

# LEICA NA2 · NAK2



*Universal automatic level*

**Leica**  
Geosystems

# LEICA NA2

## *The classical level from Leica Geosystems*

The NA2 universal automatic level meets all requirements regarding precision, convenience and reliability.

It was designed by surveyors and development engineers with years of experience and who know what a field instrument has to be able to do.

The NA2 soon pays for itself, because it can be used for all types of surveying job; on building sites for routine levelling, in engineering projects, and for geodetic control at all levels of accuracy.

### **Universal application**

- Levelling of all types and all orders of accuracy
- Precise levelling and settlement determinations on buildings
- Routine heighting for the construction of roads, railways, pipelines, tunnels and so forth
- Setting-out work and control measurements on the construction site
- Area levelling of high accuracy
- Tacheometric levelling with the K-version on flat terrain by combining stadia and angular measurements with height readings
- Deformation measurement and monitoring of bridges



# Quickly set up, simple to use

## **Strong tripods**

In principle, the NA2 can be set up on any Leica Geosystems tripod. In practice, for all-round purposes, we recommend the heavy-duty GST20 telescopic-leg tripod. For precise levelling the GST40 fixed-leg tripod is suitable because of its extreme rigidity.

The modular relationship between instrument and tripod is an advantage when transport space is limited.

## **Centring is easy**

The circular level only needs to be centred approximately to bring the compensator well into its working range of  $\sim 30'$ , and so setting-up goes quicker.

The bubble is viewed positively via a pentaprism and is monitored down the eyepiece.

## **Play-free footscrews**

The pitch of the smooth-running and backlash-free footscrews is such that the bubble can be centred in a very short time.

## **Independent of temperature**

Unlike the tubular level of a traditional instrument, the NA2 universal automatic level is relatively insensitive to direct solar radiation and an umbrella need only be considered for the most precise levelling.





# Adjust the line of sight automatically

## Easy to level up

The advantage of this instrument is that, as soon as the bubble is centred, the line of sight is horizontal for all pointings of the telescope. The observer is freed of the time-consuming centring procedure involved with the traditional tubular level, and can concentrate on the business of staff readings.

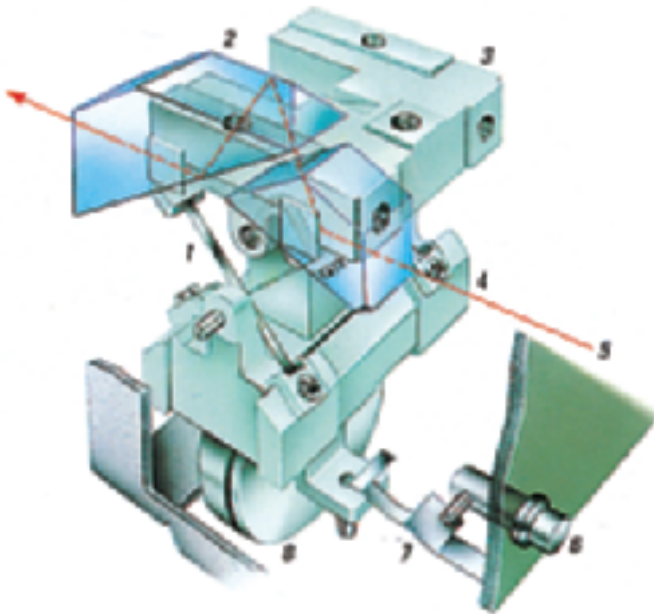
## Robust and automatic

The compensator is essentially a pendulum with a prism (4).

The suspension system comprises four flexed tapes (1) made of a special alloy to ensure faultless functioning even at extreme temperatures. The compensator, which is located between the focusing lens and the crosshair reticle, is pneumatically damped against mechanical vibration and is screened against magnetic fields.

## Minimum maintenance

In the unlikely event that the compensator is damaged (and this can only happen as a result of extremely harsh treatment) it is replaced easily, being held only by three screws.



## 2/NAK2 compensator

- 1 suspension tapes
- 2 prism (fixed)
- 3 compensator body
- 4 pendulum with prism
- 5 line of sight
- 6 push-button
- 7 spring which taps pendulum
- 8 pneumatic damping mechanism

## Push-button control – added security

With most automatics one taps the tripod or instrument to check if the compensator is functioning. Leica Geosystems offers a far more sophisticated solution.

Pressing the button under the NA2 eyepiece gives the compensator a gentle tap, so that you see the staff image swing smoothly

away and then float gently back to give the horizontal line of sight. This check, which takes less than a second, is technically perfect, as the pendulum itself is activated and swings through its full range. It is also immediately apparent if the bubble is not centred.



27  
3  
25  
23

# Top-class optics

## Top-class optics

The telescope is of excellent quality and gives a bright, high-contrast, erect image, even in poor light – an essential for accurate levelling. With the standard eyepiece the magnification is 32x, the optimum for most applications of the instrument. Optional eyepieces are available; the 40x may be preferred for precise levelling, the 25x in hot, shimmer conditions. Eyepiece exchange takes only a second or so.

The focusing knob has a coarse/fine movement:

- coarse, for rapid setting with minimum turning
- fine, for the final delicate touch to give the perfect image.

## At an advantage on unstable ground

If a tubular level is used on unstable ground it tilts out of range and has to be continuously reset. By contrast, the pendulum of the NA2 “compensates” and keeps the line of sight horizontal.

## Fatigue-free viewing

The reticle has:

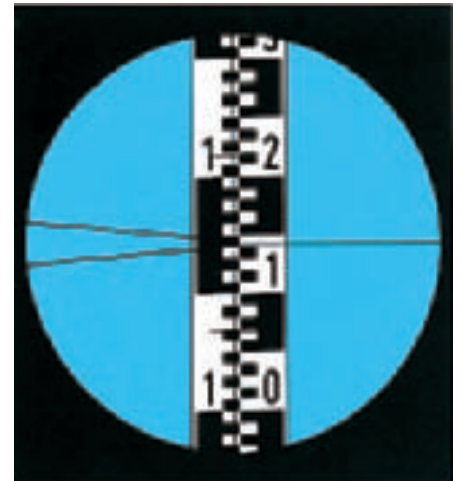
- a single horizontal hair for reading normal staffs
- a wedge-shaped hair for use with invar staffs
- stadia hairs for distance measurement and three-wire levelling.

The general layout of the controls, the smooth friction-braked rotation of the instrument, and the endless horizontal drive with bilateral knobs, all combine to make the instrument easy to use.

## Angle measurement with the NAK2

Civil engineers and contractors often require a circle for angle measurement and setting-out work. Even simple detail surveys, by taking angle, distance and height, and plotting with the polar method, can be done with a level.

The model NAK2 has an internal glass circle which is read via a scale microscope and which can be set to any value by turning the rim around the base of the instrument.



NA2 field of view with metric levelling staff  
Reading at horizontal hair: 1.143 m



NAK2  
circle reading (400 gon)  
392.66 gon



NAK2  
circle reading (360°)  
314°42'

# High-performance accessories for precise levelling

## **GPM3** **parallel-plate micrometer**

This optional accessory slips over the telescope objective and blends perfectly with the smooth lines of the NA2. With a compensator setting accuracy of  $\pm 0.3''$  (equivalent to 0.01 mm in 10 m) and a micrometer reading to 0.1 mm direct and 0.01 mm by estimation, the NA2 with GPM3 is an ideal combination for precise levelling, deformation studies, and even optical tooling. The micrometer drive for raising and lowering the line of sight is conveniently located and readings are taken on a glass scale viewed through an eyepiece just above the telescope eyepiece. This optical reading system, which is digital apart from the last and estimated figure in the metric and inch versions, is superior to the usual metal drum system.

## **GPM6** **parallel-plate micrometer**

There are tasks for which a micrometer is needed, yet for which the very high accuracy of the GPM3 is not essential.

To meet this requirement, a simpler micrometer attachment, the GPM6 with drum reading, is available for the NA2.

The GPM6 fits on to the telescope objective in the same manner as the GPM3, but the graduation is engraved on a metal drum.



## **Eye-piece accessories for specialized tasks**

Because of the bayonet fastening of the interchangeable eyepiece, all theodolite eyepiece accessories can be used with the NA2.



- Diagonal eyepiece for observing from above, below, and from the side; useful in cramped spaces



- Eyepiece lamp for converting the NA2 into a horizontal collimator for laboratory work



- Autocollimation eyepiece for setting machine parts and instrument components precisely vertical



***Compact***

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The rugged NA2 is indifferent to weather conditions and is extremely reliable in the rough world of the building site. The pendulum compensator is protected against knocks and shocks. There is a highly-effective vibration-damping mechanism.



***Precise***

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The high setting accuracy ensures that the line of sight stays put. The attachable parallel-plate micrometer renders the NA2 ideal for precise fine levelling.

***Reliable, automatic, maintenance-free***

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The instantaneous check facility with the push-button control not only makes work easier; it also promotes confidence.



***Easy handling***

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The convenient, well-arranged controls are designed for maximum convenience. The bilateral, endless horizontal drive promotes rapid fine-pointing.

***Quick levelling-up***

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The instrument is quickly set up with the three rapid-action footscrews. Their self-adjusting threads make subsequent resetting unnecessary.



***Superb telescope***

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Telescope with excellently-corrected optics for bright, high-contrast images. All optical components are coated on both sides.

***Effortless focusing***

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The erect image seen down the telescope is quickly and accurately brought into focus with the convenient rapid and fine focusing knob.

***Abundant accessories; many applications***

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Additional items such as the parallel-plate micrometer, the laser eyepiece, or the theodolite eyepiece accessories, offer almost unlimited possibilities.



# LEICA NA2 · NAK2

## Proven reliability ensures precise results

### Versatile accessories for demonstrable success

A comprehensive program of accessories enables you to expand the performance and applications range of each instrument. This way, you can match your equipment exactly to requirements.

The possibilities are described in brochure "Survey accessories" 710 883en.

### Robust container for safe transport

The NA2 is supplied in a foam-padded container made of high performance synthetic material. The foam padding absorbs all jolts and shocks. The container provides perfect protection for the NA2.

### Technical data

Standard deviation for 1 km double-run levelling, depending on type of staff and on procedure	up to 0.7 mm
With parallel-plate micrometer	0.3 mm
Telescope	erect image
Standard eyepiece	32×
FOK73 eyepiece (optional)	40×
FOK117 (optional)	25×
Clear objective aperture	45 mm
Field of view at 100 m	2.2 m
Shortest focusing distance	1.6 m
Multiplication factor	100
Additive constant	0
Working range of compensator	~30'
Setting accuracy of compensator (stand. dev.)	0.3"
Sensitivity of circular level	8'/2 mm
Glass circle (K version)	400 gon (360°)
Graduation diameter	70 mm
Graduation interval	1 gon (1°)
Reading by estimation to	10 mgon (1')
Water- and dust resistance	IP53
Temperature range:	
Operation	-20°C to +50°C (- 4°F to 122°F)
Storage	-40°C to +70°C (-40°F to 158°F)

Parallel-plate micrometer (optional accessory)	Range	Interval	Estimation
GPM3, with glass scale	10 mm	0.1 mm	0.01 mm
GPM6, with metal drum	10 mm	0.2 mm	0.05 mm



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