Pressure Calibration Using Pressure Transducers EA006

Fig 1 : Calibrating a 10Barg pressure gauge using the Druck PV411 hand pump and 0-10Barg transducer.

- **Works with a wide of pressure transducers produced by Druck, Keller etc.**
- **Accuracy : Transducers available to 0.05%**
- **Easy to Use with VFP or ProCal Software**
- **Supports all Pressure units *PSI, bar, mm, "Hg***

Overview

Using the DRUCK range of accurate pressure transducers which connect directly to the feature connector on the 2000 series calibrator* pressure calibration can be performed in any units of pressure for either Gauge or Absolute calibration.

Using external transducers for pressure calibration allows a range of pressures to be calibrated.

Technical Details

Operation is controlled from the interface using either the Virtual front panel program or ProCal software. The software reads back the voltage signal from the transducer which can be converted to pressure units (Bar, psi etc.) which is displayed on the computer.

The ProCal calibration software allows a pre-defined sequence of tests (known as a procedure) to be set up. This allows the computer to automatically step through these tests, control the calibrator, set the correct outputs and record the amount of deviation in relation to the pressure device's specifications.

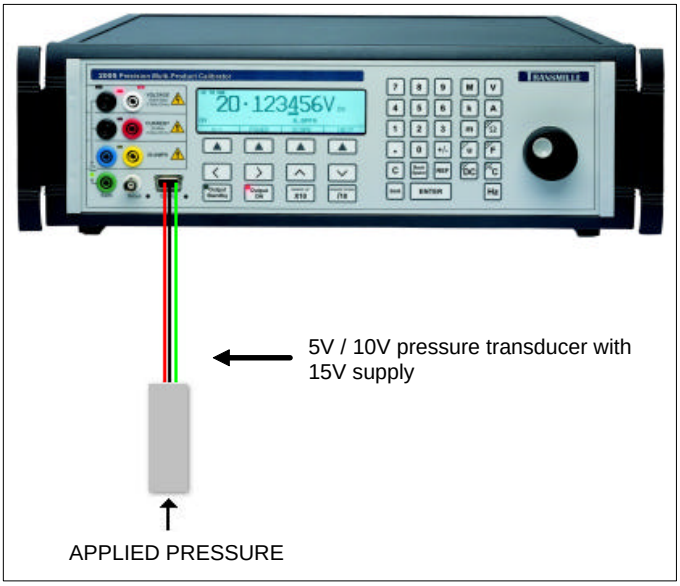


Fig 2 : Connecting a transducer to the 2000 Series

Pressure Ranges & Transducers Available

The system will work with *any* transducer using a 5V or 10V output powered from 15V supply

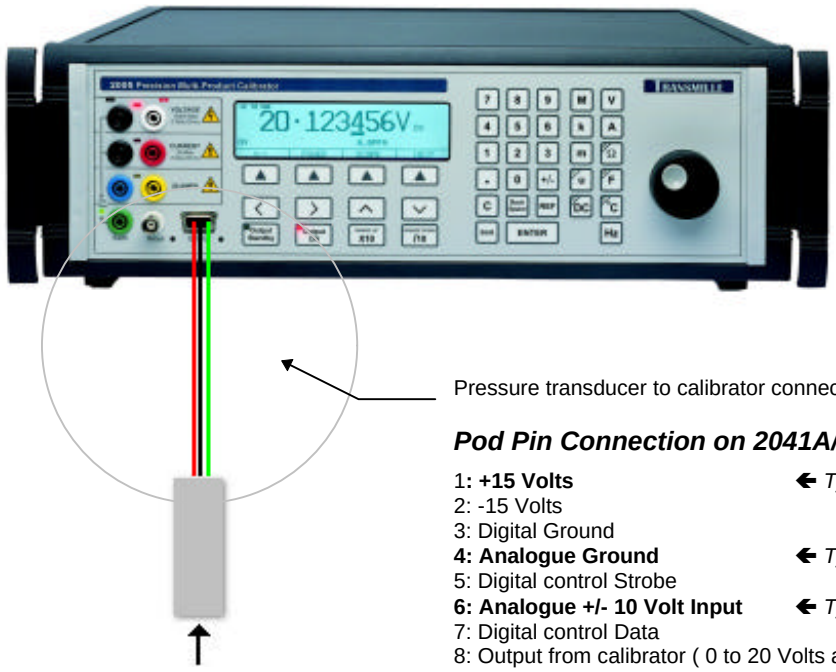
Pressure Range : Dependant on transducer used.
Optional Equipment : Druck PV411 pneumatic / hydraulic / vacuum hand pump

Transmille recommend & can supply any required transducer from the Druck range
See *www.druck.com* for the full range of available transducers.

Pressure Calibration Option - Operation

Pressure Transducer Connection

The pressure transducer is connected to the 'feature' connector of the 2000 series using a 9 way 'D' type connector to an appropriate connector for the transducer.



Input to transducer from pressure source.

Pressure transducer to calibrator connection :

Pod Pin Connection on 2041A/2006A Series Calibrators

1**: +15 Volts** ← *Typical Transducer Connection*
2: -15 Volts
3: Digital Ground
4: Analogue Ground ← *Typical Transducer Connection*
5: Digital control Strobe
6: Analogue +/- 10 Volt Input ← *Typical Transducer Connection*
7: Digital control Data
8: Output from calibrator (0 to 20 Volts ac/dc, 0 to 20mA ac/dc)
9: Clock

This connection comprises of a 9 way 'D' type connector to a suitable connector for attaching to the transducer output.

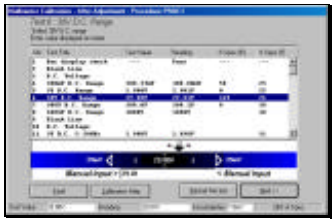
Note : Transducer connections are typically made via three connection pins (shown by arrows)

Using the Pressure Transducer Option

Calibration using the pressure transducer is achieved using one of two methods :

1. *Basic* control using the **2000 Series Virtual Front Panel Software** (Optional) with readings displayed on the PC screen.

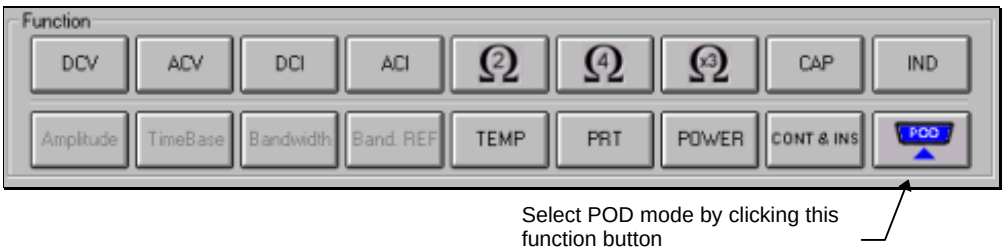
2. *Advanced* control using the **ProCal Calibration Software** (Optional), with readings displayed and automatically recorded for use in certificate creation.



Pressure Transducer - Operation Using the Virtual Front Panel

1. Start the 2000 Series Virtual Front Panel by choosing
   START -> PROGRAMS -> 2000 Series Virtual Front Panel

2. Select POD mode by clicking on the POD button

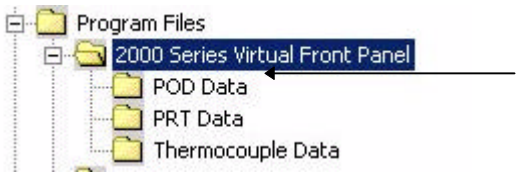


3. From the drop down list, select the one of list items (if available).
   If no pressure list items are available, proceed to the next section detailing creation of a custom datafile for transducer readback.

Creating a Custom Datafile For the Virtual Front Panel

If the default functions do not cover the pressure range required, a custom datafile can be created as follows :

A. Start *Windows Explorer* and look in the '**C:\Program Files\2000 series virtual front panel**' folder.
This folder should contain a sub-folder called 'POD Data' (If it does not, then create it).

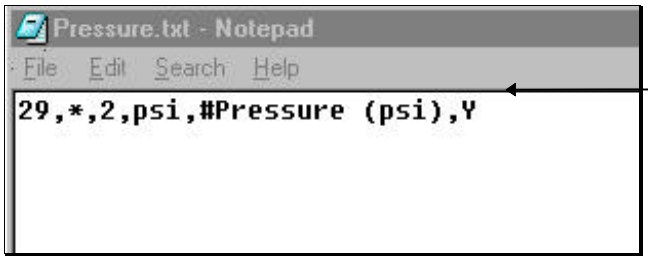


B. Create a Notepad file which contains a one line control string (6 parameters separated by a comma)
ⓘ **TIP** : To simplify this task copy an existing datafile and rename it using *Windows Explorer*

C. Using the worked example below as a guide, enter the parameters to create the custom datafile

Worked Example

The example below is configured to readback in psi.



29	Gain Factor This factor will be different for each transducer, if incorrect the pressure reading displayed will be wrong.
*****	**Multiply** the reading returned from the calibrator by the gain factor
2	Number of decimal places shown by the VFP Program
psi	The units character displayed after the reading by the VFP
#Pressure (psi)	Command to set the calibrator to the 2 Volt range and output to 0.5 Volts which will set a 0.5A load on the adapter. The '#' command sets the calibrator display to show '*Pressure (psi)*'.
Y	Readback option : Y = Readback data from feature connector N = No readback

D. Once the datafile has been saved, restart the virtual front panel program.
Your custom datafile should now be listed in the drop down list and is ready to use.

ⓘ **Note** : As many files as required can be created with different names for different transducers & pressure ranges.

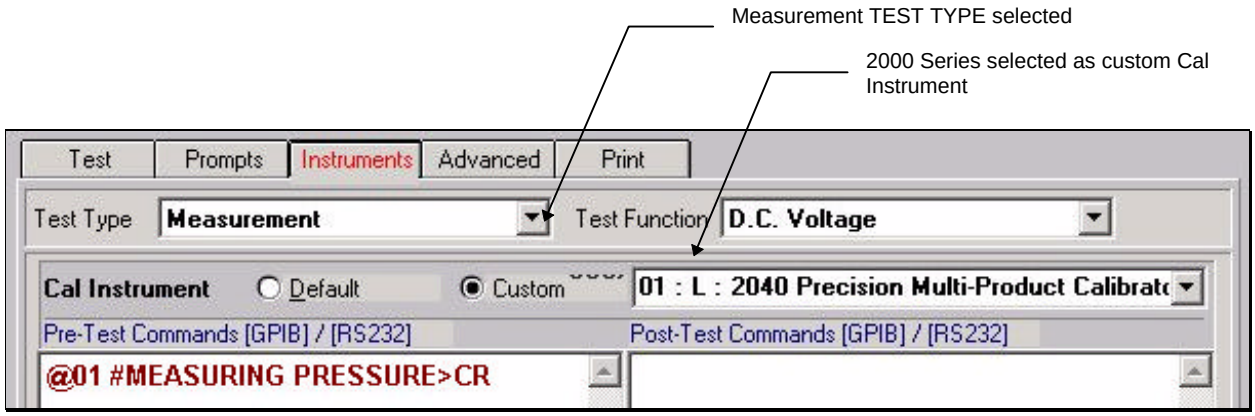
Operation Using ProCal Calibration Software

These instruction assume basic knowledge of the ProCal calibration software - ProEdit should be used to create a procedure prior to following the instructions below.

1. Select the '**MEASUREMENT**' test type and '**DC VOLTAGE**' test function - then complete the boxes for test title, test value (***with pressure units***) and accuracy etc. as normal.

   ⓘ **Note** : DC Voltage is used as the output from the transducer is measured in volts (dual units will be used to display the reading in pressure)

2. Under the **'INSTRUMENTS'** instruments tab select the *2000 series calibrator* in the **Custom Cal Instrument** section.



   ⓘ **Note** : You can also display a message in the 2000 series display whilst this test is running by entering a command in the **Pre-Test Commands** box (as shown above in the **Pre-Test Command** box)

3 Under the **'ADVANCED'** tab set the formula to multiply the returned reading (X) by the gain factor for the transducer