



Monitoring Instruments Specification Sheet

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Inclinometers piezometers load cells strain gauges and water level meters for long term geotechnical and structural monitoring.

In Place Inclinometers

In place inclinometers are left installed in the casing so a borehole is read continuously instead of being surveyed by hand. The probe is IP68 rated at 28 by 28 by 324 mm with RS485 output as standard and CAN on request, reading plus minus 30 degrees at 0.0005 degree resolution. Interval lengths of 1 m, 2 m and 3 m let a string be built to match the depth of the zone being watched.

Parameter	Value
Output	RS485 default, CAN optional
Measuring Range	plus minus 30 degrees
Resolution	0.0005 degrees
Accuracy	plus minus 0.005 degrees from 0 to 15 degrees, plus minus 0.01 degrees from 15 to 30 degrees
Repeatability	plus minus 0.003 degrees
Zero Temperature Drift	plus minus 0.002 degrees per degree C from minus 20 to 60 degrees C
IP Grade Of Probe	IP68
Cable Diameter	6.6 mm, 60 m default
Probe Size	28 by 28 by 324 mm
Working Temperature	minus 20 to 60 degrees C
Interval Length	1 m, 2 m, 3 m and others supported

Vibrating Wire Load Cell

Two earth pressure load cell models are supplied. AT-LC-2020 is a vibrating wire load cell for the pressure stress between soil and structures such as earth rock dams, revetments, wharf walls, high-rise buildings, piers, retaining walls, tunnels, subways, airports, highways, railways and cut-off walls. AT-LC-2030 is a strain type micro earth load cell for model tests, soft soil subgrade, asphalt pouring, retaining walls and pipeline fluid contact pressure.

Parameter	Value
Models	AT-LC-2020 vibrating wire load cell and AT-LC-2030 strain type micro earth load cell
Specification Steps	1 2 4 6 8 10 16 25 40 60
Measuring Range AT-LC-2020	0.1 0.2 0.4 0.6 0.8 1.0 1.6 2.5 4.0 6.0 MPa
Resolution AT-LC-2020	0.08 percent FS or better
Total Error AT-LC-2020	1.5 percent FS or better
Total Range AT-LC-2030	0 to 1.0 MPa, customised to requirement
Resolution AT-LC-2030	0.05 percent FS or better
Size AT-LC-2030	28 by 7 mm
Impedance AT-LC-2030	350 ohm
Insulation Resistance AT-LC-2030	at least 200 megohm
Working Temperature	minus 25 degrees C to plus 60 degrees C

Vibrating Wire Strain Gauge

Two vibrating wire strain gauge models are supplied. AT-SG-4051 is a concrete strain gauge for welding to steel structures such as pipe, tunnel support, piles and bridges, or fixing to a surface with screws. AT-SG-4052 is a surface strain gauge in an all stainless steel housing with secondary sealing for long-term monitoring of concrete beams, columns, bracings, retaining walls, linings, piers, footings and bedrock. Both read 1000 microstrain in tension and 1500 microstrain in compression and measure the temperature of the embedded point at the same time.

Parameter	Value
Models	AT-SG-4051 concrete strain gauge and AT-SG-4052 surface strain gauge
Specification	100 mm
Measure Range	Pull 1000 microstrain, Pressure 1500 microstrain
Resolution	0.015 percent FS or better
Total Error	1.5 percent FS or better
Temperature Measure Range	minus 25 degrees C to plus 60 degrees C
Temperature Measure Accuracy	plus minus 0.5 degrees C
Housing	All stainless steel on AT-SG-4052

Vibrating Wire Piezometer

Vibrating wire piezometers in the AT-PIE30 series measure pervious pressure in the foundations of dams, hydraulic structures and other buildings. AT-PIE3031 has secondary sealing for filling type installation, AT-PIE3032 is the filling type standard model and AT-PIE3030 is for drilling type installation. All cover ten pressure ranges from 0.1 MPa to 6.0 MPa and can be supplied with a temperature sensor for the buried point.

Parameter	Value
Models	AT-PIE3031 filling type with secondary sealing, AT-PIE3032 filling type, AT-PIE3030 drilling type
Specification Steps	1 2 4 6 8 10 16 25 40 60
Measuring Range	0.1 0.2 0.4 0.6 0.8 1.0 1.6 2.5 4.0 6.0 MPa
Resolution	0.05 percent FS or better on AT-PIE3031 and 0.08 percent FS or better on AT-PIE3032
Total Error	1.0 percent FS or better on AT-PIE3031 and 1.5 percent FS or better on AT-PIE3032
Working Temperature	minus 25 degrees C to plus 60 degrees C
Temperature Measure Accuracy	plus minus 0.5 degrees C
Temperature Measure Resolution	0.0625 degrees C

Geotechnical Inclinator

The geotechnical inclinometer is a traversing probe lowered through grooved casing to survey lateral movement with depth. The probe is IP68 at OD 25 mm by 758 mm long and reads plus minus 30 degrees at 0.001 degree resolution, with accuracy of plus minus 0.01 degrees between 0 and 12 degrees. It is supplied with 6.6 mm cable, 60 m as standard.

Parameter	Value
Measuring Range	plus minus 30 degrees
Resolution	0.001 degrees
Accuracy	plus minus 0.01 degrees from 0 to 12 degrees, plus minus 0.05 degrees from 12 to 30 degrees
Repeatability	plus minus 0.003 degrees
Zero Temperature Drift	plus minus 0.002 degrees per degree C from minus 20 to 60 degrees C
IP Grade Of Probe	IP68
Cable Diameter	6.6 mm, 60 m default

Probe Size	OD 25 mm by 758 mm length
Working Temperature	minus 20 to 60 degrees C

Water Level Meter

The GT-WLM series water level meter is a dip meter for measuring water depth in boreholes and standpipes. Eight tape lengths cover 0 to 30 m up to 0 to 500 m, all with 1.0 mm resolution and 2.0 mm repeatability, running on a DC 9 V supply. The head sounds a buzzer and lights up on contact with water so the depth can be read off the tape.

Parameter	Value
Models	WLM-30 WLM-50 WLM-100 WLM-150 WLM-200 WLM-300 WLM-400 WLM-500
Measure Depth	0 to 30, 50, 100, 150, 200, 300, 400 and 500 m by model
Resolution	1.0 mm
Repeatability	2.0 mm
Power Supply	DC 9 V
Weight	4.5 5.5 6.5 7.5 8.5 10 12 15 kg by model

Published values are general averages for reference. Actual product data should be based on the results of actual testing within the applicable scope.