

# GLÖTZL Baumeßtechnik

## INSTALLATION and MEASURING INSTRUCTIONS for PNEUMATIC SETTLEMENT CELL

**Type: T 4**  
**Art. No.: 23.01.01**

### 1. Function

The settlement cells are working with a compensation valve like the cells for earth pressure and pore water pressure. The valve is loaded with a fluid medium by a plastic line. This fluid pressure is changed by occurring settlements (difference between central and cell).

When measuring the cell, a small constant air quantity is led into the feed line in which a back pressure is developing. This back pressure can only increase in the cell up to the searched size, as the overpressure valve in the cell is independently limiting a further increase of the back pressure.

The thus detectable back pressure in bars at the beginning of the line, that means outside of the building, randomized to the loading medium, is equal to the searched settlement.



Figure: Settlement cell type TA 4 30/30 LF 20 with settlement plate

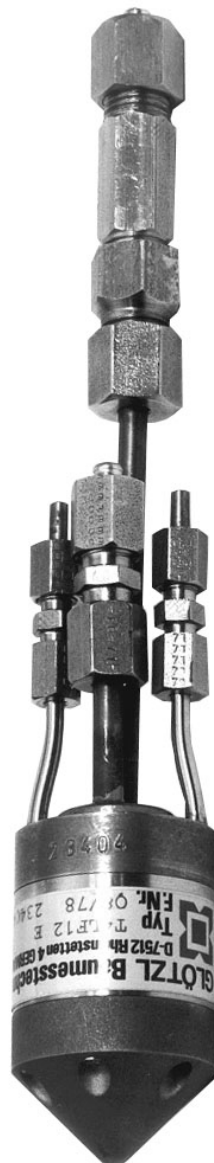
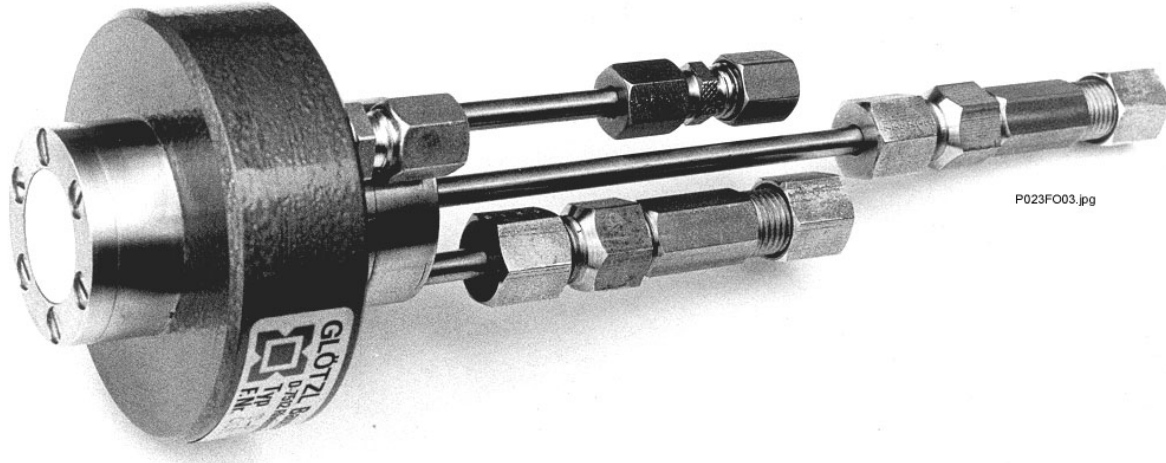


Figure: Settlement cell type TE 4 LF 12



Figure: Settlement cell type TB 4/8 LF 20

## Pressure Cell combined for Settlement Measurement and Pore Water Pressure



### Types:

- TA 4/8 LF 12** Settlement cell for mercury loading, combined with pore water pressure cell of rust- and acid-proof steel, Ø 40 mm with settlement plate, Ø 80 mm, maximum installation depth 12 m below measuring station  
 Control accuracy 1 cm settlement  
 0.01 bar pore water pressure, load limit 10 bars  
 Pore water pressure cell with ceramic filter, optional with sintered metal filter
- TA 4/8 LF 20** Settlement cell for water load, model like type LF 12  
 maximum installation depth 20 m below measuring station  
 Control accuracy: 5 cm settlement  
 0.01 bar pore water pressure, load limit 10 bars  
 Pore water pressure cell with ceramic filter, optional with sintered metal filter

### 3. Installation

For installation, you have to take care that the central is placed on a fixed point. If this is not the case, the central has to be levelled before each measurement. The lines of the settlement cell consist of the load line B1 (B2) and of pressure- and return lines. These lines have to be installed in relieving loops.

After installation of the cell, a zero measurement should immediately be carried out, if possible, to receive the reference value for further measurements.

The load line of the cell can be layed out in single line. When using mercury as load medium, a load return line should be used so that in case of danger the mercury can be removed out of line.

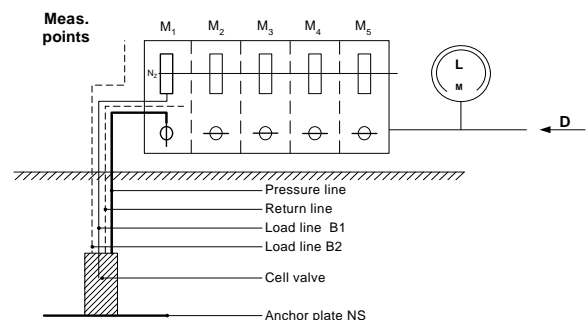
### 4. Measurement

The measurement can either be done with a manual air quantity regulator or with an electrically controlled air quantity regulator. But first, it must be checked whether the load medium of the change-over unit is reaching the marking in the inspection glasses.

Small differences can be compensated by displacement of the inspection glasses. Otherwise, the load medium has to be refilled or exhausted.

For measurement, the corresponding change-over valve has to be opened and then the measurement can be carried out with the air quantity regulator (see special description).

- M1 - M5** = Meas. points 1-5 with change-over valve and level indication  
 Load medium  
 N<sub>z</sub> level indicating central
- LM** = Display of meas. value  
 Recording with manual air quantity regulator,  
 electrically controlled air quantity regulator  
 or with an automatic measuring station
- D** = Compressed-air supply



## 4. Technical Data

### Load medium

Water	1 cm settlement =	0.00098 bar
	accuracy =	5 cm
Mercury	1 cm settlement =	0.01328 bar
	accuracy =	1 cm

### Max. meas. depth

(height difference central – settlement cell) for the above mentioned accuracy

Water	16 m = meas. value	1.568 bars
Mercury	7 m = meas. value	9.296 bars

### Connection bushing



for pressing in  $\varnothing$  45 mm, length 240 mm, one side for attachment to settlement cell, other side connection pivot,  $\varnothing$  35 mm, length 40 mm for rods, thread R 1"

## 5. Assemblage of Measuring Station with Terminal for Wall Assembly and Single Measuring Points

### Connection of Measuring Lines

corresponding to assembly example (see figure)

- Connect pressure line transparent and return line black - joined together by marking tape – to settlement cell and terminal, return line is ending free in terminal.
- Connect load lines B1 and B2, two transparent lines, to settlement cell and terminal.

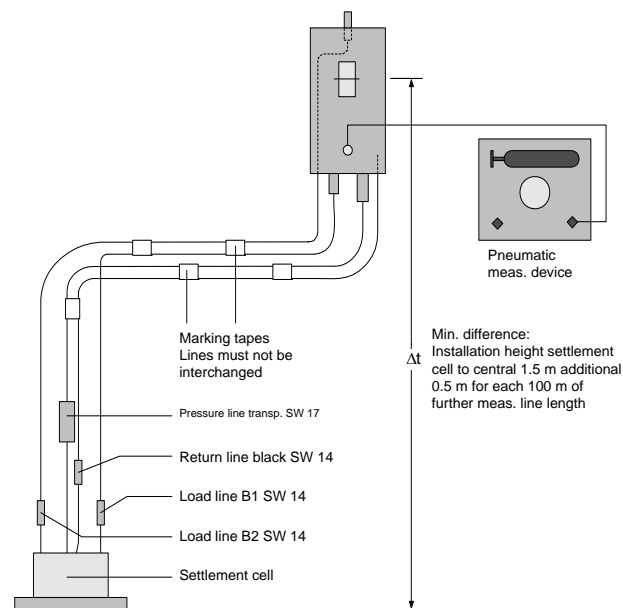
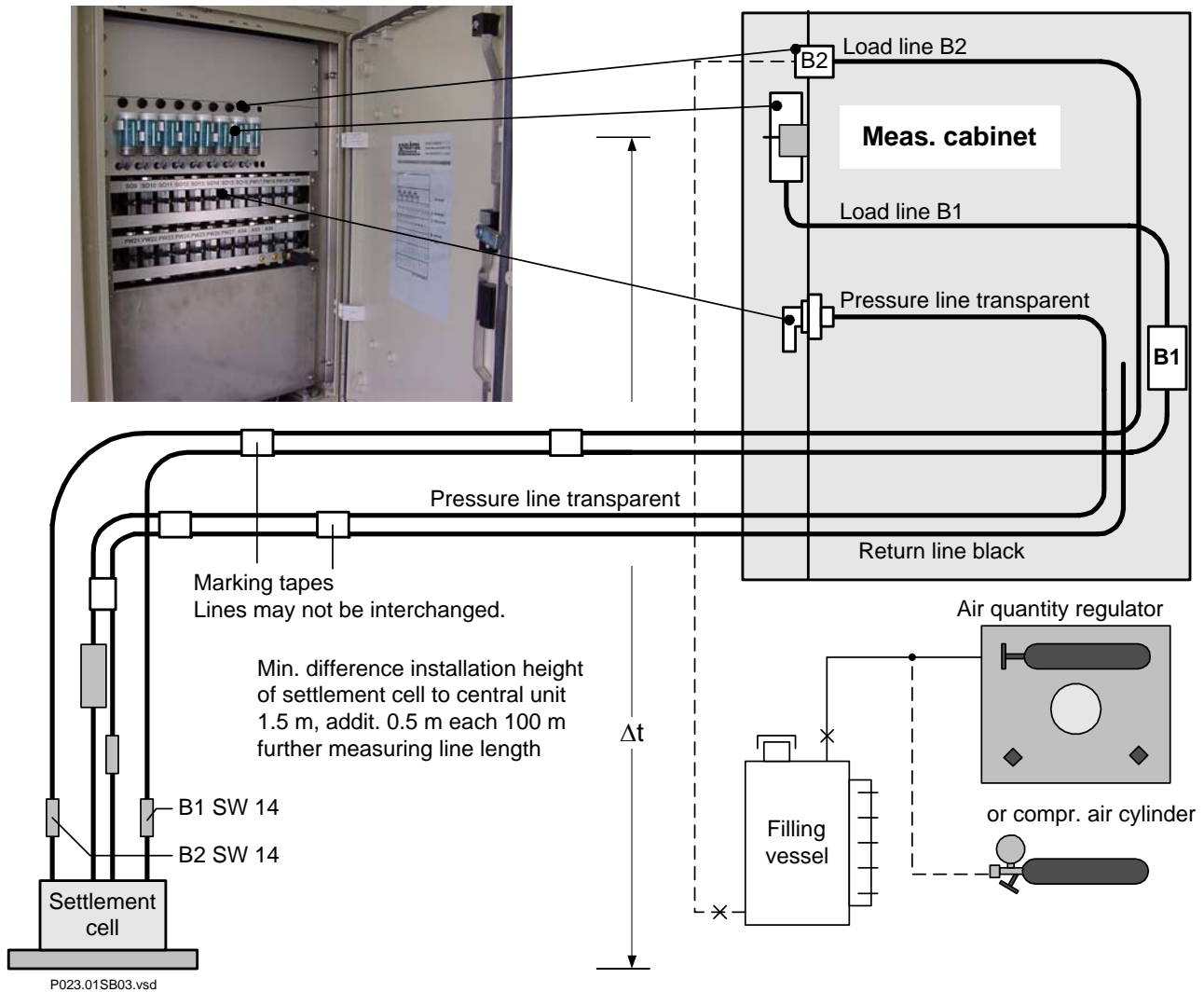


Figure: Measuring station with pneumatic measuring device ALR



Figure: Measuring central

## 6. Construction of Measuring Device, Change-over Manifold for Settlement Cell



## 7. Assembly and filling instructions

**Connection of measuring lines** corresponding to assembly example (see figure)

- Connect pressure line transparent and return line black - fitted to each other by marking tape - to settlement cell and terminal, return line is free ending in terminal.
- Connect load lines B1 and B2, two transparent lines, to settlement cell and terminal.

### Filling of load line

- Fill filling fluid, e.g. water demineralized, water with antifreeze agent as in the coolant of a car or acid-free highly-fluid oils in the filling vessel.
- Close filling vessel and apply 0.5-1 bar compressed air with an air quantity regulator or by a compressed air cylinder with pressure-reducing valve. Adjust corresponding pressure at the initial pressure manometer of the air quantity regulator and operate the device in the function "filling".
- Fill the load ring line by the connection of the load line B2. Pour filling fluid slowly and without bubbles. Completely rinse the load circuit once so that air inclusions can be removed. Fluid requirement 0.7 l./100 m line, e.g. for 100 m line length (50 m distance) let flow out approx. 0.7 l at the load vessel. For this, take load vessel out of holding device and collect the filling medium in a vessel.
- An outlet cock for fluid, a cock for the draught and also a filling level indicator are attached at the filling vessel. Before opening the vessel, always discharge it. Furthermore, discharge the vessel after each filling procedure so that no air is binned in the fluid. Adjust filling level by sucking away or refilling of fluid at the load vessel.