MDP360

_ MD-PROFILE 360

INCLINOMETERS
& PENDULUMS

SISGEO®

MDP360_EN_07_04/2026

MD-PROFILE 360

MD-Profile gauges are designed to be placed within internally flush tubes or inclinometer casing without internal discontinuity.
The system is suitable for geotechnical and structural applications, where accurate profiling is required.
Each segment is mechanically and electrically linked to one another through connectors in a RS485 Modbus daisy chain configuration.
Its centering device has the joint between two probes exactly at the point of contact with the tube. This design maintains the orientation of the entire chain in the center of the tube and prevents unwanted movement of nearby gauges.
Centering device pressors are available in three sizes for different tubes. They can be removed and replaced to use the same gauge in different tube sizes.
Innovative 360° technology, allows each gauge to be calibrated over the full 360° range on three axes. This permits the MD-Profile to be installed in any orientation in space with no effect on measurement quality.
Customers may utilize any electronic device compatible with RS485 and Modbus RTU protocol as a logger.
The MD-Profile system gives a complete and transparent set of data without any previous filtering or interpretation.

MAIN APPLICATIONS

- Deep excavations
- Retaining walls / Slurry walls
- Tunneling
- Dams
- Landslides
- Embankments

FEATURES

- each sensor is individually calibrated
- available in different gauge length: 0.5, 1, 1.5, and 2m
- saving time for installation and higher flexibility in change the system's arrangement at site.
- connector not compatible with previous MD-Profile biaxial

Patent No.102021000011177
Calibration method registered with SIAE under number 2024/00874

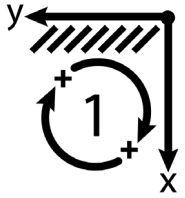
CE *Meet the essential requirements of the EMC Directive 2014/30/UE*

MDP360_EN_07_04/2026

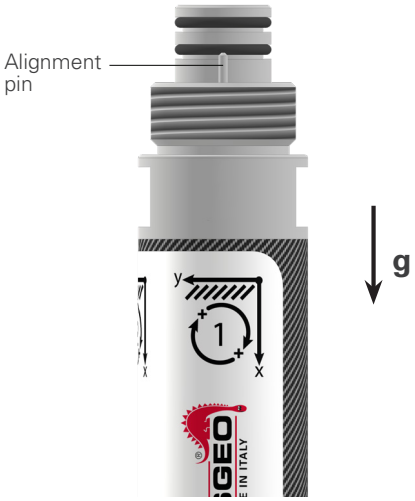
WORKING PRINCIPLE

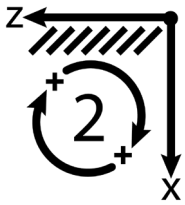
The sensor utilized in MD-Profile 360 is a triaxial MEMS accelerometer. The three axes x, y and z of the MEMS sensor define three planes XY, XZ and ZY generated by the pairs of axes xy, xz and zy.
MEMS sensors are capable of measuring inclinations with respect to the acceleration of gravity "g."

In the three next pictures, the MD-Profile is installed in a **vertical tube** so that the x axis is vertical and parallel to g.
In this position, the MEMS sensor will be able to measure the rotations of the XY and XZ planes, while it will NOT be able to measure the rotations of the ZY plane (perpendicular to the acceleration of gravity "g").
The rotations of the three planes XY, XZ and ZY are defined by the numbers 1, 2 and 3 corresponding to channels 1, 2 and 3 of the instrument output (refer to the labeling on the gauges, the label "3" is not applied due to clearance).
So, with MD-Profile installed in a vertical tube like in the below pictures, channels 1 and 2 of the gauge will give the rotation of the YX and XZ planes, while channel 3 will return no data (channel automatically disabled). Channel 3 will remain disabled if the inclination of the ZY plane relative to the horizontal is less than 40° or greater than 140°. In this way, the stated accuracy performance can be guaranteed.

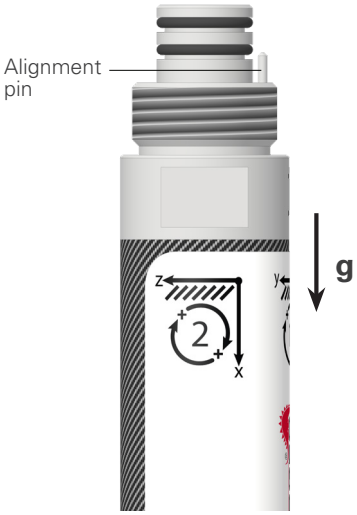


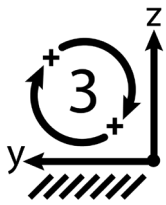
MALE CONNECTOR ON TOP, LABEL "1" AND ALIGNEMENT PIN IN THE FOREGROUND.



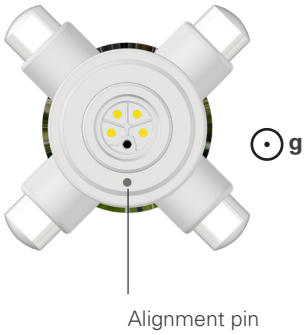


MALE CONNECTOR ON TOP, LABEL "2" IN THE FOREGROUND, ALIGNMENT PIN AT RIGHT SIDE.





VIEW FROM MALE CONNECTOR, ALIGNMENT PIN ON BOTTOM



If the gauge is installed e.g. in a **horizontal tube** such that the y-axis is vertical and parallel to g, the data returned by the gauge will be on channel 1 (XY plane rotation) and channel 3 (ZY plane rotation), while channel 2 will return no data (channel automatically disabled as described before for the vertical application).
With this configuration, by simply reading channels 1 and 2, or 1 and 3, a MD-Profile string can cover most of the required installation types (vertical, sub-vertical and horizontal tubes). In addition, due to calibration over the entire 360° range on all axes, there will be no risk of install the instrument out of range.

The MD-Profile 360 gives the values of internal temperature and voltage tension on channels 13 and 15, and the calibrated components of gravity accelerations g_x, g_y and g_z on channels 7, 8 and 9. This is in keeping with Sisgeo's view of complete data transparency.

MDP360_EN_07_04/2026

TECHNICAL SPECIFICATIONS

MD-PROFILE 360 PRODUCT CODES	0MDP3600050 (0.5m gauge length) 0MDP3600100 (1.0m gauge length) 0MDP3600150 (1.5m gauge length) 0MDP3600200 (2.0m gauge length)
Measurement principle	Triaxial MEMS accelerometer
Measuring range	**360° (±180°) on all three axes** (see WORKING PRINCIPLE)
Repeatability	<± 0.001°
Resolution	0.0001°
Stability @ 24 hours	<± 0.008° (max temperature variation during the test 0.1°C)
Sensitivity (1)	see Calibration Report
MPE Accuracy (2)	<±0.02° (<±0.0055% FSR @360°)
Offset temperature dependency	±0.002° / °C
Power supply	from 8 to 28 Vdc
Signal output and protocol	RS485, Modbus RTU (3)
Average consumption	3.7 mA @ 24 Vdc, 7.0 mA @ 12 Vdc
Temperature operating range	from -30°C to +70°C
Repeatability (precision) of a string of MD-Profile gauges (4)	±0.5 mm / 30 m
Internal temperature sensor (5) - measuring range - accuracy (resolution)	Embedded on electronic board (output channel 13) - 40°C to +125°C ±1°C with temperature range -10°C to +85°C (res. 0.01 °C)
On-board supply voltage monitor (5) - measuring range - accuracy (resolution)	Embedded on electronic board (output channel 15) 0 to 36 V ±5% FS (res. 0.01 V)
Max. cable length to logger	1000 m (for more information see FAQ #077) (6)

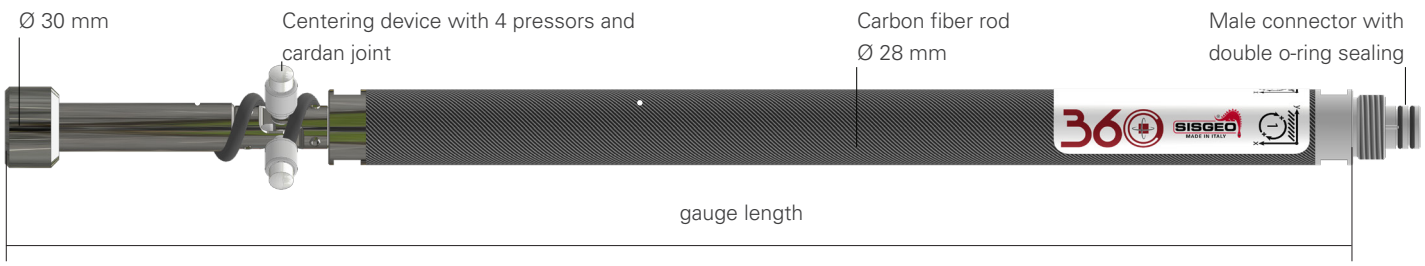
CENTERING DEVICE PRODUCT CODES	0MDP4PRESS52	0MDP4PRESS58	0MDP4PRESS73
Nominal range (tube ID)	52 ± 1 mm	58 ± 1 mm	73 ± 1 mm
Total range	50 to 54 mm	54 to 61 mm	69 to 76 mm

(1) Sensitivity is a specific paramenter different for every gauge. The sensitivity is calculated during gauge calibration test and inserted into the Calibration Report.
(2) MPE is the Maximum Permitted Error on the measuring range (FSR). In the Calibration Report, the accuracies of the gauge are calculated using the linear regression; the error reported is the maximum residual error on the FSR on the three axis
(3) RS485 not-optoisolated Modbus communication with RTU Protocol Default output is degree. Other units available are mm/m or inch/feet (to be requested at order). Sisgeo Modbus protocol manual is available for download on Sisgeo web site.
(4) 12 days test, reference reading taken 3 hours after installation, system composed by 30 MD-Profile gauges with 0.5m elongation rod. Test performed in nearly-repeatability conditions.
(5) These sensors are installed on the internal electronic board to give information in the event of probe malfunction.
(6) Refer to FAQ section on Sisgeo website: www.sisgeo.com/faq

MDP360_EN_07_04/2026

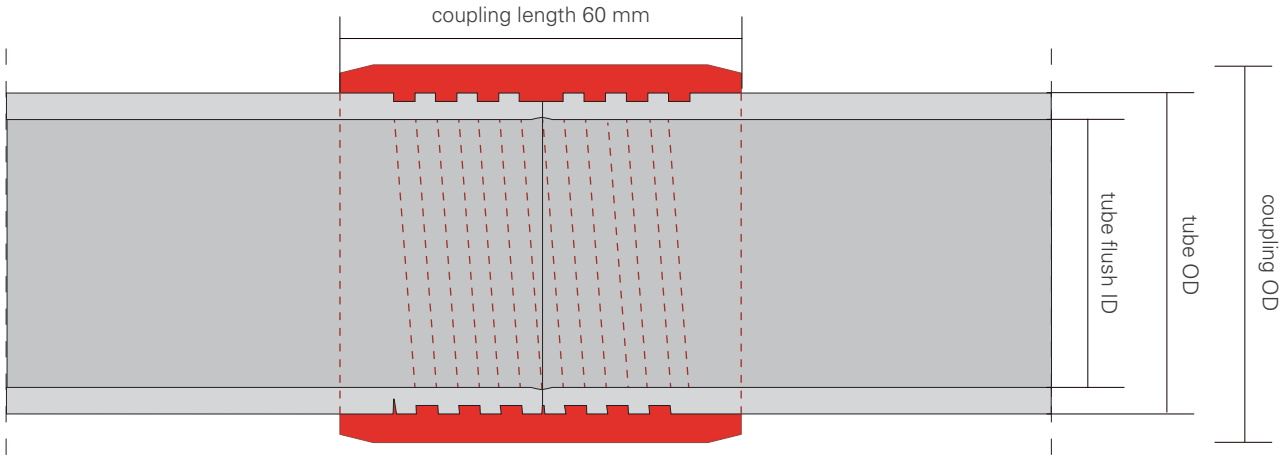
PHYSICAL FEATURES

Main body material	Carbon fibre rod with steel joints
IP protection class	IP68 up to 1.0 MPa (up to 2.0 MPa under request)
Tubes compatibility nominal internal diam.	52 ± 1mm (2" MD Profile tube) - 58 ± 1mm (S143 inclinometer casing) - 73 ± 1mm
Standard length / weight weights include the centering device	0.5 m length/ 0.70 kg - 1.0 m length / 0.85 kg - 1.5 m length / 0.97 kg - 2.0 m length / 1.10 kg



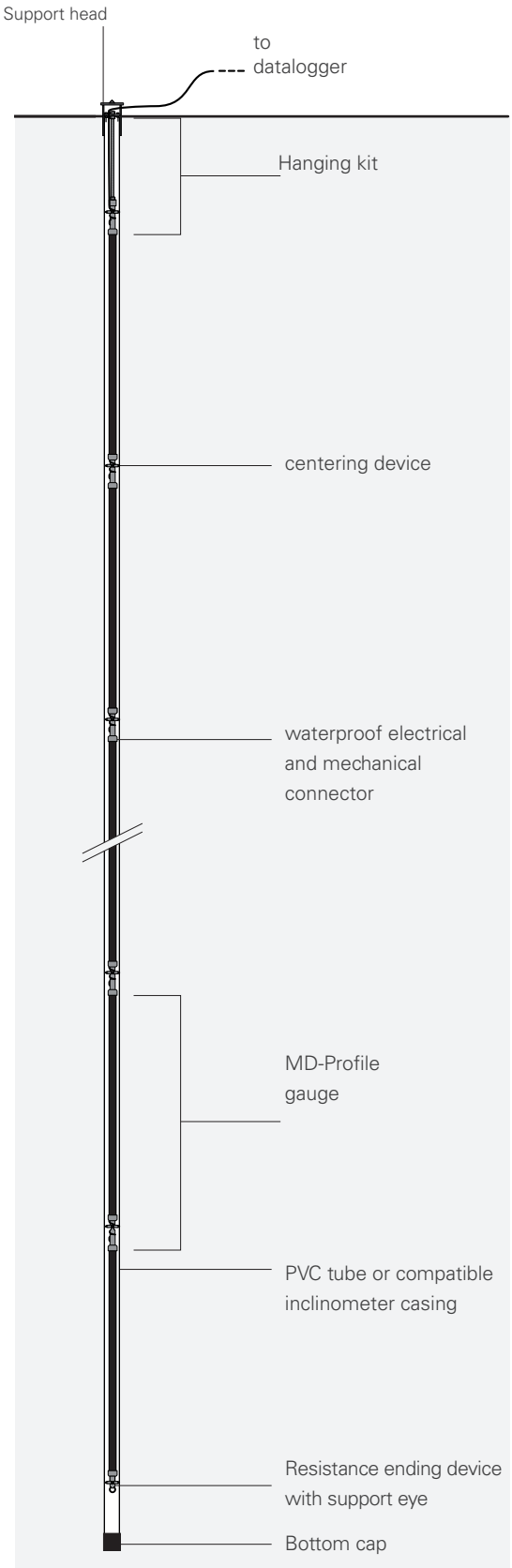
MD-PROFILE 2" TUBES

PRODUCT CODES: TUBE WITH ONE COUPLING BOTTOM CAP	 0MDP20TPV30 0MDPT020CAP
Applications	MD-Profile array
Tube diameters and length	flush ID 52 mm, OD 60 mm, length 3000 mm
Collapse test	15 bar
Material	PVC DURVINIL®
Coupling	Threaded joint without internal discontinuity OD 70 mm, length 60 mm



MDP360_EN_07_04/2026

ACCESSORIES AND SPARE PARTS FOR VERTICAL APPLICATION



4 PRESSORS KIT FOR MDP360
OMDP4PRESS52
OMDP4PRESS58
OMDP4PRESS73

Kit consisting of 4 pressors for tubes with an inner flush diameter of 52±1mm, 58±1mm, or 73±1mm

HANGING KIT
OMDHANGK52N
OMDHANGK58N
OMDHANGK73N

It includes the electro-mechanical connector for the upper gauge, 15m long signal cable, three 1m steel positioning rods, funnel installation device, wrench for disassembly pressors, 52mm, 58mm, or 73mm centering device kit, and 4 spare pressors

SUPPORT HEAD
OS4TS101000

It is installed at the top of the tube for loking the hanging kit. It includs the locking cap with topographic bolt.

MDP RESIST. ENDING DEVICE
OETERMMDOON

Termination resistance with connector, needed to close every digital MD-Profile chain. The value of resistor depends on the layout of the project. For more detail see the FAQ#076.

MIND PORTABLE READOUT
OMIND000000

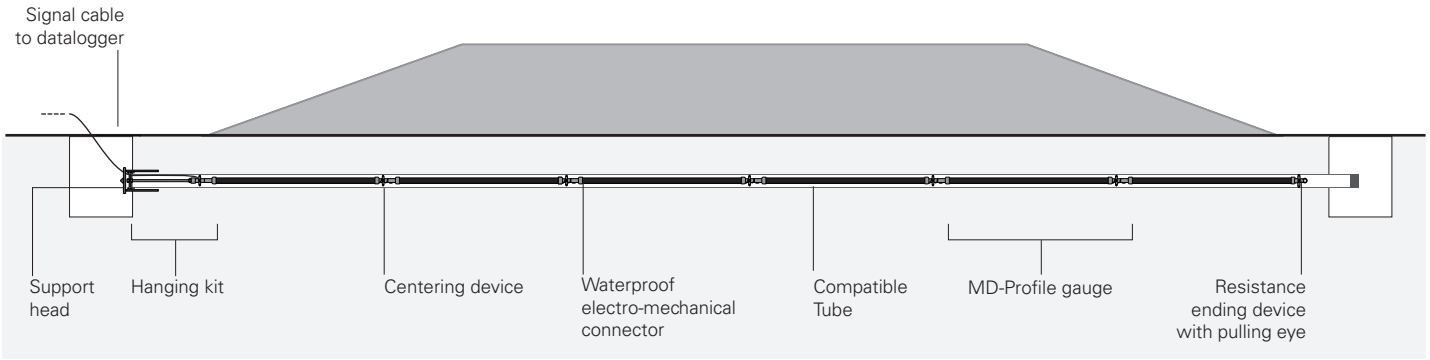
MIND is a portable readout unit that can read all Sisgeo instruments. It is strongly recommended that a MIND readout be used to check instruments in the field before and after installation. MIND will also be useful for changing addresses, updating firmware, changing power modes and measuring units of MD-Profile gauges.

MDP-MIND CABLE
OECAV8PDIG2

Cable to connect MIND readut to MD-Profile 360° male connector. This cable is not compatible with older biaxial MD-Profiles.

MDP360_EN_07_04/2026

ACCESSORIES AND SPARE PARTS FOR HORIZONTAL APPLICATION



HORIZ. SUPPORT HEAD
ODEXOTS2350

It is installed on tube collar for loking the hanging kit. It includs the locking cap with topographic bolt.

MDP RESIST. ENDING DEVICE
OETERMMDOON

Termination resistance with connector, needed to close every MD-Profile chain. The value of resistor depends on the layout of the project.

STEEL PULLING WIRE
OWRAC250000

Pulling wire 2.5mm OD to be placed within MDP tube (open at both ends) for long array installation.

4 PRESSORS KIT FOR MDP360
OMDP4PRESS52
OMDP4PRESS58
OMDP4PRESS73

Kit consisting of 4 pressors for tubes with an inner flush diameter of 52±1mm, 58±1mm, or 73±1mm

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It includes the electro-mechanical connector for the upper gauge, 15m long signal cable, three 1m steel positioning rods, funnel installation device, wrench for disassembly pressors, 52mm, 58mm, or 73mm centering device kit, and 4 spare pressors

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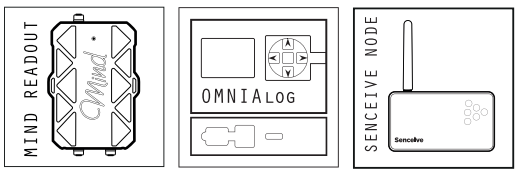
READABLE BY



For further information refer to their own datasheets

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ADDITIONAL SUPPORT

SISGEO offers on-line assistance service to the Customers in order to maximize the performance of the system and training on the correct use of the instrument/readout.

For more information contact mail: ***assistance@sisgeo.com***