



PRESSURE SOLUTIONS

P501: Pressure Comparators

A pressure comparator is basically a device to generate or control pressure, which is fitted with at least two pressure connections, one for the unit under test, the second for the pressure reference.

Pressure Medium:

Pressure comparators will be either pneumatic or hydraulic. Pneumatic comparators are used at low pressures, simply because at high pressures, a lot of gas is used.

Hydraulic Comparators can be either oil based or water based. Water based units are usually more expensive, because no carbon steel is used in their construction due to rust. Some may be required for special fluid like Skydrol, which is a fire-retardant oil used in aircraft systems, which attacks normal hydraulic seals, thus requiring a special version, usually with EPDM seals.

Portability:

Hand Held Pumps: To be inclusive, we will cover hand-held pumps, which while not generally classed as comparators, do in fact perform this function. Their advantage is compactness and light weight, making them ideal for carrying up ladders. They are also useful for installations where a multi-port isolating valve allows calibration in situ, without removing the instrument under test.

Again these may be pneumatic or hydraulic. Pneumatic systems are cleaner and require no separate operating fluids. Low pressure systems have larger swept volumes, and can generate low pressures much more quickly than high pressure systems. High pressure hand-pumps have a smaller swept volume. This means that to achieve a high pressure may take a lot of work, particularly if the system under test has any significant volume. Hydraulic hand pumps have an even smaller volume, and should only be used with systems under test containing very little air or gas.

We would offer from the Ametek Jofra range, their systems A, B or C

Comparators Requiring an Operating Surface: These are normally light hydraulic comparators which don't require a lot of effort. They can be taken to the working area, placed on a bench top, and used. Examples would be firstly the Jofra system D, available for use with water or oil at the same price, and rated up to 35 MPa. This is a screw press system and the lowest cost to 35 MPa. At the next price level, The Budenberg Fig. 106 has quite a proud history in our power stations, and can be supplied for either oil or water use at the same price. It is a screw press, rated to 60 MPa, but at higher pressures should be fixed to the bench. The Jofra system E is a lever type pump with a vernier adjustment rated to 70 MPa for use on oil. The Jofra system F is another lever type pump with vernier adjustment, but available for either water or oil use, and with different seal materials to cover different operating fluids, at varying prices. All these Jofra pumps are available with an optional aluminium carrying case.

Comparators Requiring a Fixed Installation: The most definite example is the pneumatic comparator, 550C, which is the base of the 550 series air-operated deadweight-testers. This requires to be plumbed into a compressed gas supply but goes to 12 MPa. Less clear-cut examples are the Budenberg Fig. 106 referred to above, the cheapest way to get to 60 MPa, which for best use requires to be bolted down to the bench. The Budenberg 580C is the comparator based on the 580 series of oil-operated deadweight-testers. It is only slightly more expensive than the Fig. 106 in the oil version, but water operation costs a bit more. It has levelling screws which fit into mounting pads screwed to the bench. It is very ergonomic with the dual area screw press, and can be used to 120 MPa in the standard version, and 260 MPa in the extra-high pressure version.

P.O.Box 3357, Benoni 1500. 169, Elston Ave, Benoni, 1501, Gauteng, South Africa
Phone 422-1749/1840 Fax 421-5379 Dial code international +2711 local 011

E-mail: rod@pressuresolutions.co.za

Web: www.pressuresolutions.co.za

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