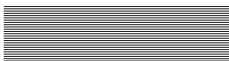




## Operating Instructions TPL 50 HV

Serial No:



Owner:

Delivered by:

### Introduction

The laser, TPL 50 HV, featuring a visible laser beam, is a product from the THEIS PROFI LASER family. A beam splitter provides a permanent plummet beam. The instrument is levelled automatically via servo-motors.

Both horizontal and vertical measurement operations are possible with the laser without any further adaptations.

The TPL 50 HV is equipped with numerous functions for easy-to-use operation owing to the clear layout of the operating panel.

As an option a radio remote control is available.

Prior to shipment all instruments are carefully checked.

Read the complete Operating Instructions including the Technical Data and the Safety Requirements prior to using the equipment the first time.

We recommend you to observe the following items so that your laser is ready for use at all times:

1. **Never** place the instrument in its case when **wet**.
2. Check the accuracy each time before using the instrument, as we cannot assume any responsibility for adjustment errors.
3. Follow the instructions for handling the accu.
4. Treat the laser beam window and sensor window of the receiver (option) with care.

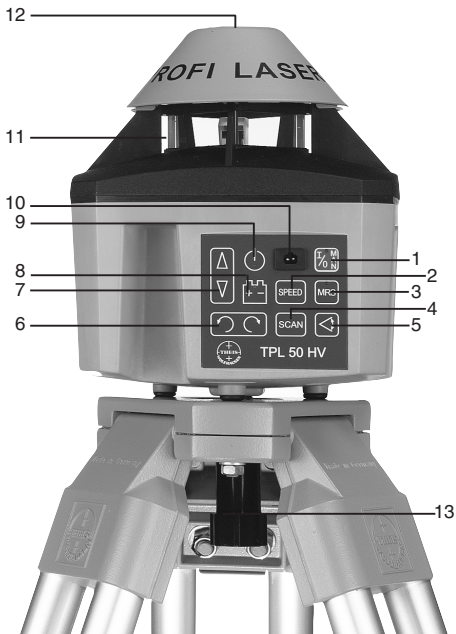


Figure 1



Figure 2

- |  |                                      |
|--|--------------------------------------|
| 1. ON/OFF, MAN, out of levelling indicator | 8. Battery condition lamp            |
| 2. Speed                                   | 9. Stand by indicator (green LED)    |
| 3. MRS                                     | 10. Charging socket                  |
| 4. SCAN                                    | 11. Laser beam window (rotation)     |
| 5. SCAN angle                              | 12. Laser beam window (plummet beam) |
| 6. Step-by-step operation                  | 13. Tripod clamping screw            |
| 7. Tilt/Alignment                          | 14. Axis designation (X, Y)          |

For operating panel assignment and explanations, see Page 3.

## Instructions in brief / Operating panel assignment



ON/OFF as well as **MAN** (manual), i.e. automatic off

**ON:** 1st press of key (red LED flashes during levelling)

**OFF:** 2nd press of key

**MAN-mode:** Press key long until condition lamp lights up continuously.  
(But first make sure that the instrument is levelled)



Speed: 4 steps



Motion Resistance System (vibrations are ignored)

The levelling plane is continuously re-levelled in case of minor vibration where the unit has been set up (limited compensation range).



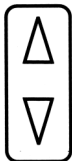
Scan-mode



Scan-angle: (3 sizes)



Step-by-step operation: Left – right motion of the laser beam  
(also possible in Scan-mode)



Tilting in horizontal operation only in MAN-mode via the Y axis  
(in direction to operating panel)

Alignment of laser beam for vertical operation

# 1. Preparations for measurement

## 1.1 Horizontal surveying

Align the tripod within the range of  $< 5^\circ$  and tighten the laser level with tripod clamping screw (13). Press key (1) to activate the instrument. At that moment the red LED in the horizontal levelling indicator key (1) and the LED in the MRS key as well as the yellow LED of the battery condition lamp (8) flash one time, simultaneously. The red horizontal levelling indicator and the laser beam then flash until the built-in servo-motors have levelled the instrument.

If the tripod head was tilted more than  $5^\circ$ , this will be indicated after a brief period of time by rapid flashing of the LED in key (1) and the laser beam. Should this occur, shut off the instrument and align the tripod more carefully. If this correction is not carried out, the laser will automatically shut off after approx. 5 minutes.

As soon as the laser levelling process has been finished, the laser beam starts rotating. If the laser is readjusted from horizontal to vertical operations or visa versa, it must first be turned off.

## 1.2 Vertical surveying

Set up the laser level as described in section 1, however turned by  $90^\circ$ , i.e. the operating panel points upwards (see Figure 2).

For different use of single keys for vertical operations, see Instructions in brief (Page 3).

# 2. Descriptions of operation

Should minor position changes in the instrument occur while working due to ground vibration, it will relevel itself automatically and indicate this operation by blinking of the laser beam and the horizontal levelling indicator in key (1). If the ground is subject to constant minor vibrations and, as a consequence, it is difficult to keep the instrument levelled, the **MRS-mode** can offer assistance.

This is activated by using key (3) and indicated on the relevant red control lamp. It effects a diminishment of the adjustment sensitivity on the instrument. The levelling plane is, however, continuously controlled automatically. If the enlarged MRS-range is exceeded, this is indicated by a flashing laser beam and horizontal levelling indicator in the normal operation mode. Because the automatic levelling unit is generally constantly carrying out readjustment operations in **MRS-mode**, the energy consumption is relatively high reducing the running time of the instrument.

Should major height changes occur (e.g. an inadvertent jerk of the tripod leg), a so-called **tilt function** effects a shutdown of the laser beam even within the automatic levelling range, and this occurrence is signalled by rapid flashing of the LED in the horizontal levelling indicator in key (1). The instrument shuts off automatically after approx. 5 minutes.

For the remaining key assignments, see Instructions in brief (Page 3).

### 3. Power supply

As soon as the battery condition lamp (8) blinks, this indicates that the battery is almost discharged. The operation of the laser is, however not affected. The instrument switches off automatically a short time later.

Charge the batteries only with standard charger ~~Type BCN 72 – 350~~ via charging socket (10). When the condition lamp goes off, this indicates that the battery is re-charged. Overcharging is not possible unless charging operations are repeated constantly. Overcharging will shorten the life of the battery.

The charger can also be used as power supply unit.



**Never operate charger in damp rooms!**

### 4. Calibration check

#### 4.1 Horizontal

Set up levelling instrument as described in section 1.1 onto an extremely well levelled tripod, and along a measuring range of approx. 30 metres – for example in the X-axis direction – level and turn on.

Place a mark at the end of the measuring range at the height of the laser beam. Subsequently, turn the laser 180° and place a second mark. Afterwards, carry out the same test along the Y-axis (14). If all marks are at equal height or hardly deviate (max. 2 mm), the calibration is correct. If larger deviations are found, the unit must be re-calibrated by an authorised workshop.

## 4.2 Vertical

Set up the laser as described in section 1.1 onto an extremely well levelled tripod. Subsequently, carry out a plumbing operation on an absolutely vertical measuring range of at least 10 metres in height which has been defined by starting and end points. The instrument is to be set up at the shortest possible distance (max. 1 metre) right-angled to the front of the bottom starting point, and the rotating laser beam is to be adjusted in such a manner so that it strikes this bottom point. When the beam also hits the end point, the calibration is correct. If larger deviations are found, the instrument must be re-calibrated by an authorised workshop.

## 5. Radio Remote Control (Option) (Figure 3)

The remote control unit has an operating panel similar to the laser (see Page 2 and 3). It is, however, not equipped with the MAN and MRS modes of operation in order to eliminate an inadvertent activation of these functions.

Using the key combination SCAN (20) and Scan-angle (18), the laser can be switched to Stand by, which reduces energy consumption substantially.

The Stand by mode is indicated in the operating panel of the levelling instrument by a blinking green control lamp (9).

The laser is also reactivated by using any key. This is of course also possible directly on the levelling instrument via the operating panel (1). The transmission of the input commands to the laser via the remote control are delayed slightly for technical reasons. (If inadvertently other key combinations were selected, commands could possibly be signalled which were possible by pressing a single key).

When working with remote control and receiver a minimal distance of 0,5 m is to be maintained between the units, as the remote control unit may interfere the receiver.

- 15. Battery condition lamp
- 16. Speed
- 17. Tilt / alignment of laser beam
- 18. Scan-angle
- 19. Stand by (key 18 and 20 simultaneously)
- 20. Scan-mode
- 21. Step-by-step operation
- 22. Control lamp – transmission

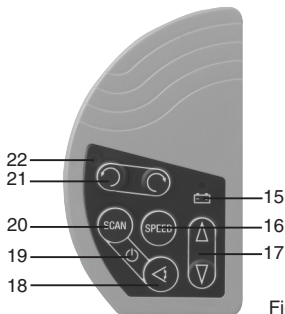


Figure 3

## 6. Indicators and malfunctions

- |   |                                   |  |
|---|-----------------------------------|--|
| 1. Red LED in key (1)   | flashes slowly:                   | Instrument executing levelling operat.   |
|   | * flashes rapidly:                | Unit is outside compensation range<br>or                                       |
|   | *flashes rapidly:<br>remains lit: | TILT function active<br>MAN-mode (manual), i.e. automatic<br>mode switched off |
| 2. Red LED in MRS key (3)   | lights up:                        | MRS-mode activ   |
| 3. Green LED Stand by (9)   | flashes briefly:                  | Stand by-mode active (can only be<br>activated with radio remote control)      |
| 4. Yellow LED bat. control.<br>lamp (8)   | flashes slowly:                   | Battery voltage low  |
| 5. Yellow LED bat. control. (8) and red LED in<br>MRS key (3) flashing simultaneously,<br>Red LED in key (1) flashes rapidly: |                                   | Laser malfunction **<br>(notify customer service)                              |

\* Unit will shut off automatically after approx. 5 minutes.

\*\* Short-time malfunctions are of insignificance.

## 7. Supplier's declaration / Safety informations

The unit is designed in accordance with European Standards 89/336/EEC Electromagnetic Compatibility and 73/23/EEC Electric Equipment for use within certain voltage limits (Low-voltage Directive).

For evaluation purposes, the harmonised Standards EN 50082-1, EN 55011, EN 61010-1 and EN 60825 + A 11 have been applied.

Safety information label is placed on the rear of the instrument.



**A Class 3A embedded laser has been installed. On opening the unit, one must be aware of the fact that higher energy levels than Class 2 are present. Avoid pointing the laser in the direction of persons. Do not look into the laser beam.**

**There are no parts requiring adjustment or maintenance inside the unit. Service operations may only be carried out by authorised workshops.**

## 8. Technical data

### Laser levelling instrument

Laser class	2	Speed rpm	420/200/5/0 left/right turn (step-by-step Ctrl.)
Wavelength	635 nm	Power supply	Battery 6 V; 2,5 Ah
Output	max. 1 mW	Running time	≈ 18 h
Beam divergenz	≈ 0,5 mrad	Charging time	≈ 10 h
Range (radius)	≈ 50 m	Operating temp.	- 10 to + 40°C
With receiver (option)	≈ 250 m	Type of protection	IP 65 waterproof
Auto. Levelling range	± 5°	Relative humidity	10–90%
Tilt (Y-axis)	± 5°	Weight	2 kg
Accuracy	± 2,5 mm / 50 m		
Scan-mode	3 sizes		

### Radio Remote Control (option)

Range	≈ 80 m	Stand by function from	Radio Remote Control
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## 9. Accessories

Standard: Standard charger  
Operating instructions

Options: Radio Remote Control  
Target  
Receiver TE 2 ~~oder TE 3~~  
Fixing clamp



Subjects to changes



THEIS FEINWERKTECHNIK GMBH  
D-35236 Breidenbach-Wolzhausen · Germany