Operating instruction and appropriate treatment of analog precision spirit levels (Vers. 2.4)

We thank you very much for your confidence in us by purchasing this product.

16. The measurement device is highly sensitive and must be protected against humidity, cold and heat. The working temperature of mechanical Precision Levels is 20°C (+/-5 K), the storage temperature is from -40°C to +70°C.
17. Before use, the precision spirit level must be acclimatized to the same temperature as the object to be measured. Both objects must be within the working temperature range.
18. The measuring surface of the object to be measured and the measuring surface of the precision spirit level must be absolutely clean.
19. Before and during measurement the spirit level only must be touched on the plastic hand grips for thermal protection.
20. Human body and respiratory heat as well as solar radiation can influence the measurement result. Unnecessarily long body proximity to the precision spirit level is to be avoided.
21. Slide (but don't put) the level on the object. There must be a close contact between the level and the object. The precision spirit level must always rest well.
22. In order to obtain a stable result, the precision spirit level on the measuring surface must not be damaged (scratches or impact marks) and, in particular, must not tilt or wobble. Small scratches can be removed carefully with a whetstone.
23. The measurement result can only be read when the air bubble has completely stopped oscillating. This can be up to 40 seconds depending on the sensitivity of the spirit level.
24. In the case of multiple measurements, the precision spirit level must always be pushed to the same position so that any unevenness of the surface to be measured is excluded.
25. For high-precision precision spirit levels, it must be ensured that vibrations in the environment are not transmitted to the object to be measured.
26. **In order to exclude all measuring errors, it is essential to carry out a control measurement on the reversal measurement (turn by 180 °) before each measurement, for instructions see below procedure: Checking the zero point deviation.**
27. After use, the measuring surface of the precision spirit level always must be stored oiled or greased in its case for protection.
28. Repairs require expertise and should therefore only be performed by the manufacturer.
29. In order to keep the spirit level reliable for a long time in a usable condition, the manufacturer offers a cost-economic calibration and maintenance service.
30. Attention: In case of damage of the vial by external impact, the room must be vented effectually. The liquid of the vial evaporates into the environment. It may cause nausea, dizziness or unconsciousness in the worst case.

Checking the inclination, e.g. of a machine, by an 180° turn of the precision spirit level:
Slide the level on a clean, plane and smooth horizontal surface. The negative range is on the left of both index lines, the positive range is on the right. The position of the static bubble is the value A1 and A2 (in scale parts Scp) on the scale. Turn the level through 180 degrees, slide it to the same position of the surface. The values B1 and B2 will be added to A1 and A2 then devided by 4. The result is the inclination (A1+A2+B1+B2)/4 in Scp. (For A1 it has to be read the difference from the right bubble end to the right zero line, for A2 on the left side. For B1 and B2 it will be read after turning with the same method. The algebraic sign must be observed.

E.g.: Sensitivity 0.1 mm/m: value A1 = -1.2 Scp, value A2 = -0.2 Scp, value B1 = -1.0 Scp, value B2 = +0.0 Scp
Inclination of the machine = -0.6 Scp = -60 µm/m (increasing left)

Checking the zero point deviation of precision spirit levels by an 180° turn (self-testing of the spirit level):
Slide the level on a clean, plane and smooth horizontal surface. The negative range is on the left of both index lines, the positive range is on the right. The position of the static bubble is the first indicated value A (in scale parts Scp) on the scale. Turn the level through 180 degrees, slide it to the same position of the surface. Read the second indicated value B. Subtract value B from value A then devide by 2. The result is the zero point deviation DoE = (A-B)/2. Each test result is to be read on the equal index line (e.g. on the right). The algebraic sign must be observed.

E.g.: Sensitivity = 0.02 mm/m, value A = -0.6 Scp, value B = -1.0 Scp, DoE = +0.2 Scp = 4 µm/m

Tolerances allowable (Tzul) regarding the German standard DIN877 depending on the sensitivity at L > 100 mm (L ≤ 100 mm):
0.01 mm/m: T_{zul} = 10 (10)µm/m, DoE = 2.0(2.0) Scp; 0.02 mm/m: T_{zul} = 10 (10)µm/m, DoE = 1.0(1.0) Scp;
0.04 mm/m: T_{zul} = 10 (10)µm/m, DoE = 0.5(0.5) Scp; 0.1 mm/m: T_{zul} = 20 (40)µm/m, DoE = 0.4(0.8) Scp;
0.3 mm/m: T_{zul} = 60(120)µm/m, DoE = 0.4(0.8) Scp; 0.6 mm/m: T_{zul} =120(240)µm/m, DoE = 0.4(0.8) Scp;
Key: T = tolerance; Scp = scale parts; L = base length; DoE = difference value on envelope

The warranty claim of 2 years expires as a result of improper handling, repairs or dismantling of the goods as well as alteration or manipulation of the goods.