

# INCLINOMETER CASING

## Model ICA-2000

### APPLICATIONS

ICA-2000 inclinometer casing is used to house inclinometer probes that measure either lateral movement and deformation of soil, rock and structures when installed in near vertical boreholes, or settlement when installed horizontally in boreholes or trenches. Applications include:

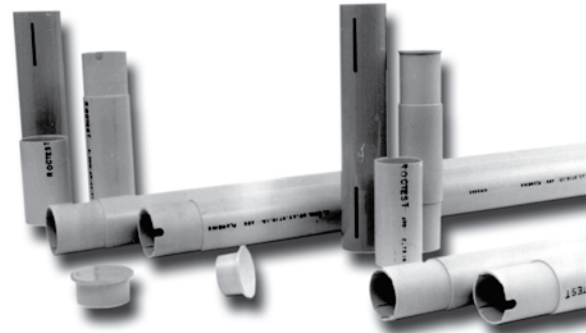
- Monitoring of landslide
- Monitoring of dam and embankment performances
- Monitoring of movement in retaining walls, diaphragm walls, sheet piles and laterally loaded piles
- Measuring of ground movement due to tunneling
- Monitoring settlement in landfills, tank foundations and embankments

### DESCRIPTION

The ICA-2000 inclinometer casing is an ABS pipe with four orthogonal grooves running longitudinally along its inside surface. When installed in a borehole, one set of grooves is aligned in the anticipated direction of movement. The grooves act as guides for the wheels of the inclinometer probe, maintaining the orientation of the probe as it traverses the casing.

A standard ICA-2000 inclinometer casing has machined ends with alignment notches that engage the alignment key of the coupling. Couplings are assembled with solvent cement and rivets. The couplings are pre-drilled to ensure correct alignment of rivets.

Telescoping couplings and sections are used when significant settlements are anticipated. The ends of the casing have four pre-drilled holes that line up with four slots in the telescoping coupling. Cap screws inserted through the slot of the coupling into the casing enable the coupling to be extended or compressed, while maintaining groove alignment from one section of casing to the next. Spiral surveys may be performed on deep installations, or where high accuracy is critical. Spiral data allows inclinometer data to be corrected for twisting of the casing that may occur during installation.



ICA-2000 casing with couplings and caps

### FEATURES

- Self-aligning casing and couplings
- Environmentally resistant, strong and flexible ABS plastic construction
- Precision manufacturing to meet or exceed all industry standards
- Pre-drilled couplings
- Available with standard or telescoping couplings or telescoping casing sections
- Compatible with all inclinometer and settlement probes

### OPERATING PRINCIPLE

The casing, whether installed within boreholes or fastened to the surface of a structure, responds to any deflection or deformation of the surrounding material or structure. An inclinometer probe, fixed or wheel-mounted and oriented by the internal grooves, measures the tilt angle of the casing from the vertical. Changes in the tilt angle caused by casing deflection or deformation are converted to displacements normal to the casing axis and are incrementally summed to provide profiles of total displacement versus depth.

## SPECIFICATIONS

	70 mm Casing	85 mm Casing
Casing sizes (standard & telescoping)	70 × 59 mm (OD × ID)	85 × 72 mm (OD × ID)
Casing length (standard & telescoping)	1.5 m 3 m	1.5 m 3 m
Groove control (spiral)	<1/3° / 3 m	<1/3° / 3 m
Maximum compr./ext. using standard couplings	1% of length	1% of length
Material	ABS	ABS
Weight		
Standard (1.5 / 3 m)	1.6 / 3.4 kg	2.2 / 4.7 kg
Telescopic (1.5 / 3 m)	1.6 / 3.3 kg	2.2 / 4.6 kg
<b>STANDARD COUPLING</b>		
Dimensions (OD × length)	69.9 × 152.4 mm	88.9 × 152.4 mm
Weight	0.1 kg	0.2 kg
<b>TELESCOPING COUPLING</b>		
Dimensions (OD × length)	72.9 × 381 mm	88.9 × 381 mm
Effective length (extended position)	150 mm	150 mm
Telescoping range per coupling (maximum from extended position)	150 mm	150 mm
Weight	0.22 kg	0.40 kg
<b>TELESCOPING SECTION</b>		
Diameter	72.9 mm	88.9 mm
Length, fully extended	762 mm	762 mm
Length, fully compressed	610 mm	610 mm
Weight	0.7 kg	1.1 kg
<b>PROTECTIVE CAP</b>		
Outside diameter	69.9 mm	84.8 mm
Weight	0.03 kg	0.05 kg

## ACCESSORIES

- Grout plug and grout tube
- Centralizers
- Solvent cement & cleaner
- Casing clamp
- Pop rivets and gun
- Settlement flange

## INSTALLATION

Inclinometer casing is installed in boreholes ranging from 82 mm to 150 mm in diameter. The casing string and lower end cap are glued to form a solvent welded assembly. Pop rivets are used to provide greater initial strength as well as for deep installations. Coupling joints are wrapped with tape. The top end terminates with a protective plastic cap and an optional steel protective housing.

## ORDERING INFORMATION

DESCRIPTION	MODEL NUMBER	
	70 mm (2.75") OD casing	85 mm (3.34") OD casing
Standard casing (1.5 m length)	ICA-2010	ICA-2031
Standard casing (3 m length)	ICA-2012	ICA-2033
Standard coupling	ICA-2014	ICA-2035
Telescoping casing (1.5 m length)	ICA-2016	ICA-2037
Telescoping casing (3 m length)	ICA-2017	ICA-2039
Telescoping coupling	ICA-2018	ICA-2041
Telescoping casing section	ICA-2019	ICA-2043
Protective cap	ICA-2020	ICA-2045
Settlement flange	ICA-2021	ICA-2047
Grout plug – Quick connect type	ICA-2022	ICA-2049
Female connector for grout plug		ICA-2050
Pop rivet (standard coupling)		ICA-2051
Allen screw (telescoping coupling)		ICA-2052
Allen screw (telescoping section)		ICA-2052A
ABS – DWV solvent cement (per 20 couplings)		ICA-2053
ABS – DWV solvent cleaner		ICA-2061
Casing clamp		ICA-2055
Drill bit		ICA-2058
Pop rivet gun		ICA-2059
Sealing tape		ICA-2060
Grout tube 12.7 × 15.9 mm (1/2 × 5/8 in.)		ICA-2070
Grout tube 15.9 × 19.1 mm (5/8 × 3/4 in.)		ICA-2080
Installation tool kit complete		ICA-2090