Application Note PE005

Magnetic Units 1
Conversion 2

1 Magnetic Units

Size	Symbols	SI - unit	not allowed anymore cgs - unit	Conversion
Magnetic flux density (induction)	B	T (Tesla)	G (Gauss)	$1\ T = 1\ \frac{Vs}{m^2} = 10^4\ G$ 1 mT = 10 G
Magnetic field strength	H	$\frac{A}{m}$ $\frac{(Ampere)}{(Meter)}$	Oe (Oersted)	$1\ \frac{kA}{m} = 12{,}57\ Oe$ $1\ Oe = 79{,}5\ \frac{A}{m}$
Magnetic flow	Φ	Wb (Weber) = Vs (Volt • Sek)		
Magnetic field constant	μ_0	$\frac{T}{\frac{A}{m}} = \frac{Vs}{Am}$	$\frac{G}{Oe}$	$\mu_0 = 4\pi \cdot 10^{-7} \frac{T}{\frac{A}{m}}$ $\mu_0 = 1\ \frac{G}{Oe}$

Our teslameters measure the magnetic flux density B.
This means

$$B = \frac{\Phi}{F} \qquad \left[\frac{Vs}{m^2}\right]$$

F = effective sensor surface (see datasheet)

In addition, the following relationship applies between magnetic field strength H and magnetic flux density B:

$$B = \mu_0 \mu_R H \qquad \left[\frac{Vs}{m^2}\right]$$

μ_R = Permeability number, relative permeability

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2 Conversion

from \ in	Oe	A/cm	kA/m	γ	G	T	Vs/m²
Oe	1	0,796	0,0796	10^{5}	1	10^{-4}	10^{-4}
A/cm	1,256	1	0,1	$1{,}256 \times 10^{5}$	1,256	$1{,}256 \times 10^{-4}$	$1{,}256 \times 10^{-4}$
kA/m	12,56	10	1	$1{,}256 \times 10^{6}$	12,56	$1{,}256 \times 10^{-3}$	$1{,}256 \times 10^{-3}$
γ	10^{-5}	$0{,}796 \times 10^{-5}$	$0{,}796 \times 10^{-6}$	1	10^{-5}	10^{-9}	10^{-9}
G	1	0,796	0,0796	10^{5}	1	10^{-4}	10^{-4}
T	10^{4}	7960	796	10^{9}	10^{4}	1	1
Vs/m²	10^{4}	7960	796	10^{9}	10^{4}	1	1

The conversions between magnetic field and magnetic flux density mentioned in the table apply only to $\mu_R = 1$.

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