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PRASEODYMIUM, Pr. See Rare earth elements.

PRECIPITATION HARDENING. See Metal treatments.

PRESSURE MEASUREMENT

Knowledge of the pressure existing in a pipeline, tank, process tower, boiler, molding press, airplane cabin, space cabin, and many other units is an absolute necessity in most phases of industry, and in research and development. Knowledge of the pressure data enables the engineer to operate within safe design limits, and the researcher to establish the optimum conditions for product yield and product quality.

Pressure Terms

Pressure is defined as force per unit of area. It can be expressed in a wide range of units; Table 1 gives interconversion factors among lb/in.² (psi), kg/cm², mm Hg (Torr), in. Hg, ft of water, and cm of water.

Table 1. Conversion Table of Pressure Units Based on Water at 60°F (62.367 lb/ft³) and Hg at 60°F (846.32 lb/ft³)^a

Known pressure unit	Required pressure unit					
	lb/in. ² (psi)	kg/cm ²	mm head Hg (Torr)	in. head Hg	ft head of water	cm head of water
cm head of water	0.014209	0.00099902	0.73691	0.029012	0.032808	
ft head of water	0.43310	0.030451	22.461	0.88430		30.480
in. head Hg	0.48977	0.034434	25.400		1.1308	34.468
mm head Hg (Torr)	0.019282	0.0013557		0.039370	0.044521	1.3570
kg/cm ²	14.223		737.63	29.041	32.840	1001.0
lb/in. ² (psi)		0.070309	51.862	2.0418	2.3089	70.376

^a Multiply known pressure units by factors given to obtain the required pressure units.

Atmospheric pressure (barometric pressure) is the pressure exerted by the column of air on the earth's surface, at a specified place and time. It varies with elevation above and below sea level and with weather conditions. To eliminate the normal ex-

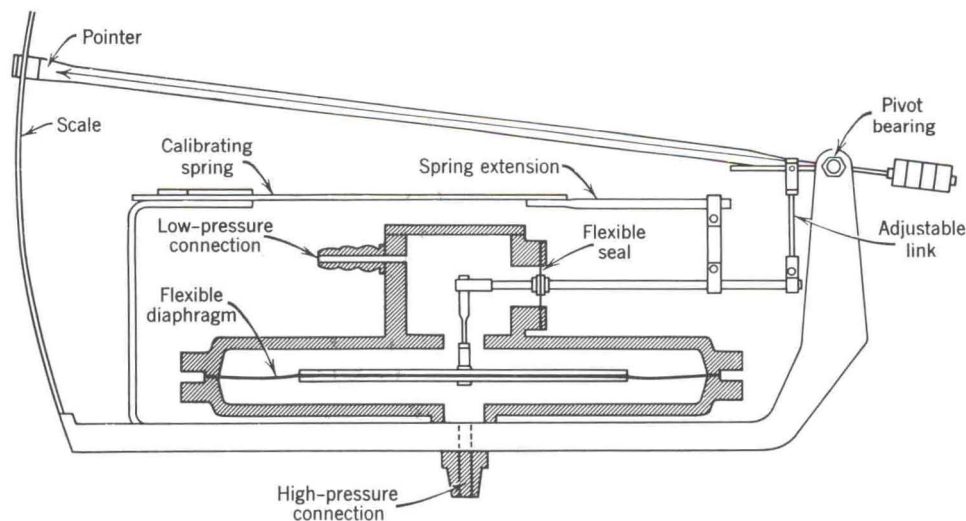


Fig. 1. Slack-diaphragm pressure gage. Courtesy The Hays Corporation.