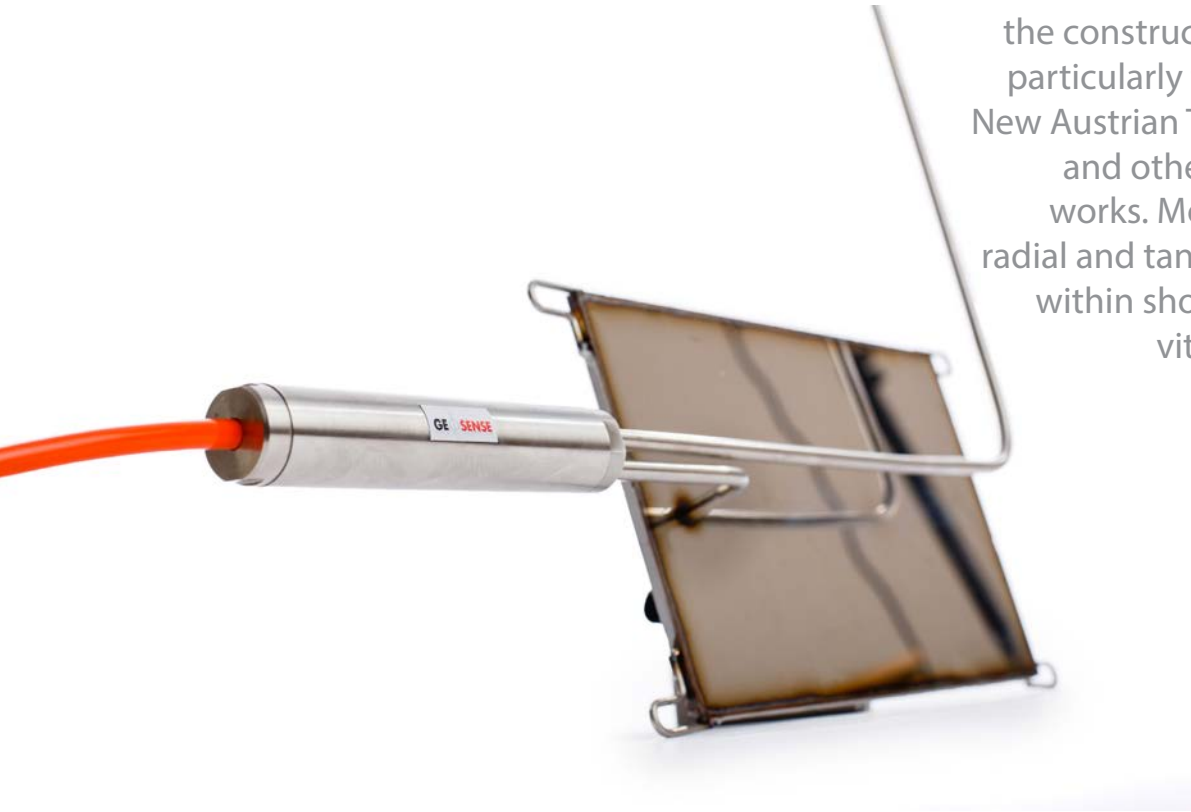


## NATM Pressure Cells NPC-3000 Series

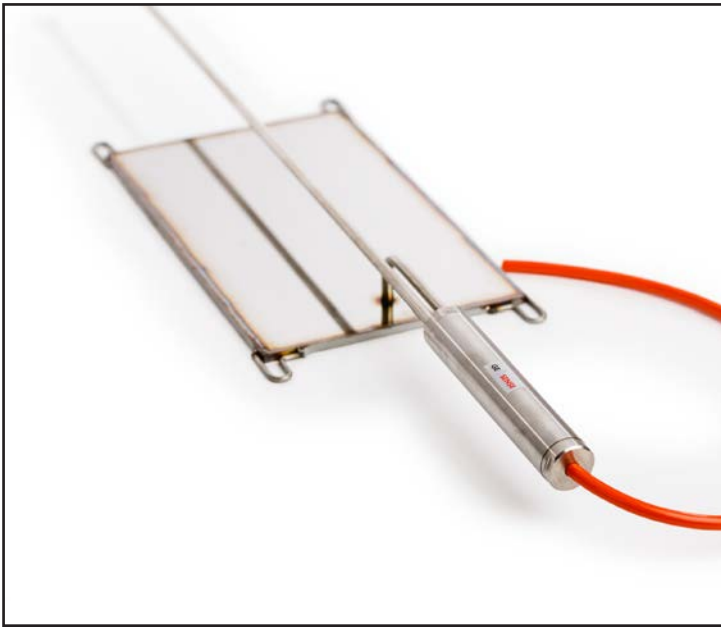
Monitor stress of shotcrete in the construction of tunnels, particularly those using the New Austrian Tunnel Method, and other underground works. Monitoring of the radial and tangential stresses within shotcrete linings is vital to its success



# NATM Pressure Cells NPC-3000 Series



## Overview



Geosense® NPC-3000 Series NATM Pressure cells are designed to monitor stress of shotcrete in the construction of tunnels, particularly those using the New Austrian Tunnel Method and other underground works. Monitoring of the radial and tangential stresses within shotcrete linings is vital to its success.

The cells are constructed from two stainless steel plates welded around their periphery with the narrow gap between the plates filled with hydraulic fluid.

As the stress increases within shotcrete or concrete the fluid pressure within the cell rises as the plates are squeezed together.

A length of stainless steel tube connects the plates to a pressure transducer (VWDT 5000 or SGT 3000) that converts the pressure to an electrical signal which can be read directly with a MP12 readout or data logged.

NATM cells installed in concrete expand with increasing temperature as the concrete or shotcrete cures. After cooling the cell will contract leaving a gap between it and the concrete so that the stresses are prevented from reaching the well. In order to continue to monitor the stresses the cell can be re-pressurised using the attached pinch tube to re-expand the cell so that it once again comes in contact with the concrete surface.

### APPLICATIONS

Measurement of:

- Radial stress in shotcrete tunnel lining
- Tangential stress in shotcrete tunnel lining
- Radial stress in concrete tunnel lining
- Tangential stress in concrete tunnel lining

### FEATURES

- High rigidity
- High accuracy
- Long-term stability
- Stainless steel construction
- Environmentally friendly internal fluid
- VWT-3000 pressure transducer
- Strain gauge transducer
- Direct reading
- Data logger compatible

# NATM Pressure Cells NPC-3000 Series

## Specifications

MODEL	VWNPC-3000	VWNPC-3010	SGNPC-3020	SGNPC-3030
Type	Tangential	Radial	Tangential	Radial
Range	2, 3, 5, 7, 20, 35 MPa	2, 3, 5, 7, 20, 35 MPa	2, 3, 5, 7, 20, 35 MPa	2, 3, 5, 7, 20, 35 MPa
Over range	150% FS (maximum)	150% FS (maximum)	200-500%	200-500%
Signal output	2000 - 3500 Hz	2000 - 3500 Hz	4-20mA	4-20mA
Resolution	± 0.025% FS	± 0.025% FS	Infinite	Infinite
Accuracy <sup>1</sup>	± 0.1% FS	± 0.1% FS	± 0.25% FS	± 0.25% FS
Linearity	<0.5% FS	<0.5% FS	-	-
Overall length	450mm	450mm	450mm	450mm
Cell dimension	100 x 200mm	150 x 250mm	100 x 200mm	150 x 250mm
Cell thickness	5mm	5mm	5mm	5mm
Operating temp	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
Cable	Type 900 - VW Sensor with Foil Screen & Drain Wire /Type 710 Heavy Duty			

### ORDERING INFORMATION

Type
Size
Pressure range
Cable length
Accessories
Crimping tool

<sup>1</sup> Calibrated accuracy of pressure sensor

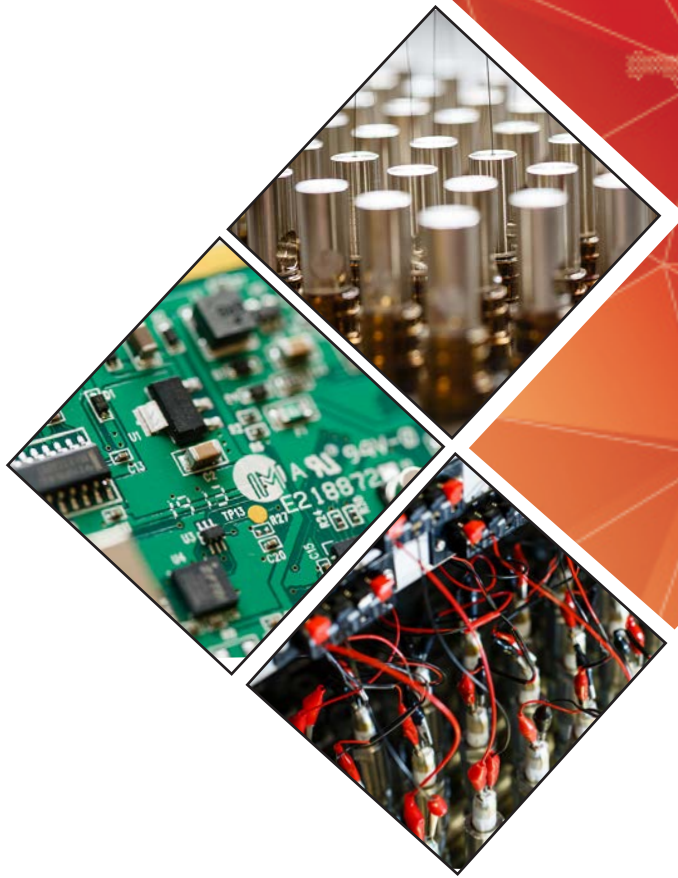
### NOTES

VWT-3000 vibrating wire pressure transducers may be read by the VWR-1 or any vibrating wire readout device and may be readily data logged using the GeoLogger G8-Plus or any other data loggers with vibrating wire interface modules.

Vibrating wire sensors output a frequency signal, and are therefore insensitive to resistance changes in connecting cables caused by contact resistance or leakage to ground.

Cable may be readily and simply extended on site without special precautions. Gauges may be read up to 1000 metres away from their installed location without change in calibration.

Strain gauge pressure transducers can be read with a direct readout in MPa or 4-20mA output which can be data logged.



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