

Ratiometer Indicators

RATIOMETERS

Moving coil ratiometer indicators can be made available in various models for a number of applications, typical examples being temperature, pressure and position measurement. There are many other applications in which a ratiometer can be calibrated for use with customer's own transmitter device.

Weston ratiometers are of the permanent magnet moving coil type and employ two balanced but opposed windings, differently disposed in a non-uniform magnetic field and without mechanical restoring torque. Currents are fed to the windings by means of fine ligaments and the moving system will assume a definite position in the non-uniform field when the flux-current torques associated with the opposed windings are exactly balanced. The indications are therefore proportional to the ratio of the currents in the two windings and substantially independent of variations in the supply voltage.

There are two basic methods of controlling the deflections in the ratiometer -

- (a) By varying the current in one winding only, with constant current in the other winding.
- (b) By varying the current in both windings in opposite sense, that is by increasing the value in one winding and decreasing the value in the other.

This first method of control (Fig.1) is more suitable for transmitters that do not employ moving contacts, that is, a resistance which changes its value by a non-mechanical action.

The second method of control (Fig.II) is basically designed for use with a three-terminal potentiometer where the supply voltage can be connected to the slider or wiper of the potentiometer device.

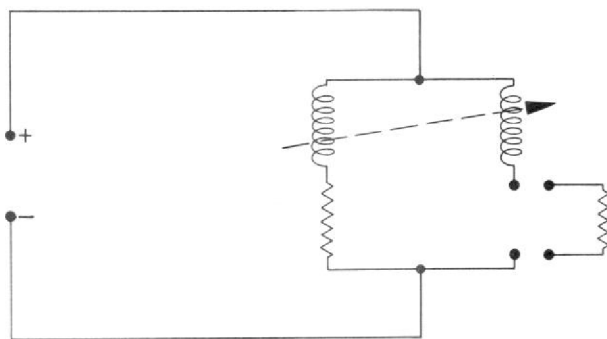


FIG. I

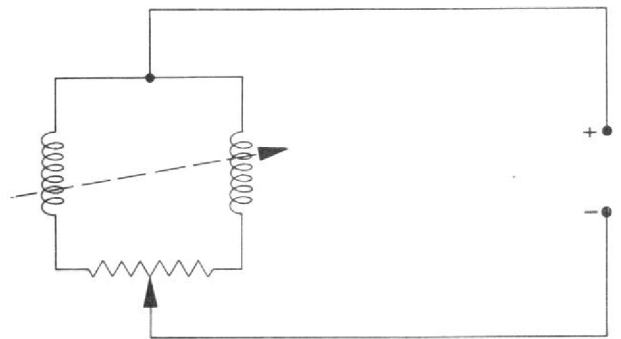


FIG. II

The majority of indicators listed in this section are provided with spring control to deflect the pointer off scale in the event of a failure in the power supply to the indicator. In cases where the torque of the movement is not sufficient to permit the use of spring control a special pointer return device is normally fitted. A failure in the power supply causes the pointer to deflect above the upper end of the scale on pressure and position indicators and below the lower end on temperature indicators.

DIAL PRESENTATION:

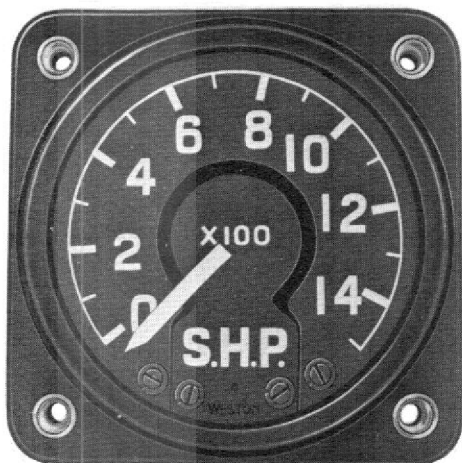
- White markings on black background (standard)
- Black markings on white background
- Fluorescent markings on black background

DIAL MARKING LINEARITY:

All ratiometer indicators have individually calibrated scales which can vary in linearity from one indicator to another even though they may be to the same specification. The limits of dial linearity are such that any one division on the dial will not exceed 2 1/2 times the width of any other division.

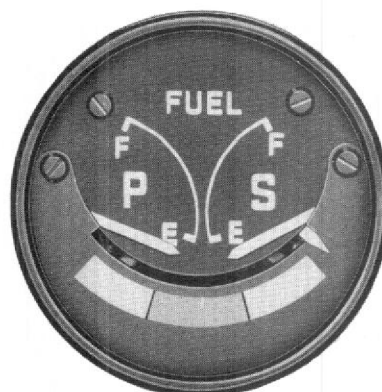
RATIOMETERS CALIBRATED AS TEMPERATURE INDICATORS

The minimum temperature span for ratiometer indicators of the S63 and S149 variety is 100°C or (200°F) when used in conjunction with S110(G) Platinum Resistance Bulbs.



Model S 63 Form 4

Typical Presentation



Model S 214 Form 1

Typical Presentation

RATIOMETERS

MODEL	FORM	DESCRIPTION	CASE DEPTH	NOMINAL SCALE ANGLE	SCALE LENGTH	ELECTRICAL CONNECTIONS	NORMAL ACC. OF FSD	APPROX. WEIGHT	F.D.
S62	3	Small S.A.E. shielded bakelite case	1.91 in (49 mm)	90°	1.6 in (41 mm)	A3.B3.	± 2%	8 oz (227 g)	687
S62	5	Large S.A.E. shielded bakelite case	2.42 in (62 mm)	90°	2.25 in (57 mm)	A3.B3.	± 2%	16 oz (454 g)	775
S63	4	Small S.A.E. shielded bakelite case	2.94 in (75 mm)	260°	4.25 in (108 mm)	A3.B3.	± 2%	12 oz (340 g)	684
S63	5	Large S.A.E. shielded bakelite case	3.21 in (82 mm)	260°	5.875 in (149 mm)	A3.B3.	± 2%	16 oz (454 g)	777
S127	5	Large S.A.E. shielded bakelite case Dual movements	3.1 in (79 mm)	100°	1.75 in (44 mm)	A3.B3.	± 2%	20 oz (567 g)	784
S149	1	2 in dia flangeless steel case. (Sealed)	3.25 in (83 mm)	260°	3.25 in (83 mm)	A3.B3.C3. C4.C5.	± 2%	13 oz (369 g)	814
S174	5	Large S.A.E. shielded bakelite case. Four movements	2.97 in (76 mm)	90°	0.93 in (24 mm)	A3.	± 3%	22 oz (625 g)	931
S181	1	Edgewise metal case, bakelite case. 2.75 in (70 mm) x 4.625 in (118 mm)	3.188 in (81 mm)	52°	1.29 in (33 mm)	A5.	± 4%	18 oz (510 g)	968
S214	1	2 in dia Flangeless steel case (Sealed) Triple movements	3.9 in (99 mm)	90°	0.83 in (21 mm) 2 Mvts. 1.5 in (38 mm) 1 Mvt.	C10	± 3%	12 oz (340 g)	993
S216	1	2 in dia Flangeless steel case (Sealed) Dual movements	3.9 in (99 mm)	90°	0.83 in (21 mm)	C6.C7. C8. C9.D1.	± 3%	11 oz (312 g)	972
S453	4	Small S.A.E. shielded bakelite case (Flangeless)	2.94 in (75 mm)	260°	4.25 in (108 mm)	A3.B3.	± 2%	10 oz (283 g)	1135
S453	5	Large S.A.E. shielded bakelite case (Flangeless)	3.21 in (82 mm)	260°	5.875 in (149 mm)	A3.B3.	± 2%	12.5 oz (354 g)	1136
S454	1	2 in dia Flangeless steel case (Sealed)	3.89 in (99 mm)	90°	1.3 in (33 mm)	A3.B3.	± 3%	10 oz (283 g)	1164
S455	5	Large S.A.E. shielded bakelite case (Flangeless)	3.21 in (82 mm)	100°	1.75 in (44 mm)	A3.B3.	± 2%	17.5 oz (496 g)	1137
S483	1	2 in square front steel case with integral lighting	4.32 in (110 mm)	260°	3.3 in (84 mm)	A6.B4.C7.	± 2%	20 oz (566 g)	1374
S484	1	2 in square front steel case with integral lighting. Dual movements	4.51 in (115 mm)	90°	0.9 in (23 mm)	A6.B4.C12.	± 4%	16 oz (454 g)	1374





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