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CALCULATION OF THE REGULATOR OF THE CURRENT OF WELDING

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Welding transformers on annular magnets have essential advantages: there are no losses of magnetic energy and mechanical regulators of a welding current; the weight and sizes are reduced.

The purpose of researches - optimisation of parametres of a winding of regulating of a welding current.

Results of researches. External and internal radiuses of an annular magnet it is accepted equal to radiuses of a magnet of the transformer. Resistance of a winding of regulating pays off for the maximum current of welding.

$$\dot{Z} = \frac{\acute{U}_2}{\acute{I}_2} \quad (1)$$

Where $\acute{U}_2$ - voltage on the secondary winding of the transformer at the moment of welding, V.Prinimaem 20÷25 In; $\acute{I}_2$ - as much as possible accepted current of welding, And.

The maximum current of welding we count behind the formula:

$$\acute{I}_2 = K d_{\text{ел}}, \quad (2)$$

Where $d_{\text{ел}}$ - diameter of an electrode, mm;

To - factor that depends on an electrode brand (To = 40 … 60 And/mm,).

Cross-section of wire $S_{\text{др.}}$ We Accept J = 8 А/мм^2, I = 250 And.

$$S_{\text{др.}} = {}^{\text{I}}/_{J} \quad (3)$$

By pure resistance of windings it is neglected. Then the minimum induced drag it is definable

$$X = \omega L_{\text{др}} = \frac{\acute{U}_2}{\acute{I}_2} \quad (4)$$

And inductance

$$L_{\text{др}} = \frac{\acute{U}_2}{\acute{I}_2 2\pi f}. \quad (5)$$

Knowing inductance and parametres became (fig. 1), we define quantity of convolutions. Steel quality we accept 3411 … 3416, μ = 500 … 600.

$$W_{\text{др}} = \sqrt{\frac{L_{\text{др}} 2\pi}{\mu\mu_0 h \ln\frac{R_2}{R_1}}} \quad (6)$$

Where h - butterfly governor altitude, m; R_1, R_2 - internal and external radiuses of the butterfly governor, m.

$$W_{\text{др}} = \sqrt{\frac{\acute{U}_2}{\mu\mu_0 h \acute{I}_2 f \ln\frac{R_2}{R_1}}}$$

Or (7)

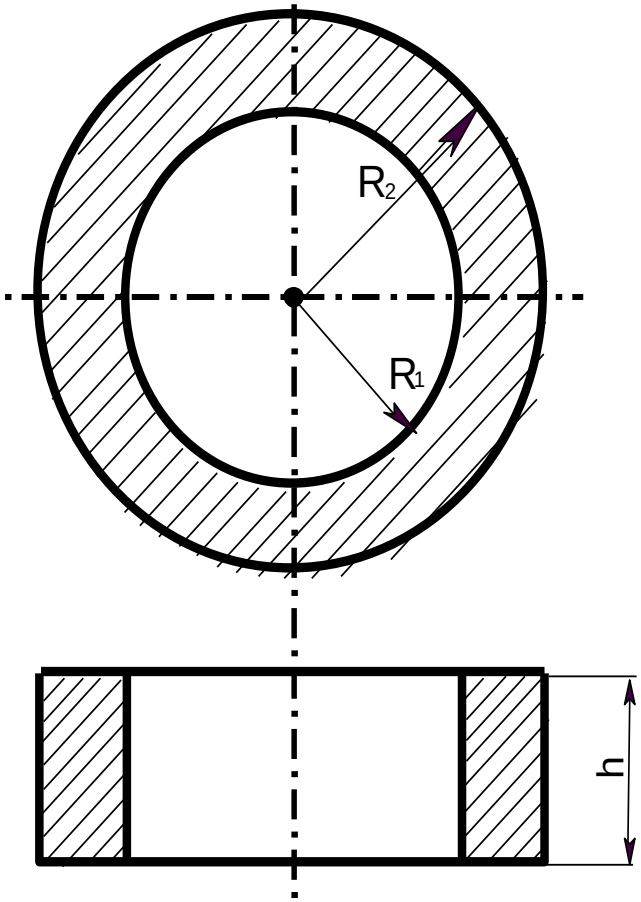

Fig. 1. A design of a magnet of a winding of regulating

The internal radius of an annular magnet should be such that the winding was located on its round. Should will be executed an inequality

$$2\pi R_1 \geq k_{\text{ук}} W_{\text{др}} b. \quad (8)$$

Where $k_{\text{ук}}$ - factor that considers gaps $k_{\text{ук}}$ = 1,2; b - width to a wire, m.