

Builders' Levels and Theodolites



®

Precise surveying
and measuring

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The principles of optics

The magnification of an optical instrument indicates how much closer a target appears to the user when looking through the instrument

Levelling instruments in general

Levels are used to create a horizontal line of sight in order to determine differences in height. The main components include a telescope with crosshair which can rotate around the vertical axis, a horizontal circle for marking off the angles, and the bubble which helps to keep the instrument in a horizontal position with a tribrach. Automatic levels also feature a compensator mechanism which will adjust the level to an exactly horizontal position within a small working range. The compensators are equipped with a damping system. In practice, air-damped and magnetically damped compensators have become generally accepted. The air-damped compensators are of better quality whereas magnetically damped compensators are more favourably priced.

Theodolites

A theodolite is an instrument used for precise measurements of vertical and horizontal angles. On construction sites, theodolites are

compared when looking to the target without instrument. The larger the magnification is chosen, the smaller the field of vision and the light intensity get. The objective aperture also has a

Selecting the right Nedo level

Nedo offers a range of various automatic builders' levels:

- F-Series:** modern builders' levels with robust optics and rugged design
- X-Series:** premium-class builders' levels for the most demanding requirements
- Z-Series:** High class builders' levels for highest quality standards. Absolutely protected against water spray thanks IP X6.

Each Nedo builders' level is carefully checked and adjusted before dispatch. All Nedo builders' levels are accompanied by an inspection record as part of the scope of delivery.

further used for making exact alignments e.g. when foundations are cast and for checking if formwork and facades are perfectly vertical. The precision of a theodolite is given in arcseconds.

great influence on the light intensity. The larger the objective aperture, the better is the light intensity of the object, i.e. the brighter the image.

Selecting the right magnification

As a rule of thumb, the magnification should be the target distance in metres. Levels with a 24x magnification are ideal for applications on the construction site. An interesting alternative from the aspect of cost is a level with a 20x magnification. Levels with a 28x or 32x magnification are used mainly for engineering and surveying purposes.

Electronic theodolites with digital displays have become generally accepted as they provide easy read-offs.



Builders' Levels F-Series

Strong optics and impressive design



Builders' Levels F-series

The F-levels feature first-class optics with 24x, 28x or 32x magnification, a top-quality magnetic-damped compensator and a modern design. Just right for use under tough conditions.

Features:

- Automatic builder's level with 24x, 28x or 32x magnification
- Bright optics with large objective aperture
- Sturdy, reliable magnetic-damped compensator
- High-contrast image
- Inspection record
- Comes with plumb bob, adjusting pin and robust case
- Also available as a set



Also available as a set

Levelling set with F-level consisting of:
5 m levelling staff and bag
Ref.-No. 345 122-613
Aluminium tripod Ref.-No. 200 215-613

Technical data:

	F24	F28	F32
Image	upright	upright	upright
Magnification	24x	28x	32x
Clear objective aperture	30 mm	30 mm	40 mm
Shortest focusing distance	0.6 m	0.6 m	0.6 m
Multiplication factor	100	100	100
Compensator operating range	± 15'	± 15'	± 15'
Setting accuracy	±0.5"	± 0.3"	± 0.3"
Horizontal circle	400 gon	400 gon	400 gon
Sensitivity of circular bubble	8'/2 mm	8'/2 mm	8'/2 mm
Standard deviation per km double-run levelling	± 2.5 mm	± 2.0 mm	± 1.5 mm
Protection class	IP 54	IP 54	IP 54
Weight	1.26 kg	1.26 kg	1.26 kg
Connecting thread	5/8"	5/8"	5/8"
Ref.-No.	460 777-613	460 795-613	460 797-613
Ref.-No. Set	463 105	465 105	466 105

Builders' Levels X-Series

eXtra robust –
for eXtremely tough
working environments



Builders' Levels X-series

Nedo X-levels are top-quality builders' levels which meet the very highest demands.

These builders' levels feature particularly bright optics, a large objective aperture, a sturdy air-damped compensator and quality workmanship – just right for use under eXtremely tough conditions.

Features:

- Automatic builders' level for the very highest demands
- Bright optics with large objective aperture
- Sturdy, reliable air-damped compensator
- High-contrast image
- Inspection record
- Comes with plumb bob, adjusting pin and robust case
- Available with 20x, 24x, 28x and 32x magnification
- Also available as a set



Also available as a set

Levelling set with X-level consisting of:
5 m levelling staff and bag
Ref.-No. 345 122-613
Aluminium tripod Ref.-No. 200 215-613

Technical data:

	X20	X24	X28	X32
Image	upright	upright	upright	upright
Magnification	20x	24x	28x	32x
Clear objective aperture	30 mm	36 mm	36 mm	36 mm
Shortest focusing distance	0.6 m	0.6 m	0.6 m	0.6 m
Multiplication factor	100	100	100	100
Compensator operating range	± 15'	± 15'	± 15'	± 15'
Setting accuracy	± 0.5"	± 0.5"	± 0.4"	± 0.3"
Horizontal circle	400 gon	400 gon	400 gon	400 gon
Sensitivity of circular bubble	8'/2 mm	8'/2 mm	8'/2 mm	8'/2 mm
Standard deviation per km double-run levelling	± 2.5 mm	± 2.0 mm	± 1.5 mm	± 1.0 mm
Protection class	IP 54	IP 54	IP 54	IP 54
Weight	1.7 kg	1.7 kg	1.7 kg	1.7 kg
Connecting thread	5/8"	5/8"	5/8"	5/8"
Ref.-No.	460 770-613	460 745-613	460 787-613	460 792-613
Ref.-No. Set	462 205	462 245	462 285	462 325

Builders' Levels Z-Series

High class builders' levels for highest quality standards



Builders' Levels Z-series

Thanks IP X6 the builders' levels of the z-series are protected against water spray.

Features:

- Automatic builder's level with 24x, 28x or 32x magnification
- Bright optics with large objective aperture
- Jet water protected
- Sturdy, reliable air-damped compensator
- High-contrast image
- Inspection record
- Comes with plumb bob, adjusting pin and robust case
- Also available as a set



Also available as a set

Levelling set with Z-level consisting of:
5 m levelling staff and bag
Ref.-No. 345 122-613
Aluminium tripod Ref.-No. 200 215-613

Technical data:

	Z24	Z28	Z32
Image	upright	upright	upright
Magnification	24x	28x	32x
Clear objective aperture	36 mm	36 mm	36 mm
Shortest focusing distance	0.65 m	0.65 m	0.65 m
Multiplication factor	100	100	100
Compensator operating range	± 15'	± 15'	± 15'
Setting accuracy	± 0.5"	± 0.4"	± 0.3"
Horizontal circle	400 gon	400 gon	400 gon
Sensitivity of circular bubble	8'/2 mm	8'/2 mm	8'/2 mm
Standard deviation per km double-run levelling	± 2.0 mm	± 1.5 mm	± 1.0 mm
Protection class	IP X6	IP X6	IP X6
Weight	1.75 kg	1.75 kg	1.75 kg
Connecting thread	5/8"	5/8"	5/8"
Ref.-No.	460 756	460 757	460 758
Ref.-No. Set	465 245	465 285	465 325

Electronic Theodolite

Robust builders' theodolite



Electronic Theodolite ET-5

Robust builders' theodolite with digital display and automatic vertical compensator. The Nedo ET-5 stands out thanks to its precision, reliability and simple and intuitive handling.

Features:

- Bright optics with 30x magnification
- 2 large, easy-to-read LCD illuminated displays
- 2 clearly arranged control panels
- Automatic vertical compensator; Working range $\pm 3'$
- Horizontal circle with right/left function
- Horizontal circle can be set to zero in any position
- Hold function for horizontal circle
- Automatic switch-off after 30 minutes; can be deactivated
- Robust tribrach with 5/8" connecting thread
- Incl. batteries, rechargeable batteries, charger, plumb bob, weather protection, tools and robust case
- Available with optical plummet or with laser plummet



Diagonal eyepiece

Designed for measuring steep vertical angles. With bag.

Ref.-No. 460 813-613

Technical data telescope:

Image	upright
Magnification	30x
Shortest focusing distance	1.3 m
Clear objective aperture	45 mm
Field of view	1° 30'
Multiplication factor	100

Technical data angle measurement system:

Minimum reading	1"/5"
Accuracy	5"
Angle units	degrees (0-360) gon (0-400) mil (0-6400)

Diameter of reference circle approx. 78 mm

Technical data compensator:

Tilt sensor	automatic vertical compensator
Compensator range	$\pm 3'$

Technical data Optical plummet:

Image	upright
Magnification	3x
Field of view	5°
Accuracy	± 0.5 mm/1.5 m

Technical data laser plummet:

Laser	< 1 mW, lase class2, 650 nm
Accuracy	± 1.5 mm/1.5 m

General information:

Spirit level	30"/2 mm
Circular bubble	8"/2 mm
Connecting thread of tribrach	5/8" BSW
Operating temperature	-20° to +50°
Power supply	4 x 1.5 V AA or rechargeable batteries
Operation duration	batteries 36 h, rechargeable batteries 18 h
Weight	4.4 kg
Dimensions	160 mm x 180 mm x 330 mm
Ref.-No.	460 812-613 with optical plummet
Ref.-No.	460 814-613 with laser plummet

Precision Zenith Plummet



Precision Zenith Plummet FG-L100

For high-accuracy zenith plumbing for the erection of tall buildings, chimneys, shaft or cooling towers, drilling derricks and for special tasks in industrial measurement as well as shaft measurement.

Technical data:

Telescope

Image	upright and true-to-side
Magnification	32x
Shortest focusing distance	2.2 m
Free objective diameter	40 mm

Compensator

Working range	$\pm 10'$
Mean square setting error	$\pm 15''$

General information

Measuring accuracy	$\pm 1 \text{ mm}/100 \text{ m}$
Dimensions	180 x 180 x 340 mm
Weight	3.5 kg
Ref.-No.	460 806

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