

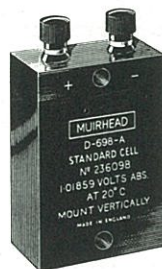
## STANDARD CELLS



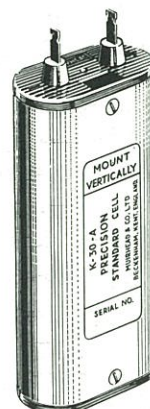
D-402  
STANDARD CELL



D-550-A  
MINIATURE STANDARD CELL



D-698-A  
MINIATURE STANDARD CELL



K-30-A  
STANDARD CELL

MUIRHEAD standard cells are fundamental standards, the e.m.f. of each cell being reproducible at any temperature over the entire working range. Although the e.m.f. given under the individual headings is for a temperature of 20°C, it can be calculated for any temperature by means of the formula in the Specification.

## TYPES AVAILABLE

**K-30-A STANDARD CELL**

This is a precision standard cell which is intended to meet the requirements of research and industry for cells having a much higher order of accuracy and stability than has hitherto been available. After each cell has been aged, it is subjected to a three month test period, during which its e.m.f. is regularly checked and noted. Before a cell is dispatched to a customer, the values of e.m.f. obtained on this test must all be within  $\pm 1\mu\text{V}$  of the mean value. In practice, this stability can be achieved by keeping the temperature of the cell constant to within  $\pm 0.01^\circ\text{C}$ . It is recommended that the cell be immersed in a temperature-controlled oil-bath if maximum stability is desired.

**D-402 STANDARD CELL**

This unit is available as a single cell in a Bakelite case (D-402-A), two cells in a Bakelite case (D-402-B), or as a single unmounted cell (D-402-C). All types are recommended as laboratory standards, the double cell being particularly useful as the two cells can be used for purposes of intercomparison. Unmounted cells are suitable for building into portable potentiometers and similar equipment.

In the mounted types, provision is made for the insertion of a thermometer (D-420-A) for use when a temperature correction is required.

**D-550-A MINIATURE STANDARD CELL**

This is a particularly compact cell, and is especially suitable for mounting in positions which would be too confined for other types. The construction of the cell is very robust, being in the form of a single tube. The electrodes are placed side by side in the base, and are separated by a glass partition. An important advantage of this construction is that little temperature difference can exist between the elements.

The cell is firmly mounted in a moulded Bakelite case, the connexions being brought out at the top by tinned brass spills clearly marked with their corresponding polarities. Provision is made for bottom and side mounting.

**D-698-A MINIATURE STANDARD CELL**

This cell is an alternative to the D-550-A, for use where a higher capacity is required. It employs a modified form of the conventional H-type construction, making it very compact and robust; also, the modified construction minimizes temperature differences between the limbs. The cell is resiliently mounted within the container, connexions being brought out to two shrouded terminals on the top of the case. Provision is made for bottom and side mounting.



## SPECIFICATION

Type	Manufacturing Tolerance of E.M.F. at 20°C* (volts abs)	Guaranteed Accuracy of E.M.F. on Test Certificate	Internal Resistance (ohms)	
			Average	Maximum
K-30-A	1.01858 to 1.01864	0.001 %	600	1000
D-402 (series)	1.01856 to 1.01866	0.002 %	600	1000
D-550-A	1.01851 to 1.01871	0.01 %	800	1200
D-698-A	1.01851 to 1.01871	0.01 %	400	600

\*The e.m.f. (volts abs.) at any temperature between 10°C and 40°C may be derived from the following formula:

$$dE = -40.6 (t-20) - 0.95 (t-20)^2 + 0.01 (t-20)^3$$

where,

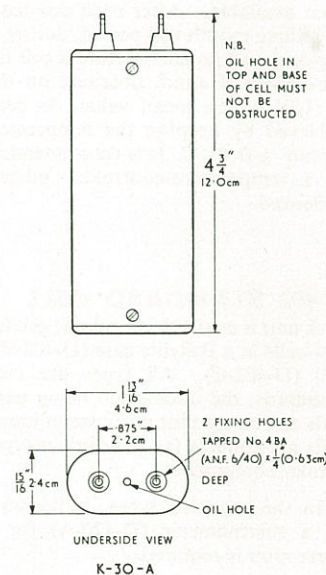
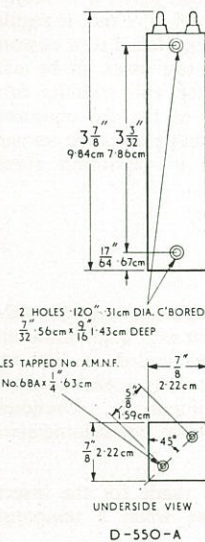
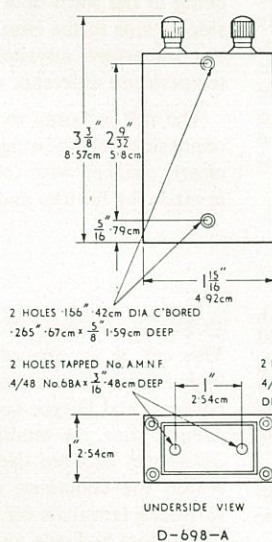
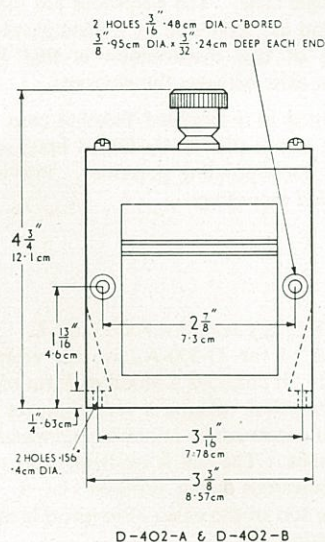
dE = difference in microvolts from the e.m.f. at 20°C

t = temperature in °C

## DIMENSIONS

TYPE	HEIGHT		WIDTH		DEPTH		WEIGHT	
	in	cm	in	cm	in	cm	oz	g
K-30-A	4 <sup>3</sup> / <sub>4</sub>	12.1	1 <sup>13</sup> / <sub>16</sub>	4.6	<sup>15</sup> / <sub>16</sub>	2.4	5.6	160
D-402-A	4 <sup>1</sup> / <sub>4</sub>	12.1	3.0	7.6	3 <sup>3</sup> / <sub>8</sub>	8.6	18.0	510
D-402-B	4 <sup>3</sup> / <sub>4</sub>	12.1	3.0	7.6	3 <sup>3</sup> / <sub>8</sub>	8.6	22.0	625
D-402-C	2 <sup>3</sup> / <sub>4</sub>	7.0	2 <sup>1</sup> / <sub>16</sub>	5.3	<sup>5</sup> / <sub>8</sub> *	1.6*	2.0	57
D-550-A	3 <sup>7</sup> / <sub>8</sub>	9.8	<sup>7</sup> / <sub>8</sub>	2.2	<sup>7</sup> / <sub>8</sub>	2.2	2.6	74
D-698-A	3 <sup>3</sup> / <sub>4</sub>	8.5	1 <sup>15</sup> / <sub>16</sub>	4.9	1.0	2.54	4.0	114

\*Diameter of tubes



### MOUNTING DETAILS