

Datasheet P6

# Vibrating Wire Pressure Cell

## DESCRIPTION

The Vibrating Wire Pressure Cell is used to measure total pressure, particularly in earth or rockfill structures.

The cells are normally used to validate design assumptions and to give adequate warning of soil pressures in excess of those which a structure is designed to withstand.

The VW Pressure Cell has two designs; the double face design is formed from a circular flat cell comprising two flexible plates of Stainless Steel

welded together around their periphery, providing two active faces, the single face design has one thick metal plate and one flexing plate, providing one active face.

A narrow gap is formed between the plates and is filled with highly de-aired hydraulic oil, a Vibrating Wire pressure transducer is connected to the cell by a short length of steel tubing forming a closed hydraulic system.

## FEATURES

- ✓ Uses proven Vibrating Wire technology
- ✓ Accurate, reliable and robust
- ✓ Low, medium and high pressure ranges available
- ✓ Low volume change and slender profile
- ✓ Single and double active faces available
- ✓ Various ranges of size and pressure available
- ✓ Suitable for manual or remote monitoring

## BENEFITS

- ✓ Accurate, repeatable readings over long cable lengths
- ✓ Long working life with long-term stability
- ✓ Arching and stress concentrations minimised
- ✓ Over-voltage surge arrestor protects against electrical damage
- ✓ Design prevents case stresses from affecting readings

## OPERATION

Both cell and transducer are embedded in the medium to be monitored with an armoured cable that connects the instrument to a terminal unit, portable readout unit or data logger. Any external pressure on the cell causes the steel plates to compress creating a change in pressure in the oil within the cell.

The change in pressure is converted by the VW transducer into an electrical signal and may be

remotely read using a VW readout or data logger.

The readout or data logger can display either frequency based units or, by inputting the instrument calibration factors, engineering based units.

The double faced cell measures the pressure from two directions while the single faced cell will only measure the pressure acting on its thinner plate.

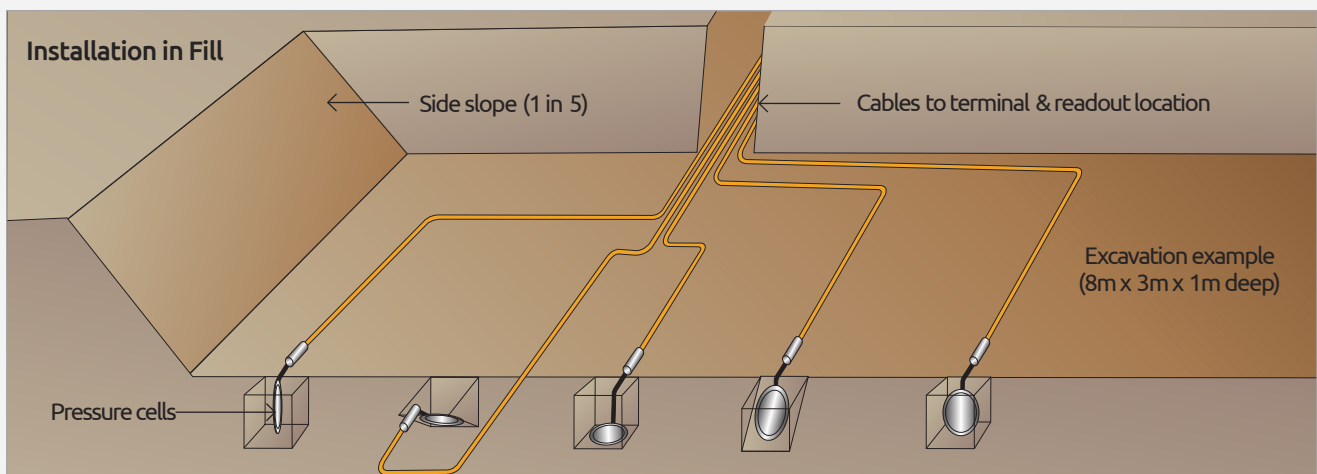
## Applications

Vibrating Wire Pressure Cells are installed within fills to determine the distribution, magnitude and directions of total pressure. They can also be installed with one surface against a structure to measure total pressure acting on retaining walls, or against piles, pipes and slurry trench walls.

Typical applications include:

- ✓ Concrete, Embankment and Tailings Dams
- ✓ Retaining Wall
- ✓ Diaphragm or Sheet Pile Wall

## INSTALLATION IN FILL



## SPECIFICATIONS

### Cell

Standard ranges (kPa)	300   500   700   1000   1500   2000   3000   4000   6000   10000   15000
Frequency range	1700 – 2800Hz
Resolution <sup>1</sup>	0.025% full scale (minimum)
Accuracy <sup>2</sup>	±0.1% full scale
Linearity <sup>2</sup>	±0.1% full scale
Temperature range	-20 to +80°C
Over-range capacity	150% full scale
Excitation method	Pluck or sweep

### Thermistor

Type	NTC 3KΩ
Accuracy	0.5°C
Resolution <sup>1</sup>	0.1°C

### Weights, Dimensions and Materials

Type	Two active faces – 200mm	Single active face – 240mm	Two active faces – 300mm	Single active face – 345mm
Active face diameter	176mm	176mm	276mm	276mm
Length excluding cable	670mm	670mm	770mm	765mm
Weight excluding cable	2.7kg	5.4kg	4.5kg	9.1kg
Material	Stainless Steel	Powder coated	Stainless Steel	Powder coated

### Cables

Type	2 core Armoured PVC outer sheath	4 core Armoured PVC outer sheath
Accuracy	12mm	13mm
Weight /m	220g	336g

<sup>1</sup>Dependent on readout. <sup>2</sup> Of the pressure transducer

## ORDERING INFORMATION

### Vibrating Wire Earth Pressure Cell – two active faces, 200mm diameter

For use in soil and rock fill. Oil filled, Stainless Steel pressure cell

P6-1.1-SS-3	300kPa pressure range
P6-1.1-SS-5	500kPa pressure range
P6-1.1-SS-10	1000kPa pressure range
P6-1.1-SS-20	2000kPa pressure range
P6-1.1-SS-40	4000kPa pressure range
P6-1.1-SS-60	6000kPa pressure range
P6-1.1-SS-100	10000kPa pressure range
P6-1.1-SS-150	15000kPa pressure range
P6-1.1-SS-3-T	300kPa pressure range with thermistor
P6-1.1-SS-5-T	500kPa pressure range with thermistor
P6-1.1-SS-10-T	1000kPa pressure range with thermistor
P6-1.1-SS-20-T	2000kPa pressure range with thermistor
P6-1.1-SS-40-T	4000kPa pressure range with thermistor
P6-1.1-SS-60-T	6000kPa pressure range with thermistor
P6-1.1-SS-100-T	10000kPa pressure range with thermistor
P6-1.1-SS-150-T	15000kPa pressure range with thermistor

### Vibrating Wire Earth Pressure Cell – two active faces, 300mm diameter

For use in soil and rock fill. Oil filled, Stainless Steel pressure cell

P6-1.2-SS-3	300kPa pressure range
P6-1.2-SS-5	500kPa pressure range
P6-1.2-SS-10	1000kPa pressure range
P6-1.2-SS-20	2000kPa pressure range
P6-1.2-SS-40	4000kPa pressure range
P6-1.2-SS-60	6000kPa pressure range
P6-1.2-SS-100	10000kPa pressure range
P6-1.2-SS-150	15000kPa pressure range
P6-1.2-SS-3-T	300kPa pressure range with thermistor
P6-1.2-SS-5-T	500kPa pressure range with thermistor
P6-1.2-SS-10-T	1000kPa pressure range with thermistor
P6-1.2-SS-20-T	2000kPa pressure range with thermistor
P6-1.2-SS-40-T	4000kPa pressure range with thermistor
P6-1.2-SS-60-T	6000kPa pressure range with thermistor
P6-1.2-SS-100-T	10000kPa pressure range with thermistor
P6-1.2-SS-150-T	15000kPa pressure range with thermistor

## ORDERING INFORMATION

### Vibrating Wire Earth Pressure Cell – single active face, 240mm diameter

For interface between concrete and soil. Oil filled, mild steel pressure cell

P6-2.1-MS-3	300kPa pressure range
P6-2.1-MS-5	500kPa pressure range
P6-2.1-MS-10	1000kPa pressure range
P6-2.1-MS-20	2000kPa pressure range
P6-2.1-MS-40	4000kPa pressure range
P6-2.1-MS-60	6000kPa pressure range
P6-2.1-MS-100	10000kPa pressure range
P6-2.1-MS-150	15000kPa pressure range
P6-2.1-MS-3-T	300kPa pressure range with thermistor
P6-2.1-MS-5-T	500kPa pressure range with thermistor
P6-2.1-MS-10-T	1000kPa pressure range with thermistor
P6-2.1-MS-20-T	2000kPa pressure range with thermistor
P6-2.1-MS-40-T	4000kPa pressure range with thermistor
P6-2.1-MS-60-T	6000kPa pressure range with thermistor
P6-2.1-MS-100-T	10000kPa pressure range with thermistor
P6-2.1-MS-150-T	15000kPa pressure range with thermistor

### Vibrating Wire Earth Pressure Cell – single active face, 345mm diameter

For interface between concrete and soil. Oil filled, mild steel pressure cell

P6-2.2-MS-3	300kPa pressure range
P6-2.2-MS-5	500kPa pressure range
P6-2.2-MS-10	1000kPa pressure range
P6-2.2-MS-20	2000kPa pressure range
P6-2.2-MS-40	4000kPa pressure range
P6-2.2-MS-60	6000kPa pressure range
P6-2.2-MS-100	10000kPa pressure range
P6-2.2-MS-150	15000kPa pressure range
P6-2.2-MS-3-T	300kPa pressure range with thermistor
P6-2.2-MS-5-T	500kPa pressure range with thermistor
P6-2.2-MS-10-T	1000kPa pressure range with thermistor
P6-2.2-MS-20-T	2000kPa pressure range with thermistor
P6-2.2-MS-40-T	4000kPa pressure range with thermistor
P6-2.2-MS-60-T	6000kPa pressure range with thermistor
P6-2.2-MS-100-T	10000kPa pressure range with thermistor
P6-2.2-MS-150-T	15000kPa pressure range with thermistor

### Connecting Cable and Fittings

CA-1.1-2-A	Armoured cable, 2 cores, 1.5mm <sup>2</sup> ; PVC jacket, priced per metre
CA-1.1-4-A	Armoured cable, 4 cores, 1.5mm <sup>2</sup> ; PVC jacket, for instruments with thermistors, priced per metre
CA-4.1	Joint sealing kit
CA-4.2	Coloured adhesive tapes; set of 10No.
CA-4.3	Crimping tool
CA-4.4	Crimping sleeves; set of 100No.
W6-6.1	Nylon ties; 150mm x 3.5mm, pack of 100No.
ST1-3.5	Nylon ties; 370mm x 4.7mm, pack of 100No.

### Manual

MAN-34	Vibrating Wire Pressure Cell
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