

## TEST RESULTS

This instrument has been tested using a calibrated dead weight system:

Model: 2081 Serial No: 430243317

This instrument has been tested in: mbar

Tested by: ms

INPUT	READING
10.00	9.90
19.00	18.86
60.0	59.8
130.0	130.0

PSI	mHg	mmHg	mH <sub>2</sub> O	in H <sub>2</sub> O	Pa	20x1P	20x1P	20x2P	20x3P	20x4P	20x5P
0.00 - 0.28 psi	0.00 - 16.75 mm	0.00 - 0.73"	0.00 - 16.99 mm + 0.2553 mm	0.00 - 16.99 mm + 0.6611 mm	0.00 - 2900 Pa + 29.00 Pa	0.00 - 15.59 mbar + 0.1530 mbar	0.00 - 15.59 mbar + 0.1528 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar
0.00 - 1.96 psi	0.00 - 19.99 mm + 0.975 mm	0.00 - 3.85"	0.00 - 19.99 mm + 0.1201 mm	0.00 - 20.43 m + 0.64"	0.00 - 13.00 kPa + 0.1999 kPa	0.00 - 15.59 mbar + 0.1599 mbar	0.00 - 15.59 mbar + 0.1528 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar	0.00 - 159.9 mbar + 0.1599 mbar
0.00 - 29.00 psi	0.00 - 199.99 mm + 150.0 mm	0.00 - 59.00"	0.00 - 19.99 mm + 0.115 m	0.00 - 19.99 mm + 0.64"	0.00 - 700 kPa + 0.1999 kPa	0.00 - 700.0 mbar + 0.1999 mbar	0.00 - 700.0 mbar + 0.1999 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar
0.00 - 101.5 psi	0.00 - 199.99 mm + 150.0 mm	0.00 - 59.00"	0.00 - 19.99 mm + 0.115 m	0.00 - 19.99 mm + 0.64"	0.00 - 700 kPa + 0.1999 kPa	0.00 - 700.0 mbar + 0.1999 mbar	0.00 - 700.0 mbar + 0.1999 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar	0.00 - 1599.9 mbar + 0.1599 mbar
0.00 - 290.0 psi	0.00 - 1999.99 mm + 1500.0 mm	0.00 - 59.00"	0.00 - 19.99 mm + 0.115 m	0.00 - 19.99 mm + 0.64"	0.00 - 1999.9 Pa + 0.1999 Pa	0.00 - 1999.9 mbar + 0.1999 mbar	0.00 - 1999.9 mbar + 0.1999 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar
0.00 - 145.0 psi	0.00 - 199.99 mm + 150.0 mm	0.00 - 59.00"	0.00 - 19.99 mm + 0.115 m	0.00 - 19.99 mm + 0.64"	0.00 - 1000 kPa + 0.1999 kPa	0.00 - 1000.0 mbar + 0.1999 mbar	0.00 - 1000.0 mbar + 0.1999 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar	0.00 - 15999.9 mbar + 0.1599 mbar

## 2000 SERIES MANOMETER

**Digitron**  
www.digitron.co.uk

## OPERATING INSTRUCTIONS

www.topac.com

101 Derby St Hingham MA 02043  
781 740 8778

Some of the options described may not apply to this instrument. Please check the functions of the instrument you have purchased before proceeding.

RANGE		
Models	Operating Range	Overrange
2000P, 2020P, 2080P	25mbar / 10 <sup>3</sup> H <sub>2</sub> O	350mbar / 140 <sup>3</sup> H <sub>2</sub> O
2011P, 2021P, 2081P	130mbar / 52 <sup>3</sup> H <sub>2</sub> O	1bar / 401 <sup>3</sup> H <sub>2</sub> O
2022P, 2022P, 2082P	2bar / 28 PSI	4bar / 58 PSI
2033P, 2023P, 2083P	7bar / 101.5 PSI	10bar / 145 PSI
2024P, 2084P	External Transducer	-
2005P, 2025P, 2085P	2bar absolute	4bar
2028P, 2088P	10bar / 145 PSI	10.342bar / 150 PSI

FEATURES	
Models	Features
2000P, 2001P, 2020P, 2023P, 2080P	Backlight, Out of Range, Zeroing, Zeroing Absolute & Hold
2004P, 2021P, 2022P, 2023P, 2024P, 2025P, 2028P	As above plus: Smoothing, Units of Pressure, Rangefix & Max/Min
2080P, 2081P, 2082P, 2083P, 2084P, 2085P, 2088P	As above plus: Manuallog and AutoLog

Particular care should be taken not to over pressure the device as this may rupture the sensor membrane. This is not covered by the manufacturers warranty.

NOTE: The differential/gauge instruments will only measure positive pressures i.e. positive pressure applied to the positive port, or negative pressure applied to the negative port.

## INSTRUMENT APPLICATION


The range of 2000P instruments are suitable for gauge, differential, or absolute measurements over a wide range of pressures. They are not suitable for use with corrosive substances or cyclic hydrocarbons, e.g. motor oil, transmission fluid and freon.

To use the 2000P with these components, isolation must be provided in the form of a buffer, such as a mineral oil or dry air.

## INSTRUMENT OPERATION

### BATTERIES


Two AA or equivalent cells (not supplied). Follow instructions on reverse of instrument for fitting/replacement.

When  appears on display, replace batteries.

### IP65/IP67 RATING

The waterproof rating for this product will not be maintained unless the screws holding the battery compartment are firmly tightened when inserting or replacing batteries.

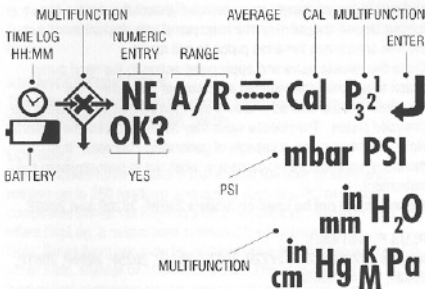
### ON - OFF

Press **ON** key for on and **OFF** key for off. Automatic switch-off after 12 minutes, unless any key is activated or the instrument is in **LOG** or **MAX/MIN** mode. If  key is held when unit is switched on, automatic switch-off function will be disabled until the unit is switched off.

### BACKLIGHT

Press and hold **ON** key.

### DISPLAY



### OUT OF RANGE


If pressure exceeds the scale range **Out** will appear on the display.

### ZEROING

In order to achieve maximum accuracy it is recommended to zero the instrument in the orientation it will be used before taking any measurements.

**Models 2000P, 2001P, 2002P, 2003P, 2020P, 2021P, 2022P, 2023P**  
Ensure both ports are open to atmosphere. If indicated pressure is within 1% (3% for Models 2000P, 2020P and 2080P) of the factory calibrated zero, press **0.0** key which will adjust the reading to zero.

**Models 2080P, 2081P, 2082P, 2083P, 2084P**

As above but press  key instead of the **0.0** key.

### ZEROING ABSOLUTE


This feature enables correction of the indicated ambient pressure between 900mbar and 1100mbar.

**Models 2005P, 2025P**




Open port to atmosphere and the instrument will indicate ambient pressure. Press **0.0** key and 900mbar (or the equivalent in other engineering units) will appear on the display. Press and hold this key. The display will scroll and when required atmospheric pressure is displayed (maximum 1100mbar) release key. The current pressure being measured will then be adjusted to the displayed reading and used for the rest of the session.

Note: This setting will be lost when the instrument is switched off.

**Model 2085P**

Press  key instead of **0.0** key.

### DISPLAY HOLD

Pressing  key freezes the display. The  symbol will appear on the display. Press  key again to return to normal display.

### HOSE FITTING

The input port(s) on the instrument are designed to accept a hose with 4mm I.D. and 1mm wall. The hose is fitted by unscrewing the clamping nut, sliding the hose on to the stepped shaft and refitting the nut.

Note: Do not tighten fittings attached to the pressure ports to a torque greater than 2Nm otherwise the pressure seals may be damaged.

#### HAND PUMP OPERATION (if applicable)

Use the T piece to connect the hand pump to the instrument's + port and to the equipment being tested. Exhaust the system by turning the release valve on the hand pump anti-clockwise and set the fine adjustment threaded piston to mid range.

Close the release valve and apply pump action to the hand pump piston to generate the required approximate pressure. Fine adjustment of the desired pressure can then be made by rotating the threaded piston. The release valve may be used to vent the system. Note: The hand pump is capable of generating 7bar max. It is, therefore, essential that extra care is taken not to over-pressure the instrument.

**A pump must not be used on models 2000P, 2020P and 2080P**

#### PLUS FUNCTIONS

Models 2020P, 2021P, 2022P, 2023P, 2024P, 2025P, 2080P, 2081P, 2082P, 2084P, 2085P

#### SMOOTHING MODE

Press = key and the instrument continuously averages the last four measurements to give a more stable reading on the display. Press = key again to return to normal measurement.

#### UNITS OF PRESSURE

Press  $\square$  key to select required units of pressure. Chosen units will be saved when the instrument is switched off. Please refer to the table on the back page.

The 20x0P 0-25mbar instruments cannot show the  $\mu$ bar or mmHg symbols on their displays. When switching the units on they are reading in  $\mu$ bar and so show no unit symbol. Pushing the autorange button will put the unit into mbar and show the mbar symbol. When reading in mmHg only the symbol Hg will show on the display. This function will not operate while in store mode.

Note: 2024P - 2084P

$K = x 10^3$  when using in H<sub>2</sub>O and Pa.

$M = x 10^6$  when using in H<sub>2</sub>O and Pa.

#### MAX/MIN RECORDER

Press  $\diamond$  key to start. The instrument will display alternating  $\wedge$   $\vee$  symbols and current reading. Press again to display the maximum temperature reading and  $\wedge$  symbol will be displayed. Press again to display the minimum temperature reading and  $\vee$  symbol will be displayed. Press again to return to the actual temperature display.

Press  $\bar{x}$  key to display the average temperature since the MAX/MIN mode was activated and  $\bar{x}$  symbol will appear on display. Press  $\bar{x}$  key again to return to actual temperature display.

NOTE: To reset MAX/MIN recorder function switch the instrument off.

NOTE: Some functions may be inhibited while information is stored in either Auto, Manual or Max/Min modes. This is to prevent inadvertent parameter mixing whilst in any of the above modes. To re-activate these functions please delete any stored information by following the "Output of data" section.

#### RANGE LOCK

This instrument has a Range Lock feature that displays readings to the best resolution, shown by A/R on the display. This can be turned off by pressing the A/R key. The display will then use the same display resolution for the entire pressure range. This is useful to stop the display switching between resolutions where there are fluctuations in pressure. To cancel this mode, press the A/R key again.

#### ADVANCED FUNCTIONS

The following additional functions apply to models 2080P, 2081P, 2082P, 2083P, 2084P, 2085P

#### LOGGING

These models have functions that enable the user to store and retrieve up to 250 readings and output such to a PC or Epson compatible printer via Digitron's Infra-red DigLink. Digitron also offers DigLog, a customised Windows™ software package. Note: Some functions may be inhibited while information is stored in either Auto, Manual or Max/Min modes. This is to prevent inadvertent parameter mixing whilst in any of the above modes. To re-activate these functions please delete any stored information by following the "Output of data" section.

#### SETTING INTERNAL CLOCK

Press decimal point (.) key and the  $\odot$  and NE symbols will appear on display with the current year and month settings (YYMM). Key in new year and month if desired and press  $\downarrow$  key to accept. Display will show current date of month setting (DD). Key in new value if desired and press  $\downarrow$  key to accept. Display will show current hours and minutes setting (24 hour clock). Key in new values if desired and press  $\downarrow$  key to accept. Instrument will then return to normal mode.

#### LOGGING ON DEMAND



This function allows readings to be stored as and when required. A maximum of 50 readings can be stored this way. When ready to store a reading press  $\diamond$  key.  $\diamond$ , NE symbols and 0 will appear on the display. It is possible to enter up to a four digit reference number including decimal point. Press  $\downarrow$  key to enter and store reading, time, date and reference number. Instrument will return to standard mode, however  $\diamond$  symbol will remain on display until data is erased.




#### PRESET INTERVAL LOGGING


This function allows readings to be taken automatically at a preset time interval.


NOTE: If data is already stored, as signified by the  $\diamond$  or  $\odot$  symbols appearing on display, this function will not operate. Press  $\diamond$  key. NE symbol and 0000 will appear on the display. Enter required time interval in hhmm (ie, in order to take a reading every 1 minute, key in 0001) and press  $\downarrow$  key. Current reading will return to display and  $\odot$  symbol will remain on display. Instrument will continue logging until a maximum of 250 readings are taken or data is down-loaded.

## OUTPUT OF DATA

This feature will only function if either the  or  symbols are displayed.



To view data press  key, then **1** and  keys. The first stored reading will be displayed. Press  key to view successively stored readings and any other key to return to normal mode.





To output data to a PC press  key, then **2** key.

To output data to an Epson compatible printer press  key, followed by **4** key. Printer settings must be as follows: 9600 Baud, 8 data bits, No Parity, One stop bit, No flow control. It is also possible to print to Hyper Terminal in your PC in this way. Ensure PC/Printer is ready to receive information.




The selected transmit option will be displayed during transmission.

After transmission, the unit will return to normal operation and any auto logging will stop.

To erase stored data press  key, then **3** and  keys.

There will be a delay before the unit will accept the  key and symbol  will be displayed. This is to help stop accidental erasure. After erasure, neither  or  symbols will be displayed. The unit will return to normal mode. If after pressing **3** key you do not wish to delete data, you must turn instrument off and on, then the stored data will not be lost.

## AVERAGING







Press  key (when in MAX/MIN mode) and  symbol, together with average reading, will appear on display. Press  to return to MAX/MIN mode.

## LEAK TESTING

This function enables testing for leaks in pressure systems. The instrument has a function to automate leak testing in a variety of applications.



Automatic leak test results are logged, not stored and cannot be output directly via DigLink into your DigLog PC software. To send leak test results to your PC please use your PC's Hyper Terminal and output as to an Epson Printer. When entering pressure values (P1, P2, P3) you must enter numbers to exactly the same number of decimal places as full pressure range of the instrument being used. The number of decimal places required can be seen in the table of pressure ranges on the back page.

## SETTING UP

Press  key (when not in MAX/MIN mode) and **NE** and **P1** symbols will appear on the display. Enter pre-stress pressure level (if pre-stress pressure function is not required, press  key) and the display will show **NE** and **P2** symbols. Key in start pressure and press  key and the **NE** and  symbols will now be displayed. Key in test time in minutes and seconds (MM.SS), press  key and the **NE** and **P3** symbols will now be displayed. Key in permissible change in pressure and press  key. The instrument is now ready to run test and **P1** will appear on display.



## PERFORMING A TEST

This test only functions if the **P1** symbol is displayed. Apply pressure to system until **P1** changes to **P2** (Test Pressure). If a **P1** (pre-stress) pressure has been entered the system must be pressurised to this level. Bleed system. The display will then clear until test time has elapsed. **PASS** or **FAIL** will appear on the display and be

automatically logged with test conditions. This logged reading can be replayed on screen by pressing  and **1** keys or output to an Epson compatible printer by pressing  and **4** keys. It cannot be output to a PC other than via Hyper Terminal. Consecutive records will overwrite each other so must be output to printer before performing another test. After showing the **PASS/FAIL** the display will immediately revert to current pressure. The instrument must be reset manually for each new test.

## PRESSURE TRANSDUCER SELECTION

### Models 2024P, 2084P

At switch-on press and hold the  key (2024P - "0.0" key) and the display will scroll through the available transducer range option, 10.0 to 50.0 Bar (in 5 Bar steps) or 55.0 to 500.0 Bar (in 5 Bar steps) (release to select) — appears on the display. To customise press and hold the  key (2024P - "0.0" key) again to select the required input voltage range, 10.0 to 50.0 Bar with 1 to 50mV (in 1mV steps) or 55.0 to 500.0 Bar with 10 to 50mV (in 1mV steps) (release to select). These are now the default settings.

## EXTERNAL PRESSURE TRANSDUCER CONNECTION

Pressure range selectable (in Bar) with Sensitivity range selectable (in mV).

### Power supplied


+5 Volts ( $\pm$  0.25 Volts equivalent to 5%)

### Wiring instructions

Red Wire = + supply, Blue Wire = - supply,  
Green Wire = + signal, Yellow Wire = - signal

**WARNING:** Care should be taken to ensure the wiring instructions are followed as incorrect wiring of the cable to the transducer may damage the instrument.

## USER DEFINED SCALE

Press  key and **NE** will appear before the display clears. Enter scale percentage. Only the first two digits entered are valid - this gives a scaling from 1 - 99%. This value will be multiplied into current display to give user defined scale. **NE** will stay displayed and current reading will appear. A downward arrow will indicate that this feature is active. **WARNING** - whilst in this mode over range indication (out) is disabled. Do not over pressure the instrument.

## INSTRUMENT ACCURACIES

From +20°C to +30°C/+68°F to +86°F 0.1%rdg +0.1%fs +1 digit  
From -10°C to +50°C/+14°F to +122°F 0.15%rdg +0.15%fs +1 digit

*The overall performance of the instrument is obtained by combining the stated accuracy and any uncertainty due to the measurement process.*

## WARRANTY

This instrument has been carefully assembled and tested, and is warranted against faulty workmanship and materials for two years from the date of purchase. During the warranty period any defective instrument will be repaired or replaced at the discretion of the manufacturer. This warranty does not cover damage or failure resulting from misuse or accident.

Modification, adjustment or any alteration with the internal arrangement of the instrument shall absolve the manufacturer from any liability in respect of the instrument.

Any instrument to be repaired should be forwarded to the supplier, carriage paid and at the owner's risk. A brief description of the fault should be included.