



DIVIDER Model 1500

For pneumatic pressure calibrations
at high static pressures

- ✓ UNMATCHED ACCURACY
- ✓ EASE OF OPERATION
- ✓ UNSENSITIVE TO LINE PRESSURE

- ✓ LONG TERM STABILITY
- ✓ UNSENSITIVE TO GAS CLEANLINESS
- ✓ EX PROOF OPERATION

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The Divider model 1500, when combined with an hydraulic pressure standard measures pneumatic differential & gauge pressures from 0 to 10 bar at static pressures between 0 gauge and 400 bar. Any differential pressure increment desired can be performed.



1500 divider with 5300 DH-Budenberg DWT

FUNDAMENTAL STABILITY AND REPEATABILITY

The divider relies upon the intrinsic qualities and effective area ratios of three specially selected tungsten carbide piston-cylinders which give exceptional stability and specifications reliable over time. Typical stability over 1 year is in the order of magnitude of 1 PPM.

As all the piston-cylinders are made of the same material, temperature changes have no effect on measurement.

EASE OF OPERATION

The large piston acts as a pressure generator/regulator, simplifying considerably calibration procedures. Though built-in facilities for differential pressure adjustment are included, for small differential increments movement of the pistons, without operator intervention, directly generates a differential pressure.

Thanks to DH-Budenberg unique gas operation-liquid lubrication system problems of contamination are eliminated any non-corrosive gas may be used as the pressure medium.

ACCURACY

Two accuracy classes are offered: the uncertainty on the dividing ratio is +/- 0,01% or +/- 0,005% including all sources of error. Most importantly, the magnitude of the line pressure has no effect on the uncertainty on a differential pressure.

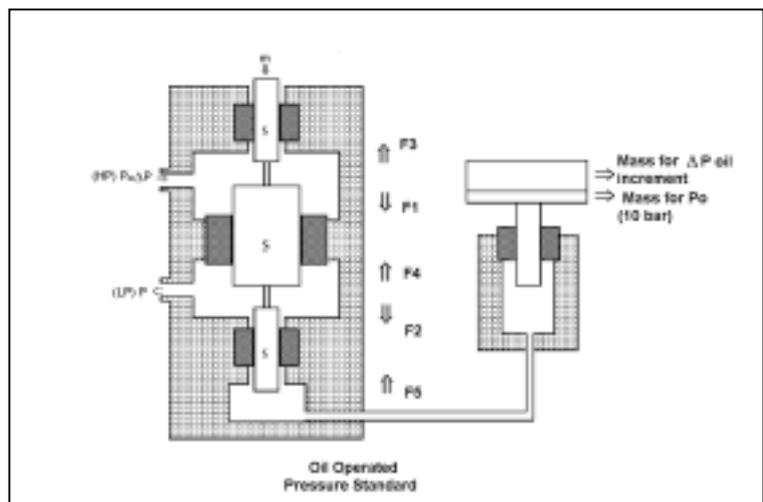
The divider model 1500 may be driven by any high quality hydraulic pressure standard. Total uncertainty on differential pressure is the relative uncertainty on the hydraulic pressure plus the uncertainty on the divider.

The model 1500 is made up of three coaxially linked piston-cylinders. The middle piston has an effective area nominally 101 times greater than the upper and lower pistons (S = 101s).

In operation, the mass of the three piston mobile assembly is balanced out by an oil pressure coming from an oil-operated pressure standard with the 1500's upper and lower chambers at the static pressure P. At equilibrium, a by pass valve is closed isolating the upper chamber from the lower chamber.

To generate a differential pressure, a mass equivalent to 100 times the differential pressure desired is placed on the oil-operated standard. The piston of the oil-operated standard is put back into equilibrium and the result is a differential pressure exactly 100 times smaller across the large piston divider:

$$\Delta P_{gas} = \frac{\Delta P_{oil}}{100}$$



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METROLOGICAL CHARACTERISTICS

➤ DIFFERENTIAL PRESSURE UP TO 10 BAR

The operating range of the model 1500 and the overall accuracy on a differential pressure depend upon the range and accuracy of the oil-operated pressure standard in conjunction with which it is used.

The model 1500 may be used at static pressures up to 400 bar. As a standard the maximum differential pressure range is 0 to 5 bar with a 500 bar in conjunction with a 500 bar pressure balance.

Optionally the maximum differential pressure can reach 10 bar in conjunction with a 1000 pressure balance

The maximum differential pressure attainable depends upon the maximum oil pressure attainable on the oil-operated pressure standard.

➤ UNCERTAINTY BETTER THAN 0.01% OF DIFFERENTIAL PRESSURE

The accuracy of a differential pressure is function of the uncertainty on the dividing ratio KD and of the uncertainty on the oil pressure. Uncertainties better than 0.005% are reached on the dividing ratio.

The magnitude of the static pressure at which a differential pressure defined has no effect on accuracy.

In addition, a 0,1 mbar constant reflects the uncertainty on the initial balancing between the oil-operated pressure standard and the divider as well as the noise inherent in the divider due to the rotation of pistons.

Thus total uncertainty is:

$$\pm [(0,1\text{mbar}) + (\text{uncertainty on dividing ratio KD}) (\Delta P) + (\text{uncertainty on oil pressure}) (\Delta P)]$$

Depending on the performance of the oil operated pressure balance used in conjunction with the divider a relative uncertainty better than 0.01% of differential pressure can be achieved.

OPTIONS AND ACCESSORIES

Optionally 1500 divider can be equipped with:

- Explosion proof electrical system for use in hazardous area. Differential pressure measurements can directly be performed with natural gas.
- Piston position sensors for compatibility with TERMINAL5000.
- TERMINAL5000.

TERMINAL 5000 is an electronic interface performing:



- ✓ Monitoring of divider and DWT pistons respective position, drop rate, trend ...
- ✓ Piston cylinder assemblies temperature data acquisition and calculation of related correction.
- ✓ Environment conditions corrections.
- ✓ Conversion in engineering units.
- ✓ Display of corrected true pressure corrected for all parameters of influence.
- ✓ Computer interfacing for automated data acquisition and processing.

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