

LASER MEASURING HEAD FOR OPERATION ON BSF2



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AREAS OF APPLICATION

For a long time, laser measuring heads were only available for use at atmospheric pressure. Since 2023, the LASCTL2 laser measuring heads are available for measurements in gaseous media at up to 200 bar, which can be operated with the modular BSF2 tool.

When measuring in air in particular, the sonar signal is attenuated too much, meaning that a sufficient range cannot be achieved. In turn, the laser light is strongly absorbed in natural gas, making it unsuitable for use here. The laser measuring heads close this gap and can also be used in hydrogen.

MEASUREMENT PRINCIPLE

Modified laser modules from Loke are used in the laser measuring head. As with the sonar probe, the combination of the BSF2's tilt drive together with the vertically and horizontally aligned sensors in the new measurement head enables the measurement of pockets in the cavern walls as well as the roof and sump area.

Laser measurement requires a free optical line of sight. It is independent of the storage pressure and temperature as well as the gas composition.

SURVEY PROCEDURE

As the laser measuring heads are operated on the BSF2 tool, the usual range of functions and the measurement procedure only change slightly.

TECHNISCHE DATEN

Diameter:	75 mm
Length LASCTL2:	0.41 m
Weight LASCTL2:	3.3 kg
Maximum pressure:	200 bar
Range:	> 180 m (horizontal and vertical)
Laser class:	1 (no protective measures are required)
Wavelength:	905 nm
Accuracy:	0.06 m
All BSF2 modules (except sonar) can be used	

First, a log of all desired parameters including M-CCL (Multiple Casing Collar Locator) is run and a depth correction is made at the reference point (casing shoe LZRT). The cavern geometry is then measured with a large number of horizontal sections over the entire depth of the cavern. The floor, roof and any existing cavern back pockets are measured with the measurement head tilted. Depending on the cavern geometry, both the vertical distances between the individual horizontal sections and the angular steps between the tilted measurements are optimised.

During the survey of a section, the measuring head with the laser is positioned with servo support in the required direction and inclination and remains there until the distance to the cavern wall can be determined accurately. For this purpose, the BSF2 tool is operated in combination with a gyro stabilisation system that prevents rotational vibrations of the tool.

In addition to three magnetic field sensors, the latest generation of tools suitable for operating the laser heads also have an integrated natural gamma sensor and an optimised stabilisation unit.

