

## Description

**Inclinometer casing** is used for the portable inclinometer or in place inclinometer, comprised of three meters lengths of ABS pipe with four internal grooves spaced 90 degrees apart and running along the entire casing length. Inclinometer casing is typically installed in bore holes, but may also be embedded in fills, cast into concrete, or attached to a structure.

The internal groove of inclinometer casing controls the orientation of inclinometer probe or in place inclinometer.

The deflection or deformation of the surrounding soil or structure causes change in tilt angle of the casing from vertical. These changes in tilt angle are measured by the readout.

Inclinometer casing is affected by causes; the diameter of casing, appreciate strength, flexibility and spiral. Ace's casing is made for being fit for them.

## Consideration of selection of casing

### ■ Casing diameter

Casing diameter has mainly influence on inclinometer installation because big deformation may cause the closure of the casing, and also the inclinometer probe can not be come out in case of installing the small diameter casing in the place which the big deformation is expected. In preparation in this corporation, we recommend using bigger diameter casing due to providing longer life.

Casing O.D	Application
φ60 mm	<ul style="list-style-type: none"> <li>■ Attaching to surface of structures or being embedded in cast into concrete</li> <li>■ Installing in borehole surrounded by rock</li> <li>■ Installing in area acting large deformation or distributed load</li> </ul>
φ70 mm	<ul style="list-style-type: none"> <li>■ Installing in field which large displacements is expected.</li> <li>■ Most appreciate for most structures and fills</li> </ul>
φ85 mm	<ul style="list-style-type: none"> <li>■ Installing for long term monitoring</li> <li>■ Installing in area, that depth is more than 40 meters deep or much shearing exist</li> <li>■ Installing a Horizontal inclinometer</li> </ul>

### ■ Sleeve

Ingress of grout may be choked up and damage to the wheels of their inclinometer probe. Sleeve manufactured by Ace Instrument is designed to prevent the problem and to be easy to assemble.

## Standard for selecting casings

Model	Grade	Processing method	Operating site	Features
RC Casing	High Accuracy	Guide groove is processed by broaching machine. The internal and outer diameter is processed by CNC machine.	The site that the general inclinometer is operated. The area that is the change of the water is much big.	Snap-In type without the coupling Available to quick installation. It is superior collapse strength at the connecting part
SC Casing	High Accuracy	Guide groove is processed by broaching machine. The internal and outer diameter is processed by CNC machine.	The site that the general inclinometer is operated. The site that the installation depth is more than 30m.	Flush type which diameter of coupling and casing are same.
EC Casing	Accuracy	Extruded finished goods	The site that the general inclinometer is operated. The site that the installation depth is less than 20m.	Economical price compared to precision.

### ■ Casing materials

Inclinometer casing extruded by ABS resin in Ace Instrument is used in ground water, grouts, all types of soils and soft ground that large deformation or deflection is expected. It is designed to be easy to assemble and to retain flexibility over a wider temperature range.

Inclinometer casing provides better conformance to be flexible than aluminum casing and to handle than fiber- glass casing.

ABS casing can be formed with greater precision than aluminum casing and does not corrode. It is also more flexible than aluminum casing and is unaffected by electrical noise.

Inclinometer casing has strength and flexibility over a wider temperature range than PVC or PP casing.

### ■ Spiral

Guide grooves are aligned in orientation of inclinometer probe. If grooves are twisted during transport, installation and storage, the direction of inclinometer probe or in place in inclinometer will alter during measurement so it will be impossible to determine the direction of ground behavior.

Inclinometer casing manufactured by Ace Instrument has within spiral of 1/2 degree and a protrusion outer surface of it for coupling between casings.

### ■ Collapse strength

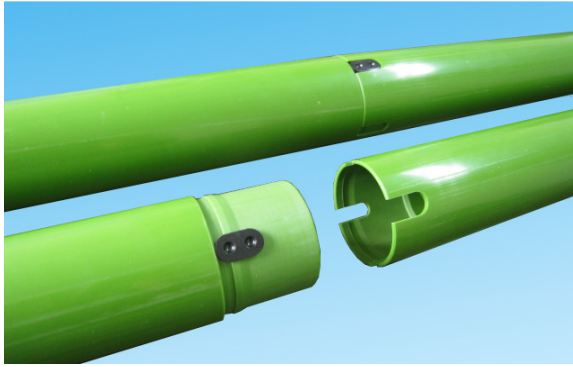
In installation in borehole, the annular space between the casings is filled with grout or a granular material.

To avoid collapse caused by high pressure during grouting, Ace Instrument manufactures strong couplings and thick-walled casing. Also the depth of guide grooves is precisely controlled to keep within the limits of weakening of the casing wall.

## Notice of installation and handling of casings

- When the deep borehole and large behavior is expected, telescopic sections should be installed between casings to prevent casings from damage that may be caused by rapid behavior.
- Direct sunlight and heat can be caused of twist of ABS casing, so it should be stored in boxes during transport and before installation. Also it should be kept flat and horizontally supported during long term storage in field.
- In installation, pop rivets are used to strengthen sleeve joints, and ABS solvent cement to bond ABS sleeves. And then sleeve joints are wrapped with tape.

## RC Type Inclinometer Casing



### Description

**RC type inclinometer casing** is the high-precision casing which coupling (Sleeve) is not required. And also four internal guide grooves inside of inclinometer casing are proceed by a broaching machine.

**Internal and outer surface of RC type inclinometer casings** are proceed by CNC machine, and the connection part is manufactured in a precision structure not to come out because the casing is connected as a snap-in type.

To improve the waterproof and the strength of connection, ABS solvent bond should be pasted on the connection part of casings.

After RC type inclinometer casing is connected each other, it doesn't require riveting, and taping

And there are two types of RC type inclinometer casing such as 59mm and 73mm according to internal diameter. And if the big displacement is expected, the telescopic section should be used.

In case of using RC 70, it can be installed with NX drill, and in case of RC 85, 100mm drill should be used to install it.

Model No.	RC 70	RC 85	
<b>Casing</b>	ID, OD	φ59×70mm	φ73×85 mm
	Groove depth	2mm	
	Thickness	5.5mm	6mm
	Weight	3.6kg/3m	4.4kg/3m
	Spiral	Less than 0.33° / 3m	
	Cutting length	1.5m / 3m	
	Collapse strength	More than 600kg / f	
	Operating temperature	-30 ~ 80 °C	
	Material	High impact ABS resin	
<b>Bottom cap</b>	Dimension	φ58 × φ70 × 50mm	φ73 × φ85 × 50mm
	Material	High impact ABS resin	
	Weight	0.44kg	0.58kg
<b>Top end cap</b>	Dimension	φ51 × φ70 × 35mm	φ67 × φ80 × 35mm
	Material	High impact ABS resin	
	Weight	0.36kg	0.46kg
<b>Telescopic section</b>	Expandable length	150mm	
	Material	High impact ABS resin	
	Dimension	φ70×600mm	φ85×600mm
	Weight	0.6kg	1kg

### Features

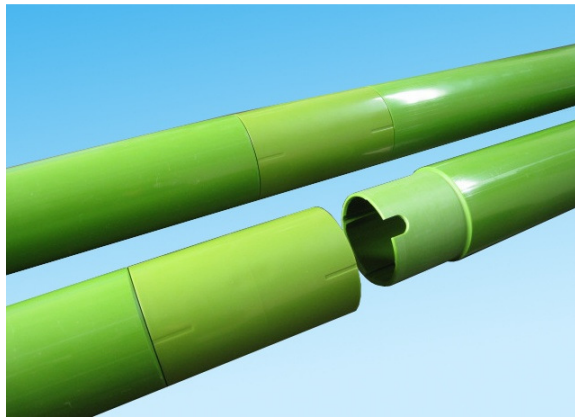
- Available to quick installation.
- It is proceed by CNC machine with high precision, and high reliability.
- Two types of cutting length (1.5m and 3m)
- Mechanical structure that the coupling is not necessary.
- More than 600kg-f for collapse strength

### Ancillary Equipments

- ABS solvent bond



## SC Type Inclinometer Casing



### Description

SC type inclinometer casing is proceed mechanically to operate the portable inclinometer set for measuring the displacement in a slope, and displacement in borehole, settlement in embankment etc. It is installed to get a data with rapidity, and precision, so it is normally used in various weather conditions.

SC type inclinometer casing has got four internal grooves spaced 90 degrees apart which is proceed by a broaching machine. Spiral is less 0.3 degree. And the connection part on casing that should be connected to the coupling manufactured by CNC machine.

And there are two types of SC type inclinometer casing such as 59mm and 73mm of internal diameter. And if the big displacement is expected, the telescopic section should be used.

Model No.SC 70 can be installed with NX drill, because the casing and coupling has got the same outer diameter.

### Caution

In order to keep the strength in connection part of casing, attach the ABS bond in inner diameter of sleeve.

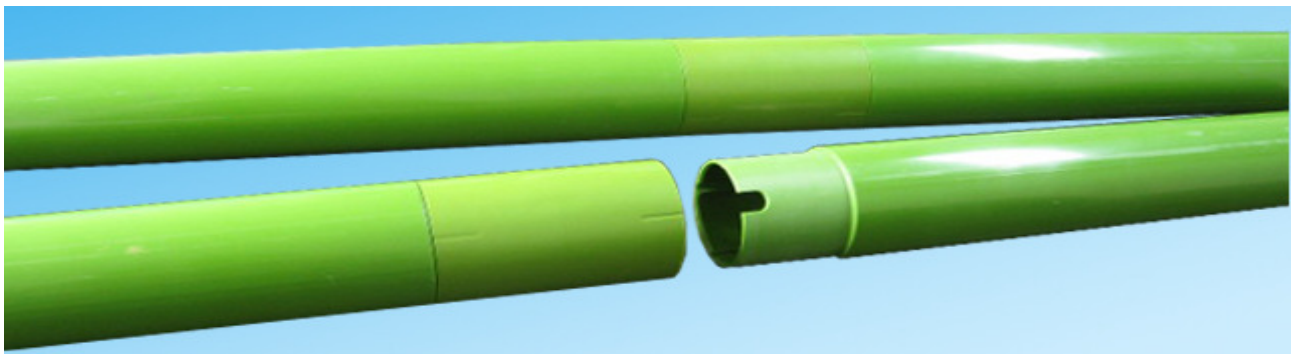
Model No.		SC 70	SC 85
Casing	ID, OD	φ59×70mm	φ73×85 mm
	Groove depth	2mm	
	Thickness	5.5mm	6mm
	Weight	3.6kg/3m	4.4kg/3m
	Spiral	Less than 0.33° / 3m	
	Cutting length	1.5m / 3m	
	Collapse strength	More than 320kg / f	
	Operating temperature	-30 ~ 80 °C	
Sleeve	Material	High impact ABS resin	
	Dimension	φ70×115mm	φ85×115mm
	Weight	70g	120g
End cap	Material	High impact ABS resin	
	Dimension	φ65 × φ70 × 53mm	φ80 × φ85 × 53mm
	Weight	70g	100g
Telescopic section	Expandable length	150mm	
	Material	High impact ABS resin	
	Dimension	φ70×600mm	φ85×600mm
	Weight	0.6kg	1kg

### Feature

- 100% of cut-casing with high precision, and high reliability.
- Two types of cutting length (1.5m and 3m)
- Flush type that the outer diameter for casings and coupling is same.
- It is available for the installation depth to install in deep place.
- It is suitable to the place that the water condition is various.

### Ancillary Equipments

- ABS solvent bond
- Pop rivet
- Pop rivet gun
- Mastic tape
- Pipe chain clamp
- Drill and drill bit
- Protect cover
- Silicone



## EC Type Inclinometer Casing



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Part		EC 70	
Casing	ID, OD	φ60×φ70 mm	
	Groove depth	2 mm	
	Thickness	5.5 mm	
	Lengths	3 m	
	Spiral	Less than 0.5° / 3 m	
	Collapse strength	More than 320 kg·f	
	Operating temperature	-30~80 °C	
	Material	High impact ABS resin	
	Weight	3 kg / 3 m	
Sleeve	Dimension	φ70×φ80×140mm	
	Material	High impact ABS resin	
	Weight	0.1 kg	
End cap	Material	High impact ABS resin	
	Dimension	φ70×φ80×62mm	
	Weight	0.08 kg	0.06 kg
Telescopic section	Expandable length	150 mm	
	Material	High impact ABS resin	
	Dimension	φ70×600 mm	
	Weight	0.6 kg	

### Ancillary Equipments

- ABS solvent
- Pop rivet
- Pop rivet gun
- Adhesive tape
- Chain clamp for pipe
- Cordless drill
- 4 mm drill bit
- Protective cover (PC-50)
- Silicone