Symbols

(Manuscript received October 20, 1953)

The following list gives the symbols used through the several articles appearing in this issue of the JOURNAL. The list does not include all the variant forms of the different symbols distinguished by subscripts, as these distinctions are indicated in the context where they are used.

MECHANICAL:

a Cross sectional area
ℓ Length
m Effective armature mass
T Kinetic energy
V Work done to overcome static load
x Armature displacement

ELECTRICAL:

e Copper efficiency or fraction of the copper volume occupied by conductor
E Applied battery voltage
G Total equivalent single turn conductance
G_C Equivalent single turn conductance of coil; N^2/R
G_E Equivalent single turn eddy current conductance
G'_E Effective single turn eddy current conductance; $G_E e^{-G_E/(G_C+G_S)}$
G_S Equivalent single turn conductance of sleeve
i Instantaneous current
I Steady state current
m Mean length of turn in winding
N Number of turns in winding
L_1 Single turn inductance; $\dfrac{4\pi}{\mathcal{R}'(x)}$
NI Ampere turns
NI_0 Just operate or just release ampere turn value
q Ratio of just operate to final ampere turns; $\dfrac{NI_0}{NI}$

ρ Resistivity of material
R Resistance
S Coil volume
v Ratio of flux attained at time t to steady state flux
W Power; I^2R

MAGNETIC:

A Equivalent pole face area
A_2 Effective pole face area (design value)
B Induction (flux density)
B' Value of B for maximum permeability
B'' Saturation density
B_M Density at $\mu = 1000$
B_R Remanence (density at $H = 0$)
C_L $\dfrac{\mathfrak{R}_0 + \mathfrak{R}_L}{\mathfrak{R}_0}$
F Magnetic pull
$\mathfrak{F}$ Magnetomotive force; $4\pi NI$
$\mathfrak{F}_C$ Coercive magnetomotive force
H Field intensity
H_C Coercive force
L Inductance
μ Permeability
μ_A Permeability of air
μ' Maximum value of permeability
$\mathfrak{R}$ Reluctance
$\mathfrak{R}_C$ Reluctance of the core
$\mathfrak{R}_C'$ Minimum value of core reluctance
$\mathfrak{R}_1$ $\mathfrak{R}(x)$ for $x = x_1$
$\mathfrak{R}_i$ Initial incremental reluctance
$\mathfrak{R}_0$ Equivalent closed gap reluctance
$\mathfrak{R}_L$ Equivalent leakage reluctance
$\mathfrak{R}_{L2}$ Effective leakage reluctance (design value)
$\mathfrak{R}_{02}$ Effective closed gap reluctance (design value)
$\mathfrak{R}(x)$ Equivalent relay reluctance $\dfrac{\mathfrak{R}_L\left(\mathfrak{R}_0 + \dfrac{x}{A}\right)}{\mathfrak{R}_0 + \mathfrak{R}_L + \dfrac{x}{A}}$
φ flux
Φ Steady state flux

φ_1 Initial equilibrium flux
φ' Flux for maximum permeability or minimum reluctance
φ'' Flux at saturation
φ_0 Residual flux
φ_G Gap flux
U Field energy
u $x/A\mathfrak{R}_0$ or x/x_0
W Mechanical work done by magnet
x_0 $A\mathfrak{R}_0$

TIME:

t Time
t_0 Operate or release time
t_1 Waiting time
t_2 Motion time
t_3 Stagger time
t_E Eddy current time constant; $L_1G'_E$
t_C Winding time constant; L_1G_C
t_S Sleeve time constant; L_1G_S