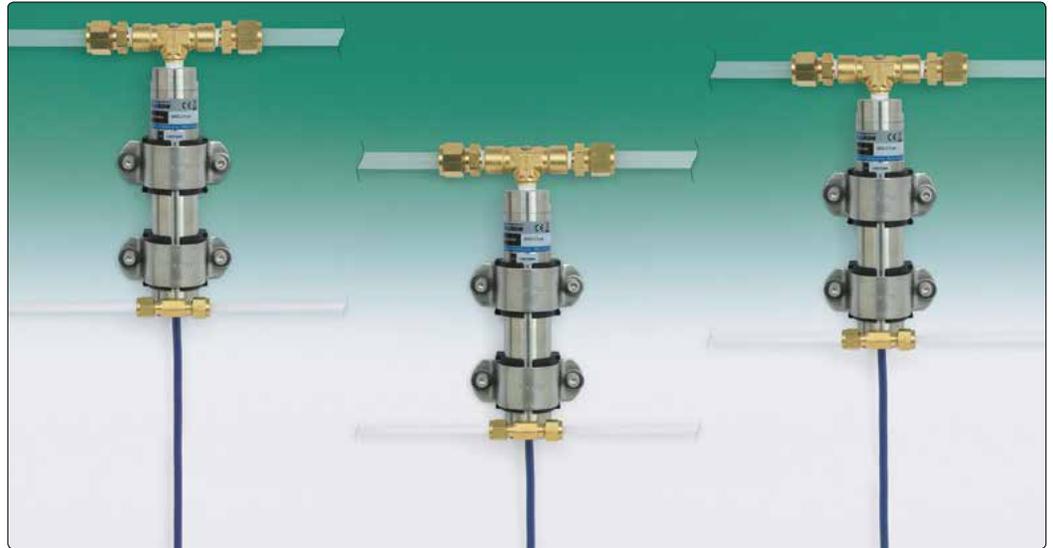


# Multipoint Hydraulic Leveling System Pressure Transducer Type

## Applications

For the measurement of differential settlements in...

- Tunnels
- Bridges
- Excavations
- Floor slabs
- Compensation grouting projects



• Model 3655 Multipoint Settlement System, semiconductor pressure transducers.

## Operating Principle

**GEOKON**'s Model 3655 and 4655 are Multipoint Settlement Systems comprising of a series of sensitive Semiconductor Pressure Transducers (3655) or Vibrating Wire Pressure Transducers (4655) connected together with a special Nylon tube filled with de-aired water or, where necessary, de-aired water and antifreeze.

The string of sensors is connected to a common reservoir. The reservoir has a large liquid capacity, compared to the volume required to fill the system; this helps minimize the effects caused by small changes in tubing volume which may occur due to varying temperatures.

Any of the sensors may be used as the "reference" where the elevation is known to be fixed and stable or can be easily surveyed. Where the reservoir is to serve as the reference point, a pressure transducer is connected alongside to correct for any changes in reservoir level.

In use any change in elevation of a sensor will result in a change in the pressure measured by that sensor. Since all the sensors share the same liquid line and are referenced to the same liquid elevation in the reservoir, changes in the sensor elevations, relative to one another can be measured.

To eliminate barometric effects, a common vent line is also connected to the sensors and terminated at the reservoir as a closed loop settlement system.

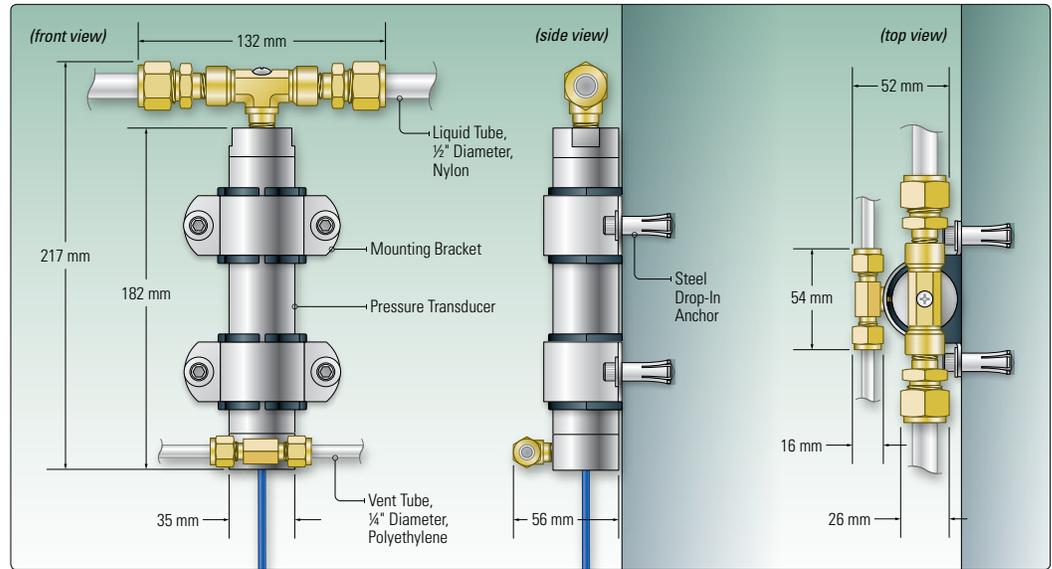
The 3655 Series uses molecularly bonded strain gages to provide 100 mV output for full pressure when used with a 10 VDC supply. The high output versions provide 0-5 VDC or 4-20 mA, which are capable of being used in control and indicating loops without further amplification.

The 4655 Series uses a sensitive vibrating wire pressure transducer which senses changes in elevation by a vibrating wire attached to a pressure sensitive diaphragm. Changes in elevation result in changes in pressure, which cause the diaphragm to deflect and so change the resonant frequency of the vibrating wire.

Each sensor is equipped with a thermistor for temperature measurement.



● Model 4655 Multipoint Settlement System, vibrating wire pressure transducer.



● Model 3655/4655 Multipoint Settlement System sensor dimensions.

### Advantages and Limitations

The pressure transducer system allows for greater differences in elevation between the sensors, takes up less physical space than the high precision Model 4675, is connected by relatively small diameter tubing and responds immediately to any changes in elevation as there is no flow between the sensors.

The Model 3655 Analog System is particularly well suited for rapid data acquisition or where the readout or data acquisition system is incompatible with vibrating wire sensors.

The Model 4655 Vibrating Wire System offers outstanding long-term stability and reliability, and low thermal zero shift. Cable lengths of several kilometers are possible and the frequency output signal is not affected by changing cable resistances (caused by splicing, changes of length, contact resistance, etc.) nor by penetration of moisture into the electronic circuitry.

### System Components

Both systems include a vented pressure transducer in a rugged housing with fittings for a liquid line and an air (compensation) line, plus a bleed screw for eliminating trapped air.

### Technical Specifications

	3655	4655
<b>Range</b>	7 kPa (0.68 m) H <sub>2</sub> O 10 kPa (1.02 m) H <sub>2</sub> O 17 kPa (1.73 m) H <sub>2</sub> O 35 kPa (3.57 m) H <sub>2</sub> O	70 kPa (7.14 m) H <sub>2</sub> O
<b>Resolution</b>	depends on readout	0.025% F.S.
<b>Accuracy<sup>1</sup></b>	±0.1% F.S.	±0.1% F.S.
<b>Temperature Range<sup>2</sup></b>	-20°C to +80°C	-20°C to +80°C
<b>Liquid Tubing</b>	½" Nylon	½" Nylon
<b>Vent Tubing</b>	¼" Polyethylene	¼" Polyethylene

<sup>1</sup>Accuracy established under laboratory conditions.

<sup>2</sup>Other ranges available on request.

#### ▼ Input/Output Specifications

Model	Input	Output
3655-1	10 VDC regulated	100 mV (10 mV/V)
3655-2	6.5-35 VDC	0-5 VDC
3655-3	24 VDC (7-35 VDC)	4-20 mA (2 wire)
4655	Swept frequency square wave	Hz

#### ▼ Cable Specifications

Model	Cable
3655-1, 3655-2	<b>04-375V9:</b> 4 twisted pairs, Violet PVC Jacket, 9.53 mm Ø
3655-3, 4655	<b>02-250V6:</b> 2 twisted pairs, Blue PVC Jacket, 6.35 mm Ø