FERRANTI

T.R. CELL

QF41

Type QF41 is a tuneable T-R Cell for operation in the 3 cm. band. It is designed for coupling to rectangular waveguide 0·9in. x 0·4in. internal dimensions (Waveguide No. 16 in RCL351) and is fitted with an engraved tuner. It is similar to Type QF40 but its effective bandwidth when tuned has been increased to about 25 M/cs. for a V.S.W.R. of 2·0, or 15 M/cs. if the limit of V.S.W.R. is 1·5.

PHYSICAL DIMENSIONS.

Max. overall height	3 11/16 ins. (94 mm.)
Max. overall width	1·0in. (25·4 mm.)

For other dimensions see drawings in margin and overleaf.

The Keep-alive electrode is connected to a 5 BA terminal at the top of the cell.

RATINGS.

Max. Transmitter Power level	50 kW. peak.
*Tuning Range	9,500 Mc/s. ± 5%
Preset Tuning Range ...	Centre Frequency ± 100 Mc/s.
V.S.W.R.	1·4.
Max. Insertion Loss at Resonant Frequency ...	1·2 db.
Max. Insertion Loss at ± 15 Mc/s. off Resonant Frequency	1·5 db.
†Max. Leakage at 40 kW. Peak— spike	0·10 ergs/pulse.
flat	30 mW.
‡Min. Breakdown Power	250 mW.
§Effective R.F. short circuit	(a) 0·25 ± 0·03 inches.
	(b) 0·20 ± 0·03 inches.
Max. Recovery Time (to 6 db. loss) at 40 kW.	4 μsecs.
Max. Keep-alive Breakdown voltage	1000 volts.

TYPICAL PERFORMANCE DATA.

Low Level Characteristics.

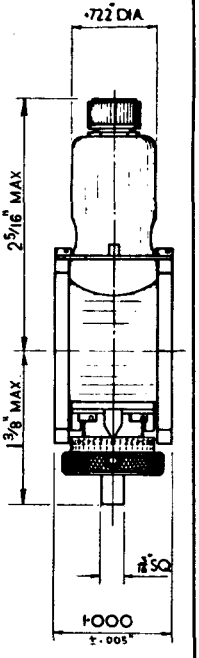
Q_L	130 approx.
V.S.W.R. at Resonance ...	1·1 approx.
Insertion Loss at Resonance ...	0·8 db.

High Power Characteristics.

Leakage at 40 kW.— spike	0·06 ergs/pulse.
—flat ...	20 mW.
Breakdown Power	100 mW.
Recovery Time (to 6 db. loss)	1·5 μsec.

Keep-Alive Characteristics.

Breakdown Voltage	700 volts.
Potential Drop at 150 μA. ...	350 volts.



All dimensions shewn are in inches.

* The engraved tuner provides a covergae of ± 100 Mc/s. about the centre frequency. Each division of the tuner scale corresponds to an alteration in frequency of approx. 10 Mc/s. The cell is normally supplied with the tuner centred on 9375 Mc/s. but on request it may be set at other points within the range 9075 Mc/s. to 9925 Mc/s.

† 1 μsec. pulses.

‡ For protection against external transmitters.

§ See note overleaf.

Formerly known as Type TTR31MR.

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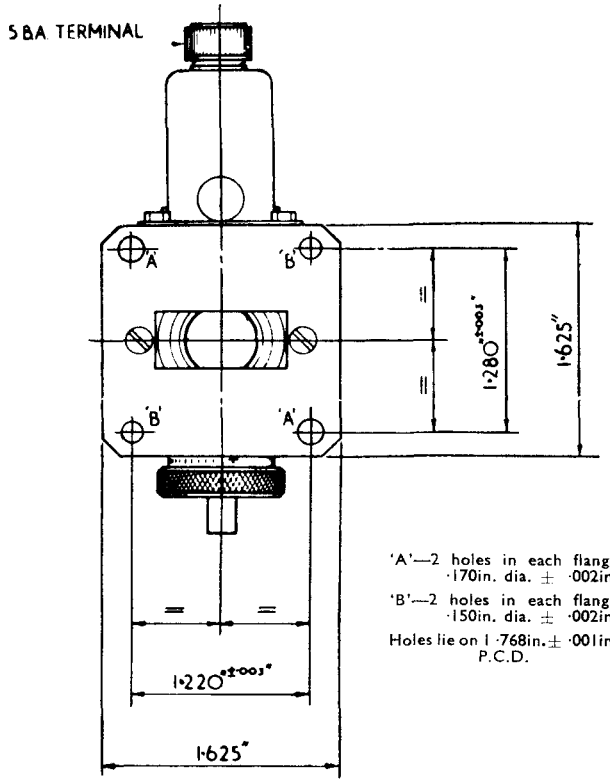

'A'—2 holes in each flange ·170in. dia. ± ·002in.

'B'—2 holes in each flange ·150in. dia. ± ·002in.

Holes lie on 1·768in. ± ·001in. P.C.D.

OPERATING NOTES.

This T.R. Cell in a simple duplexer, gives complete protection to all types of crystals both from the local and neighbouring transmitters, with an appreciable margin of safety and long life.

To ensure rapid breakdown a negative voltage of 1000V. D.C. should be applied to the keep-alive electrode. The keep-alive current should be restricted to between 100 μA and 150 μA by means of a suitable limiting resistance. Some of this resistance may be located in the power supply but at least 1 megohm should be connected directly on to the keep-alive terminal to prevent relaxation oscillations at the keep-alive. It is advisable to arrange that the keep-alive current is passing for a few seconds before the transmitter begins to operate.

To give protection from neighbouring transmitters when the set is not operating and the keep-alive unenergised a suitable gate or crystal shutter must be fitted.

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* The position of the R.F. short has two alternative values, depending on whether a window discharge occurs or not, but in either case the crystal protection is not affected.

(a) At peak powers below approximately 15 kW. or with 0·1 μsec. pulse lengths at all power levels, discharge is confined to the cones, and the effective short is at 0·25in. ± 0·03in.

(b) At peak powers above approximately 15 kW. with pulse lengths greater than 0·1 μsec., a window discharge occurs as well and the effective short is at 0·20in. ± 0·03in.

These distances are measured from the face of the input flange of the cell.