Calibration system
for pressure-based water level sensors

The system can be used to calibrate water level instruments based on hydrostatic pressure measurement - submersible water level sensors and bubblers. It uses gauge pressure generator with built-in reference sensor.
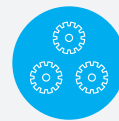

Calibrates bubblers and submersible water level sensors	**Complete solution for calibration**	**Pressure range equivalent to 0 to 70 m of water column or more**	**Calibrates multiple instruments at once**	**Calibration process automation with IMS4 CalibLab software**

An automated pressure controller simulates water depth by creating a stable pressure difference against ambient atmosphere. Calibrated sensors are connected by dedicated tubing and flanges professionally designed to create an air tight homogeneous pressure. The reading of the sensors is compared to a reference pressure sensor. We automate the calibration process where possible. The software controls the controller pressure, and takes readings from the reference pressure sensor. Electronic water level sensors can be calibrated automatically.

Multiple instruments connect to a data collection system via channel switch – Matrix. The system can handle up to 45 instruments at a time. Actual maximum number of instruments depends on their size, air supply and power supply requirements. Instruments that are not hermetic during measurement (bubblers) cannot be calibrated in parallel. Default calibration range is from 0 m to 70 m of water level (gauge pressure up to 700 bar). Contact us, if you require other ranges.

The pressure controller measurement accuracy includes linearity, hysteresis, repeatability and temperature effects over calibrated temperature range for gauge pressures. Precision of the controller is ensured by steady state temperature and regular zeroing.

Pressure controller parameters

Gauge pressure range (FS)	(0 to 700) kPa
Accuracy	0.02 % Rdg +0.02 % FS
Long-term stability	0.03 % FS per year
Pressure control stability	0.005 % FS
Calibration	accredited
Calibration uncertainty (k = 2)	300 Pa or better
Barometric reference	optional (0.01 kPa precision)
Communication interface	RS-232, Ethernet
Weight (without pressure control module)	5 kg
Dimensions	440 x 88 x 320 mm

Oil-free silent compressor

The compressor provides compressed air supply to the pressure controller. The compressor is low noise and maintenance free.

Air supply capacity	110 lpm
Tank capacity	15 l
Maximum pressure	800 kPa
Supply power consumption	550 W
Acoustic noise level	54 dB(A)
Weight	23 kg
Dimensions	530 x 370 x 370 mm

Universal digital multimeter

The sensors with dedicated analog output are calibrated using the digital multimeter capturing the analog value representing the sensor pressure. The digital multimeter is a standalone bench top device capable of voltage and current measurements. The data is send over communication interface to the software.

Current measurement range	100 mA at least
Calibration uncertainty (k = 2)	0.01 mA or better
Voltage measurement range	10 V at least
Calibration uncertainty (k = 2)	0.02 mV or better

Automate calibration with IMS4 CalibLab

With IMS4 CalibLab, the process of calibration and adjustment of sensors can be fully automated. Read more:

The software guides the user through the calibration setup in several steps. The software can read serial numbers from certain (digital) sensor types. Preconfigured sensor types include specific calculation of uncertainty, corrections and other formulas. Graphic user interface (GUI) allows the user to configure a new type of sensor. A list of setpoints can be edited, saved or loaded (after choosing the setpoint list, the fully automated calibration system sets the water depth by creating a stable pressure difference against ambient atmosphere) and scans the readings from all devices under the test. The system evaluates the readings for stability, calculates mean values and uncertainty. In case of any problem, error is readily indicated. After the process goes through all setpoints, the results are stored in a database. You can generate certificates for all devices under the test by one click. The certificate is generated from a template. You can freely edit the template to fit your needs. The database of calibrations holds the history of calibrations from whole calibration laboratory at one place. You can browse it by quantity, year, sensor type, serial number etc. Looking for calibration history of a certain instrument is a brief. The built-in database browser allows online tabular and graphical view of multiple certificates. The software supports export to .csv, .odt, .xml and .pdf formats. Whole database can be backed-up or restored by simple click of a button. There is also provision of automatic periodic back-up.

- Support for calibration of more quantities
- Graphical user interface
- Multiple step wizard for easy setup of calibration
- Automated instrument serial readout (if supported by instrument)
- Simultaneous calibration of multiple instruments
- User defined sensor types
- Automated calibration controller
- User defined calibration process (setpoint list)
- Support of saving / loading of setpoint list
- On-line graphing of read values, chart zooming
- On-line calculation of statistics and uncertainty
- On-line display of elapsed time and time estimate until the end
- Display of preliminary results during calibration
- Possibility to stop, pause or restart the calibration process
- Detection of sensor fault, automatic kick-out or wait until the problem is solved
- Indication of errors, sound alarm
- Generation of calibration certificates from template document
- Database of calibrations, filtering, graphing, export to .csv, .pdf, .odt, .xml
- Database backup / restore from file, automatic backup scheduler

For the automatic adjustment of the other types of sensors please contact **info@microstep-mis.com**.