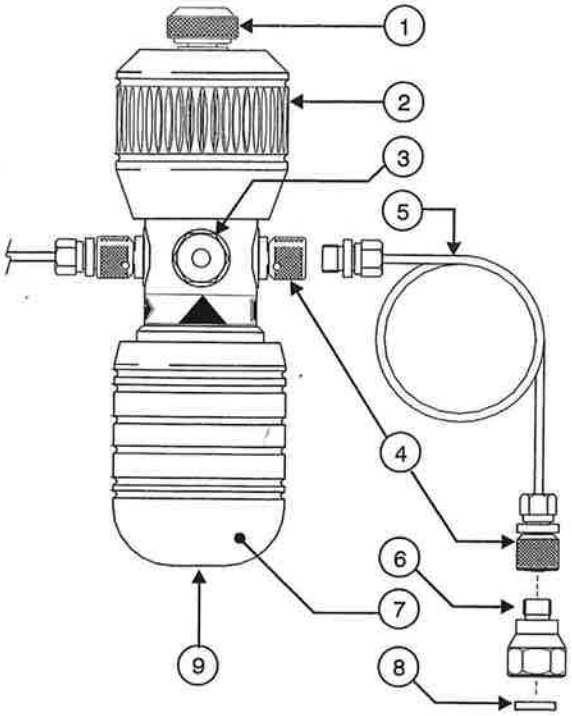
OPERATING INSTRUCTIONS FOR THE LOW PRESSURE HAND PUMP - LTP1

Key:

1. Pressure release valve.
2. Fine adjustment control.
3. Pressure / Vacuum selector.
4. Knurled 'quick-fit' connectors.
5. Two flexible hoses to item under test and master instrument.
6. BSP or NPT adaptor set.
7. Pump Handle.
8. Nylon seals for BSP adaptors (see seal kit provided) **DO NOT use 'PTFE' tape for sealing with parallel threads.**
9. Pressure Relief Valve.



Specification:

Output pressure:	0 to 3 bar / 0 to 45 psi
Output Vacuum:	0 to -900 mbar / 0 to -27 inHg
Materials:	Bright nickel plated brass, clear anodised aluminium.
Adjustment:	Fine volumetric pressure / vacuum adjuster
Dimensions:	150mm (MIN.) x 46mm DIA.
Weight:	approx. 600 grams (pump only).

The pump is a portable dual source of vacuum and pressure. Each pump incorporates a vacuum / pressure selector and fine adjustment control.

TEST INSTRUMENTS AVAILABLE
LTPG1 - LTPG4 Analogue gauges - 1.0% accuracy
Digital Indicator (DTG-2K) - 0.2% accuracy
PC6, PC6-PRO, PC6-IS & PC6-AV Pressure Calibrators - up to 0.025% accuracy.
DPM Digital Pressure Module - up to 0.025% accuracy

RELEASE VALVE (1)
This can be used to reduce or release the pressure in the system. The rate of pressure reduction is dependent upon the degree of rotation when opening the valve. Minimal force is required to seal the system.

FINE ADJUSTMENT CONTROL (2)
The pressure generated can be finely adjusted by turning the fine adjustment control (2) in or out to increase or decrease pressure accordingly.

IMPORTANT
Do not wind the fine adjustment control (2) any further when the top of the pump body is visible.

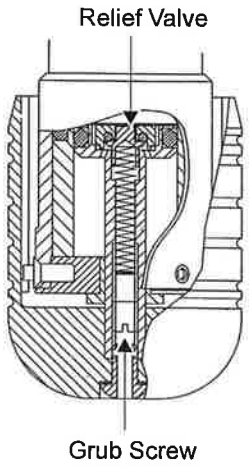
PRESSURE/VACUUM SELECTION (3)
Press the selector (3) as indicated on the label to engage the desired mode. Ensure that the release Valve (1) is open before changing mode.

PRESSURE PORTS (4)
The hoses (5) and adaptors (6) are fitted by simply screwing them into the connectors (4) by Turning the knurled nut on the connector fully anti-clockwise.

ADJUSTABLE PRESSURE RELIEF VALVE (8) (For protection of sensitive instruments)
The maximum output pressure can be set using the pressure relief valve located inside the main Piston, accessed via the handle retaining screw (adjustment range between 50mbar and 3 bar).

NOTE
The pump should only be used for pressurising small volumes due to its small displacement.
If the pump has not been used for a period of time, it could be difficult to operate on the first stroke.

For seal replacement, refer to service kit LTPK1 instructions.



⚠ **WARNING: DO NOT CONNECT LTP1 TO EXTERNAL PRESSURE SOURCE.**

Guidelines for use:

1. Calibration / Comparison against Analogue gauge

1.1 Connect a SI Test Gauge (LTPG's) using appropriate adaptor and sealing to one of the flexible hoses (5) or directly to body using adaptor (6).

1.2 Connect item under test using appropriate adaptor and sealing to the second flexible hose (5) or directly to body using adaptor (6).
Note: adaptors tightened to a maximum torque of 15 Nm.

1.3 Screw fine adjustment control (2) in fully and then out 4 - 6 full turns.

1.4 Screw pressure release valve (1) in fully, tightening to ensure good seal.

1.5 Using a flat blade screwdriver (2.5mm wide max.), adjust the pressure relief valve (8) to set the desired maximum output pressure. Turn the grub screw located in the main piston clockwise to increase or anti-clockwise to decrease the pressure setting.

1.6 Operate handle (9) until the pressure is close to that finally required.

1.7 Wind the fine adjustment control (2) in to increase pressure or out to decrease pressure until required pressure is reached.
Note: The pressure may take up to 30 seconds to settle after increasing pressure due to thermodynamic effects, settling of seals and expansion of the flexible hose.
Caution: STOP unscrewing the fine adjustment control (2) when the top of the pump body becomes visible.

1.8 Reductions in pressure can also be achieved by careful use of the pressure release valve (1).

1.9 Vacuum is achieved using the above procedure and having the pressure / vacuum selector (3) pushed completely towards the vacuum position. **Note: release pressure before changing mode.**

2. Use With High Resolution Pressure Calibrators

When used with instruments such as the PC6 Calibrator the connections and use are as for gauges above, however the higher resolution available will amplify the visibility of the thermodynamic effects as mentioned in paragraph 1.7. These will settle to useable values within one minute of pressurisation.
Note: On very high resolutions such as 1 mbar or 0.1 inches of water, small movements of the pipe may result in noticeable pressure changes.

3. Fault Investigation.

In the event that the pump appears to lose pressure then the procedure above should be repeated ensuring new seals are used, adaptors are tightened sufficiently and the pressure release valve (1) is tightened firmly.
Note: The connections to the hand held test system are sealed with 'o' ring or bonded seals and should not leak.
DO NOT attempt to tighten the other fittings to the pump as this could lead to damage of sealed joints.
When testing for leaks it may be noticed that air is drawn in or expelled from around the pressure / vacuum selector. This is normal and should cause no concern.

Ordering Codes.

LTP1	Hand Pump in rigid carrying case, two flexible hoses with ¼"BSP female adaptors and seal set
PC6, PC6-AV, PC6-IS & PC6-PRO	A range of Pressure Calibrators and Indicators available between -1 and 3 bar / 45 psi
DTG-2K	A range of Digital Indicators between -1 and 3 bar / 45 PSI
LTPG1 to 4	Analogue Gauges between -1 and 3 bar / 45 PSI
DPM	A range of Digital Pressure Modules between -1 and 3 bar / 45 psi
LTPK1	Service kit containing a set of seals, 'O' rings, retaining screws and allen key
LTPA-BSP-QF	Set of 7 BSP Quick-fit adaptors
LTPA-NPT-QF	Set of 6 NPT Quick-fit adaptors

SI PRESSURE INSTRUMENTS