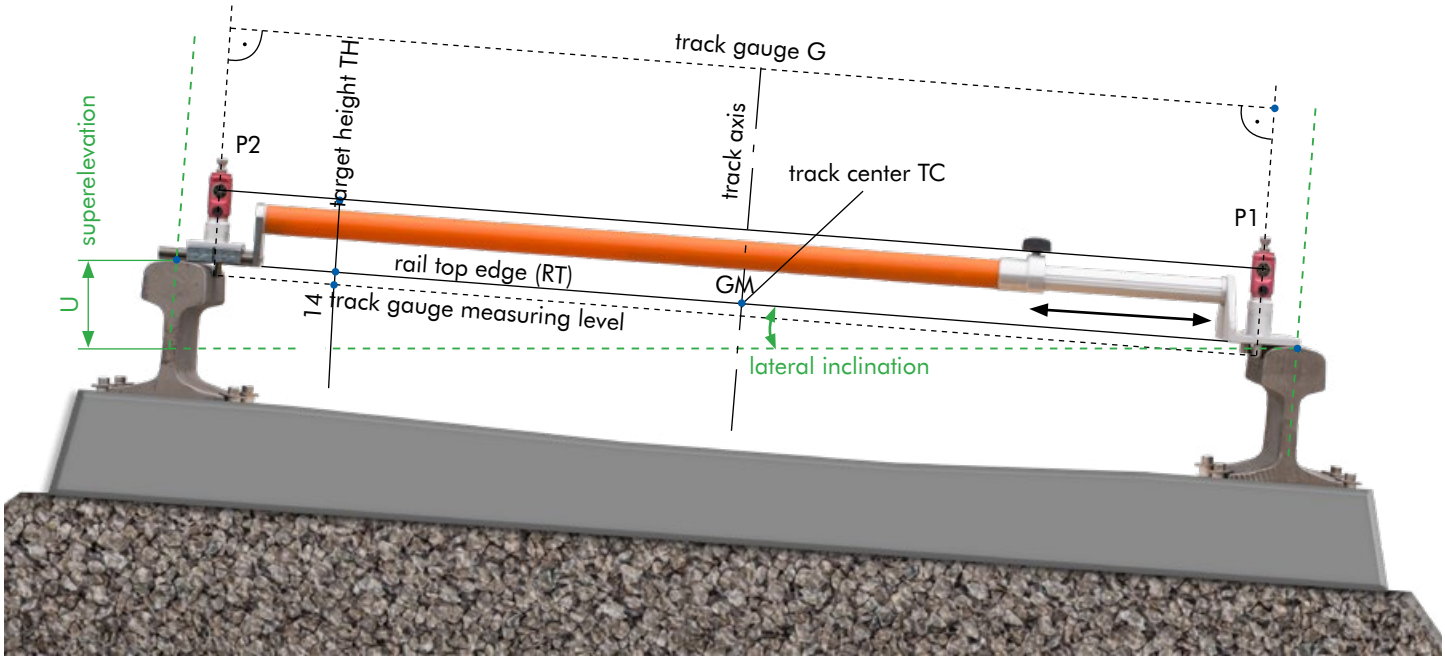


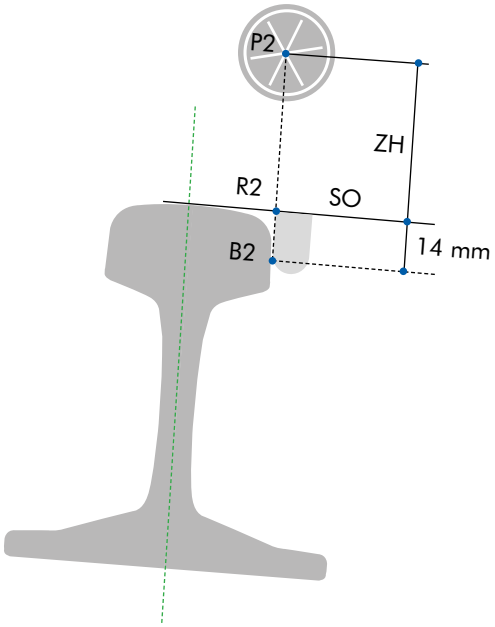
TGS-FIX & TGS-MOVE
usable for track gauges
of 950 to 1500 mm

Track surveying with the tachymeter

With precision total stations, measurements in the differential range can be carried out with an accuracy in the submillimeter range.
In order to achieve this also for the indication of **track gauge**, lateral inclination (**superelevation**) and track centre (**track axis**), the exact reference to the relevant points must be given and the measurement must be carried out with precision reflectors.

With the TGS track gauge system, the 3-D coordinates of the two **reference points R1 and R2** located on the top **edges of the rails RT** can be determined with high precision and the desired data calculated from them.





The basis of the track measurement is the definition of the track gauge within the relevant regulations.

INFO	The track gauge of the track is the distance between the running edges of the rails and **in Germany** is measured 14 mm below the connecting line of the highest points of the two rails (rail top edge = RT).

The **track gauge G** is thus the distance between the two **reference points B1 and B2**, which lie opposite each other on the inside of the two rails. The track gauge system is designed in such a way that the prism centres P1 and P2 lie on a parallel with a defined distance to the connecting line of points B1 and B2, in each case at an exact right angle to these.
After placing the pole at the inner rail edges, the two **prism centres P1 and P2** are measured tachymetrically. From their 3D coordinates, taking into account the target height TH, The **reference points R1 and R2** can be calculated, and from this, independent of the coordinate system, the actual **track gauge** and the **superelevation SE**.
If the tachymeter is stationed accordingly, the coordinates of the **track centre TC** in the desired system are additionally obtained by averaging the points R1 and R2.

The only requirement is software that can calculate the relatively simple geometric correlations.

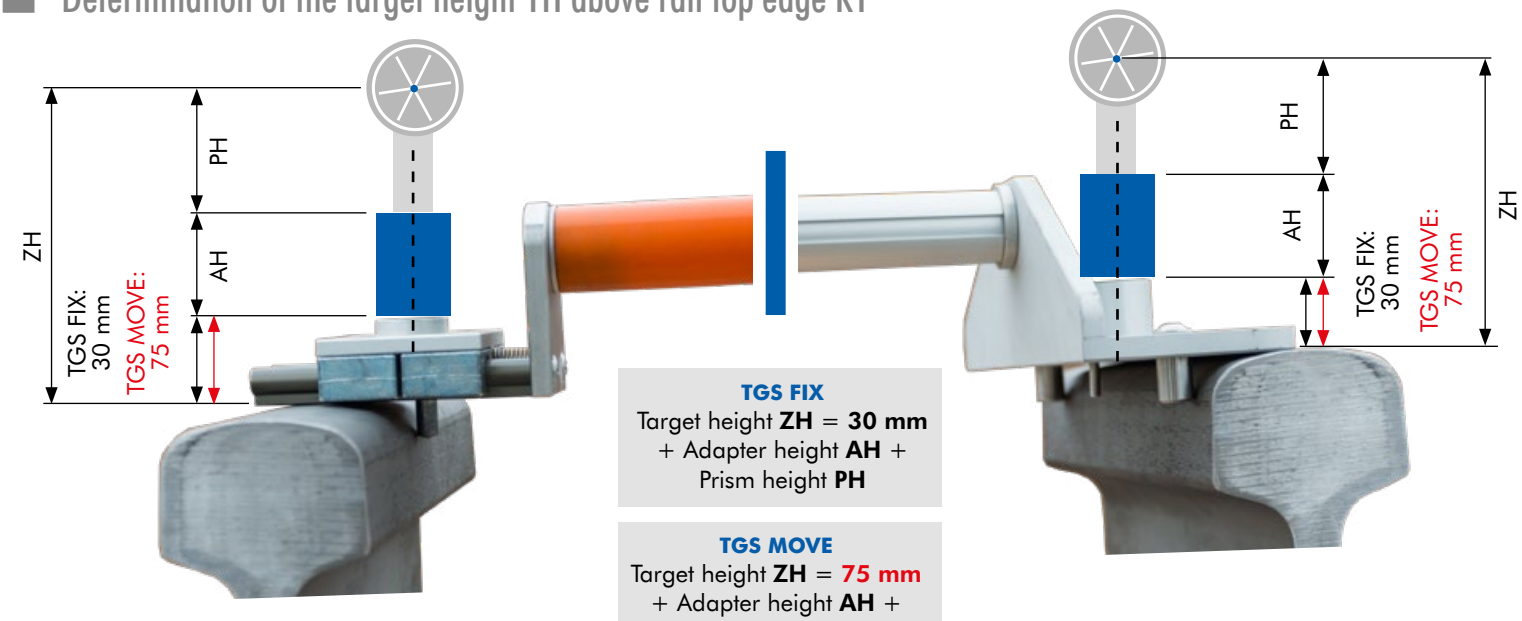


Use of the TGS in the Gotthard Tunnel

M8 adapter for track gauge system for prisms and targets

The accuracy of the track measurement depends on the one hand on the tachymeter used and the stationing and on the other hand on the exact mapping of the track geometry by the track gauge system. The third essential factor is the reflectors used.
The track gauge system TGS has an M8 internal thread on both sides. So almost all commercially available prisms can be used with appropriate adapters.
For precision measurements, however, high-quality prisms or prism holders should be used. It is very important that the visible prism centre (centrally symmetrical point) runs through the vertical axis of the support. In addition, the necessary stability must be taken into account; the best results are obtained with metal mounts and supports. It goes without saying that the prism constants must be clearly indicated. It is recommended to use the same prism type on both sides of the TGS, in best case with identical constants checked by comparison measurements.
Our ball prism series meets all these requirements. In addition, they have a very low overall height, which also increases accuracy.

Determination of the target height TH above rail top edge RT



TGS FIX
Target height **ZH** = **30 mm** + Adapter height **AH** + Prism height **PH**

TGS MOVE
Target height **ZH** = **75 mm** + Adapter height **AH** + Prism height **PH**

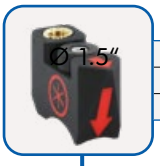
M8 Adapter heights, examples



No.	0385.007
€	18,-
177	177

Option for TGS MOVE
For attaching the push rod directly to the HIP prism (s. image 177)

Option for TGS MOVE
For attaching the push rod directly to the ball prism (s. image 177)



No.	1509.M8
€	19,-
177	177

HIP 2 x 5/8"



various prism constants	
23	23

HIP 5/8"-Leica



various prism constants	
24	24

LEICA PRISMS



INFO
With tilting axis heights = 86 mm



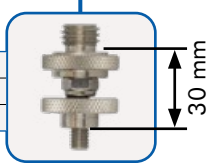
BALL PRISMS



Ø 1.5"

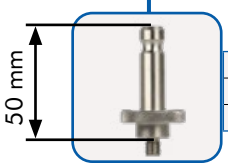
No.	1448
€	152,-
62	62

TGS FIX
Target Height **ZH** = **110 mm**
TGS MOVE
Target Height **ZH** = **155 mm**



No.	0820
€	43,-
36	36

TGS FIX
Target Height **ZH** = **140 mm**
TGS MOVE
Target Height **ZH** = **185 mm**



No.	0831
€	20,-
36	36

TGS FIX
Target Height **ZH** = **80 mm**
TGS MOVE
Target Height **ZH** = **125 mm**



No.	1466.08A
€	54,-
70	70



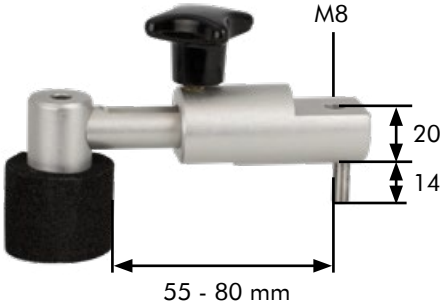
Rail angle SW PRO

Rail angle for exact measurement of the track position. The reference point P (running edge) to be measured is located on the inside of the rail, 14 mm below the top edge of the rail SOK (running surface).
Exactly this point is realized by setting up the **SW PRO** rail angle.



Design and advantages

- Metal construction with a hardened 14 mm cylindrical pin for precise positioning on reference point P.
- Cylindrical support of the SW PRO ensures vertical use even on inclined tracks, maintaining a constant distance to the rail head (SOK).
- Prism mount (M8 thread) is positioned exactly above reference point P.
- The prism can be rotated around its axis and aligned with the total station regardless of the track angle.
- Adjustable foam rubber stop presses the cylindrical pin lightly against reference point P and only needs to be set once for the rail width. Also ensures secure positioning when using extensions (e.g., prism rod).
- Can be set up while standing, making it ideal for a large number of measurement points.
- Slim cylindrical pin reliably secures any side markings on the rail.
  Vertical alignment of the track angle with the prism is achieved using a circular bubble, which can be mounted on the prism holder or prism rod.



Description	Item No.	Euro
Rail angle tool SW PRO	**0800**	148,-
Weight: 190 g		
Info: Applicable for rail widths from 55 - 80 mm		









All prism types on next page 181



Transport case for SWPro and Prism

Plastic case for storing and transporting the SWPro, as well as a prism / accessories.

Description	Item No.	Euro
Transport case for rail tool SWPro	**1468.12**	54,-
Weight: 420 g, Outer dimensions: 275 x 230 x 80 mm		



SW PRO: Prisms and adapters



No.	1580
€	24,-
	31

M5



No.	0700
€	43,-
	37

5/8“

5/8“



No.	1585.30
€	41,-
	31

5/8“



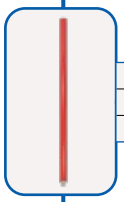
No.	5672
€	47,-
	14



POLES

Vorhandene Prismen-/GNSS-Stäbe

5/8“



No.	5455
€	105,-
	263

Ø



No.	3008.30
€	59,-
	256

5/8“



No.	1468.2
€	34,-
	257



BALL PRISMS

€	27,-
	8



Various ball prism designs

	62



No.	5670
€	336,-
	14

MHC-58



No.	5693.58
€	610,-
	8

CAGE SYSTEM



Various combinations

	17



Various combinations

	17



Various combinations

	19

HIP PRISMS



Various prism constants

	23



Various prism constants

	24

LEICA PRISMS



INFO

With tilting axis heights = 86 mm



1/4“

MHC-M8



No.	5693.M8
€	520,-
	8

Ø1.5“

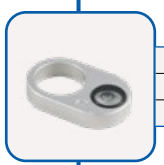


No.	1466.B
€	38,-
	74

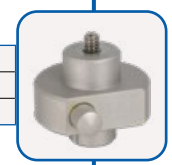
1/4“



No.	5676
€	37,-
	14



No.	1466.B
€	38,-
	74



No.	0692
€	50,-
	35



No.	0374.015
€	19,-

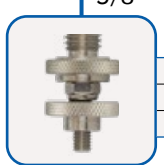


No.	1466.08a
€	54,-
	70



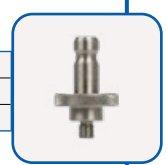
No.	1443
€	44,-
	162

5/8“



No.	0820
€	43,-
	36

Leica



No.	0830
€	18,-
	36

M8



No.	0800
€	148,-
	180

SWPro	Adapter/ connection	Prism	Target height ZH from rail OK to prism center
0800	1443	ball prism Ø1.5“	45 mm
	1466.08a	ball prism Ø1.5“	70 mm
	0820	HIP 2 x 5/8“	100 mm
	0820	Cage + Bo 360°	100 mm
	0820	Cage + Ø1.5“	100 mm
	0820	MHC-58	100 mm
	0830	HIP 5/8“-Leica	120 mm
	0830	Other Leica prisms	120 mm







Prism holder for bolt surveying

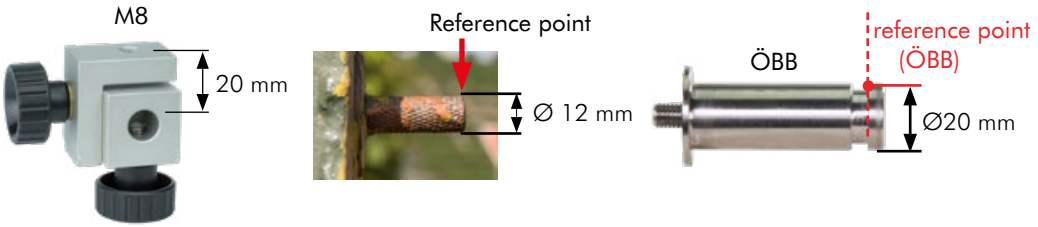
The holder can be used on all horizontal bolts (Ø12 mm or ÖBB: Ø20 mm) found on overhead catenary poles made of steel or spun concrete.
The prism center is at an exactly determined distance above the **reference point** (see pictures). If the prism does not have a circular level, the holder with integrated circular level can be used.

After placing the holder on the bolt, the prism is aligned on the tachymeter and set perpendicular. This position is fixed with the two knurled screws and the measurement is taken.

- Precisely machined metal construction made of anodized aluminum
- Ergonomic knurled screws
- Screw-in axis of the prism holder (M8 thread) lies exactly above the reference point (= center of front edge of bolt)
- For ÖBB bolts, the screw-in axis is 5 mm behind the leading edge of the bolt
- The circular level integrated in the 0852 and 0854 holders can be viewed from above or below. This makes work much easier, especially when bolts are mounted high up, as no time-consuming and dangerous climbing is required.
- Prism holders for Ø12 mm bolts are DB-GV-Target-compliant (see below).

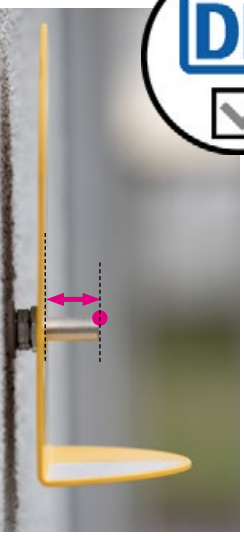
Description	Item No.	Euro
Prism holder for horizontal bolt (**Ø12 mm**), without integrated level	**0850**	146,-
Prism holder for horizontal bolt (**Ø12 mm**), with integrated (see-through) level	**0852**	163,-
Prism holder for horizontal bolst **ÖBB** (**Ø20** mm), with integrated (see-through) level	**0854**	163,-
Info: 0854 without integrated circular level is also available on request.		













1630.34.DB

DB -GV-Targets compliant HIP prisms

The installation of GV targets (laser scan targets for track marketing bolts) is carried out in accordance with the specifications of Deutsche Bahn (Ril 883.3000A2, Ril 883.3000A03). Accordingly, among other things, a usable length of at least 25 mm must remain on the catenary mast bolts. Our complete HIP series (24) is now also available in compliance with DB-GV-Target without tilting axle pivot covers and with shortened axle bearings. The prism can be rotated all round.

Example (see picture): Prism HIP Leica-5/8" GV-Target-compliant with prism constant K = -34.4 (Leica = 0) mm



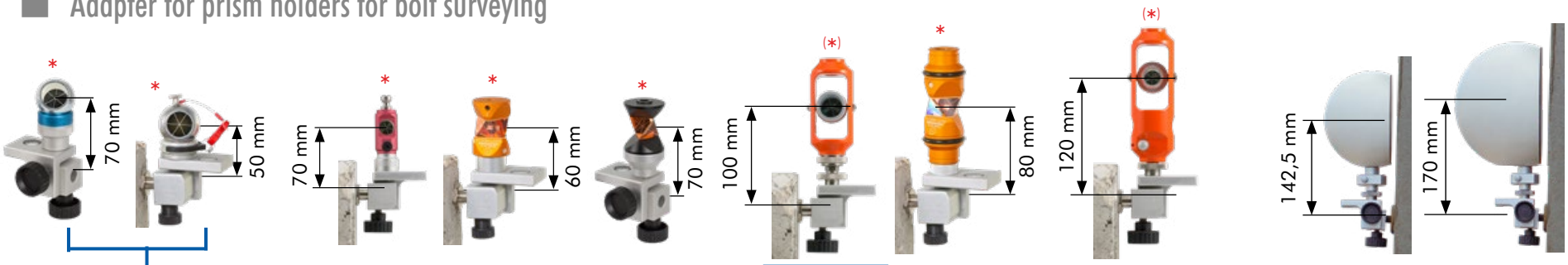
Transport case for Track prisms and prism holders

Plastic case for storing and transporting the 4 track prisms as well as prism holders. Note: Made for HIP-Prisms.

Description	Item No.	Euro
Transport case for rail prisms and bolt adapters	**1467.50**	64,-
Weight: 520 g, Outer dimensions: 340 x 280 x 85 mm		



Adapter for prism holders for bolt surveying



No.	1444
€	174,-
	62

No.	1533
€	7,-
	65

Ø1.5“



No.	1466.08a
€	54,-
	70



No.	1557.M8a
€	39,-
	67



No.	6620.A
€	26,-
	28

B1216

MHC-M8



No.	6611
€	158,-
	28



No.	0374.015
€	19,-

M8

MHC-M8

No.	5693.M8
€	520,-
	8

M8



No.	5670	5665
€	336,-	390,-
	14	14



No.	5674.A
€	35,-

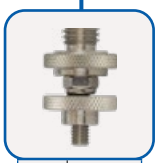
1/4“

HIP PRISMS



Various prisms constants

	23



No.	0820
€	43,-
	36

5/8“

MHC-58



No.	5693.58
€	610,-
	8



No.	0384.010
€	17,-

5/8“

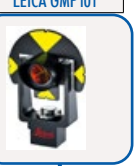
HIP PRISMS



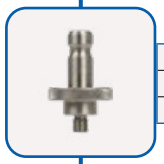
Various prisms constants

	24

LEICA GMP101

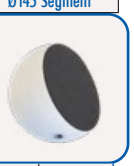


Leica



No.	0830
€	18,-
	36

Ø145 Segment



No.	6050
€	227,-
	212

M8



No.	0690
€	50,-
	35

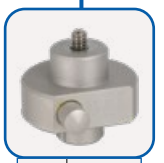
Ø200 Segment



LEICA GMP111



1/4“



No.	0692
€	50,-
	35

Track/Rail Prism

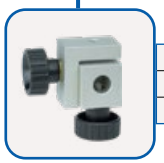


Ø10 x 20 mm



No.	0856.40
€	36,-
	184

M8



No.	0850
€	146,-
	182



No.	0852
€	163,-
	182



No.	0854
€	163,-
	182

DB

* DB-GV-Target-compliant
(*) HIP-Prisms 10

Ø10 x 20 mm Bolt Adapter

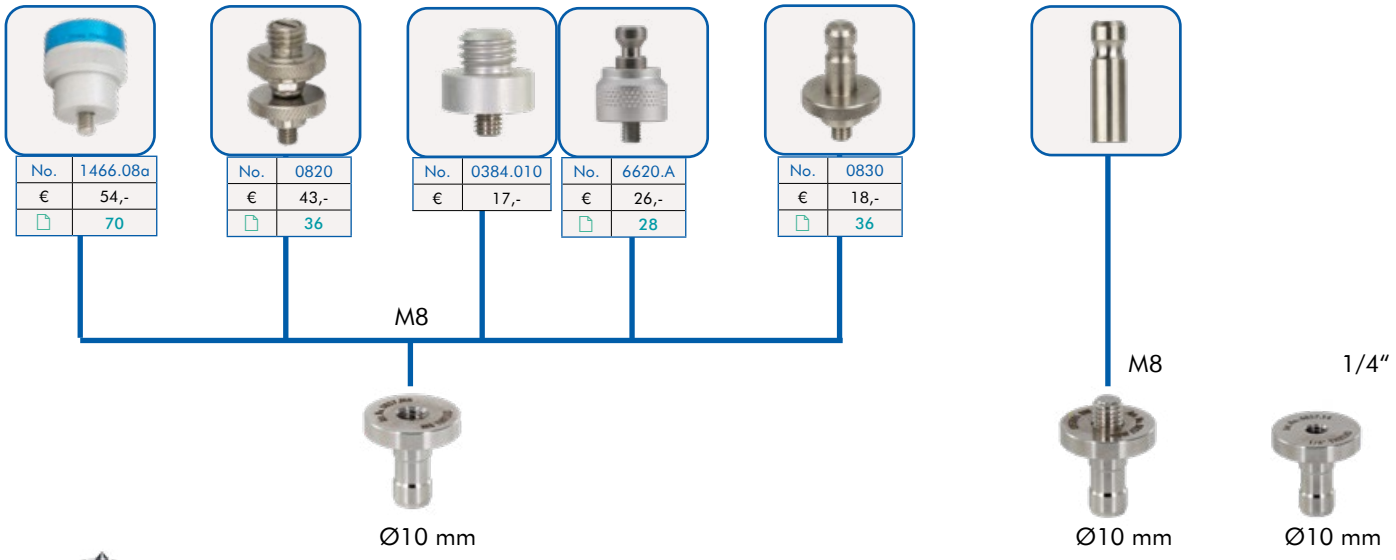
For adapting the commonly used Ø10 mm bolt connection in the surveying industry to various threads and Leica bolts.

Bolt Adapters





Ø10x20 mm Stainless Steel Bolts	⚖	№	€
With 1/4" internal thread, with height offset 5 mm	28 g	**0857.14**	20,-
With M8 internal thread, with height offset 5 mm	27 g	**0857.M8**	20,-
With 1/4" outer thread, with height offset 5 mm	31 g	**0857.M8a**	24,-





Ø10 mm Bolt Socket

For adapting the commonly used rail prisms with Ø10 mm bolt connection in the surveying industry to M8 thread (and thus to a wide range of tools and accessories).

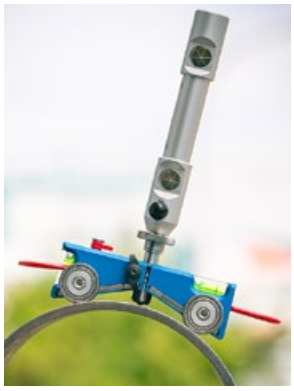


Ø10 x 20 mm - M8 Adapter	⚖	№	€
M8 external thread to Ø10x20 mm bolt mount	50 g	**0856.40**	36,-

Cylinder Measuring Tools 1/1

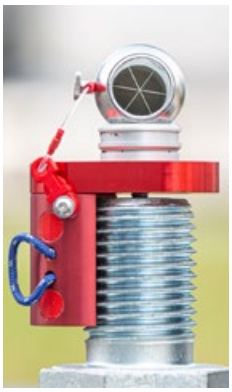
D.1. APEX and PIPE QUICK: Measurement of Cylinders 186






D.2. BOAXE: Measurement of bolt axis Ø16 – 56 mm 191



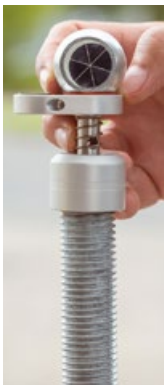



D.3. HEMI: Measurement of bore axis up to Ø95 mm 200






D.4. CONE: Cone adapter for measuring bolts and boreholes 193







APEX

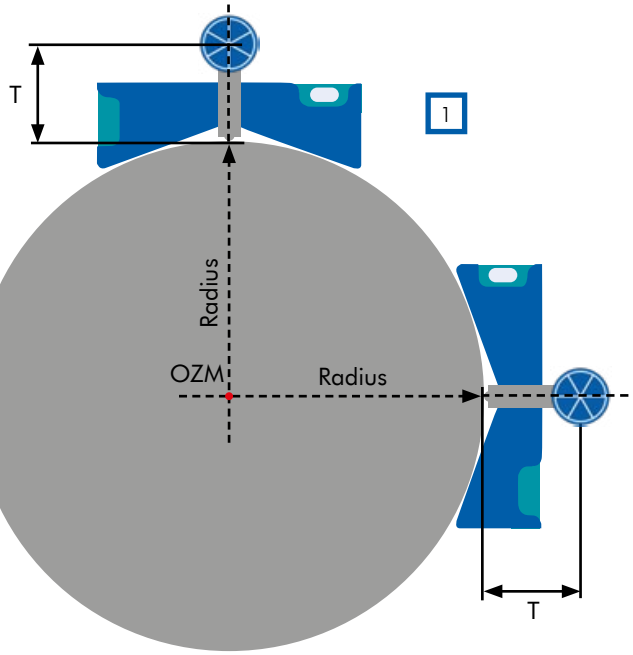
Tool for tachymetric measurement of the axis of all types of cylinders, such as shafts, rollers, tubes, rolls, etc.

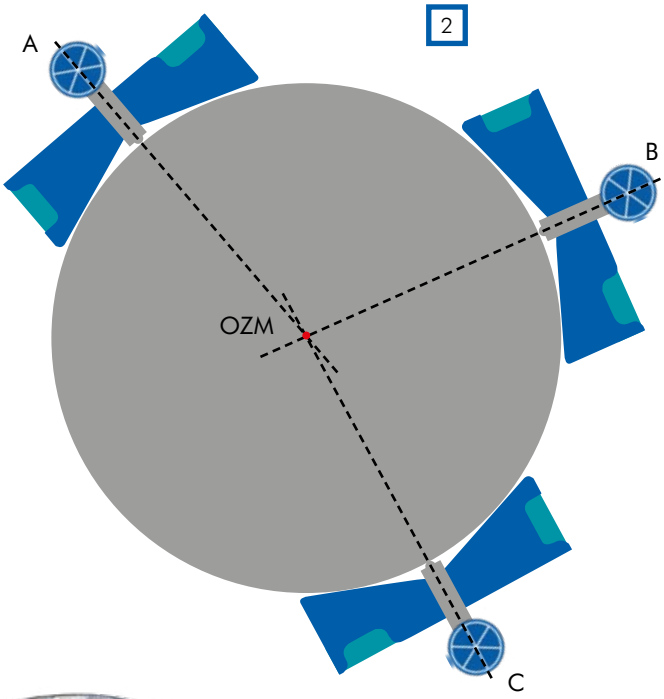


Measurement methods

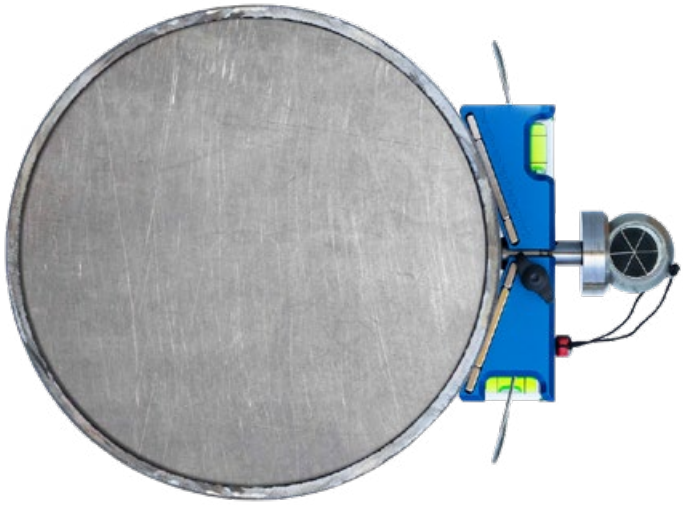
The Apex consists of a prismatic attachment that is placed on/against the cylinder OZ to be measured and a movable probe that touches the cylinder surface. The axis of the probe passes through the cylinder center OZM and the prism center. The prism center, which is seated on the probe, also lies in this axis. This is determined tachymetrically.
Then the 3D coordinates of the point OZM can be calculated. Examples:

1. Apex is placed in the apex of the cylinder by inserting the tube level: The radius and the target height T are subtracted from the Z-coordinate of the prism center (see sketch 1). With a 2nd tube level (only available on the APEX, not on the APEX Mini), the Apex can also be attached to the side of the cylinder so that the prism center lies on a horizontal line which runs through the cylinder axis.
2. The coordinates of points A, B and C are determined one after the other with the APEX. The center point OZM lying in the cylinder axis can be calculated in the plane defined by the 3 points. The determination is most accurate if the measurements are carried out in the same cross-sectional plane.

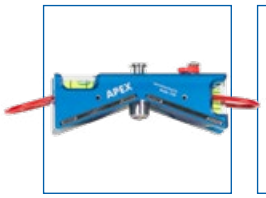














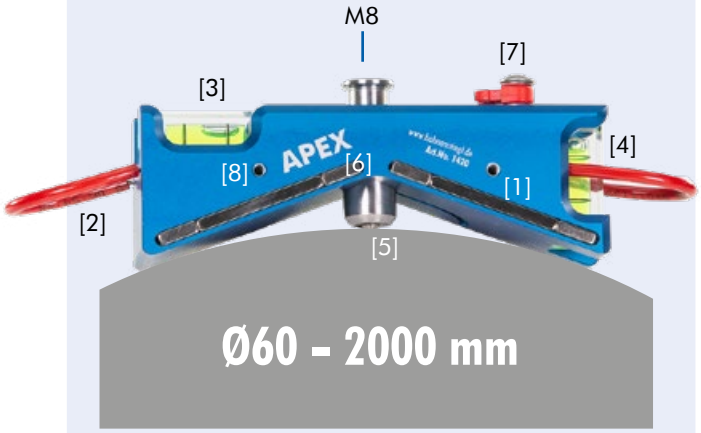
Features

- Integrated permanent magnets for holding on to cylinders made of magnetic steel (1)
- 2 eyelets for attaching rubber bands for cylinders made of non-magnetic material (2)
- Tubular bubble level for defined positioning of the apex vertically above the cylinder axis (3)
- Effective height of the probe: 45 mm
  Anodized aluminium profile



Description	Order-No.	Euro
APEX for cylinders with **Ø 60 - 2000 mm**	**1420**	445,-
APEX Mini for cylinders with **Ø 20 - 60 mm**	**1741**	224,-

APEX

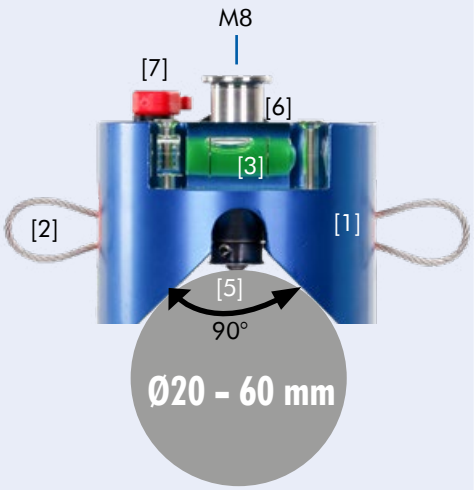


- 2nd tubular level for defined positioning of the apex horizontally to the cylinder axis (4)
- Movable feeler (5) rests reliably on the cylinder surface due to spring pressure. The feeler can be fixed in a specific position using a wing screw (6)
- Dimensions of prismatic attachment:
  140 x 45 x 38 mm
- Effective height of the push-button: 45 mm
  Total weight (without prism): 178 g
- 4x M6 hole [8] for optionally screwing in the attachment rollers 188.

- Connection possibility ball prism with drop protection (7)
- Locking screw (6)
- horizontal tube level (3)
- Wire rope eyelet (2)
- Integrated permanent magnets (1)
- probe (5)
- vertical tube level (4)



APEX Mini



- Movable touch probe (5) which can be fixed in a specific position by a knurled screw (6)
- Dimensions of the prismatic attachment: Ø65 X 50 mm
- Effective height of the probe: 45 mm
- Total weight (without prism): 330 g
  90° edges, including chamfered edges, can also be measured (similar to 90° edge adapter 161)







Elastic band

- For fixing the apex to cylinders made of non-magnetic material

Description	Order-No.	Euro
Adjustable elastic band for cylinders Ø60 - 300 mm	**1421**	12,-
Adjustable elastic band for cylinders Ø300 - 700 mm	**1422**	16,-

INFO For cylinders with a diameter of more than 0.7 m, the rubber band must be extended.



Attachment rollers for APEX

For using the APEX on stationary and rotating cylinders (pipes, rollers, etc.)

- After screwing in 4 rollers, the APEX can still be used for Ø 60 to 2000 mm Up to Ø 120 mm, the APEX rests on the center section; from Ø 120 mm, the rollers rest on the cylinder surface
- From Ø 120 mm, it is therefore also possible to hold the APEX on rotating cylinders such as pipes and rollers. For this application, the button must be clamped in the retracted position
- Ball-bearing-mounted rollers Ø 32 mm
- Simple screwing on of the rollers with SW5 Allen screws



Description	Order-No.	Euro
Ball-bearing-mounted attachment rollers for APEX (1 pcs.)	**1423.KL**	38,-

INFO 4 rollers are required to use the APEX.

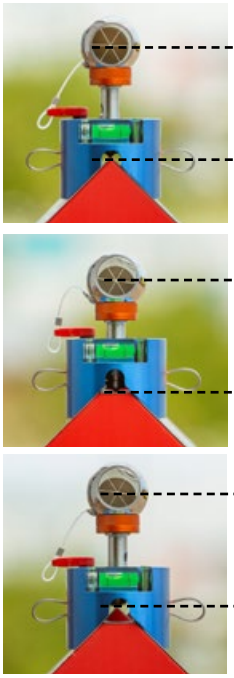


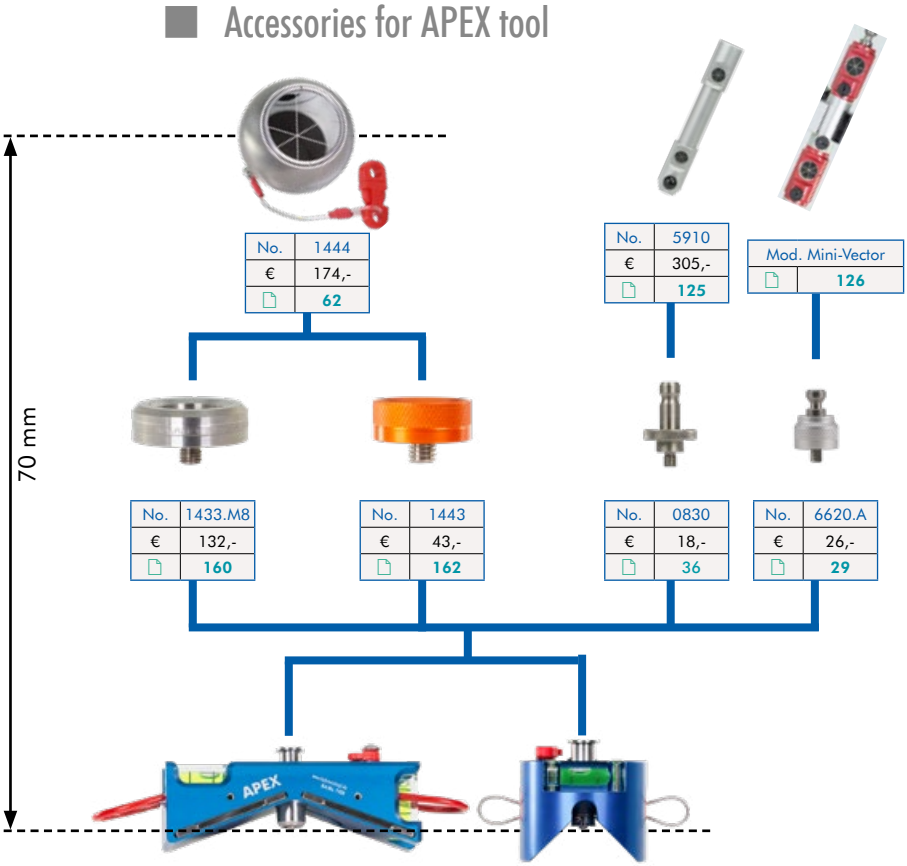


Accessories for APEX tool



Transport case for APEX tool
Art.-No. **1468.09** • 54 Euro
257





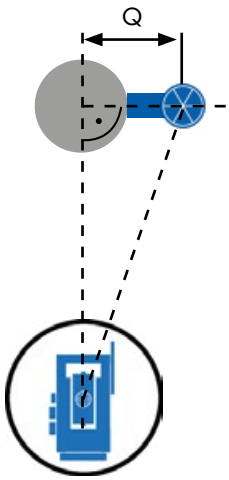


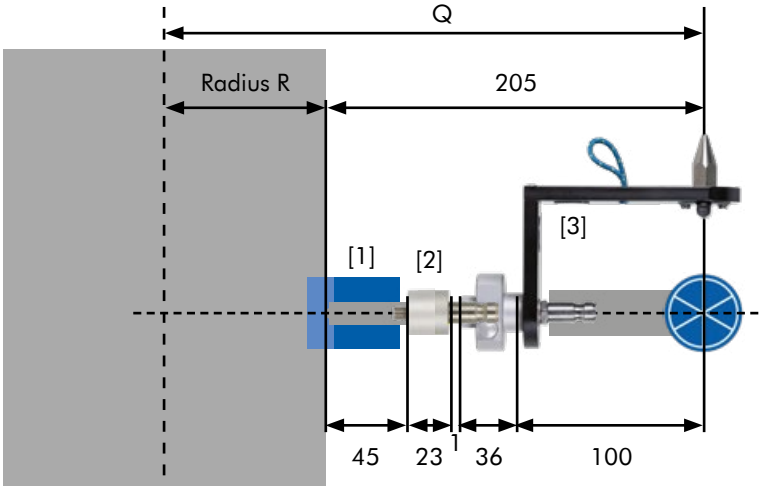


INFO

In addition to the APEX Mini, the somewhat simpler 90° adapter (Nr. 1740) 161 can also be used to measure 90° edges.

Measurement of vertical cylinders (columns, beams, etc.) with APEX and Mini Prism Pole with lateral eccentric Q with a measurement with lateral eccentric Q





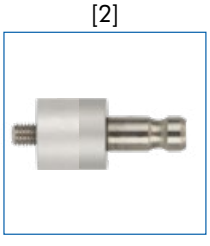
Q = R + 205 mm

Items

- APEX
- Mini Prism Pole 49
- Adapter (s. below)



[2]



M8 outer <-> Leica 27 mm bolt
Art **0404.050** • 36,-€




Pipe-Quick for measuring pipes, pipelines, cables, etc.

The Pipe-Quick can be used together with existing prism/antenna poles. The standard pole tip is unscrewed and replaced with the Pipe-Quick and adapter. The plumb line is set using the vial (Fig.).
For tachymeter measurements, commercially available single or 360° prisms can also be screwed directly onto the Pipe-Quick. In this case, the plumb line is set with the aid of a circular bubble attached to the prism carrier (Fig.) or, if a rod extension is used, with the bubble level attached to it (Fig.).

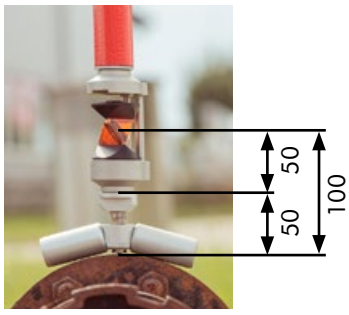
During the measurement, the Pipe-Quick is positioned so that both support legs touch the pipe. After the circular bubble has been inserted, the movable center pin of the Pipe-Quick is pressed down against a compression spring onto the apex of the pipe and the measurement is triggered. Taking into account the pipe radius and prism height, the position of the pipe axis is obtained.

- 2 cylindrical legs with 150° contact angle
- Movable center pin with compression spring and 5/8" external thread
- Height offset: 50 mm, screw-on aid SW 17 mm
- For pipes/pipes/cylinders with Ø60 - Ø1000 mm




Description	Order-No.	Euro
PIPE Quick adapter for measuring horizontal cylinders	**1735**	138,-



CAGE adapter for ball prism 78, Bo 360° Prism 17 oder Leica GRZ101 19

Adapter sleeve Pipe-Quick for prisms-/ Antenna poles with pole tip L = 86 mm

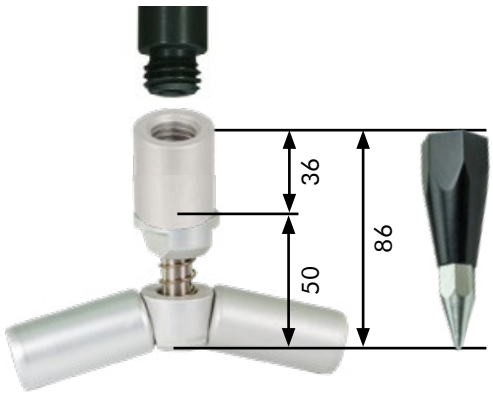


For screwing onto the Pipe-Quick. Sleeve Ø32x36 mm with continuous 5/8'' internal thread

Description	Order-No.	Euro
Adapter sleeve 5/8" inner thread on both sides, H = Ø32x36 mm	**0295.036**	24,-

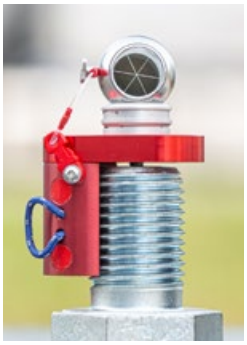


SECO prism pole





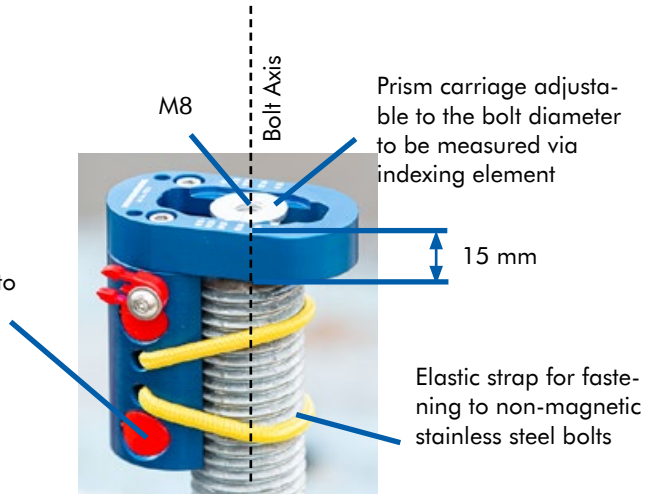


BOAXE UNI for Bolts Ø16 – 60 mm

For determining the axes of vertical or inclined (threaded) bolts

The BOAXE consists of a 90° positioning prism that is placed against the bolt and a screwed-on cover. Inside it runs a prism carriage that can be locked onto the nominal diameter of the bolt. Vertical bolts can be measured with one prism (see overview on the next page), while inclined bolts can be measured using the "VECTOR method" with two prisms (see below).
The BOAXE is available in 2 sizes: The UNI S for bolt diameters from 16 to 39 mm and the UNI B for diameters from 40 to 60 mm.






Description	⚖	№	€
BOAXE UNI S for bolt diameters from Ø16 to Ø39	286 g	**1721.U**	296,-
BOAXE UNI B for bolt diameters from Ø40 to Ø60	318 g	**1731.U**	324,-



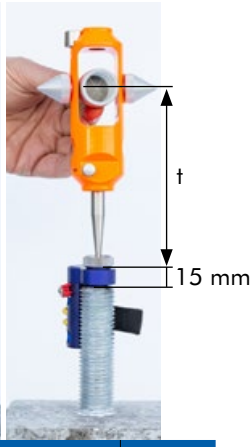

Description	⚖	№	€
Transportkoffer: BOAXE, plastic, red, with cut-outs for BOAXE	446 g	**1468.11**	54,-




Centering Adapter M8

Is screwed onto the prism carriage of the BOAXE Uni. This allows any existing prism with staking tip to be used. However, a circular level is required for vertical alignment.

The tip is centered in the bolt axis by means of the adapter. To obtain the total target height, the construction height of the BOAXE cover (15 mm) must be added to the distance "t" (tip – prism center).

Description	⚖	№	€
Centering Adapter M8	30 g	**1723**	14,-

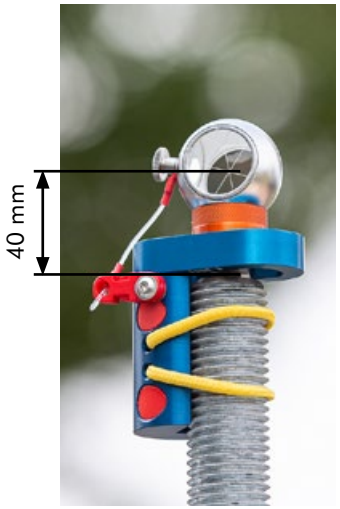


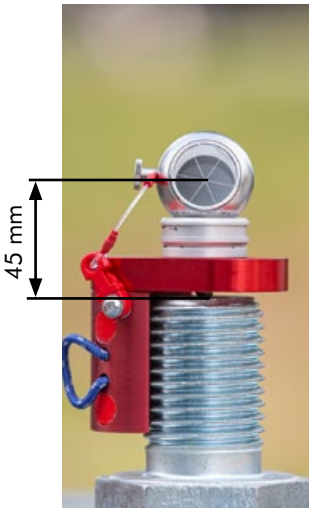

Inclined Bolts

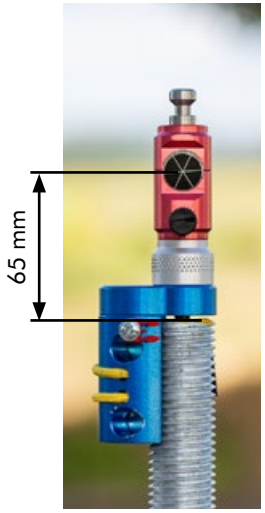
By using a vector with 2 prisms, the axis position of an inclined bolt can also be coordinated – both at the bolt head and at any other point. By entering the extension length L, the 3D coordinates of the desired point can be calculated with the help of a program for computing hidden points ("2 prism method," "channel measuring rod," etc.).



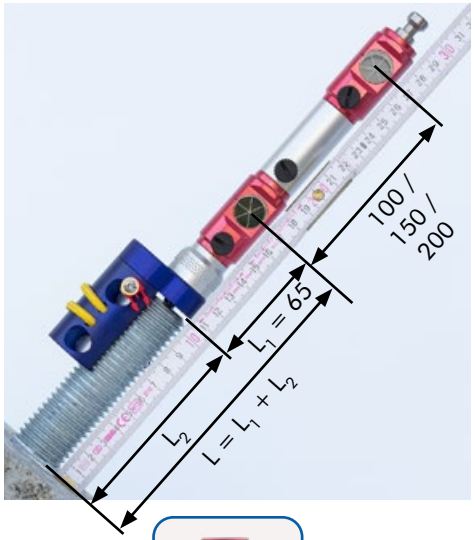
Vertical bolts

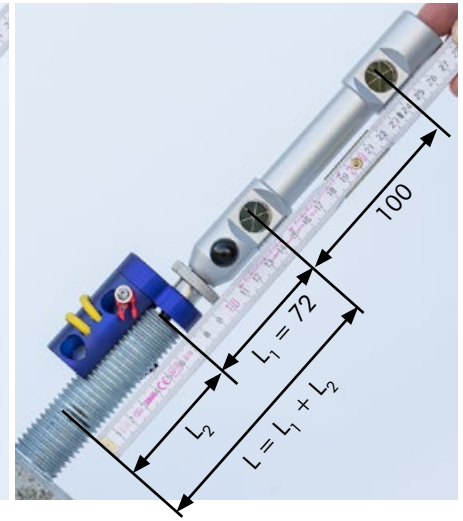






Inclined Bolts







No.	1444
€	174,-
	62



No.	1443
€	44,-
	162



No.	1557.M8a
€	39,-
	67



No.	6611
€	158,-
	126



No.	6620.A
€	26,-
	126

40 mm

45 mm

65 mm

M8

15 mm



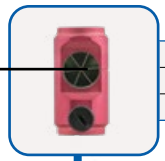
BOAXE UNI Small
Ø16 - Ø39
191

M8

15 mm



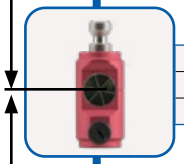
BOAXE UNI BIG
Ø40 - Ø60
191



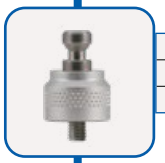
No.	6611.M6
€	142,-
	126



No.	div.
€	div.
	126



No.	6611
€	158,-
	126



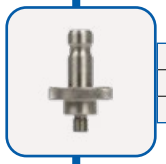
No.	6620.A
€	26,-
	126

100 / 150 / 200 mm

$L_1 = 65$



No.	5910
€	305,-
	125



No.	0830
€	18,-
	35

100

$L_1 = 72$





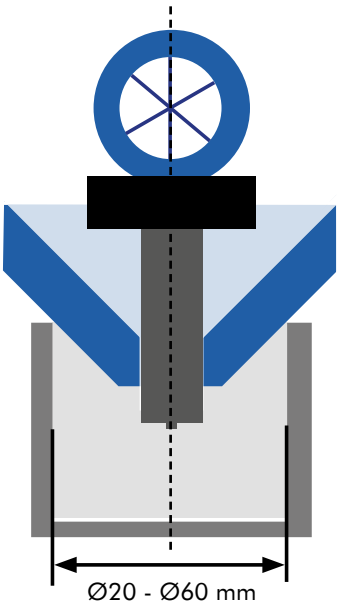
Cone Adapter B60

Measuring of bore holes, as well as bolts, bolt heads, nuts, etc.

The exact tachymetric measuring of the axis position of circular objects is only possible with auxiliary means.
The cone adapter B60 can be used to precisely determine the position of both vertically drilled holes and vertically inserted bolts.
Depending on the application, the cone adapter B60 can be rotated 180°. An axial pin is inserted through the axial bore of the cone adapter, over which the prism sits.

Determine center of borehole

- Insert Ø12 mm stainless steel axis pin with prism into cone adapter
- Place adapter on drill hole
- Set perpendicular with the aid of the circular level
- Take measurement







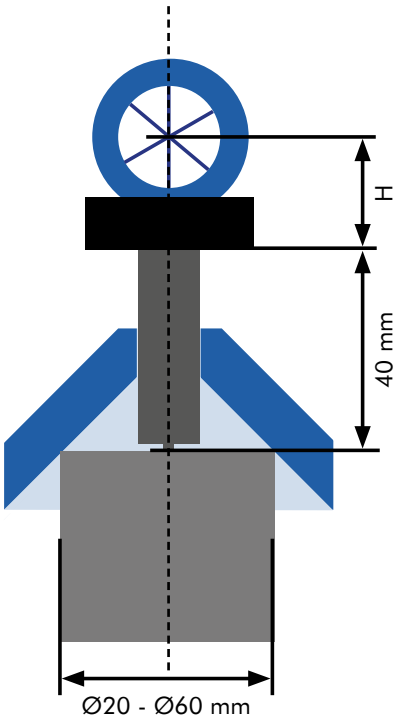


In the example shown here, the axis pin has been left out, since the ball prism can also be inserted without the cone adapter axis pin.

Determine bolt/cylinder center and height

- Insert Ø12 mm axis pin with prism into cone adapter
- Place adapter on cylinder/bolt
- Set perpendicular with the help of the circular level
- Take measurement

The length of the axis pin (40 mm) and the height H of the prism and adapter must be added to the measured Z coordinate.













Cone Adapter B60

- Anodized aluminum construction
- 3 integrated magnets give the cone adapter a hold on magnetic parts
- Axial bore Ø12 mm
- Recess on both sides for optional circular level No. 1580 (see below)

Description	No.	Euro
Cone adapter B60 for bore holes and bolts, Ø20 to 60 mm	**1481**	160,-
Weight: 110 g		





Circular level „integral“

If there is no circular level on the prism/carrier itself, the circular level integral (No. 1580) must be mounted on one or the other side of the cone adapter B60. It ensures that the entire unit is perpendicular.

Description	No.	Euro
Circular level „integral“	**1580**	24,-
Weight: 10 g		





Various axis pins are available for the cone adapter, which must be selected depending on the prism used and the application. See next 195

















Axis pins for cone adapter

When using the cone adapter, the axis pin is on the upper side of the bolt. By taking into account the length of the axis pin (40 mm or 50 mm) and the prism height H, the correct height from the top of the bolt is obtained in addition to the position of the bolt axis.

Axis pin M8, without flange

For quick and frequent switching between the measuring of drill holes and the measuring of bolts.

Depending on the application, the axis pin is inserted into the cone adapter from one side or the other.

- Stainless steel cylinder Ø12 x 40 mm
- Ball segment on underside to be placed on top of the bolt
- M8 inner thread for screwing on adapters/prisms
- Cross hole Ø 6 mm as tightening aid when screwing on

Description	No.	Euro
Axis pin Ø12x40 mm, M8, without flange, L = 40 mm	**1482**	26,-
Weight: 42 g		





Axis pin M8, with flange

For rare change between the measuring of boreholes or bolts.

For the change, the axis pin on the M8 thread must be loosened from the prism adapter in order to be able to insert it from the other side. The advantage is that the entire unit can be held on the prism. Prism, cone adapter and axis pin are securely connected.

- Stainless steel cylinder Ø12 x 40 mm with flange Ø13 mm
- Flange prevents the axis pin from falling out
- Ball segment on underside to be placed on top of the pin
- M8 inner thread for screwing on adapters/prisms
- Cross hole Ø 6 mm as tightening aid when screwing on

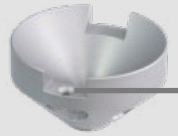
Description	No.	Euro
Axis pin Ø12x40 mm, M8, with flange, L = 40 mm	**1482.S**	32,-
Weight: 42 g		



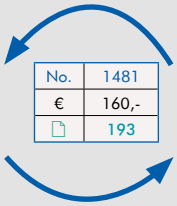




CONE ADAPTER B60



No.	1481
€	160,-
	193





AXIS PIN



No.	1482
€	26,-
	195



No.	1482.S
€	32,-
	195

M8



No.	1580
€	24,-
	31



No.	1468.10
€	54,-
	257

WITH BALL PRISM AND M8 BASE



No.	1466.08a
€	54,-
	70



No.	1443
€	43,-
	162



No.	1433.M8
€	132,-
	160



No.	1466.B
€	38,-
	89



No.	1580
€	24,-
	31

Level on Cone Adapter



Various Designs | 62

PRISMS WITH B1216 BOLT, 5/8" OR LEICA CONNECTION



No.	6620.A
€	26,-
	28

B1216



Zylinder Prism ZP11 | 28



HIP Prism 5/8"-5/8" | 23



HIP Prism 5/8"-U | 23

Level on Cone Adapter



Bo 360° Medium Format | 14



No.	5693.58
€	610,-
	8



No.	0384.010
€	17,-

5/8"



HIP Prism Leica-5/8" | 24



HIP Prism Leica-U | 24

Level on Cone Adapter



Bo 360° Medium Format | 14



No.	0830
€	18,-
	36

Leica



No.	0374.015
€	19,-
	259



No.	5693.M8
€	520,-
	8

Level on Cone Adapter



Cone Adapter B60: Use with prism pole

For bolts, bolt heads, nuts, etc. Ø15 - 60 mm.

For high accuracy, exact positioning in the axis of the bolt is first necessary. This is given by using the cone adapter. In addition, the distance of the prism center from the bolt to be picked up should be short in order to minimize the effects of the level error.

This can also be achieved when using a prism pole. The prism is attached to the underside of the pole and the cone adapter is attached underneath. The measurement can thus be carried out in an upright posture, constant bending is not necessary.

Approach

- Unscrewing the tip of the prism pole (5/8" thread).
- Screwing on a prism and below it the cone adapter „60" or the S40.
  For possibilities see page 199
- Placing the cone adapter on the bolt, automatic axial centering
- Perpendicular adjustment with the aid of the circular level on the prism pole
- Pressing down the pole against the resistance of the pressure spring until the axis pin rests on the bolt
- Starting the measurement
- By taking into account the distance from the upper edge of the pin to the center of the prism, the correct height of the pin is obtained in addition to the axial position.



Axis pin M8, with flange and compression spring

- Stainless steel cylinder Ø12 x 40 mm with flange Ø13 mm
- Flange prevents the axis pin from falling out
- Ball segment on underside to be placed on top of the pin
- M8 inner thread for screwing on adapters/prisms
- Ø6 mm cross hole as tightening aid when screwing on

Description	No.	Euro
Axis pin Ø12x40 mm, M8, with flange and compression spring, L = 40 mm	**1482.SF**	33,-
Weight: 29 g		





Axis pin 5/8", with flange and compression spring

- Stainless steel cylinder Ø12 x 40 mm with flange Ø13 mm
- Flange prevents the axle pin from falling out
- Ball segment on underside to be placed on top of the pin
- 5/8" outer thread for screwing on prism (carriers) with 5/8" inner threads
- Ø6 mm cross hole as tightening aid when bolting on
- Effective length of axis pin + 5/8" threaded connection: 50 mm

Description	No.	Euro
Axis pin Ø12x40 mm, 5/8", with flange and compression spring, L = 50 mm	**1482.58**	67,-
Weight: 56 g		







Cone Adapter S40

For bolts, bolt heads, nuts, etc. Ø15 - 40 mm.

The operation of the S40 cone adapter is the same as for the larger cone adapter (order no. 1481 + 148X), but it can only be used up to Ø40 mm instead of Ø60 mm.

Cone Adapter S40, M8

- Aluminum cylinder Ø40 mm with conical bottom part
- Captive axis pin Ø12 mm with collar and compression spring
- Ball segment at the bottom of the axis pin to be placed on the top of the bolt
- M8 inner thread for screwing on adapters/prisms
- Cross hole Ø6 mm in the axis pin as tightening aid when screwing on
- Effective length of axis pin: 45 mm



Description	No.	Euro
Cone adapter S40, M8	**1734.M8**	82,-
Weight: 115 g		





Cone Adapter S40, 5/8"

- Aluminum cylinder Ø40 mm with conical bottom part
- Captive axis pin Ø12 mm with collar and compression spring
- Ball segment at the bottom of the axis pin to be placed on the top of the bolt
- 5/8"-outer thread to screw on prisms with 5/8" inner thread
- Tightening aid on 5/8" thread: SW17
- Effective length axis pin + 5/8" threaded connection: 50 mm
- Usage with prism pole 199



Description	No.	Euro
Cone Adapter S40, 5/8"	**1734**	89,-
Weight: 132 g		



Cone Adapter Accessories



No.	6672
€	27,-
	8



No.	1585.30
€	41,-
	31



No.	1580
€	24,-
	31

5/8“



No.	0700
€	43,-
	37

5/8“



POLES

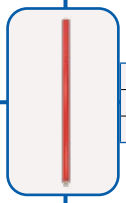
Existing Prism-/ GNSS poles

5/8“



No.	3008.30
€	59,-
	256

Ø



No.	5455
€	105,-
	263

5/8“

BALL PRISMS



Various ball prism designs

	62

Ø1.5“



No.	1466.B
€	38,-
	89



No.	1443
€	44,-
	162



No.	1466.08a
€	54,-
	70



No.	1433.M8
€	132,-
	160

M8

MHC-M8



No.	5693.M8
€	520,-
	8

MHC-58



No.	5693.58
€	610,-
	8

CAGE SYSTEM WITH PRISM



Various combinations

	17

HIP PRISMS



Various Prism constants

	23



Various Prism constants

	24

LEICA



INFO

With tilting axis height = 86 mm



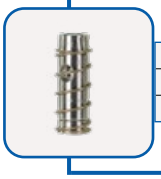
No.	0374.015
€	19,-



No.	0377.27
€	30,-
	35

M8

5/8“



No.	1482.SF
€	33,-
	197



No.	1482.58
€	67,-
	197

S40 | M8



No.	1734.M8
€	82,-
	198

Ø13-36 mm

B60



No.	1481
€	160,-
	193

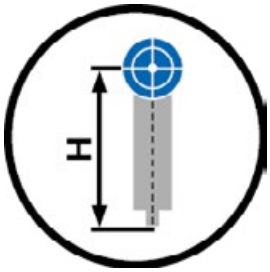
Ø13-60 mm

S40 | 5/8“



No.	1734
€	89,-
	198

Ø13-36 mm



	Adapter/Conection	Prism	Heihgt **H** from bolt top surface
1734.M8	1443 oder 1433.M8	Ø1.5“ ball prism	70 mm
1481 + 1482.SF	1443 oder 1433.M8	Ø1.5“ ball prism	65 mm
1482.SF	0374.015	MHC-M8	80mm
1734.M8	0374.015	MHC-M8	85 mm
1734.M8	1466.08a	Ø1.5“ ball prism	95 mm
1481 + 1482.SF	1466.08a	Ø1.5“ ball prism	90 mm
1481 + 1482.58	-	MHC58, Cage System o. HIP 5/8“	100 mm
1734	-	MHC58, Cage System o. HIP 5/8“	100 mm
1481 + 1482.58	0377.27	HIP Leica	147 mm
1734	0377.27	HIP Leica	147 mm
1734	0377.27	Leica Prism with 86 mm	147 mm



Borehole adapter Hemisphere

To determine the axes of circular openings / holes

The hemisphere adapter can be placed on all boreholes and circular openings with Ø35to Ø95 mm. In combination with a Ø1.5" (38.1 mm) ball prism, the axis of the borehole can be measured with high precision.
The spherical prism is placed on the magnetic base integrated in the hemisphere adapter and aligned with the total station.
The centers of the hemisphere and the spherical prism are absolutely identical.

- Anodized hemispherical base body Ø 110 mm made of aluminum
- Permanently integrated magnetic base to hold the ball prism also overhead
- 20 integrated permanent magnets. These independently hold the borehole adapter on vertical openings made of magnetic material from a Ø of 60 mm and upwards
- With M8 thread for connection of handholds or pole extensions (see below and next page)
- Clip closure for attaching ball prisms with drop guards (see next page)
- Measuring accuracies: With Bohnenstingl ball prisms up to +-0.1 mm achievable
- Weight 1780.110: 412 g (without ball prism) / 1438: 295 g (without ball prism)





Description	Order-No.	Euro
Borehole adapter "HEMI90" for boreholes Ø35 to 80 mm, for 1.5" (38.1 mm) ball prisms	**1438**	245,-
Borehole adapter „Hemisphere" Ø110 mm for boreholes Ø35 to 95 mm, for ball prisms 1.5" (38.1 mm)	**1780.110**	325,-

INFO On request, the hemisphere adapter is also available for the small ball prisms with Ø30 mm.



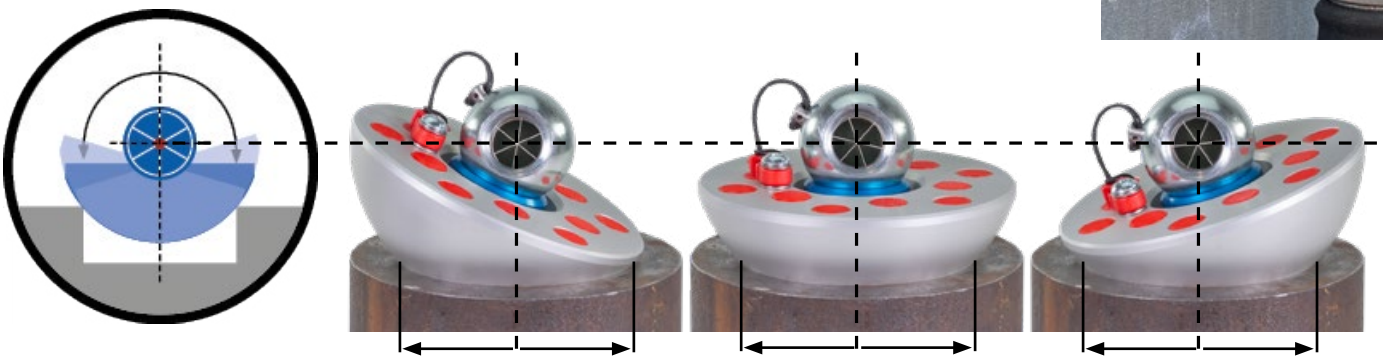
Due to 20 integrated magnets, the adapter also holds in vertical holes in magnetic material.

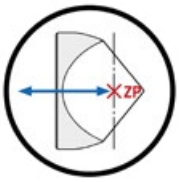


Optimal magnetic holding forces are achieved:
1438: Ø 45 to 70 mm
1780.110: Ø 50 to 70 mm

A ball head with handle can be screwed into the M8 thread.
This makes handling, especially when measuring round openings made of non-magnetic material easier.







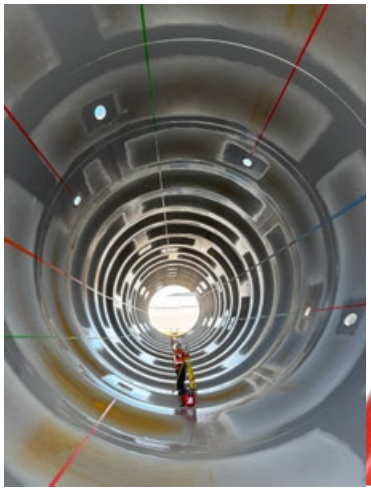
No matter how the hemisphere adapter is placed, the center of the spherical prism always remains in the same position in the borehole axis.

INFO The sphere prism can be inserted directly (without hemisphere adapter) into holes smaller than Ø35 mm.





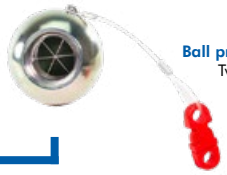




Accessories

We recommend to use a ball prism with drop protection (article no. 1444 / 1454 page 140). By means of a plug-in connector, the ball prism can be connected to the Hemishere adapter and thus cannot fall down.





Ball prism with fall protection
Two designs available
page 140



Borehole adapter„Hemisphere“
Art. **1780.110** • 325,- Euro
page 200



Ball head M8
Art. **5081** • 50,- Euro

M8 a



Handle with M8 outer thread
Art. **0702** • 44,- Euro

5/8“i



Telescopic extensions/poles
Note: Must have **5/8“ outer** thread.

Transport case for HEMI Adapter
Art.-No. **1468.10** • 54,- Euro
257

Laser Scanning 1/3

G.1. Systems in overview 206

- Systems in overview & Info
- Georeferencing / Laser scanning
- Target height 60 mm (Leica)
- Wall distance 50 / 100 mm
- Target height 80.8 mm
- Target height: 97 / 100 mm
- Target height: 197 / 200 mm (Ø200 sphere)

G.2. Scan sphere and segment sphere 211

- Laserscanning Sphere
- Scan sphere Ø145 mm
- Scan sphere „segment“ Ø145 mm
- Scan sphere Ø200







G.3. Targets (target size: 110 x 110 mm) 214

- Laser Scanning Targets
- with magnetic base Ø40
- with Leica connection, not tiltable
- tiltable
- U-beam for changing between prism and target plate
- with reflective foil on the back for total station measurements









G.4. Targets: Ø270 mm in U-Holder, tiltable 218

Circular Target in U-Holder
- Ø270 mm
- In U-Holder, tiltable
- With Leica connection
- With hemisphere on the back for magnetic connection
- With reflective foil on the back for tachymeter measurement
- SLAM Target with reflective foil
- With magnetic base Ø40 mm





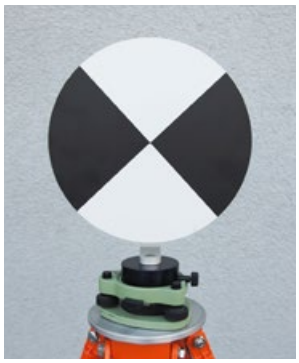


Laser Scanning 2/3

G.5. Laser Scanning Targets Ø270 mm

217

- Circular target with rear hemisphere
- Ø270 mm
- Rear hemisphere for connection to magnetic bases
- L-beam with 5/8“
- L-beam with magnetic base Ø40 mm
- Overviews System height 196 mm

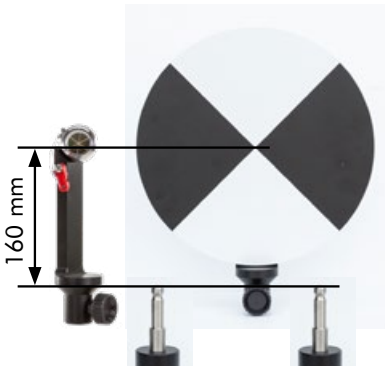




G.6. L-Carrier „STAFF“

219

- Change between ball prism and Scanning target
- High accuracy georeferencing
- With Leica connector or magnetic base
- Switch between target and prism in seconds (magnetic connection)
- Suitable for drone control






G.7. Prism for georeferencing

229

- Prism for georeferencing
- Tilting axis with different system heights
- Magnetic base Ø40 mm
- For high-precision switch of laser scanning target and prism



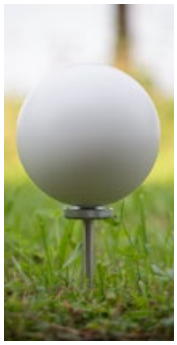

G.8. Laser Scanning in free space

230

- Laser scanning in free space
- With Leica connection
- With magnetic base, Ø40 mm
- Overview
- Suction/Magnet Holder
- Universal clamps
- Mini-Tripod M8
- Target holder for natural grounds



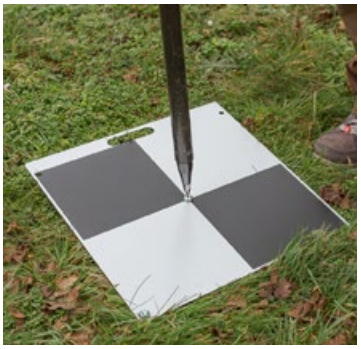




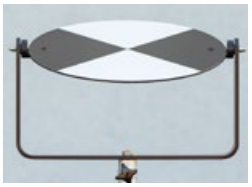
Laser Scanning 3/3

G.9. Targets für scanning with drones 222

- Targetfs for scanning with drones











G.10. Tripods / adapter for laser scanners 235

- Tripod options for laser scanner
  - Adapter plate 5/8“ - 3/8
  - Instrument tripod mini



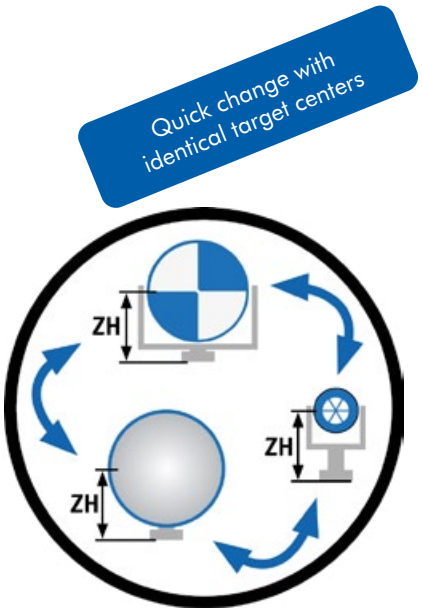






Laserscanning

Targets and prisms for registration and georeferencing



Modern processing software allows the registration of point clouds even without targets (target plates/spheres). Nevertheless, targets still have their justification for:

- Registration possibility of point clouds with unclear point identities within the individual scans
- Increase of accuracy and reliability
- Accuracy estimation
- Georeferencing by replacing targets with prisms whose 3D coordinates can be determined tachymetrically with high accuracy

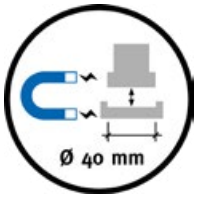
For terrestrial laser scanners we offer scanner spheres with Ø145 mm and Ø200 mm, target plates also in 2 different sizes, in general with a checkerboard pattern. For measuring points with total stations we offer various prism systems, such as the HIP prism series or the ball prisms. We offer target plates and prisms with four different target heights (see overviews on the next pages).
Within a target height, the 3D coordinates of the target centers are identical when targets and prisms are exchanged.

A condition for the exchange possibility is a forced centering of the target and prism holders. Here you can choose between:

- Quick-change system with magnetic base for centering plate Ø40 mm
- Quick-change system with adapter for stud bolt Ø12 mm (Leica)
- Adapter for screwing into a bolt with M8 female thread on the specimen.

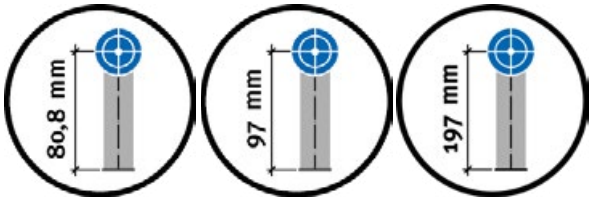
The following logos are used for quick orientation

Quick change with magnetic base for centering plate Ø40 mm

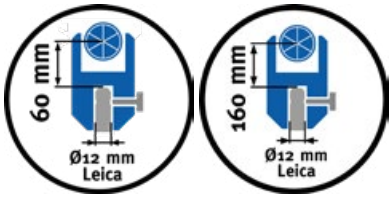


With target height ZH:

- 80,8 mm s. page 207
- 97 (100) mm s. page 208
- 197 (200) mm s. page 209

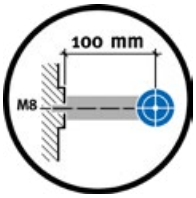


Quick change with mount for spigot Ø12 mm (Leica)

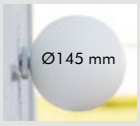
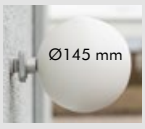
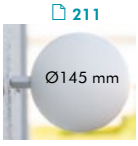
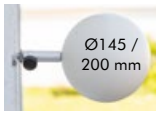
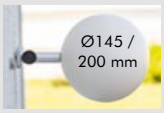
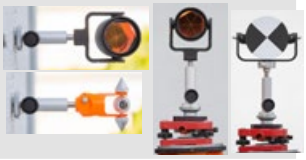
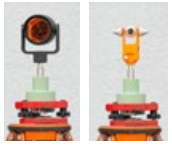
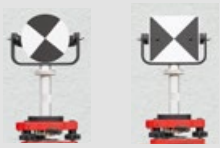


From top edge of bolt target height ZH = 60 mm s. page 216,
With additional distance piece ZH = 160 mm s. page 209

Adapter for screwing into a bolt with M8 inner thread on the object



With magnetic base Ø40 mm or Leica bolt
226

	Target height / Offset	Quick connection system	Laser Scann. sphere	Laser Scanning Target „Pocket“	Laser Scanning Target Ø270 mm	Total Station Prism/Reflector
-	50 mm, M8	M8	—	 215	 217 Ø270 mm	 70
207 / 230	80,8 mm	Ø 40 mm	211  Ø145 mm	 214 215	—	 229
208	60 mm, Ø12 mm Leica	Ø12 mm Leica	—	 216 215	—	
208 / 210	97 mm	Ø 40 mm	211  Ø145 mm	 215	 217 Ø270 mm	 229
-	100 mm, M8	M8	211  Ø145 mm	 216	 217 Ø270 mm	
229	108,3 mm	Ø 40 mm	213  Ø200 mm	—	—	 229
209	160 mm, Ø12 mm Leica	Ø12 mm Leica	213  Ø145 / 200 mm		Ø270 mm 218  219 	
209	197 mm	Ø 40 mm	213  Ø145 / 200 mm		Ø270 mm 218  219 	
208		Ø12 mm Leica	—	216  215 	—	 228
227	196 mm	5/8"	Ø145 mm 		—	
227		Ø 40 mm	Ø145 / 200 mm 213 	214  215 	217  Ø270 mm 220 	 228
209	296 mm	Ø12 mm Leica			160 mm, Ø12 mm Leica	

TLS - Magnetic quick change system, ZH = 80,8 mm





Ø145 mm	
	211



No.	6050
€	227,-
	212



No.	6179
€	189,-
	214



No.	6178
€	168,-
	215



L-Prism with magnetic base



Prism on L-Holder
various designs
229



No.	1075
€	40,-
	229



No.	6150.40
€	24,-
	226



No.	6009.VA
€	12,-
	73

196 mm

150 mm



No.	6150.40
€	24,-
	226



No.	1448
€	156,-
	62



6180.R



6180

No.	6180 / 6180.R
€	74,-
	215



No.	0383.0897
€	28,-



No.	0385.0662
€	28,-



Tribrach claw adapter 5/8"

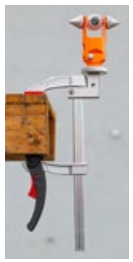




Applications in free space: Examples, s. page 230











wall bolts
91

Perforated plate
92



No.	6150.40
€	24,-
	226



No.	6009.VA
€	12,-
	73



TLS - Quick Change System Leica 60 mm, magnetic ZH = 97/100 mm



100 mm (with M8 centering plate)

97 mm

60 mm

86 mm

3 mm

Ø145 mm	
	211

No.	6183
€	142,-
	216

No.	6184
€	194,-
	216

No.	6185
€	173,-
	215

No.	L-Prisma
	87

Leica Prisma

No.	HIP Leica Prisma
	24

No.	1448
€	156,-
	62

6180.R

6180

No.	6180 / 6180.R
€	74,-
	215







No.	6019.037
€	41,-
	226

No.	6037.0245
€	34,-
	211

No.	6150.40
€	24,-
	226

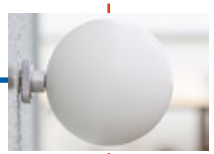
No.	0830
€	18,-
	36

100 mm

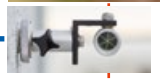






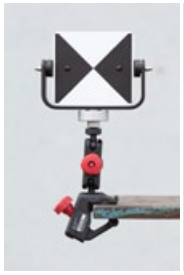




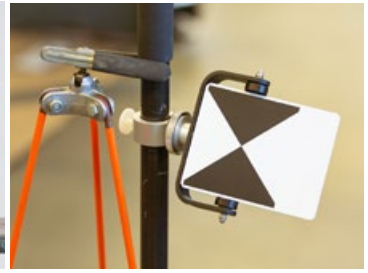


No.	6150.40
€	24,-
	226

Applications in free space: Examples, s. page 230













TLS - Quick change system, Leica ZH = 160 mm, magnetic ZH = 197



No.	6172
€	143,-
	219



Ø145 mm	
	211



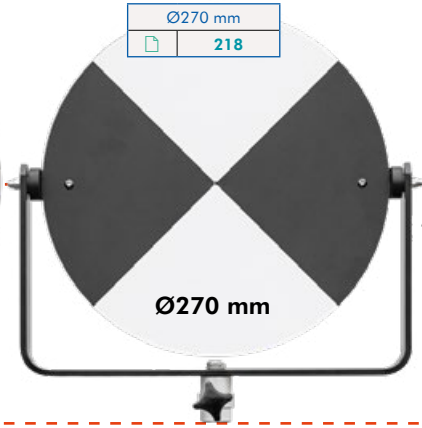
No.	0302.0875
€	37,-

Ø200 mm	
	213



No.	0302.060
€	35,-
	213

Ø270 mm	
	218



Target Pocket Leica
various designs
page 216



Leica original prisms



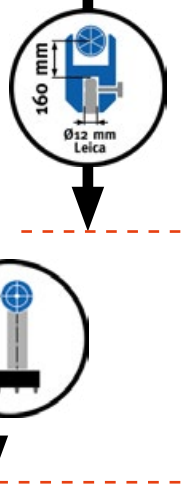
HIP Prism Leica
various designs
24





No.	0304.100
€	38,-

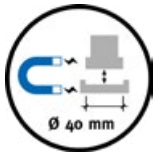












No.	6019.037
€	41,-
	226



No.	0830
€	18,-
	36



No.	6150.40
€	24,-
	226



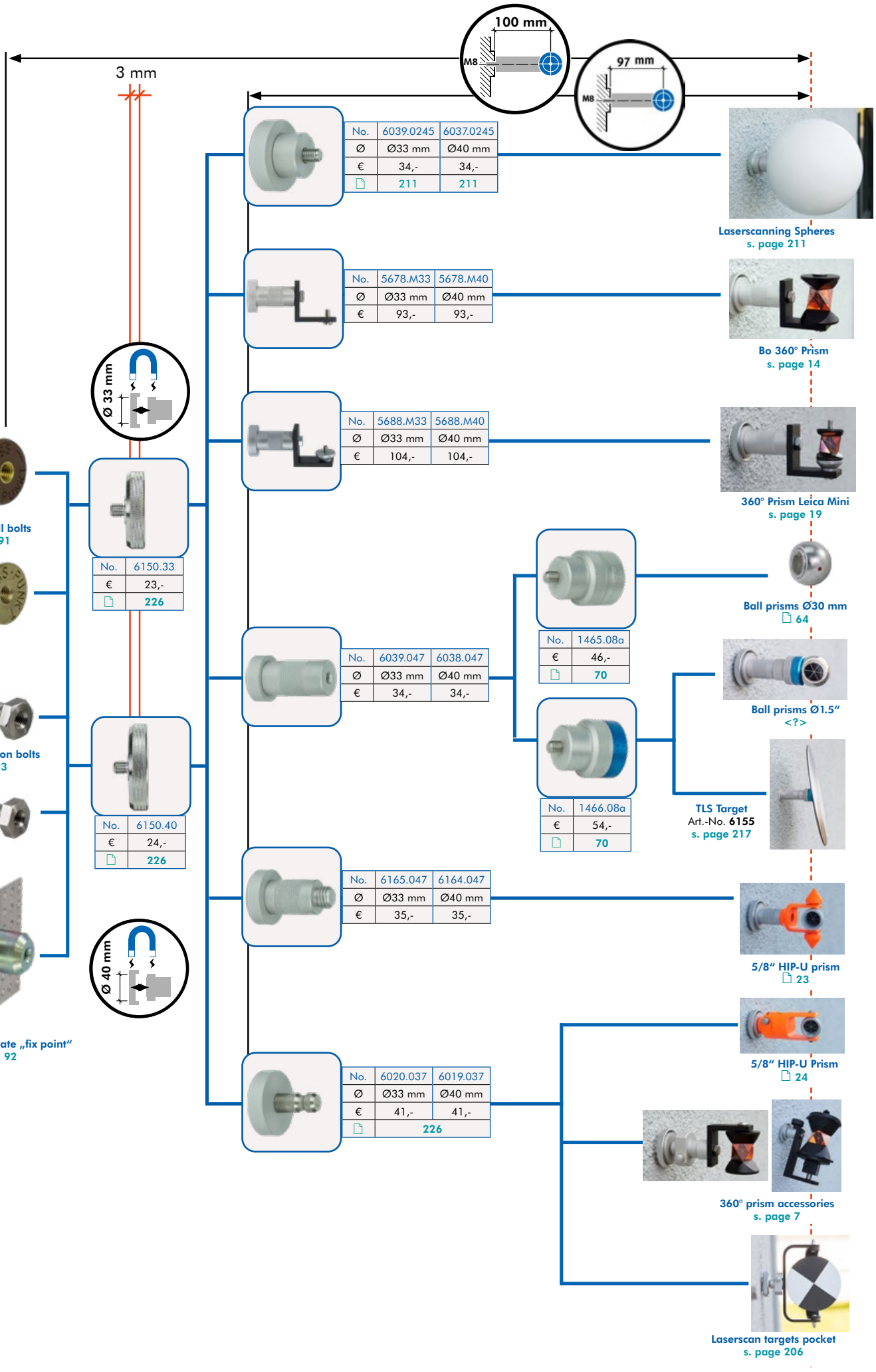
No.	6009VA
€	12,-
	73

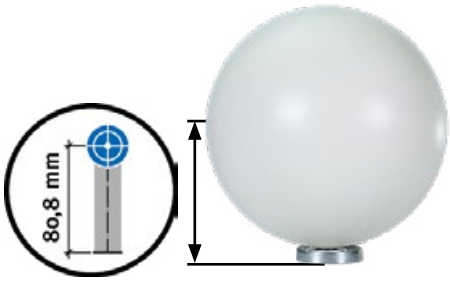
Applications in free space








100 mm
M8
97 mm
M8
3 mm
Ø 33 mm
Ø 40 mm
No. 6039.0245 6037.0245
Ø Ø33 mm Ø40 mm
€ 34,- 34,-
211 211
Laserscanning Spheres
s. page 211
No. 5678.M33 5678.M40
Ø Ø33 mm Ø40 mm
€ 93,- 93,-
Bo 360° Prism
s. page 14
No. 5688.M33 5688.M40
Ø Ø33 mm Ø40 mm
€ 104,- 104,-
360° Prism Leica Mini
s. page 19
M8 wall bolts
91
No. 6150.33
€ 23,-
226
No. 1465.08a
€ 46,-
70
Ball prisms Ø30 mm
64
No. 6039.047 6038.047
Ø Ø33 mm Ø40 mm
€ 34,- 34,-
Ball prisms Ø1.5"
<?>
M8 precision bolts
93
No. 6150.40
€ 24,-
226
No. 1466.08a
€ 54,-
70
TLS Target
Art.-No. 6155
s. page 217
No. 6165.047 6164.047
Ø Ø33 mm Ø40 mm
€ 35,- 35,-
5/8" HIP-U prism
23
Perforated plate „fix point"
92
5/8" HIP-U Prism
24
No. 6020.037 6019.037
Ø Ø33 mm Ø40 mm
€ 41,- 41,-
226
360° prism accessories
s. page 7
Laserscan targets pocket
s. page 206



Scanning Sphere Ø 145 mm: Target Height: 80.8 mm

Spheres can usually be scanned by all terrestrial laser scanners to be processed as a control or connection point. Optimal placement in the measuring range is therefore most important.

- M8 inner thread
- With every sphere comes a magnet Ø40 x 8,3 mm and M8 x 13 mm outer thread
- Target height: 80.8 mm = 72.5 mm (ball radius) + 8.3 mm (height of magnet)
- Georeferencing prism with target height 80,8 mm 229
- Operation: -20° bis +50° C
- Plastic with shock-absorbing surface coating



with M8 magnet
Ø40 x 8,3 mm



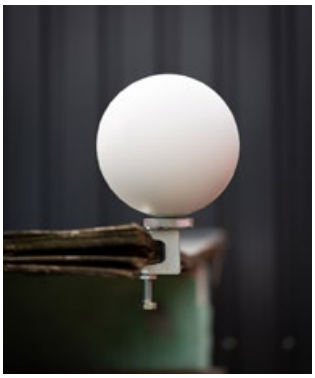




Description	Order-No.	Euro
Sphere **Flex**, Ø 145 mm, with M8 Standard magnet	**6002**	150,-

Sturdy plastic case (575 x 470 x 250 mm)

Description	Order-No.	Euro
Set of 6 spheres **Flex**, Ø 145 mm, with 6 magnets	**6054**	875,-







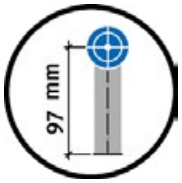
Magnetic base Ø40 mm

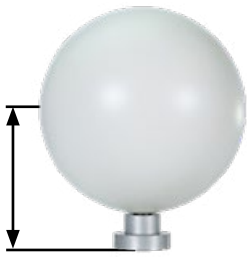




Screws into the M8 thread of the ball instead of the standard magnet

- Anodized aluminum, integrated permanent magnet
- Magnetic base Ø 40 x 10 mm, holding force of the magnet approx. 5 Kg
- Effective height: 24,5 mm, Target height ZH: 97 mm





Description	Order-No.	Euro
Magnetic base Ø40 x 24,5 mm, M8 outer thread	**6037.0245**	34,-





INFO When using prisms/target marks with target height ZH 97 mm in conjunction with centering plates No. 6150 (226) results in the target height of 100 mm according to AdV version (German standard) (270)

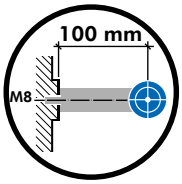


Nr.: 6150





M8-Adapter: Offset 100 mm



- Aluminium hexagon with 2 x M8 outher thread (stainless steel)
- Effective length (without M8 threads) = 27,5 mm

Description	Order-No.	Euro
Adapter 2 x M8 for scanning sphere Ø 145 mm	**6005**	16,-



Scanning Sphere Segment

For installation in positions with little distance to the wall or other objects

- Cut-off scanning ball Flex Ø 145 mm, M8 inner thread
- Cutted surface weatherproofed
- Cutted surface is located approx. 25 mm behind the ball axis (M8 thread)
- Comes with Standardmagnet Ø40 mm/M8 outer thread

The scanning sphere **segment** is predestined for the signalization of connection points in railroad surveying. It can be attached to the standard bolts on the catenary masts (see picture).
Since the ball segment must be able to be aligned, the use of the standard magnet M8 or a Leica adapter is required (see bottom of this page).

with standard magnet(s) Ø40 mm/M8









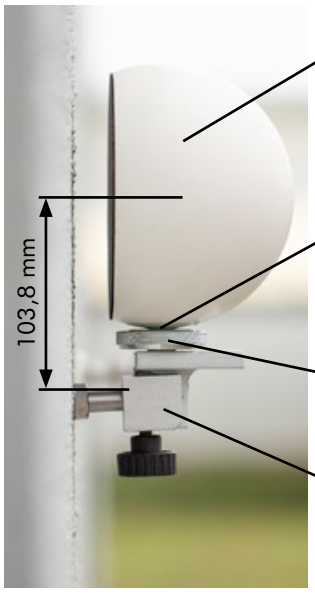
Description	Order-No.	Euro
Scanning Sphere **Segment**, Ø 145 mm, with Ø40, M8 magnet	**6050**	227,-

Description	Order-No.	Euro
6 pc. set **flex** sphere segments, Ø 145 mm, with M8 magnets	**6051**	1.280,-

TIP	For perfect results, the complete circular shape of the sphere should be visible in the scan.



Example: With standard magnets



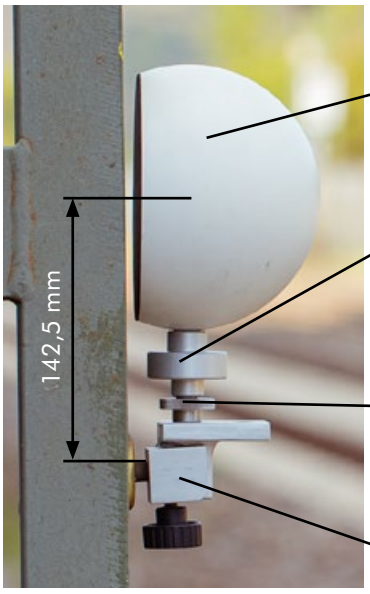
Scan Sphere Segment -
Art.-No.: **6050**

Ø40 mm Standard Magnet
comes with every scanning sphere

M8 centering plate Ø40 mm
Art.-No.: **6150.40**
s. page 226

Bolt adapter
with circular level
Art.-No.: **0852**
s. page 182

Example: With Leica-Adapter



Scan Sphere Segment -
Art.-No: **6050**

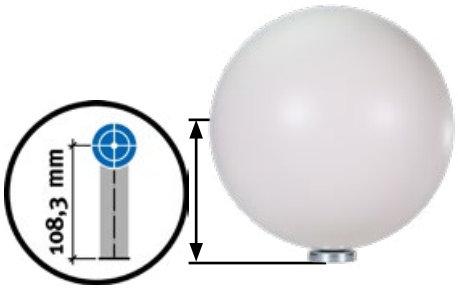
PRO Leica Adapter
Art.-No.: **0680**
s. page 35

M8 / Leica spigot
Art.-No.: **0830**
s. page 36

Bolt adapter
with circular level
Art.-No.: **0852**
s. page 182

Scanning Sphere Ø200 mm

Standard magnet M8 (ZH = 108,3 mm)



For registration and georeferencing with laser scanner at long distances

- Ø200 mm
- Flex design: plastic with shock-absorbing surface coating
- Use and storage: -20° to + 50° C
- M8 inner thread
- 2 standard magnets Ø40 mm with M8 male threads of different lengths are supplied with each sphere
- Target height ZH with standard magnet: 108.3 mm
- Georeferencing prism with target height 80,8 mm 229





Single scanning sphere

Description	Order-No.	Euro
Scanning sphere **Flex** Ø200 mm, incl. standard magnet M8	**6056.1**	241,-



incl. M8 magnet
Ø40 x 8,3 mm



Set of 3 in transport case

Description	Order-No.	Euro
Set of 3 scan. sphere Flex Ø200 mm, with standard magnets	**6056**	735,-

INFO	The Ø200 mm scanning spheres are not stock items. Delivery times may be longer than usual.

Adapter Leica – M8 (ZH = 160 mm)



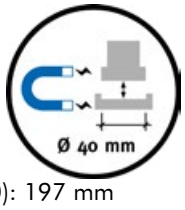


Screws into the M8 thread of the ball instead of the standard magnet

- Anodized aluminum Ø25 x 86 mm with mounting for Leica bolt
- Effective length from top of Leica bolt: 60 mm
- Horizontal screw with star grip to secure the ball
- Target height ZH to ball center: from top of Leicab bolt 160 mm =
- From underside of adapter 186 mm

Description	Order-No.	Euro
Adapter Leica – M8, with locking screw	**0302.060**	35,-

Magnetic base – Leica Ø12 mm (ZH = 197 mm)



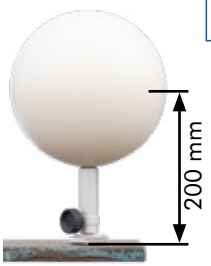




For use with magnetic quick-change system Ø40 mm

- Description - s. page 226
- Target height ZH to prism center from magnet bottom (with 6150.40): 197 mm

Description	Order-No.	Euro
Magnet base **Ø40 mm** with Leica bolts Ø12 x 27 mm	**6019.037**	41,-



INFO	When using a Ø200 mm scanning sphere (Nr. 6056.1) with adapter Leica-M8 (No. 0302.060), magetic base Ø40 mm (No. 6019.037) and M8 centering plate (No. 6150.40) -s. page 226- a **target height ZH** of 200 mm results **overview** page 209



Scanning Target with Magnet Base

- Stable aluminum construction of outer bracket and board axis
- Weatherproof plate 118 x 108 mm, checkerboard pattern diagonal: 150 mm = 6“
- Center of target mark lies exactly in the standing and tilting axis of the holder
- Tiltable target board: tilt resistance adjustable with open-end wrench SW8
- Magnetic base Ø40 mm, holding force 5 kg

Interchangeable use in centering plate 6009.VA with centering accuracy ± 0,1 mm. 73.



Target ZH = 80,8 mm, Magnet Base Ø40 mm

Target mark suitable for laser scanners and total stations at short to medium distances. Thanks to the gimbal suspension, vertical alignment is not required. The target board can always be oriented to any instrument station, with complete positional identity of the center.



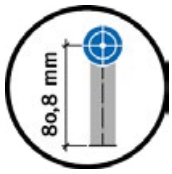
- Fully pass-through
- Target height TH (tilt axis height) from bottom of magnetic base: 80.8 mm
- Compatible with laser scanning sphere Ø145 mm with standard magnet

1. Seite: For Laserscanning



2. Seite: For Total Station

- Back side: Target mark: red-yellow reflective target Ø45 mm with crosshair
  Prism constant K = +3.0 (Leica +37.4) mm





Target Pocket, ZH= 80,8 mm, with Magnet Base Ø40 mm	⚖	№	€
Target board with checkerboard pattern / reflective target mark, tiltable	267 g	**6179**	189,-

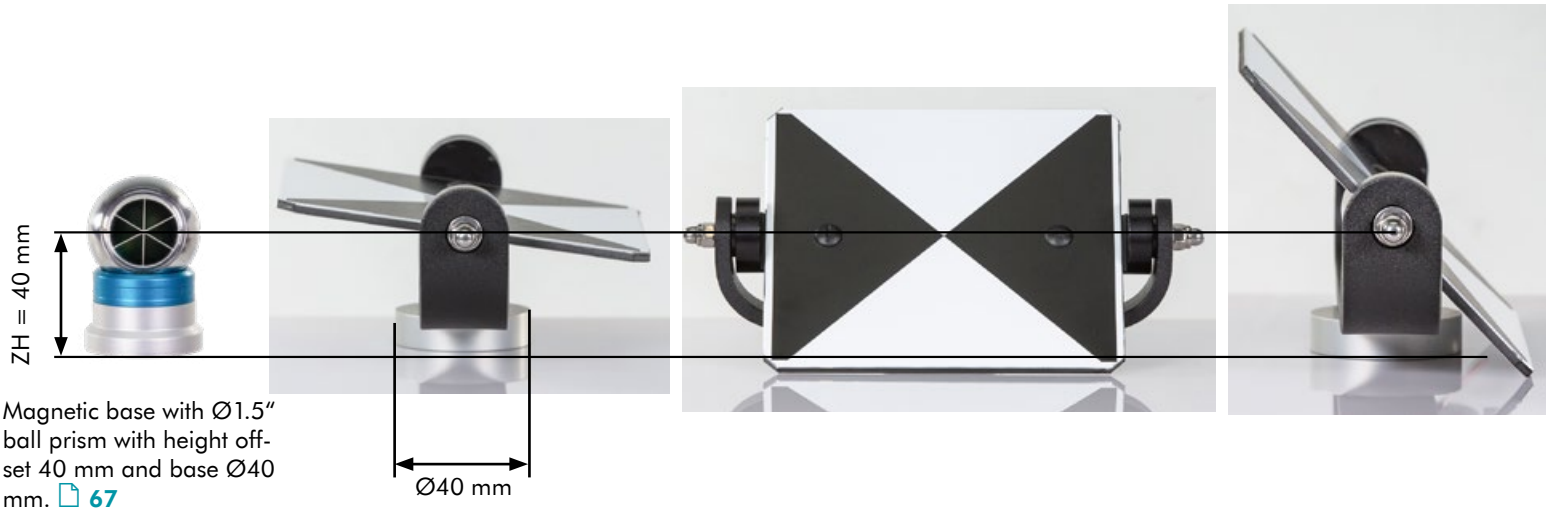
Target ZH = 40 mm, Magnet Base Ø40 mm

- Tiltable board (up to ±45°)
- Compatible with spherical prism on magnetic base 40/40
- Back side: no reflective foil





Target Pocket, ZH= 40 mm, with Magnet Base Ø40 mm	⚖	№	€
Target board with checkerboard pattern , ±45° tiltable	225 g	**6179.040**	179,-



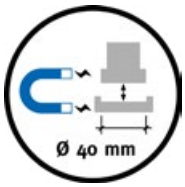
Magnetic base with Ø1.5“ ball prism with height offset 40 mm and base Ø40 mm. 67

Target für Laser Scanning & Total Station, ZH = 80,8 mm or ZH = 60 mm

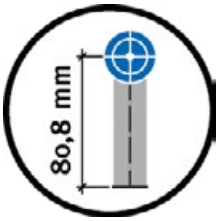


A magnetic base is mounted on the U-shaped inner bracket, on which either a target board for laser scanners or a Ø1.5" (38.1 mm) ball prism for total stations can be placed. **High-precision alignment of the two target centers.**
Thanks to the **gimbal suspension**, vertical alignment is not required. The target board or ball prism can also be oriented to any instrument station with an inclined standing axis, while the 3D position of the target point center remains unchanged.

- Stable aluminum construction of inner and outer brackets
- Gimbal-mounted magnetic base for ball Ø1.5" (38.1 mm)
  Magnet holding force for ball mount: approx. 2 kg
- Tilt resistance adjustable with open-end wrench SW8



With magnet base Ø40 mm





- Magnetic base Ø40 mm, holding force of the magnetic base: approx. 5 kg
- Target height TH (tilt axis height): 80.8 mm from bottom of magnetic base to target center

Description	Order-No.	Euro
Target Pocket *, ZH= 80,8 mm, magnet base Ø40 mm, magnet base for ball-Ø 1.5", **holding force ball: 2 kg**	**6178**	168,-

With Leica Bolt Mount Ø12 mm

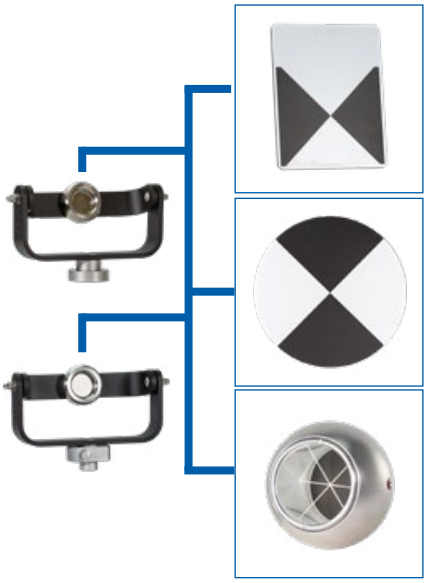




- Leica quick-release with push button, for all Leica bolts Ø12 mm
- Target height TH (tilt axis): 86 mm from bottom / 60 mm from top of Leica bolt

Description	Order-No.	Euro
Laserscan Target Pocket *, ZH= 60 mm, Leica-Anschluss Ø12 mm, Magnetbasis für Kugel-Ø 1.5", Haltekraft 2 kg	**6185**	173,-

Scanning target with ball connection Ø1.5"



- Plane, weatherproof composite panel 150 x 118 mm
- At back galvanized steel hemisphere Ø 1.5" (38.1 mm)
- Target: checkerboard design 112 x 102 mm (diagonal: 150 mm = 6")
- Center of the target is exactly in tilt and standing axis of the carrier
- Labeling field approx. 40 mm high

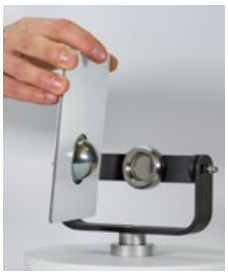
Description	Order-No.	Euro
Target 150 x 118 mm, with hemisphere Ø1.5" connection	**6180**	74,-

Like 6180 above, but: Circular shape Ø108 mm (4.25") / Without space for labeling

Description	Order-No.	Euro
Target Ø108 mm, with hemisphere Ø1.5" connection	**6180.R**	74,-

Description	Bestell-Nr.	Euro
Ball Prism v3.0, Ø1.5" (38,1 mm), hardend, K= -16,9 mm	**1448**	156,-















Leica Mount Target for Laser Scanning & Total Station

Target mark suitable for laser scanners and total stations at short to medium distances.

1. Side: For Laser Scanning

- Target: Checker board design 112 x 102 mm Diagonal: 150 mm = 6“
- Center of the target mark lies exactly in the standing axis of the holder



2. Side: For Total Station

- Target: Red-yellow reflective target mark Ø45 mm with crosshair
- Prism constant K = +3 (Leica +37,4) mm

INFO	For rigid, non-tiltable target plates, the Leica bolt should be approximately vertical. For tiltable target plates in the U-shaped beam, its position is not important.





Non-tiltable target, ZH = 60 mm

- Target plate: plane, weatherproof composite plate 150 x 118 mm
- Labeling space approx. 40 mm high
- Leica bolt quick connector with pushbutton, for all Leica bolts Ø12 mm
- Target height: from bottom 86 mm / from top Leica bolt 60 mm
- Weight: 143 g

Description	Order-No.	Euro
Target Pocket, ZH= 60 mm, with Leica connector, target plate with checkerboard design and reflective foil, non-tiltable	**6183**	142,-





Tiltable Target ZH = 60 mm

Thanks to the gimbal suspension, vertical alignment is not required. The target board can always be oriented to any instrument station, with complete positional identity of the center.

- Stable aluminum construction of inner and outer brackets
- Target board: flat, weatherproof composite plate 118 x 108 mm
- Tiltable board, fully pass-through
- Tilt resistance adjustable with open-end wrench SW8
- Leica quick-release with push button, for all Leica bolts Ø12 mm

Description	Order-No.	Euro
Target Pocket, ZH= 60 mm, with Leica bolt connection, target with checkerboard design and reflective target, tiltable	**6184**	194,-

With target height ZH = 97 / 100 mm

208



Application in „open space“

230

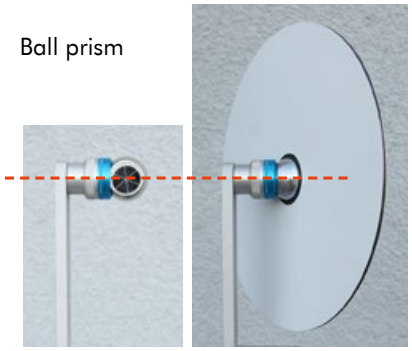


Transport case

257

Scanning target

Ball prism



Circular Target with centric ball connection

For registration and georeferencing in terrestrial laser scanning

In the back center of the target plate a hemisphere is attached. Target plate and sphere center are identical. When stored in a magnetic ball base, the circular target can be exchanged with a ball prism very easily: within seconds and with high precision.
Due to the forced centering on the ball base, a positional identity in the range of tenths of a millimeter is given.

The target can be tilted in any direction without changing the 3D coordinates of the target center for optimal alignment to the total station / laser scanner position.

INFO	The center of the circular target / prism is always identical to the system point. So no eccentricities must be considered.

Circular Tartget with checkerboard design







- Torsionally rigid aluminum composite plate Ø 270 mm, Weatherproof
- Temperature for use and storage: -10° to 50°
- Centric hemisphere Ø 1.5" (38,1 mm), magnetic stainless steel, To use with ball base

Description	Order-No.	Euro
target Ø 270 mm, checkerboard design, **hemisphere Ø 1.5" connection**	**6155**	125,-

Description	Order-No.	Euro
Transport bag for Ø270 mm scanning targets (up to 8 units)	**6148**	44,-





Ball Base Ø 1.5“ with magnet & M8 thread

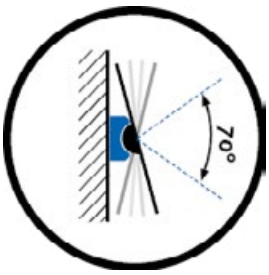
For alternating use of ball prism and circular target

- Magnetic holding force towards hemisphere: around. 6 kg
- Offset of ball center/target center from back of base (without M8 thread) = 50 mm
- Tilting range: ± 35°

Description	Order-No.	Euro
magnet. base, M8 outer thread, holding force 6 kg (70)	**1466.08a**	54,-

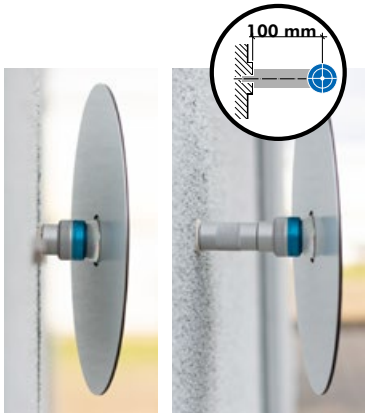
INFO	Also available with Ø30 mm ball connection: Scanning taget Ø270 mm Order-No. 6150, Base Order-No. 1465.208a

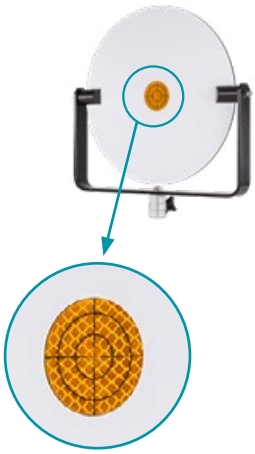
To use with M8 wall bolts



- Direct screwing into the M8 inner thread of the wall bolt
- Distance 50 mm from wall stud to ball/target center [Fig. 1].
- With adapter (see 71) Distance 100 mm from wall bolt to ball/target center [Fig. 2].
- Overview 271

Wall bolts see 91





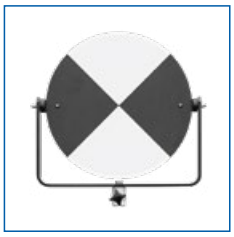
Circular target Ø 270 mm for laser scanning & total station in U-beam, Leica connection

Titltable scanning target, ZH = 160 mm

Target suitable for laser scanners at long distances.
Due to the gimbal suspension, perpendicular use is not necessary. The target plate can always be aligned to any scanner standpoint, even with the Leica bolt at an angle, with complete positional identity of the target character center.

- Stable aluminum construction of outer bracket and panel axle
- Circular panel: plane, weatherproof composite panel Ø 270 mm
- Target sign front side: checkerboard design for laser scanner
- Center of the target sign is in tilting and standing axis of the beam
- Target mark back side: Reflective foil for total station
- Prism constant K = +3 (Leica +37.4) mm
- Fully penetrable
- Tilt resistance adjustable
- Leica connection with locking screw, for all Leica bolts Ø12 mm
- Target height ZH (tilt axis h.): from bottom 186 mm = from top Leica bolt: 160 mm



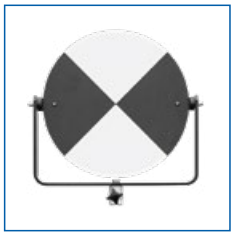


Description	Order-No.	Euro
Laserscan circular target, tiltable, ZH= 160 mm, Leica bolt connection, checkerboard design, reflective foil on back	**6154**	236,-

Hemisphere on back side Ø1.5“







Target with dual fuction when **laser scanning**:

1. Use on U-Beam with Leica connection as no. 6154 (see above)

2. Use with magnet base, like article no. 6155 (s. page 217)
- Magnetic hemisphere Ø1.5“
- Identical center of checkerboard target and hemisphere
- U-beam remains on circular target board, without functio

Description	Order-No.	Euro
Laserscan circular target, tiltable, ZH= 160 mm, Leica bolt connection, checkerboard design, hemisphere 1.5“ on back	**6154.B**	236,-









SLAM target Ø270 mm in U-support, Leica and magnetic ball connection

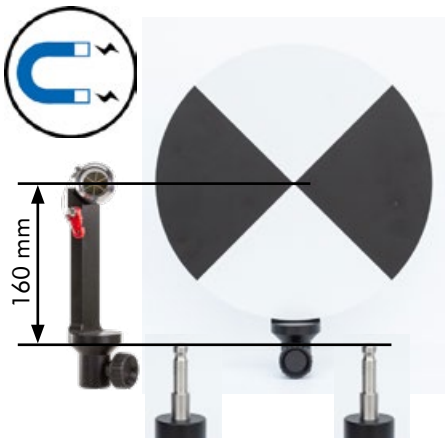
Properties as no. 6154.B, but reflective foil instead of checkerboard pattern

- Continuous reflective foil on the front side enables automatic target finding
- Additional centric target mark for tachymetric coordinate determination
- Dual function due to Leica connection on U-beam and magnetic ball connection on rear side
- Weight: 733 g

Description	Order-No.	Euro
SLAM-Target Ø270 mm, tiltable, reflective foil, ZH= 160 mm, Leia connection Ø12 mm, hemisphere Ø1.5‘‘ on backside	**6154.RB**	236,-

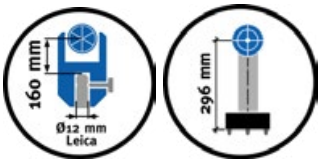
L-Carrier „STAFF"

For all ball prism with Ø1.5'' and scanning taget with hemisphere Ø1.5'' (38,1 mm).





With Leica bolt connection



For use on all Leica bolts Ø12 mm

- Aluminum carrier anodized black
  Integrated magnetic base for inserting scanning targets or ball prisms
- Magnet holding force: ca. kg
- Scanning targets (up to Ø270 mm) with hemisphere can be adjusted from vertical standing to horizontal alignment in all directions
- Securing on Leica bolt with horizontal locking screw
  Target height: 160 mm from top of bolt to ball/target center
  Center accuracy:
  - When changing between ball prism and scan plate: **± 0.1 mm**,
  - With additional rotation around the vertical axis of the L-carrier: **± 0.3 mm**
- Weight around: 404 g

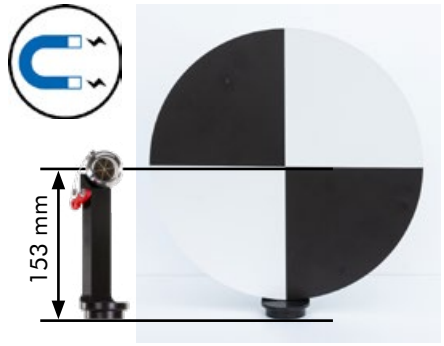
Description	Order-No.	Euro
L-Carrier „STAFF" with magnetic ball connection 1.5" for scanning target + ball prism, **Leica connection**	**6172**	143,-



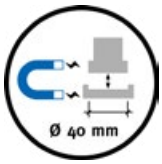


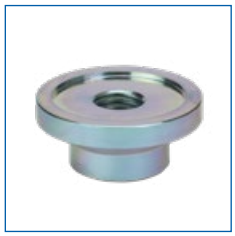












With magnetic base Ø40 mm

To use with centering plates Ø40 mm and quick change adapter

- Aluminum carrier anodized black
  Integrated magnetic base for inserting scanning targets or ball prisms
- Magnet holding force: ca. kg
- Scanning targets (up to Ø270 mm) with hemisphere can be adjusted from vertical standing to horizontal alignment in all directions
- Holding force magnetic base: approx. 5 kg
- Target height: 153 mm from top of bolt to ball/target centers
  Center accuracy:
  - When changing between ball prism and scan plate: **± 0.1 mm**,
  - With additional rotation around the axis of the L-carrier in plate: **± 0.1 mm**
- Weight approx. 238 g

Description	Order-No.	Euro
L-Carrier „STAFF" with magnetic Ø1.5" ball connection for scanning target + ball prism, **magnet base Ø40 mm**	**6172.M40**	137,-

Quick-change adapter: 5/8"inner thread – Ø 40 mm

- Adapter to screw-in / out, with forced centering
- Bottom: 5/8" inner thread
- Top: centering for magnetic base Ø 40 mm
- Centering accuracy ± 0,1 mm
- Galvanized steel, magentic
- Effective length: 20,5 mm
- s. overview 221



Bezeichnung	Bestell-Nr.	Euro
Centering adapter 5/8" - **Ø40 mm**	**6162.40**	27,-

























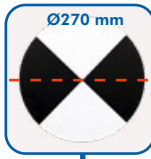

No.	1444
€	174,-
	62

Ø108 mm



No.	6180.R
€	74,-
	215

Ø270 mm



No.	6155
€	125,-
	217

153 mm



No.	6172.M40
€	137,-
	220



No.	6172
€	143,-
	219

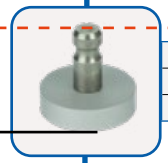
186 mm

160 mm



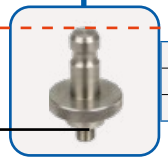


37 mm



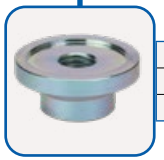
No.	6019.037
€	41,-
	226

40 mm

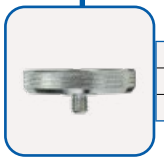


No.	0830
€	18,-
	35



No.	6162.40
€	27,-
	220



No.	6150.40
€	24,-
	226



No.	6009.VA
€	12,-
	73

Targets for measuring with drones

Our UAV targets for scanning and photogrammetry.

Tiltable targets

Targets in the U-beam can easily be aligned upwards.





Circular targets with ball connection on back

With a magnetic base with 5/8" or M8 thread, the circular Ø270 mm target with rear hemisphere connection can be easily placed on a mini tripod, ground spike, tribrach or prism pole.





Target directly above prism

With the help of an adapter, the above targets can be screwed directly onto prisms. The center of the target and prism are always in the standing axis.

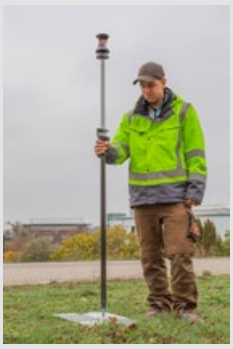
page 223




Square target plate with pole centering

For re-coordinating the center of the target or for positioning on known points.

page 224

Swap between scanning taget and ball prism

With the high-precision STAFF L-Beam, ball prisms and scan panels can be used alternately with the aid of an integrated magnetic base.

s. 219

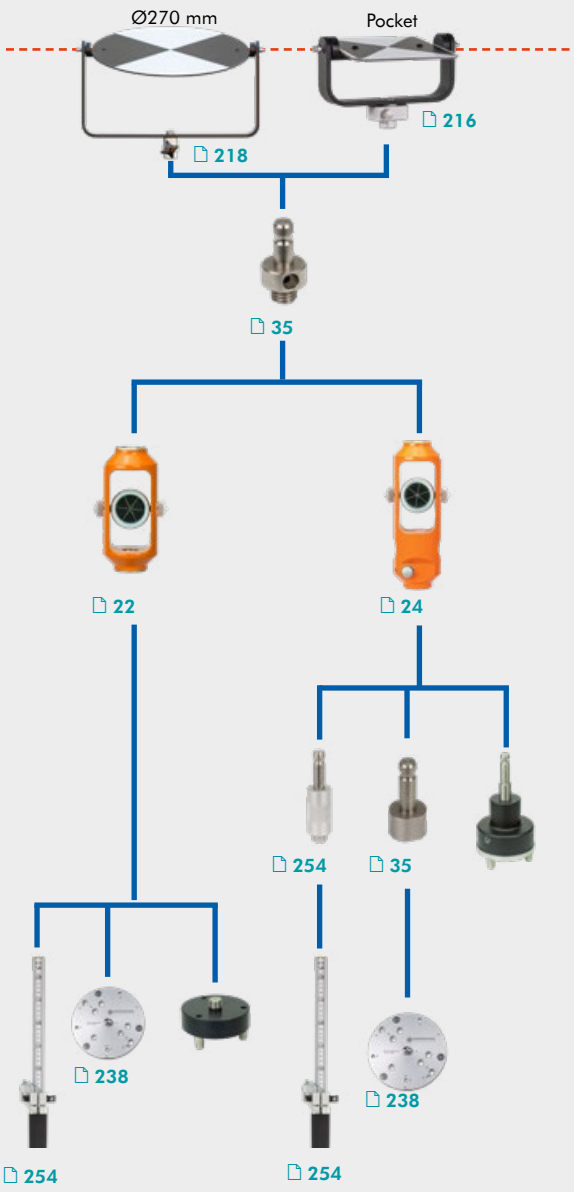




Laser Scanning: Linking drone scans and terrestrial measurements

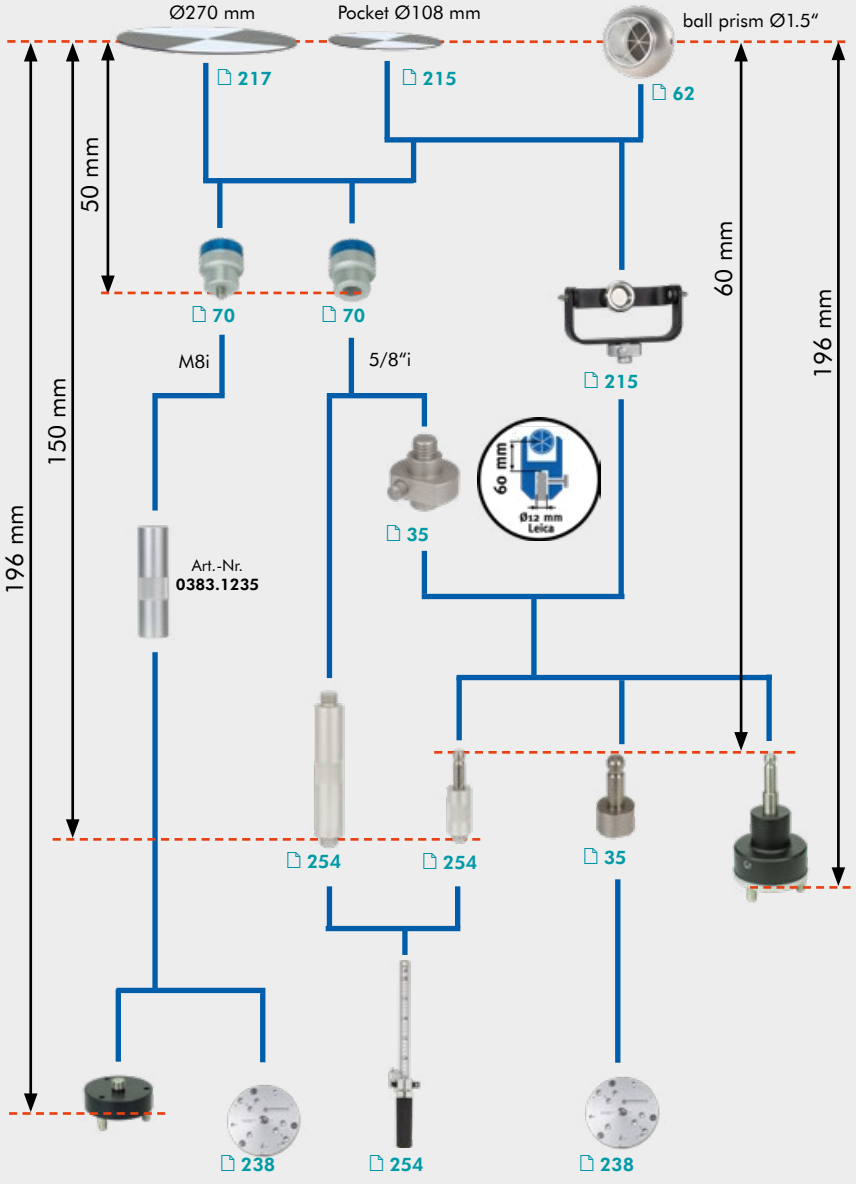
Prism below target in standing axis

(Target usable with drone and terrestrial)



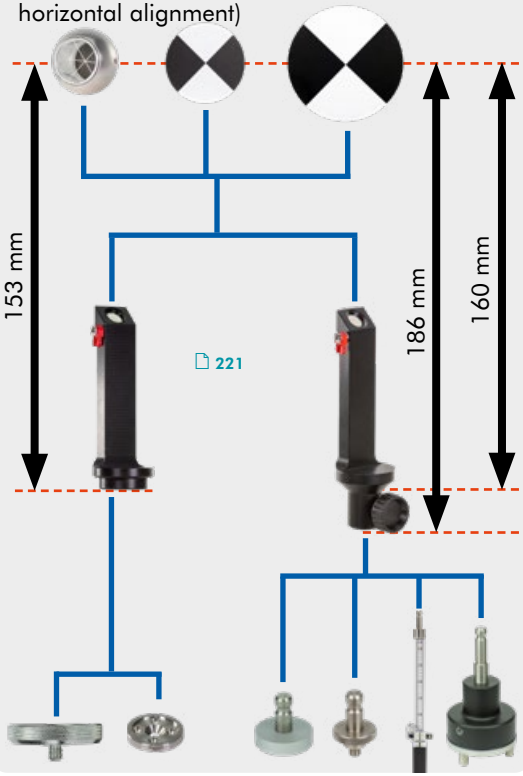
Target and ball prism, magnetic quick change

(Target Ø270 mm in this combination can only be used with drone)

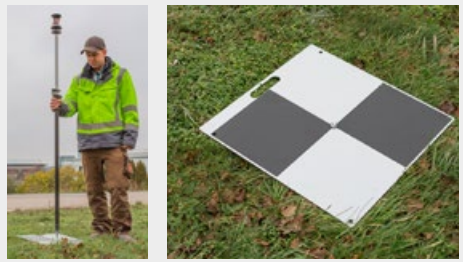


Target & ball prism - L-Carrier

(Scanning target can be tilted from vertical to horizontal alignment)



Square target 400 x 400 mm



224



Target plate for drone photography

Checkerboard target plates/targets are suitable for photogrammetric surveys with drones. Depending on the application, they can be used for georeferencing and as a control or pass point.

- Torsion resistant aluminum composite panel
- Plane surface
- Weatherproof
- Checkerboard pattern white/black 200 x 200 mm
- Panel size: 450 x 420 mm
- Handle for panel lifting
- 5 holesØ10 mm: 1x centrically, 4 x in the corners
- Weight: 875 g
- **Comes with two nails Ø 9 x 90 mm with centering**

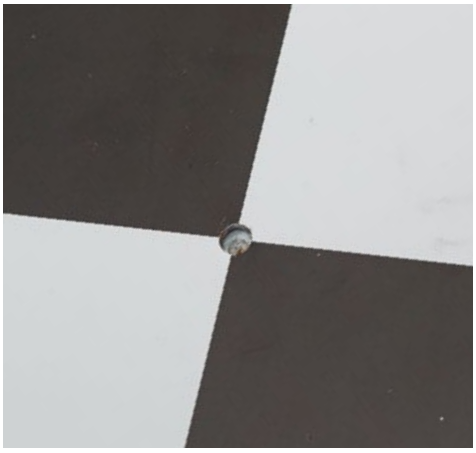


Description	Order-No.	Euro
Target for drone recordings, checkerboard pattern, 450 x 420 mm	**6076**	48,-

Positioning of the target board on known point

The board is placed with the center hole on the already coordinated point.
On natural soil, the board can be secured against slipping with nails in the corner holes.







Coordination of panel center

On natural soil, driving a centering nail into the center hole of the panel has proven effective against slippage. The center of the plate is then coordinated by holding the GNSS/ prism pole on the center nail.





Holder for drone targets

For storage and transport of max. 10 target plates no. 6076

The target boards are hooked into the stand at the center hole.
The handle in the boards allows comfortable carrying along with holding stand.

- Quick release fastener for fixing the boards on the stand
- Fold-out cross strut for safe parking when deploying / collecting the target boards
- Weight: 530 g



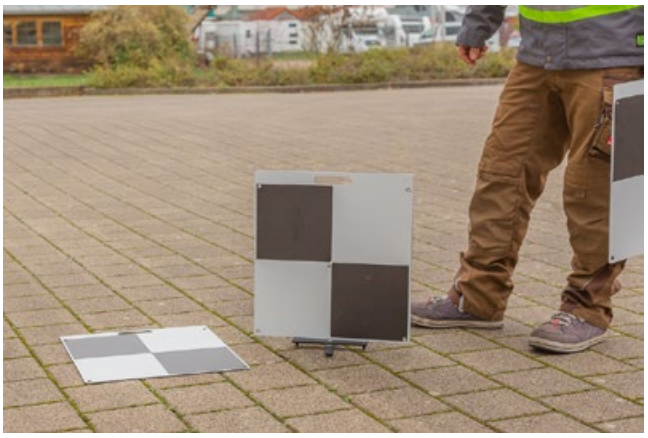


Description	Order-No.	Euro
Holder stand for up to 10 target boards	**6076.H**	78,-

















Magnetic Quick Change System M8

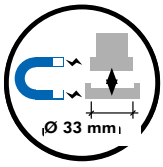
Instant exchange of target marks/ball prisms equipped with magnetic bases

The centering plate 6150.33 or 6150.40 is screwed into the wall bolt or the target holders with M8 internal thread. No tool is required for this.

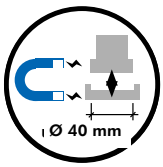
The target marks (reflectors, prisms, scan ball, target boards, etc.) are equipped with a cylindrical base with an integrated permanent magnet, the length of which is matched to the system height TH up to the target mark center.

The target marks adhere securely and force-centered in the centering plate with a repeat accuracy of ±0.05 mm.

- External thread M8 x 8 mm
- Electro-galvanized steel (6150.33: outer Ø43 mm, 6155.40: outer Ø50 mm)
- Knurled grip for tool-free screwing into M8 wall bolts









Description	Order-No.	Euro
M8 centering plate Ø 33 mm, effective length 3 mm	**6150.33**	23,-

Description	Order-No.	Euro
M8 centering plate Ø 40 mm, effective length 3 mm	**6150.40**	24,-



INFO	**Attention** 6150.40 **can not** be combined with item 6160.M40.

Magnet Base - Leica Ø12 mm

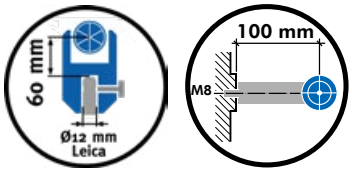


For tiltable reflector holders with Leica connection Ø12 mm

- Cylindrical base with integrated magnet, magnetic holding force approx. 5 kg
- Anodized aluminum with Leica bolt Ø12 x 27 mm, stainless steel
- Total length = 37 mm



Description	Order-No.	Euro
Magnetic base **Ø40 mm** with Leica bolt Ø12 x 27 mm	**6019.037**	41,-
Magnetic base **Ø33 mm** with Leica bolt Ø12 x 27 mm	**6020.037**	41,-

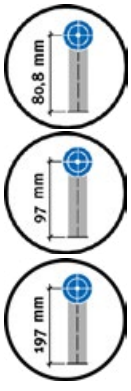








Applied target heights



■ Target height ZH 80,8 mm

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■ Target height ZH 97 / 100 mm

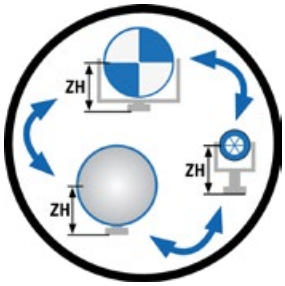
s. page 208

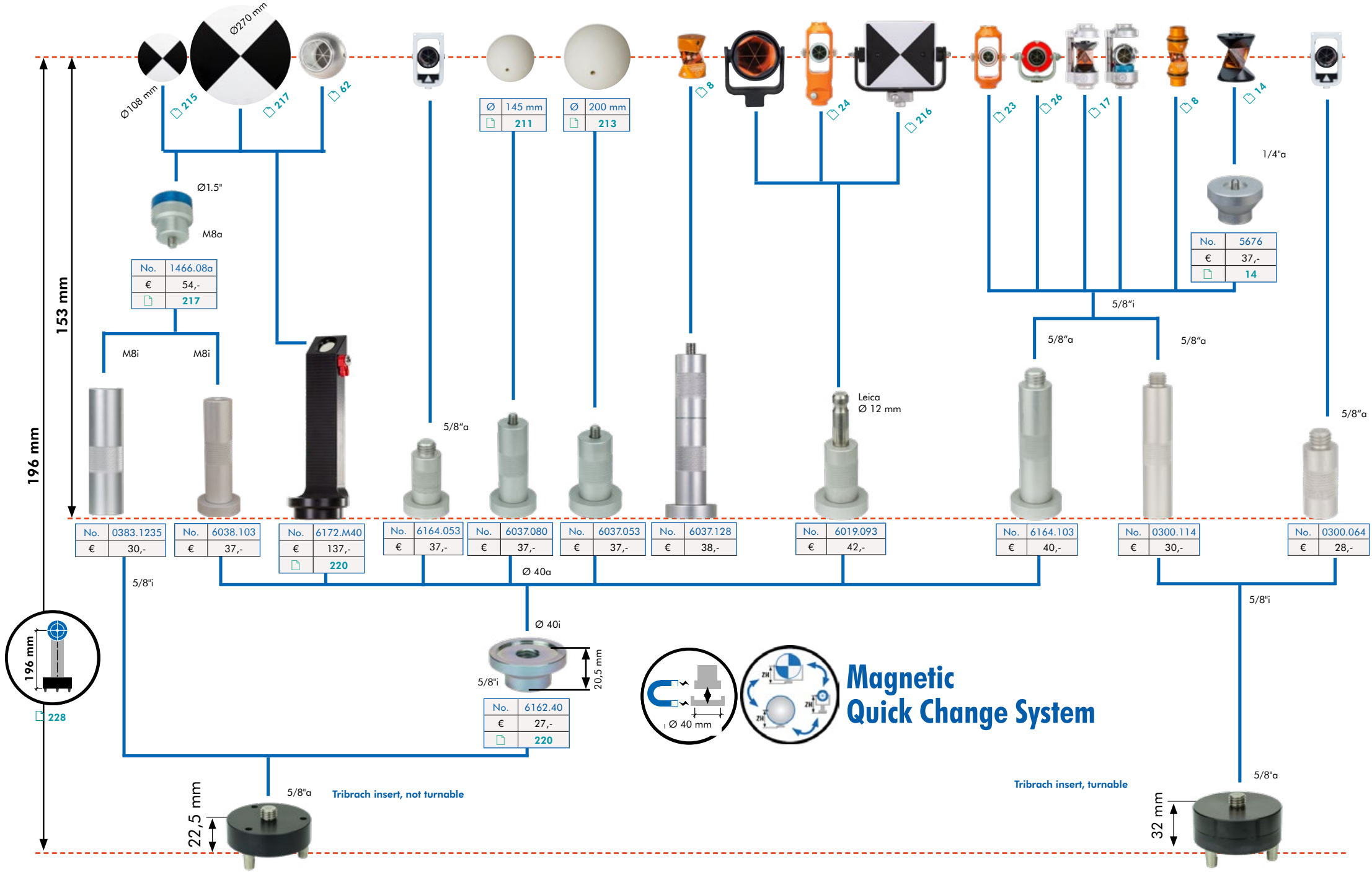
■ Target height ZH 197 / 200 mm

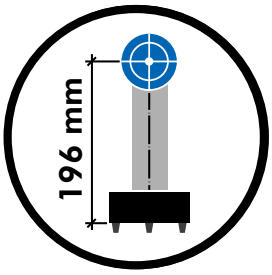
s. page 209

■ TLS quick change system

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Ø270 mm
Ø108 mm
215
217
62
Ø1.5"
M8a
No. 1466.08a
€ 54,-
217
153 mm
196 mm
M8i
M8i
No. 0383.1235
€ 30,-
No. 6038.103
€ 37,-
No. 6172.M40
€ 137,-
220
5/8"i
5/8"a
No. 6164.053
€ 37,-
Ø 145 mm
211
No. 6037.080
€ 37,-
Ø 200 mm
213
No. 6037.053
€ 37,-
Ø 40a
Ø 40i
5/8"i
20,5 mm
No. 6162.40
€ 27,-
220
196 mm
228
22,5 mm
5/8"a
Tribrach insert, not turnable
8
No. 6037.128
€ 38,-
24
216
Leica
Ø 12 mm
No. 6019.093
€ 42,-
Ø 40 mm
Magnetic
Quick Change System
23
26
17
8
14
1/4"a
No. 5676
€ 37,-
14
5/8"i
5/8"a
5/8"a
No. 6164.103
€ 40,-
No. 0300.114
€ 30,-
5/8"a
No. 0300.064
€ 28,-
5/8"i
Tribrach insert, turnable
5/8"a
32 mm



Tilting Axis Height 196 mm

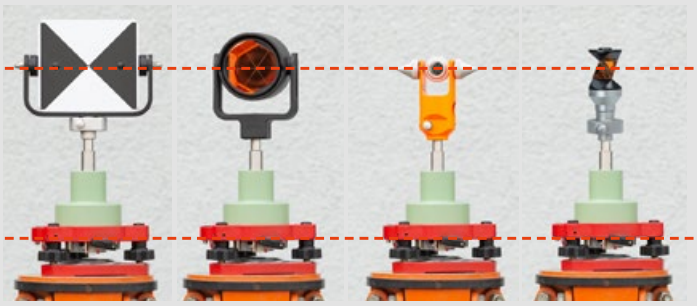
Various adapters in use

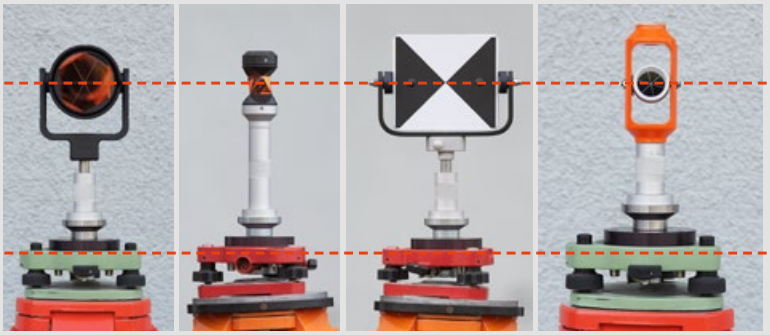
INFO

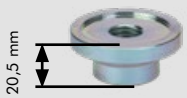
We are happy to help you in choosing the right adapter. An overview of all available adapters can be found on page **227.**



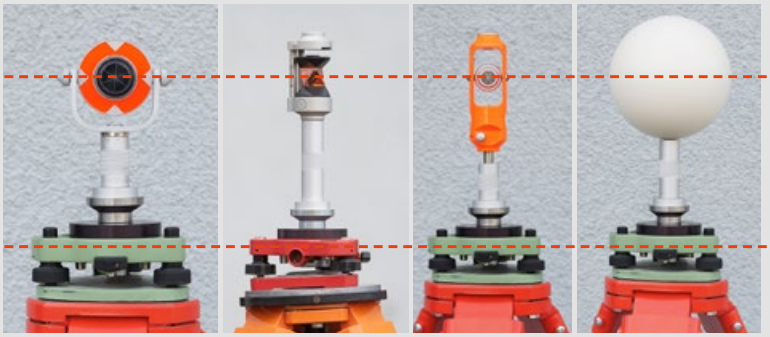
Tribrach insert, Leica

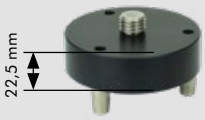




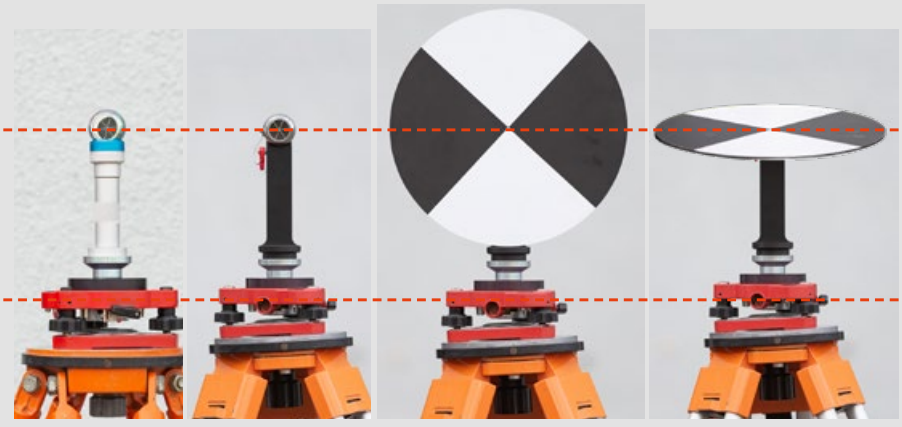


Adapter 5/8" - Ø40 mm
Art.-Nr. **6162.40** • 27,- €
page 220





Tribrach insert, not turnable

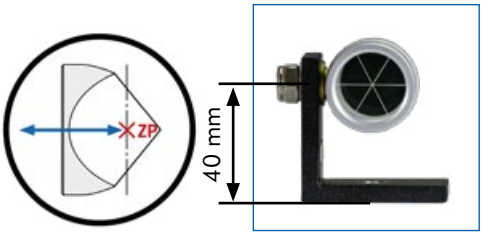




L-Prism & Magnet Base

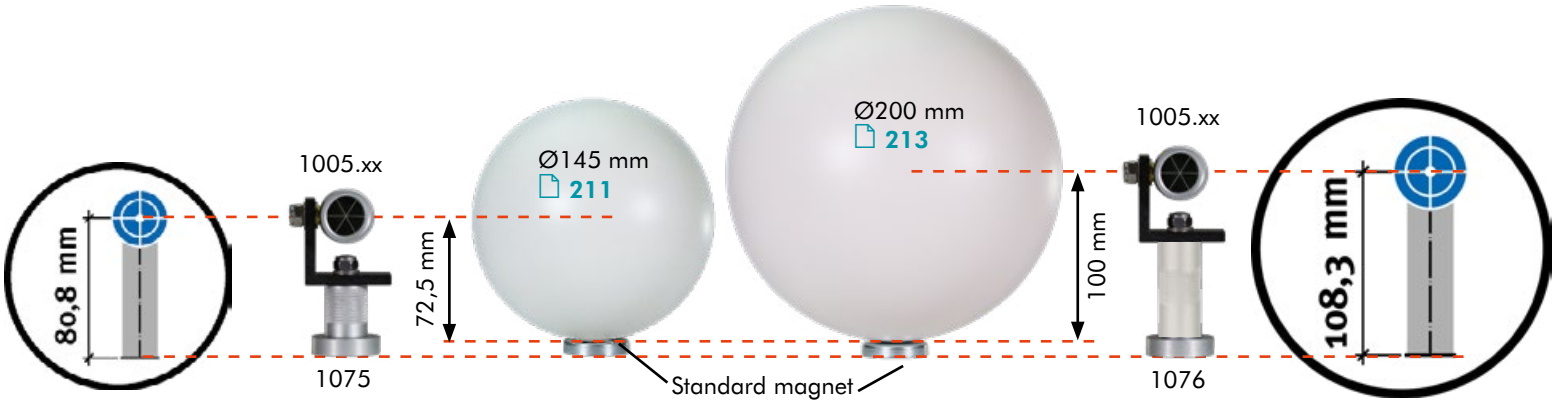
L-Prism

- Can be aligned in any direction due to gimbal mounting
- Adjustable tilt resistance with open-end wrench SW13
- Robust manufacturing from full metal



Description	glass prism	prism constant K	Order-No.	Euro
Tiltable prism on L-Carrier with Ø 8 mm hole	Ø 17,5 mm	**-11,3** (Leica = +23,1) mm	**1005.11**	124,-
	Ø 25 mm	**-16,9** (Leica = +17,5) mm	**1005.17**	113,-
		-30,0 (Leica = +4,4) mm	**1005.30**	166,-
		-34,4 (Leica = 0) mm	**1005.34**	166,-
		-35,0 (Leica = -0,6) mm	**1005.35**	166,-

Magnetic base for target heights 80,8 mm and 108,3 mm





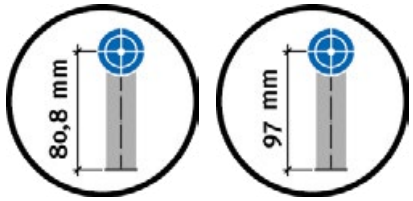
- Magnetic base Ø 40 mm, holding force of the magnet: approx. 5 Kg
- Cardanic suspension of the prism: The L-beam can be rotated axially on the magnetic base, the prism can be tilted (360° each)
- Rotation and tilting resistance are adjustable with open-end wrench SW13
- Magnetic base and L-prism are supplied as an assembled unit

Description	Order-No.	Euro
Magnetic base Ø 40 x 40,8 mm for L-prism	**1075**	40,-

Description	Order-No.	Euro
Magnetic base Ø 40 x 68.3 mm for L-prism	**1076**	44,-

INFO	When ordering an L-prism and a magnetic base, both are delivered as an assembled unit.

TLS - Leica / Quick change system, in „open space“







Centering plate Ø40 mm
Art.-No. **6009** • 12,- Euro
73





M8 centering plate Ø40 mm
Art.-No. **6150.40** • 24,- Euro
page 226







WA Leica Adapter, M8
Art.-No. **0830** • 18,- Euro
36





Joint clamp Leica
Art.-No. **6176.L** • 48,-
page 231



M8 Adapter Ø25 x 70 mm
Art.-No. **0373.070** • 25,- Euro



Suction holder M8
Art.-No. 5938 • 80,- Euro
page 134



Switchable Magnet M8
Art.-No. **5929.M8** • 74,- Euro
page 112



Triangle plate M8
Art.-No. **6114.M8i** • 51,-



Lever clamp M8
Art.-No. **5934** • 78,- Euro
page 133



Joint clamp M8
Art.-No. 6176.M8 • 48,-
page 231



Strong M8 clamp
Art.-No. **6884** • 79,-
page 133



Magnet Base „SECTION“
Art.-Nr. **1740** • 88,-
161

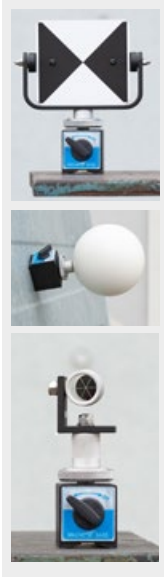


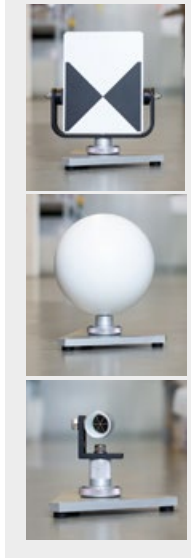
Pole clamp Ø18-32 mm
Art.-No. **2290.80** • 63,-

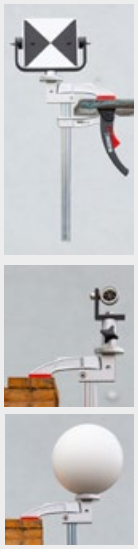


Mini Tripod M8
Art.-No. **6273** • 139,-
page 232

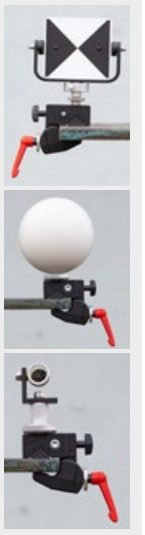


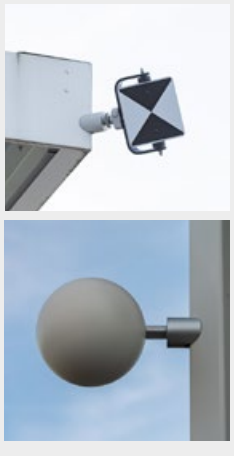


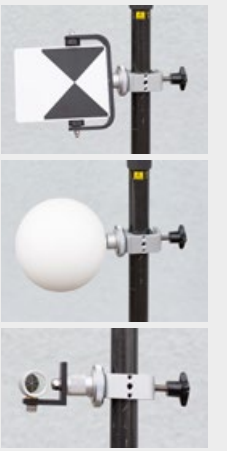


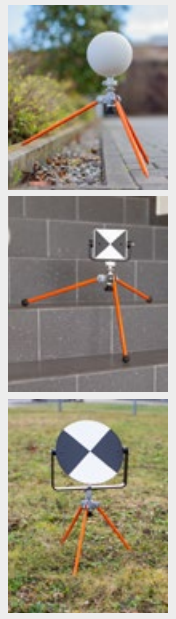


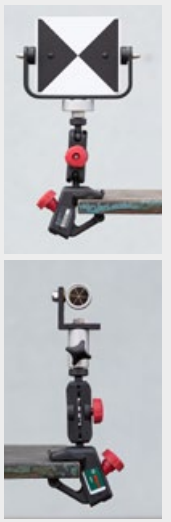












Universal Screw Joint Clamp

For attaching instruments, prisms and other targets to tubes and surfaces such as scaffolding struts, table tops, steel beams, floorboards, etc.

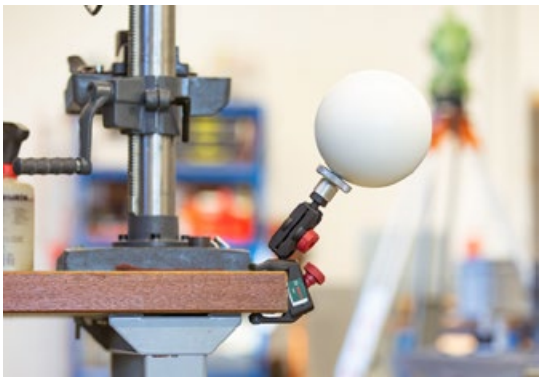
- Quality clamp made of plastic
- Rubberized clamping surfaces to protect the material
- Clamping range on cylinders and surfaces, Ø or thickness: 10 - 60mm
- Double joint for aligning and, if necessary, perpendicular setting of the target sign
- 1. rotary knob for screwing on the clamp
- 2. rotary knob for loosening and locking the double joint

Leica M8 i



Description	Order-No.	Euro
Universal screw clamp with joint arm **M8 inner thread**	**6176.M8**	48,-
Universal screw clamp Leica-Bolt Ø12 x 27 mm	**6176.L**	48,-





Sturdy M8 screw clamp

Very robust metal alternative to this screw clamp you can find on **page 133**



Beam clamp M8

- Simple alternative made of galvanized steel
- Clamping range up to 23 mm
- Particularly suitable for attachment to steel beam structures

See for more information **91**.







Universal tripod for laser scanning targets

For targeting with scanner and total station from different directions

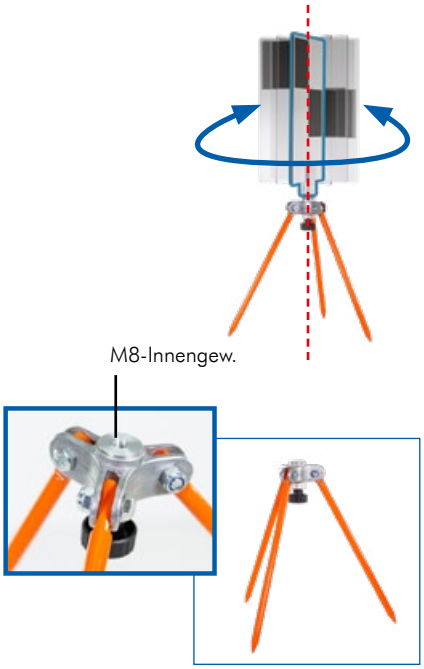
Laser scanning requires multiple scans to be linked together (registration) to capture as much information as possible. Targets that are visible from every point of view can be used either for registration itself or for accuracy control of the scans.

With the **TALASCA PRO** universal tripod, targets of any kind can be freely positioned in space, with a firm stand on almost any surface.

Target plates can be rotated around the standing axis on the tripod. Without changing the position of the target centre, even if the standing axis is not vertical.

Ideal for use with our dual-function targets: Checkerboard pattern on one side and reflective tape on the opposite side. After targeting the reflective tape with the total station, the generated 3D coordinates can be used for georeferencing the laser scans.

- Robust tripod
- High weight ensures stable stand
- Backlash-free joints with adjustable resistance for spreading the legs
- Interchangeable insert with inner M8 thread for holding targets/adapters
- Insert rotates around standing axis with adjustable resistance
- Tripod length with legs attached: 30 cm, weight: 1.000 g



Description	Order-No.	Euro
Universal Tripod TALASCA PRO, M8 inner thread	**6273**	139,-

Solid ground



Natural ground



Smooth and sensitive surfaces







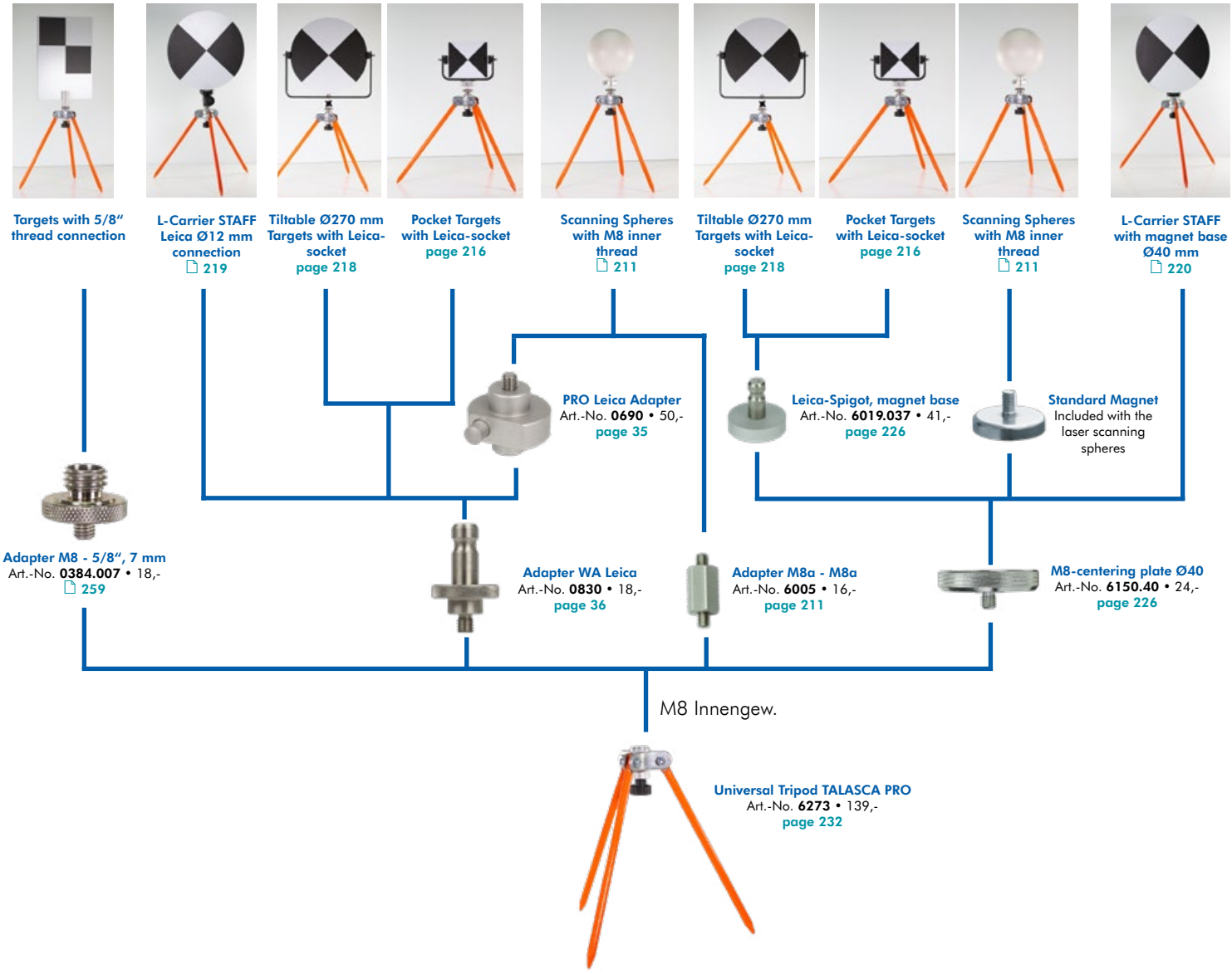


INFO

Our Pocket Targets (**page 206**) and Ø270 mm Tagets in U-beam have aiming marks for both laser scanners and total stations. They can be aimed from all directions by rotating them around the standing axis.

Accessories and adapters on the next page

Accessories & Adapters for Mini Tripod



Rubber Ball for Mini Tripod



- Ball Ø25 mm made of high-quality rubber
- Hole for attaching to the leg of the TALASCA PRO
- Safe standing of the tripod on sensitive or slippery surfaces

Description	Order-No.	Euro
Rubber ball to plug on (1 piece)	**5356.06**	3,20







Target spike for natural grounds



A simple solution to get a reference point in soil is the combination of our M8 centering plates and our stainless steel spikes.

The earth spike is simply inserted into the ground and a scanning sphere is attached with the magnetic quick release.





Description	Order-No.	Euro
M8 centering plate Ø40 mm, effective offset 3 mm, s. page 226	**6150.40**	24,-



M8 stainless steel spikes

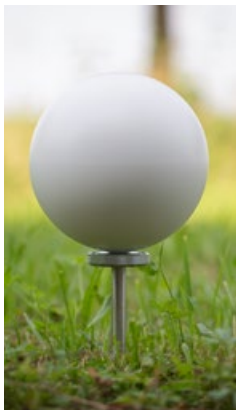
- Material: Ø12 mm stainless steel
- M8 inner thread

Description	length	Order-No.	Euro
stainless steel spike with **M8 inner** thread	120 mm	**1863.120**	18,-
	143 mm	**1863.143**	19,-
	170 mm	**1863.170**	20,-



Example with Pocket Target s. page 214

Attention: Rotating/turning the target between scans is not recommended. Often natural soils do not provide enough „grip“ to ensure an accurate second measurement (with identical 3D coordiantes) after touching the target.



Example with Scan-Sphere: s. page 211



Example: Target Ø270 mm page 217 & Thread base M8 70

Tripod for Laser Scanners

Laser scanners are delivered with tripods for standard applications.
For exceptional conditions special accessories are required. Such as our **Mini Instrument Tripod**. This allows measurements to be carried out even in confined spaces. It can also be attached to a wide variety of objects and vertical surfaces. Targets such as scanning spheres and scanning targets can also be used on the Mini tripod.

Laser Scanner Examples







Example:
Leica BLK360
(with Leicas BLK360 tripod adapter)

Brand-owned quick change systems

Brand-owned adapter plates

5/8“

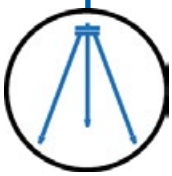
5/8“

3/8“

5/8“



Instrumenten Tripod Mini „Base“
+ various tripod feet / applications
238



Surveying tripod with 5/8“

3/8“



Instrumenten Tripod Mini „Base“
+ various tripod feet / applications
238

Adapter plate 3/8“ to 3/8“ outer
Art.-No.: 5035.1 / 44,- EURO










Surveying Accessories 1/2

H.1. Instrument Tripod Mini 238







H.2. Instrument Tripod Accessories: Tripod Star, Tripod Feet 244

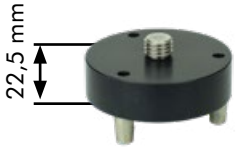
- Tripod Feet 244
- Tripod Base Adapter 245
- Tripod Star 246

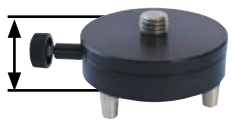


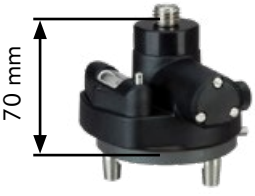



H.3. Tribrach Accessories 246







H.4. Instrument Wall Tripod 251





Surveying Accessories 2/2

H.5. Prism/GNSS pole, strud tripod & Accessories 254



H.6. Transport Case and Transport Bag 257





Mini Instrument Tripod

For the use of laser scanners and total stations in confined spaces.

Surveying instruments cannot be used with the common standard tripods in all areas of application. Often they are too large, too heavy, too bulky. Our Mini Instrument Tripod on the other hand is reduced to the bare essentials.

Stainless steel cap nuts can be screwed into the circular plate with the aid of cylinder head screws (supplied) and used as support tips. In this way, the lowest design can be achieved (see pictures to the right).







Features:

- Stable circular plate with the possibility to screw in various short legs (see next page)
- Positioning close to the ground
- 5/8" (or 3/8") outer thread to screw on instruments
- Weight: 650 g



Description	Order-No.	Euro
Mini Instrument Tripod (without ball heads) - **5/8"**	**6880**	130,-
Mini Instrument Tripod (without ball heads) - **3/8"**	**6880.38**	134,-

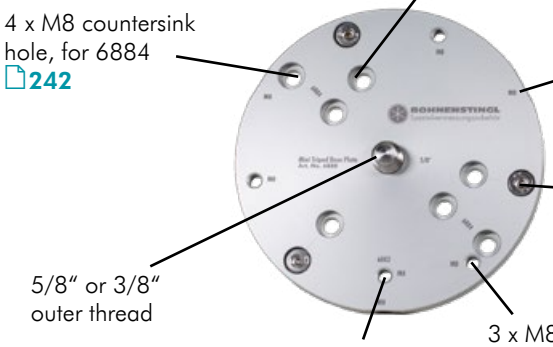
Scope of delivery and equipment



3 x cylinder head screw for mounting the cap nuts and other accessories (**s. page 240**)



3 x stainless steel cap nuts, can be used as contact tips or to secure the cylinder head screws during transport (**s. page 241**)





Carrying case (not suitable for magnets and suction holders)
s. page 257

Ball heads / joints see page 239

Overview of complete accessories s. page 240











Functional extension using ball joints

Three ball joints extend the range of use enormously and can be attached to the tripod plate as required.

Stable ball joint with tightening screw



- Uneven ground can be compensated
- Alignment of the ball joint possible in virtually all directions
- Wider, more stable installation possible
- Can either be screwed directly into the M8 through-hole threads from below or onto the lateral M8 threads (see picture examples)
- M8 external thread on both sides
- Very stable fixation by star grip tightening screw
- With adapter 6882 (s. page 243) the instrument stand can also be attached vertical surfaces using magnets or suction holders
- Weight: 135 g

Description	Order-No.	Euro
Ball joint with tightening screw - M8 outer threads (1 pc.)	**5089**	51,-











Lightweight flex swivel head



- **Slight** curvature of the ground can be compensated
- Wider, more stable set-up possible
- Space-saving and lightweight design
- M8 external thread on both sides
- To secure swivel head fork spanner SW13 is needed
- Weight: 62 g

Description	Order-No.	Euro
Ball joint with swivel bearing - M8 outer threads (1 Stk.)	**6885**	36,-











Laser Scanner

If necessary, adapter from 5/8" to laser scanner

5/8" prisms & adapters

Leica prisms & adapters

5/8" <-> Leica-stud adapter
Art.-No. **0377.27** • 30,- Euro
page 35

Total Stations

tribrachs



Instrument tripod Mini „Base" can also be used without additional accessories.



Instrument Tripod Mini „Base" - 3/8"
Art.-No. **6880.38** • 134,- Euro
page 238

Instrument Tripod Mini „Base" - 5/8"
Art.-No. **6880** • 130,- Euro
page 238



Ball head, M8
Art.-No **5089** • 51,- Euro
page 239
3 pieces are nesessary.



Swivel joint M8
Art.-No. **6885** • 36,- Euro
page 239
3 pieces are nesessary.



Additional arm for vertical set-up of „mini tripod"
Art.-No. **6882** • 68,- Euro
page 243





Switchable Magnet M8
Art.-No. **5931** • 38,- Euro
page 241
3 pieces are nesessary.





Suction holder M8
Art.-No. **5938** • 80,- Euro
page 241
3 pieces are nesessary





Rubber ball M8
Art.-No. **5422** • 7,50 Euro
page 241
3 pieces are nesessary.





Stainless steel spikes
page 241
3 pieces are nesessary.





Stable screw clamp M8
Art.-No. **6884** • 79,- Euro
page 242
2 pieces are nesessary.





Switchable Magnet M8
Art.-No. **5929.M8** • 74,- Euro
page 241
3 pieces are nesessary.





Suction holder M8
Art.-No. **5938** • 80,- Euro
page 241
3 pieces are nesessary.



Further setup options

Depending on the type and condition of the ground, the ball heads (or the circular plate directly) can be equipped with further types of feet.

Please note that you need the respective foot **three times**:





Spikes for various undergrounds





Description	Length	Order-No.	Euro
Spike, stainless steel, M8 internal thread	**20 mm**	**2059.20**	14,-
	34 mm	**2059.34**	15,-
	70 mm	**2059.70**	18,-
	84 mm	**2059.84**	19,-



Rubber balls for smooth floors





Description	Order-No.	Euro
Rubber ball foot with M8 inner thread	**5422**	7,50



Switchable magnets for magnet. surfaces





Description	Order-No.	Euro
Switchable magnet M8 (132)	**5929.M8**	74,-

Magnetic holding force (up to 68 kg) depends on the properties and thickness of the metal ground.



Suction holder for gastight surfaces



Description	Order-No.	Euro
Suction holder with vacuum indicator s. page 134	**5938**	80,-

Stable universal screw clamp M8

For attaching the „Instrument Tripod Mini“, prisms and targets to poles and surfaces, such as scaffold struts, table tops, steel beams, floorboards, etc.

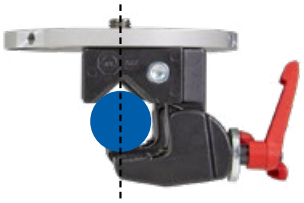
- Very stable quality clamp made of full metal
- Rubberized clamping surfaces to protect the material
- Clamping range on cylinders and surfaces, Ø/thickness: 13 - 55 mm
- Two M8 inner threads
- Clamping lever with latching function, i.e. lever direction can still be aligned even after after tightening
- Insertable insert for flat surfaces (plates, table edges, boards, etc.)
- Incl. two cylinder screws M8x20 mm for attachment to tripod plate 6880 /6880.38



Description	Order-No.	Euro
Uni. Screw clamp M8, with screws and flat piece	**6884**	79,-



Clamping range (diameter or flat material): **13-55 mm**.



Pressure range of the clamp is exactly in the center axis of the instrument tripod.



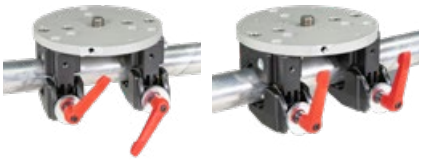
With optional usable flat pressure piece.



Use with instrument tripod Mini

For this purpose, 2 screw clamps are screwed to plate 6880/6880.38 (**s. page 238**):





Clamping levers can still be aligned after tightening.

NOTE	For use with tripod plate 2 pieces are needed.

Alternative application possibilities



With joint arm **s. page 124**



With scanning targets **s. page 2**





Extension: Support arm

For using the mini tripod on vertical walls and surfaces

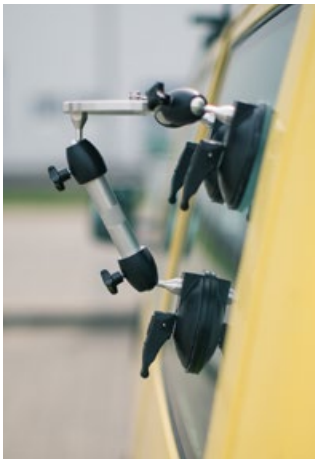
The support arm consists of a additional ball head with attached extension. It is particularly suitable for using the mini tripod vertically, with switchable magnets on steel constructions, or with suction holders on gas-tight surfaces.

- M8 inner thread for screwing to one of the 3 ball heads of the circular plate
- M8 outer thread for fastening the switchable magnet or the suction holder
- Extension (incl. ball head) approx. 160 mm

Description	Order-No.	Euro
Vertical arm, with ball joint for Mini Tripod	**6882**	68,-

INFO | For this application, one of the three ball heads of the Mini Instrument Tripod must be screwed into the circular plate from below instead of from the side.





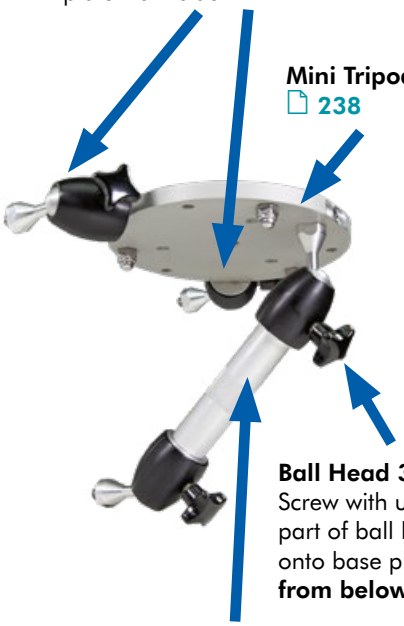




Ball Head 1
With underside firmly screwed on to the base plate from side

Ball Head 2
With underside firmly screwed on to the base plate from side

Mini Tripod Plate
238



Ball Head 3
Screw with upper part of ball head onto base plate **from below**

Extension 6882
Screw cylindrical upper part to the lower part of **ball head 3**

Manual: Instrument Tripod Mini - Vertical

- 6880/6880.38 is delivered with three ball heads. For vertical installation, two ball heads must be screwed in at the sides. The third one from below.
- All connections should be screwed firmly and tight.
- We recommend to test the mini tripod after vertical assembly on its load capacity - first without instrument

Procedure

- Attach the 3 switchable magnets (or suction holders) to the object with the ball head **locking screws loosened**. Make sure that the tripod base plate is approximately horizontal.
- Flip magnetic switch / flip suction holder lever.
- When the magnetic surfaces (suction surfaces) rest flat on the object, **lock all 4 ball heads** with star grip screws

Notes: Switchable magnets



- Full holding power is only guaranteed on solid, magnetic surfaces, such as solid steel plates, tanks, ships, trains, oil rigs, etc.
  The strength of car roof material is usually not sufficient.

Notes: Suction holder



- Full adhesion is only guaranteed on clean, gas-tight surfaces.
- Check suction holders regularly if they have become porous (due to solar radiation). Only use the suction holders if they are in perfect condition.
- Check the vacuum display at regular intervals after mounting (if the red marking of the lever is clearly visible, the vacuum holding force has decreased. Therefore the holder must be reattached.



Tripod-Leg Shoes

- Can be used with all instrument tripods
- Mounting with variable rubber cords
- Centric mounting of the tripod-leg shoe with even distribution of the weight on the tripod foot plates
- Automatic levelling of the tripod-leg shoe when the stand is placed on the floor
- No bending over - the tripod foot plates remain at the tripod during the point of view change
- No cumbersome and time-consuming positioning as when using a tripod star
- The possibility of variable spreading of the tripod remains unchanged





Dual Function

In summer on hot, soft asphalt surfaces
- Even distribution of the instrument weight on the 3 large-surface tripod foot plates
- Minimized sinking in

On smooth surfaces
- 3 slip-resistant hard rubber buffers per tripod-leg shoe
- Uniform distribution of the instrument weight over a total of 9 hard rubber buffers

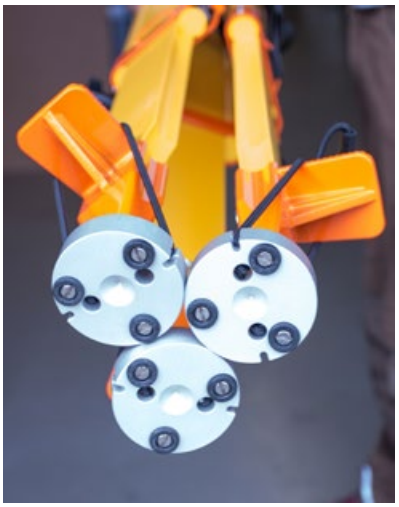
Description	Order-No.	Euro
Tripod-leg shoe with rubber-buffers (1 piece)	**1973**	44,-

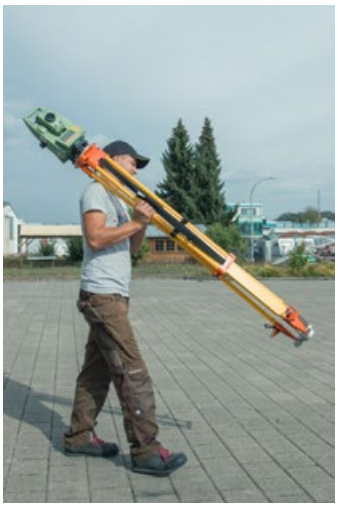
INFO	Despite the 9 rubber buffers, the tripod should not be set up too wide on very smooth floors.













Universal Transport Case
s. page 257



Tripod stand adapter for special floors

The measuring possibilities reach their limits on extremely smooth surfaces if even the rubber buffers on the tripod star (No. 1975) or on the tripod stand plate (No. 1973) do not provide sufficient stability or safety against slipping.

A tripod stand adapter acts as an intermediate element between a standard tripod and 3 suction holders or 3 magnetic holders (see below).

- Can be used with all instrument tripods
- Variable rubber cord attachment
- Secure centering of the tripod foot tip
- Cylinder Ø25 x 32 mm made of anodised aluminium with M8 stainless steel thread
- Knurling as screwing and unscrewing support
- Weight: 50 g









Description	Order-No.	Euro
Tripod stand adapter with M8 thread (1 piece)	**1976**	35,-

The tripod foot adapters can be screwed in easily:



In suction holder

For extremely smooth floors such as waxed or polished industrial floors, glass, stone or plastic surfaces
page 134



In magnet holder

For magnetic surfaces such as ships, rail vehicles, industrial plants, tanks etc.
page 112132



(Design of magnet may differ from image)

Tripod star for Measurements indoors







The tripod star was specially developed for measurements on smooth surfaces or indoors. There it is also suitable for the use of motorized tachymeters and laser scanners, if no special tripod is to be purchased.

- Borehole (1x per leg) for mounting the tripod feet
- Secure the tripod feet with rubber bands. The length of these can be adjusted so all common tripod types can be used
- The single tripod foot lies optimally between 2 hard rubber buffers. This guarantees a shake-free stand and prevents the tripod from slipping
- Foldable for transport
- Side length: 51 cm, therefore diameter of the installation circle: 102 cm
- Weight: 900 g

Description	Order-No.	Euro
Tripod star, with 3 rubber bands and 6 hard rubber buffers	**1975**	106,-







Transport case



Safe protection of the wall stand during transport.
If necessary, space for a spirit level (max. 80 cm) and some ball adapters.
But not for the tribrach.

- Robust hard shell case with nap foam in base and lid
- External dimensions L x W x H: approx. 81 x 23 x 10 cm
- 4 sliding closures
- Weight: 1.8 kg

Description	Order-No.	Euro
Transport case: Wall tripod (fixed height), 81 x 23 x 10 cm	**6890**	96,-



Spirit level



For attaching the fix points to the wall/structure

- LxWxH: 80 x 5 x 2 cm
- aluminium, yellow lacquered
- 3 levels (180°, 90°, 45°), level accuracy 1 mm/m,
- milled bottom side
- weight: 350 g

Description	Order-No.	Euro
Spirit level 80 cm	**6854**	21,-



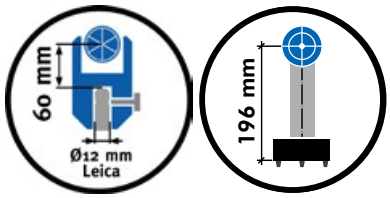


Assembly adhesive



For attaching the perforated plate „fix point“. More information: <?>

Description	Order-No.	Euro
Assembly adhesive, white, 1 cartridge à 290 ml	**1462**	16,50

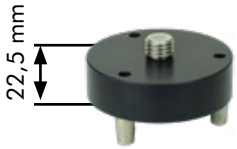


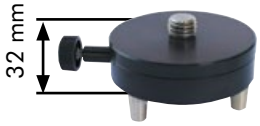


Adapter for Tribrach claw inserts

- To reach target / tilting axis height: 196 mm
- Made of anodized aluminium and stainless steel
- **See also adapter table on the next page**

Description	bottom	top	effective length	Order-No.	Euro
Adapter 5/8"- Leica for tribrach inserts **H = 70 mm**	5/8" inner thread	Leica stud bolt Ø 12 x 40 mm	66 mm	**0366.066**	36,-
Adapter 5/8"- Leica for tribrach inserts **H = 32 mm**			104 mm	**0366.104**	36,-
Adapter 5/8"- Leica for tribrach inserts **H = 22,5 mm**			113,5 mm	**0366.1135**	36,-





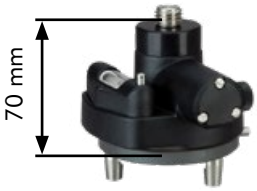


Plate holder to mount tribrachs on desks

For safe mounting of measuring instruments on tables, workbenches etc.



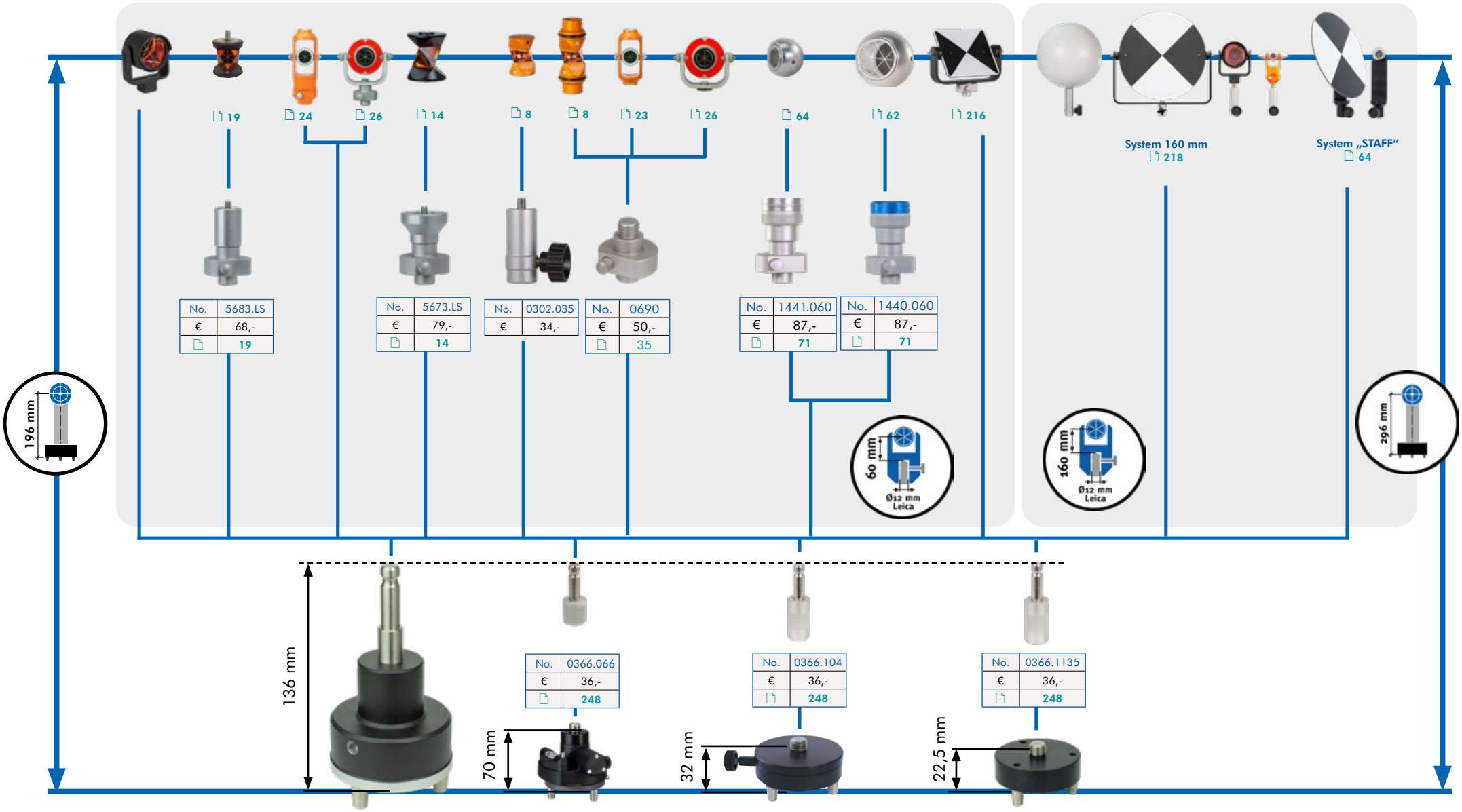
- Cylindrical plate made of anodized Aluminium
- Ø 160 mm, height: 12 mm
- 5/8" outer stainless steel thread for screwing on the tripod
- Brand screw clamp for plates up to 100 mm thickness
- Thigh length of the screw clamp: 50 mm
- Weight: 850 g

Description	Order-No.	Euro
Cylindrical plate with 5/8" outer thread and scew clamp	**3350**	79,-



Tribrach Claw Insert with Leica spigot Ø12 mm (Leica)

To reach a target / tilting axis height of 196 mm or 296 mm



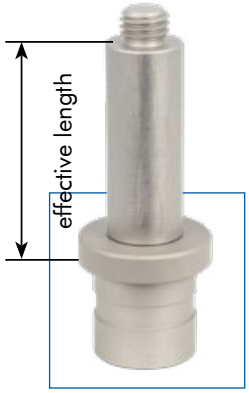


DIN spigots with 10 mm flange

Outer threads: 5/8" made of aluminium, all others of stainless steel

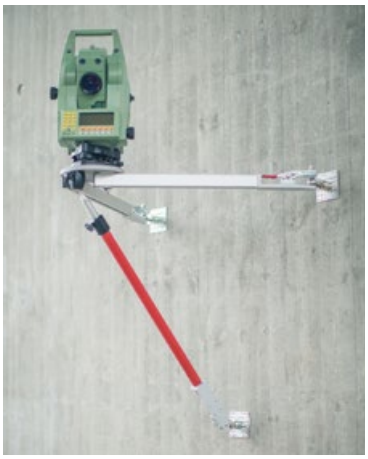
Description	bottom	top	effective length	Order-No.	Euro
DIN spigot Ø 34 mm with flange 10 mm	5/8" inner thread	M8 outer thread	10 mm	**0360**	30,-
		5/8" outer thread	10 mm	**0340**	23,-
		Leica spigot Ø 12 x 40 mm	50 mm	**0367.40**	38,-

INFO | Other top connections are available on request. For example: 1/4“, 3/8“, Leica spigot Ø 12 x 27 mm, etc.



Description	bottom	top	effective length	Order-No.	Euro
DIN spigot Ø 34 mm with flange 10 mm and extension	5/8" inner thread	5/8" outer thread	58 mm	**0305.58**	36,-
			75 mm	**0305.75**	38,-
			108 mm	**0305.108**	42,-
			125 mm	**0305.125**	44,-

INFO | Other lengths are available on request.







Wall tripod for instruments

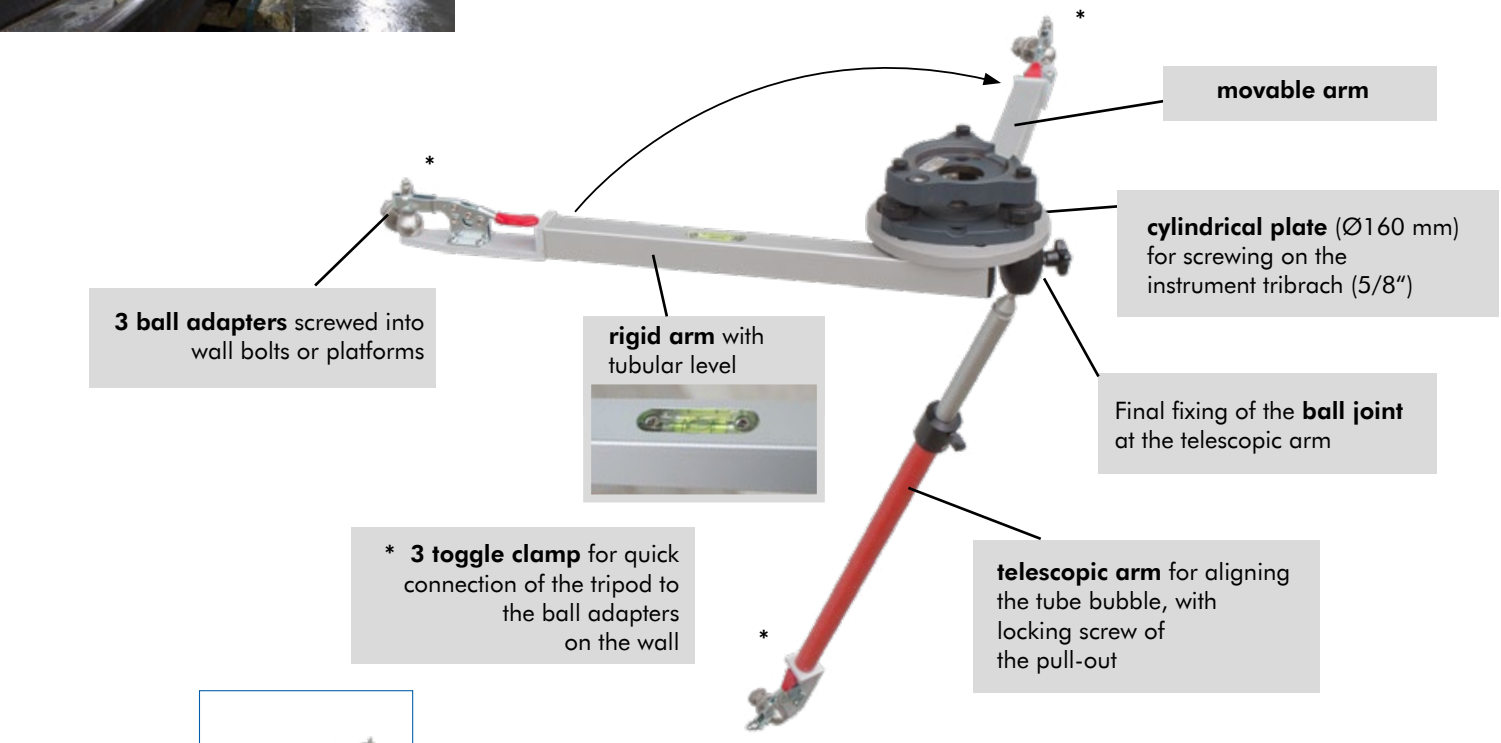
Surveying point on the wall: Fast, accurate, universal, stable, light and compact.
If required, non-destructive mounting without drilling.

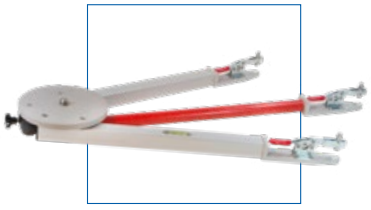
Installation of surveying instruments within seconds without ground contact on walls, buildings, tunnel tubes, other structures.
The tripod ist fastened at 3 points, which are attached in a triangular shape. Two at approximately the same height, the third below in between. When reassembled for repeat measurements, the position of the instrument is identical in tenths of a millimetre. This also applies to the height, if the tubular bubble built into one of the arms is aligned precisely and a height-stable instrument tripod is used.

Setup

Two fixed length arms and a telescopic arm are attached to the cylindrical support plate for the instrument. One of the fixed length arms is rigidly screwed on, the other can be moved via a joint. The arms are fixed to the two upper wall points with quick-releases. The telescopic brace is connected to the lower wall point and supports the tripod. With the telescopic pull-out, a tubular bubble can be aligned, which is embedded in the rigid leg. The height of the wall tripod is therefore always fixed at the same point on the top right of the wall.
To fix the tripod to the object, either wall bolts with M8 internal thread or alternatively platforms with steel cylinders, which also have an M8 internal thread, are attached. While holes have to be drilled in the object for the wall bolts, the platforms can be glued non-destructively.
After screwing ball adapters into the M8 thread, the wall stand can be docked in a matter of seconds using toggle clamps.
The 3-point fixing in connection with the M8 ball adapters enables the use of the tripod not only on walls, but also on buildings, equipment, containers, towers, vehicles, etc.

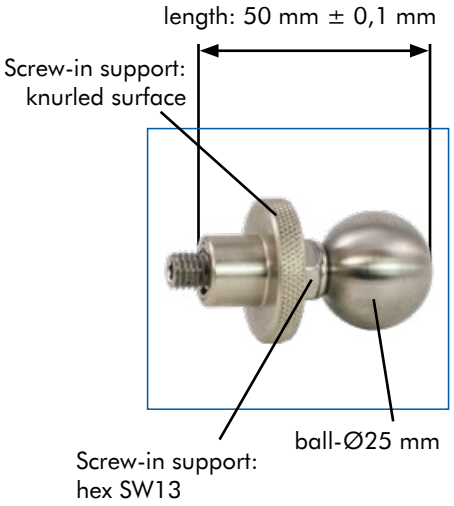
Maximum additional load: 30-35 kg





Description	Order-No.	Euro
Wall tripod WATRIPO (Weight: 2,8 kg)	**6850**	935,-

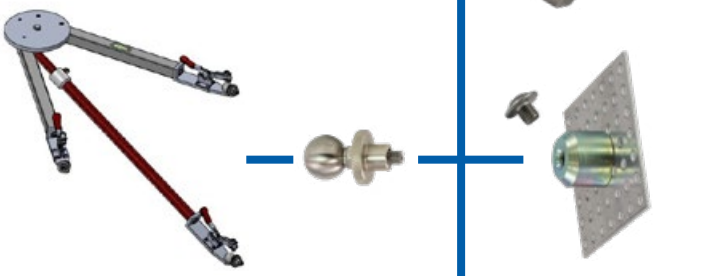
Wall tripod: Accessories



M8 ball adapter

- for connecting the tripod to the object
- uniform length for accurate repeat measurements
- stainless steel
- Weight: 120 g

Description	Order-No.	Euro
M8 ball adapter	**6860**	33,-





M8 wall bolts
necessary bore hole Ø12 mm
91



M8 stainless steel bolts
necessary bore hole Ø14 mm
93



Perforated plate „Fix point“ M8
non-desctructive adhesive
92

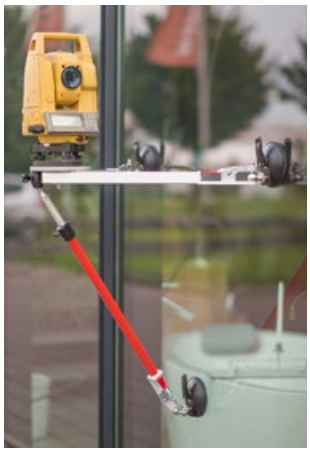


Suction holder
for smooth, gas-tight surfaces
page 134



Switchable magnet
for magnetic surfaces (iron)
page 112132







Mounting of the tripod without drilling bore holes

Fixing of the 3 platforms „fix point“ to the wall

Tip: Mount the upper two points at approximately the same height.





After hardening of the adhesive: Screw in the 3 ball adapters.





Wall tripod docking with 3 quick releases (toggle clamps)





Aligning the tube bubble which is to be found in the right arm





Fixing the ball joint of the telescopic arm

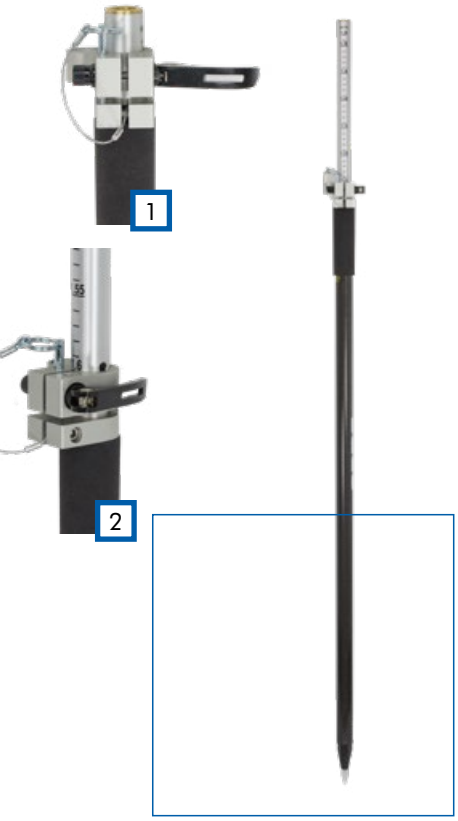




Measurement and subsequent removal of the platforms with a multifunction device







Prism pole with eccentric lever

- Carbon outer shell, Ø 32 mm, Inner pole made of aluminium with cm-scale,
- 5/8“ inside thread , Adjustable 20' circular level
- Soft rubber handle for comfortable handling even in winter
- Optional: Stainless steel latching pins for particularly secure fixing of the tilting axes or antenna height at 20 cm intervals from 1.60 m. The locking pin is secured with a steel cord and can be stored in the clamping element when not in use
- Exchangeable tip with 5/8" inside thread
- Length of pole:
  - without prism / adapter: 1,18 – 2,05 m,
  - with adapter & prism (to prism center): 1,33 – 2,20 m (= scale)
- Weight (without adapter / prism): 1,1 kg

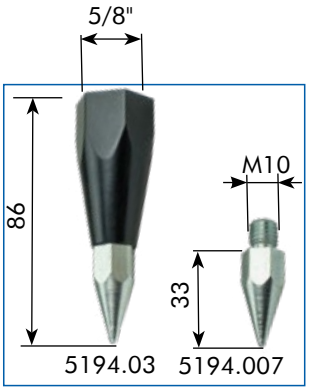
Special Feature

The inner rod is not clamped with a screw clamp (as with other prism rods), but with an eccentric lever (Figs. 1 and 2).

- High clamping forces can be generated with smooth operation
- The clamping force can be adjusted with an adjusting ring
- The risk of unintentional „sinking in“ of the inner tube, which may well occur with regular screw clamping, is reduced

Description	Order-No.	Euro
Prism pole S_10 with eccentric lever, 1,33 – 2,20 m	**5612**	395,-

INFO	An adapter and a prism with an effective height of 150 mm up to the prism centre must be screwed into the 5/8“ internal thread. Then the scale on the inner tube indicates the correct target height.



Wear and spare parts

Description	Order-No.	Euro
Tip for prism pole, complete	**5194.03**	16,-
Tip for prism pole, only steel base part	**5194.007**	5,-

Adapter for Prism Pole

- The scaling on the inner pole is matched to the adapters.
- **150 mm** from upper edge of prism pole to prism/target centre





For prisms with: 5/8" inside thread and 50 mm tilting axis heights

z.B. our prism series HIP

Description	Order-No.	Euro
Extension 2 x 5/8" outside thread, effective length 100 mm	**0297.100**	30,-





For prisms with: 5/8" inside thread and 100 mm tilting axis heights

Works with prism KTR1 (for example)

Description	Order-No.	Euro
Extension 2 x 5/8" outside thread, effective length 50 mm	**0297.050**	28,-

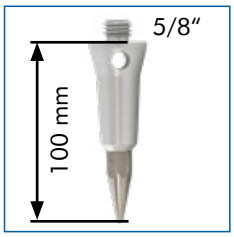




For prisms with: Leica socket Ø 12 mm

For Leica prisms with distance of 60 mm from top edge of bolt to centre of the prism.

Description	Order-No.	Euro
Extension with Leica spigot Ø 12 x 40 mm, stainless steel	**0378.90**	30,-



Tip for prism/GNSS pole

- Ø32 x 100 mm, Aluminium with exchangeable V2A-tip, Weight: 100 g

Description	Order-No.	Euro
Prism pole tip, 5/8“, Ø32 x 100 mm	**5502**	37,-

Protective sleeve for poles with Ø32 mm

Modern materials like GFRP and CFRP enable the production of lightweight yet rigid prism and GNSS poles. However, their thin walls make them sensitive to point pressure.

Accessories such as controller mounts or tripods should therefore be attached using clamps that conform to the pole’s shape. Alternatively, a protective sleeve can be used to distribute point pressure, making it ideal for heavy or high-leverage accessories.



- Sleeve inner Ø 32 mm, outer Ø 35 mm, Anodised aluminium, Length 60 mm, Weight: 24 g
- Can be used on already damaged pole

Description	Order-No.	Euro
Protective sleeve for Ø32 mm poles, length 60 mm	**5610.B**	20,-









Compass with Velcro fastener

- Very fast alignment to „North“
- Velcro fastener with redirection for reliable and quick attachment to the pole
- Weight: 20 g, Compass-Ø: 20 mm

Description	Order-No.	Euro
Compass with Velcro fastener, for poles **Ø 18 - 32 mm**	**5475**	18,-
Compass with Velcro fastener, for poles **Ø 40 mm**	**5476**	21,-
Compass (single) as spare part, with adhesive foil	**5475.E**	1,50

Simple circular level with Velcro fastener

- For attachment to all poles up to Ø 35 mm with Velcro fastener
- Plastic level with sensitivity 50' (not adjustable)
- Weight: 25 g

Description	Order-No.	Euro
Circular level with Velcro fastener	**5425**	21,-





Compass in Aluminium-Holder

- Robust aluminium construction
- For mounting on all prism/GNSS antenna poles with **Ø 32 mm** (1 1/4")
- Simple screwing/height adjustment of the compass holder with Allen key (5 mm)

Description	Order-No.	Euro
Holder with compass for poles with Ø 32 mm	**3008.K**	38,-
Compass (single) as spare part, with adhesive foil	**5475.E**	1,50







Replacing a defective compass (single):



Adjustable circular level in Aluminium-Holder

- Sturdy aluminium construction
- For mounting on all prism/GNSS antenna poles with Ø 32 mm (1 1/4")
- Easy screwing/height adjustment of the holder with Allen key (5 mm)
- Level adjustment with 2,5 mm-hex wrench
- Glass level in aluminium frame
- Level sensitivity: 10' or 30'



Description	Order-No.	Euro
Holder with circular level 10', for poles with Ø 32 mm	**3008.10**	61,-
Holder with circular level 30', for poles with Ø 32 mm	**3008.30**	59,-



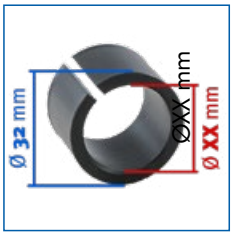
Second Level

If only one circular level is used on the pole, its adjustment should be checked daily. To increase the reliability of the measurement, we therefore recommend the use of a second level for high accuracy applications. It is screwed to the pole independently of the 1st level. After careful adjustment of both vials, the correct vertical position of the pole is ensured, if both levels are being used simultaneously. The two levels virtually controll each other.

Only when the levels no longer correspond, an adjustment is obligatory.

Reduction Sleeve





For other poles with **Ø 20 to 32 mm we offer a reduction sleeve made of plastic**. It ensures a firm fit of the compass holder and protects the pole surface.

Description	Order-No.	Euro
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø20 mm (POM)	**3008.3220**	11,-
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø23 mm (POM)	**3008.3223**	11,-
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø25 mm (POM)	**3008.3225**	11,-
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø26 mm (POM)	**3008.3226**	11,-
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø27 mm (POM)	**3008.3227**	11,-
Pole-Ø reduction sleeve (Ø32 mm): For poles Ø30 mm (PLA)	**3008.3230**	7,-

INFO	Other diameters available on request.

Transport Case / Bags

Bag



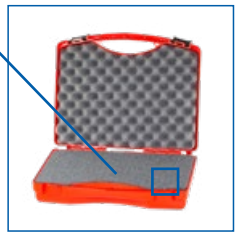


Ideal for carrying mini-vectors or HIP prisms on the belt for quick access

- Bag made of durable black fabric Ø80 x 250 mm
- Cord with stopper to close the bag
- Various tabs for attaching the bag to the belt, etc.

Description	Order-No.	Euro
Transportation bag Ø80 x 250 mm	**6645**	26,-





Case with grid foam 10 x 10 mm for individual cutting out



Foam in the bottom part with pre-cut grid foam. 10 x 10 mm grid parts can be quickly and easily cut out for individual use.

- Same features as universal case above
- **Lid**: bubble foam (already glued in)
- **Bottom**: grid foam (to be cut out by yourself as required)

Description	Order-No.	Euro
Transport case Universal with 1 x 1 cm grid foam	**1468.R**	48,-



Paint outlines of the accessories on grid foam, taking into account the slighlty pre-cut 1 cm squares.



If possible, always leave 2 grids (20 mm) free between compartments to ensure sufficient stability.



Cut out grid foam using cutter / parcel knife. Tip: Use a sharp knife. Do not „tear" but cut.



Insert foam in the bottom of the case and glue into case with craft glue or double-sided tape (carpet tape).



Transport Cases

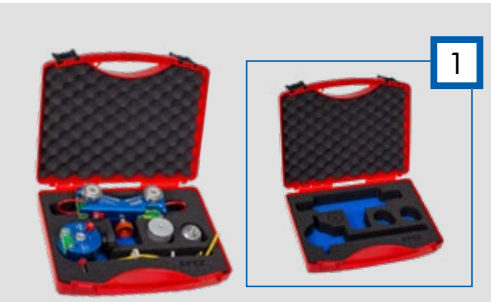
Outer dimensions (plastic): Approx. 275 x 230 x 80 mm, Weight: 450 g, 2 Click fasteners

Universal Case with bubble foam inlay

Description	Bubble Foam	Order-No.	Euro
Universal Transport Case	**medium (30 mm)**	**1468.2**	34,-

Special case with watercut inlay

Description	Bild	Order-No.	Euro
Transport case for APEX accessories	**1**	**1468.09**	54,-
Transport case for CONE/HEMI-Adapter or HIP-Prism	**2**	**1468.10**	54,-
Transport case for BOAXE accessories	**3**	**1468.11**	54,-
Transport Case for Nail Holder HIT	**4**	**1468.20**	54,-
Transport Case for Klimax	**5**	**1468.7**	46,-
Transport case for PtW	**6**	**1468.19**	54,-
Transport Case Tripod Feet	**7**	**1468.18**	54,-
Transport Case Rail Tool HUG	**8**	**1468.12**	54,-
Transport Case Triangle Tripod	**9**	**1468.13**	54,-
Transport Case Rail Tool SWPro	**10**	**1468.17**	54,-
Transport Case Manual Prism Holder	**11**	**1468.16**	54,-



HEMI90, HEMI110, CONE Adapter, Bolt stud adapter, other Accessories



Examples



1x **HIP Leica-Prism**
Cone adapter
Ball prism
More accessories



HEMI-Adapter
Cone adapter
Ball prism
More accessories



Bo 360° Prism
PLA-Leica-Adapter
Ball prism
More accessories





















Thread connection Adapters



Made of stainless steel with cross knurl

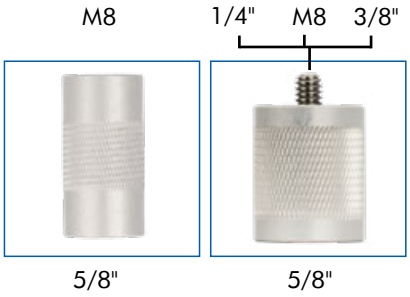
Description	1. side	2. side	Effective length	Order-No.	Euro
Short adapter, stainless steel	5/8" outer	M8 inner	7 mm	**0385.007**	18,-
		M8 outer		**0384.007**	18,-
		1/4" outer		**0392.007**	21,-





Made of aluminium with stainless steel external thread

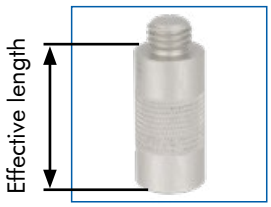
Description	bottom	top	Effective length	Order-No.	Euro
Adapter M8 - M8	M8 inner	M8 inner	50 mm	**0372.050**	24,-
		M8 outer	50 mm	**0373.050**	25,-
	M8 outer	M8 outer	50 mm	**0374.050**	26,-
		M8 outer	15 mm	**0374.015**	19,-
		M8 outer	5 mm	**0374.005**	14,-



Made of aluminium with stainless steel external thread

Description	bottom	top	Effective length	Order-No.	Euro
Extensions Ø 25 mm, 5/8" thread	5/8" inner	M8 outer	40 mm	**0381.040**	26,-
		M8 inner	40 mm	**0383.040**	24,-
		1/4" outer	30 mm	**0390**	23,-
		3/8" outer	30 mm	**0382**	26,-

5/8" Extensions



Made of aluminium

Description	bottom	top	Effective length	Order-No.	Euro
Extension Ø 25 mm, 5/8" thread	5/8" inner	5/8" outer	30 mm	**0300.030**	26,-
			40 mm	**0300.040**	26,-
			50 mm	**0300.050**	27,-
			64 mm	**0300.064**	27,-
			65 mm	**0300.065**	28,-
			75 mm	**0300.075**	28,-
			86 mm	**0300.086**	29,-
			86,5 mm	**0300.0865**	29,-
			100 mm	**0300.100**	30,-
			114 mm	**0300.114**	30,-
			115 mm	**0300.115**	30,-
			136 mm	**0300.136**	31,-
			150 mm	**0300.150**	31,-
			175 mm	**0300.175**	32,-
			200 mm	**0300.200**	32,-

Other lengths are available as special designs under the number 0300.L (**s. page 262**).







Adapter: Thread connection to Leica spigot

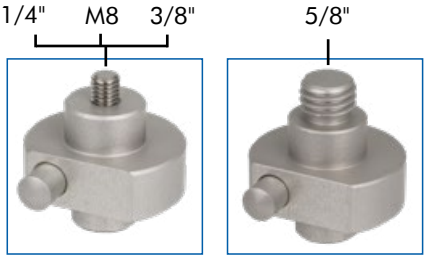
- Stainless steel design

Description	bottom	top	Effective length	Order-No.	Euro
Adapter M8 - Leica	M8 inner	Leica spigot Ø 12 x 27 mm	27 mm	**0180.25**	13,-
		Leica spigot Ø 12 x 40 mm	40 mm	**0180.30**	15,-

Description	bottom	top	Effective length	Order-No.	Euro
Adapter 5/8" - Leica	5/8" inner	Leica spigot Ø 12 x 27 mm	47 mm	**0377.27**	30,-
		Leica spigot Ø 12 x 40 mm	60 mm	**0377.40**	33,-
	5/8" outer	Leica spigot Ø 12 x 27 mm	40 mm	**0378.27**	30,-
		Leica spigot Ø 12 x 40 mm	60 mm	**0378.40**	33,-

Adapter: Leica mount to thread connection

- With push button for one-hand operation
- Made of anodised aluminium



Description	bottom	top	Effective length	Order-No.	Euro
Adapter, Leica - Threads	Leica socket Ø 12 x 26 mm	M8 outer	10 mm	**0680**	50,-
		1/4" outer	10 mm	**0692**	50,-
		3/8" outer	10 mm	**0693**	50,-
		5/8" outer	10 mm	**0690**	50,-

- With horizontal locking screw
- No. **0291.10** can be used for all Leica spigot sØ 12 mm, for No. **0306.10** the spigot has to be 40 mm long
- Made of anodised aluminium

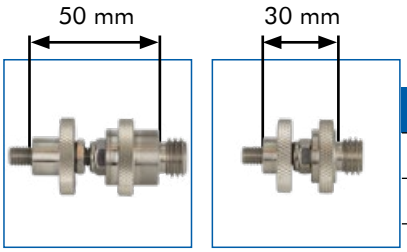


Description	bottom	top	Effective length	Order-No.	Euro
Adapter Leica - Thread	Leica socket Ø 12 x 26 mm	M8 outer	10 mm	**0302.10**	29,-
	Leica socket Ø 12 x 26 mm	5/8" outer	10 mm	**0291.10**	29,-
	Leica socket Ø 12 x 40 mm		10 mm	**0306.10**	30,-

Adapter: Rotateable

- One common axis -> independently rotatable around this axis
- Rotation resistance can be adjusted with self-locking hexagon nut (SW 13)
- Large knurls for safe insertion without tools
- Stainless steel design

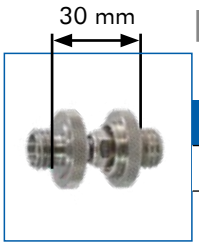
M8 / 5/8“



- Screwing-in can be supported with a fork wrench (SW 13)

Adapter WA, M8 - 5/8“ - turnable	⚖	№	€
WA50, L = 50 mm	145 g	**0810**	43,-
WA30, L = 30 mm	100 g	**0820**	43,-

5/8“ / 5/8“ - Length 30 mm



Adapter, 5/8“ - 5/8“ - turnable	⚖	№	€
Stainless steel, L = 30 mm	105 g	**0824**	47,-

Quick Change Adapter M8

- Precision-machined stainless steel hex bolt <-> aluminum bolt receiver with push-button quick-release function
- M8 external thread on top, M8 internal thread on bottom



Description	Order-No.	Euro
Adapter: 5/8“ Hex quick-release adapter **Kombo**	**3412**	66,-
Bolt intake adapter, M8 quick-change adapter	**3412.A**	54,-
Hex bolt, M8, for quick-change adapter	**3412.B**	12,-
Round bolt, M8, for quick-change adapter	**3412.R**	12,-

Quick Change Adapter 5/8“

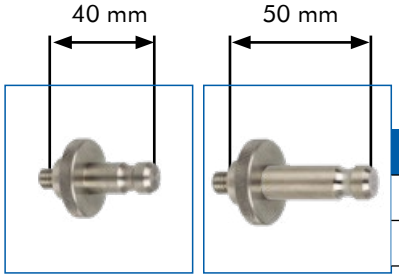
- Precisely manufactured hexagonal stainless steel bolt <-> aluminum bolt mount with push button for quick-release function
- 5/8“ external thread on top, 5/8“ internal thread on bottom



Description	Order-No.	Euro
Adapter: 5/8“ hex quick adapter **combo**	**3410**	68,-
Bolt mount quick-change adapter	**3410.A**	48,-
Bolt for quick-change adapter	**3410.B**	24,-

Adapter: M8 – Leica Ø 12 mm

- Side 1: M8 outer thread to screw in common wall bolts
- Side 2: Leica Ø12 mm spigot to put on any prism with Leica connection
- Knurl Ø 30 mm for easy screwing into wall bolts (without tools)
- Spigot Ø 12 x 27 mm, total length (without M8 thread): 40 mm
- Stainless steel design



Adapter WA Leica, M8 – Leica Ø 12	⚖	№	€
M8 – Leica Ø 12 x **27 mm (Standard), Total length: 40 mm**	70 g	**0830**	18,-
M8 – Leica Ø 12 x 40 mm - total length: 50 mm	72 g	**0831**	20,-

Custom Length Aluminium extensions

up to 100 or 200 mm length (see below)

NOTE	When ordering please state Order-No. + effective length in mm

- Made of aluminium Ø 25 mm
- Leica spigot made of stainless steel
- Leica socket with horizontal locking screw



Example: 0377.L

1. Side	2. Side	max. Length	Order-No.	Euro
5/8" inner thread	5/8" inner thread	200	**0295.L**	34,-
5/8" inner thread	5/8" outer thread	200	**0300.L**	36,-
5/8" inner thread	Leica-27-mm bolt	100	**0377.L**	41,-
5/8" inner thread	Leica-40-mm bolt	100	**0366.L**	39,-
5/8" inner thread	1/4" outer thread	100	**0365.L**	35 ,-
5/8" inner thread	1/4" inner thread	100	**0390.L**	33,-
5/8" inner thread	M8 inner thread	200	**0383.L**	33,-
5/8" inner thread	M8 outer thread	200	**0381.L**	35,-
5/8" inner thread	3/8" outer thread	200	**0382.L**	35,-



Example: 0300.L

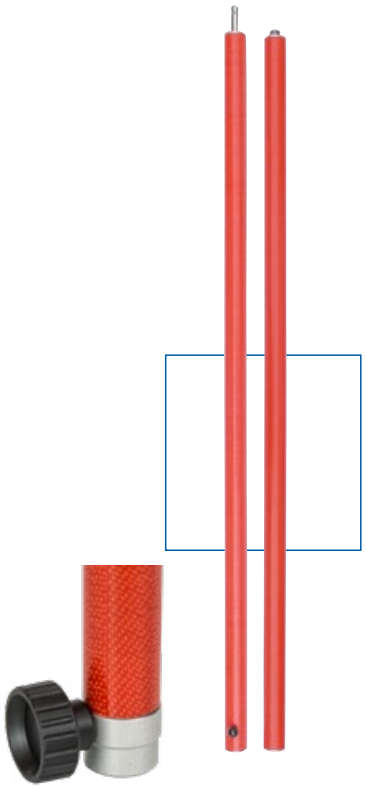
5/8" outer thread	1/4" outer thread	100	**0392.L**	37,-
5/8" outer thread	5/8" outer thread	200	**0297.L**	39,-
5/8" outer thread	Leica-27-mm bolt	100	**0376.L**	42,-
5/8" outer thread	Leica-40-mm bolt	100	**0378.L**	43,-
5/8" outer thread	M8 inner thread	200	**0385.L**	35,-
5/8" outer thread	M8 outer thread	200	**0384.L**	37,-

Leica socket 27	5/8" inner thread	100	**0290.L**	47,-
Leica socket 27	5/8" outer thread	100	**0291.L**	49,-
Leica socket 27	Leica-27-mm bolt	100	**0304.L**	53,-
Leica socket 27	M8 outer thread	100	**0302.L**	43,-
Leica socket 27	1/4" outer thread	100	**0405.L**	44,-
Leica socket 40	5/8" outer thread	100	**0306.L**	49,-



Example: 0291.L

M8 inner thread	M8 inner thread	200	**0372.L**	32,-
M8 inner thread	M8 outer thread	200	**0373.L**	34,-
M8 outer thread	M8 outer thread	200	**0374.L**	36,-
M8 outer thread	3/8" inner thread	100	**0344.L**	38,-
M8 outer thread	1/4" outer thread	100	**0403.L**	38,-
M8 inner thread	1/4" outer thread	100	**0402.L**	38,-
M8 outer thread	Leica-27-mm bolt	100	**0404.L**	40,-
3/8" inner thread	3/8" outer thread	100	**0288.L**	39,-
other adapters		-	**0298.L**	at cost



Extensions 0,5 m and 1 m

Made of GFK/CFK. Very light and durable.

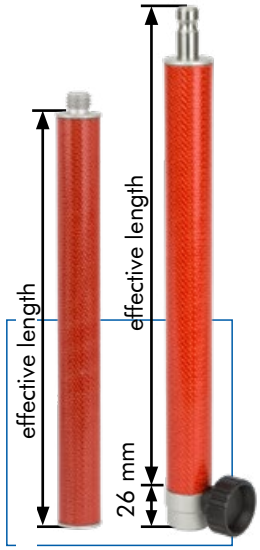
NOTE	The longer the material, the less straightness is guaranteed. The extensions are therefore not suitable for measuring in the sub-milimeter range.

5/8" Extensions						
Ø	bottom	top	length	weight	Order-No.	Euro
32 mm	5/8" inside thread	5/8" outside thread	0,5 m	350 g	**5455.2**	90,-
			1,0 m	379 g	**5455**	115,-

Leica Extensions						
Ø	bottom	top	length	weight	Order-No.	Euro
32 mm	Leica socket	Leica spigot, 40 mm	0,5 m	370 g	**5455.2L**	126,-
			1,0 m	400 g	**5455.L**	141,-

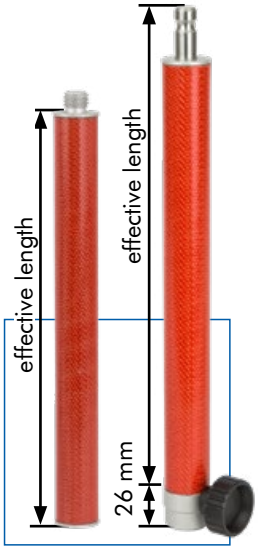
Extensions GFK/CFK - Custom Length

NOTE	When ordering please state Order-No. + effective length in mm



Ø32 mm - 200 - 1000 mm Length

Description	bottom	top	Order-No.	Euro
Extension Ø 32 mm	5/8" inner-thread	5/8" inner thread	**5456.L**	118,-
		5/8" outer thread	**5457.L**	121,-
		Leica spigot Ø 12 x 27 mm	**5458.L**	126,-
	5/8" outer-thread	5/8" outer thread	**5459.L**	124,-
		Leica spigot Ø 12 x 27 mm	**5461.L**	129,-
	Leica socket Ø 12 x 26 mm	5/8" inner thread	**5462.L**	139,-
		5/8" outer thread	**5463.L**	142,-
		Leica spigot Ø 12 x 27 mm	**5464.L**	147,-
	M8 inner thread	M8 inner thread	**5468.L**	108,-
	Connection of Choice A	Connection of Choice B	**5466.L**	145,-

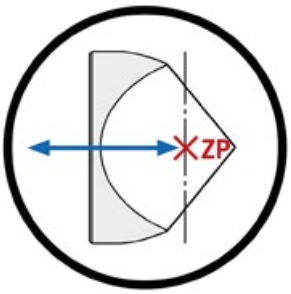


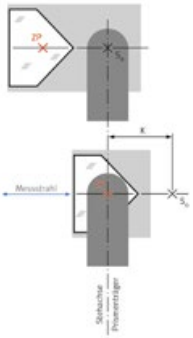
Ø26 mm - 200 - 500 mm Length

Description	bottom	top	Order-No.	Euro
Extension Ø 26 mm	5/8" inner-thread	5/8" inner thread	**5630.L**	86,-
		5/8" outer thread	**5631.L**	89,-
		Leica spigot Ø 12 x 27 mm	**5632.L**	95,-
	5/8" outer-thread	5/8" outer thread	**5633.L**	89,-
		Leica spigot Ø 12 x 27 mm	**5634.L**	98,-
	Leica socket Ø 12 x 26 mm	5/8" inner thread	**5635.L**	112,-
		5/8" outer thread	**5636.L**	116,-
		Leica spigot Ø 12 x 27 mm	**5637.L**	121,-
	M8 inner thread	M8 inner thread	**5650.L**	86,-

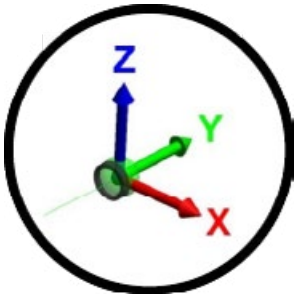
Appendix 1/1

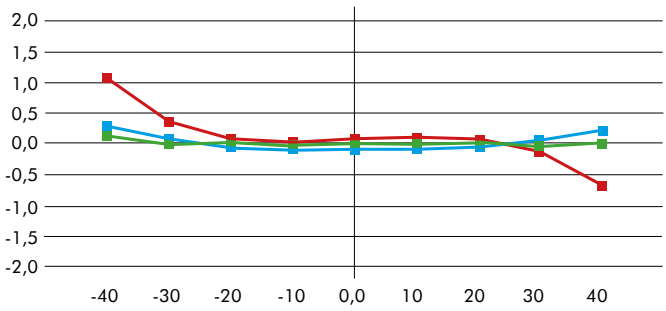
I.1. Info: Prism contents 267



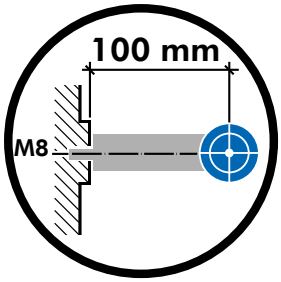


I.2. Info: Alignment of prism towards total station 269

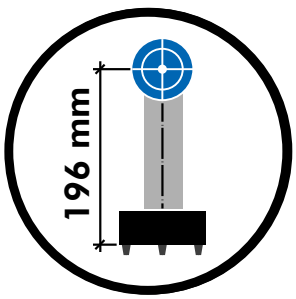




I.3. Info: System 100 mm Wall Offset 270



I.4. Info: Leica Tiltring axis height and stud connection 272







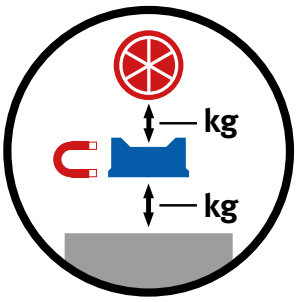
Appendix 2/2

I.5. Info: Magnetic holding force 274

I.6. Info: Two prism / Vector method 275

I.7. Order Form 276

I.8. Terms of sale, delivery and payment 277







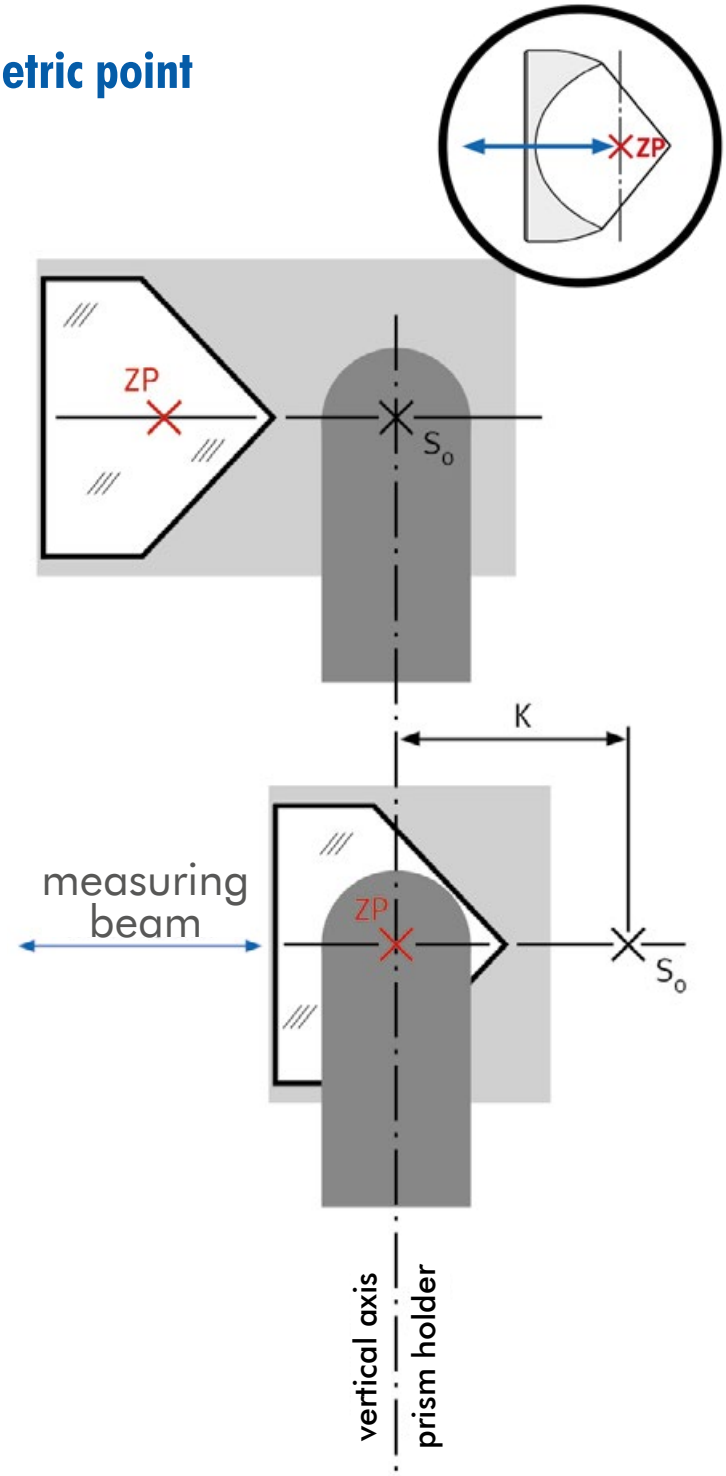




Prism constant and central symmetric point

In the current tachymeter generation, 2 definitions of the prism constants (offset) have to be distinguished.

The manufacturers **Nikon, Pentax, Sokkia, Spectra Precision, Topcon, Trimble** (in the past Geodimeter, Zeiss) and more now define the prism constant without exception as an „improvment", i.e. as correct-sign correction of the measured distance based on the physical and design properties of the measured prism or reflector. With the triple prism, these are the type and length of the glass body and the mechanical mounting of the prism on the carrier / holder. The size of the prism constants results from the distance between the vertical axis of the prism holder and the (theoretical) reversal point $\mathbf{S}_0$ of the measuring beam. If the standing axis is realized exactly in this point $\mathbf{S}_0$ (e.g. this was the case for early Geodimeter prisms - see upper drawing) the prism constant is = 0. With commercially available prisms (except some prism rings), the vertical axis is always in front of the reversal point $\mathbf{S}_0$. A distance is therefore measured too long and the improvement (= prism constant **K**) is therefore negativ. If the vertical axis runs through the visible center of the prism as shown in the drawing below, also known as **central symmetric point ZP**, this is the most error-theoretically favourable mounting of the reflector. A prism that is inaccurately aligned with the tachymeter then has the least effect on the angle and distance measurement.



The range of constants of glass prisms varies from -11.3 mm to -35 mm, depending on the length of the glass.

Only the company **Leica** has another definition of the prism constant. It refers the specification of the prism constant to its standard round prism (GPH1 + GPR1). According to the above calculation, this has a true prism constant (improvement) of -34.4 mm. Leica defines this prism in its system with a constant of 0.0 mm.

Therefore, the constants of Leica prisms and non- Leica prisms must be converted into the other system as follows when used in conjunction with each other:

If a non-Leica prism, where the true prism constant is given, is to be used with a Leica total station, 34.4 mm must be added. Example of a non-Leica prism with a true constant of K = -30 mm:
-30.0 mm +34.4 mm = **+4.4 mm**. This must be set on the Leica total station.

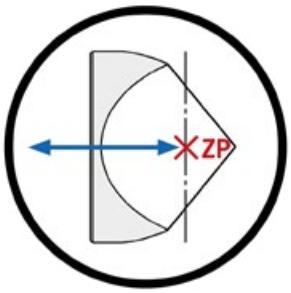
However, if a Leica prism, where the prism constant is specified in the Leica system, is to be used with a non-Leica total station, 34.4 mm has to be subtracted.

Example for the Leica 360°-Prism GRZ122 with the Leica constant of +23.1 mm:
+23.1 mm - 34.4 mm = **-11.3 mm**. This must be set on the non-Leica total station (rounded if necessary).

The following table (next page) takes the above facts into account and shows the constants of the most commonly used prisms and reflectors for the non-Leica systems and the Leica system. With modern total stations, the individual constants can be entered directly as values and called up via hotkeys.
Each measured distance is thus automatically corrected.

If it is to be avoided that the setting of the constants on the total station must be changed during a prism change, standard prisms or prisms from other manufacturers with identical constants must be used.

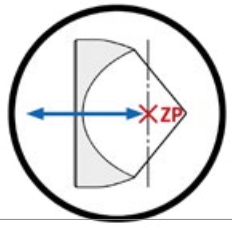
Standard prisms and small prisms with adapted prism constant



The purchase of a tachymeter usually involves the purchase of a standard prism. Small prisms or 360° prisms from the same manufacturer have constants that differ from this standard prism and therefore it is necessary to change the set prism constants on the total station. If you forget to change the setting (often only by pressing a key), the measurement result will be significantly falsified. This source of error can only be eliminated if the prisms used have a constant adapted to the standard prisms.
For this reason, we have developed small prisms with identical prism constants for all important standard prisms of the large manufacturers. By using high-quality glass material in combination with high grinding accuracy, these prisms are completely adequately dimensioned for today's high-performance tachymeters. In addition, they have been designed to be optimized in terms of error theory.

All prisms available by us (with prism constant) are listed in the table below.

Prism-/Reflector Type Standard	prism constant K in mm		● ○ available **by Bohnenstingl** Prisms and Reflectors											
	physic. constant, used by all manufacturers except LEICA	constant as defined by LEICA	Prism Series HIP	Prism and reflec. foils on L-carrier	Prism Series ONRT	„Rundum"-Prism 6x60°	360°-Prism Medium Format	Precision Prism 17.5	PP 17,5 for concrete bevels	Ball prism Ø 30 mm and 1.5"	Prism on L-holder with magn. base	Ball prism, indust. 3D-Measurments	Ball prism, Ground points	Monitoring Prism Series MoniPro	Cylindrical prism ZP11
Trimble Multi Track Prism MT1000	**+10**	+44,4													
Trimble 360°-Prism (passiv)	**+2**	+36,4													
Reflective foil, Prisms by Nikon, Sokkia, Topcon etc., Leica CPR 105	**0**	+34,4	●	●	○			○	○						
Topcon 360°-Prism A7	**-2**	+32,4													
Trimble 360°-Prism for Zeiss S10	**-3**	+31,4													
Leica 360° Mini GRZ101	**-4,4**	+30													
360°-Prism Medium Format	**-6**	+28,4					○								
Leica MPR122 360°-Prism	**-6,3**	+28,1													
TOPCON/Sokkia 360°-Prism ATP1/ATP1 S	**-7**	+27,4													
Leica 360°-Prism GRZ4, GRZ121, GRZ122	**-11,3**	+23,1	●	●	○	●				●	●	●	●		●
Leica Mini GMP101, GMP 111	**-16,9**	+17,5	●	●	●					●	●	●	●	●	
Prisms by Nikon, Sokkia, Topcon etc.	**-30**	+4,4	●	●	○						●				
Leica Standard prism GPH1P, GPR121, GPR1, GPH1	**-34,4**	0	●	●	○						●				
Trimble (Zeiss ETR, KTR, KTO, KTM)	**-35**	-0,6	●	●	○						●				



• = Mounting of the prism/reflector at the centrally symmetrical point (visible center). A prism that is not aligned accurately with the total station has the minimum effect on angle and distance measurements. This is of great advantage if only the prism center is available as a target for measurements or if automatic target determination is carried out on it.
With these prisms precision measurements can be performed.

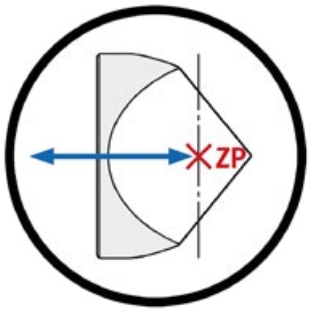
0 = No mounting of the prism/reflector in the centrally symmetrical point (visible center)



Leica GRZ4 Leica GRZ122



Leica GRZ122



The prism constant K = -11.3 (Leica = +23.1) mm for all surveying tasks

Modern tachymeters with automatic target setting or target tracking require an all-round or 360° prism as reflector. It represents a continuous reflection even with a moving target. The 3 large 360° reflectors of Leica, **GRZ4, GRZ121 and GRZ122**, have a true prism constant of K = -11.3 (according to Leica definition = +23.1) mm. They are for Terrain surveys and profile measurements in one-man measuring mode very suitable and therefore often present in the measuring equipment. Disadvantages of these prisms are size, high weight and price, the limited accuracy of the automatic Target acquisition. Due to the design of the individual prisms of all 360° prisms on the market the visible center "wanders out of the standing axis" depending on the rotation of the prism pole.

That is why we have developed a series of small prisms that are matched uniformly to the large 360° prisms from Leica mentioned above. Since the **central symmetrical point** of these prisms lies exactly in the vertical axis of the holder, they are also suitable for precision measurements.

Thus, the requirement to perform all surveying tasks with one prism constant can be met with the constant K = -11.3 (Leica definition = +23.1) mm with the following prism family:

- Single tiltable prism HIP
- Single tiltable prism TOP/ONRT
- Single tiltable prism on L-carrier
- Ball prism
  - Monitoring-System
  - Industrial 3D Measurements
  - Surveying of wall and ground points
- Universal prism pole (sewer measuring pole) System Vektor
- Mini-Vektor for precision measurements
- RUNDUM-Prism 6x60°
- Twin-Systems
- Cylidner prism ZP11

Only for measurements on reflective foil and of points on facades a second prism with prism constant K = 0 mm (Leica definition = +34.4 mm) is still required.



HIP Prism



ONRT Prism



L-Bar Prism



Monitoring Systems



Industr. 3D-Measurements



Wall and ground points



Mini-Vektor



Twin-Systems

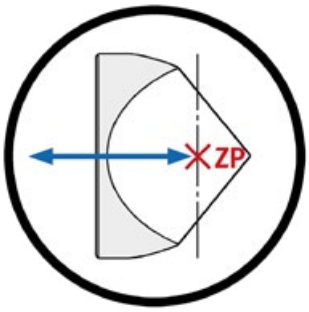


Sewer Surveying System



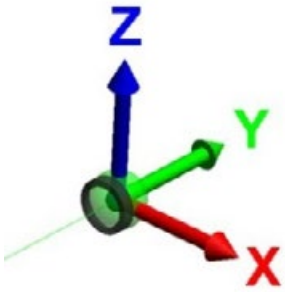
Cylinder Prism ZP11

Error when aligning prism towards total station

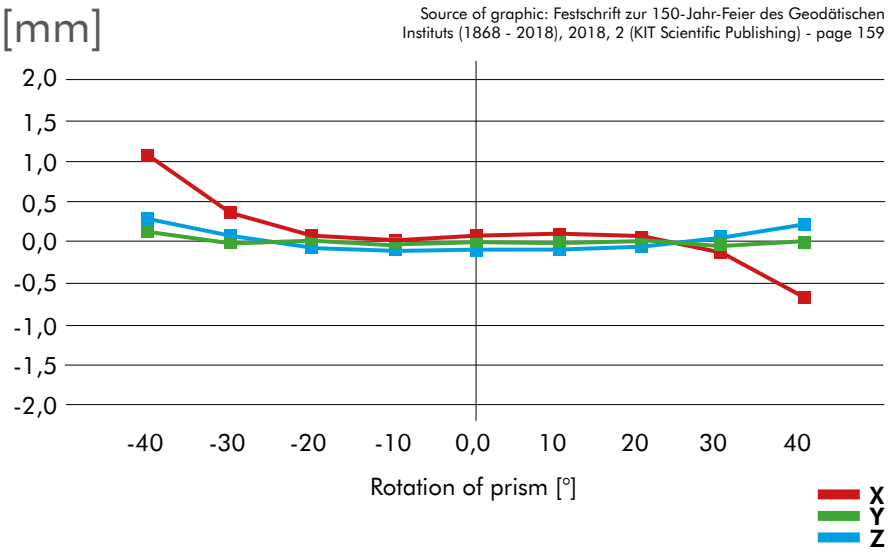


If the prism is not exactly aligned to the tachymeter, errors occur in the angle and distance measurement. These errors are lowest if the vertical axis of a prism carrier runs through the central symmetrical point of the prism, or if the centre of the sphere and the central symmetrical point of the prism are identical in the case of a prism built into a sphere.
This is the case with all our ball prisms. The Institute of Technology Karlsruhe has used a laser tracker to analyze the effects of a ball prism that is not exactly aligned with the instrument (ball Ø 38.1 mm, triple prism Ø 25 mm). It was placed in a base (nest) and precisely aligned with the laser tracker. The ball was then rotated around the zenith axis (Z axis). The following diagram shows the deviations depending on the degree of rotation.
The coordinate system of the positions has its origin in the absolute center of the sphere, the X-axis points from the tracker to the right, the Y-axis to the target direction, the Z-axis to the top.

Prism "zero-point" when rotating the prism around Z-axis (horizontal) [mm]

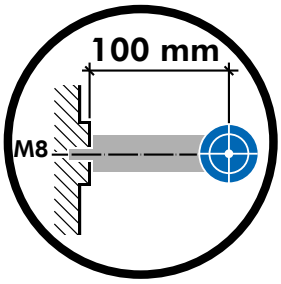


Reference system



The Y-value shows the effect of the rotation on the **distance measurement**. It is marginal even with a misalignment of up to 40° and remains below 0.1 mm.
For the **angle measurement**, however, this only applies to a rotation of up to 20°. With a larger rotation, the ball centre "wanders" disproportionately strongly. In the case of an extreme misalignment of approx. 45° (shortly before the prism centre is no longer visible and therefore measurement is no longer possible), deviations of the order of 1 mm occur.

M8 wall bolt / target distance 100 mm



Application

- Marking of survey points with wall bolts (M8 inner thread):
- In cadastral and engineering surveying as connection points instead of ground points
- For building control measurements as object points to be tested or for fastening surveying instruments to the wall/structure

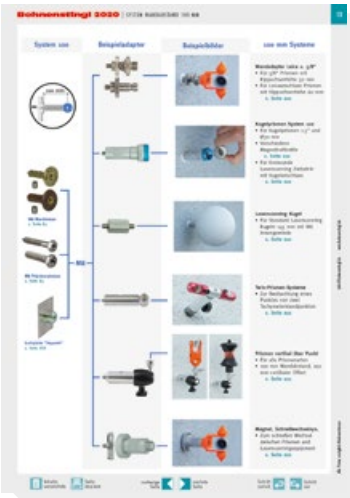
Concept

- By screwing the wall adapter with the corresponding target (including prism) into the M8 wall bolt, the prism is **force-centred in position** (X, Y) and height (Z) at the nominal point

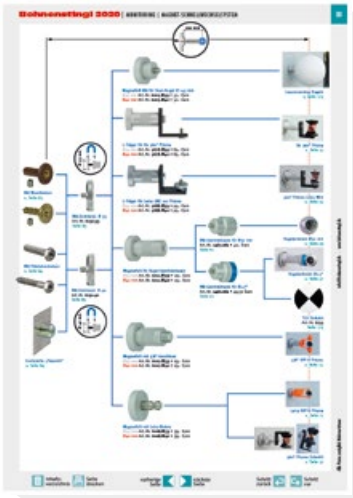
AdV Version (Germany)

- The points have an **M8 internal thread**. A hole must be drilled for bolts. Then they can be inserted into the building using the dowel or mortar method. Modern injection mortars (2-component basis) have also proven their worth. Without drilling, i.e. non-destructively, steel cylinders with M8 internal threads can be fastened to the building structure on platforms made of perforated sheet metal using assembly adhesive
- The measurement setpoint P0 is according to definition in the axis of the M8 thread, **100 mm in front of the wall surface at the wall bolt**
- The prism/target is freely rotatable around the screw-in axis of the M8 thread and the tilting axis of the reflector. Due to this **gimbal suspension**, the prism/target can be aligned to any instrument position

Helpful overviews



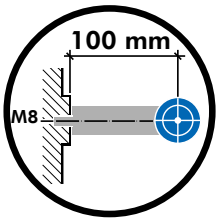
Adapters in M8 thread 271



Quick change system with M8-centering-plates, 210

System 100

AdV-version

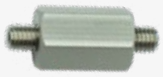


Example Adapters











M8



M8 wall bolt
91



M8 precision bolts
93



Plate "Fixed point"
92

Example Images


see 40

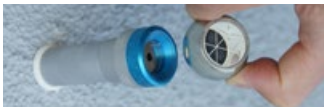

s. 20


s. 19


s. 29


s. 34


s. 36


s. 79


s. 180

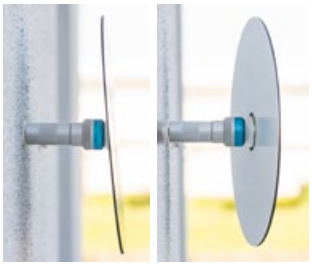

all pictures s. 102

Overview System100 mm

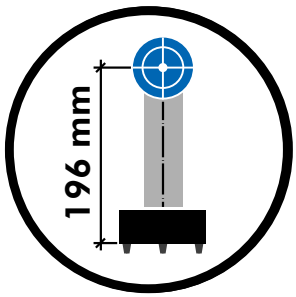

s. 19


s. 19


s. 187


s. 190

Tribrachs for surveying instruments / tilting axis and target height



The tribrach is the connecting element between the tripod and the surveying instrument or target and enables a quick exchange between each other.
It fulfils several functions:

- **Secure hold:** After insertion of the instrument/target sign into the tripod, securing is achieved by means of a clamping screw or locking lever. This ensures that the instrument/target sign is held reliably in the tribrach so that it can also be transported overhead if necessary
- **Compatibility:** Possibility to use instruments and targets of different manufacturers in one tripod type
- **Levelling:** The upper part of the tribrach and thus the instrument or the target holder can be leveled with 3 adjusting screws.
- **Forced centering:** After removing the instrument or the target from the tribrach and reinserting it, they are again in exactly the same position on the tripod. The standing axes of different devices are identical within very small limits.



Different types: The tripod with claw system of the former company WILD has found the largest spreading. On the underside of the instrument/target sign there is a cylinder with 3 claws which are inserted and secured in the tribrach.
In addition, there are tribrachs with the so-called DIN pin Ø34 mm (formerly ZEISS) or, very rarely still, tribrachs from the former KERN company.



Tilting axis/target height 196 mm with the claw system

The **tilt axis height** is the distance from the underside of the instrument to the tilt axis of the tachymeter telescope. In the claw system it is measured from the cylindrical underside of the tachymeter resting on the tripod. The 3 claws are disregarded.



The **tilting axis height** of the tachymeters of many manufacturers is **196 mm** (e.g. Leica, Trimble etc.).
The advantage of a tribrach is the possibility of levelling the horizon as well as the very fast, force-centered exchange of tachymeter and target. If the centre of the aiming point also has a distance of 196 mm to the underside of the claw insert, height transmissions can be carried out very precisely without having to take an offset into account.

When using tachymeters with other tilting axis heights, appropriate height compensation adapters must be used or the difference in height must be taken into account mathematically.

Thread connections and Quick connections Ø12 mm (LEICA)

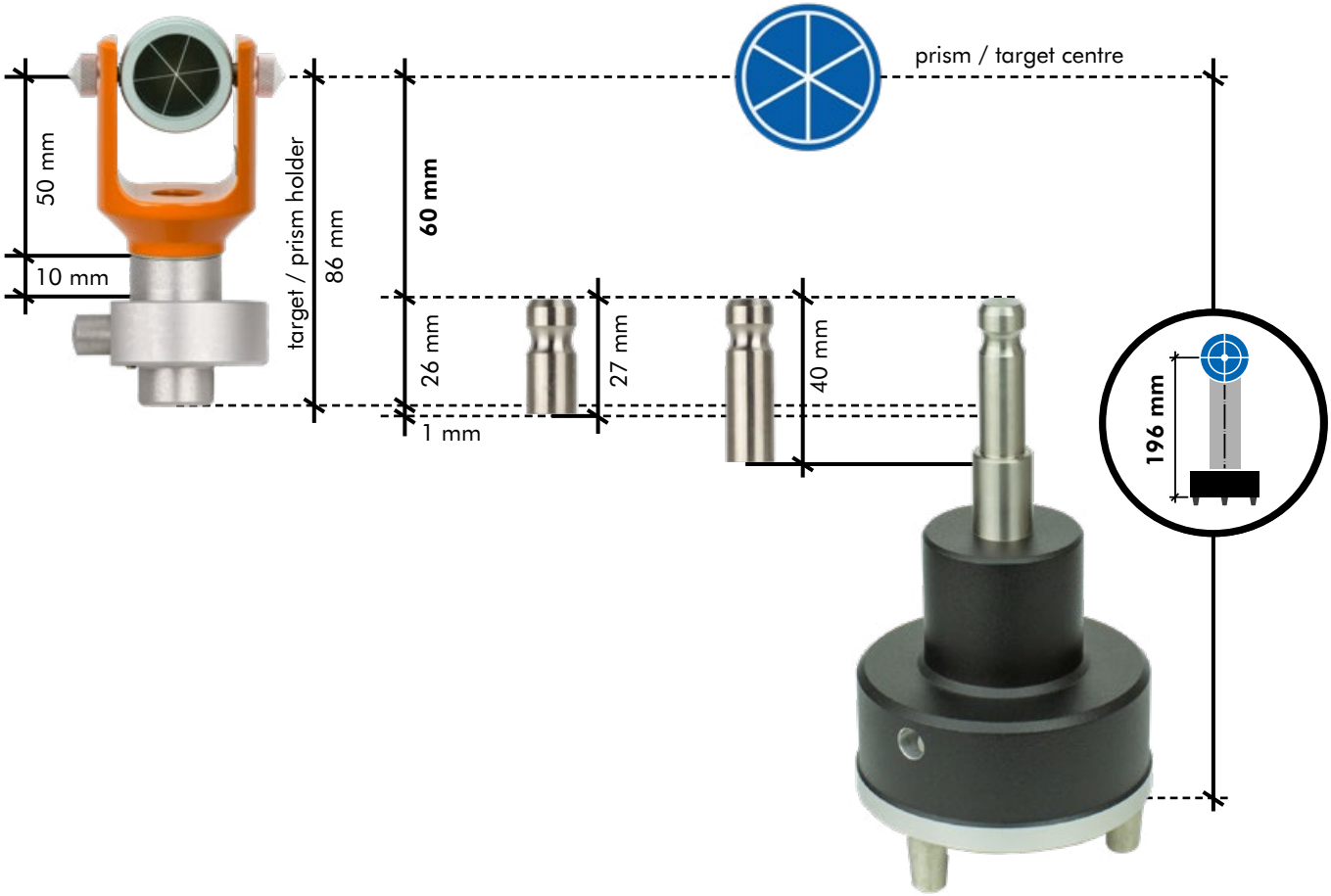
There are also quasi standards for the assembly of surveying accessories. The 5/8" thread has become established for threaded connections. While it was initially mainly known for screwing tribrachs onto the instrument stand, it can now be found in all types of screw connections. The main advantage of the relatively coarse thread is its stability and robustness. Furthermore, M6 and M8 metric threads as well as smaller inch threads can be found, like 3/8" and 1/4".



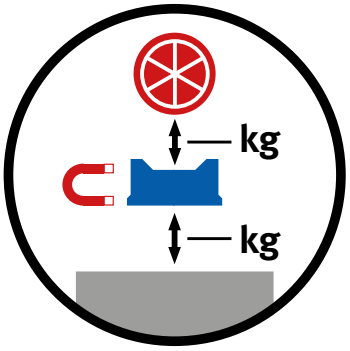
The Leica quick-release fastener has established itself as a screwless connection. On a Ø12 mm stud bolt (spigot) with a conical notch, a bolt receptacle is inserted, the stop surface of which rests on the top of the stud bolt. The sleeve and accessories are secured against falling out by means of a screw or a spring-loaded transverse pin which puts pressure on the notch. The advantage of this fastener is the quick change between different add-on and body parts and the possibility to rotate around the standing axis without changing the height.

For a correct height measurement with a prism or other target, the height of the target centre must be known. This consists of the height to the top of the stud and the distance of the stud support surface to the target center.

The Ø12 stud is available in different lengths, usually 27, 40 or 60 mm long. It has to be clarified whether the mounting in the target/prism carrier requires a length greater than 27 mm in order to guarantee the functionality of the fastener. If the manufacturer specifies a target/tilting axis height of 86 mm, the short stud bolt is sufficient. Then the hole in the sleeve has a depth of 26 mm up to the stop. The distance from this stop to the target/prism center is 60 mm (see logo). The standard dimension of 60 mm also applies to accessories that have a deeper hole in the stud bolt holder.
The correct height display on the scale of a prism pole is therefore not dependent on the length of the stud but on the 60 mm dimension in the prism holder.
All our products with this logo comply with this standard.



Ball bases with magnet – Two holding forces



When bases with a magnet are used, the magnetic force always acts in two directions. Once in the direction of the steel housing of the ball prism and once in the direction of the centering plate. Or, in an application without a centering plate, directly to the metallic (magnetic) surface. The holding forces in kilograms indicate how strongly the ball is pulled towards the base and how strongly the base is pulled towards the object / centering plate.

Your choice: Strength of the magnetic holding force



Most of our ball bases (which serve as support cones for the ball and at the same time as attachment to the object to be measured) are available with different magnetic holding forces. A weak holding force makes sense if the ball is placed on the base and removed again within a short time.
The use of bases with weak magnets in practice however has shown that although the prism remains reliably attached to the ball base, in certain applications the set direction towards the tachymeter can change when left unsupervised.
For example during long-term monitoring on railroad-tracks. When a train drives by, the rail is subjected to strong vibrations. These vibrations are transmitted to the ball base. For this we recommend bases with strong magnetic forces, so the ball prism does not change its set alignment towards the total station.

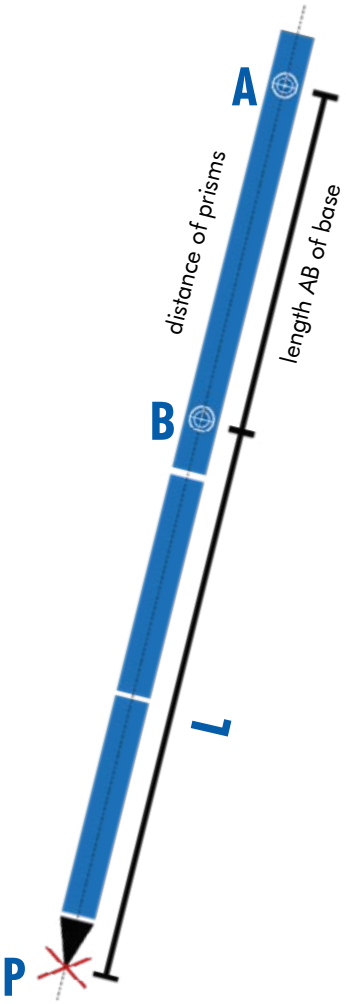




Determination of hidden points with the Two-prism method aka. "Vector" method

Explanation vector method

The coordinates X, Y, Z of the prisms A and B are determined tachymetrically. With the distance L from the object point P to the lower prism B, the 3-D coordinates of point P can be calculated.
The prism pole can be inclined at will. Only the tip must come to rest on the object point P and the two prisms must be aligned with the total station. Of course, the position of the prism pole must not be changed between the measurement of prism A and B.



Vector systems in our catalog

Sewer pipe system separate catalog

- Survey of manhole low points
- (manhole bottoms, inlets, etc.)
- Object points hidden by obstacles
- Inside corners of rooms
- etc.



Mini-Vectors

- Accurate determination of not directly visible object points
- Industrial surveying
- Precision surveying







■ One-unit-Vector s. page 124

■ Modular Mini-Vector s. page 124

■ Mini-Vector Telescope s. page 124

■ BOAXE UNI, angled bolts 191

Software solutions for vector method

Many electronic total stations already have a program for measuring concealed points (often called: sewer measuring pole) integrated as standard.
It does not matter wheather the vector system for sewer measurements or the small mini-vectors are used - the principle is always the same.

Required parameters for the calculation of 3D coordinates are:

- Prism constant K
- Base length AB (distance between the two prisms)
- Extension dimension L (distance from the lower prism to the pole tip)

Please note that "pole length" may be defined differently by different total station manufacturers or software providers. To increase the accuracy, it is often possible to determine the base with 3 prisms instead of 2. For this purpose, we offer corresponding expansion options for the channel measuring system Vektor and the "Mini-Vektor Modular".

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Notes:	

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