SIEMENS

Data Book 1975/76

Soft-Magnetic SIFERRIT

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List of Sales Offices

SIEMENS

Soft-Magnetic SIFERRIT and SIRUFER Material

Data Book 1975/76

SIEMENS AKTIENGESELLSCHAFT

Prices and delivery information can be obtained from our sales offices and representatives (listed on page 443) or from

SIEMENS AKTIENGESELLSCHAFT
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The German specifications (DIN and VDE) have been used for reference purposes in this data book.

The sign Ø on drawings denotes diameter.
A comma in the outline drawings and tables represents the decimal point.
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2) For the adjusting device to B 65579 see also page 193, 201, 211, 219, 227, 233, 239.

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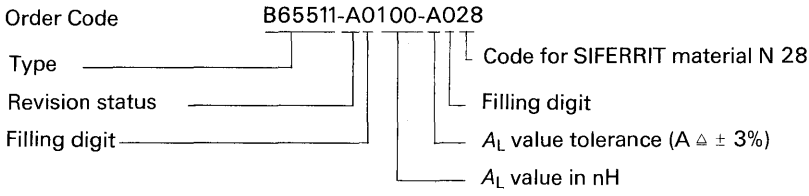
Characteristics
Definitions and Symbols

Definitions and symbols

Order code system

Example of the order code for a pot core 7 mm dia x 4 mm height (see also figure on page 59) SIFERRIT material N 28, A_L value = 100 nH, A_L value tolerance ± 3%, type B 65 511 (see page 94).



For particular components an uncoded inquiry is requested. The appropriate order code will be allocated.

Improvements and technical developments are indicated by a changed revision status code letter. Components can be supplied with a later revision status than applicable at the time of ordering.

Tolerance code letters

The A_L value tolerances are coded (12th digit) by letters similar to the IEC publication 62/1968.

Code letter	A_L value tolerance	Code letter	A_L value tolerance
A	± 3%	Q	+30% −10%
F	± 1%	R	+30% −20%
G	± 2%	X	filling letter only
J	± 5%	Y	+40% −30%
K	±10%		

The tolerance values available are indicated in the appropriate order codes.
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Definitions and symbols

SI units

In the present data book SI units were introduced in conformity with the Performance specifications of the law for units in testing procedures dated 26th July, 1970. The main relations between these units and those used in previous editions of this data book are summarized in the following:

Magnetic flux density (magnetic induction)

1 T (Tesla) = 1 Vs/m^2 = 10^{-4} Vs/cm^2 = 10^4 G (Gauss)
Decimal multiples or parts of this unit are permissible,
e.g. mT (Millitesla), 1 mT = 10 x 10^{-8} Vs/cm^2 = 10 Gauss.

Magnetic field strength, magnetization

1 A/m = 10^{-2} A/cm = 1.256 x 10^{-2} Oe (Oersted)
Decimal multiples or parts can be used here, too
e.g. 1 kA/m = 10^3 A/m = 10 A/cm = 12.56 Oe.

Density of energy

1 J/m^3 = 1 T x 1 A/m = 1 mT x 1 kA/m = 125.6 GOe
A decimal multiple of this unit is
1 kJ/m^3 = 1 mJ/cm^3 = 1.256 x 10^5 GOe.

Magnetic flux

1 Wb (Weber) = 1 Vs = 1 Tm^2 = 10^8 Gcm^2 = 10^8 M (Maxwell)
A decimal part of this unit is the milliweber (mWb)
1 mWb = 10^{-3} Wb = 10^5 M.

Magnetic field constant (induction constant) μ_o

$$\mu_o = 1{,}256 \cdot 10^{-6} \frac{T}{A/m} = 1{,}256 \cdot 10^{-6} \frac{Vs}{Am} = 1{,}256 \cdot 10^{-8} \frac{Vs}{Acm} = 1 \frac{G}{Oe}.$$

From the stated decimal multiples and parts, it follows for μ_o:

$$\mu_o = 1{,}256 \frac{mT}{kA/m}.$$

Resistance (e.g. resistance to tension and compression)

The previously used term kp/mm^2 was replaced by Newton/square millimeter (N/mm^2); 10 N/mm^2 correspond to about 1 kp/mm^2.

Thermal conductivity

1 J/mm x s x K = 2.38 cal/cm x s x °C.

Characteristics

Symbols

Symbols	Meaning	Unit
U	Electrical voltage	V
$\hat{U}$	Peak value of the electrical voltage	V
B	Magnetic flux density 10^{-4} Vs/m² = (1 G) = 0.1 mT	Vs/m²
$\hat{B}$	Peak value of the magnetic flux density	Vs/m²
B_{-}	Direct field flux density	Vs/m²
I	Current	A
$\hat{I}$	Peak value of the current	A
H	Magnetic field strength	A/m
$\hat{H}$	Peak value of the magnetic field strength	A/m
H_{-}	Dc field strength	A/m
μ_0	Magnetic field constant $\mu_0 = 1.257 \times 10^{-6}$ H/m	Vs/Am
μ_i	(Rel.) initial permeability	
μ_e	(Rel.) effective permeability	
μ_a	(Rel.) amplitude permeability	
μ_{rev}	(Rel.) reversible permeability	
μ_{app}	(Rel.) apparent permeability	
μ_{tot}	(Rel.) total permeability derivated from the static magnetization curve	
$\bar{\mu}$	(Rel.) complex permeability	
μ_s'	(Rel.) real (inductance) component of $\bar{\mu}$	
μ_s''	(Rel.) imaginary (dissipation) component of $\bar{\mu}$	
μ_p	(Rel.) pulse permeability	
L	Self inductance	$H = \frac{V \cdot s}{A}$; nH = 10^{-9} H
A_L	Inductance factor; $A_L = L/N^2$	H
N	Number of turns	
tan δ	Dissipation factor	
tan δ_L	Dissipation factor of the coil	
tan δ_r	(Residual) dissipation factor at $H \longrightarrow 0$	
tan δ/μ_i	Relative dissipation factor of the material at $H \longrightarrow 0$	
Q	Quality factor ($Q = \omega L/R_s = 1/\tan \delta_L$)	
P_v	Relative power loss	mW/g
ω	Angular frequency; $\omega = 2\pi f$	s^{-1}, Hz
f	Frequency	s^{-1}, Hz

Symbols

Symbols	Meaning	Unit
h	Hysteresis coefficient of the material	cm/A
h/μ_i^2	Relative hysteresis coefficient	cm/A
η_B	Hysteresis material constant (in accordance with IEC)	
	$\eta_B = \frac{1}{2\pi \cdot \sqrt{2} \cdot \mu_0} \cdot \frac{h}{\mu_i^2}$; $h/\mu_i^2 = 2\pi \cdot \sqrt{2} \cdot \mu_0 \cdot \eta_B$	1/mT
ϑ	Temperature	°C
α	Temperature coefficient (previously "TC")	1/°C; 1/K
α/μ_i	Relative temperature coefficient of the material (TC/μ_i)	1/°C; 1/K
t	Time	s, h
d	Disaccomodation coefficient	
D_F	Relative disaccomodation coefficient $D_F = d/\mu_i$	
$\Sigma l/A$	Core factor	mm^{-1}
l_e	Effective length	mm
A_e	Effective area	mm^2
V_e	Effective volume	mm^3
R	Resistance	Ω
R_h	Hysteresis loss resistance of a core	Ω
R_s	Series resistance of a coil	Ω
R_{ks}	Series loss resistance of a core	Ω
R_r	Residual or after-effect loss resistance of a core	Ω
R_{Cu}	Winding resistance ($f = 0$)	Ω
τ	Dc current time constant $L/R_{Cu} = A_L/A_R$	s
f_{Cu}	Copper factor	
ϱ	Resistivity	$\Omega \cdot mm$; $\Omega \cdot m$
A_R	Resistance factor, $A_R = R_{Cu}/N^2$	$\mu\Omega = 10^{-6}\ \Omega$
l_N	Average length of turn	mm
A_N	Winding cross section	mm^2
ε	Rel. dielectric constant	
λ_s	Magnetostriction at saturation magnetization	
s	Total air gap	mm
$\tilde{Z}$	Complex impedance	Ω
t_d	Pulse duration	s

Definitions

1. Permeability

(See also definitions in DIN 1325, DIN 41280 and IEC publication 125, 205, 218, 219.)

1.1 Initial permeability μ_i

Initial permeability is defined as the ratio of the variation of flux density ΔB to that of the field strength ΔH, measured with a magnetically closed core without air gap (toroidal core). It is assumed that magnetization only takes place at very weak ac fields (ΔH approaching zero). A measuring flux density of less than 1 mT is recommended.

Initial permeability is sometimes known as ring core permeability or material permeability.

1.2 Effective permeability μ_e

If an air gap is introduced in a magnetically closed core, e.g. a toroidal core or pot core, the permeability is lower than that of the same core without air gap. This smaller permeability is due to the higher reluctance of the air gap, and is called effective permeability. Its value depends not only on the core material but also on the shape and dimensions of the core.

The effective permeabilities of SIFERRIT pot cores and SIFERRIT E cores with air gap are listed in the appropriate pages.

$$\mu_e = \frac{A_L \cdot \Sigma l/A}{\mu_o}$$

1.3 Apparent permeability μ_{app}

This is defined as the relationship between the inductance L of the measuring coil with a magnetic core and the inductance L' of the same coil without core, so that

$$\mu_{app} = \frac{L}{L'}$$

This definition is preferably used with cylindrical, tubular and screw cores where, because of the substantial stray inductances, a clear identification either as initial or effective permeability is not possible.

The apparent permeability μ_{app} of a given core material is a function of the core shape, the position of the winding with respect to the core and of the coil data. A simple comparison of the apparent permeabilities of cores of different materials is therefore possible only if these conditions are identical.

The apparent permeability μ_{app} is in general lower than the effective permeability μ_e.

Definitions

1.4 Reversible permeability μ_{rev}

When a SIFERRIT core is magnetized with a dc field upon which a weak ac field is superimposed, the ac field produces a small lancet-shaped hysteresis loop which changes to a straight line as the ac field is reduced. The slope of this line is denoted reversible permeability.

The reversible permeability μ_{rev} is a function of the dc flux density, usually reaching its maximum value when $B-$ is zero (then called initial permeability μ_i).

It is difficult to determine from toroidal core ratings what effect dc premagnetization has on other core shapes. For this reason relevant premagnetization curves are shown on page 66 covering pot cores and on page 368 covering E cores. The curves were plotted at 20 °C (68 °F) and 800 Hz.

For stability reasons a dc bias should be avoided with high Q filter coils if possible, or its effect should at least be reduced adequately by an air gap (see para. 6, disaccomodation).

1.5 Complex permeability $\bar{\mu}$

In an equivalent circuit the inductance of a coil with a SIFERRIT core and the ac field losses caused by the core can be represented by a lossless self-inductance (L_s) connected in series with a loss resistance (R_{ks}), which is attributable only to the ferrite core material. Therefore, the impedance $\bar{Z}$ can be given by

$$\bar{Z} = j\omega L_s + R_{ks}.$$

It is advisable to express both permeability and loss properties of the core by its permeability rating. If, for this purpose, a relative complex permeability $\bar{\mu} = \mu_s' - j\mu_s''$ is introduced and $\bar{Z}$ is made equal to $j\omega\bar{\mu}L_o$

($L_o = \mu_o \frac{N^2 A_e}{l_e}$ is the inductance of the coil without core),

where l_e = effective magnetic length, A_e = effective magnetic area, N = number of turns, μ_o = magnetic field constant

then the complex impedance can also be expressed in the form:

$$j\omega L_s + R_{ks} = j\omega\bar{\mu}L_o.$$

From this, the complex permeability obtained is:

$$\bar{\mu} = \frac{L_s}{L_o} - j\frac{R_{ks}}{\omega L_o}.$$

This equation contains in its real part the (inductance) permeability determining the inductance L_s of the coil:

$$\mu_s' = \frac{L_s}{L_o} = \frac{L_s\, l_e}{\mu_o N^2 A_e}$$

Definitions

The imaginary part gives the (resistance) permeability determining the core losses

$$\mu_s'' = \frac{R_{ks}}{\omega L_o} = \frac{R_{ks}\, l_e}{\omega \mu_o N^2 A_e}$$

The dissipation factor of the core is then

$$\tan \delta = \frac{\mu_s''}{\mu_s'} = \frac{R_{ks}}{\omega L_s} .$$

Due to the influence of the hysteresis losses (see para. 3.5), R_{ks} and $\tan \delta$ depend on the measuring field strength, but since normally the value extrapolated for a negligibly low field strength is given, the dissipation factor of the core only includes the residual loss resistance, due to the magnetic after-effect (see also para. 3.1), so that:

$\tan \delta = \tan \delta_r$.

Pages 37 to 38 show the variation of μ_s' and μ_s'' with frequency at a field strength of < 1 mT for SIFERRIT materials. With SIFERRIT material having a higher permeability, a low resistivity and high dielectric constant, the shape of the curve depends largely on the dimensions of the core sample because dielectric (capacitive) eddy currents are allowed to build up along the full cross section as a result of the higher permeability and dielectric constant (volume resonance).

An example of this is shown on page 38 covering measurements on toroidal cores of different thickness made of material N 22.

For these reasons small thin-walled pot cores made from materials of relatively low resistivity can be used at higher frequencies than larger pot cores.

2. Magnetization curves

2.1 Static (steady field) magnetization curves

The static magnetization curves shown on pages 48 to 54 were measured at room temperature by the ballistic galvanometer method. Curves are also shown at a temperature of 100 °C (212 °F) for those materials which are frequently used at higher flux densities.

The relative total permeability $\mu_{tot} = \frac{B}{\mu_o H}$ was determined from the curve of normal magnetization (new curve).

2.2 Dynamic (alternating field) magnetization curves

The graphs on page 55 show the dynamic magnetization curves of SIFERRIT K 1, M 25, M 33, and N 22 at various frequencies. From the relationship $\mu_a = \frac{\hat{B}}{\mu_o \hat{H}}$, in which $\hat{B}$ and $\hat{H}$ are the peak values of flux density and sinusoidal field strength respectively, the amplitude permeability can be determined.

2.3 Coercive force H_c and remanence B_r

When a hysteresis loop is drawn in the usual manner with flux density B as the ordinate and field strength H as the abscissa, H_c is the field strength at which the loop cuts the axis of the abscissa. The point where the hysteresis loop intersects the ordinate is called the remanence B_r.

Definitions

2.4 Saturation magnetization $\hat{B}_s$

This is the value reached by the flux density $\hat{B}$ at high field strength. The flux densities shown on pages 34 and 35 (core materials) are already close to the saturation point. They were measured at a field strength of 3000 A/m. Values obtained otherwise are marked accordingly.

3. Core losses

In SIFERRIT materials the core loss resistance R_{ks} (see para. 1.5) with weak magnetic fields (up to about 2 A/m) is essentially caused by the residual loss resistance R_r and the hysteresis loss resistance R_h. Eddy currents are only of secondary importance because of the low conductivity, especially at low frequencies.

3.1 Relative dissipation factor

Due to an air gap the dissipation factor tan δ of the coil appears only as the ratio μ_e/μ_i. The table of the material characteristics (pages 34 and 35) and graph (page 36) show therefore the dissipation factor referred to μ_i : tan δ/μ_i.

The effective dissipation factor for a core with air gap is therefore:

$$\tan \delta_e = \frac{\tan \delta}{\mu_i} \mu_e.$$

The residual loss resistance R_r is given by

$$R_r = \omega L \tan \delta_e.$$

3.2 Optimum frequency range

The relative dissipation factor tan δ/μ_i is plotted against frequency for SIFERRIT materials on page 36. These curves provide a quick reference for the selection of SIFERRIT materials for high Q coils. The curves of μ'_s and μ''_s of the complex permeability $\bar{\mu}$ on pages 37 to 38 are generally more suitable for designing wideband transformers and attenuators.

3.3 Upper frequency limit f_{max}

The upper frequency limit is that frequency at which the dissipation factor curve has not yet begun to rise too steeply. This is approximately the case when the Q factor of the toroidal core is about 50 or when tan δ is about 0.02. The Q factor below the limit frequency and for cores with air gaps is much higher.

3.4 Lower frequency limit f_{min}

The lower frequency limit is that frequency at which a change to the material with the next higher permeability is recommended because of its lower losses.

Definitions

3.5 Hysteresis coefficient h, relative hysteresis coefficient $h/\mu_i{}^2$ and η_B

When the loss resistance of a coil with a magnetic core is measured at different alternating field strengths it is found that the loss resistance increases with the field strength.

This loss resistance is normally represented e.g. for a ring core without air gap by the formula: $R_h = h\, f\, L\, H$.

where:
R_h = hysteresis loss resistance, h = hysteresis coefficient, f = measuring frequency, L = inductance, H = rms magnetic field strength.

An air gap results in a lower hysteresis coefficient h_e:

$$h_e = \frac{h}{\mu_i{}^2}\ \mu_e{}^2.$$

An alternating current change in the coil by $\Delta I = I_2 - I_1$ (rms values) produces a hysteresis loss resistance:

$$R_h = R_2 - R_1 = \frac{h}{\mu_i{}^2} \cdot \mu_e{}^2\, f \cdot L \cdot \frac{N \cdot \Delta I}{l_e}$$

The table of the material characteristics on pages 34 and 35 lists the relative hysteresis coefficients $h/\mu_i{}^2$. These were determined on ring cores measuring 35 dia x 22 dia x 10 (in mm) at a frequency of 10 kHz and field strength variation ΔH from 0.5 to 2 A/m. The coefficients apply, for example at a permeability μ_i of about 2000 in close approximation up to about 10 A/m for cores of higher permeability and correspondingly wider for lower permeability cores. In case of stronger fields outside the Rayleigh range, the hysteresis losses can no longer be defined by the hysteresis coefficient.

To determine the hysteresis loss resistance, the mean field strength in the magnetic core must always be known. The geometric average path length l_m only corresponds also to the average path length of the flux lines in the core ($H = N \cdot I/l_m$) for a thin ring core ($D_A/d_i \cdot 1$). For cores with a high value of D_A/d_i and a non uniform cross section, however, a magnetic path length l_e must be introduced, e.g. for pot cores, so that H is equal to $N \times I/l_e$ [1].

The magnetic path lengths l_e of the individual core shapes are indicated on the appropriate pages.

In accordance with the IEC publications 125 and 218 the hysteresis material coefficient is defined as:

$$\eta_B = \frac{R_h}{\omega L \cdot \mu_i \cdot \hat{B}} \quad \text{for ring cores } \mu_e = \mu_i;$$

and can be modified to:

$$\frac{h}{\mu_i{}^2} = 2\pi \cdot \sqrt{2} \cdot \mu_o \cdot \eta_B; \quad \eta_B = \frac{1}{2\pi \cdot \sqrt{2} \cdot \mu_o} \cdot \frac{h}{\mu_i{}^2}$$

For simplification, the formula can be modified to:

$$\eta_B = 0{,}896 \cdot \frac{h}{\mu_i{}^2} \left[\frac{1}{\mathrm{mT}}\right]$$

where only $h/\mu_i{}^2$ must be replaced by numerical figures, e.g. for $h/\mu_i{}^2 = 0.8 \cdot 10^{-6}$ cm/A;

[1] For further in formation see IEC publication 205.

Definitions

$$\eta_B = 0{,}896 \cdot 0{,}8 \cdot 10^{-6} \left[\frac{1}{mT}\right] = 0{,}71$$

When comparing different pot cores, a relation between core size or the magnetic data of the core geometry, the effective permeability and the hysteresis coefficient is sometimes of interest.

IEC defines this as the "hysteresis core constant" η_i (η_B applies only for the material)

$$\eta_i = \frac{R_h}{\hat{I} \cdot L^{3/2} \cdot \omega} = \eta_B \cdot \sqrt{\frac{\mu_o \cdot \mu_e{}^3}{V_e}}$$

$$= \frac{1}{2\pi \cdot \sqrt{2}} \cdot \frac{h}{\mu_i{}^2} \cdot \sqrt{\frac{\mu_e{}^3}{\mu_o \cdot V_e}}$$

The pages covering individual core shapes contain the effective magnetic volume $V_e = l_e \cdot A_e$ and the effective magnetic core factor $\Sigma\, l/A = l_e/A_e$.

The measurement of η_B is based on two flux density ratings ($\hat{B}_1$, $\hat{B}_2$), whereas the measurement of $h/\mu_i{}^2$ is referred to two field strength ratings (H_{rms1} and H_{rms2}).

When $h/\mu_i{}^2$ is measured, the coil current is defined such that it causes field strength values in the ferrite core of 0.5 or 2 A/m. (If cores with an air gap are used, the coil current increases in the ratio of μ_i/μ_e).

Therefore, a core in a material with $\mu_i = 2000$, an effective field strength of 2 A/m, at a flux density of $\hat{B} = \mu_i \cdot \mu_o \cdot \hat{H}$ measures:

$$2000 \cdot 1{,}257 \cdot 10^{-6} \left[\frac{Vs}{Am}\right] \cdot 2 \left[\frac{A}{m}\right] \cdot \sqrt{2}$$

$$= 7080 \cdot 10^{-6} \left[\frac{Vs}{m^2}\right] = 7{,}08 \left[mT\right].$$

In accordance with an IEC recommendation, η_B is measured at $\hat{B} = 1.5$ and 3 mT and $f = 10$ or 100 kHz.

The hysteresis coefficient depends on frequency and excitation. When comparing η_B figures, the different measuring conditions of the individual manufacturers must be taken into account.

3.6 Power loss at higher flux densities

The power loss of SIFERRIT materials which can be used also at higher flux densities is shown on page 47 as a function of frequency, with several magnetic flux densities as parameters. Page 46 indicates the total losses as a function of temperature for material N 27, which is specially suitable for output transformers.

Definitions

4. Q factor of coil or coil dissipation factor tan δ_L

The ratio of the reactance to the total resistance of a coil is called the Q factor:

$$Q = \frac{\omega L}{R_s} = \frac{1}{\tan\delta_L} = \frac{\text{reactance}}{\text{total real resistance}}$$

where

R_s = resistance in series with the inductance L,
$\tan \delta_L$ = dissipation factor of complete coil.

The measuring technique determines only inaccurately the loss components – losses per core and losses per winding – especially for pot cores with air gap. Examples are therefore given showing the quality characteristics of pot cores as a function of frequency.

5. Influence of temperature

5.1 Curie temperature

This is the temperature at which ferrites practically lose their magnetic properties. With SIFERRIT materials, this transition occurs fairly abruptly. The phenomenon is reversible, i.e. when cooled to a point below Curie temperature the material becomes magnetic again. See pages 34 and 35 for the Curie temperatures of materials.

5.2 Temperature dependance of initial permeability μ_i and relative dissipation factor $\tan \delta / \mu_i$

The curves for both values as a function of temperature are shown on pages 39 and 40. In the range +5 °C (+41 °F) to +55 °C (+131 °F) variation of the dissipation factor with temperature is of minor significance as in most cases the variation of the copper resistance has the greater effect on the coil Q factor.

5.3 Temperature coefficient α of permeability

The TC value of the initial permeability is defined as follows:

$$\alpha = \frac{\mu_{i2} - \mu_{i1}}{\mu_{i1}} \cdot \frac{1}{\vartheta_2 - \vartheta_1}$$

μ_{i1} = initial permeability at temperature ϑ_1 (20 °C to 25 °C) (68 °F to 77 °F)
μ_{i2} = permeability value at temperature ϑ_2

In a magnetic circuit with an air gap and effective permeability μ_e, the temperature coefficient is effective only in the ratio μ_e/μ_i, resulting in the formula:

$$\alpha_e = \alpha \frac{\mu_e}{\mu_i} = \frac{\mu_{i2} - \mu_{i1}}{\mu_{i1}} \cdot \frac{1}{\vartheta_2 - \vartheta_1} \cdot \frac{\mu_e}{\mu_i}$$

Definitions

The material table (pages 34 and 35) therefore contains the relative temperature coefficients α/μ_i between + 20 °C/68 °F and + 55 °C/131 °F. The graphs on pages 43 to 45 show the values for an extended temperature range; from these the relative inductance variation between two temperature values can be determined using the permeability factor $(\mu_i - \mu_{i1})/\mu_i \cdot \mu_{i1}$:

$$\frac{\Delta L}{L} = \frac{\mu_i - \mu_{i1}}{\mu_i \times \mu_{i1}} \times \mu_e = \frac{\alpha}{\mu_i} \times \mu_e \times (\vartheta - \vartheta_1)$$

For details see reprint "Design of Pot Cores for Resonant Circuits with Temperature Compensation", Order No. 2-6100-119-101. Values of α/μ_i are also given there for some temperatures in accordance with IEC recommendations.

6. Disaccomodation

Disaccomodation is the variation of permeability with time under constant operating conditions, especially at constant temperature. Tests over a period of few years have shown that a few hours after production the permeability of a SIFERRIT core decreases almost linearly, if time t is plotted logarithmically. Therefore characteristics have been introduced: the disaccomodation coefficient.

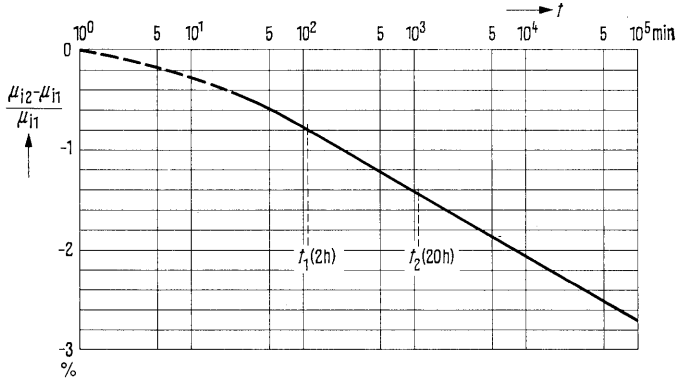
$$d = \frac{\mu_{i1} - \mu_{i2}}{\mu_{i1} \times \log \frac{t_2}{t_1}}$$

μ_{i1} = permeability at time t_1

μ_{i2} = permeability at time t_2 $\quad (t_2 > t_1)$

and the disaccomodation factor, independent of effective permeability μ_e

$$D_F = \frac{d}{\mu_{i1}}$$



From the indicated measuring points at t_1 and t_2 follows: d = 0.6% and at $\mu_e = \mu_{i1}$ = 2000
$D_F = 3 \times 10^{-6}$

Definitions

Magnetic, thermal or mechanical stress can cause decrease in permeability with time again. The data in the material table (pages 34 and 35) is referred to a thermal stress of at least 170 °C (338 °F) and is measured at times t_1 = 2 hours and t_2 = 20 hours after the test. Experience has shown that the value obtained by this method is almost identical with the long-term value wanted.

After a magnetic shock (value of demagnetization in an alternating field) shorter periods of time t_1 and t_2 can be selected than after thermal stress. After periods below 2 hours, generally, lower values for the disaccomodation are obtained than at periods longer than two hours. [1]
Every inductance variation is reduced by air gaps in the ratio μ_e/μ_i. It can be said that

$$\frac{L_1 - L_2}{L_1} = D_F \times \mu_e \times \log \frac{t_2}{t_1}$$

Example: For a pot core 22 dia x 13 of material K 1 with an effective permeability of μ_e = 15.9 (A_L value = 40 nH) and a disaccomodation factor $D_F < 35 \times 10^{-6}$ which has been placed in operation at a time t_1 = 5 weeks (after production) and which should function at least until time t_2 = 10 years (appr. 500 weeks) a max. inductance variation $\Delta L/L$ of

$< 35 \times 10^{-6} \times 15.9 \times \log \frac{500}{5}$, i.e. < 0.11% can be expected.

7. Resistivity

The material table (pages 34 and 35) also provides information on the resistivity ϱ, measured at room temperature, low current density (< 0.01 mA/mm²), and with Indium-Gallium junctions. Higher values are normally obtained using some other type of junction, for example high conductive silver.
The effect of frequency on resistivity with material N 22 is shown in the following table:

f	kHz	10	100	500
ϱ	Ωm	1,0	0.95	0.65

The effect of frequency on resistivity with high resistance SIFERRIT materials, e.g. K 1, is negligible.

[1] For information see reprints: "Some Mechanism Governing the Permeability vs Time of Ferrite Cores", order No. 2-6100-068-101, and "Desakkomodation der Permeabilität von Ferritkernen nach Teilanstößen", order No. 2-6100-220.

Definitions

8. Dielectric constant

High conductivity SIFERRIT materials exhibit a high dielectric constant (ε) at low frequencies which is based on a layer effect of the fine grain structure. At high frequencies, all SIFERRIT materials approach the true dielectric constant of the crystalline SIFERRIT material (ε approx. 10 to 20). SIFERRIT materials with a low conductivity already display these characteristics at lower frequencies, as is shown in the following table:

SIFERRIT material	Resistivity Ωm approx.	Dielectric constant ε at 10 kHz approx.	100 kHz approx.	1 MHz approx.	100 MHz approx.	300 MHz approx.
K 1	10^4	30	15	12	11	11
N 22	1	$140 \cdot 10^3$	$50 \cdot 10^3$	$30 \cdot 10^3$		

9. Magnetostriction

Linear magnetostriction is defined as the relative change in the length of a magnetic core under the influence of a magnetic field. The greatest relative variation in length $\lambda = \Delta\, l/l$ occurs at saturation magnetization. The values of the saturation magnetostriction (λ_S) of SIFERRIT materials are given in the following table (negative values denote contraction).

SIFERRIT material	K 12	K 1	M 11	N 22
λ_s in 10^{-6}	−21	−18	−8.5	−1.5

Magnetostrictive effects in SIFERRIT power transformers can produce audible whistling similar to that in laminated iron cores, particularly when U or pot cores without air gap are used. The parts must be rigidly mounted and the use of cores with air gap or the provision of suitable spacers is recommended.

10. Inductance factor A_L

It has been found useful to employ the magnetic conductance (permeance) in the calculation of the inductance or the number of turns of coils and this is called "inductance factor A_L" or "A_L value". The A_L value is the inductance L per unit turn

$$A_L = \frac{L}{N^2}\,;\; A_L = \frac{\mu_e \cdot \mu_0}{\Sigma\, l/A}$$

The A_L value is conveniently expressed in nH = 10^{-9} H. Accordingly the inductance L of a coil is obtained in nH from the product $A_L \cdot N^2$.

Occasionally the so-called turns factor c (also designated K or α) is used for determining the number of turns in accordance with the formula

$$N = c\sqrt{L}$$

Definitions

where L is expressed in mH. When c is expressed in $1/\sqrt{\text{mH}}$ and the A_L value in nH, the conversion factor from A_L to c is

$$c = \frac{10^3}{\sqrt{A_L}}.$$

SIFERRIT pot cores with air gap are ground to specific A_L values; air gap dimensions are approximate.

11. Resistance factor A_R

The resistance factor A_R, or A_R value, is the dc resistance R_{Cu} per unit turn, analogous to the A_L value:

$$A_R = \frac{R_{Cu}}{N^2}.$$

When the A_R value and the number of turns N are given, the dc resistance R_{Cu} is equal to $A_R N^2$. From the winding data etc. the A_R value can be computed:

$$A_R = \frac{\varrho\, l_N}{f_{Cu} A_N}.$$

where

ϱ = resistivity (for copper = 17.2 $\mu\Omega$ mm), l_N = mean length of turn in mm, A_N = cross section of winding space in mm^2, f_{Cu} = copper factor. If these units are used in the equation, the A_R value is obtained in $\mu\Omega = 10^{-6}\Omega$.

For coil formers A_R values are stated in addition to A_N and l_N and are based on a copper factor of $f_{Cu} = 0.5$. This permits the A_R value to be computed for any copper factor f_{Cu} according to the formula

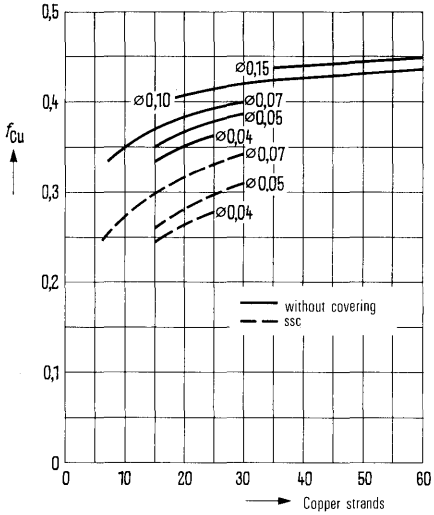
$$A_{R\,(f_{Cu})} = A_{R\,(0,5)}\,\frac{0{,}5}{f_{Cu}}.$$

Characteristics

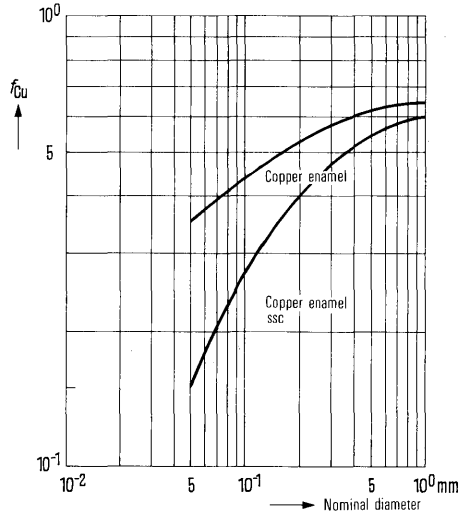
Definitions

The following diagrams show the copper factor of wires and litz wires as a function of their nominal diameters and the number of strands:

Copper factor f_{Cu} for litz wires



Copper factor f_{Cu} for wires



The cross section of the useful winding space as given in data for each coil is smaller than that computed from the dimensions of the drawing. It is an empirical value which takes into account the fact that the winding space is not fully utilized because the wire ends are brought out and the top layer is incompletely wound.

12. Time constant

The time constant τ is defined as the ratio of the inductance L to the loss resistance R

$\tau = L/R.$

At low frequencies, coil losses are essentially caused by the dc resistance R_{Cu}, the dc time constant being

$\tau_{Cu} = L/R_{Cu}.$

According to paragraphs 10 and 11, the dc time constant can be simply obtained from the equation

$\tau_{Cu} = A_L/A_R.$

SIFERRIT Materials
Characteristics and Application

SIFERRIT Materials

General material data

Magnetic ferrites are either mixed crystals or compounds of ferromagnetic oxides (Fe_2O_3) with one or several oxides of bivalent metals such as NiO, MnO, ZnO, MgO, CuO, BeO, CdO, BaO, CoO. They have a much higher resistivity than metallic materials; the resistivity is 10^0 to 10^5 Ωm compared with 10^{-3} to 10^{-2} Ωm for metallic materials. Contrary to metallic cores, most ferrites therefore have negligible eddy current losses in an alternating magnetic field.

Siemens ferrite cores are well-known under the trademark SIFERRIT® .

General technical data

Tensile strength	approx.	20 N/mm^2
Resistance to compression	approx.	100 N/mm^2
Vickers hardness HV_{15}	approx.	8000 N/mm^2
Modulus of elasticity	approx.	150000 N/mm^2
Heat conductivity	approx.	4 to 7 x 10^{-3} J/mm x s x K
Linear expansion coefficient	approx.	7 to 10 x 10^{-6}/K

Resistance to moisture

SIFERRIT is moisture, water and also sea-water-resistant, but can be attacked by several acids in high concentrations.

Resistance to radiation

SIFERRIT materials can be exposed without significant variation ($\Delta L/L \leq 1\%$ for cores without an air gap) to the following radiation:

gamma quanta	10^9 rad
quick neutrons	2 x 10^{20} neutrons/m^2
thermal neutrons	2 x 10^{22} neutrons/m^2

Skrinkage due to the sintering process

The burning or sintering process produces a considerable shrinkage of the molded body, linearly by 15% and 40% by volume. For this reason, often a slight distortion must be accepted, when the cores are not worked after the burning and sintering process. The dimensional tolerances of unworked parts are ±2 to ±3%.

Application

Application	Frequency range (MHz)	Flux density low[1]	high
High Q coils in resonant circuits and filters	to 0.1	x	
	to 0.3[2]	x	
	0.2 to 1.6	x	
	1.5 to 12	x	
	6 to 30	x	
High Q coils in resonant circuits and filters (open)	0.2 to 1.6	x	
	1.5 to 12	x	
	6 to 40	x	
	10 to 220	x	
	200 to 600	x	
Transformers with flat permeability characteristic	to 0.3	x	
Wideband transformers (e.g. aerial transformers for MW, SW, VHF, TV) and pulse transformers for EDP	to 3[2]	x	
	to 5[2]	x	
	to 10	x	
	to 250	x	
	to 400	x	
	to 1000	x	
Power transformers (e.g. for transistorized dc converters, pulse transformers, TV line transformers ignition coils etc.)	to 0.1 (pulse operation to 1.0)		x
			x
			x
Attenuators (e.g. wound cylindrical cores, wires with slided-on tubular core)	to 500	x	x
Erase heads	0.2		x
Microwave components (e.g. for gyratons, circulators)	500 to 20000	x	

1) Low flux density up to approx. 10 mT (Rayleigh range).
2) Upper frequency limit also depends on core dimensions (in pot core filters also on gap).

Material	Type
N 28. N 29. N 32. N 48	Pot Cores, RM, M cores with air gap
N 22	
M 33	
K 1	
K 12	
M 25	Cylindrical cores Tube cores Screw cores Aerial rods, round, slotted
K 1	Cylindrical cores Tube cores Screw cores
K 12	
U 17	
U 60	
T 26. N 30. T 38	Pot cores (round, RM, X, cube) E cores
N 30	Pot cores
N 30. T 35, T 38	Toroidal cores
T 26	Pot cores E cores
N 22. M 33	Pot cores
U 17	Cylindrical cores Tube cores
K 1. K 12	Pot cores Double aperture cores
U 60	Cylindrical cores Double aperture cores
M 25	Cylindrical cores
T 26	Pot cores
N 27	U cores, E cores, Pot cores
N 22	Cylindrical cores Tube cores Six aperture cores
N 22. T 8. T 9. T 10. T 51	Recording head cores
Spinel and garnet ferrites	Bar, cylindrical, disc cores

Material characteristics

The values were obtained from toroidal cores, R 10, and, unless otherwise stated, are valid at room temperature. For definitions and symbols see page 14 to 28.

SIFERRIT material		U 60	U 17[1]	K 12	K 1	M 33	M 25	N 22
Colour code		pink	grey	light blue	violet	–	white	red
Initial permeability μ_i		8 ±20%	10 ±20%	24 ±20%	80 ±20%	600 ±20%	650 ±20%	1800 ±20%
Optimum frequency range	f_{min}	MHz	100	10	3	1.5	0.2	0,2	0,001
	f_{max}	MHz	1000	220	40	12	1.0	1.6	0.2
Relative dissipation factor $\tan \delta / \mu_i$	f_{min}	10^{-6}	<2000	< 100	<150	< 40	< 12	< 12	< 2
	f_{max}			<1700	<600	<100	< 30	< 60	< 20
Curie temperature		°C	> 250	> 500	>400	>350	>200	>200	>145
Coercivity		A/m	1000	1500	1200	500	100	80	30
Flux density $\hat{B}$ at $\hat{H}$ = 3000 A/m		mT	110	–	145	360	400	400	380
Dc resistivity ϱ		Ω m	10^5	10^2	10^5	10^5	5	5	1
Hysteresis coefficient η_B (IEC) at f = 10 kHz at $\hat{B}$ = 1.5 and 3 mT		$\frac{10^{-6}}{mT}$	–	< 27	< 45	< 36	< 1,8	< 1.8	< 1.4
Relative temperature coefficient[2] α/μ_i		10^{-6}/K							
for 20 to 55 °C/68 to 131 °F			–	–	3 to14	2 to 6	0.5 to 2.3	–	0,6 to 1.6
for 20 to 5 °C/68 to 41 °F			–	–	-0.5to 14	1 to 6	0,5 to 2.5	–	0,6 to 1.8
for 20 to −25 °C/68 to −13 °F			–	–	−1 to 14	1 to 6	0.5 to 3.0	–	0.7 to 2,3
Mean value of α/μ_i for +20 to +55 °C (+68 to 131 °F)		10^{-6}/K	150	40	7	4.0	1.6	2	1.1
Disaccomodation factor D_F		10^{-6}							
at +60 °C (140 °F)			–	–	< 50	< 35	< 12	< 25	< 7
at +25 °C (77 °F)			–	–	–	20	8	18	4
Specific gravity		kg/m3	4800	4100	4200	4400	4500	4600	4700
Core shapes			Cylindrical tube threaded		Cylindrical tube threaded pot		Pot RM	Cylin-drical tube threaded aerial rods	Pot ring E and U

1) Perminvarferrite; irreversible changes in quality and permeability occur with fields in the core>1500 A/m (gap field strength).

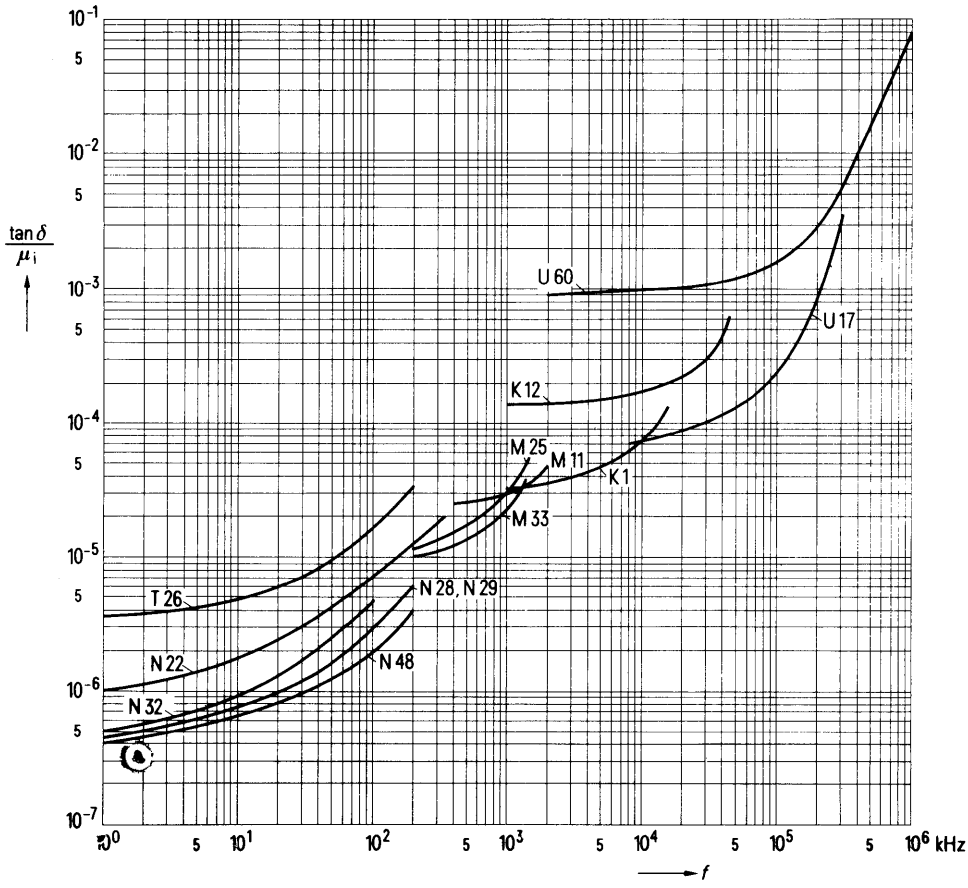
2) For further details see pages 43 to 45.

N 48	N 27	T 26	N 28	N 29	N 32 [1]	N 30	T 35	T 38
–	–	–	–	–	–	–	–	–
2000 ±20%	2000 ±20%	2200 ±20%	2200 ±20%	2400 ±20%	2400 ± 20%	4300 ±20%	6000 ±20%	10000 ±30%
0.001 0.1	–	–	0.001 0.1	0.001 0.1	0.001 0.1	–	–	–
< 0.5 < 2.5	–	–	< 0.7 < 3.5	< 1 < 3.5	< 1 < 5	–	–	–
>150	>200	>145	>150	>150	>115	>150	>130	>130
20	20	20	20	18	13	13	6	4
390	460	390	390	390	300	390	380	380
1	1	1	1	1	1	0,5	0,2	0,2
< 0.4	–	< 1.8	< 0.65	< 0.9	< 0.9	< 1.4	< 0.9	< 0.9
0.4 to 1.0 0.4 to 1.0 0.4 to 1.5	– – –	– – –	0.5 to 1.4 0.5 to 1.6 0.6 to 2.2	–0.6 to 0.6 –0.6 to 0.6 –	0.5 to 1.1 0.5 to 1.1 0.5 to 1.3	– – –	– – –	– – –
0.7	3	1	0.8	0.2	0.8	1	0.7	0.5
< 4 2	– –	– –	< 4 2	< 6 3	< 5 2.5	– –	– –	– –
4700	4800	4800	4700	4700	4700	4800	4900	4900
Pot, RM	U and E, pot	Pot cube RM, X, E	Pot RM	Pot RM	Pot RM	Pot RM, E toroids, X	Pot, RM, EP, cube, toroids	Toroids up to max. 10 dia cube, pot, RM

For further material data see page 418 (para "Magnetic Head Cores, Microwave SIFERRIT") and page 435 (para "SIRUFER Cores")

1) For new design the material N 48 featuring in addition to an almost constant temperature coefficient (−25 °C to +55 °C / −13 to +131 °F) also very low losses, is recommended.

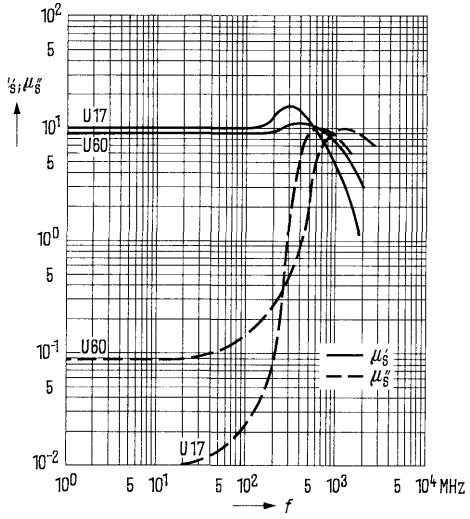
Relative dissipation factor as a function of frequency



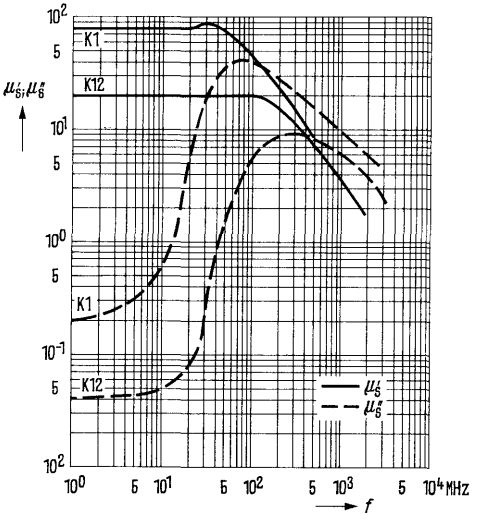
Sample core dimensions D_A = 10 mm, d_i = 6 mm, h = 4 mm
Measuring flux density $B \leq 1$ mT

Complex permeability as a function of frequency

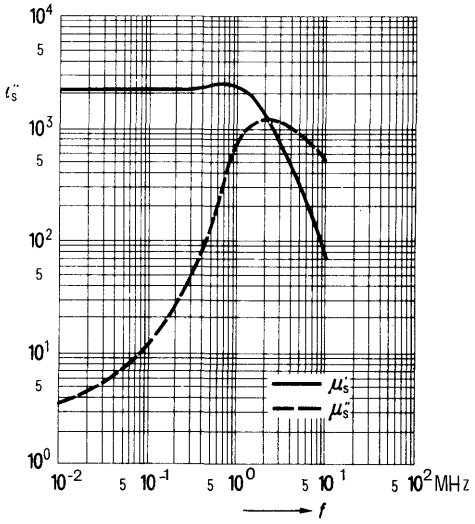
U 17, U 60



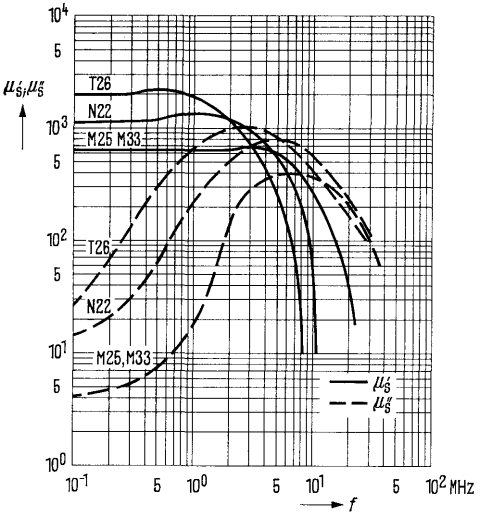
K 12, K 1



N 28, N 29



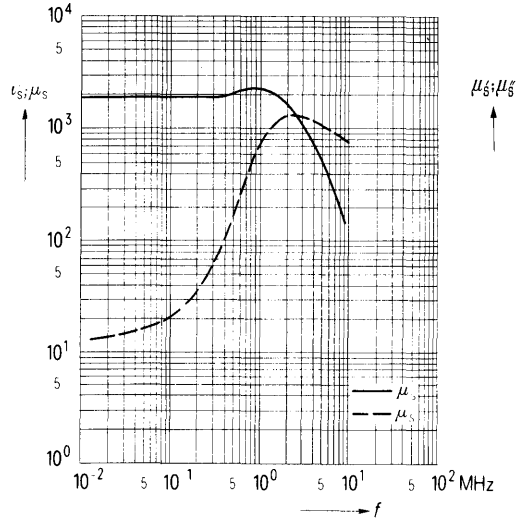
M 25, M 33, N 22, T 26



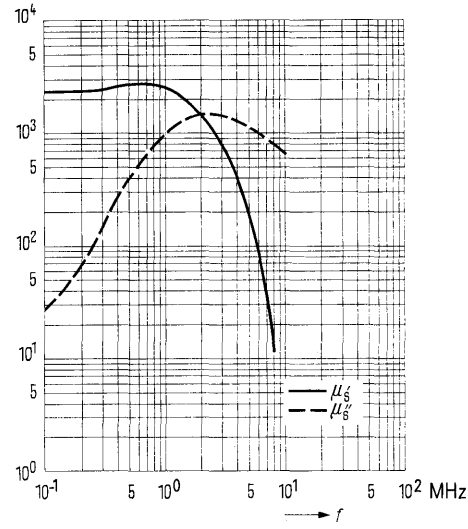
Sample core dimensions D_A = 10 mm, d_i = 6 mm; h = 4 mm
Measuring flux density $B \leq 1$ mT

Complex permeability as a function of frequency

N 27

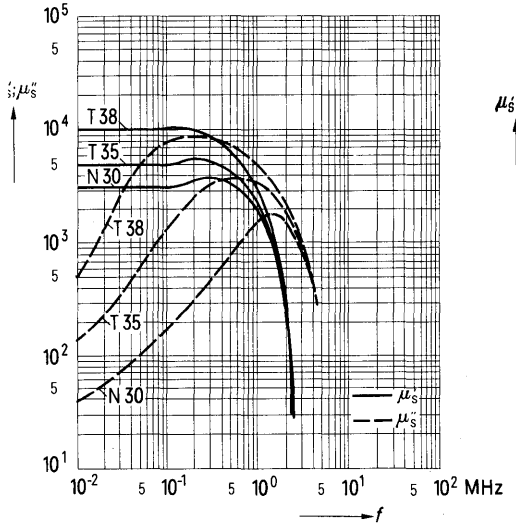


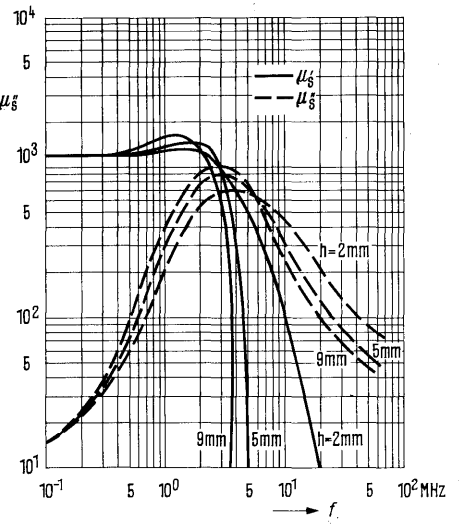
N 32



Influence of the core size on the frequency characteristic of the complex permeability, measured with a toroidal core of material N 22. Parameter: core height *h*

N 30, T 35, T 38

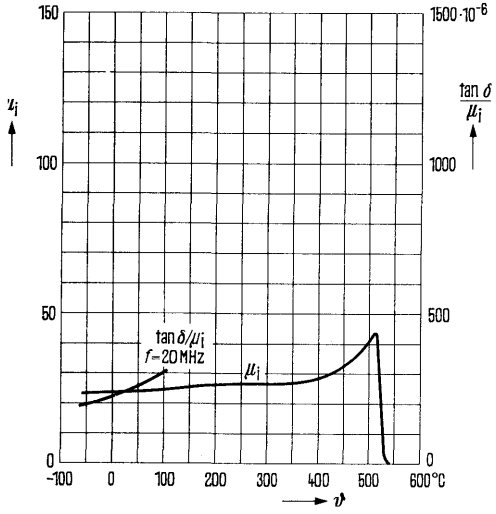




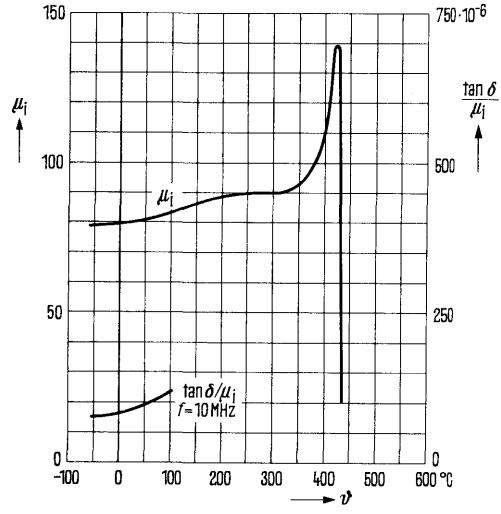
Sample core dimensions: D_A = 10 mm, d_i = 6 mm; h= 4 mm. Measuring flux density $B \leq 1$ mT

Initial permeability and relative dissipation factor as a function of temperature

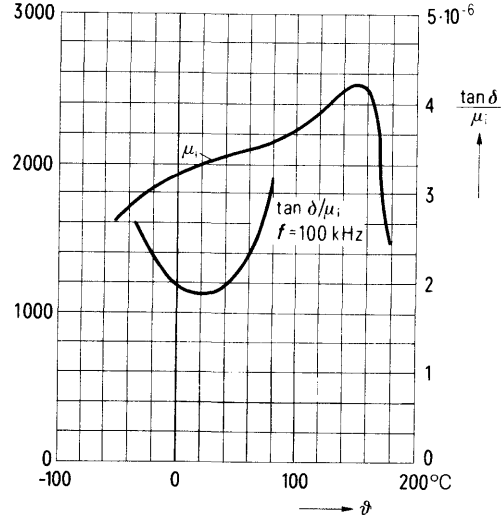
K 12



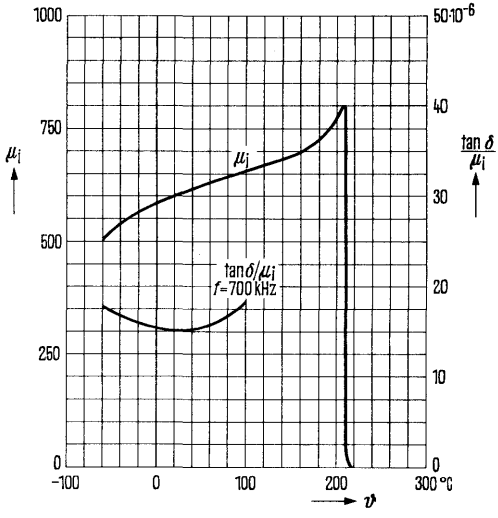
K 1



N 48



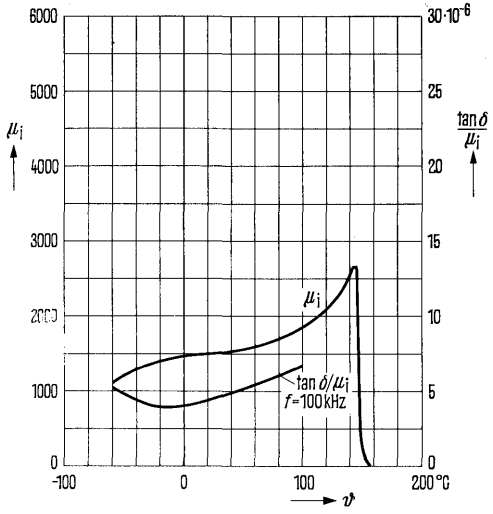
M 33



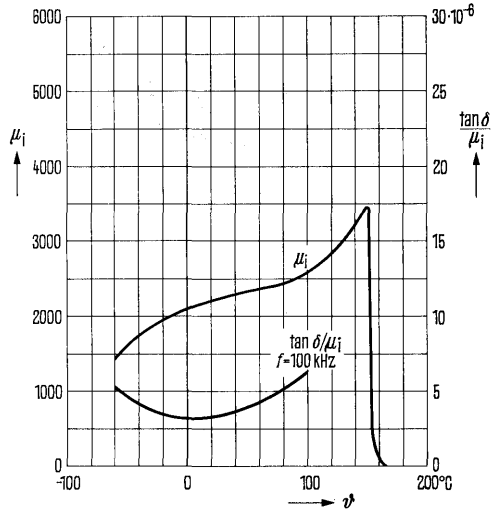
Measuring flux density $B \leq 1$ mT

Initial permeability and relative dissipation factor as a function of temperature

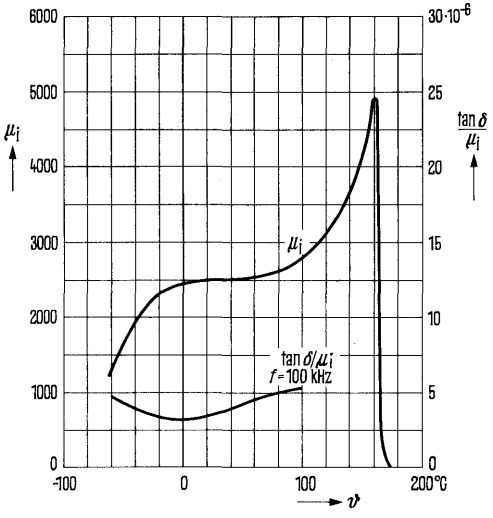
N 22



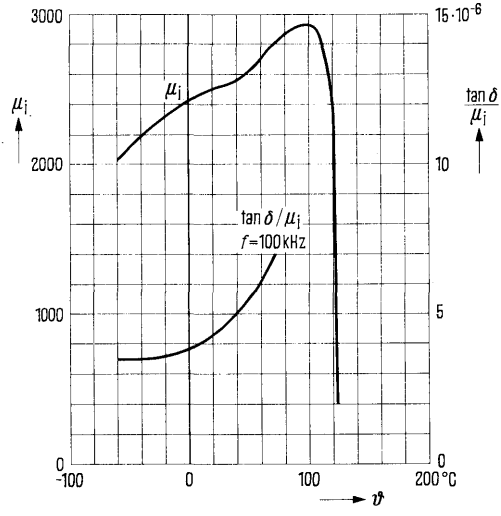
N 28



N 29



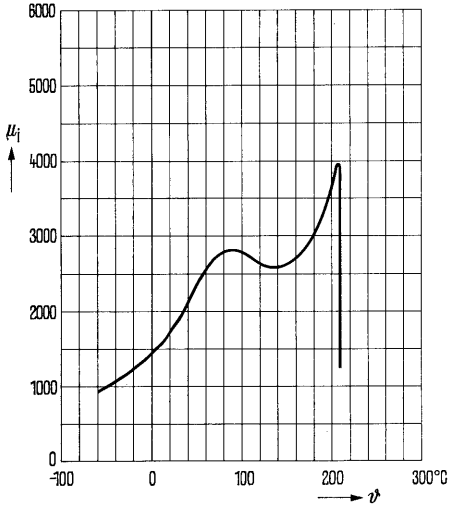
N 32



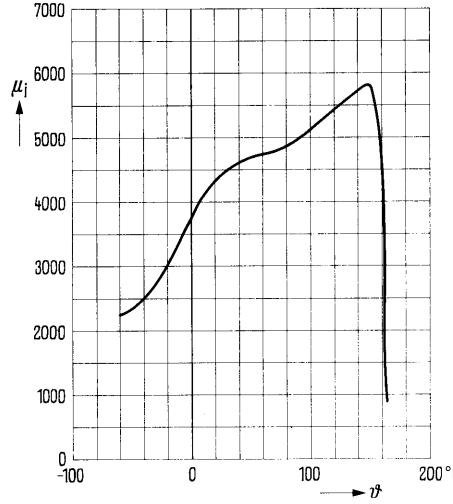
Measuring flux density $B \leq 1$ mT

Initial permeability as a function of temperature

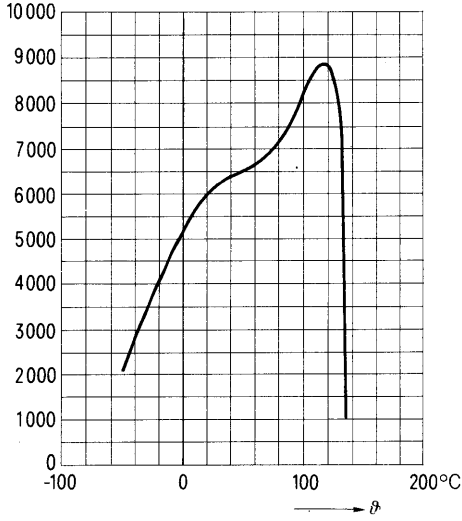
N 27



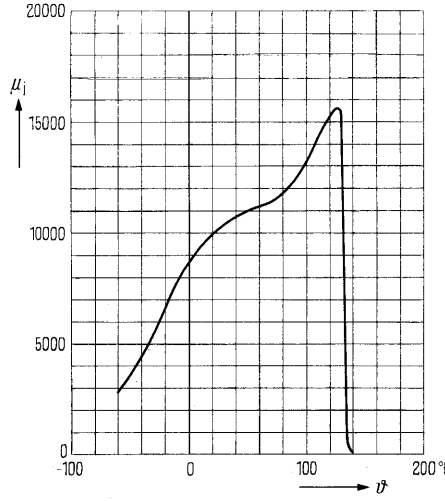
N 30



T 35



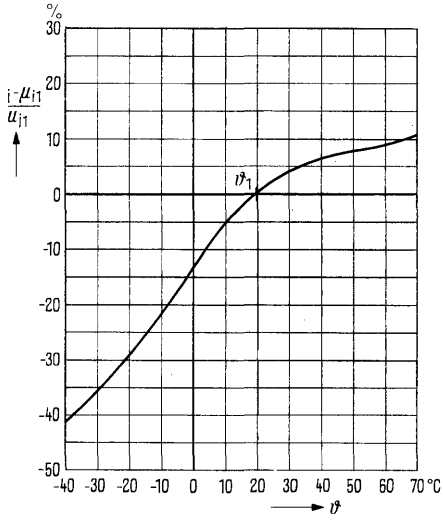
T 38



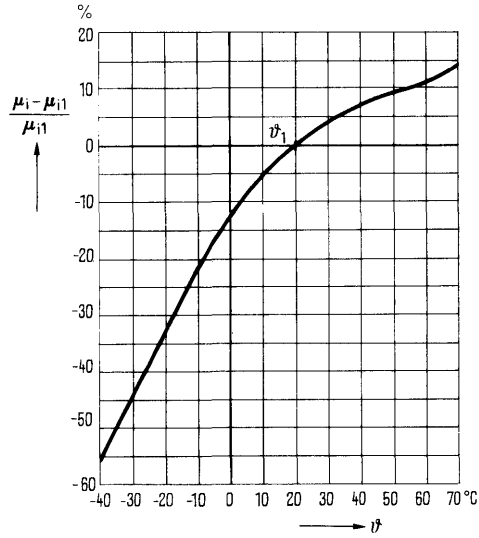
Measuring flux density $B \leq 1$ mT

Variation of initial permeability as a function of temperature for transformer materials N 30, T 35, T 38

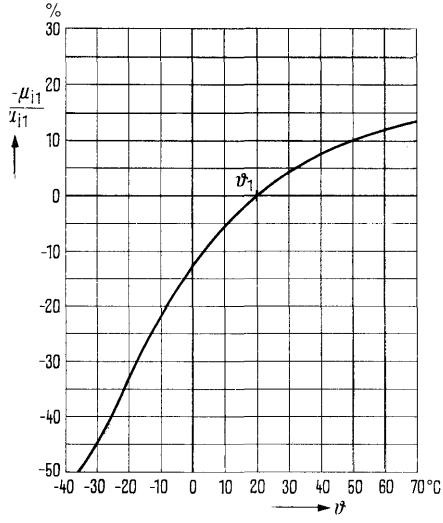
N 30; $\mu_{i1} \approx 4300$



T 35; $\mu_{i1} \approx 6000$

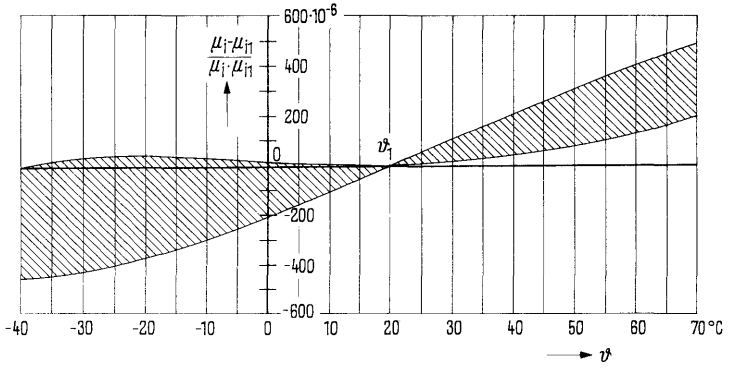


T 38; $\mu_{i1} \approx 10000$



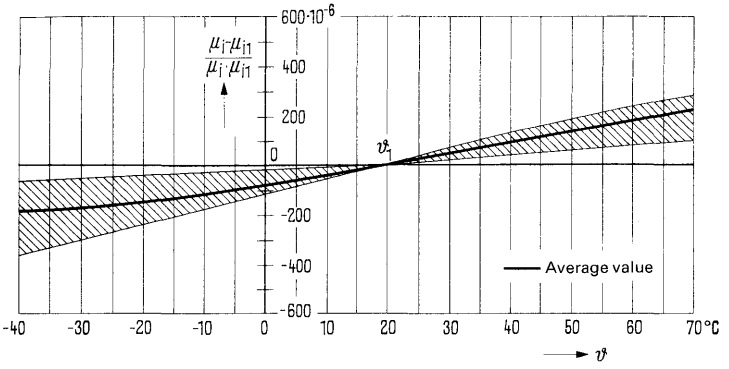
Measuring flux density $B \leq 1$ mT

Permeability factor as a function of temperature



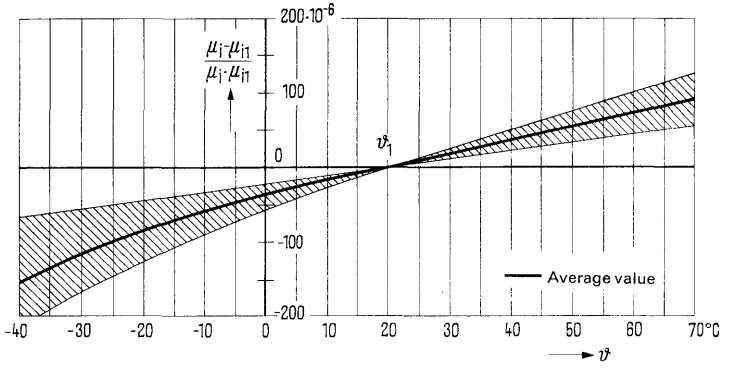
K 12 ($\mu_{i1} \approx 24$)

ϑ °C	α/μ_i 10^{-6}/K
20... 55	3 ...14
20... 5	−0,5...14
20...−25	−1 ...14



K 1 ($\mu_{i1} \approx 80$)

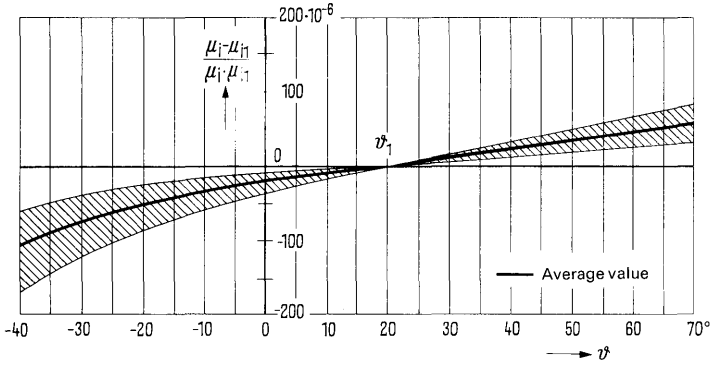
ϑ °C	α/μ_i 10^{-6}/K
20... 55	2...4,5...6
20... 5	1...4 ...6
20...−25	1...3,5...6



M 33 ($\mu_{i1} \approx 600$)

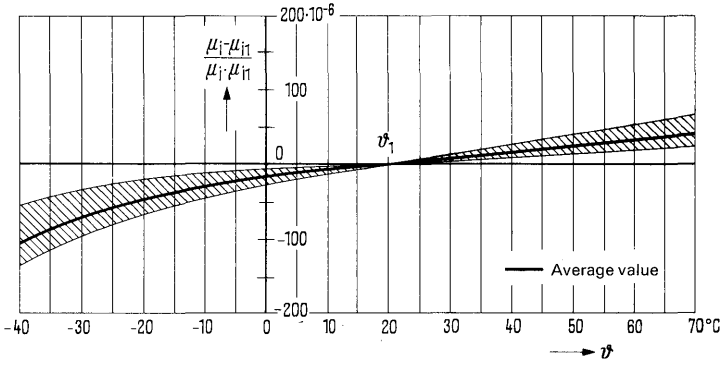
ϑ °C	α/μ_i 10^{-6}/K
20... 55	0,5...1,6...2,3
20... 5	0,5...1,8...2,5
20...−25	0,5...2,0...3,0

Permeability factor as a function of temperature



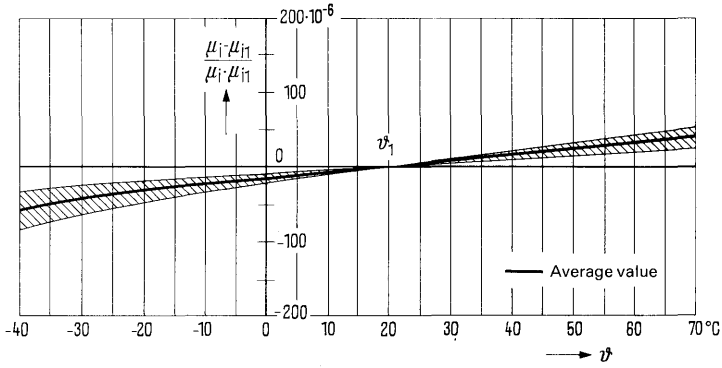
N 22 ($\mu_{i1} \approx 1500$)

ϑ °C	α/μ_i 10^{-6}/K
20... 55	0,6...1.1...1.6
20... 5	0.6...1.1...1.8
20...–25	0.7...1.4...2.3



N 28 ($\mu_{i1} \approx 2200$)

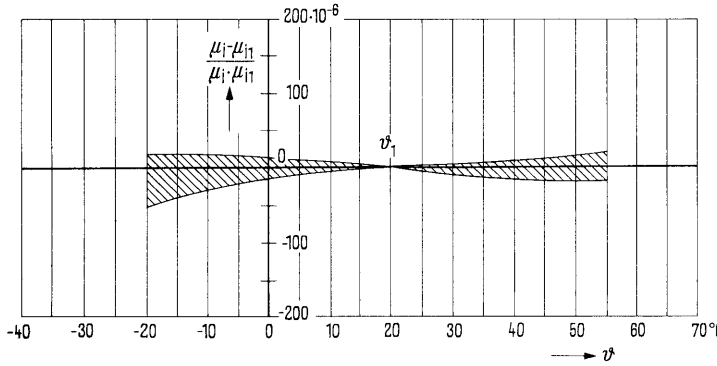
ϑ °C	α/μ_i 10^{-6}/K
20... 55	0,5...0.8...1.4
20... 5	0,5...0.8...1.6
20...–25	0,6...1.3...2.2



N 32 ($\mu_{i1} \approx 2400$)

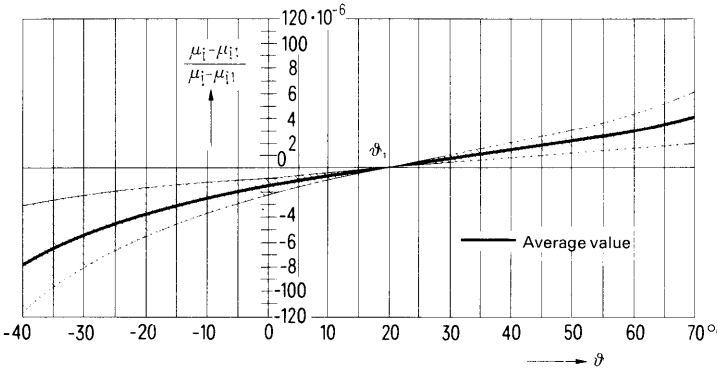
ϑ °C	α/μ_i 10^{-6}/K
20... 55	0.5...0.8 ...1.1
20... 5	0.5...0.8 ...1.1
20...–25	0.5...0.85...1.3
20...–40	0.5...0.9 ...1.4

Permeability factor as a function of temperature



N 29 ($\mu_{i1} \approx 2400$)

ϑ °C	α / μi 10⁻⁶ /K
20... 55	-0.6...0.2...0.6
20... 5	-0.6...0 ...0.6



N 48 ($\mu_{i1} \approx 2000$)

ϑ °C	α / μi 10⁻⁶ /K
20... 55	0.4...0.7...1.0
20... 5	0.4...0.7...1.0
20... -25	0.4...0.9...1.5

$$\frac{\alpha}{\mu_i} = \frac{\mu_i - \mu_{i1}}{\mu_i \times \mu_{i1}} \times \frac{1}{(\vartheta - \vartheta_1)}$$

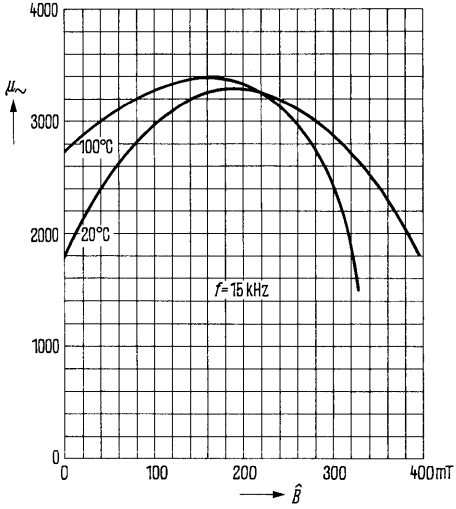
μ_i at the temperature ϑ
μ_{i1} at the temperature ϑ_1

$$\frac{\Delta L}{L}\,[\%] = \frac{\alpha}{\mu_i}\,[10^{-6}/K] \times (\vartheta - \vartheta_1)\,[K] \times \mu_e \times 100$$

$$\frac{\Delta L}{L}\,[\%] = \frac{\mu_i - \mu_{i1}}{\mu_i \times \mu_{i1}} \times \mu_e \times 100$$

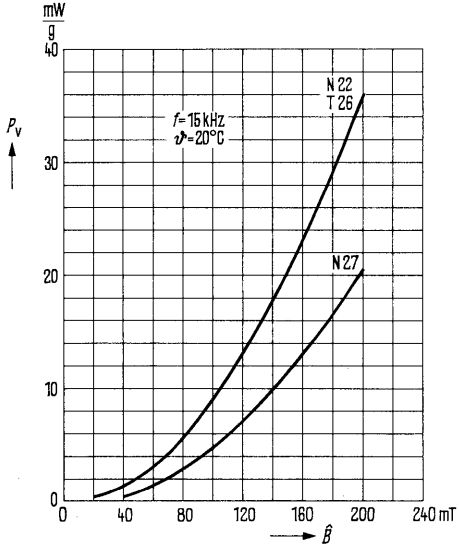
Amplitude permeability as a function of alternating field flux density $\hat{B}$

N 27

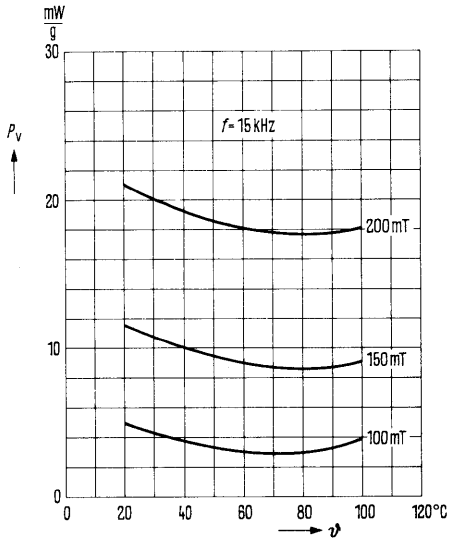


Power loss as a function of alternating field flux density $\hat{B}$, and temperature ϑ

N 22, T 26, N 27

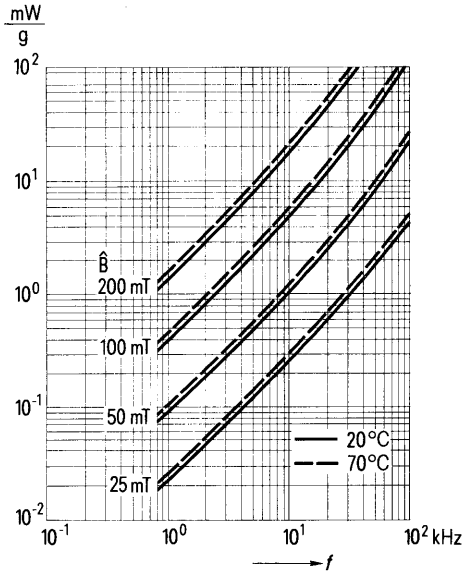


N 27

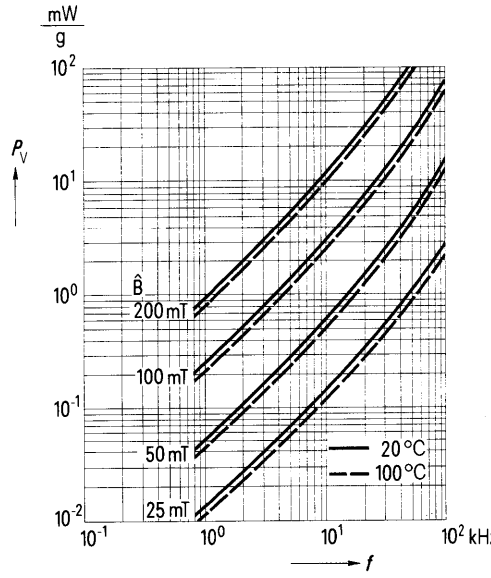


Relative power loss as a function of frequency for N 22, T 26, N 27

N 22, T 26



N 27



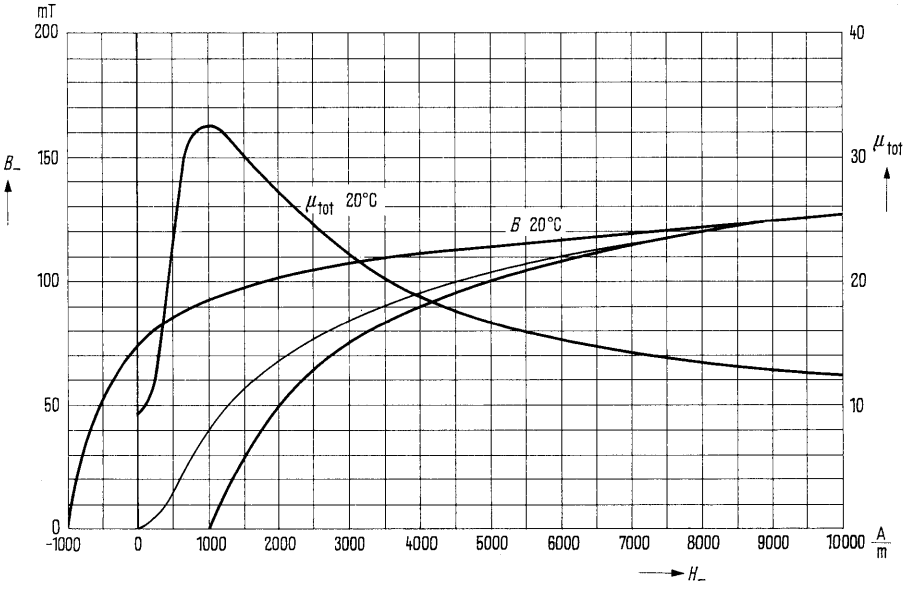
Measuring temperature 20°C (68 °F)

Static magnetization curves

The static magnetization curves were obtained by the ballistic galvanometer method.

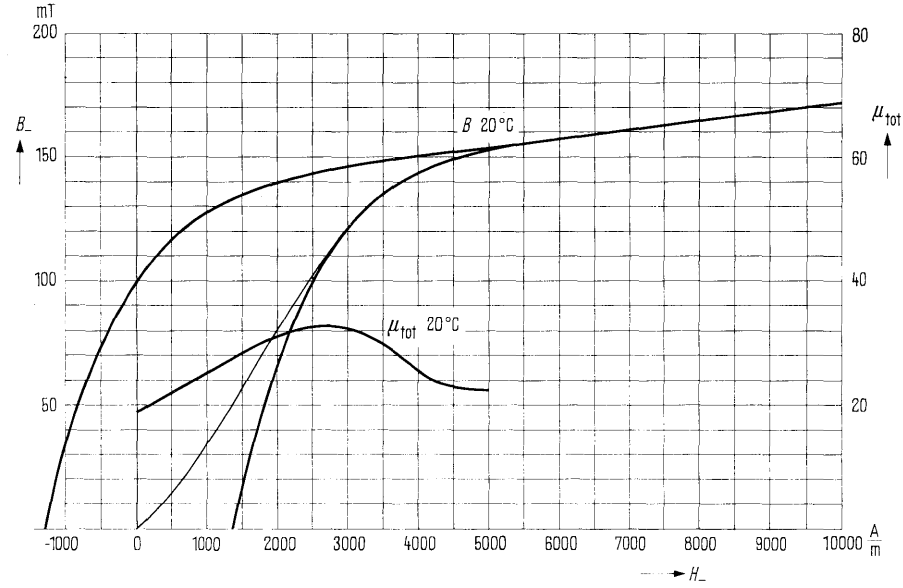
The relative total permeability $\mu_{tot} = \frac{1}{\mu_o} \cdot \frac{B}{H}$ is taken from the curve of normal magnetization (new curve).

U 60

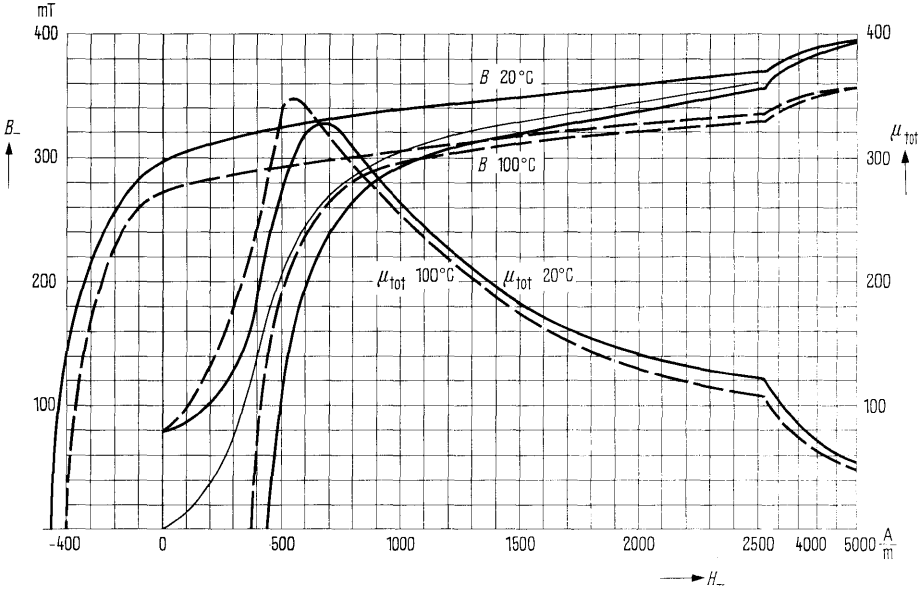


Static magnetization curves

K 12

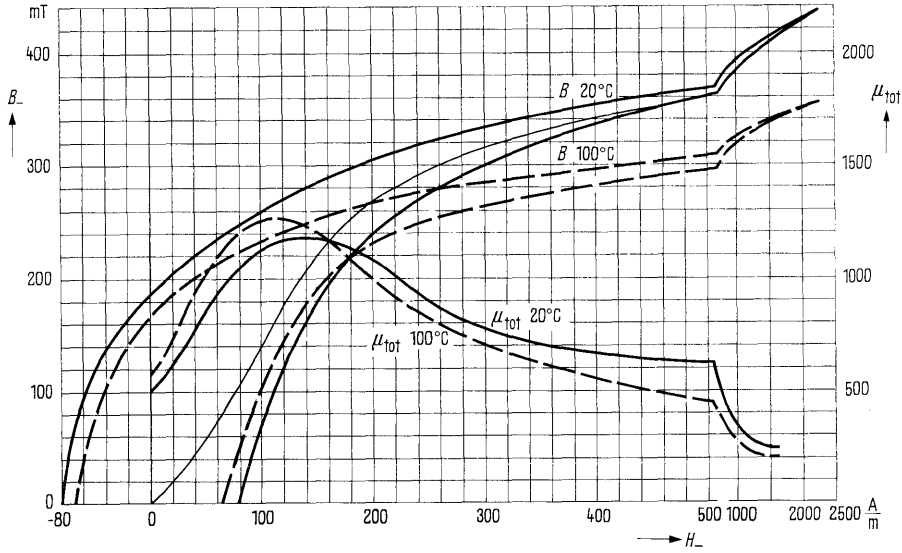


K 1

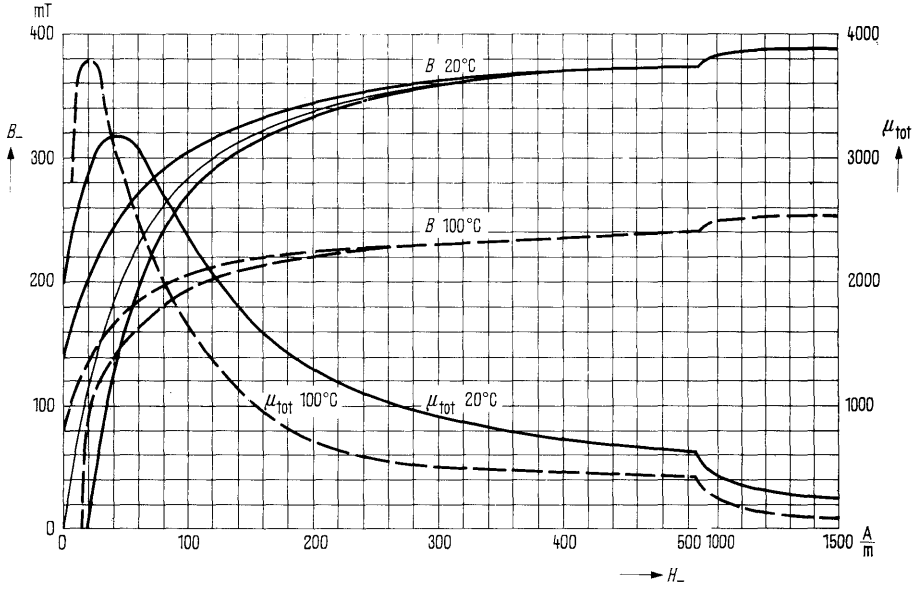


Static magnetization curves

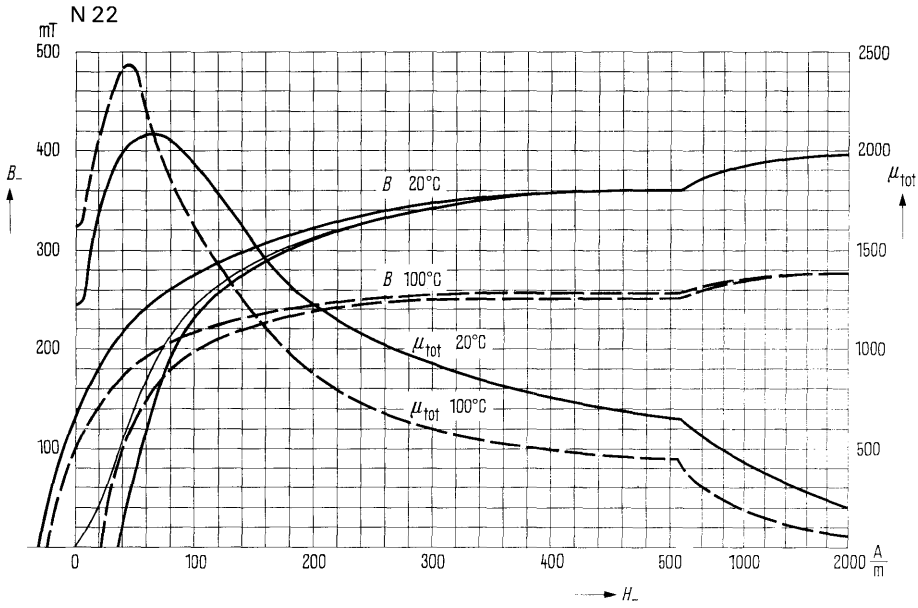
M 25, M 33

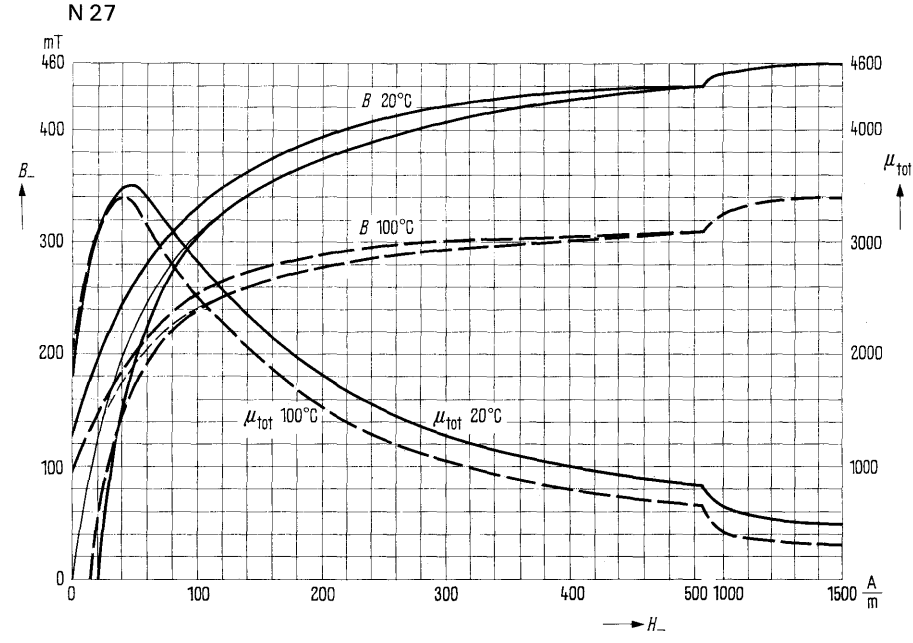


N 29



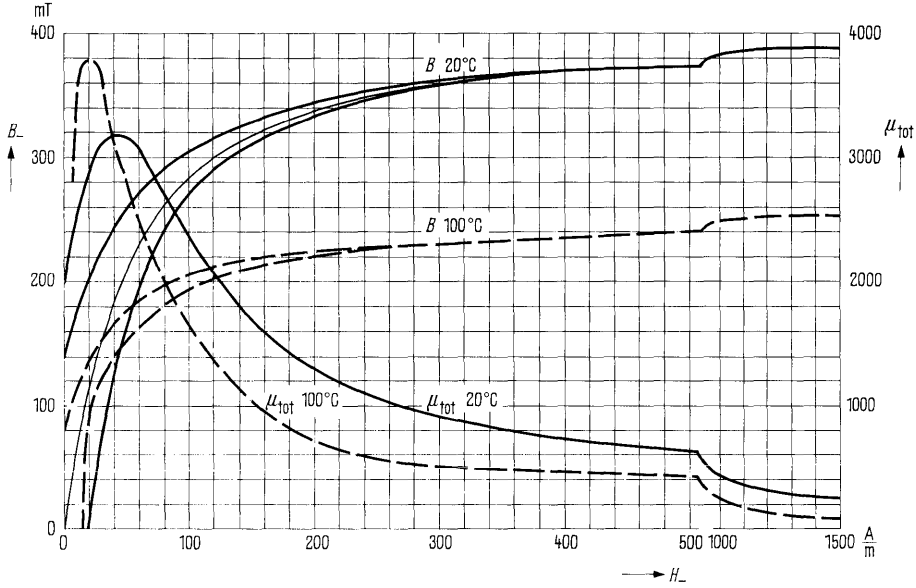
Static magnetization curves



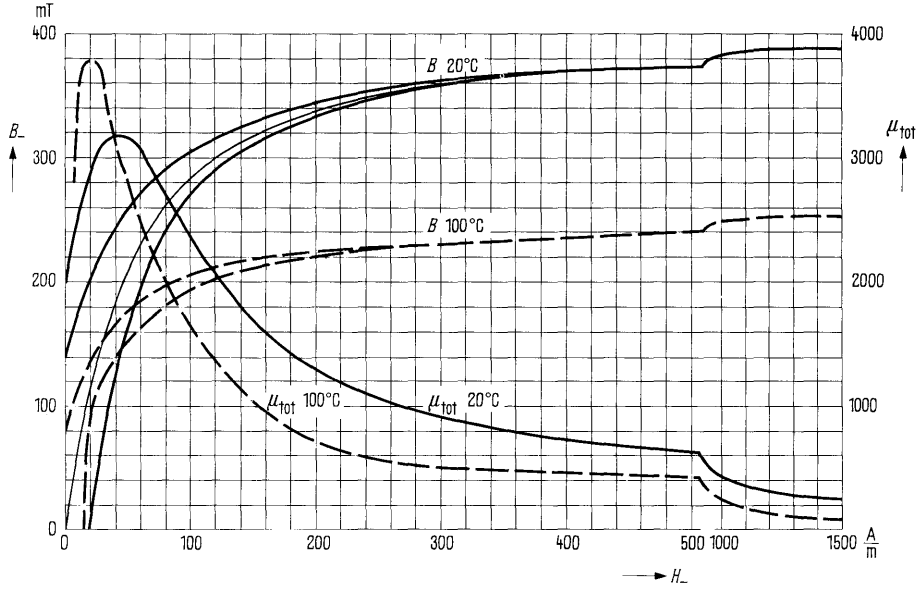


Static magnetization curves

T 26

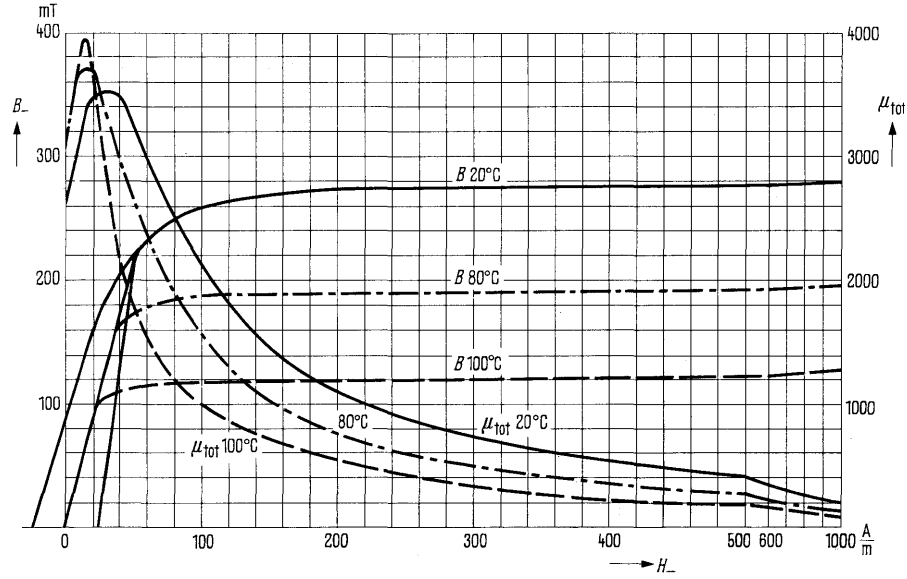


N 28

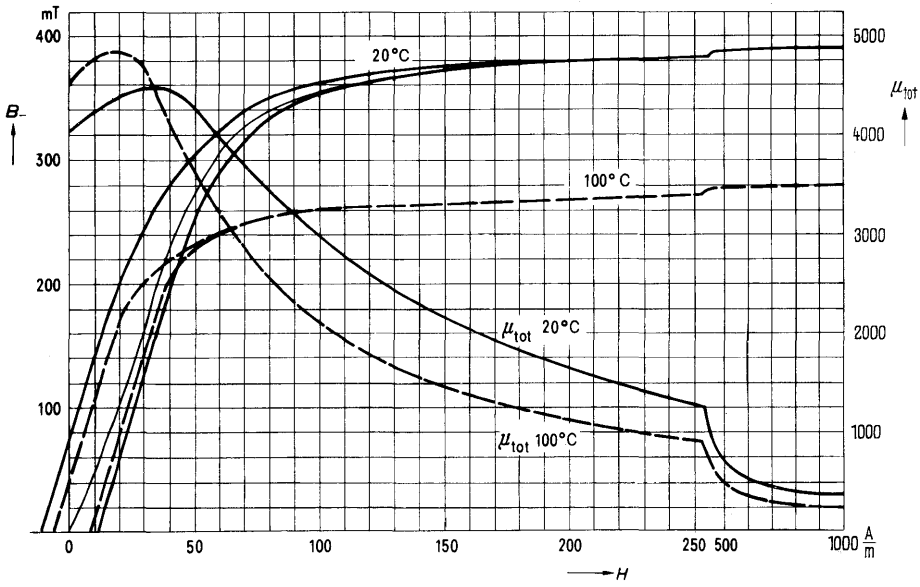


Static magnetization curves

N 32

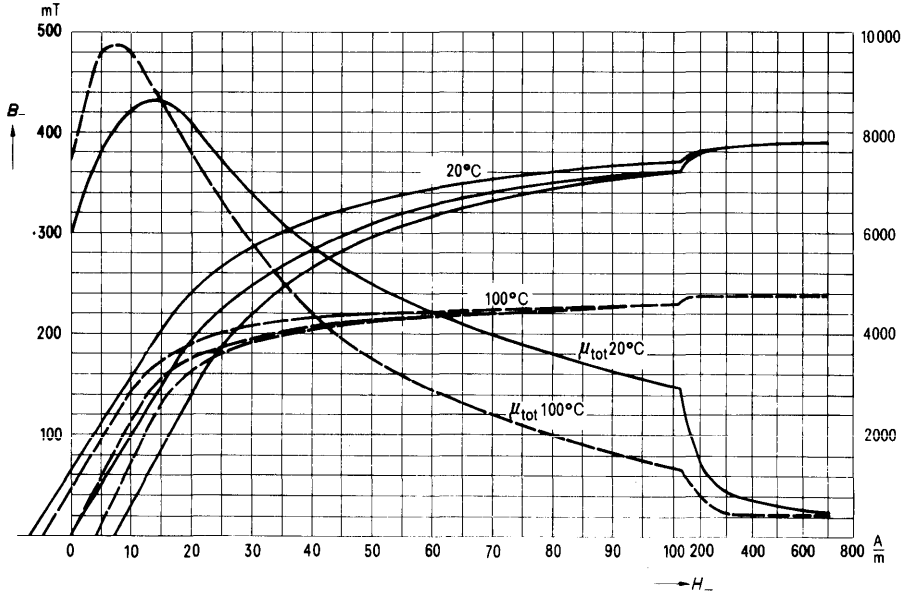


N 30

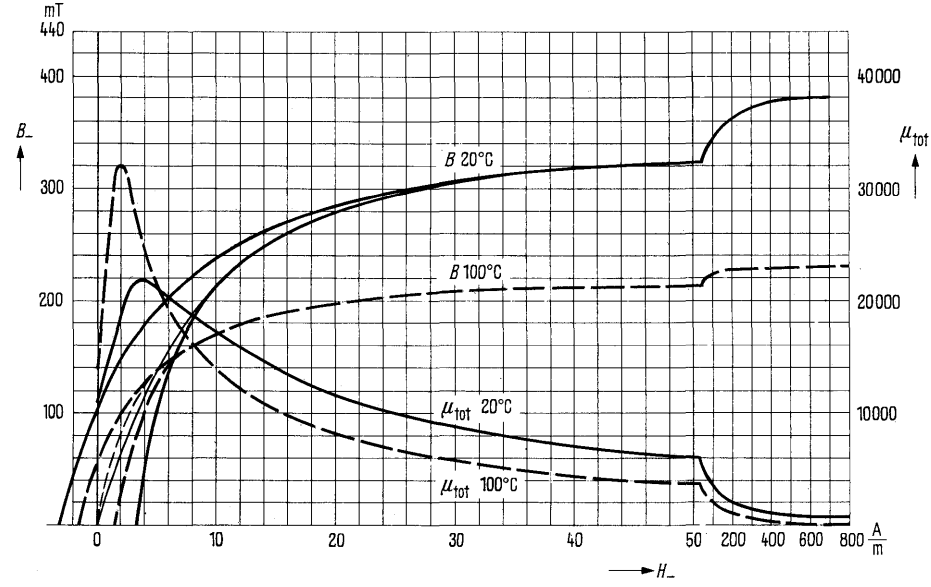


Static magnetization curves

T 35

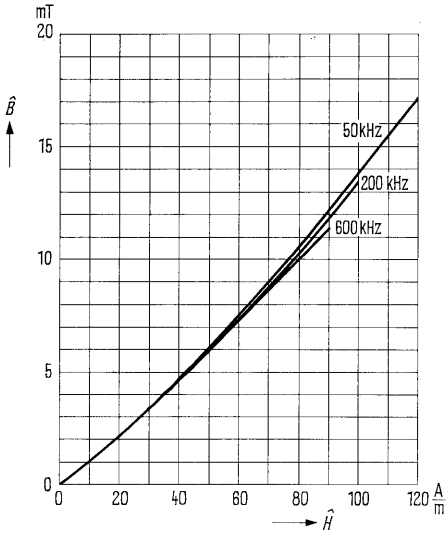


T 38

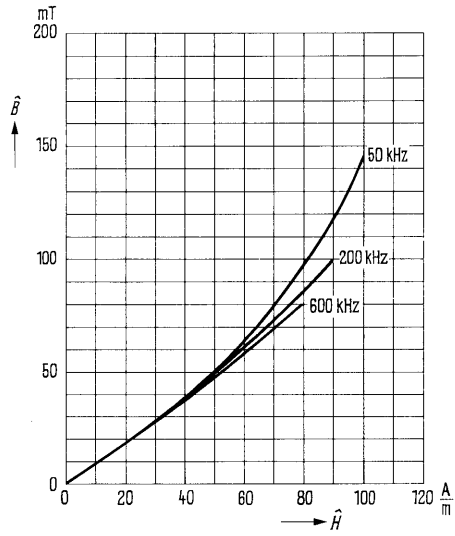


Dynamic magnetization curves

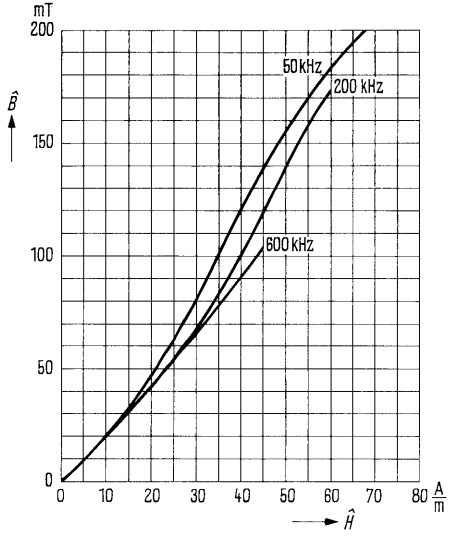
K 1



M 25, M 33



N 22



Pot cores (tubular and similar types)
Design and Assembly of Coils

Design of coils

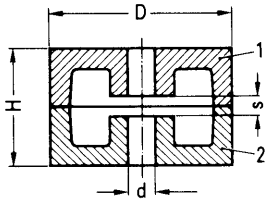
1. Pot cores without an air gap

Even with the best grinding methods known today, a certain degree of roughness on ground surfaces cannot be avoided, so that the usual term "without air gap" does not in fact imply no air gap at all. The A_L values quoted allow for a certain amount of roughness of the ground faces. The tolerances on the A_L value of pot cores without air gap is generally +30 to −20%. Cores with closer tolerances cannot be supplied for two reasons. Firstly the spreads in the A_L value of a pot core without air gap practically equal the spreads in ring core permeability, and secondly the A_L value largely depends on the grinding quality of the matching surfaces. With increasing material permeability the influence of the inevitable residual air gap grows.

2. Pot cores with an air gap

This type of core is used in high quality filter and resonant circuits. In case of small air gaps (max. 0.15 mm for round types or 0.2 mm for RM cores) the air gap can be ground into only one core half. Then, only the half with the ground air gap has been stamped whereas the other half is blank. The gap reduces after-effect losses, the temperature coefficient and the disaccomodation factor by the ratio of the permeability of a core with air gap to the permeability of the same core without air gap, and hysterises losses by the square of this ratio. Furthermore, closer tolerances on the A_L value can be obtained.

The rated A_L values for cores with a ground air gap can be obtained from the appropriate sheets on pot cores, which also indicate the relative effective permeability μ_e used to approximately determine the loss and temperature coefficients etc. for the appropriate effective permeability (see pages 399 and 400) from the toroidal core characteristics.
In cores with a larger air gap the stray field immediately around the air gap causes additional eddy current losses in the copper winding. If the coil Q must meet stringent requirements, it is therefore advisable to wind several layers of polystyrene or nylon tape instead of that part of the winding in the proximity of the air gap, for example in the section near the air gap of the center compartment of a three-compartment former, and thus "pad" the winding.



Pot core set
comprising
two pot core halves
1 and 2

Design of coils

3. Inductance adjustment

Inductance curves are included in the data for pot core adjusting devices; adjustment is made by bridging the air gap with a cylindrical or screw core, and is therefore only possible on pot cores with an air gap.
In order to avoid unstable conditions of inductance, Q etc. due to intermittent magnetic contact, the adjusting device should not come into direct contact with the wall of the center boss during the adjusting procedure. The adjustment of SIFERRIT pot cores is therefore provided with a suitable insulator.
Although wide variations of inductance can be obtained with a large air gap, it should be remembered that the magnetic properties depend to a great extent on the size of the air gap. If the coils have to comply with stringent Q and temperature coefficient requirements etc., it is advisable to use the smallest possible adjustment range.
These conditions can be met by suitably selecting the adjusting core material (SIFERRIT or SIRUFER).

4. Characteristic magnetic data $\Sigma\, l/A$, l_e, A_e, V_e

The appropriate pages indicate the characteristic data used for calculating the field strength, flux density and hysterises losses of pot cores.

For instance:

$$\mu_e = \frac{A_L \cdot \Sigma\, l/A}{\mu_o};\ \Sigma\, l/A = l_e/A_e$$

(see also DIN 41290 of August 1971 and IEC publications 218 and 367).

Design of coils

5. Winding design

The usual litz wires and wires as well as nomograms for determining the flux density and A_L value are contained in the following pages.

Litz wire table (Extract from DIN 46447, sheet 1)

Litz wire	Nominal diameter of the copper enamel wire	Outer diameter of the insulated litz wire (max. dimensions)			Dc resistance at 20 °C (68 °F)
		non-covered	covered		
			single natural silk (S)	double natural silk (2 S)	
	mm	mm	mm	mm	Ω/m
1 x 12 x 0.04	0.04	0.208	0.243	0.278	1.190
1 x 15 x 0.04		0.228	0.268	0.298	0.950
1 x 20 x 0.04		0.260	0.300	0.330	0.710
1 x 30 x 0.04		0.321	0.361	0.391	0.475
1 x 45 x 0.04		0.400	0.440	0.470	0.316
1 x 10 x 0.05	0.05	0.226	0.266	0.296	0.910
1 x 15 x 0.05		0.282	0.322	0.352	0.610
1 x 20 x 0.05		0.322	0.362	0.392	0.456
1 x 30 x 0.05		0.398	0.438	0.468	0.304
1 x 45 x 0.05		0.496	0.536	0.566	0.203
1 x 3 x 0.07	0.07	0.184	0.219	0.254	1.550
1 x 6 x 0.07		0.255	0.295	0.325	0.780
1 x 10 x 0.07		0.310	0.350	0.380	0.465
1 x 15 x 0.07		0.387	0.427	0.457	0.310
1 x 20 x 0.07		0.442	0.482	0.512	0.232
1 x 30 x 0.07		0.546	0.586	0.626	0.155
1 x 45 x 0.07		0.680	0.720	0.760	0.103
3 x 20 x 0.04	0.04	0.475	0.515	0.545	0.237
3 x 30 x 0.04		0.590	0.630	0.670	0.158
3 x 45 x 0.04		0.735	0.775	0.815	0.105
3 x 20 x 0.05	0.05	0.588	0.628	0.668	0.152
3 x 30 x 0.05		0.732	0.772	0.812	0.101
3 x 40 x 0.05		0.856	0.906	0.956	0.076
3 x 20 x 0.07	0.07	0.807	0.847	0.887	0.078
3 x 30 x 0.07		1.005	1.055	1.105	0.0517
3 x 45 x 0.07		1.250	1.300	1.350	0.0344

Design of coils

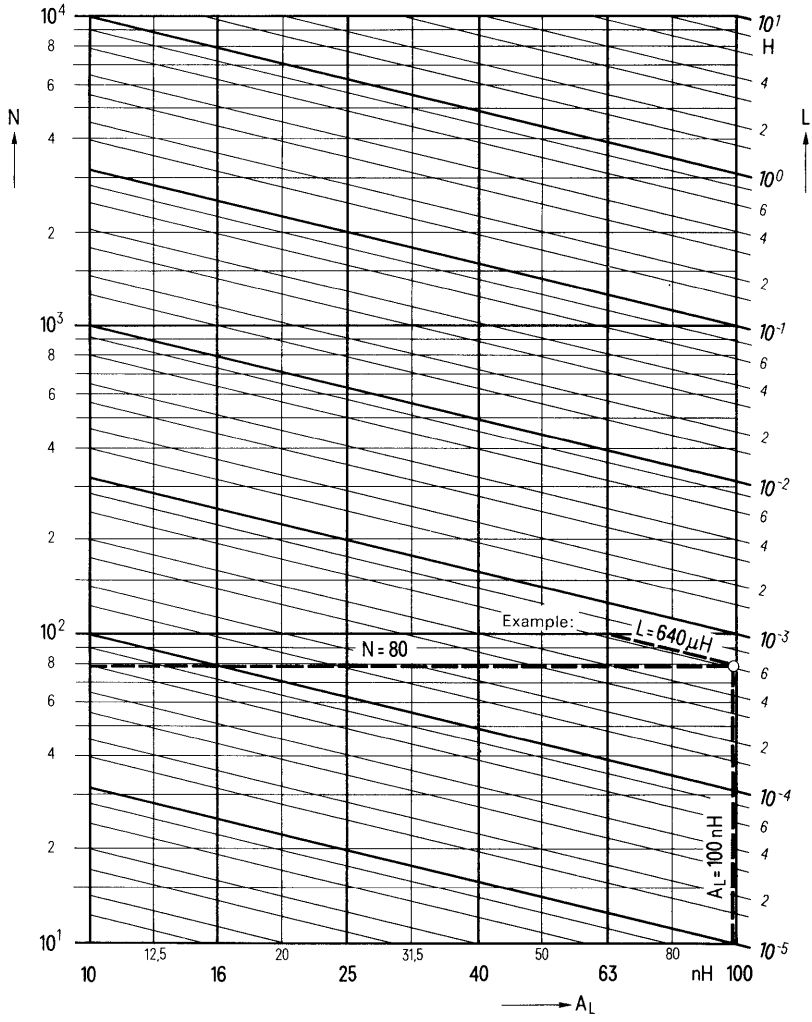
Wire table (Extract from DIN 46435, sheet 1, and DIN 46436, sheet 2)

Nominal diameter (= conductor diameter)	Outer diameter of the insulated wire (max. dimensions)				Dc resistance (nominal value at 20 °C/68 °F)
	enamelled (L)	double enamelled (2 L)	enamelled and silk covered (natural silk) (LS)	enamelled and silk covered (coppered artificial silk) (LKc)	
mm	mm	mm	mm	mm	Ω/m
0.03	0.038	0.041	0.077	–	24.39
● 0.032	0.040	0.043	–	–	21.44
0.036	0.045	0.049	–	–	16.94
● 0.04	0.050	0.054	0.087	–	13.72
0.045	0.056	0.061	–	–	10.84
● 0.05	0.062	0.068	0.100	–	8.781
0.056	0.069	0.076	–	–	7.000
0.06	0.074	0.081	0.110	0.125	6.098
● 0.063	0.078	–	–	–	5.531
● 0.071	0.088	0,095	–	–	4.355
● 0.08	0.098	0.105	0.133	0.148	3.430
● 0.09	0.110	0.117	0.147	0.162	2.710
● 0.1	0.121	0.129	0.157	0.172	2.195
● 0.112	0.134	0.143	–	–	1.750
● 0.125	0.149	0.159	–	–	1.405
● 0.14	0.166	0.176	0.204	0.219	1.120
0.15	0.177	0.188	0.214	0.229	0.9756
● 0,16	0.187	0.199	0,225	0,240	0.8575
0.17	0.198	0.210	0.235	0.250	0.7596
● 0.18	0.209	0.222	0.245	0.260	0,6775
0.19	0.220	0,233	0.255	0.270	0.6081
● 0.2	0.230	0,245	0.265	0.280	0.5488
● 0.224	0.256	0,272	–	–	0.4375
● 0.25	0.284	0.301	0,325	0.335	0.3512
● 0.28	0.315	0,334	0,357	0,367	0.2800
0.3	0.336	0,355	0,377	0.387	0.2439
● 0.315	0.352	0.371	–	–	0.2212
● 0,355	0.395	0.414	–	–	0,1742
● 0,4	0,442	0,462	0,484	0.504	0.1372
● 0,45	0.495	0.516	0.541	0.561	0.1084
● 0.5	0.548	0.569	0.591	0.611	0.08781
● 0.56	0.611	0.632	–	–	0.07000
0.6	0.654	0.674	0,699	0.719	0.06098
● 0.63	0.684	0,706	–	–	0.05531
● 0.71	0.767	0,790	–	–	0.04355
● 0.75	0.809	0,832	0,862	0,882	0.03903
● 0.8	0,861	0.885	0.912	0,932	0.03430
● 0.85	0,913	0.937	–	0,992	0.03038
● 0.9	0.965	0.990	–	1.042	0.02710
● 0.95	1,017	1,041	–	1.092	0.02432
● 1	1.068	1,093	–	1.142	0,02195

The nominal diameters marked by ● comply with the diameters of the IEC publication 182-1, 1st edition 1964, part 1: "Diameters of conductors for round winding wires" and are preferred diameters.

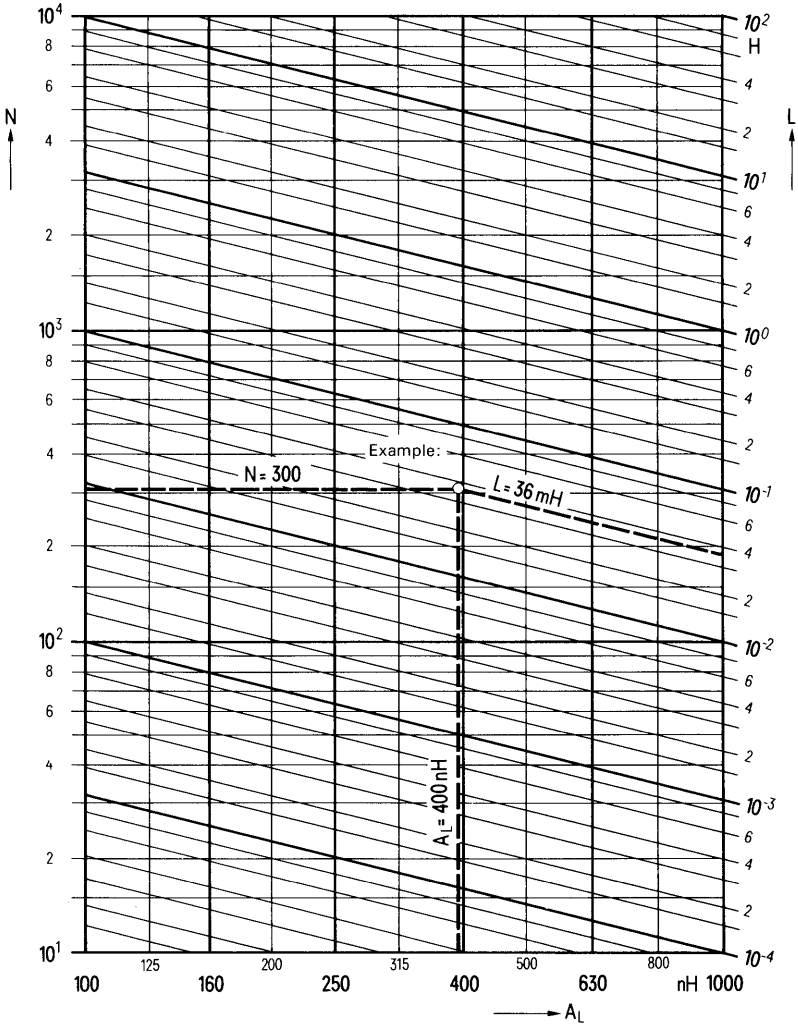
Design of coils

Nomogram for determining the number of turns N
from inductance L and inductance factor A_L for A_L values 10 to 100 nH



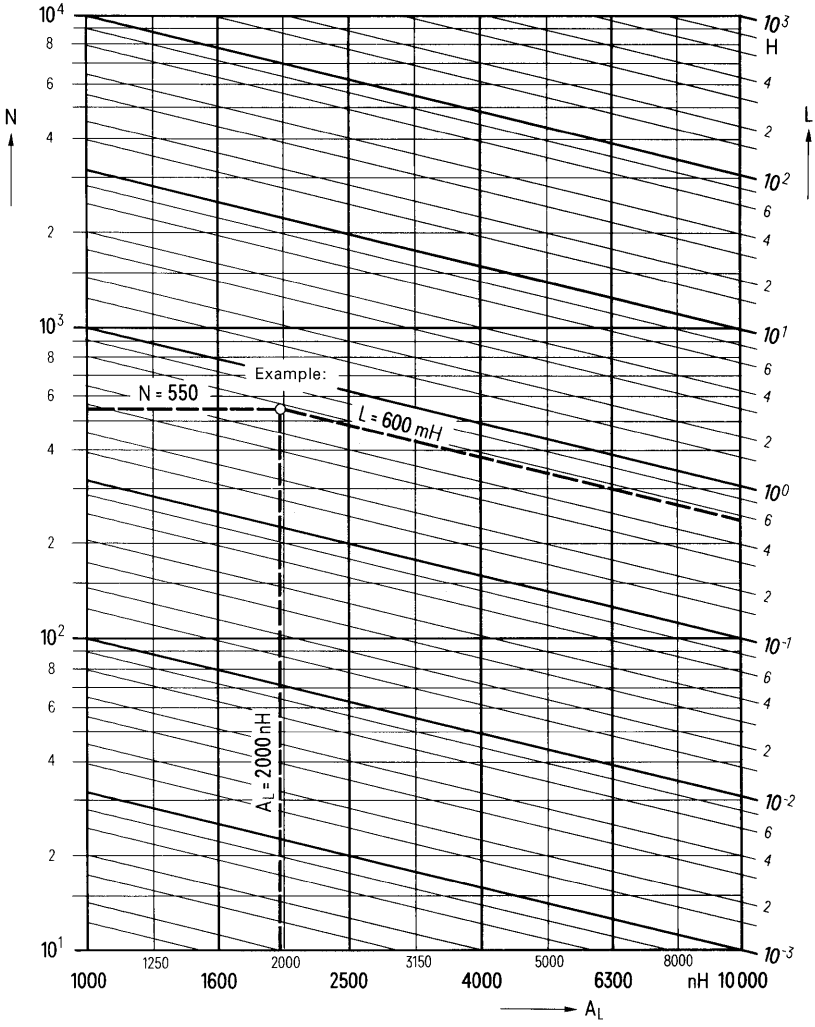
Design of coils

Nomogram for determining the number of turns N
from inductance L and inductance factor A_L for A_L values 100 to 1000 nH



Design of coils

Nomogram for determining the number of turns N
from inductance L and inductance factor A_L for A_L values 1000 to 10000 nH



Design of coils

6. Dc premagnetization

Definitions

$$H_{=} = \frac{I \cdot N}{l_e}$$

where H = dc field strength in A/m
I = dc current in A
N = number of turns
l_e = effective length (in mm)

For further definitions see pages 14 to 28.

Explanations to the graphs

The curves of $\mu_{rev} = f(H)$ allow an approximate calculation of the variation in a.c. permeability (μ_{rev}) and A_L value due to premagnetization. These curves are of particular interest for pot core coils used as transformers, since premagnetization should be avoided if possible with coils to high stability requirements (filter coils etc.). In the case of geometrically similar pot cores, only the effective permeability of the actual pot core in question in conjunction with the given curves suffices in determining the reversible permeability to a close approximation.
In determining the variation of reversible permeability with premagnetizing dc field strength H, the effective permeability μ_e for the desired A_L value is taken from the appropriate pot core data. If the curve $\mu_{rev} = f(H)$ for the actual effective permeability is not shown, this can be obtained by interpolation from two curves shown. The associated dc field strength H can be calculated from the above equation with the effective length l_e obtained from the data.
The curves were determined at 20 °C/68 °F and 800 Hz.

Example

Pot core 26 x 16, B65671, (page 187)
Material SIFERRIT N 22

A_L = 400 nH
μ_e = 127.5
l_e = 37.5 mm

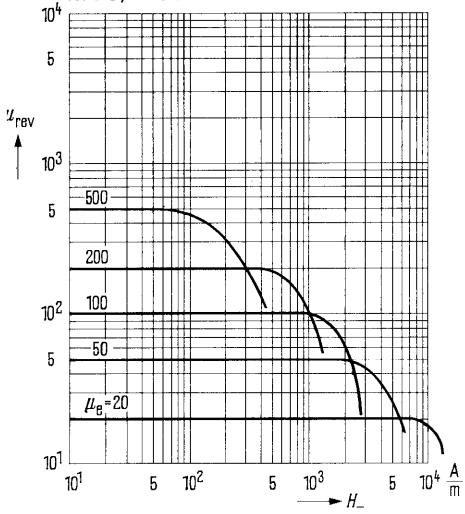
The decrease in permeability caused by premagnetization begins at a dc field strength of about 600 A/m. This corresponds to an ampere-turns value of

$I \cdot N = H_{=} \cdot l_e = 600 \cdot 37.5 \cdot 10^{-3} = 22.5$ A.

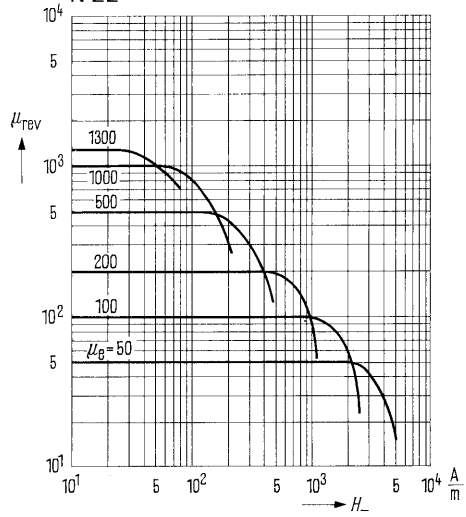
Design of coils

Dc premagnetization

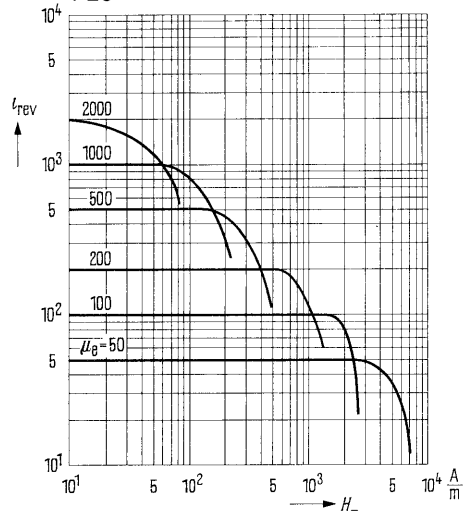
M 25, M 33



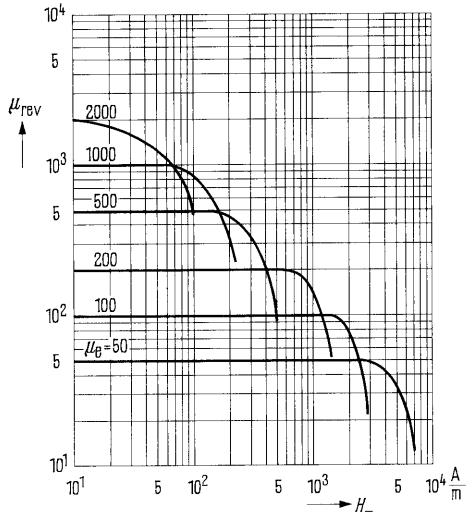
N 22



T 26



N 28



Design of coils

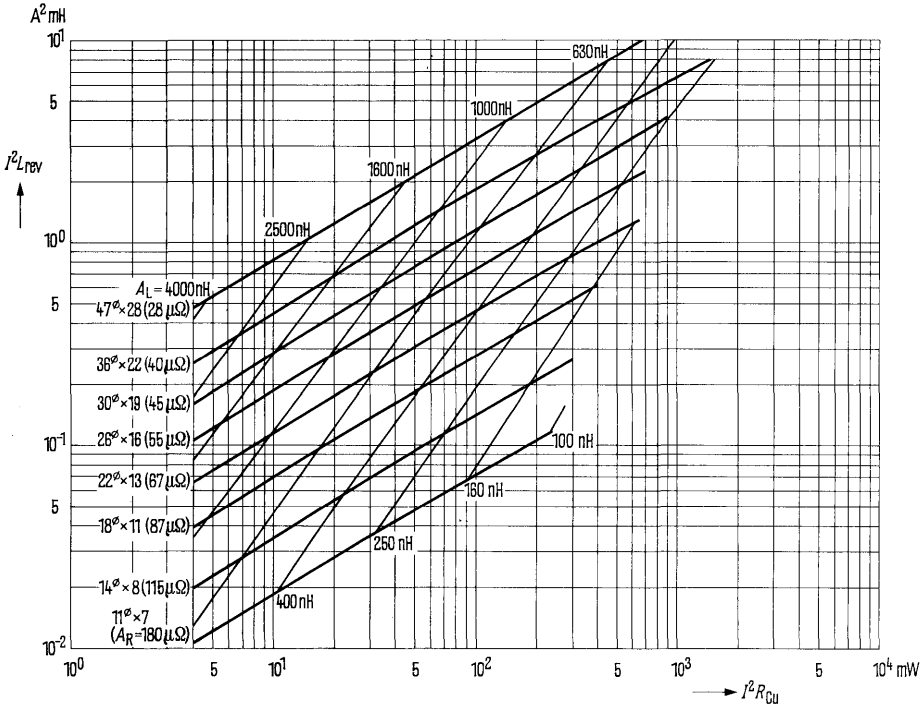
Optimum value of premagnetized pot cores, SIFERRIT material N 28 and T 26

The following graph shows for SIFERRIT N 28 and T 26 pot cores the maximum value of the inductance L_{rev} (inductance corresponding to the reversible permeability) or the minimum value of the dc resistance R_{Cu} which can be obtained at a definite premagnetization current I.

Example: at I = 0.1 A, L_{rev} > 10 mH and R_{Cu} < 1 Ω.

Unknown: the smallest possible pot core

Solution: All core sizes contained in a rectangle limited at the bottom by the horizontal $I^2 \times L_{rev}$ = 0.1 A² mH and at the right by the vertical $I^2 \times R_{Cu}$ = 0.01 W are possibilities. Therefore, the size of the smallest possible pot core is 22 mm dia x 13 mm with A_L = 1000 nH, $R_{Cu} \approx 0.86\ \Omega$, $L_{rev} \approx 10.6$ mH and $N = \sqrt{R_{Cu}/A_R} = 114$, 1 section coil former. [1]



[1] For information see also reprint: "Dimensionierung vormagnetisierter SIFERRIT-Schalenkerne", order No. 2-6100-253.

Design of coils

7. Typical calculation

A SIFERRIT pot core inductor is required with an inductance of 640 μH and a minimum Q of 400 (tan $\delta_L = \frac{1}{Q} = 2{,}5 \cdot 10^{-3}$) for a frequency of 500 kHz. The temperature coefficient α_e of this coil should be $100 \cdot 10^{-6}$/K.

a) Choice of material

According to the material tables on pages 34 and 35, and the curves tan ϑ/μ_i on page 36 the material for 500 kHz is M 33.

b) Choice of A_L value

The Q and temperature coefficient requirements demand a pot core with air gap. The average relative temperature coefficient α/μ_i of SIFERRIT M 33 according to the material table is 1.9 x 10^{-6}/K. Since the required α_e value of the core with air gap should be about $100 \cdot 10^{-6}$/K, the effective permeability is:

$$\frac{\alpha}{\mu_i} = \frac{\alpha_e}{\mu_e}\ ; \qquad \mu_e = \alpha_e \cdot \frac{\mu_i}{\alpha} = \frac{100 \cdot 10^{-6}}{K} \cdot \frac{1 \cdot K}{1.9 \cdot 10^{-6}} = 52.6.$$

For pot core 18 x 11 (B65651) is $\mu_e = 48.0$ for $A_L = 100$ nH
For pot core 22 x 13 (B65661) is $\mu_e = 39.8$ for $A_L = 100$ nH.

c) Choice of winding material

Single silk covered, high frequency litz wire 45 x 0.04 mm is particularly suitable for frequencies around 500 kHz. The approximate overall diameter of the wire including insulation, say 0.44 mm, and the average resistance per meter of say 0.316 Ω/m, are obtained from the litz table (page 61). It is recommended that the actual overall diameter always be measured, and this value used for the calculation.

d) Number of turns and type of core

For an A_L value of 100 nH and an inductance of 640 μH the nomogram on page 63 shows that the number of turns required is approximately 80. The nomogram for formers on page 68 shows that for a wire with an external diameter of 0.39 mm the two-section former for core type 18 x 11 (B65651) can easily take 80 turns. This type can therefore be used with a two-section former.

e) Length of wire and dc resistance

The length of an average turn l_N on the above former is 35.6 mm (see page 141). The length of litz necessary for the coil is therefore 80 x 35.6 = 2850 mm plus say 2 x 10 cm for the connections, giving a total length of 3.05 m.
The average resistance of this wire is 0.316 Ω/m; the total dc resistance R_{Cu} is thus 3.05 m x 0.316 Ω/m $\approx$ 0.97 Ω (resistance actually measured 0.92 Ω). It should be noted that the length of an average turn l_N given in the table always refers to the fully wound former; an appropriate correction must be made where necessary.

Design of coils

f) Verification of Q

The mathematical calculation of the total loss, i.e. the loss from the core and windings, is very laborious and only approximate; at the specified frequency of 500 kHz considerable dielectric and eddy current losses occur in the winding. Q is therefore checked on a sample coil wound as specified above, in this case the value being about 550 as shown in the graphs on page 149.

g) Checking the temperature coefficient

Pot Core 18 x 11 with A_L = 100 nH has an effective permeability μ_e of about 48. SIFERRIT M 33 has a relative temperature coefficient α/μ_i of approx. 1.9 x 10^{-6}/K; therefore the following temperature coefficient can be calculated:

$\alpha_e = \mu_e \cdot \alpha/\mu_i = 48.0\ (1.9 \cdot 10^{-6}/K) = 91.2 \cdot 10^{-6}/K;$

Actual measurement showed 95 x 10^{-6}/K;

It must be pointed out here that when the magnetic flux lies almost entirely within the core, the temperature coefficient is only reduced slightly; the influence is even less in pot cores with small air gaps. This of course only refers to the temperature coefficient of the inductance and not to that of the core self capacitance; the self capacitance can be decreased by spreading the turns over several sections and also by well insulating the wires with silk.

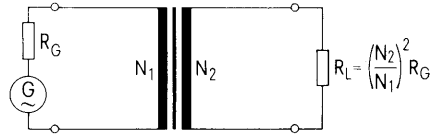
Design

SIFERRIT cores are increasingly used in power transformers. This is in particular due to the miniaturization of power equipment as a result from shifting the operating frequency from mains frequency beyond the audio frequency limit of 16 kHz.
For power transformer design – particularly those switched by semiconductors – using SIFERRIT N27 pot and E cores, the following nomograms give values for the core size, the maximum transferable power, the volts per turn and per 1 mm² cross-section of the core U/NA_e. The nomograms have been calculated for the following operational conditions and applications, using the equations shown (1) – (4).
Push-pull dc converters used for instance in switching networks (after the mains voltage has been rectified) are given as examples for applied rectangular ac voltages.

a) **Continuous load, sine-wave ac voltage; symmetrical magnetization at $\hat{B} \leq \hat{B}_{adm} = 200$ mT.**
Function: **Feed-through transformer**

$$P = 4{,}44\, A_e\, f\, \hat{B}\, (P_{Fe}, \hat{B}_{adm}) \sqrt{\frac{P_{Cu}(\hat{U}_{o\ adm})\, f_{Cu}\, f_{WP}}{2\, A_R}} \qquad (1)$$

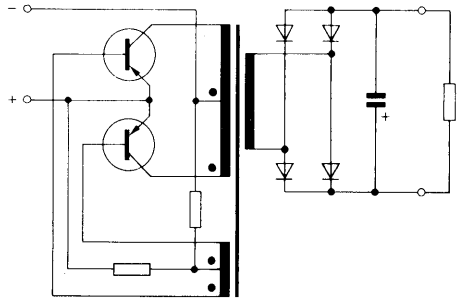
Application: e.g. for **matching** a load resistance R_L to a generator resistance R_G with **voltage isolation.**



b) **Continuous load, rectangular-wave ac voltage; symmetrical magnetization at $\hat{B} \leq \hat{B}_{adm} = 200$ mT.**
Function: **Feed-through transformer**

$$P = 4\, A_e\, f\, \hat{B}\, (P_{Fe}, \hat{B}_{adm}) \sqrt{\frac{P_{Cu}(\hat{U}_{o,\ adm})\, f_{Cu}\, f_{WP}}{2\, A_R}} \qquad (2)$$

Application: e.g. **push-pull dc converter**



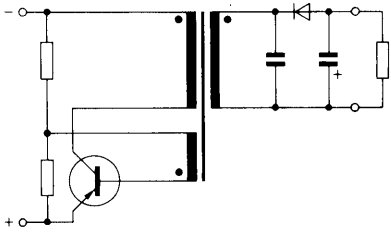
•Same winding polarity.

Design

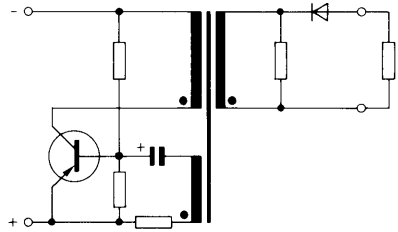
c) **Pulse load, rectangular voltage;**
pulsed, asymmetrical magnetization at $\Delta \hat{B} \leq \Delta B_{adm}$ = 100 mT and a mark-space ratio p_1 = 0.5. Function: **Feed-through transformer**

$$P = A_e f \, \Delta B \, (P_{Fe, \Delta B_{adm}}) \sqrt{\frac{P_{Cu}(\vartheta_{o,\,adm})\, f_{Cu}\, f_{WP}}{p_1\, 2\, A_R}} \qquad (3)$$

Application: e.g.
Single-ended dc converter



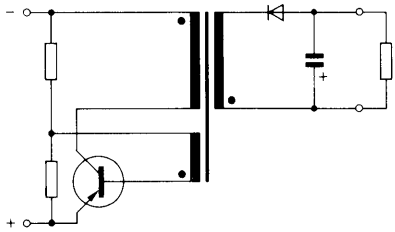
Blocking Oscillator in conducting mode



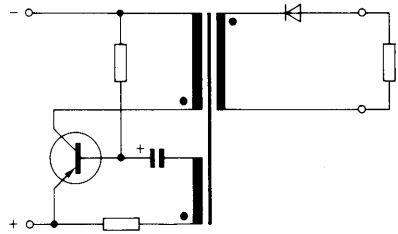
d) **Pulse load, on the primary and secondary side alternately;**
rectangular voltage and triangular current waveform;
continuous, asymmetrical magnetization at $\hat{B} \leq \hat{B}_{adm}$ = 200 mT.
Function: **Energy storage transformer**

$$P = A_e f \hat{B} \, (P_{Fe,\, \hat{B}_{adm}}) \sqrt{\frac{3\, P_{Cu}(\vartheta_{o,\,adm})\, f_{Cu}\, f_{WP}}{4\, A_R}} \qquad (4)$$

Application: e.g. **Blocking converter**



Blocking Oscillator in blocking mode



• Same winding polarity

Design

Each of the following nomograms may be considered in two parts separated by a dotted line. In the area where the constant frequency lines (f = const) are falling, the flux density decreases with increasing core size, so that the losses remain constant, with $P_{Fe} = P_{Cu}$, and produce a constant temperature rise of $\vartheta_{o,\,adm} = 30$ °C. In the area where the constant frequency lines are horizontal, the flux density is limited to $\hat{B}_{adm}$ or ΔB_{adm}, so for constant winding losses P_{Cu}, the core loss $P_{Fe} < P_{Cu}$ and the temperature rise does not reach 30 °C. In the limiting case of zero core losses for example, the temperature rise is only about 18 °C[1].

The nomograms have been calculated for a fixed winding resistance factor A_R for 70 °C and a copper factor $f_{Cu} = 0.5$. The ratio of power transfer winding volume to total winding volume, f_{wp}, is taken as 1 in nomogram 1, and 0.8 in nomograms 2–4. Parameters which differ from those incorporated in the nomograms can be allowed for by using equations 1–4 (see design examples). The windings, particularly for cores with airgaps, should be constructed with the lowest possible leakage; e.g. using interleared or bifilar windings.

Feed through transformers – Equations and nomograms 1–3

Cores without airgaps are used for feed through transformers, to minimise the magnetising power and stray flux. In the case of asymmetrical magnetization however, an airgap may be necessary to overcome the effects of the dc component on the primary inductance. An autotransformer with an upper voltage U_{ob} and a lower voltage U_{un} sees a load which is $(1-U_{un}/U_{ob})$ of the transfered power, and is designed for only this proportion of the load.

Energy storage transformers – Equation and nomogram 4

For energy storage transformers cores with airgaps are the only ones suitable, since the energy storage capacity increases with the size of the gap. The designs indicate particular values of B and H, and thus effective permeabilities μ_e to give maximum power transfer. These are shown on the nomogram at some of the points of intersection of the core size and frequency lines as μ_{eo}. For crossing points where μ_{eo} is not given the next higher value on the core size line may be used. By choosing a higher value of μ_e the stray flux can be reduced, but this results in a lower transferable power P compared with the output value P_o obtained from the nomogram. The ratio P/P_o is plotted against the increase in permeability μ_e/μ_{eo} in the adjacent diagram. The bottom curve shows the variation of P/P_o with μ_e/μ_{eo} when $\hat{B}$ = const., e.g. in the region where the flux density is limited to $\hat{B}_o$. The middle curve shows the variation of P/P_o with μ_e/μ_{eo} as the flux density is increased as shown in the top curve. (Consideration should be given to the maximum permissible temperature rise).

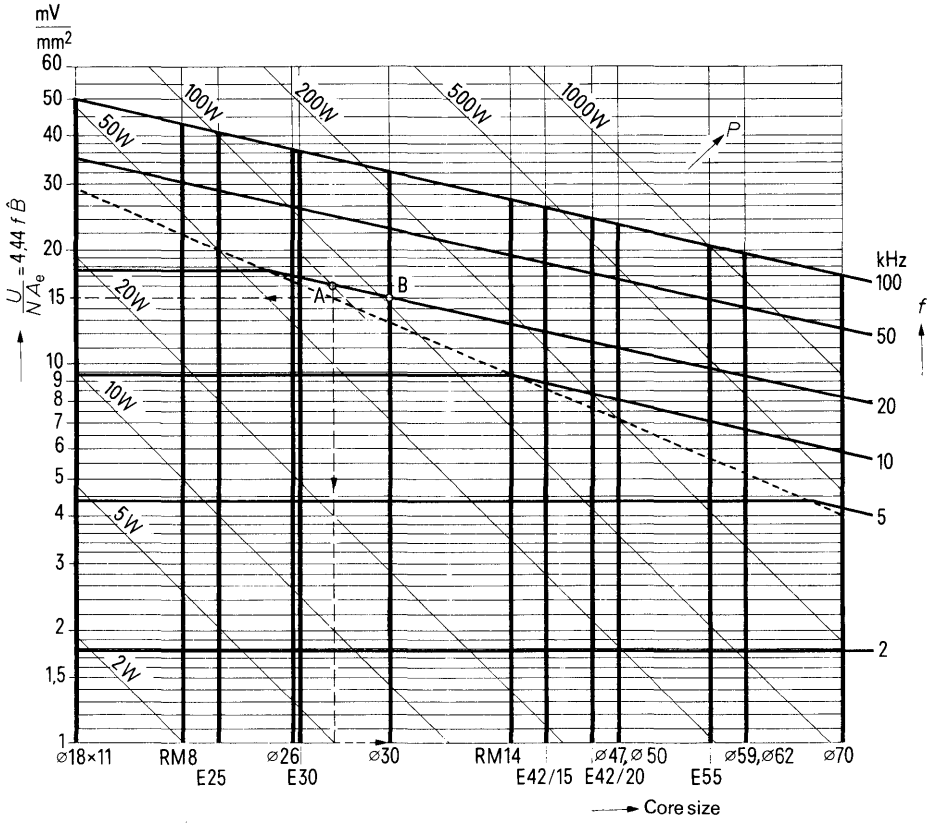
The transferable power of an autotransfromer is increased by up to $\sqrt{2}$ times the indicated value, dependant upon the transformation ratio.

Further Information. Siemens Components Report Volume X No. 1/75
March 1975 Pages 5 to 11.

[1] In order to get back to the maximum permissible temperature rise, $\vartheta_{o,\,adm} = 30$ °C, the load current and power P, can be increased by up to approximately $\sqrt{2 - (B_{adm}/B^+)^2}$ times. In this expression B^+ represents the flux density extrapolated from the value B_{adm} for $P_{Fe} = P_{Cu}$. Using this method for an energy storage transformer, μ_e is automatically decreased in inverse proportion to the load current.

Design

Nomogram 1



Feed through transformer with sinewave voltage, symmetrical magnetization; application, for example, matching.
$\vartheta_{o,\,adm}$ = 30 °C $\hat{B}_{adm}$ = 200 mT, f_{Cu} = 0.5 f_{wp} = 1.0

Example 1

Given: Sinusoidal voltage, P = 80 W, f = 20 kHz, $\vartheta_{o,\,adm}$ = 30 °C, $\hat{B}_{adm}$ = 200 mT, (f_{Cu} = 0.5, f_{wp} = 1.0)
Required: Core size and N/U turns per Volt)

Solution from nomogram 1: From point A, (P = 80 W, f = 20 kHz), the next largest core along the core size scale is the 30 mm pot core (without air gap). Using this 30 mm line and the 20 kHz line, point B is obtained, and from this a value of U/NA_e = 15 mV/mm² is obtained from the ordinate. For the 30 mm pot core A_e = 136 mm² therefore N/U = 2.04 and hence $N/U \approx 0.5\ V^{-1}$.

Design

Example 2

Given: Sinusoidal voltage, P = 80 W, f = 20 kHz, $\vartheta_{o,\,adm}$ = 30 °C, $\hat{B}_{adm}$ = 200 mT, (f_{Cu} = 0.5, f_{wp} = 1.0)

Required: P and N/U if

a) $\vartheta_{o,\,adm}$ = 45 °C instead of 30 °C, or
b) $\hat{B}_{adm}$ = 220 mT instead of 200 mT, or
c) f_{Cu} = 0.2 instead of 0.5 and f_{wp} = 0.9 instead of 1.0.

Solution from equation (1)

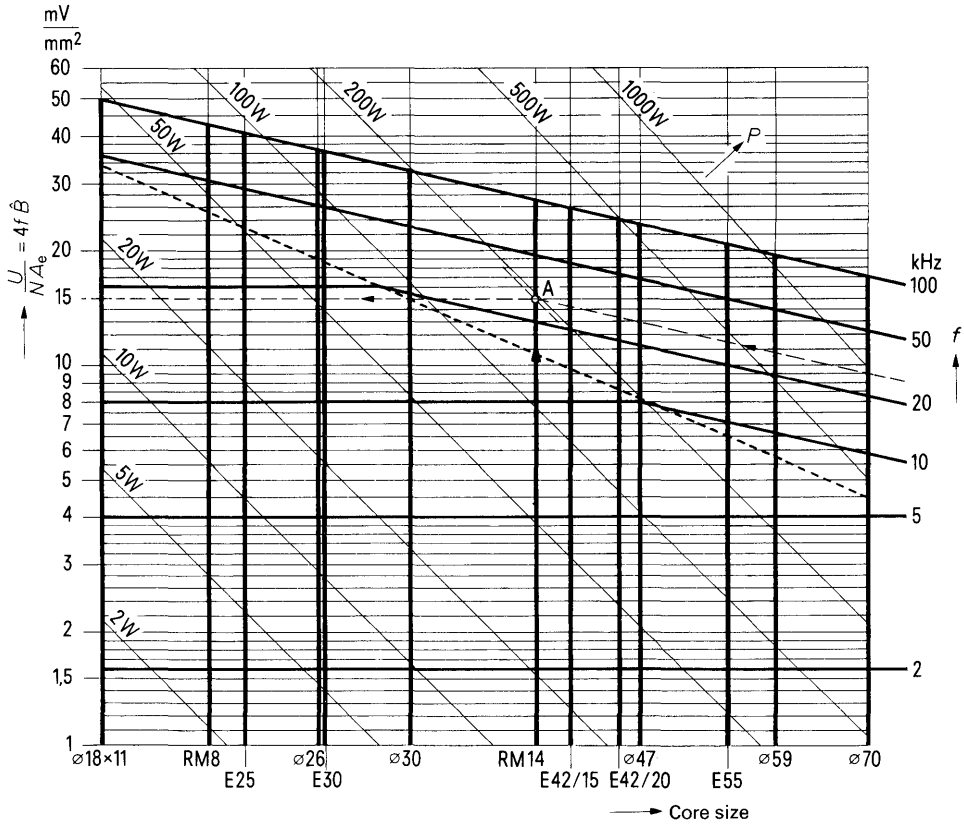
a) If the permissible temperature rise is increased from 30 °C to 45 °C, i.e. by 50 %, the losses can be increased by 50%. From equation (1) P varies as $\hat{B}$ (P_{Fe}, $B_{adm}\sqrt{P_{Cu}}$ i.e. P is approximately proportional to $\sqrt{P_{Fe}P_{Cu}}$ and ϑ_o as long $\hat{B}$ has not reached the value $\hat{B}_{adm}$. In this example the flux density increases to about $\hat{B}_{adm}$, so that starting at point B with P = approx 100 W, P can be calculated as 100 x 1.5 = 150 W. N/U varies as $1/\hat{B}(P_{Fe})$ and approximately as $1/\sqrt{P_{Fe}}$ up to about 0.5 V^{-1} / $\sqrt{1.5}$, ≈ 0.4 V^{-1}.

b) In the region of falling frequency lines $\hat{B}$ is limited by P_{Fe}, so a higher $\hat{B}_{adm}$ cannot be utilized. Hence P and N/U remain unchanged.

c) P is proportional to $\sqrt{f_{Cu} \cdot f_{Wp}}$. Thus $P \approx 100 \sqrt{\frac{0{,}2 \cdot 0{,}9}{0{,}5 \cdot 1{,}0}}$ = 60 W. As the flux density is unaltered, N/U remains unchanged.

Design

Nomogram 2



Feed through transformer; rectangular voltage, symmetrical magnetization. Application, for example, in dc push-pull converter.
$\vartheta_{o,\,adm}$ = 30 °C, $\hat{B}_{adm}$ = 200 mT, f_{Cu} = 0.5, f_{wp} = 0.8

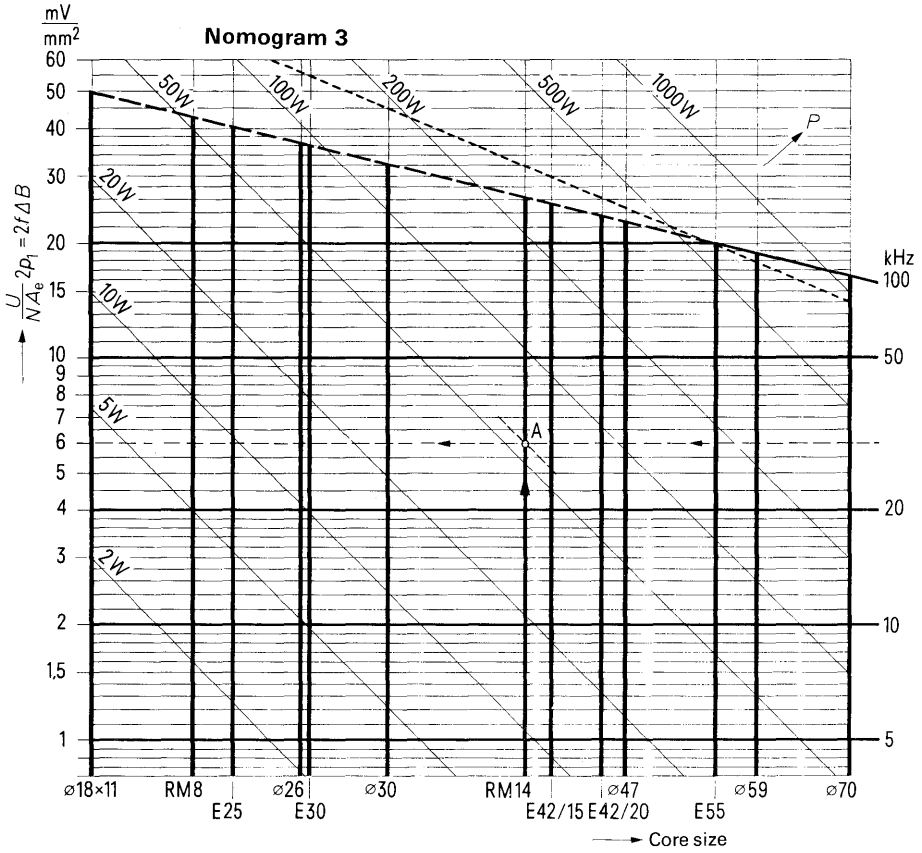
Example

Given: RM 14 core, f = 30 kHz, $\vartheta_{o,\,adm}$ = 30 °C, (f_{Cu} = 0.5, f_{wp} = 0.8)
Required: P and N/U for a dc push-pull converter with $\hat{B}_{adm}$ = 200 mT.

Solution using nomogram 2

From point A (RM 14, f = 30 kHz), a power $P \approx$ 200 W and U/NA_e = 15 mV/mm² are indicated. With A_e = 178 mm² for RM 14, N/U is approximately 0.37 V^{-1}.

Design



Feed-through transformer; rectangular, pulse-shaped voltage waveform, asymmetrical magnetization. Application, for example, in single-ended dc converter.
$\vartheta_{o,\,adm}$ = 30 K, ΔB_{adm} = 100 mT, f_{Cu} = 0.5, f_{Wp} = 0.8, p_1 = 0.5.

Example

Given: RM 14 core, f = 30 kHz and $\vartheta_{o,\,adm}$ = 30 °C (f_{Cu} = 0.5, f_{wp} = 0.8)
Required: P and N/U for a single-ended dc converter at ΔB_{adm} = 100 mT and p_1 = 0.6.

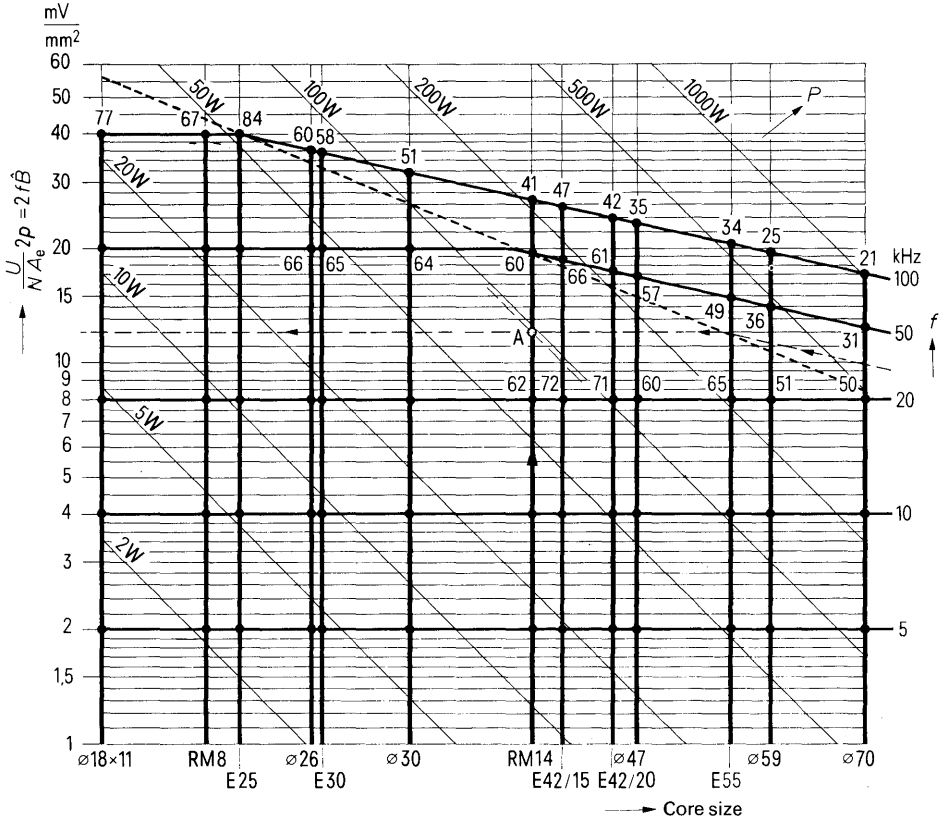
Solution using nomogram 3

From point A (RM 14 core, f = 30 kHz) with p_1 = 0.5, a power $p \approx$ 55 W and a U/NA_e = 6 mV/mm² are indicated. From equation 3, P varies as $1/\sqrt{P_1}$. Thus, for p_1 = 0.6, $P = 55 \times \sqrt{\frac{0.5}{0.6}}$ W, i.e. $P \approx$ 50 W.

To utilize fully the permitted temperature rise, $\vartheta_{o,\,adm}$ = 30 °C, the load current and power can be increased by a factor of up to $\sqrt{2 - b^2}$ times. In this factor, b is the ratio between U/NA_e from nomogram 3 (6 mV/mm²), and U/NA_e for $P_{Fe} = P_{Cu}$ from nomogram 2 (15 mV/mm²), for the same core and frequency. Thus P becomes 50 W x 1.36 = 68 W. Using U/NA_e $2p_1$ = 6 mV/mm², for p_1 = 0.6 we obtain U/NA_e = 5 mV/mm². With A_e = 178 mm², $N/U \approx$ 1.12 V⁻¹.

Design

Nomogram 4



Energy storage transformer: rectangular voltage, asymmetrical magnetization. Application example: Blocking oscillator.
$\vartheta_{o,\,adm}$ = 30 °C, $\hat{B}_{adm}$ = 200 mT, f_{Cu} = 0.5, f_{wp} = 0.8. Numbers on the nomogram at certain crossing points of the core size and frequency lines indicate the effective permeability μ_{eo} for maximum power transfer. Where a value is not given, the next higher value on the core size line should be used.

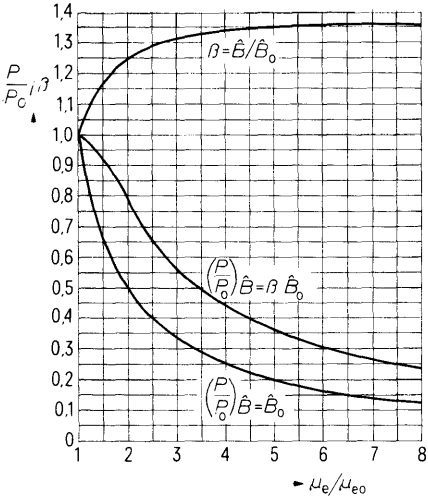
Example

Given: RM 14 core, f = 30 kHz and $\vartheta_{o,\,adm}$ = 30 °C, (f_{Cu} = 0.5, f_{wp} = 0.8)
Required: P and N/U for a blocking oscillator, with $\hat{B}_{adm}$ = 200 mT, p_1 = 0.6, $\mu_e > 70$ and A_L = ?

Solution using nomogram 4

From point A (RM 14, f = 30 kHz) a power $P \approx$ 95 W at $\hat{B}$ = 200 mT and μ_{eo} = 62 is indicated. The next A_L value with μ_e = 78 i.e. (> 70 and > 62) is 250 nH.

Design



For the increased permeability μ_e/μ_{eo} = 78/62 ≈ 1.3, the maximum power that can be transfered is reduced to 0.8 P_o; (see the bottom curve in the adjacent diagram). As the flux density $\hat{B}$ is already at the maximum permitted value, this cannot be increased to compensate for the reduced winding losses P_{Cu}. Hence $P \approx$ 0.8 x 95 W = 76 W.

For the primary winding with p_1 = 0.6, from (U/NA_e) 2p = 12 mV/mm² with A_e = 178 mm², $N/U \approx 0.56\ V^{-1}$. For the secondary winding with $p_2 = 1 - p_1 = 0.4$, $N/U \approx 0.37\ V^{-1}$.

Symbols not listed in the SIFERRIT data book pp 15–16:

Symbol	Meaning	Unit
$A_{\hat{R}}$	Resistance factor at 70 °C	$\mu\Omega$
B_o	Flux density directly from a nomogram	mT
$\hat{B}_{adm}$	(Max.) permissible flux density	mT
ΔB	Incremental flux density	mT
ΔB_{adm}	Max. permissible incremental flux density	mT
f_{WP}	Ratio of power transfer winding volume to total winding volume	
μ_{eo}	Effective permeability for maximum power transfer P from nomogram 4	
N_1	Primary turns	
N_2	Secondary turns	
N/U	Turns per volt	V^{-1}
P	(Max.) transferable power	W
P_o	Transferable power. Value from the nomogram	W
P_{Cu}	Winding losses	W
P_{Fe}	Core losses	W
p	Ratio between switching time and period T	
p_1	Ratio of on-time t_1 to period T	
p_2	Ratio of off-time t_2 to period T	
ϑ_o	Temperature rise	°C
$\vartheta_{o,\,adm}$	Max. permissible temp. rise	°C
U/NA_e	Voltage per turn, per unit cross-section area	mV/mm²

Assembly of coils

Each pot core should always be used with its associated mounting assembly. The fixing parts are vibration-resistant. The pressure of the spring jig or the clamps is only exerted on the side wall of the pot core and not on its middle part in order to prevent the sensitive air gap in the center stud from being affected.
Despite the reliable fixing, the pot core halves should also be cemented, especially when pot cores with an air gap are used for resonant circuits, the pot core halves can move slightly when subjected to strong vibration and undesired inductance changes occur. [1]

1. Cementing of the core halves

From the numerous adhesives, epoxy resins with appropriate hardeners have proved particularly suitable, for example:

1.1 Adhesive preparation

A) for cores
100 g Araldite AY 103
16 g hardener HY 956
max. pot life 1 hour
hardening: 6 hours at 70 °C (158 °F)
temperature stability of the cemented joint 70 °C (158 °C)
(for a short period 90 °C, 194 °F)

B) for cores
100 g Araldite AY 103
7 g hardener HY 992
approx. pot life 8 hours
hardening: 6 hours at 100 °C (212 °F)
temperature stability of the cemented joint 90 °C (194 °F)
(for a short period 120 °C, 248 °F)

C) for coil formers
100 g adhesive to A
200 cm^3 filler Aerosil 200
hardening procedure like A

D) for threaded sleeves of adjusting devices
100 g adhesive Araldite AW 134 B
40 g hardener HY 994
max. pot life 1 hour
hardening procedure for 24 hours at 25 °C (77 °F)
temperature stability of the cemented joint 80 °C (176 °F)
(for a short period 100 °C (212 °F)

Adhesive A even hardens at room temperature, higher strength can be obtained with a hardening temperature of 70 °C (158 °F). Adhesive B only hardens at higher temperatures with the advantage of a longer pot life, but its fluidity is higher than that of type A adhesives.

1.2 Cleaning and degreasing the pot cores

The mating surfaces must be free of dust, fat and fibers. To degrease the mating surfaces a non-fluffy nylon coated stamp pad soaked in trichlorethylene can be used. A second pad can then be used to dry the surfaces. Any remanents impair the adhesion. To improve the evaporation of the trichlor the cores can be heated by suction up to about 35 °C (95 °F).

[1] For further information see reprint "Mounting Assemblies and Adjusting Devices for Ferrite Pot Cores", order No. 2-6100-209.

Assembly of coils

1.3 Applying the adhesive and cementing the halves together

The adhesive A or B is dabbed two or four times on the cleaned surface of the pot core side wall, but the center boss must remain clean. The two core halves without coil former are then placed on a mandrel and rotated against each other two or three times to spread the adhesive. A slight ring of adhesive extended around the edges indicates sufficient adhesive has been applied.

The adhesive should be applied and spread twice on the somewhat porous, low permeability SIFERRIT materials (U and K types). The next step should follow immediately, since the adhesive film easily attracts dust and absorbs moisture. Therefore, the pot core pair with already spread adhesive must be opened for a short period and then the coil winding inserted without touching the mating surface.

The coil winding is then fixed in position by elasticized spacers, which must be inserted before the adhesive has been applied.
The spacers are available on request.
The coil former can also be fixed by an adhesive solution to C, which should only be applied as spots in one position of the pot core bottom, to prevent any mechanical stresses between the plastic and the ferrite material because of their different thermal expansion. Adhesive D is also suitable for external cementing, i.e. only four cementing spots at the joints on both sides of the openings. Because of the thus somewhat lower torsional strength, it must be taken into account that this kind of cementing should only be applied to mounted coils.

1.4 Holding jigs

The pot core assembly is cured under pressure in a centering jig. The pot core holes are used for centering and from two to eight can be held in one jig with a pressure spring. Spacers will insure that the pressure is exerted only on the side wall of the pot core. Single jigs make the core inductance measurements easier. These have proved useful to control the pot cores, particularly those with small air gaps, before the adhesive has hardened. Small inductance corrections can be made by slightly turning the pot core halves.
When pot core sets already mounted in the mounting assembly are to be cured, a good centering, possibly by mandrels with stepped diameters must be ensured. Furthermore, care should be taken that no hardener remains on parts of the mounting assembly.
The holding jigs should provide the following pressures:

Pot core type	Pot core dimensions diameter x height	Pressure in N
B 65517	Ø 9 x 5	10
B 65531	Ø 11 x 7	15
B 65541	Ø 14 x 8	25
B 65651	Ø 18 x 11	35
B 65661	Ø 22 x 13	40
B 65671/B65701	Ø 26 x 16/Ø 30 x 19	45
B 65631	Ø 47 x 28	90
B 65803/B65805	RM4/RM5	15
B 65807	RM6	30
B 65811	RM8	50
B 65887	RM14	80

Assembly of coils

1.5 Curing the assembled pot core

The curing process is more effective at an increased temperature even for adhesive A, for example at 70 °C (158 °F) for 6 hours.
The cores should be placed quickly in the oven after the adhesive has been applied to prevent the adhesive from soaking into the porous ferrite material. The cores can be moved into and also removed from the warm oven (e.g. 70 °C, 158 °F), however the holding jig should not be opened until the assembly has cooled down.

1.6 Thermal-after-treatment

Any internal stresses can be relieved by subjecting the assembled pot core to a temperature cycle up to 70 °C/158 °F (cycle time 24 hours) with a slow warm up and cooling, lasting for a period of about 4 hours. The cycle should be best performed with completely mounted pot core coils (with adjusting device when necessary).

2. Cementing of the threaded sleeves for the adjusting screw

Available are pot cores in which the threaded sleeve has already been cemented in position (for ordering codes see the appropriate pages dealing with pot cores).
For 9 and 11 mm cores a thread for the adjusting screw is provided in the base plate of the mounting assemblie.
A centering jig is necessary to press the flangeless threaded sleeve in the pot core hole, whereas threaded sleeves with a flange can be centered more easily. It is recommended to cement these sleeves in position without exception, especially because of expansion due to large temperature changes. The adhesive D stated in para. 1.1 can be used. The threaded sleeves with a flange are painted with adhesive on the inside ring.
The flangeless sleeves with spring crown type B 65579-J1 can be centrally located in a less complicated way, however care should be taken to prevent the adhesive from flowing into the thread. Therefore, the pot cores should be located during the curing period with their threaded parts downward.
The threaded sleeves must be cured for at least 24 hours at room temperature, and it has been found practical to utilize the 24 hours waiting period between curing and thermal after-treatment.

3. Final adjustment

After each thermal or mechanical stress disaccomodation arises. The complete coils should therefore be stored for at least one day or better a week, before they are finally adjusted.

Pot Cores (tubular types)

Pot Cores

Tubular types – Summary

	Page
Design of coils	59 to 79
Assembly of coils	80 to 82
Pot cores and associated parts	85 to 275

Approx. dimensions dia x height in mm	Drawing number	Type B	
3,3 x 2,6	2 x C61035–A35–C1	65 491	88
4,6 x 3,1	2 x C61035–A41–C2	65 495	89
5,8 x 3,3	2 x C60358–B3050–C1	65 501	90
7 x 4	2 x C61035–A15–C7	65 511	93
9 x 5 (standardized)	2 x C61035–A18–C11	65 517	101
9 x 7	2 x C61035–A18–C1	65 519	111
11 x 7 (standardized)	2 x C61035–A14–C1	65 531	119
14 x 8 (standardized)	2 x C60358–B3054–C3	65 541	128
18 x 11 (standardized)	2 x C61035–A10–C1	65 651	138
18 x 14	2 x C60358–B3056–C6	65 561	151
22 x 13 (standardized)	2 x C60358–B3185–C3	65 661	161
23 x 17[1)]	2 x C60358–B3057–C5	65 571	172
26 x 16 (standardized)	2 x C60358–B3181–C1	65 671	185
28 x 23[1)]	2 x C60358–B3058–C3	65 581	197
30 x 19 (standardized)	2 x C60358–B3186–C1	65 701	203
34 x 28[1)]	2 x C60358–B3059–C4	65 591	215
36 x22 (standardized)	2 x C40330–A78–C1	65 611	221
41 x 25	2 x C40330–A79–C1	65 621	229
47 x 28	2 x C60358–B3167–C1	65 631	235
50 x 30	2 x C6103–A54–C1	65644	241
59 x 36	2 x C60358–B3180–C1	65 691	245
62 x 38	2 x C61035–A52–C1	65 694	249
70 x 42	2 x C61035–A9–C8	65 696	253

4-Slot pot cores and associated parts

255 to 269

14 x 8	2 x C61035–A12–C31	65 546	259
18 x 11	2 x C61035–A10–C33	65 656	263
22 x 13	2 x C61035–A17–C30	65 666	267
26 x 16	2 x C61035–A11–C21	65 676	271

Touch-tone pot cores and associated parts, e.g. for telephone systems

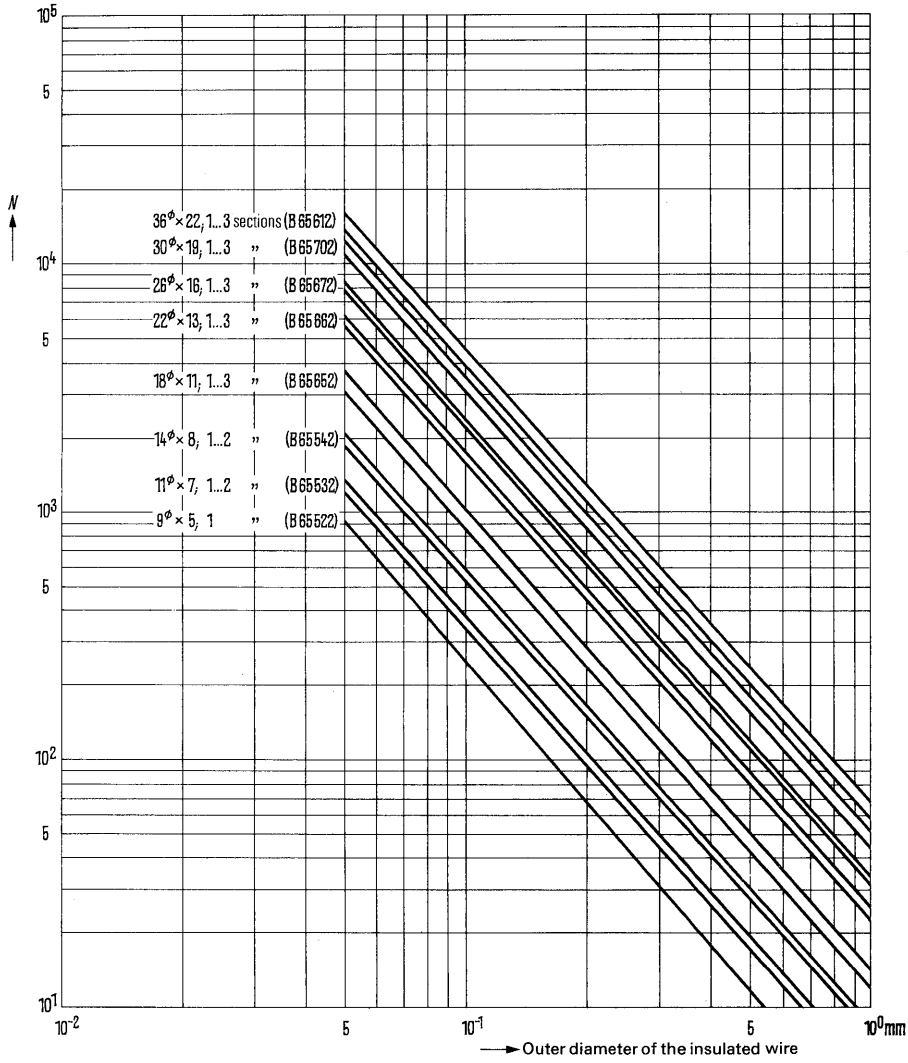
23 x 18	1 x C61035–A20–C1 1 x C61035–A20–C3	65716	181

Adjusting tools

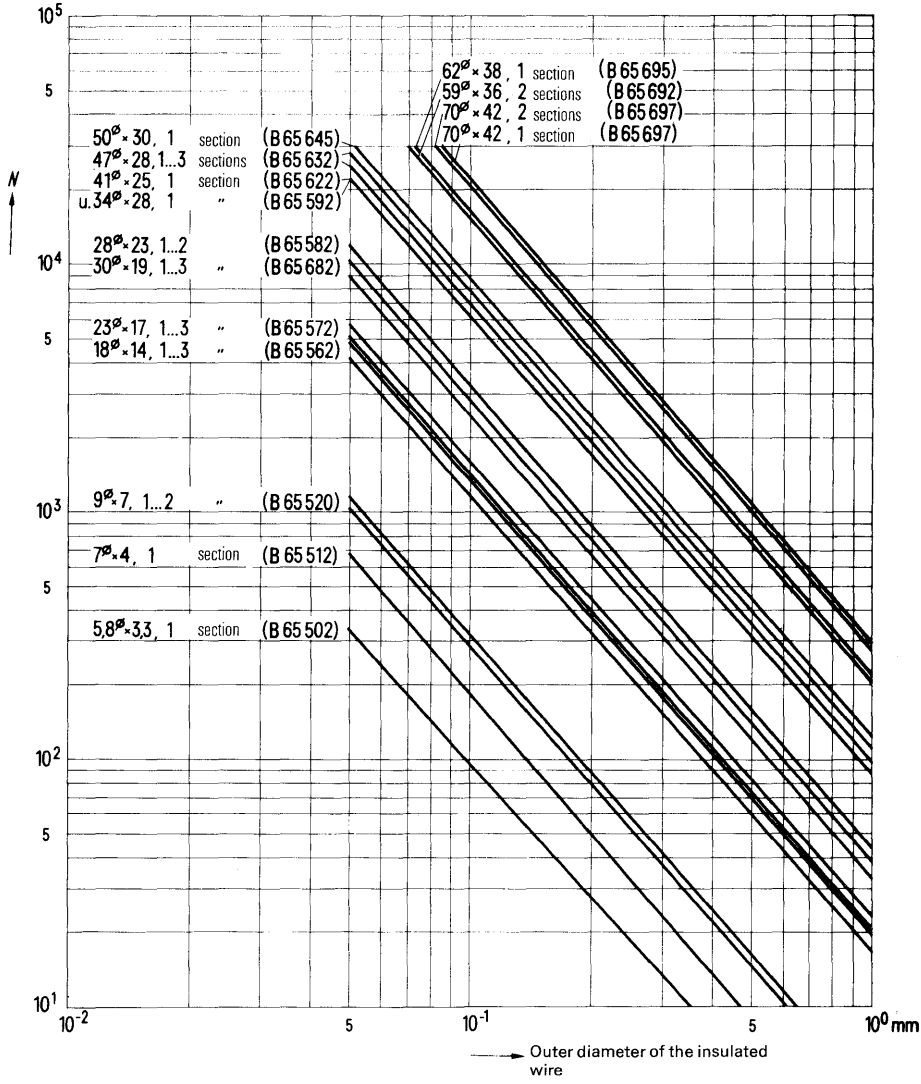
274 to 275

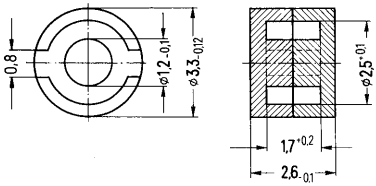
1) Not for new design, available only for a transition period

Maximum number of turns *N* for coil formers of standardized pot cores



Maximum number of turns *N* for coil formers of non-standardized pot cores





Approx. weight 0.06 g/set

Dimensions in mm

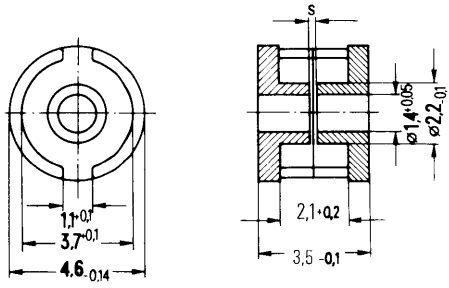
Magnetic data

Core factor	$\Sigma l/A = 4.3$ mm^{-1}
Effective length	$l_e = 5.8$ mm
Effective area	$A_e = 1.35$ mm^2
Effective volume	$V_e = 7.8$ mm^3

A_L value nH	tolerance	SIFERRIT-material	**Ordering code**
without air gap			
20	+40 % ΔY	K 1	B65491-B0000-Y001
420	−30 % ΔY	N 30	B65491-B0000-Y030

Winding data

Useful winding cross section A_N without coil former mm^2	Average length of turn l_N mm	A_R value $\mu\Omega$
0.65	5.8	310



Approx. weight 0.13 g/set

Dimensions in mm

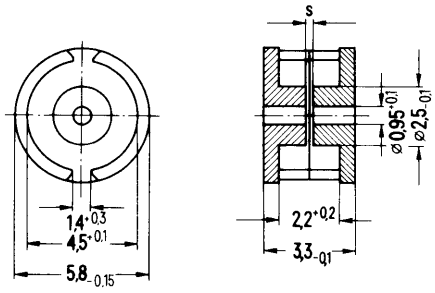
Magnetic data

Core factor	$\Sigma l/A$ = 2,28 mm^{-1}
Effective length	l_e = 6,25 mm
Effective area	A_e = 2.75 mm^2
Effective volume	V_e = 17.2 mm^3

Associated parts (Coil former, mounting assembly and adjusting device) in preparation.

A_L value nH	tolerance	SIFERRIT-material	**Ordering code**
without air gap			
40	+40 % ΔY	K 1	B65495-B0000-Y001
1100	−30 % ΔY	N 30	B65495-B0000-Y030

For these cores connecting boards according to B65496 (see page 332) can be used.



Approx. weight 0.2 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma l/A$ =	1.68	mm^{-1}
Effective length	l_e =	7.9	mm
Effective area	A_e =	4.7	mm^2
Effective volume	V_e =	37	mm^3

Associated parts

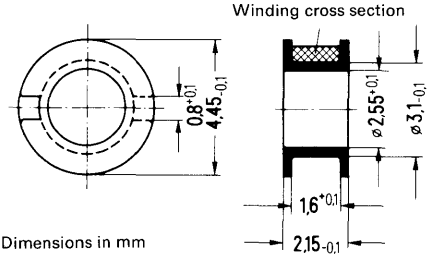
Coil former

A_L value		SIFERRIT-material	**Ordering code**
nH	tolerance		
without air gap			
500	+40 % $\triangleq$ Y −30	N 22	B65501-J0000-Y022
700		T 26	B65501-J0000-Y026
1500		N 30	B65501-J0000-Y030

Pot cores with air gap on request.

Coil former B 65 502

11-polyamide GV coil former.
For winding details see page 87.

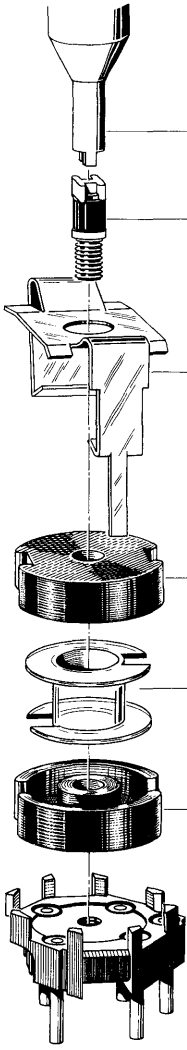


Dimensions in mm

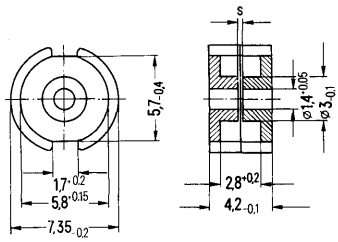
Number of sections	Useful winding cross section A_N	Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	mm²	mm	$\mu\Omega$	g	
1	0.95	11.7	433	0.03	B65502-A0000-R001

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	275, fig. 3
Adjusting screw	B65512	97
Yoke	B65512	96
Pot core	B65511	94
Coil former	B65512	95
Pot core	B65511	94
Connecting board with thread; 5 solder connections	B65512	96



Approx. weight 0.5 g/set

Dimensions in mm

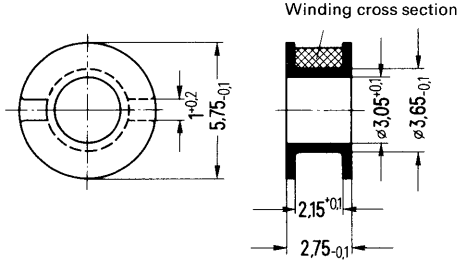
Magnetic data

Core factor	$\Sigma\ l/A$ =	1.43 mm^{-1}
Effective length	l_e = 10	mm
Effective area	A_e = 7	mm^2
Effective volume	V_e = 70	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
8	± 3% ≙ A	U 17	0.8	9.1	B65511-A0008-A017
25		K 1	0.32	28.5	B65511-A0025-A001
63		M 33	0.13	71.8	B65511-A0063-A033
100		N 28	0.10	114	B65511-A0100-A028
without air gap					
1000	+40 % ≙ Y	T 26			B655 1 1-A0000-Y026
2000	−30 %	N 30			B65511-A0000-Y030

Coil former B 65512

11-polyamide GV coil former.
For winding details see page 87.



Dimensions in mm

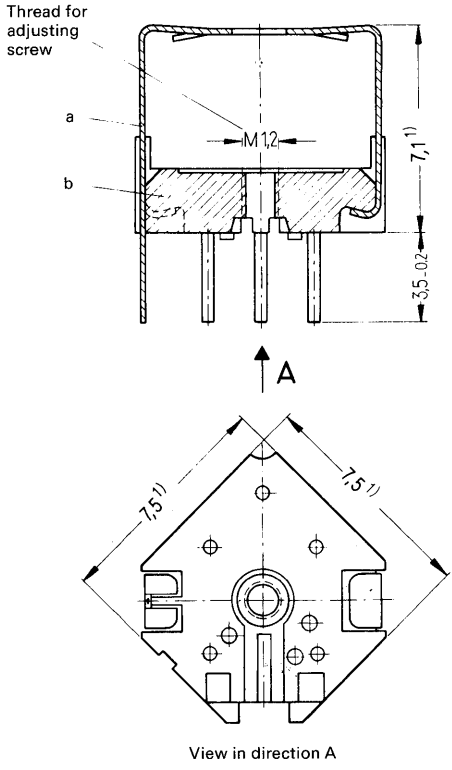
Number of sections	Useful winding cross section A_N	Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	mm^2	mm	$\mu\Omega$	g	
1	2.2	14.6	240	0.04	B65512–A0000–R001

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

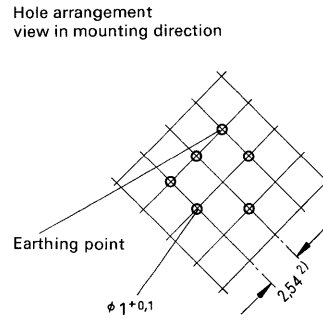
Mounting assembly for printed circuits B 65512

Mounting assembly with snap-in connection
Polycarbonate GV connecting board with 5 solder connections.
0.2 mm thick nickel-silver spring yoke with earth connection
Fixing by pins on the solder tags.

Approx. weight 0.4 g



View in direction A



Dimensions in mm

1) Max. dimension
2) 2.5 mm spacing also permissible

Ordering code B65512-A2001-X000
(Complete mounting assembly with 5 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035-A15-C5
b	1 connecting board (with thread)	C61035-A15-B1

As mounting aid a 2.15 mm dia Ms pin is recommended which is cut off to dia 1.38 x 3.2 for centering the pot core, it carries additionally about 5 threads M 1.2.

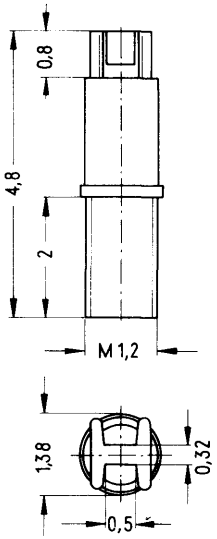
Adjusting devices B 65 512

Adjusting screw B65512–A3001–X***, consisting of a SIFERRIT tube core on which a polyacetal thread is molded and 4 cam profiles serving as core brake;

fits:

polycarbonate GV **connecting board** B65512–A2001–X000 into which a guiding thread is molded;

adjusting screw driver B63399–A1007–X000.

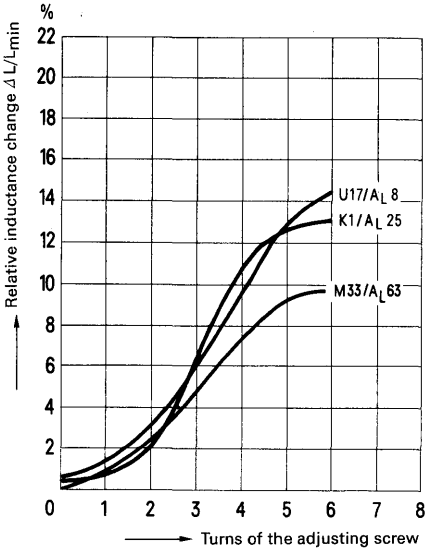


Dimensions in mm

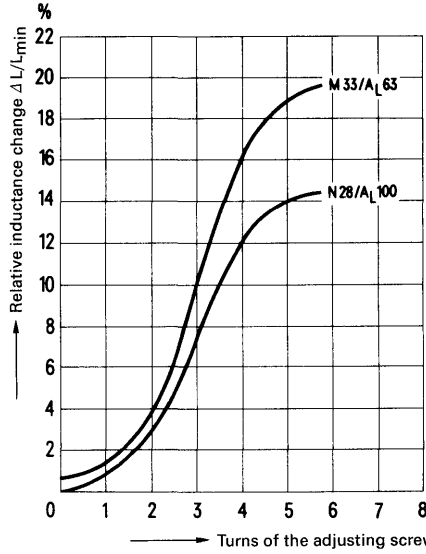
Pot cores B65511		Adjusting screw			
Material	A_L value nH	Tube core dia x length	Material	Colour code	**Ordering code**
U 17	8	1,25 x 1,8	U 17	white	B65512–A3001–X017
K 1	25				
M 33	63				B65512–A3001–X017
			K 1	yellow	B65512–A3001–X001
N 28	100				B65512–A3001–X001

Inductance adjustment curves

Adjusting screw B65512–A3001–X017
colour code white



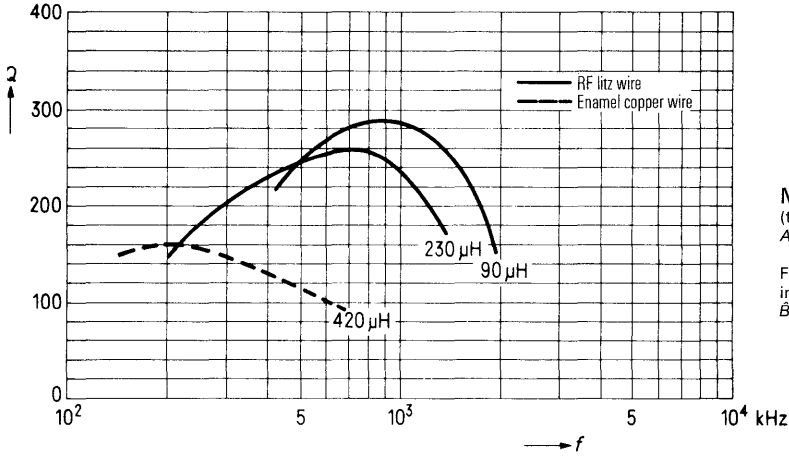
Adjusting screw B65512–A3001–X001
colour code yellow



At 0 turns screw completely engaged.

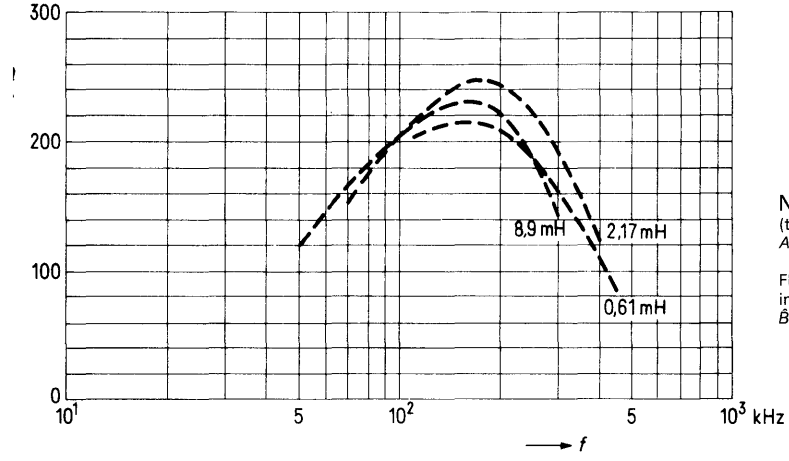
Q factor characteristics; materials M 33, N 28

Material	L	Turns	Wire; RF litz wire	Padding
M 33 A_L = 63 nH	420 µH 230 µH 90 µH	80 60 37	0,15 CuL 3 x 0.07 CuLS 12 x 0.04 CuLS	– – –
N 28 A_L = 100 nH	8.90 mH 2.17 mH 0.61 mH	300 150 80	0.07 CuL 0.10 CuL 0.15 CuL	– – –



M 33
(typical values)
A_L = 63 nH

Flux density
in the core
$\hat{B}$ = < 1 mT

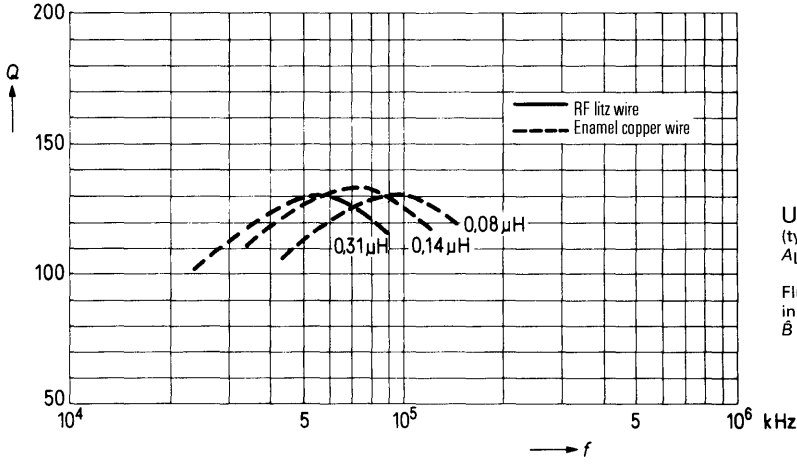


N 28
(typical values)
A_L = 100 nH

Flux density
in the core
$\hat{B}$ = < 1 mT

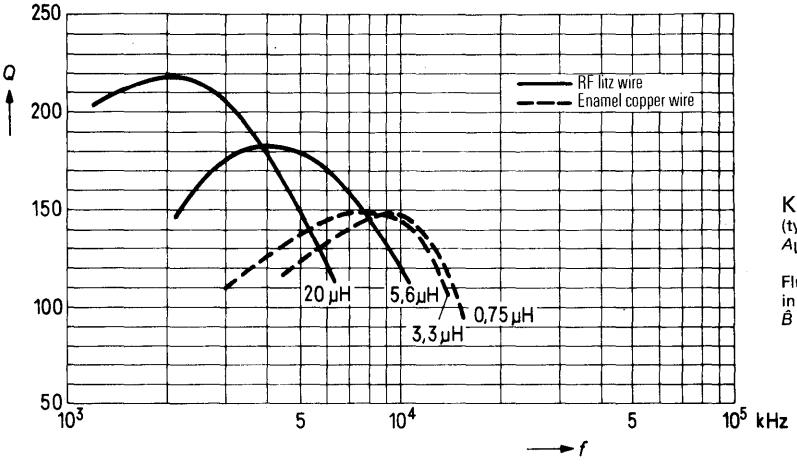
Q factor characteristics; material U 17, K 1

Material	L (μH)	Turns	Wire; RF litz wire	Number of layers
U 17 A_L = 8 nH	0.31 0.14 0.08	6 4 3	0.25 CuL 0.30 CuL 0.30 CuL	1 1 1
K 1 A_L = 25 nH	20 5.6 3.3 0.75	28 15 11 5	15x0.04 CuLS 12x0.04 CuLS 0.3 CuL 0.4 CuL	4 2 2 1



U 17
(typical values)
A_L = 8 nH

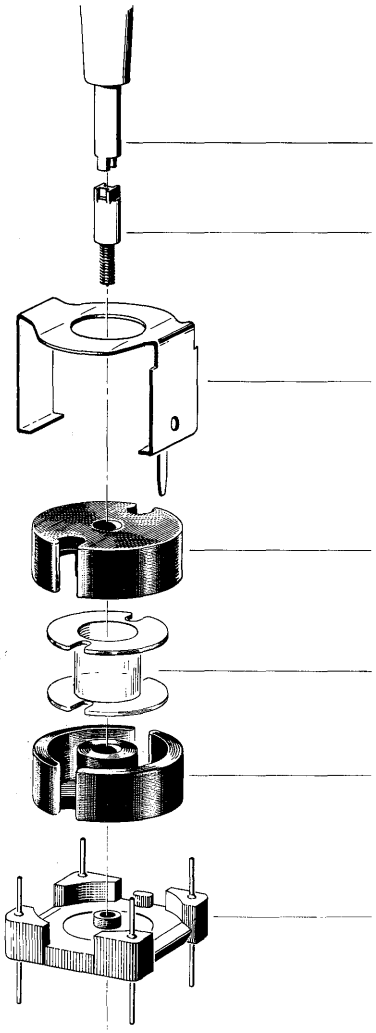
Flux density
in the core
$\hat{B}$ = < 1 mT



K 1
(typical values)
A_L = 25 nH

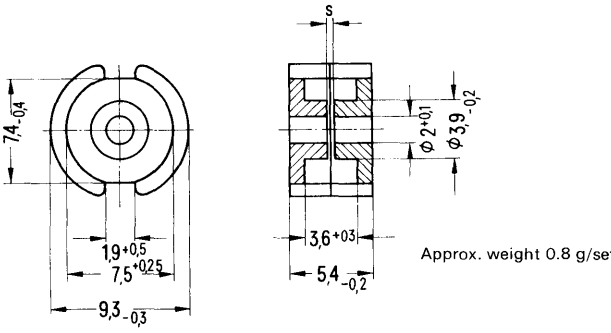
Flux density
in the core
$\hat{B}$ = < 1 mT

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65518	105
Yoke	B65518	104
Pot core	B65517	102
Coil former with 1 or 2 sections	B65522	103
Pot core	B65517	102
Connecting board with thread; 4 or 6 solder connections	B65518	104

Pot cores complying with DIN 41293 or IEC publication 133.



Approx. weight 0.8 g/set

Dimensions in mm

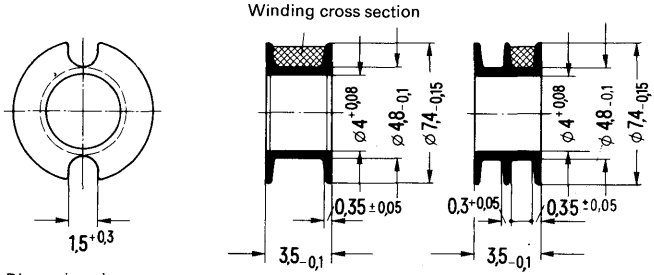
Magnetic data

Core factor	$\Sigma\ l/A$ =	1.24	mm^{-1}
Effective length	l_e =	12.4	mm
Effective area	A_e =	10	mm^2
Effective volume	V_e =	124	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
16	±3% △A	K 12	0.8	16	B65517-A0016-A012
25		K 1	0.45	25	B65517-A0025-A001
40			0.26	40	B65517-A0040-A001
40		M 33	0.37	40	B65517-A0040-A033
63			0.2	63	B65517-A0063-A033
63		N 22	0.23	63	B65517-A0063-A022
100			0.12	99.5	B65517-A0100-A022
100		N 28	0.1	99.5	B65517-A0100-A028
160			0.06	159	B65517-A0160-A028
250			0.03	249	B65517-A0250-A028
250	±10% △K	T 26	0.03	249	B65517-A0250-K026
without air gap					
95	+30 −20 % △R	K 1			B65517-A0000-R001
1200		T 26			B65517-A0000-R026
2500		N 30			B65517-A0000-R030
5000	+40 −30 % △Y	T 38			B65517-A0000-Y038

Coil former and insulating washers B 65 522

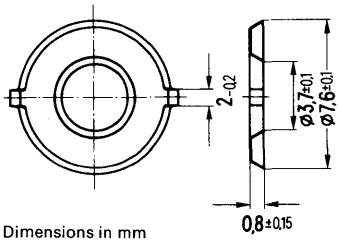
11-polyamide GV coil former complying with DIN 41 294 or IEC publication 133.
For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	total mm²	Average length of turn l_N mm	A_R value 1) μΩ	Approx. weight g	**Ordering code**
1	2.8	2.8	18.5	220	0.05	B65522–A0000–R001
2	1.25	2.5		250	0.06	B65522–A0000–R002

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65522–A5000–X000

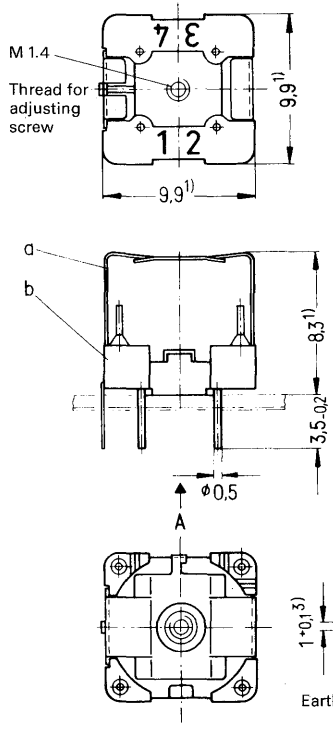
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for printed circuits B 65 518

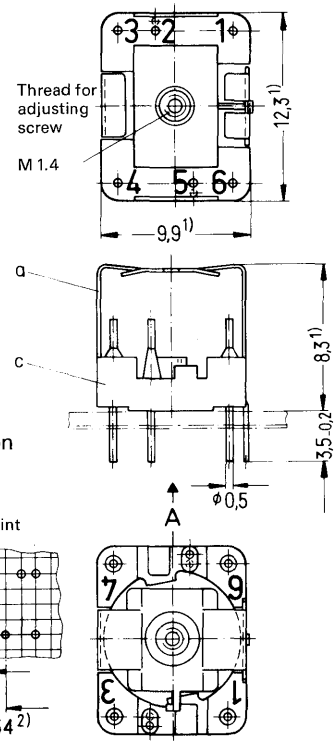
Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.25 mm thick nickel silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 0.6 g (4 solder connections)
0.7 g (6 solder connections)

B65518-A2001-X000
(with 4 solder tags)



B65518-A2002-X000
(with 6 solder tags)



1) Max. dimension 2) 2.5 mm spacing also permissible 3) 1.3 mm hole also permissible Dimensions in mm

Ordering code B65518-A2001-X00 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65518-A2002-X000 (Complete mounting assembly with 6 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C61035-A18-C7	a	1 yoke	C61035-A18-C7
b	1 connecting board (with thread)	C61035-A18-B6	c	1 connecting board (with thread)	C61035-A18-B7

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A1 (4 solder tags), C61407-A4-A2 (6 solder tags).

Adjusting devices B 65 518

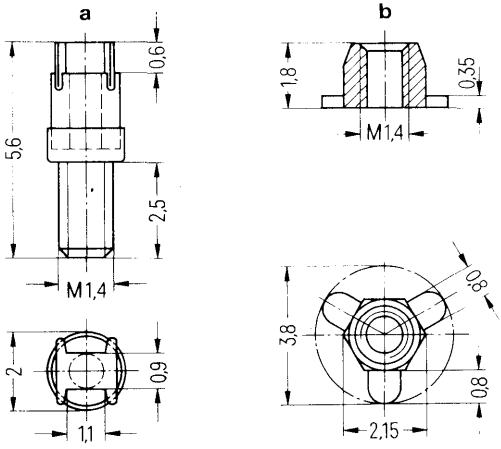
Adjusting screw (a) B65518-A3***-X***, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and 4 cam profiles serving as core brake;

fits:

polycarbonate GV **connecting board** B65518-A2***-X*** into which a guiding thread is molded;

11 polyamide GV **threaded flange** (b) B65539-J1001-X000 (only needed, when no mounting assembly is used);

adjusting screw driver B63399-B0004-X000.

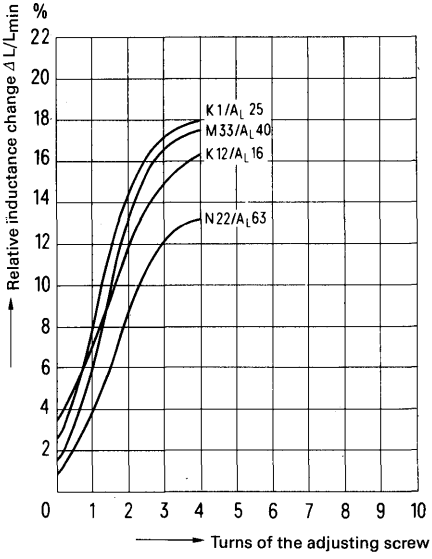


Dimensions in mm

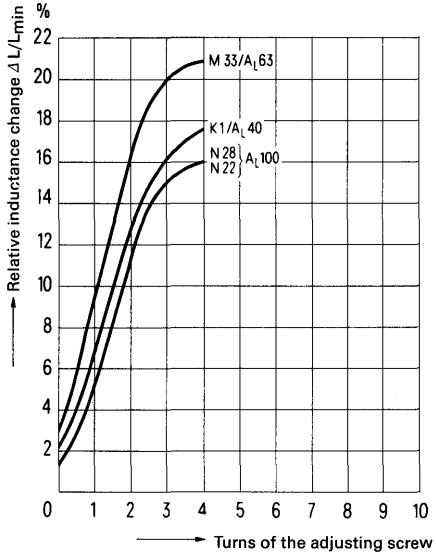
Pot cores B65517		Adjusting screw			
Material	A_L value nH	Tube core dia x length	Material	Colour code	Ordering code
K 12	16	1.81 x 2.0	Si 1s	brown	B65518-A3000-X101
K 1	25				
	40		K 1	blue	B65518-A3000-X001
M 33	40		Si 1s	brown	B65518-A3000-X101
	63		K 1	blue	B65518-A3000-X001
N 22	63		Si 1s	brown	B65518-A3000-X101
	100		K 1	blue	B65518-A3000-X001
N 28	100				
	160		N 22	green	B65518-A3000-X022
	250				

Inductance adjustment curves

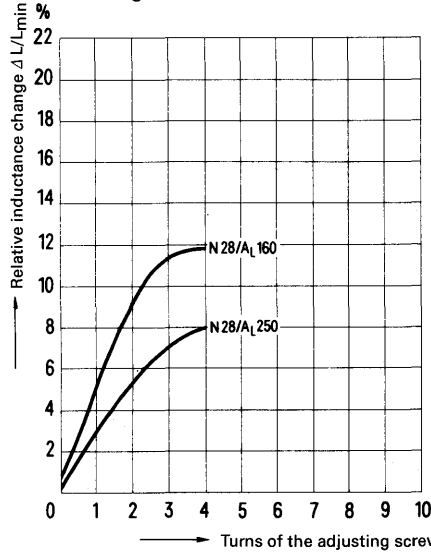
Adjusting screw B65518–A3000–X101
colour code brown



Adjusting screw B65518–A3000–X1001
colour code blue



Adjusting screw B65518–A3000–X022
colour code green

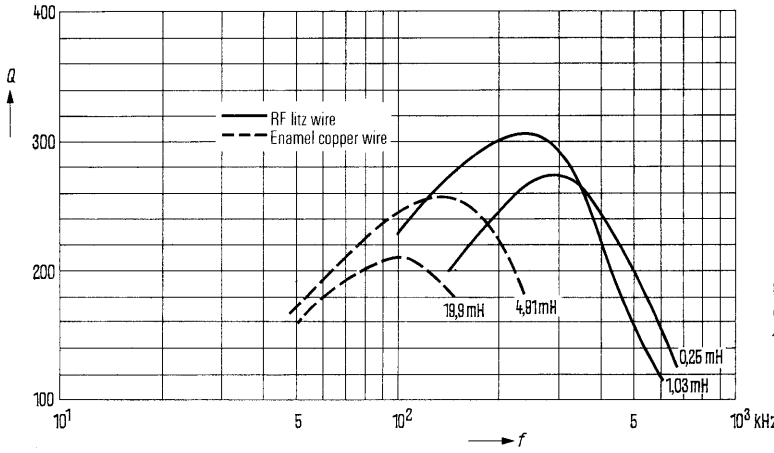


0 ≙ at least one turn engaged.

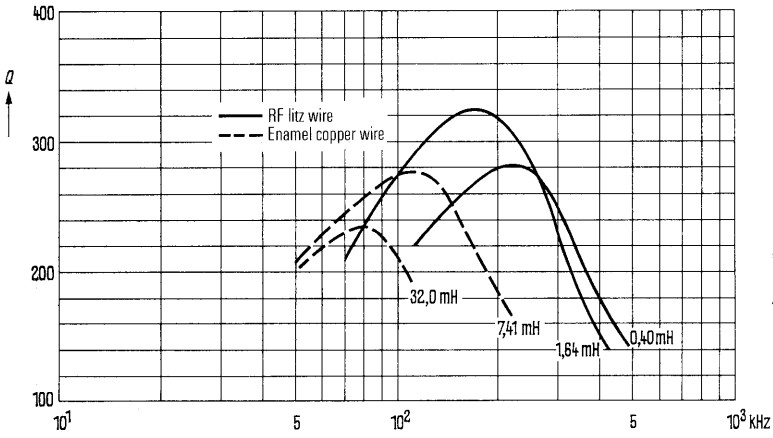
Q factor characteristics; material N 28

L (mH) for A_L = 100 nH	L (mH) for A_L = 160 nH	Turns	Wire; RF litz wire	Number of sections
19.9	32.0	450	0.07 CuL	1
4.91	7.41	250	0.1 CuL	1
1.03	1.64	100	1 x 12 x 0.04 CuL	1
0.25	0.40	50	1 x 15 x 0.04 CuLS	1

Flux density in the core $\hat{B}$ < 3 mT



N 28
(typical values)
A_L = 100 nH

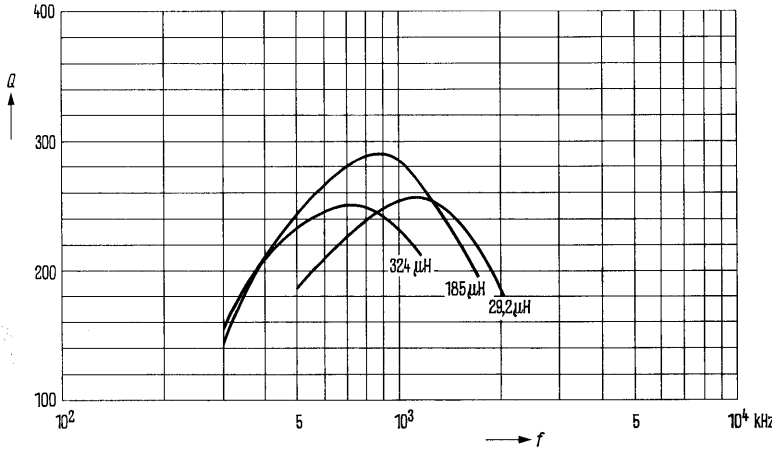


N 28
(typical values)
A_L = 160 nH

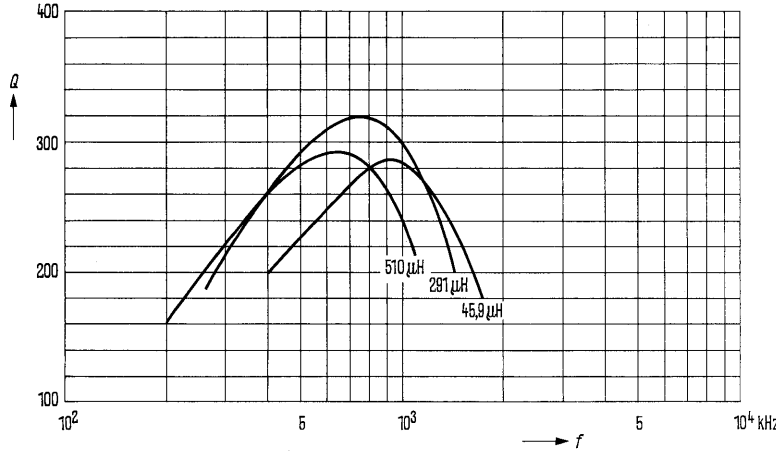
Q factor characteristics; material M 33

L (μH) for A_L = 40 nH	L (μH) for A_L = 63 nH	Turns	RF litz wire	Number of sections
324	510	90	1 x 5 x 0.05 CuLS	1
185	291	68	1 x 12 x 0.04 CuLS	1
29.2	45.9	27	1 x 30 x 0.04 CuLS	1

Flux density in the core $\hat{B} < 2$ mT



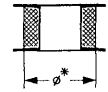
M 33
(typical values)
A_L = 40 nH



M 33
(typical values)
A_L = 63 nH

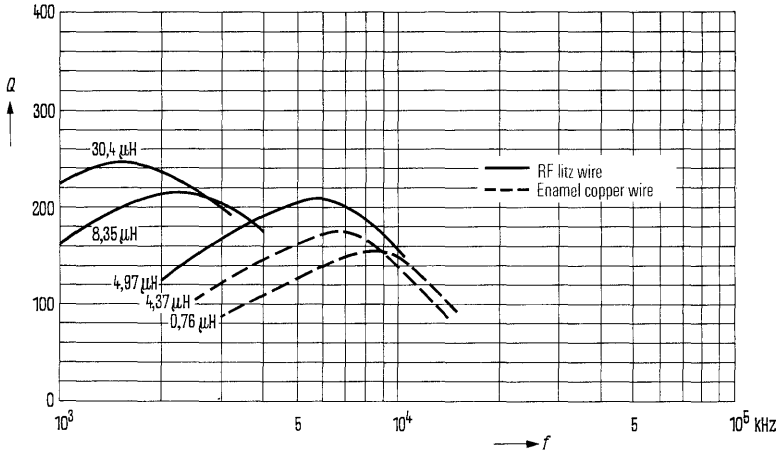
Q factor characteristics, material K 1

L (μH) for A_L = 25 nH	L (μH) for A_L = 40 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
4.37	6.21	12	0,20 CuL	1	6.7
0.76	1.08	5	0,50 CuL	1	6.0
30.4	47.3	35	1 x 20 x 0.04 CuLS	1	–
8.35	12.2	18	1 x 20 x 0.04 CuLS	1	–
4.97	7.2	13	1 x 12 x 0.04 CuLS	1	6.7

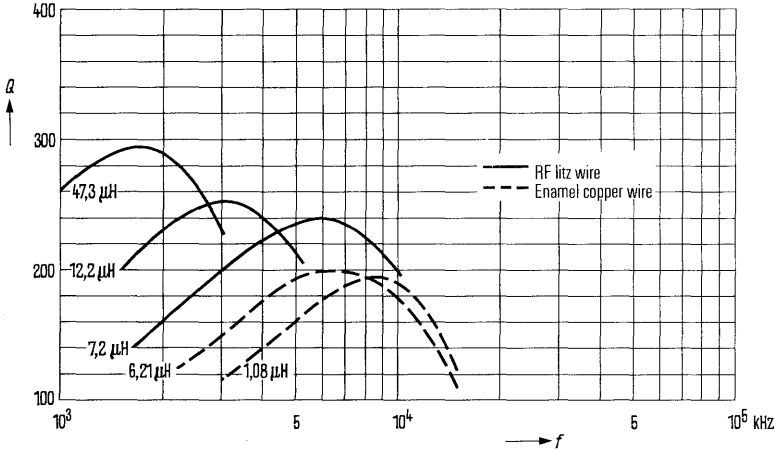


Pad of polystyrene tape up to the diameter Ø*

Flux density in the core $\hat{B}$ < 0.6 mT

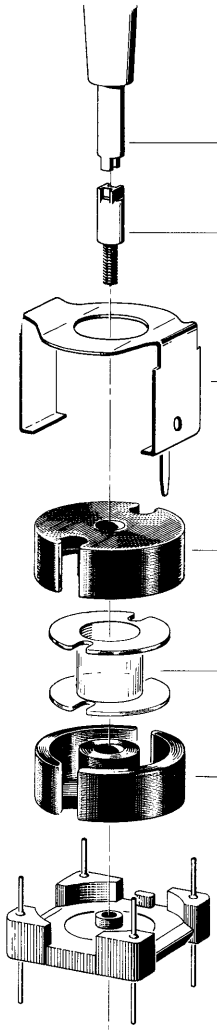


K 1
(typical values)
A_L = 25 nH

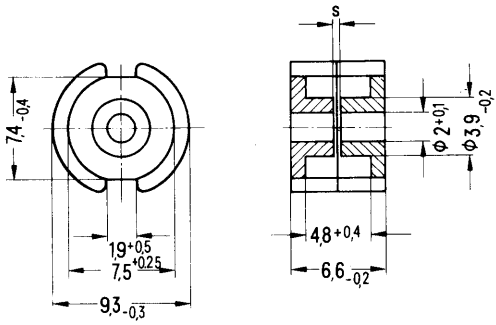


K 1
(typical values)
A_L = 40 nH

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65539	116
Yoke	B65520	115
Pot core	B65519	113
Coil former with 1 or 2 sections	B65520	114
Pot core	B65519	113
Connecting board with thread; 4 or 6 solder connections	B65520	115



Approx. weight 0.9 g/set

Dimensions in mm

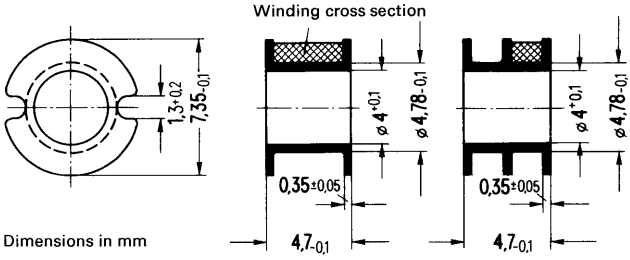
Magnetic data

Core factor	$\Sigma\ l/A$ =	1.49	mm^{-1}
Effective length	l_e =	14.6	mm
Effective area	A_e =	10	mm^2
Effective volume	V_e =	146	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
160	± 3% △A	N 28	0.06	190	B65519-A0160-A028
250			0.03	297	B65519-A0250-A028
without air gap					
900	$\pm 30\%$ -20% △R	T 26			B65519-A0000-R026

Coil former and insulating washers B 65 520

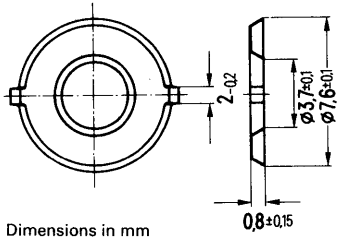
11-polyamide GV coil former.
For winding details see page 87.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	Useful winding cross section A_N total mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	3.9	3.9	18.5	162	0.05	B65520–A1000–R001
2	1.75	3.5	18.5	181	0.06	B65520–A1000–R002

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65522–A5000–X000

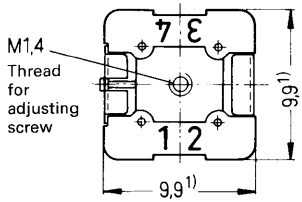
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for printed circuits B 65 520

Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.25 mm thick nickel silver spring yoke.
Fixing by pins on the solder tags.

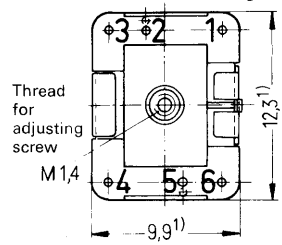
Approx. weight 0.7 g (4 solder connections)
0.9 g (6 solder connections)

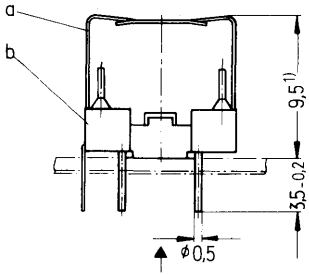
B65520–A2001–X000
(with 4 solder tags)



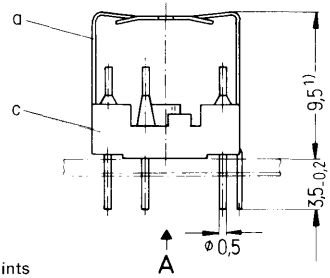
View in direction A

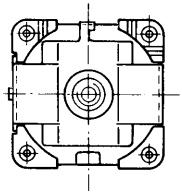
B65520–A2002–X000
(with 6 solder tags)

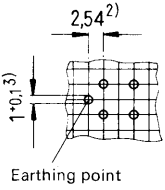


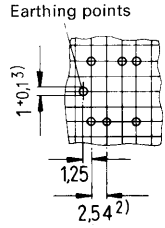


Hole arrangement
view in mounting direction









1) Max. dimension 2) 2.5 mm spacing also permissible 3) 1.3 mm hole also permissible Dimensions in mm

Ordering code B65520–A2001–X000 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65520–A2002–X000 (Complete mounting assembly with 6 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C61035–A18–C6	a	1 yoke	C61035–A18–C6
b	1 connecting board (with thread)	C61035–A18–B6	c	1 connecting board (with thread)	C61035–A18–B7

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407–A4–A1 (4 solder tags), C61407-A4-A2 (6 solder tags).

Adjusting devices B65 539

Adjusting screw (a, b) B65539-A1***-X*** consisting of a SIFERRIT tube core on which a polyacetal thread is molded and 4 cam profiles serving as core brake;

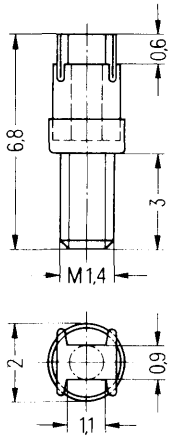
fits:

polycarbonate GV **connecting board** B65520-A2***-X*** into which a guiding thread is molded;

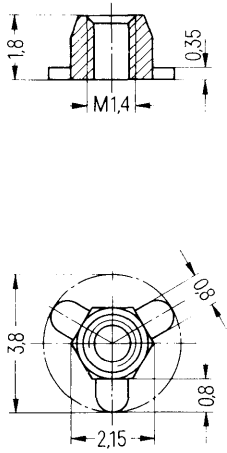
11 polyamide GV **threaded flange** (c) B65539-J1001-X000 (only needed, when no mounting assembly is used);

adjusting screw driver B63399-B0004-X000.

a, b



c

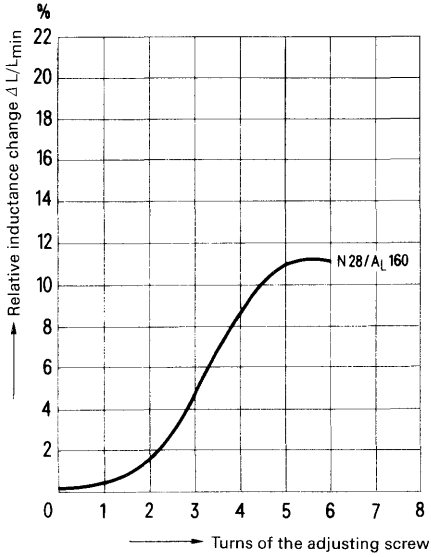


Dimensions in mm

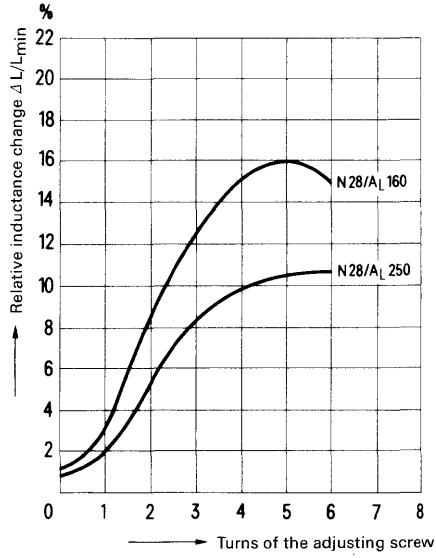
Pot cores B65519		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	Ordering code
N 28	160	a	1.81 x 2.0	N 22	violet	B65539-A1003-X022
	250	b	1.81 x 2,7		red	B65539-A1002-X022

Inductance adjustment curves

Adjusting screw B65539–A1003–X022
colour code violet

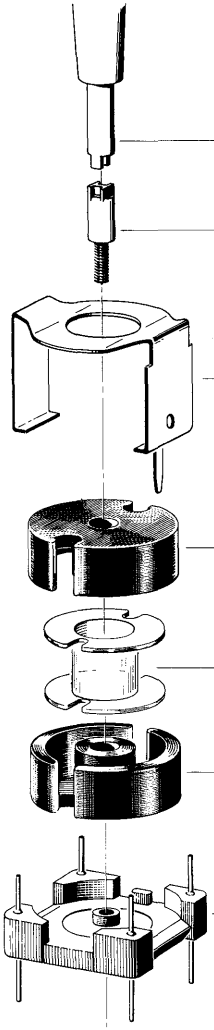


Adjusting screw B65539–A1002–X022
colour code red



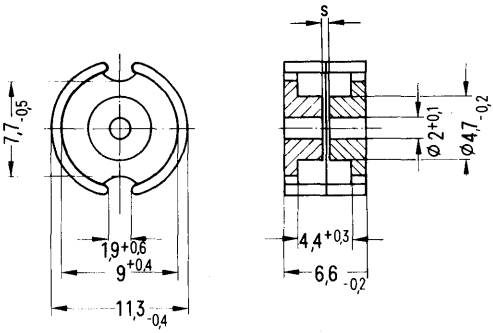
0 ≙ at least 3 turns engaged.

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65539	123
Yoke	B65535	122
Pot core	B65531	120
Coil former with 1 or 2 sections	B65532	121
Pot core	B65531	120
Connecting board with thread, 4 or 8 solder connections	B65535	122

Pot cores complying with DIN 41293 or IEC publication 133.



Approx. weight 1.7 g/set

Dimensions in mm

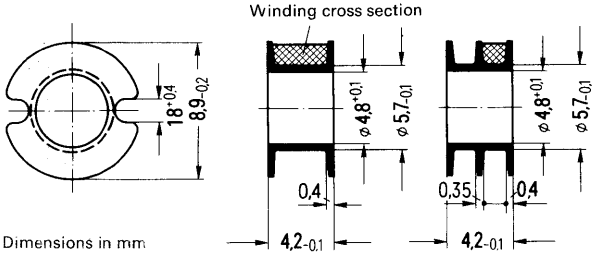
Magnetic data

Core factor	$\Sigma\, l/A$ =	0.956	mm^{-1}
Effective length	l_e =	15.5	mm
Effective area	A_e =	16	mm^2
Effective volume	V_e =	250	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
16	± 3% △A	K 12	1.0	12.2	B65531-L0016-A012
25		K 1	1.0	18.8	B65531-L0025-A001
40			0.41	30	B65531-L0040-A001
40		M 33	0.64	30	B65531-L0040-A033
63			0.38	48	B65531-L0063-A033
63		N 22	0.6	48	B65531-L0063-A022
100			0.2	75	B65531-L0100-A022
160			0.1	120	B65531-L0160-A022
100		N 28	0.2	75	B65531-L0100-A028
160			0.1	120	B65531-L0160-A028
250			0.06	188	B65531-L0250-A028
400	± 10% △K	T 26	0.03	304	B65531-L0400-K026
without air gap					
115	$^{+30}_{-20}$ △R	K 1			B65531-L0000-R001
1600		T 26			B65531-L0000-R026
3200		N 30			B65531-L0000-R030
6500	$^{+40}_{-30}$% △Y	T 38			B65531-L0000-Y038

Coil former and insulating washers B 65 532

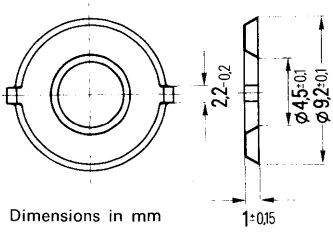
11-polyamide GV coil former complying with DIN 41 294 or IEC publication 133.
For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	Useful winding cross section A_N total mm²	Average length of turn l_N mm	A_R value 1) μΩ	Approx. weight g	Ordering code
1	4.2	4.2	22	180	0.1	B65532-A0000-R001
2	1.9	3.8		200		B65532-A0000-R002

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

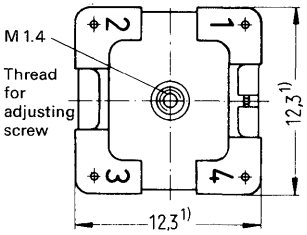
Ordering code B65532-A5000-X000

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

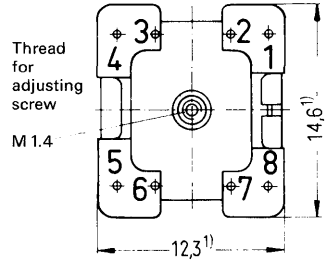
Mounting assemblies for printed circuits B 65 535

Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.25 mm thick nickel silver spring yoke.
Fixing by pins on the solder tags.
Approx. weight 1.1 g (4 solder connections); 1.4 g (8 solder connections)

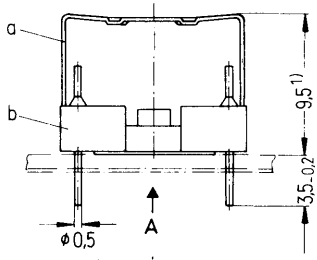
B65535-A0002-X000
(with 4 solder tags)

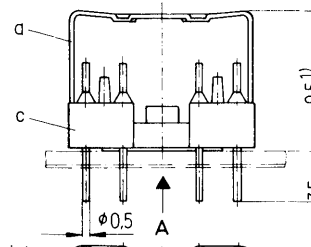


B65535-A0003-X000
(with 8 solder tags)

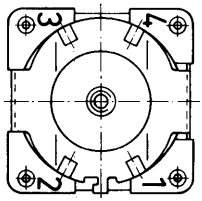


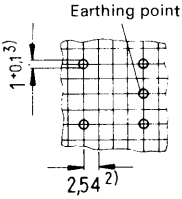
View in direction A

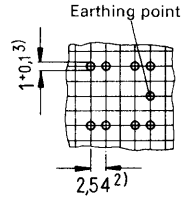


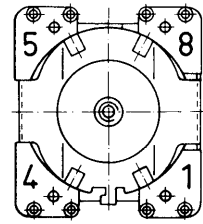


Hole arrangement
view in mounting direction









1) Max. dimension 2) 2.5 spacing also permissible 3) 1.3 mm hole also permissible

Dimensions in mm

Not interchangeable with mounting assembly B65535-A0001 (different mounting holes)

Ordering code B65535-A0002-X000 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65535-A0003-X000 (Complete mounting assembly with 8 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C61035-A14-C24	a	1 yoke	C61035-A14-C24
b	1 connecting board (with 4 solder tags)	C61035-A14-B20	c	1 connecting board (with 8 solder tags)	C61035-A14-B21

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A3 (4 solder tags), C61407-A4-A4 (8 solder tags)

Adjusting devices B 65 539

Adjusting screw (a, b) B65539-A1***-X*** consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and 4 cam profiles serving as core brake;

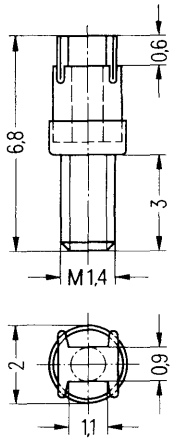
fits:

polycarbonate GV **connecting board** B65535-A0***-X*** into which a guiding thread is molded;

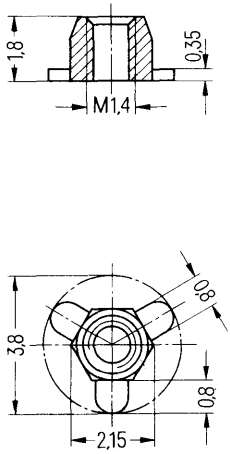
11 polyamide GV **threaded flange** (c) B65539-J1001-X000 (only needed, when no mounting assembly is used).

adjusting screw driver B63399-B0004-X000.

a, b



c

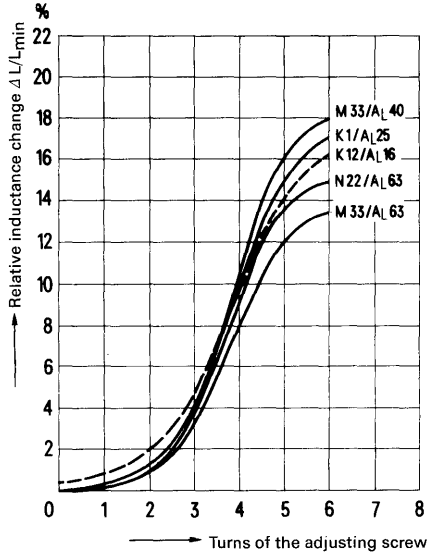


Dimensions in mm

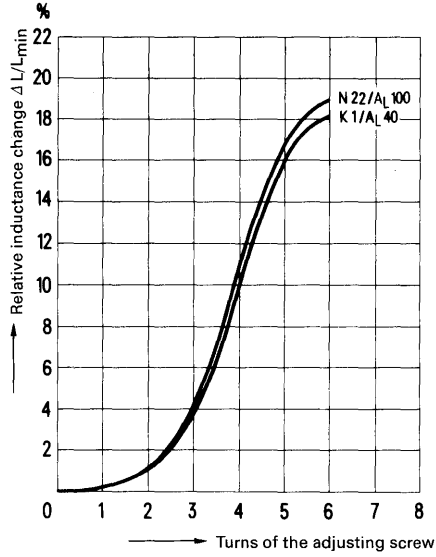
Pot cores B65531		Adjusting screw				
Material	A_L value nH	Part	Tube core Ø x length	Material	Colour code	Ordering code
K 12	16	a	1.81 x 2.0	Si 1s	black	B65539-A1003-X101
K 1	25 40			K 1	yellow	B65539-A1003-X001
M 33	40 63			Si 1s	black	B65539-A1003-X101
N 22	63 100			K 1	yellow	B65539-A1003-X001
	160	b	1.81 x 2.7	N 22	red	B65539-A1002-X022
N 28	100 160 250	a	1.81 x 2.0	K 1	yellow	B65539-A1003-X001
		b	1.81 x 2.7	N 22	red	B65539-A1002-X022

Inductance adjustment curves

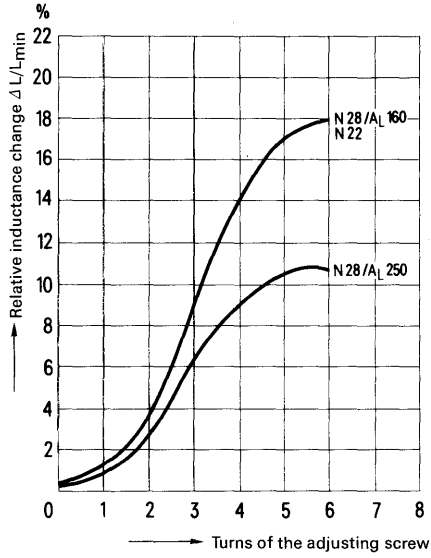
Adjusting screw B65539–A1003–X101
colour code black



Adjusting screw B65539–A1003–X001
colour code yellow



Adjusting screw B65539–A1002–X022
colour code red

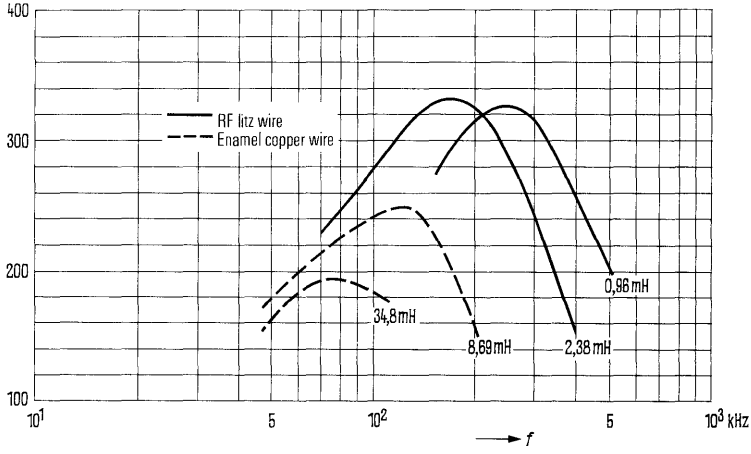


0 △ at least one turn engaged.

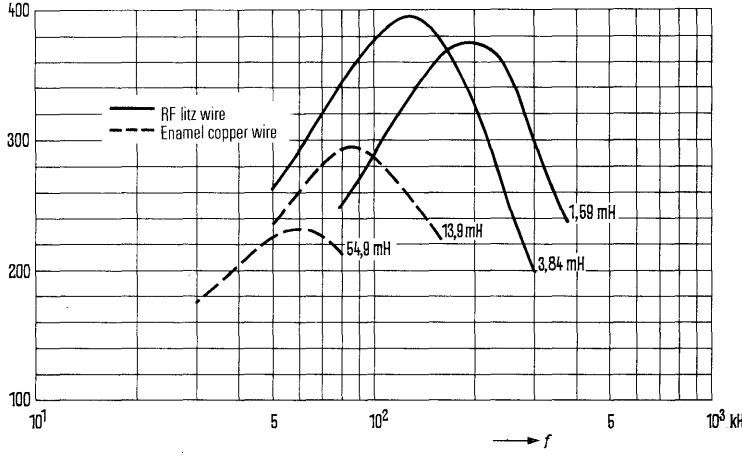
Q factor characteristics; material N 28

L (mH) for A_L = 100 nH	L (mH) for A_L = 160 nH	Turns	Wire; RF litz wire	Number of sections
34.8	54.9	600	0,07 CuL	1
8.69	13.9	300	0,10 CuL	1
2.38	3.84	160	1 x 12 x 0.04 CuLS	1
0.96	1,59	100	1 x 12 x 0.04 CuLS	1

Flux density in the core $\hat{B}$ < 1.5 mT



N 28
(typical values)
A_L = 100 nH

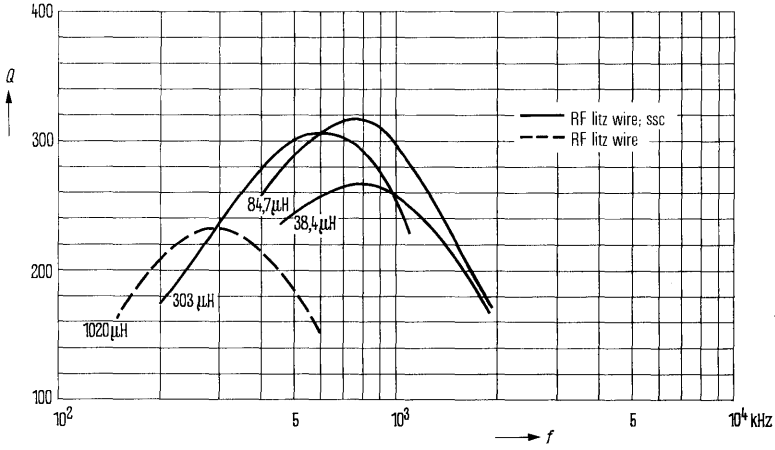


N 28
(typical values)
A_L = 160 nH

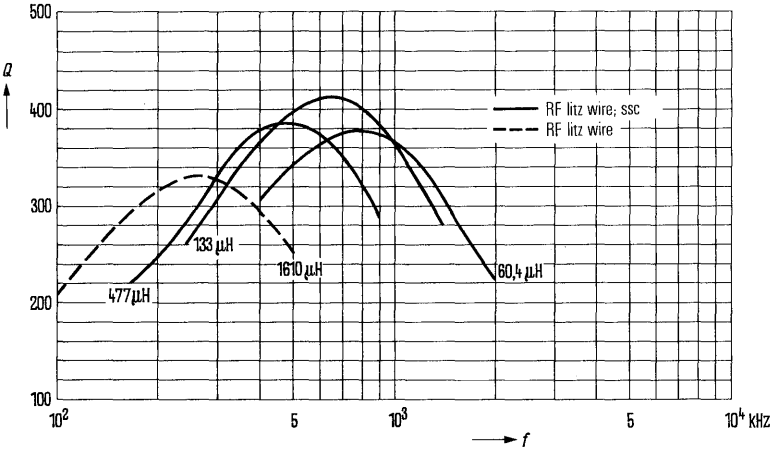
Q factor characteristics; material M 33

L (μH) for A_L = 40 nH	L (μH) for A_L = 63 nH	Turns	RF litz wire	Number of sections
1020	1610	160	1 x 12 x 0.04 CuL	1
303	477	87	1 x 15 x 0.04 CuLS	1
84.7	133	46	1 x 30 x 0.04 CuLS	1
38.4	60.4	31	1 x 45 x 0.04 CuLS	1

Flux density in the core $\hat{B} < 2$ mT



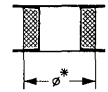
M 33
(typical values)
A_L = 40 nH



M 33
(typical values)
A_L = 63 nH)

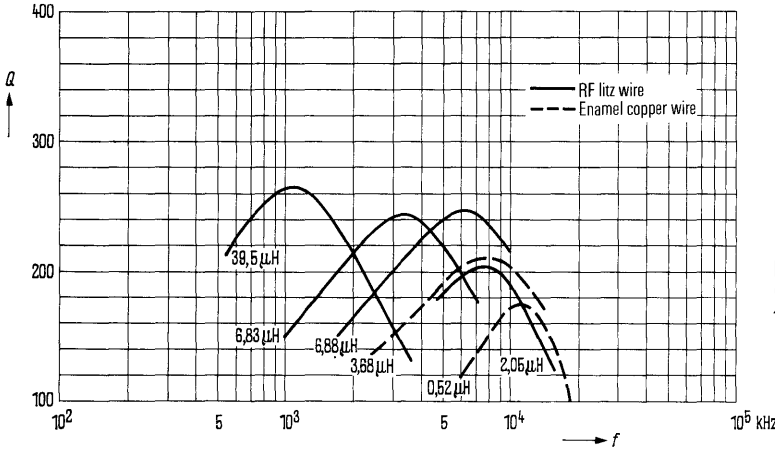
Q factor characteristics; material K 1

L (μH) for A_L = 25 nH	L (μH) for A_L = 40 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter *
3.68	5.35	11	0.25 CuL	1	8.1
0.52	0.74	4	0.70 CuL	1	7.2
39.5	60.8	40	1 x 30 x 0.04 CuLS	1	–
6.88	9.73	15	1 x 12 x 0.04 CuLS	1	8.4
6.83	9.70	15	1 x 30 x 0.04 CuLS	1	6.9
2.05	2.92	8	1 x 30 x 0.04 CuLS	1	8.1

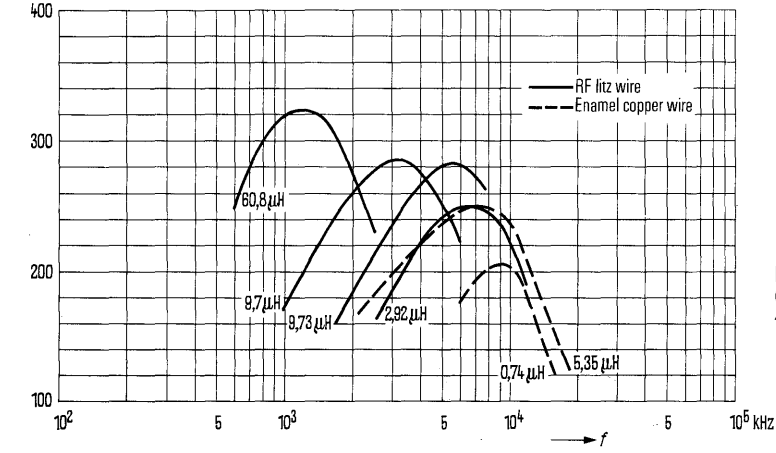


Pad of polystyrene tape up to the diameter Ø *

Flux density in the core $\hat{B}$ < 0.6 mT

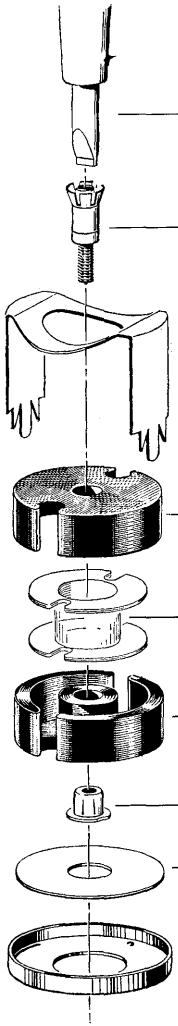


K 1
(typical values)
A_L = 25 nH



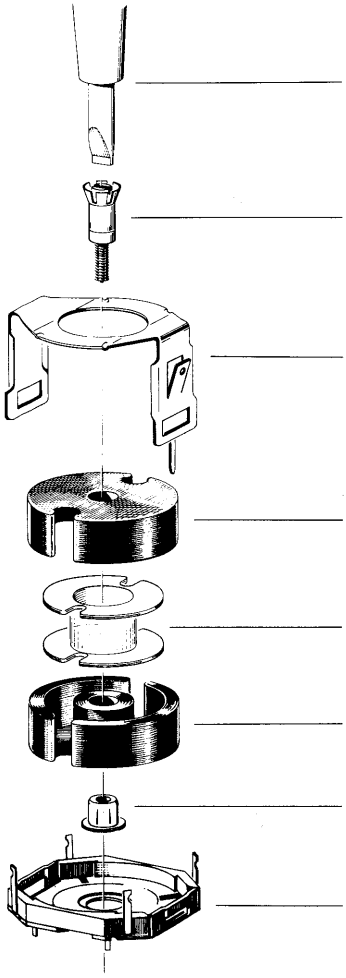
K 1
(typical values)
A_L = 40 nH

Type for wired circuits



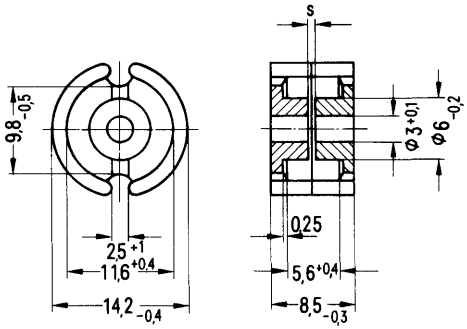
Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65549	134
Yoke	B65543	132
Pot core	B65541	130
Coil former with 1 or 2 sections	B65542	131
Pot core	B65541	130
Threaded flange or threaded sleeve	B65549 B65808	134
Bakelized paper washer	B65543	132
Base plate	B65543	132

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65549	134
Yoke	B65545	133
Pot core	B65541	130
Coil former with 1 or 2 sections	B65542	131
Pot core	B65541	130
Threaded flange or threaded sleeve	B65549 B65808	134
Connecting board with 4 or 6 solder connections	B65545	133

Pot cores complying with DIN 41 293 or IEC publication 133.



Approx. weight 3.2 g/set

Dimensions in mm

Magnetic data

Core factor $\Sigma\ l/A$ = 0.789 mm^{-1} Effective area A_e = 25 mm^2

Effective length l_e = 20 mm Effective volume V_e = 500 mm^3

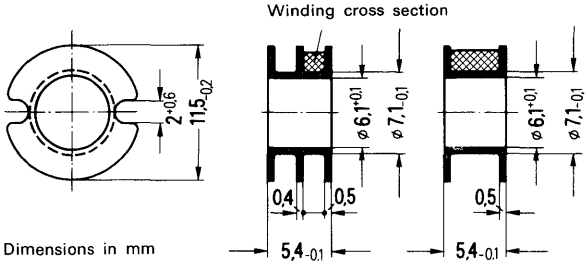
A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
20	± 3 % △A	K 12	1.0	12.7	B65541-K0020-A012
40		K 1	1.0	25.2	B65541-K0040-A001[1]
40		M 33	0.9	25.2	B65541-K0040-A033
100			0.3	63	B65541-K0100-A033
40		N 22	1.0	25.2	B65541-K0040-A022
100			0.31	63	B65541-K0100-A022
160			0.16	101	B65541-K0160-A022
160		N 28	0.17	101	B65541-K0160-A028
250			0.1	157	B65541-K0250-A028
315			0 08	198	B65541-K0315-A028
400			0.05	252	B65541-K0400-A028
250		N 48	0.1	157	B65541-K0250-A048
315			0.08	198	B65541-K0315-A048
250		N 32	0.1	157	B65541-K0250-A032
315			0.08	198	B65541-K0315-A032
250	± 5% △J	T 26	0.1	157	B65541-K0250-J026
400	±10% △K		0.05	252	B65541-K0400-K026
without air gap					
140	+30 −20 % △R	K 1			B65541-K0000-R001
2100		T 26			B65541-K0000-R026
4200		N 30			B65541-K0000-R030
9000	+40 −30 % △Y	T 38			B65541-K0000-Y038

The pot cores B65541-K****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65541-**N******-****.

1) For the cores B65541-K****-*001 no grooves are provided in the bottom.

Coil former and insulating washers B 65542

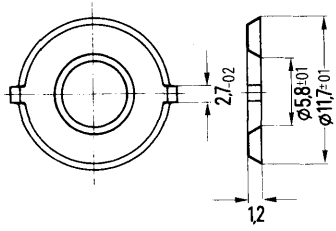
Polyacetal GV or polycarbonate coil former complying with DIN 41294 or IEC publication 133. For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	Material	**Ordering code**
	of one section	total					
	mm^2	mm^2	mm	$\mu\Omega$	g		
1	8.4	8.4	28	115	0.2	Polyacetal GV Polycarbonate	B65542-A0000-H001 B65542-A0000-M001
2	3.8	7.6		127	0.3	Polyacetal GV Polycarbonate	B65542-A0000-H002 B65542-A0000-M002

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65542-A5000-X000

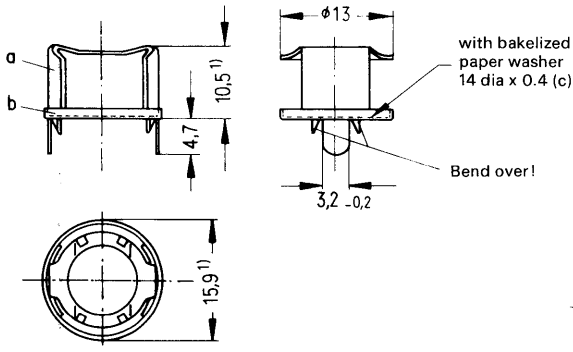
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assembly for wired circuits B 65 543

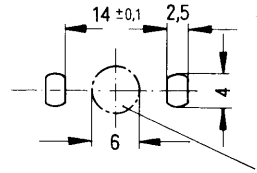
Mounting assembly with metal base plate.
0.3 mm thick nickel-silver spring yoke.
Fixing by twist prongs.

Approx. weight 1.5 g

B65543-A0001-X000



Hole arrangement
view in mounting direction



Only for adjustment
from below

Dimensions in mm

1) Max. dimension

Ordering code B65543-A0001-X000
(Complete mounting assembly)

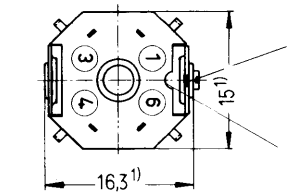
Mounting parts		Ordering code
a	1 yoke	C40330-A82-C8
b	1 base plate	C40330-A82-C9
c	1 washer	C40330-A82-C7

Mounting assemblies for printed circuits B 65 545

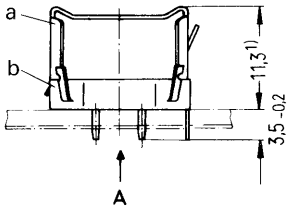
Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.3 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 1.3 g

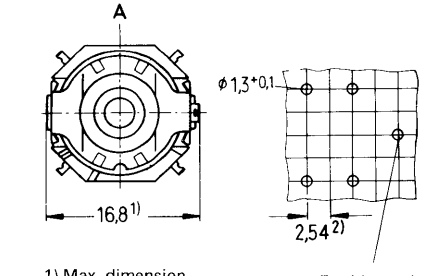
B65545–A0009–X000
(with 4 solder tags)



View in direction A

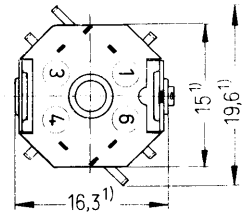


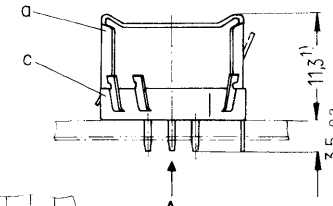
Hole arrangement
view in mounting direction

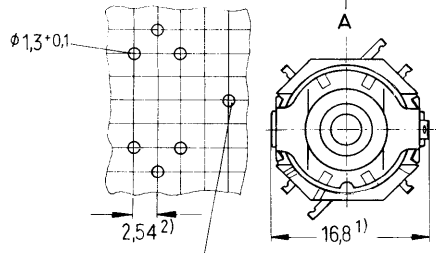


Earthing point

B65545–A0010–X000
(with 6 solder tags)







Earthing point

Dimensions in mm

1) Max. dimension
2) 2.5 mm spacing also permissible

Ordering code B65545–A0009–X000 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65545–A0010–X000 (Complete mounting assembly with 6 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C42035–A11–C1	a	1 yoke	C42035–A11–C1
b	1 connecting board (with 4 solder tags)	C42035–A11–B4	c	1 connecting board (with 6 solder tags)	C42035–A11–B3

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A5.

Adjusting devices B 65 549

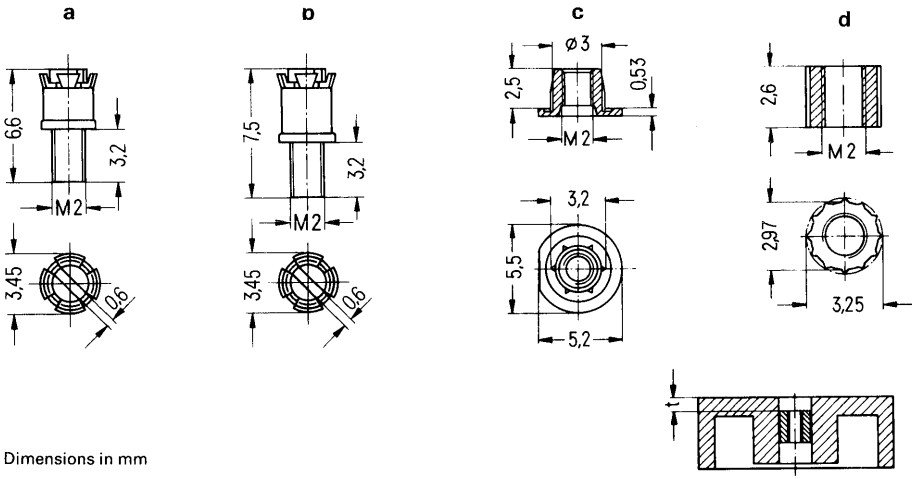
Adjusting screw (a, b) B65549-C0***-X***, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and a spring crown serving as core brake;

fits:

11 polyamide GV **threaded flange** (c) B65549-J0002-X000; colour code black.

11 polyamide GV **threaded sleeve without flange** (d) B65808-J3001-X000;

adjusting screw driver B63399-B0004-X000.



Dimensions in mm

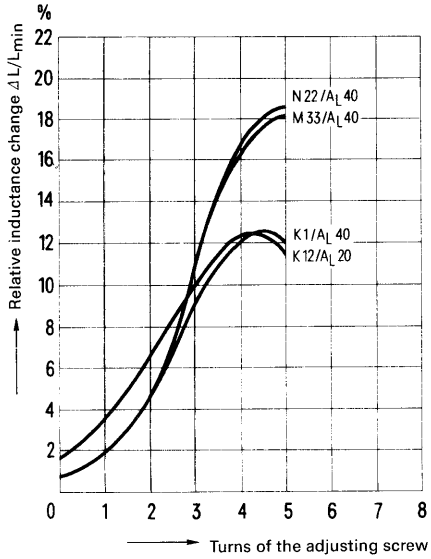
Insertion depth $t = 0.1^{+0.2}$ mm

Pot cores B65541		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 12	20	a	2,6 x 2,0	Si 1s	green	B65549-C0003-X101
K 1	40					
M 33	40					
N 22	40					
M 33	100			N 23[1]	white	B65549-C0003-X023
N 22	100					
N 22, N 28	160	b	2,76 x 2,9	N 23[1]	black	B65549-C0004-X023
N28,N32,N48	250 315					
N 28	400					

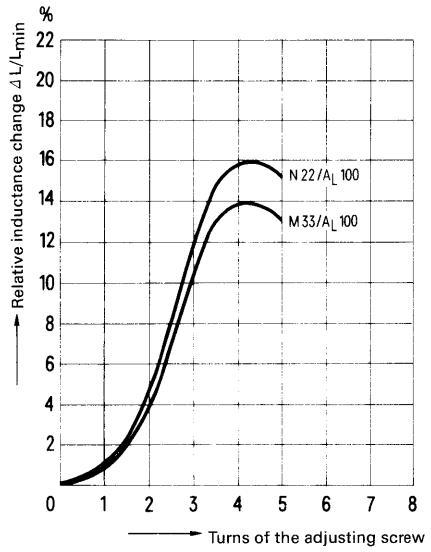
1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

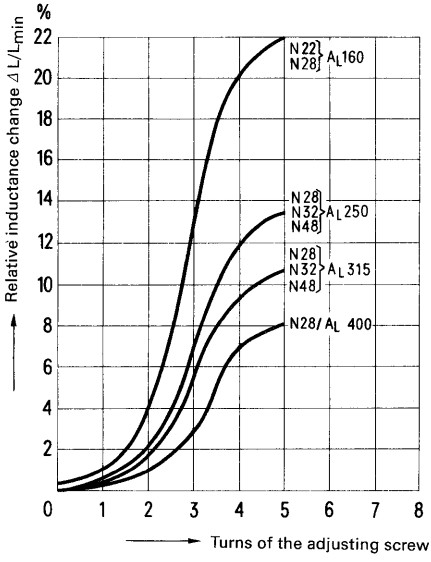
Adjusting screw B65549–C0003–X101
colour code green



Adjusting screw B65549–C0003–X023
colour code white



Adjusting screw B65549–C0004–X023
colour code black

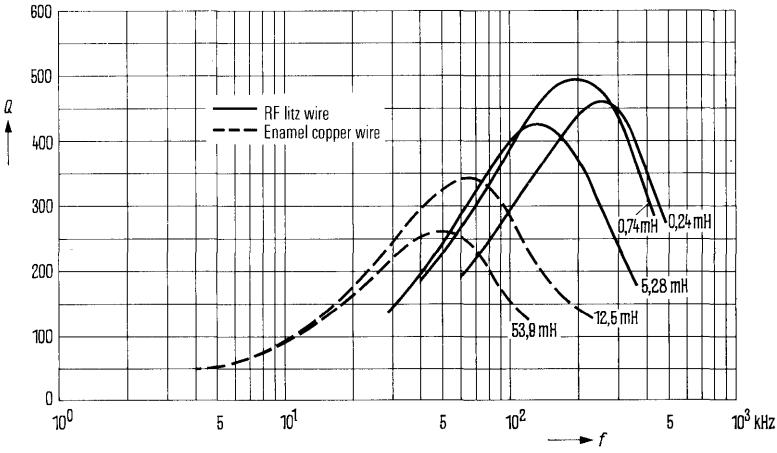


0 ≙ at least one turn engaged.

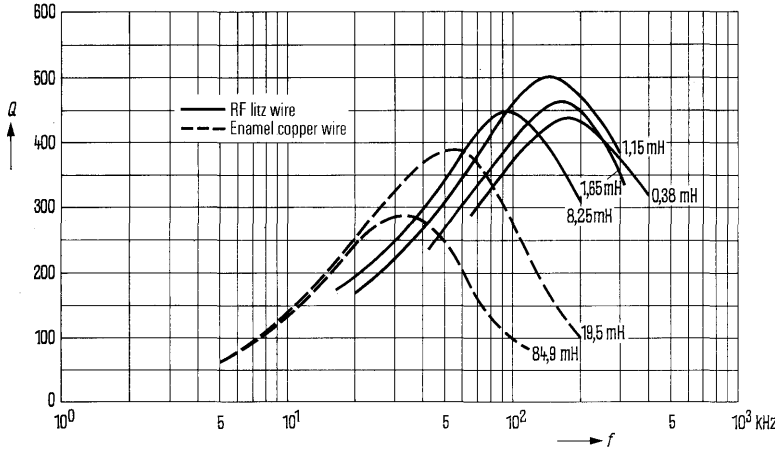
Q factor characteristics; material N 28

L (mH) for A_L = 160 nH	L (mH) for A_L = 250 nH	Turns	Wire; RF litz wire	Number of sections
53.9	84.9	580	0.10 CuL	1
12.5	19.5	280	0.15 CuL	1
5.28	8.25	182	1 x 12 x 0.04 CuLS	1
–	1.65	81	1 x 20 x 0.04 CuLS	2
0.74	1.15	68	1 x 20 x 0.05 CuLS	2
0.24	0.38	39	1 x 30 x 0.05 CuLS	2

Flux density in the core $\hat{B} < 1.5$ mT



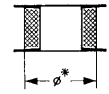
N 28
(typical values)
A_L = 160 nH



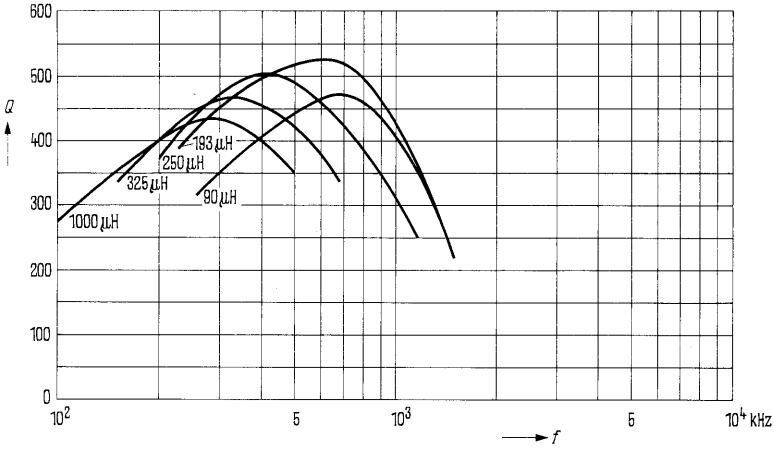
N 28
(typical values)
A_L = 250 nH

Q factor characteristics; material M 33, K 1

Material	L (μH)	Turns	Wire; RF litz wire	Number of sections	mm diameter*
M 33 A_L = 100 nH	1000	100	1 x 15 x 0.04 CuLS	1	–
	325	57	1 x 30 x 0,05 CuLS	1	–
	250	50	1 x 30 x 0.05 CuLS	1	–
	193	22 + 22	1 x 45 x 0.04 CuLS	2	–
	90	15 + 15	1 x 45 x 0.04 CuLS	2	–
K 1 A_L = 40 nH	2.23	7	0.55 CuL	1	10.1
	0,68	4	1.0 CuL	1	9.2
	33.8	30	1 x 20 x 0.04 CuLS	1	9.5
	10.3	15	1 x 20 x 0.04 CuLS	1	10.8
	4.75	10	1 x 20 x 0.04 CuLS	1	10.8
	2.53	7	1 x 20 x 0.04 CuLS	1	10.8

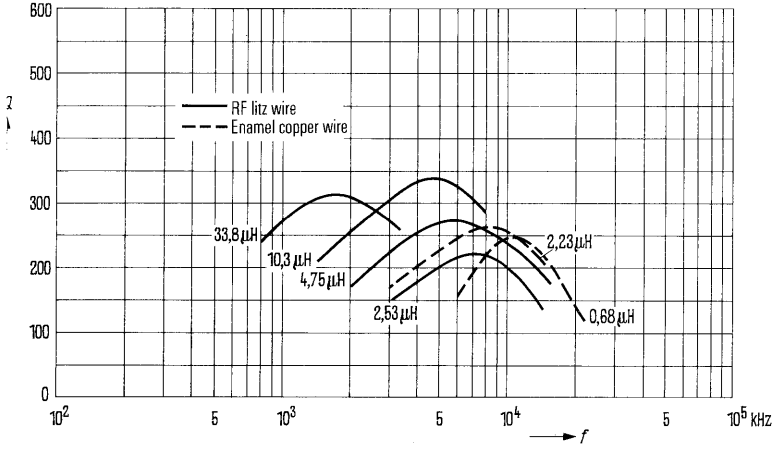


Pad of polystyrene tape up to the diameter Ø*



M 33
(typical values)
A_L = 100 nH

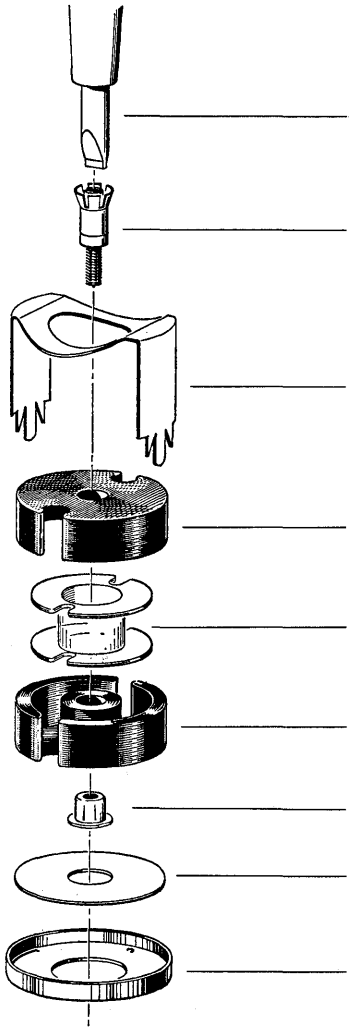
Flux density
in the core
$\hat{B}$ < 2 mT



K 1
(typical values)
A_L = 40 nH

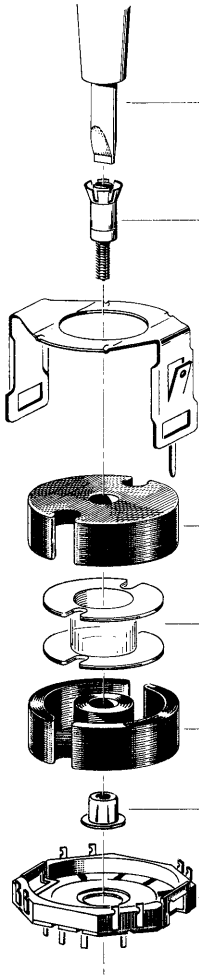
Flux density
in the core
$\hat{B}$ < 0.6 mT

Type for wired circuits



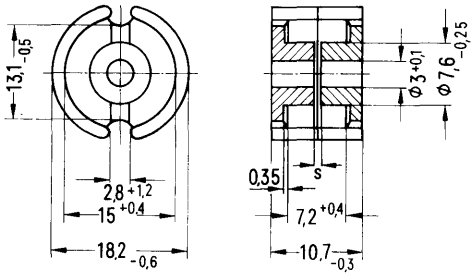
Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65659	144
Yoke	B65653	142
Pot core	B65651	140
Coil formr with 1, 2 or 3 sections	B65652	141
Pot core	B65651	140
Threaded flange or threaded sleeve	B65659 B65808	144
Bakelized paper washer	B65653	142
Base plate	B65653	142

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65659	144
Yoke	B65655	143
Pot core	B65651	140
Coil former with 1, 2 or 3 sections	B65652	141
Pot core	B65651	140
Threaded flange or threaded sleeve	B65659 B65808	144
Connecting board with 4 or 8 solder connections	B65655	143

Pot cores complying with DIN 41293 or IEC publication 133.



Approx. weight 6 g/set

Dimensions in mm

Magnetic data

Core factor $\Sigma\, l/A$ = 0.597 mm^{-1}; Effective area A_e = 44 mm^2

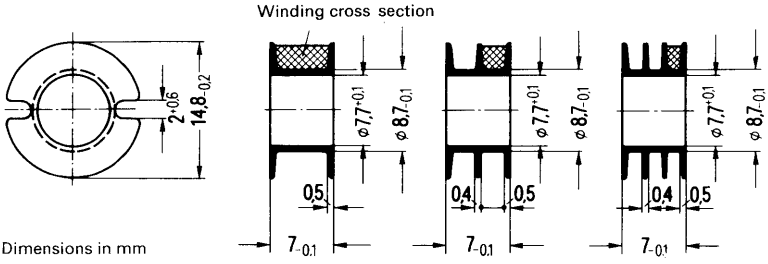
Effective length l_e = 26 mm; Effective volume V_e = 1140 mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
25	± 3% △A	K 12	2.35	12	B65651-K0025-A012
25		K 1	3.1	12	B65651-K0025-A001
40			1.6	19.2	B65651-K0040-A001
40		M 33	2.0	19.2	B65651-K0040-A033
63			1.1	30	B65651-K0063-A033
100			0.6	48	B65651-K0100-A033
63		N 22	1.3	30	B65651-K0063-A022
100			0.65	48	B65651-K0100-A022
160			0.32	76.7	B65651-K0160-A022
250			0.18	120	B65651-K0250-A022
250		N 28	0.2	120	B65651-K0250-A028
315			0,15	151	B65651-K0315-A028
400			0.1	192	B65651-K0400-A028
500			0,07	238	B65651-K0500-A028
250		N 48	0,2	120	B65651-K0250-A048
315			0,15	151	B65651-K0315-A048
400			0,1	192	B65651-K0400-A048
315		N 32	0,15	151	B65651-K0315-A032
400			0,1	192	B65651-K0400-A032
400	± 5% △J	T 26	0,1	192	B65651-K0400-J026
630	±10% △K		0.05	302	B65651-K0630-K026
without air gap					
180	+30 −20 % △R	K 1			B65651-K0000-R001
2800		T 26			B65651-K0000-R026
5600		N 30			B65651-K0000-R030
12000	+40 −30 % △Y	T 38			B65651-K0000-Y038

The pot cores B65651-K****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65651-**N******-****.

Coil former and insulating washers B 65 652

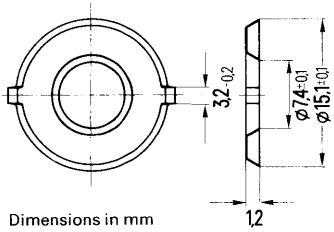
Polyacetal GV or polycarbonate coil former complying with DIN 41 294 or IEC publication 133. For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	Useful winding cross section A_N total mm²	Average length of turn l_N mm	A_R value 1) μΩ	Approx. weight g	Material	**Ordering code**
1	16	16	35.6	87	0.2	Polyacetal GV Polycarbonate	B65652-A0000-H001 B65652-A0000-M001
2	6,5	13		94	0.3	Polyacetal GV Polycarbonate	B65652-A0000-H002 B65652-A0000-M002
3	4.0	12		101	0.4	Polyacetal GV Polycarbonate	B65652-A0000-H003 B65652-A0000-M003

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65652-A5000-X000

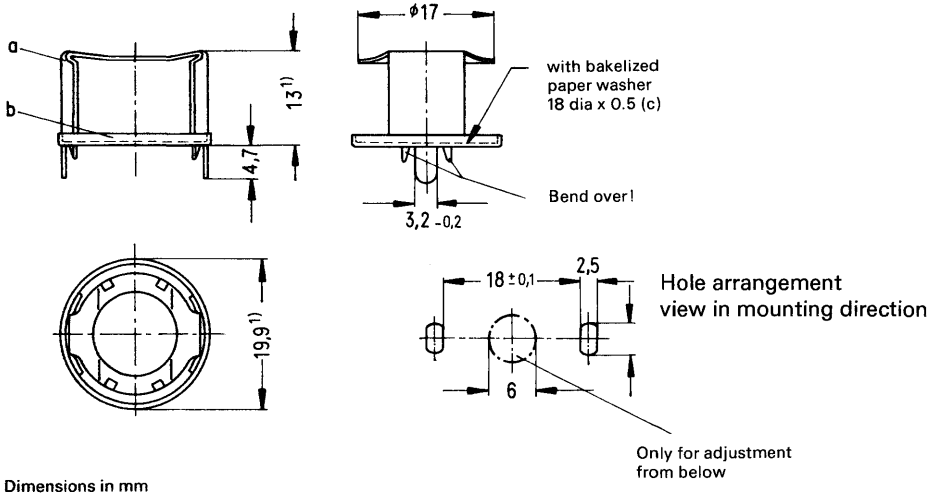
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assembly for wired circuits B 65 653

Mounting assembly with metal base plate.
0.3 mm thick nickel-silver spring yoke.
Fixing by twist prongs.

Approx. weight 2.3 g

B65653-A0001-X000



Dimensions in mm

1) Max. dimension

Ordering code B65653-A0001-X000
(complete mounting assembly)

Mounting parts		Ordering code
a	1 yoke	C40330-A75-C5
b	1 base plate	C61035-A10-C43
c	1 washer	C40330-B5-C33

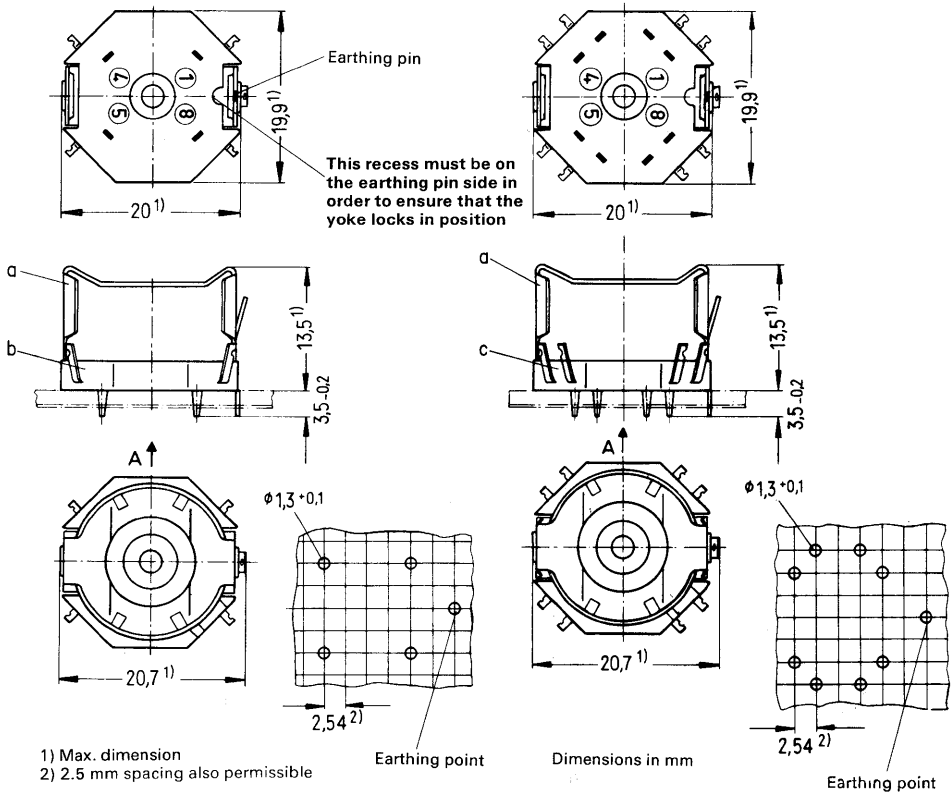
Mounting assemblies for printed circuits B 65655

Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.3 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 2.4 g

B65655–A0009–X000
(with 4 solder tags)

B65655–A0010–X000
(with 8 solder tags)



1) Max. dimension
2) 2.5 mm spacing also permissible

Dimensions in mm

Ordering code B65655–A0009–X000 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65655–A0010–X000 (Complete mounting assembly with 8 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C42035–A10–C3	a	1 yoke	C42035–A10–C3
b	1 connecting board (with 4 solder tags)	C42035–A10–B5	c	1 connecting board (with 8 solder tags)	C42035–A10–B3

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A6.

Adjusting devices B 65659

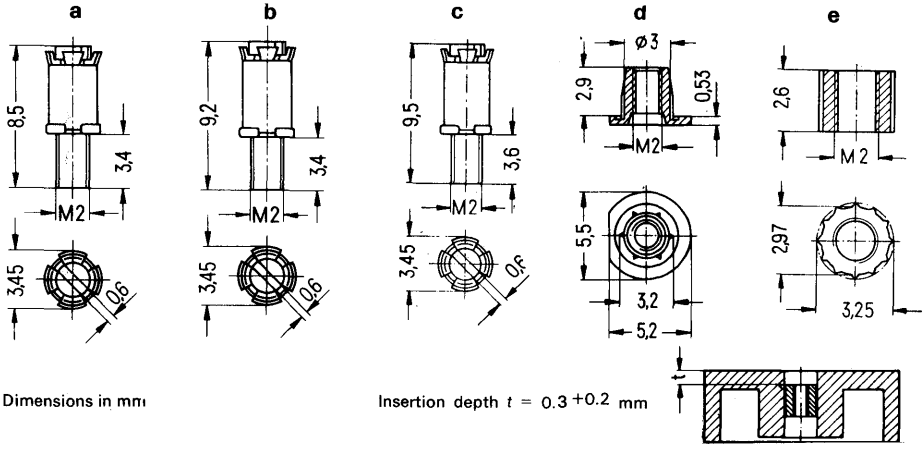
Adjusting screw (a, b, c) B65659–C0***–X***, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and a spring crown, serving as core brake;

fits:

11 polyamide GV **threaded flange** (d) B65659–J0002–X000; colour code colourless;

11 polyamide GV **threaded sleeve without flange** (e) B65808–J3001–X000;

Adjusting screw driver B63399–B0004–X000.



Dimensions in mm

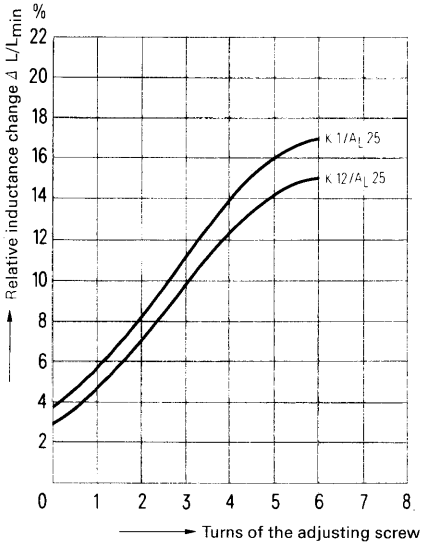
Insertion depth $t = 0.3^{+0.2}$ mm

Pot cores B 65651		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 12	25	a	2.6 x 3.7	Si 1 s	white	B65659–C0001–X101
K 1	25 40					
M 33	40					
M 33, N 22	63					
M 33, N 22	100	c	2.82 x 4.4		brown	B65659–C0004–X101
M 33	160	a	2.6 x 3.7	K 1	green	B65659–C0001–X101
N 22, N 28	160	c	2.82 x 4.4	Si 1 s	brown	B65659–C0004–X101
N 28	200	a	2.6 x 3.7	K 1	green	B65659–C0001–X001
N22, N28, N48	250	a	2.6 x 3.7	N 23[1)]	red	B65659–C0001–X023
N28, N32, N48	315 400	b	2.75 x 4.4		black	B65659–C0003–X023
N 28	500	c	2.82 x 4.4		yellow	B65659–C0004–X023

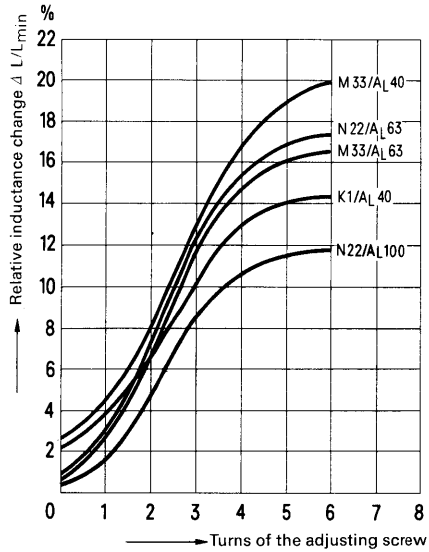
[1)] For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

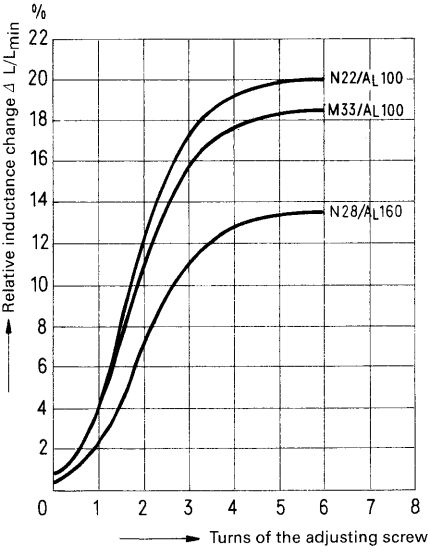
Adjusting screw B65659–C0001–X101
colour code white



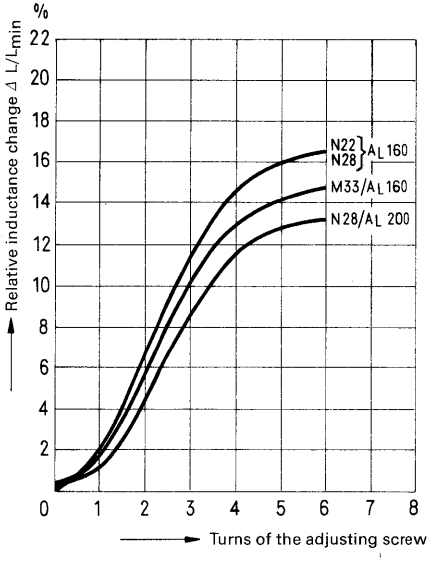
Adjusting screw B65659–C0001–X101
colour code white



Adjusting screw B65659–C0004–X101
colour code brown



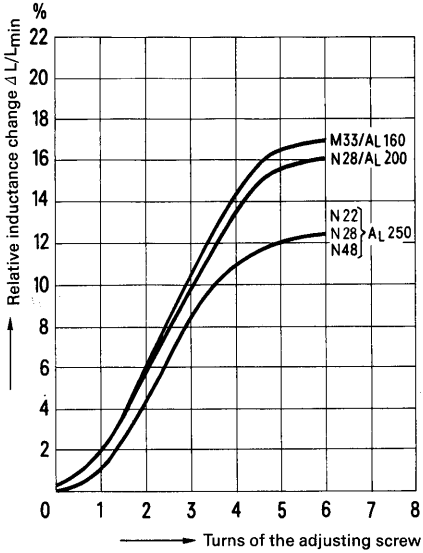
Adjusting screw B65659–C0001–X001
colour code green



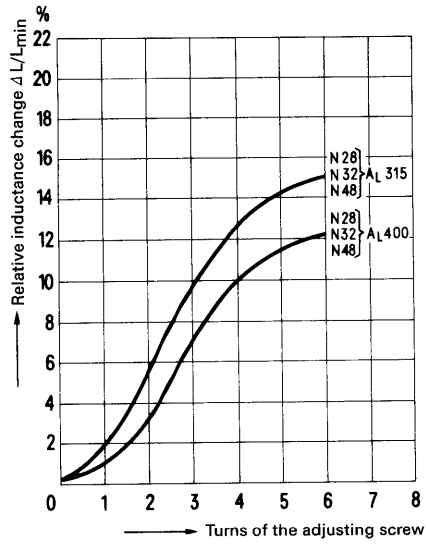
0 ≙ at least one turn engaged.

Inductance adjustment curves

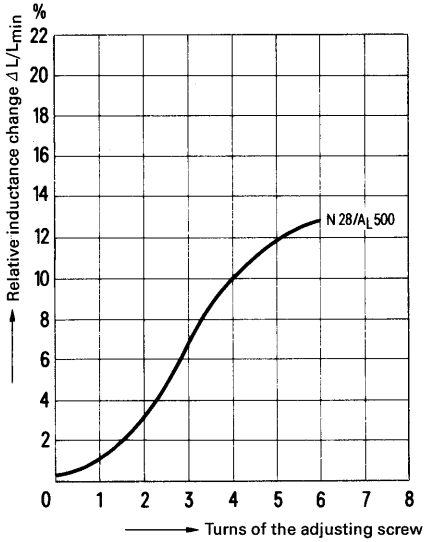
Adjusting screw B65659–C0001 –X023
colour code red



Adjusting screw B65659–C0003–X023
colour code black



Adjusting screw B65659–C0004–X023
colour code yellow

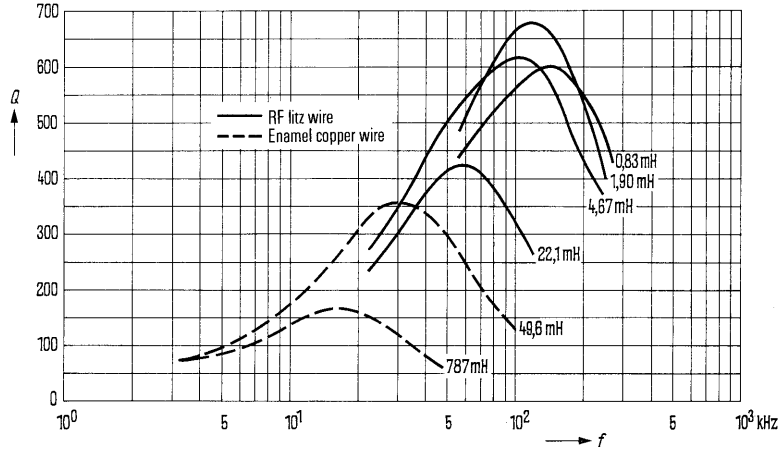


0 ≙ at least one turn engaged.

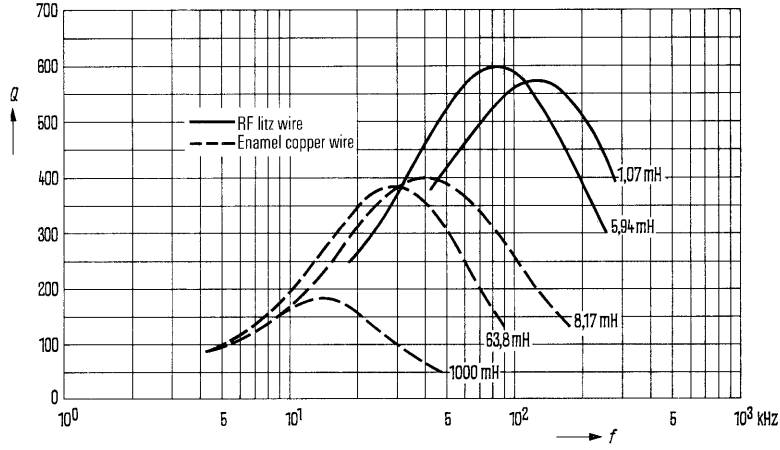
Q factor characteristics; material N 28

L (mH) for A_L = 250 nH	L (mH) for A_L = 315 nH	Turns	Wire; RF litz wire	Number of sections
787	1000	1790	0,07 CuL	1
49.6	63.8	450	0,15 CuL	1
22.1	–	301	1 x 20 x 0.04 CuLS	1
–	8.17	161	0,25 CuL	1
4.67	5.94	138	1 x 20 x 0.05 CuLS	1
1.90	–	87	1 x 45 x 0.04 CuLS	1
0.83	1,07	58	1 x 45 x 0.05 CuLS	1

Flux density in the core $\hat{B} < 1.5$ mT



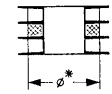
N 28
(typical values)
A_L = 250 nH



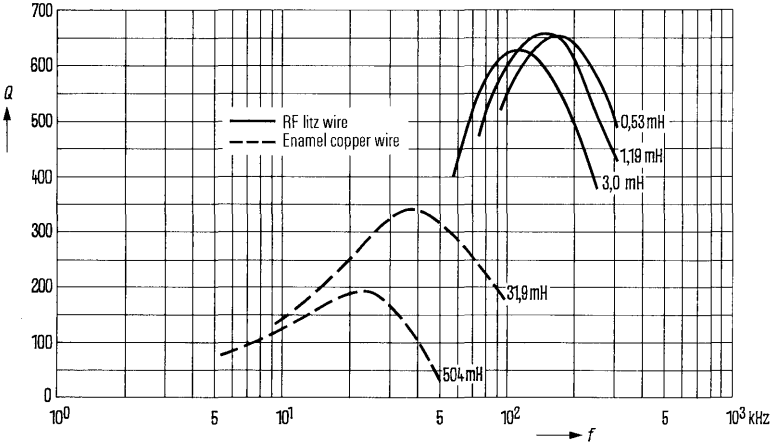
N 28
(typical values)
A_L = 315 nH

Q factor characteristics; materials N 28, M 33

Material	L	Turns	Wire; RF litz wire	Number of sections	mm diameter*
N 28 A_L = 160 nH	504 mH	1790	0,07 CuL	1	–
	31.9 mH	450	0,15 CuL	1	–
	3.0 mH	138	1 x 20 x 0.05 CuLS	1	–
	1.19 mH	87	1 x 45 x 0.04 CuLS	1	–
	0.53 mH	58	1 x 45 x 0.05 CuLS	1	–
M 33 A_L = 40 nH	900 μH	150	1 x 30 x 0.04 CuLS	1	–
	400 μH	100	1 x 45 x 0.04 CuLS	1	–
	256 μH	40+40	1 x 45 x 0.04 CuLS	2	–
	125 μH	25+6+25	1 x 45 x 0.04 CuLS	3	11,7
	46.3 μH	15+4+15	1 x 45 x 0.04 CuLS	3	10,8

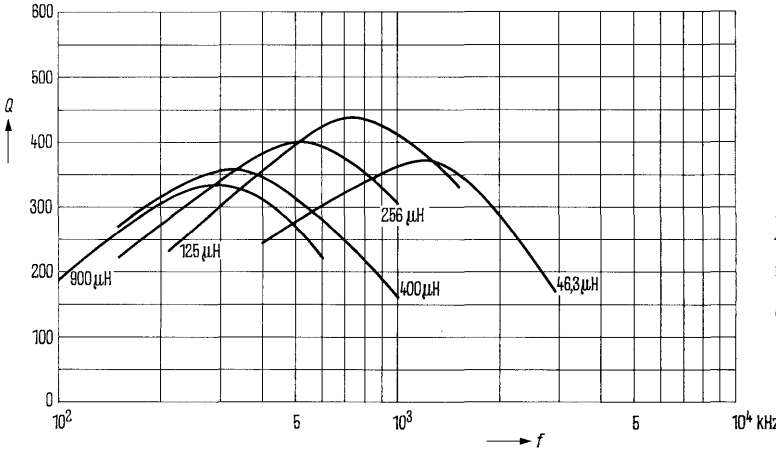


Pad of polystyrene tape up to the diameter Ø*



N 28
(typical values)
A_L = 160 nH

Flux density in the core
$\hat{B}$ < 1.5 mT

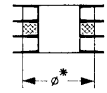


M 33
(typical values)
A_L = 40 nH

Flux density in the core
$\hat{B}$ < 1.6 mT

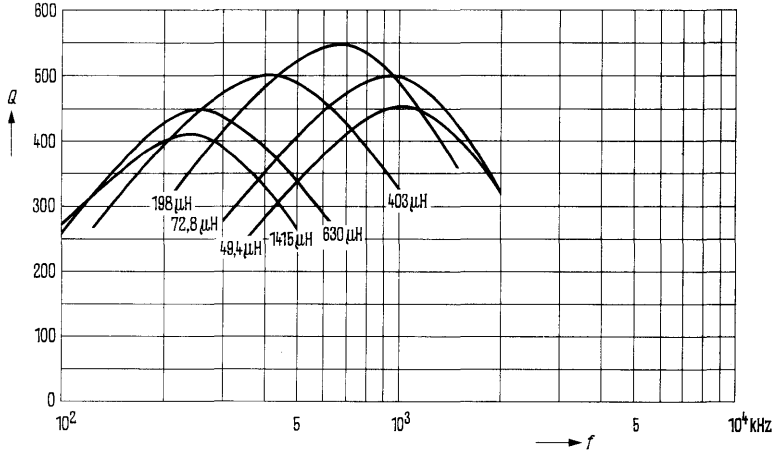
Q factor characteristics; material M 33

L (μH) for A_L = 63 nH	L (μH) for A_L = 100 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
1415	2250	150	1 x 30 x 0.04 CuLS	1	–
630	1000	100	1 x 45 x 0.04 CuLS	1	–
403	640	40+40	1 x 45 x 0.04 CuLS	2	–
198	313	25+6+25	1 x 45 x 0.04 CuLS	3	11,7
72,8	115	15+4+15	1 x 45 x 0.04 CuLS	3	10,8
49,4	81,2	12+4+12	1 x 45 x 0.04 CuLS	3	10,8

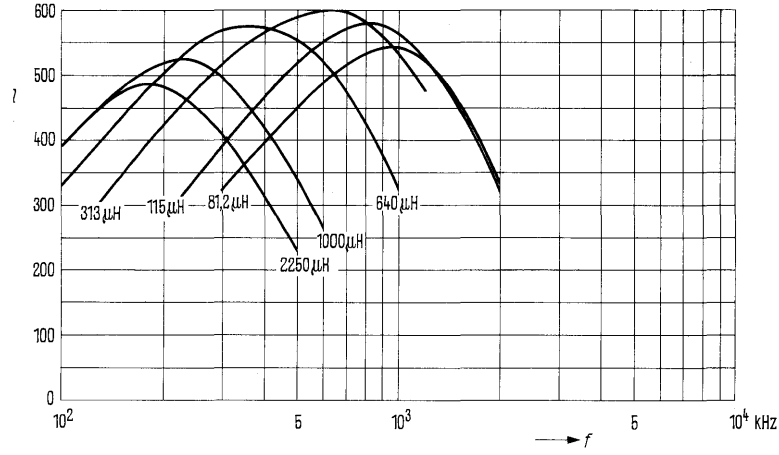


Pad of polystyrene tape up to the diameter*

Flux density in the core $\hat{B}$ < 1.6 mT



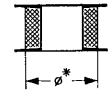
M 33
(typical values)
A_L = 63 nH



M 33
(typical values)
A_L = 100 nH

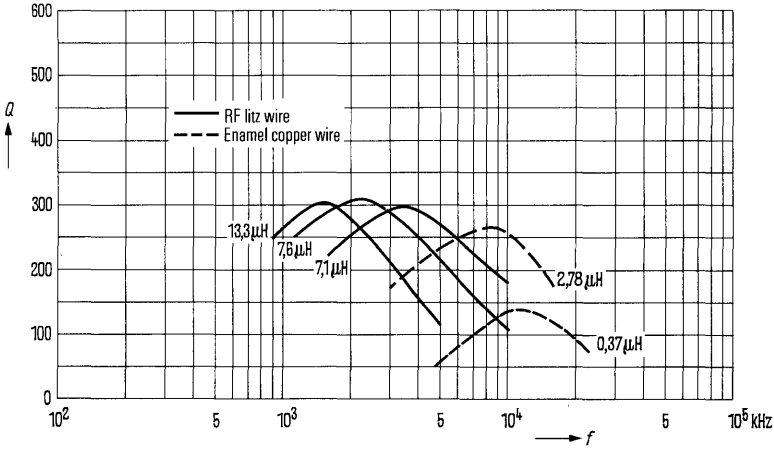
Q factor characteristics; material K 1

L (μH) for A_L = 25 nH	L (μH) for A_L = 40 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
2.78	3.75	9	0.6 CuL	1	13.0
0.37	0.49	3	1.0 CuL	1	12.2
13.3	18.3	20	3x30x0.04 CuLS	1	12.8
7.6	10.6	5+5+5	3x30x0.04 CuLS	3	12.8
7.1	9.85	15	1x45x0.04 CuLS	1	13.5

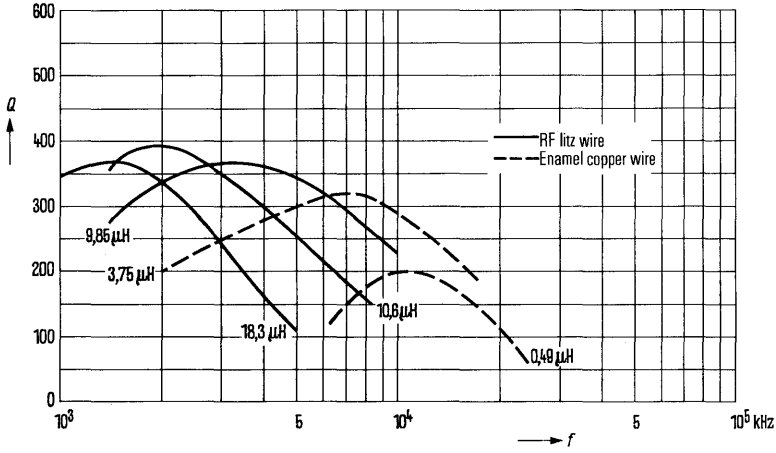


Pad of polystyrene tape up to the diameter * (valid for all sections)

Flux density in the core $\hat{B}$ < 0.6 mT

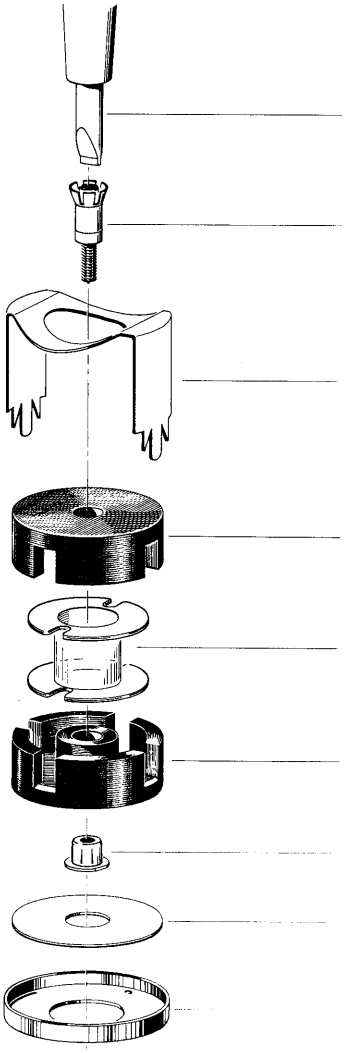


K 1
(typical values)
A_L = 25 nH



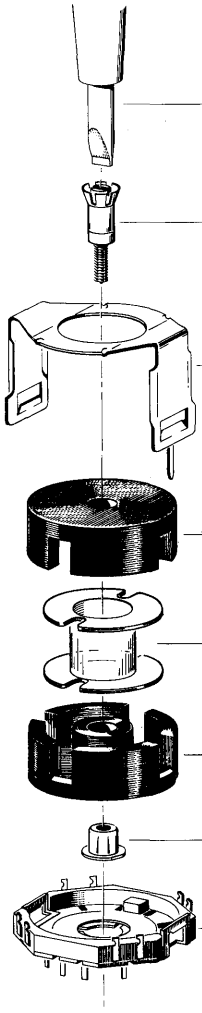
K 1
(typical values)
A_L = 40 nH

Type for wired circuits

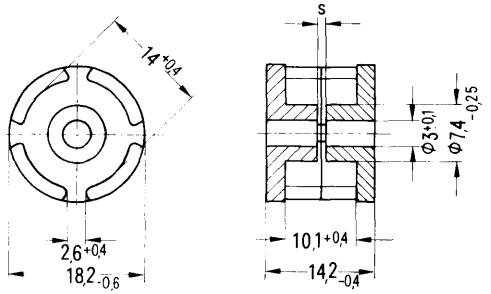


Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65569	157
Yoke	B65563	155
Pot core	B65561	153
Coil former with 1, 2 or 3 sections	B65562	154
Pot core	B65561	153
Threaded flange or threaded sleeve	B65569 B65808	157
Bakelized paper washer	B65563	155
Base plate	B65563	155

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65569	157
Yoke	B65565	156
Pot core	B65561	153
Coil former with 1, 2 or 3 sections	B65562	154
Pot core	B65561	153
Threaded flange or threaded sleeve	B65569 B65808	157
Connecting board with 4 or 8 solder connections	B65565	156



Approx. weight 9.0 g/set

Dimensions in mm

Magnetic data

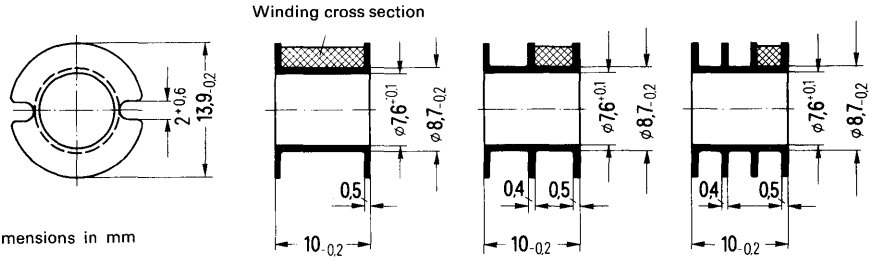
Core factor	$\Sigma\, l/A$ =	0.677	mm^{-1}
Effective length	l_e =	30.1	mm
Effective area	A_e =	45	mm^2
Effective volume	V_e =	1350	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
25	± 3% ≙ A	K 12	1.5	13.5	B65561-A0025-A012
25		K 1	2.7	13.5	B65561-A0025-A001
40			1.3	21.6	B65561-A0040-A001
40		M 33	2.0	21.6	B65561-A0040-A033
63			1.1	34	B65561-A0063-A033
100			0.6	54	B65561-A0100-A033
100		N 22	0.6	54	B65561-A0100-A022
160			0.3	86.5	B65561-A0160-A022
250			0.17	135	B65561-A0250-A022
250		N 28	0.17	135	B65561-A0250-A028
315			0.14	170	B65561-A0315-A028
400	± 5% ≙ J	T 26	0.1	216	B65561-A0400-J026
630	±10% ≙ K		0.05	340	B65561-A0630-K026
without air gap					
160	+30 −20 % ≙ R	K 1			B65561-A0000-R001
2700		T 26			B65561-A0000-R026
5300		N 30			B65561-A0000-R030

The pot cores B65561-A****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65561-**N******-****.

Coil former and insulating washers B 65 562

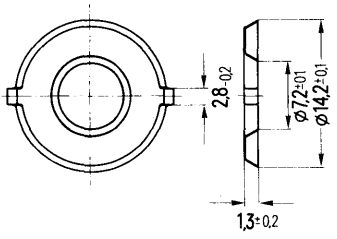
Polyacetal GV or polycarbonate coil former.
For winding details see page 87.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	Useful winding cross section A_N total mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	Material	**Ordering code**
1	20	20	34	58	0.4	Polyacetal GV Polycarbonate	B65562-A0000-H001 B65562-A0000-M001
2	8.5	17.0		68	0,4	Polyacetal GV Polycarbonate	B65562-A0000-H002 B65562-A0000-M002
3	5.3	15.9		73	0.5	Polyacetal GV Polycarbonate	B65562-A0000-H003 B65562-A0000-M003

0.04 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65562-A5000-X000

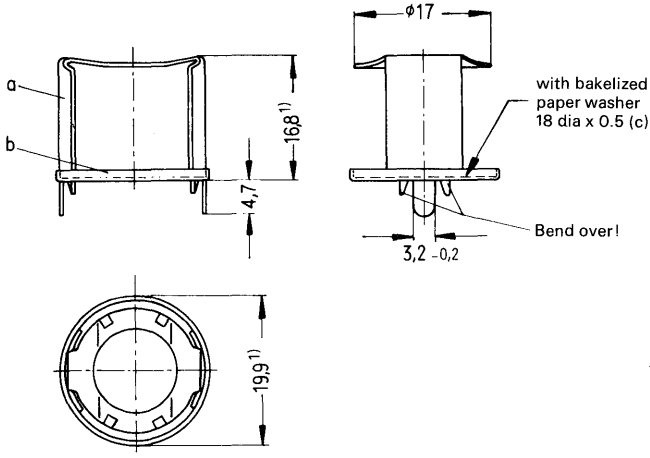
1) $R_{Cu} = A_R \cdot N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor f_{Cu} = 0.5.

Mounting assembly for wired circuits B 65 563

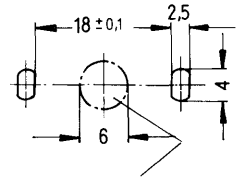
Mounting assembly with metal base plate.
0.3 mm thick nickel-silver spring yoke.
Fixing by twist prongs.

Approx. weight 2 g

B65563-A0001-X000



Hole arrangement
view in
mounting direction



Only for adjustment
from below

Dimensions in mm

1) Max. dimension

Ordering code B65563-A0001-X000
(Complete mounting assembly)

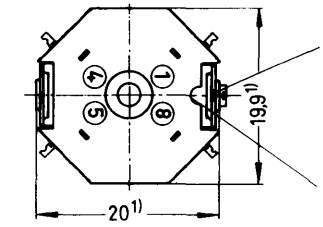
Mounting parts		Ordering code
a	1 yoke	C40330-B5-C27
b	1 base plate	C61035-A10-C43
c	1 washer	C40330-B5-C33

Mounting assemblies for printed circuits B 65 565

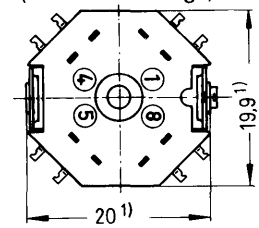
Mounting assemblies with snap-in connection.
Polycarbonate GV connecting board.
0.3 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

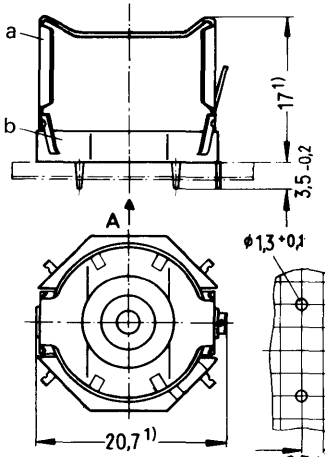
Approx. weight 2.5 g

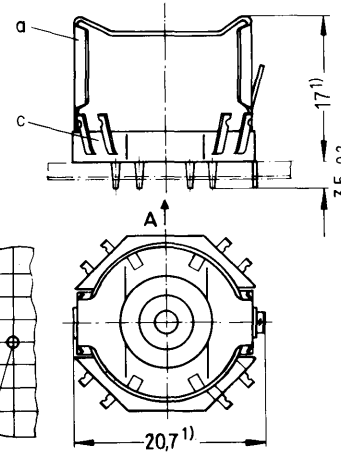
B65565-A0009-X000
(with 4 solder tags)



B65565-A0010-X000
(with 8 solder tags)







1) Max. dimension
2) 2.5 mm spacing also permissible

Dimensions in mm

Ordering code B65565-A0009-X000 (Complete mounting assembly with 4 solder tags)			**Ordering code** B65565-A0010-X000 (Complete mounting assembly with 8 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C42035-A9-C5	a	1 yoke	C42035-A9-C5
b	1 connecting board (with 4 solder tags)	C42035-A10-B5	c	1 connecting board (with 8 solder tags)	C42035-A10-B3

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A6

Adjusting devices B 65569

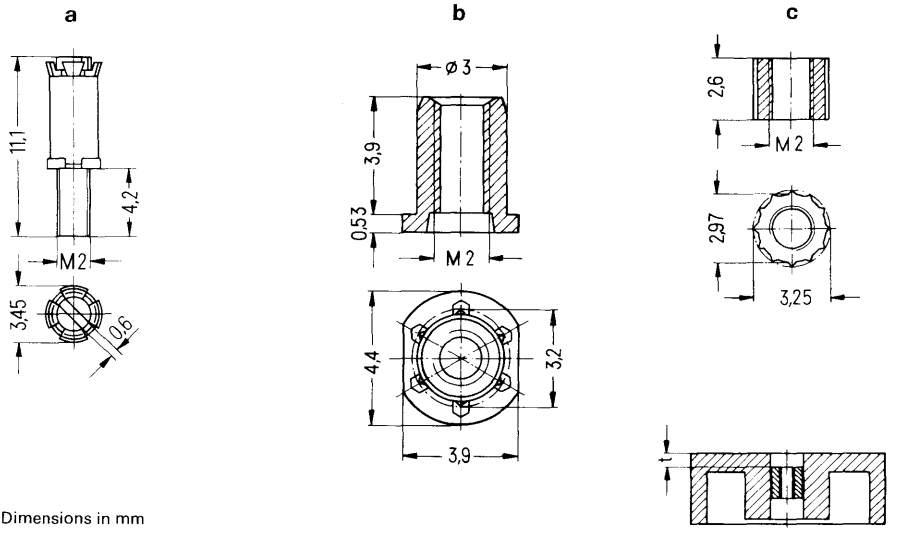
Adjusting screw (a) B65569–C0***-X***, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and a spring crown, serving as core brake.

fits:

11 polyamide GV **threaded flange** (b) B65569–K0002–X000; colour code white;

11 polyamide GV **threaded sleeve without flange** (c) B65808–J3001–X000;

adjusting screw driver B63399–B0004–X000.



Dimensions in mm

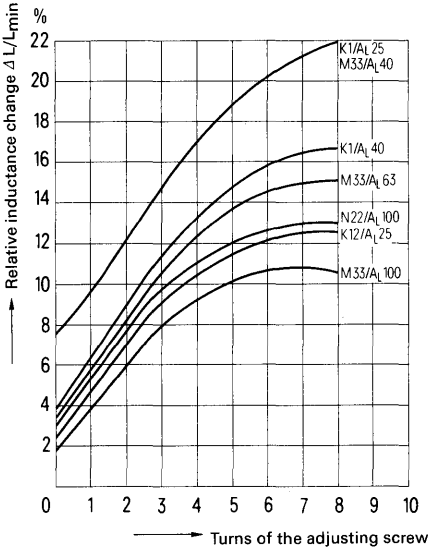
Insertion depth $t = 1.3\ ^{+0.2}$ mm

Pot cores B65561		Adjusting screw			
Material	A_L value nH	Tube core dia x length	Material	Colour code	**Ordering code**
K 12	25	2.6 x 5.5	Si 1 s	white	B65569–C0001–X101
K 1	25 40				
M 33	40 63 100				
N 22	100				
N 22	160 250		N 23[1)]	red	B65569–C0001–X023
N 28	250 315				

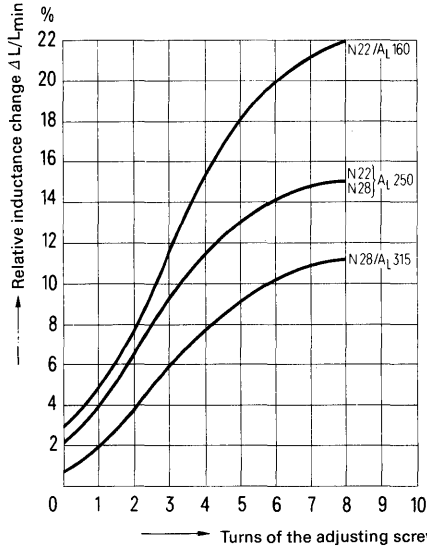
1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

Adjusting screw B65569–C0001–X101
colour code white



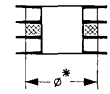
Adjusting screw B65569–C0001–X023
colour code red



0 ≤ at least two turns engaged.

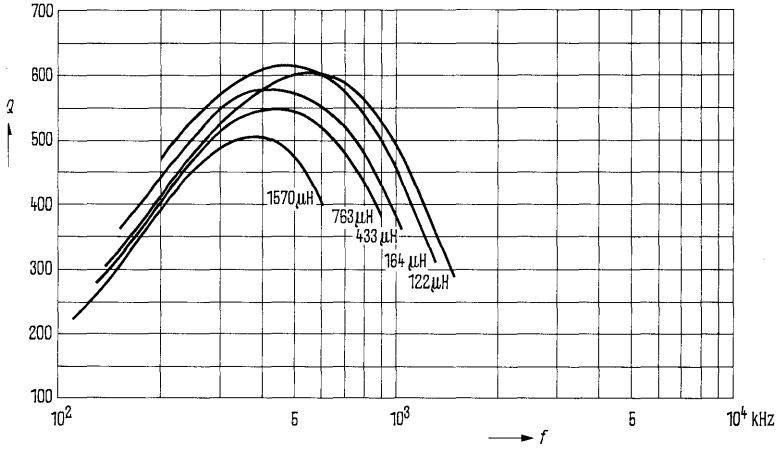
Q factor characteristics; material M 33

L (μH) for A_L = 63 nH	L (μH) for A_L = 100 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter *
1570	2500	65+38+65	1 x 20 x 0.04 CuLS	3	11.2
763	1210	50+10+50	1 x 30 x 0.04 CuLS	3	13.2
433	688	38+ 7+38	1 x 45 x 0.04 CuLS	3	11.8
164	260	20+11+20	2 x 30 x 0.04 CuLS	3	10.8
122	194	20+ 4+20	3 x 30 x 0.04 CuLS	3	11.5

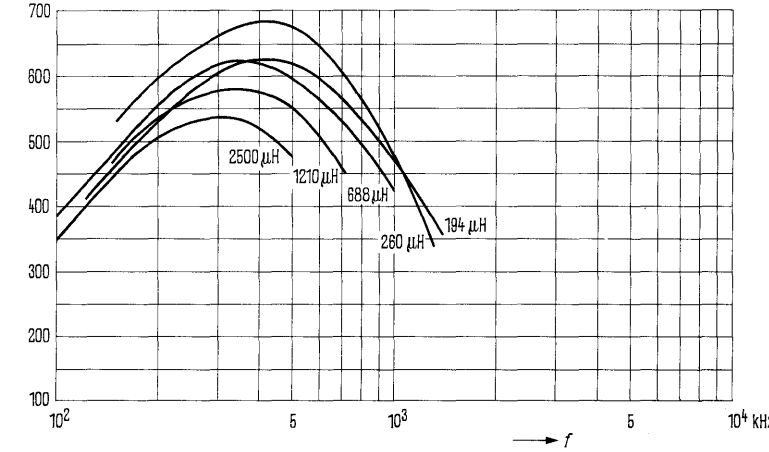


Pad of polystyrene tape up to the diameter*

Flux density in the core $\hat{B} < 1.6$ mT



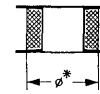
M 33
(typical values)
A_L = 63 nH



M 33
(typical values)
A_L = 100 nH

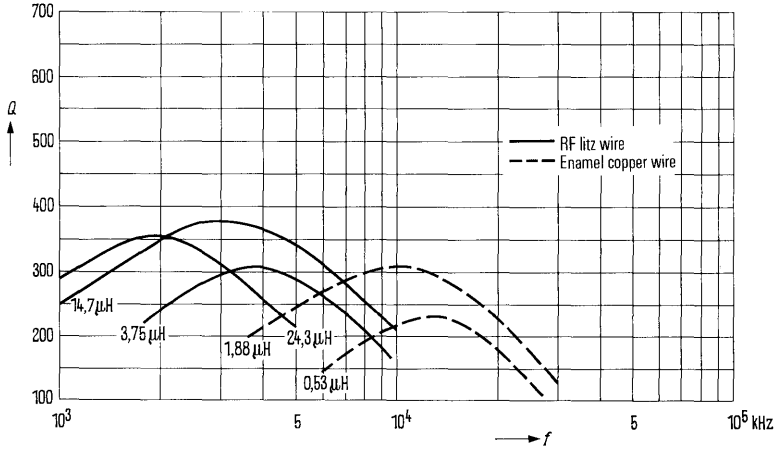
Q factor characteristics; material K 1

L (μH) for A_L = 25 nH	L (μH) for A_L = 40 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter *
1.88	2.92	8	1.0 CuL	1	11.5
0.53	0.78	4	1.2 CuL	1	11.2
24.3	38.8	10+10+10	1x45x0,04 CuLS	3	12.0
14.7	22.4	11	1x45x0,04 CuLS	1	12.8
3.75	5.65	22	3x30x0,04 CuLS	1	12.5

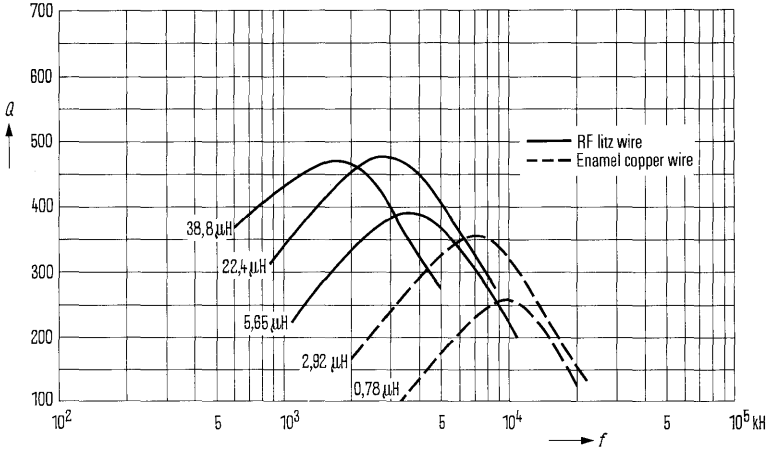


Pad of polystyrene tape up to the diameter* (valid for all sections)

Flux density in the core $\hat{B} < 0.6$ mT

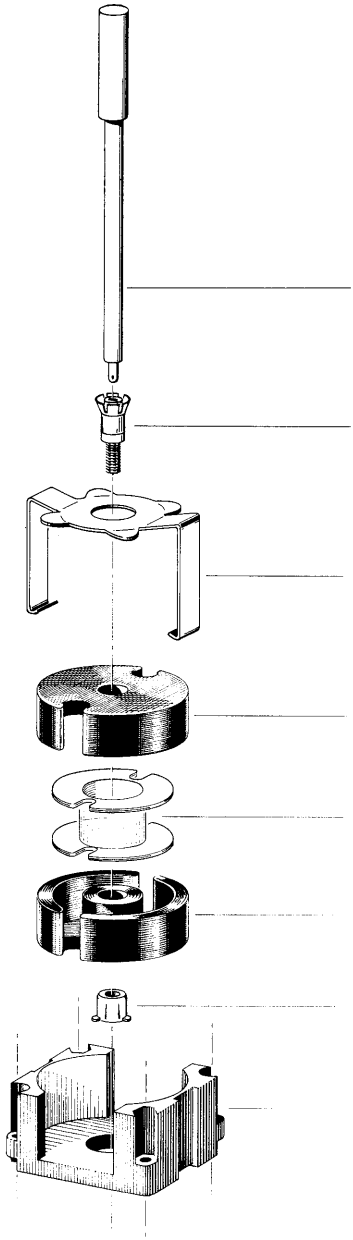


K 1
(typical values)
A_L = 25 nH



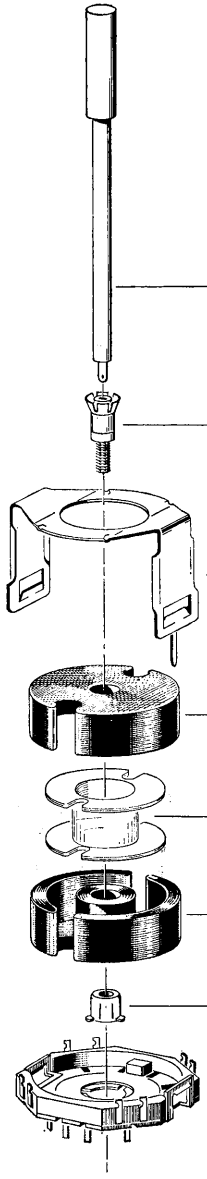
K 1
(typical values)
A_L = 40 nH

Type for wired circuits



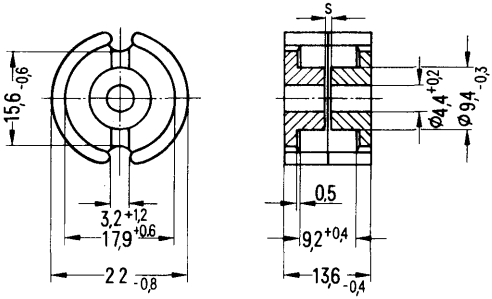
Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65669	167
Yoke	B65663	165
Pot core	B65661	163
Coil former with 1, 2 or 3 sections	B65662	164
Pot core	B65661	163
Threaded flange or threaded sleeve	B65669 B65669	167
Frame	B65663	165

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65669	167
Yoke	B65665	166
Pot core	B65661	163
Coil former with 1, 2 or 3 sections	B65662	164
Pot core	B65661	163
Threaded flange or threaded sleeve	B65669 B65669	167
Connecting board with 8 solder connections	B65665	166

Pot cores complying with DIN 41 293 or IEC publication 133.



Approx. weight 13 g/set

Dimensions in mm

Magnetic data

Core factor $\Sigma\ l/A$ = 0.497 mm^{-1}; Effective area A_e = 63 mm^2

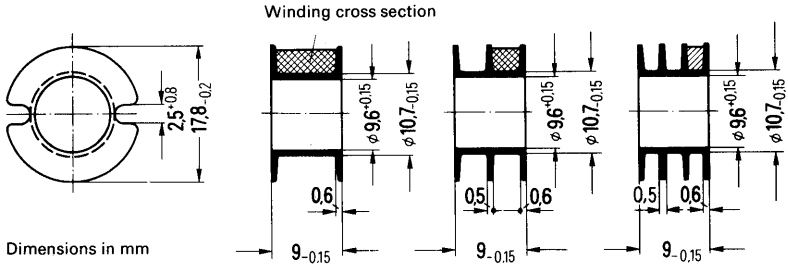
Effective length l_e = 31.5 mm Effective volume V_e = 1980 mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
40	± 3% ≙ A	K 1	2.4	15.9	B65661-L0040-A001
63			1.3	25	B65661-L0063-A001
100		M 33	0.9	39.8	B65661-L0100-A033
100		N 22	1.0	39.8	B65661-L0100-A022
160			0.5	63.5	B65661-L0160-A022
250			0.26	99.5	B65661-L0250-A022
315			0.2	125	B65661-L0315-A022
400			0.14	159	B65661-L0400-A022
250		N 28	0.29	99.5	B65661-L0250-A028
315			0.22	125	B65661-L0315-A028
400			0.16	159	B65661-L0400-A028
630			0.1	250	B65661-L0630-A028
400		N 48	0.16	159	B65661-L0400-A048
500			0.14	200	B65661-L0500-A048
630			0.1	250	B65661-L0630-A048
315		N 32	0.22	125	B65661-L0315-A032
400			0.16	159	B65661-L0400-A032
630	± 5% ≙ J	T 26	0.1	250	B65661-L0630-J026
1250	±10% ≙ K		0.05	497	B65661-L1250-K026
without air gap					
220	+30 −20 % ≙ R	K 1			B65661-L0000-R001
3800		T 26			B65661-L0000-R026
7000		N 30			B65661-L0000-R030
16000	+40 −30 % ≙ Y	T 38			B65661-L0000-Y038

The pot cores B65661-L****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65661-**N******-****.

Coil former and insulating washers B 65 662

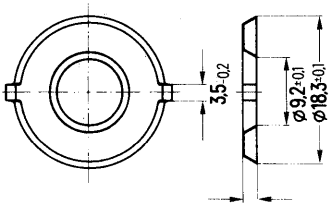
Polyacetal GV or polycarbonate coil former complying with DIN 41 294 or IEC publication 133.
For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	Material	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g		
1	23.4	23.4	44	67	0.4	Polyacetal GV Polycarbonate	B65662-A0000-H001 B65662-A0000-M001
2	11.0	22.0		69	0.45	Polyacetal GV Polycarbonate	B65662-A0000-H002 B65662-A0000-M002
3	6.7	20.0		76	0.5	Polyacetal GV Polycarbonate	B65662-A0000-H003 B65662-A0000-M003

0.06 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65662-A5000-X000

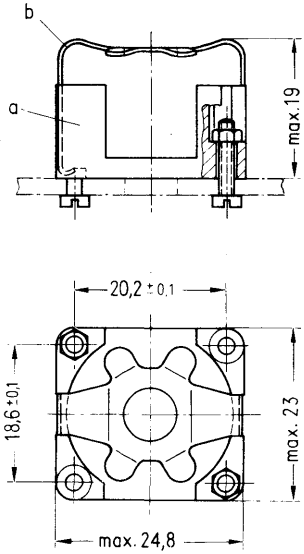
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assembly for wired circuits B 65 663

Mounting assembly with thermosetting plastic frame.
0.4 mm thick nickel-silver spring yoke.
Fixing by screws.

Approx. weight 4 g

B65663-A0001-X000
(for free terminals)



Dimensions in mm

Ordering code B65663-A0001-X000
(Complete mounting assembly for free terminals)

Mounting parts		Ordering code
a	1 frame	C60358-B3185-C103
b	1 yoke	C60358-B3185-C105

2 hex. nuts M 2 DIN 934 m-5 S
2 cylindrical screws AM 2 x 10 DIN 84-5 S
} not included with the assembly

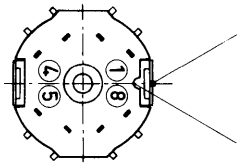
(for less than 3 mm thick mounting plates)

Mounting assembly for printed circuits B 65 665

Mounting assembly with snap-in connection
Polycarbonate GV connecting board
0.4 mm thick nickel-silver spring yoke
Fixing by pins on the solder tags

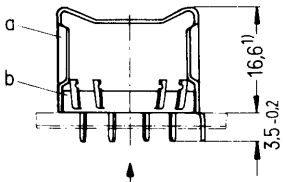
Approx. weight 5 g

B65665-B0004-X000
(with 8 solder tags)

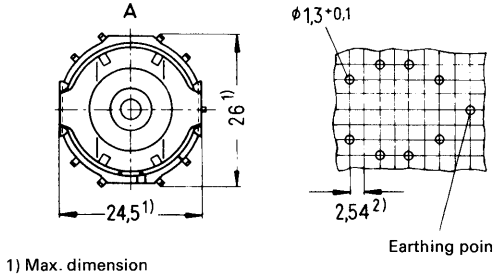


View in direction A

This recess must be on the earthing pin side in order to ensure that the yoke locks in position.



Hole arrangement
view in mounting direction



1) Max. dimension
2) 2.5 mm spacing also permissible

Dimensions in mm

Ordering code B65665-B0004-X000
(Complete mounting assembly with 8 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035-A17-C6
b	1 connecting board (with 8 solder tags)	C61035-A17-B10

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A7.

Adjusting devices B 65 669

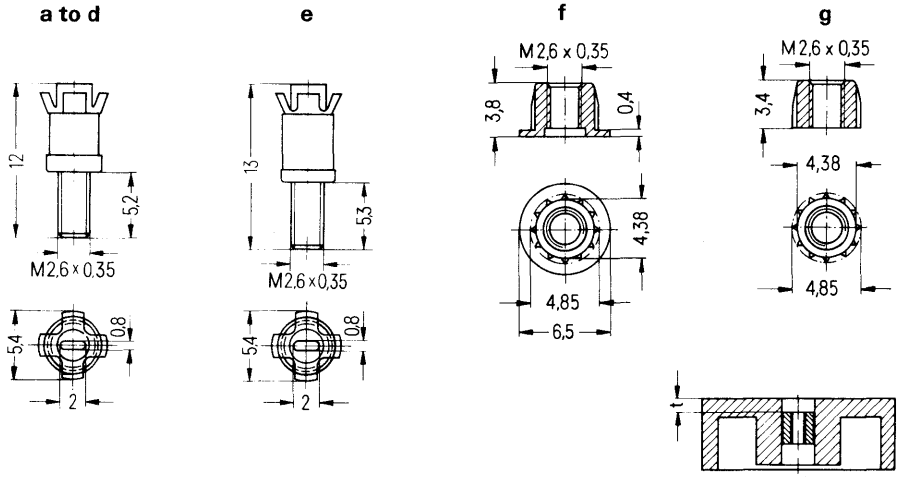
Adjusting screw (a, b, c, d, e) B65669-B0***-X***, consisting of a SIFERRIT tube core on which a polyacetal thread is molded and a spring crown serving as core brake;

fits:

11 polyamide GV **threaded flange** (f) B65669-K0002-X000;

11 polyamide GV **threaded sleeve without flange** (g) B65669-J0003-X000;

adjusting screw driver B63399-A0001-X000.



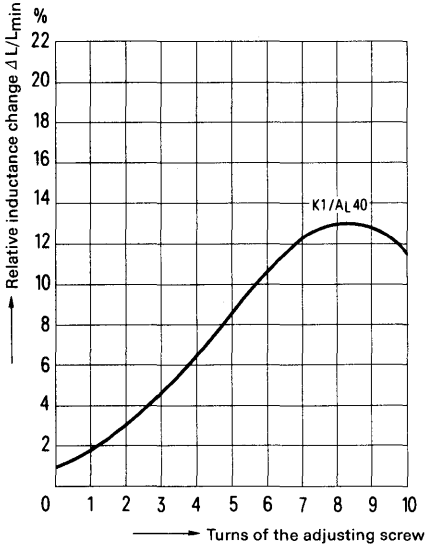
Dimensions in mm

Insertion depth t = 0.1 $^{+0.2}$ mm

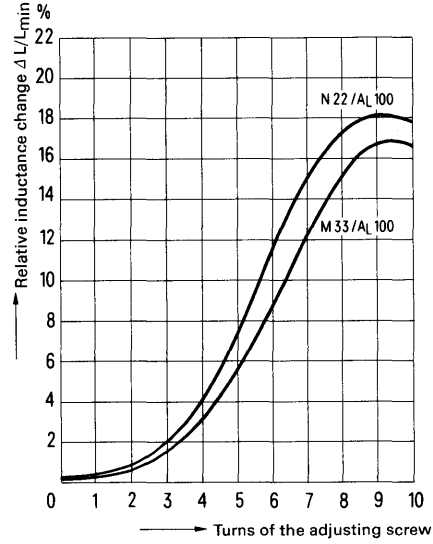
Pot cores B65661		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 1	40	a	3.5 x 3.5	Si 1s	brown	B65669-B0010-X101
	63	b	3.5 x 4.3	K 1	blue	B65669-B0009-X001
M 33	100	a	3.5 x 3.5	K 1	green	B65669-B0010-X001
N 22	100					
	160	b	3.5 x 4.3	M 25	black	B65669-B0008-X025
N 22, N 28	250 315	c	4.1 x 3.5	K 1	yellow	B65669-B0011-X001
N22, N28, N48	400	d	4.1 x 4.3	N 22	red	B65669-B0007-X022
N 28, N 48	630	e	4.18 x 5.0	N 22	white	B65669-C0006-X022
N 32	315	c	4.1 x 3.5	K 1	yellow	B65669-B0011-X001
	400	d	4.1 x 4.3	N 22	red	B65669-B0007-X022

Inductance adjustment curves

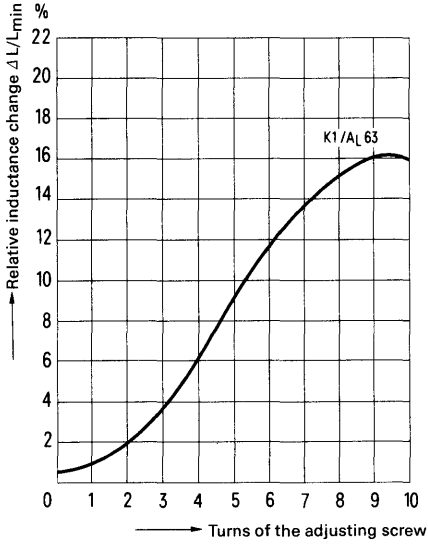
Adjusting screw B65669–B0010–X101
colour code brown



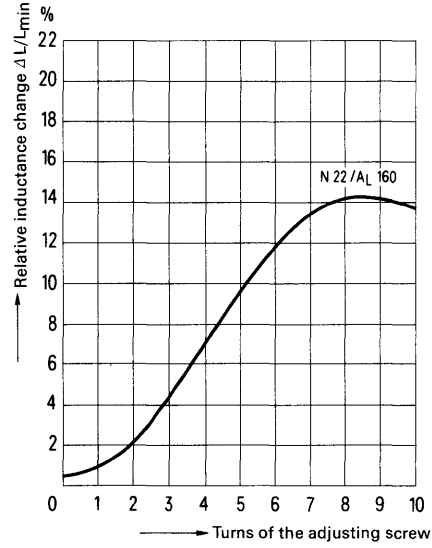
Adjusting screw B65669–B0010–X001
colour code green



Adjusting screw B65669–B0009–X001
colour code blue



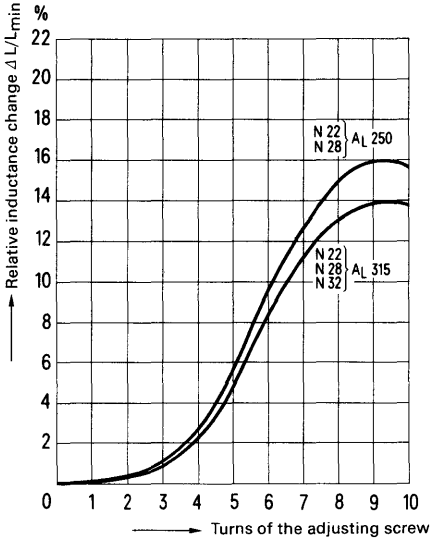
Adjusting screw B65669–B0008–X025
colour code black



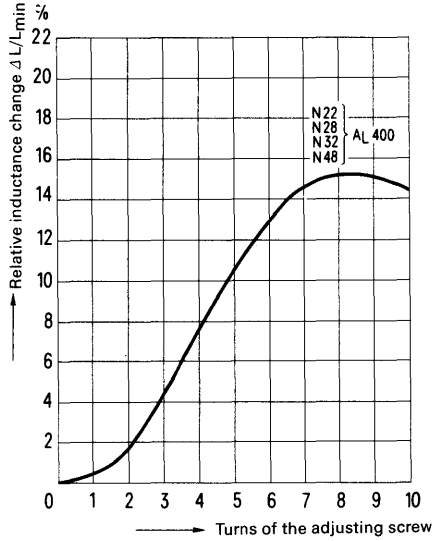
0 ≙ at least two turns engaged.

Inductance adjustment curves

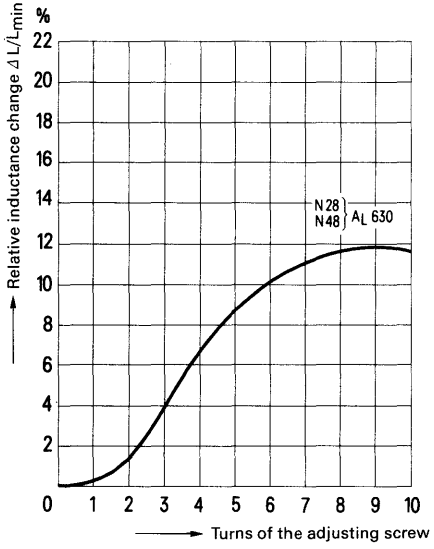
Adjusting screw B65669–B0011–X001
colour code yellow



Adjusting screw B65669–B0007–X022
colour code red



Adjusting screw B65669–C0006–X022
colour code white

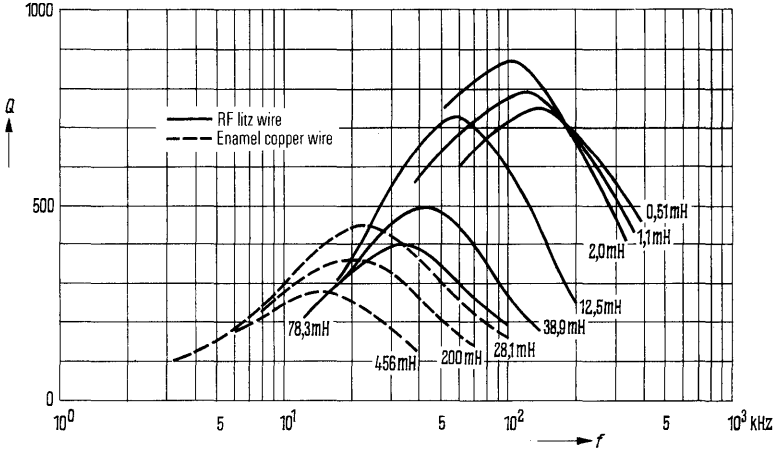


0 ≙ at least two turns engaged.

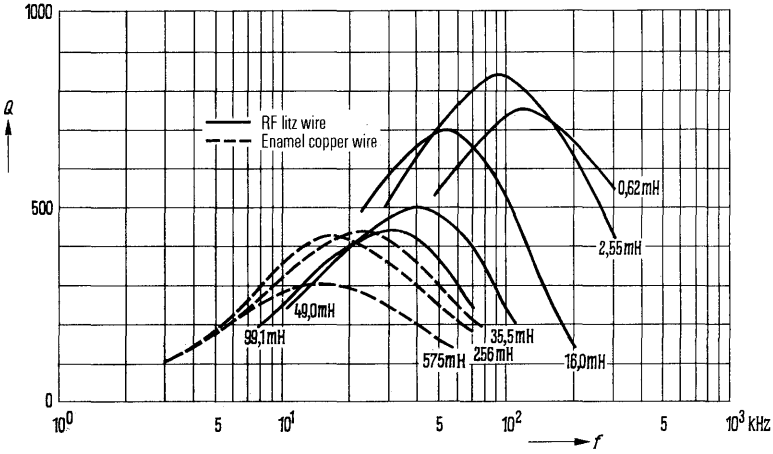
Q factor characteristics; material N 28

L (mH) for A_L = 315 nH	L (mH) for A_L = 400 nH	Turns	Wire; RF litz wire	Number of sections
456	575	1200	0.12 CuL	1
200	256	800	0.15 CuL	1
28.1	35.5	300	0.27 CuL	1
78.3	99.1	500	1 x 12 x 0.04 CuLS	1
38.9	49.0	350	1 x 15 x 0.04 CuLS	1
12.5	16.0	200	1 x 20 x 0.05 CuLS	1
2.0	2.55	80	3 x 20 x 0.05 CuLS	2
1.1	–	59	3 x 20 x 0.05 CuLS	3
0.51	–	40	3 x 20 x 0.05 CuLS	2
–	0.62	40	3 x 30 x 0.05 CuLS	2

Flux density in the core $\hat{B}$ < 1.5 mT



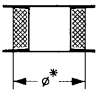
N 28
(typical values)
A_L = 315 nH



N 28
(typical values)
A_L = 400 nH

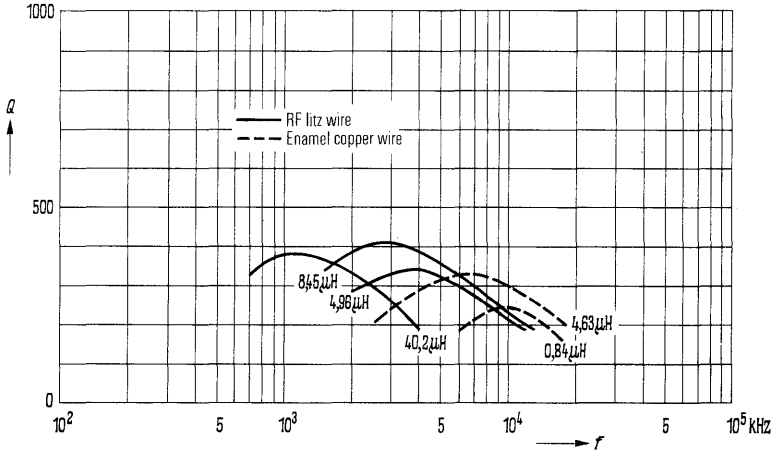
Q factor characteristics; material K 1

L (μH) for A_L = 40 nH	L (μH) for A_L = 63 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
4.63	6.74	10	0,7 CuL	1	16.1
0.84	1.17	4	1.0 CuL	1	15.5
40.2	58.0	10+10+10	1x45x0.04 CuLS	3	16.8
8,45	11.7	13	3x30x0.04 CuLS	1	16.5
4.96	7.0	10	3x30x0.04 CuLS	1	16.5

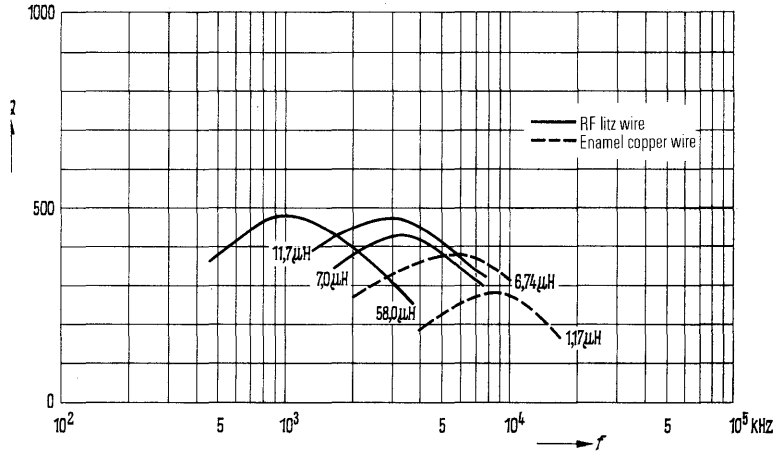


Pad of polystyrene tape up to the diameter* (valid for all sections)

Flux density in the core $\hat{B} < 0.6$ mT

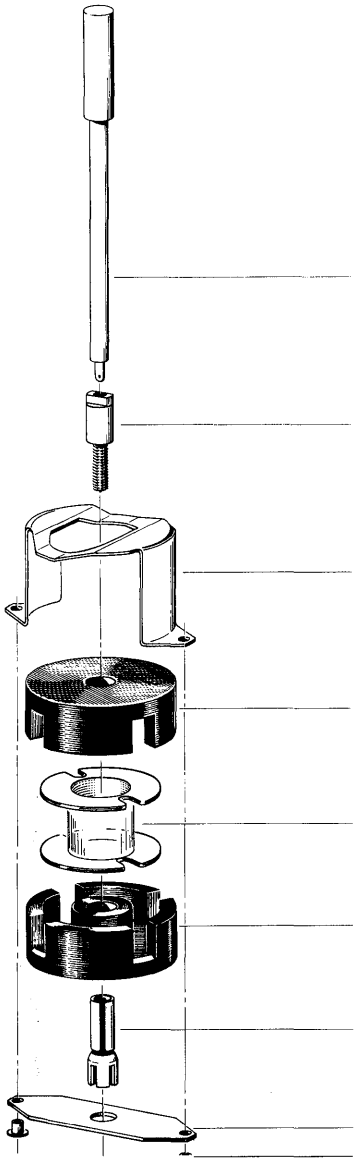


K 1
(typical values)
A_L = 40 nH



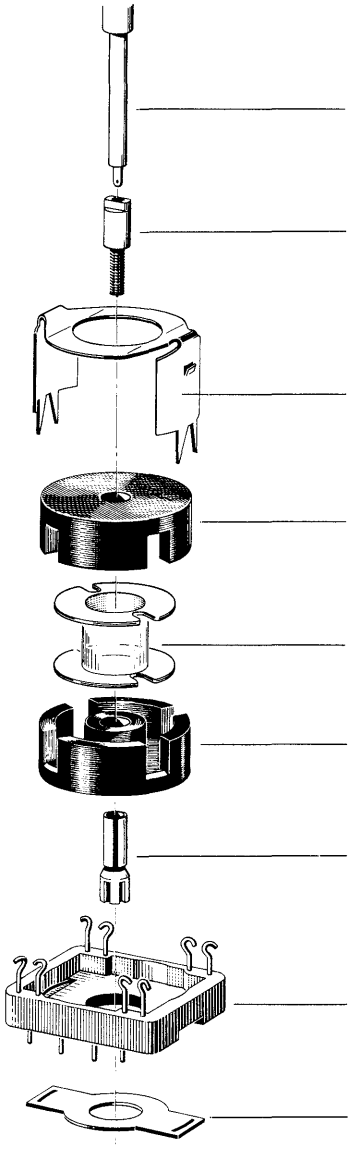
K 1
(typical values)
A_L = 63 nH

Type for wired circuits

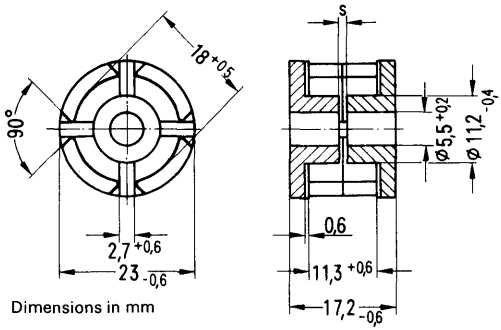


Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw or screw core	B65579 B63310	178
Yoke	B65573	176
Pot core	B65571	174
Coil former with 1, 2 or 3 sections	B65572	175
Pot core	B65571	174
Threaded sleeve part "d" or "g"	B65579	178
Base plate and 2 tubular rivets	B65573	176

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw or screw core	B65579 B63310	178
Yoke	B65575	177
Pot core	B65571	174
Coil former with 1, 2 or 3 sections	B65572	175
Pot core	B65571	174
Threaded sleeve part "d" or "g"	B65579	178
Connecting board with 8 solder connections	B65575	177
Plate	B65575	177



Dimensions in mm

Approx. weight 20 g/set

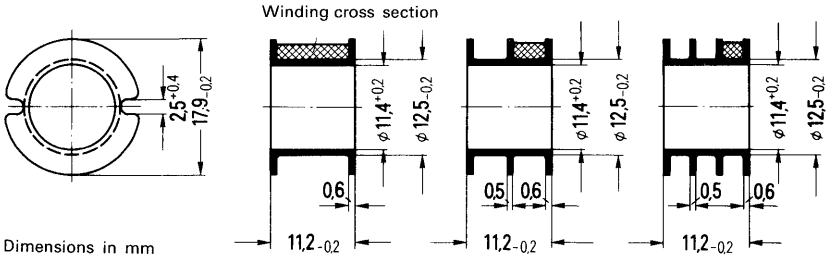
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.404	mm^{-1}
Effective length	l_e =	36.5	mm
Effective area	A_e =	91	mm^2
Effective volume	V_e =	3320	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
40	± 3% △ A	K 1	3,3	12,9	B65571-A0040-A001
63			2,0	20,2	B65571-A0063-A001
63		M 33	2,5	20,2	B65571-A0063-A033
100			1,3	32,2	B65571-A0100-A033
160		N 22	0,8	51,5	B65571-A0160-A022
250			0,43	80,5	B65571-A0250-A022
400			0,21	128	B65571-A0400-A022
400		N 28	0,22	128	B65571-A0400-A028
500			0,15	161	B65571-A0500-A028
400	± 5% △ J	T 26	0,2	128	B65571-A0400-J026
630			0,1	202	B65571-A0630-J026
1250	±10% △ K		0,05	403	B65571-A1250-K026
without air gap					
270	+30 −20 % △ R	K 1			B65571-A0000-R001
4900		T 26			B65571-A0000-R026
9000		N 30			B65571-A0000-R030

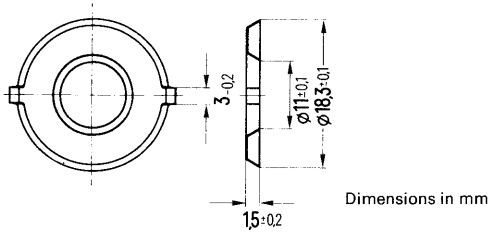
Coil former and insulating washers B 65 572

Polycarbonate coil former.
For winding details see page 87.



Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	21.0	21.0	46	74	0.6	B65572-A0000-M001
2	10.0	20.0		78	0.7	B65572-A0000-M002
3	6.3	18.9		83	0,8	B65572-A0000-M003

0.06 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



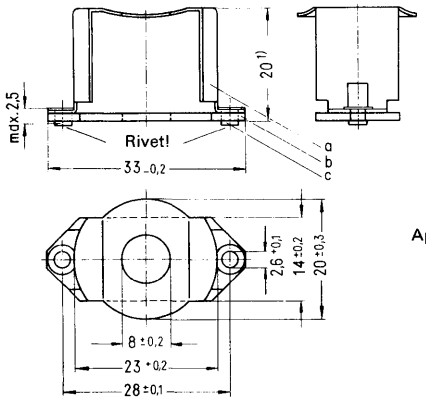
Ordering code B65572-A5000-X000

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assembly for wired circuits B65 573

Mounting assembly with metal base plate.
0.4 mm thick nickel-silver spring yoke.
Fixing by screws or rivets.

B65573–A0001–X000



Approx. weight 6.3 g

Dimensions in mm

Ordering code B65573–A0001–X000
(Complete mounting assembly)

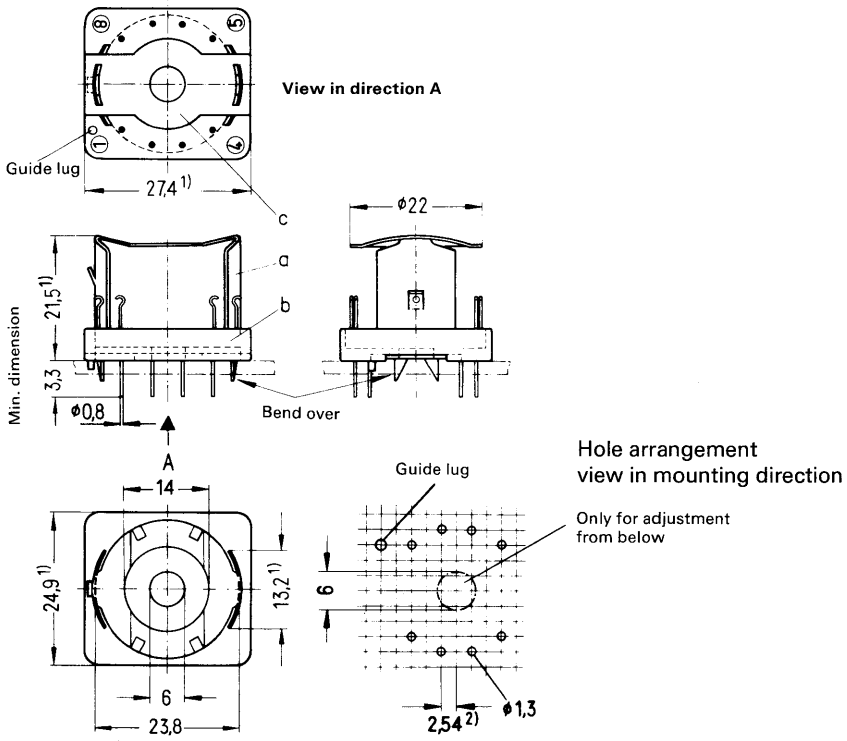
Mounting parts		**Ordering code**
a	1 yoke	C61035–A19–C11
b	1 plate	C40330–B6–C20
c	2 tubular rivets	C40330–A78–C9

1) Max. dimension

Mounting assembly for printed circuits B 65575

Mounting assembly with polycarbonate GV connecting board.
0.4 mm thick nickel-silver spring yoke.
Fixing by pins on the connecting board.

B65575-B0001-X000
(with 8 solder tags)



1) Max. dimension
2) 2.5 mm spacing also permissible

Dimensions in mm

Ordering code B65575-B0001-X000
(complete mounting assembly with 8 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035-A19-C9
b	1 connecting board (with 8 solder tags)	C61035-A19-B1
c	1 plate	C40330-B6-C48

The previous mounting assembly B65575-A0001-X000 (0.6 mm dia terminal pins) is fully interchangeable with the new mounting assembly B65575-B0001-X000.

Adjusting devices B 65579

Adjusting screw (a, b, c) B65579–A0***–X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded.

fits:

polyester GV **threaded sleeve** (d) B65579–K0001–X000 with slotted shank (core brake);

adjusting screw driver B63399–B0004–X000

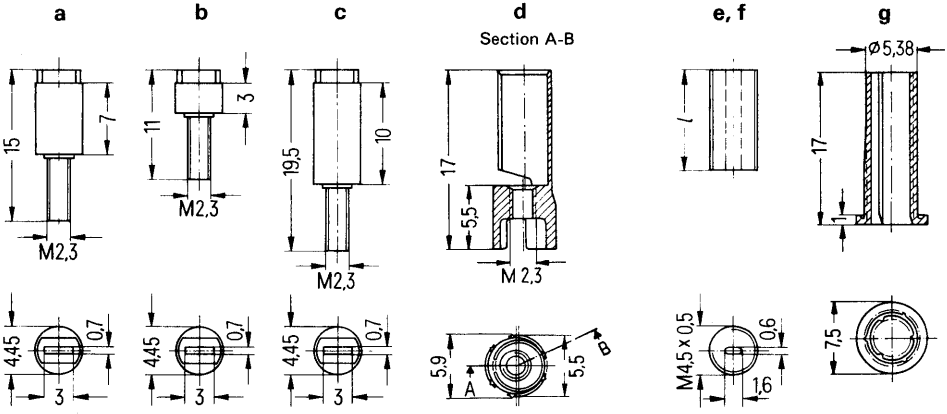
or as required

SIFERRIT **screw core** (e, f) B63310–A4***–X***, which cuts its own thread into the sleeve;

fits:

11 polyamide GV **threaded sleeve** (g) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.



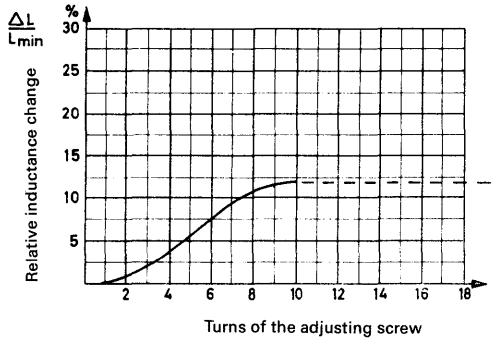
Dimensions in mm

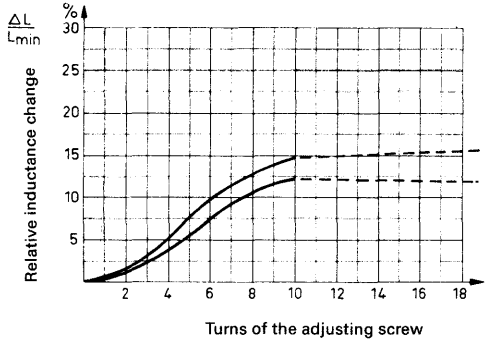
Length *l*
part *e*: $13.6_{-0.6}$
part *f*: $9.7_{-0.4}$

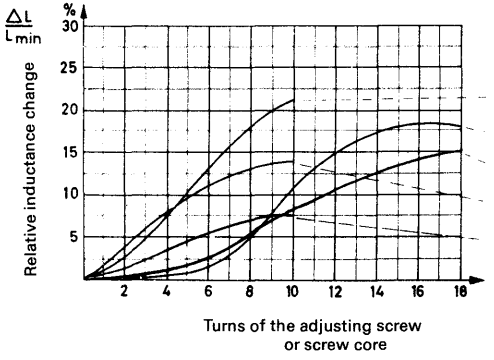
Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	d			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	a	K 1	violet	B65579–A0001–X001
	b	N 23[1)]	red	B65579–A0002–X023
	b	K 1	violet	B65579–A0002–X001
	c	N 23[1)]	red	B65579–A0003–X023
	c	K 1	violet	B65579–A0003–X001
Threaded sleeve	g			B65579–J0003–X000
Associated screw core as required	e	N 22	red	B63310–A4009–X022
	f	M 25	white	B63310–A4001–X025

1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves





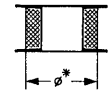


Pot core		Adjusting devices
Material	A_L value	Adjusting screw or screw core
K 1	40	b; B65579–A0002–X001
M 33	63	b; B65579–A0002–X023
M 33	100	b; B65579–A0002–X023
N 22	160	a; B65579–A0001–X023
N 22	250	f; B63310–A4001–X025
N 22	400	e; B63310–A4009–X022[1)]
N 22	250	a; B65579–A0001–X023
N 22	400	a; B65579–A0001–X023

1) Initial position of the core is approx. 5.2 mm above the flange of the threaded sleeve.

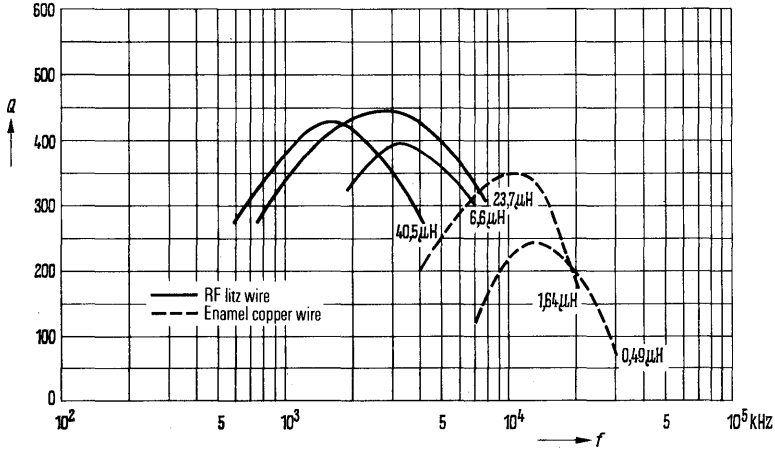
Q factor characteristics; material K 1

L (μH) for A_L = 40 nH	L (μH) for A_L = 63 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
1.64	2.32	6	1.3 CuL	1	15.0
0.49	0.65	3	1.2 CuL	1	15.0
40.5	57.0	10+10+10	1x45x0.04 CuLS	3	16.6
23.7	33.4	23	1x45x0.04 CuLS	1	16.6
6.6	9.4	12	3x30x0.04 CuLS	1	16.3

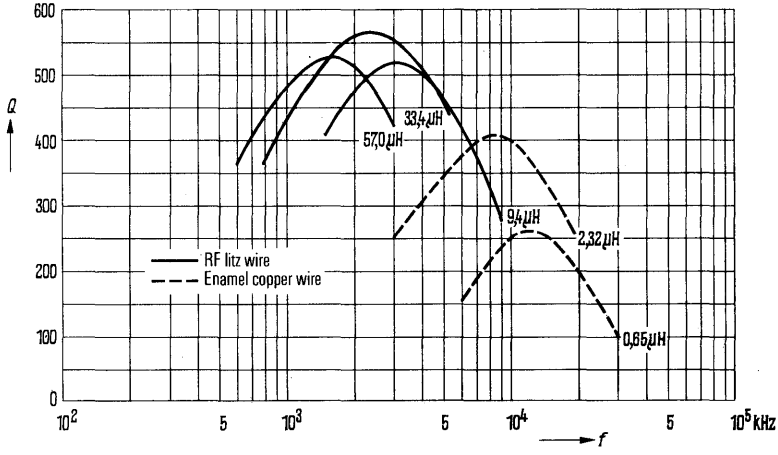


Pad of polystyrene tape up to the diameter* (valid for all sections)

Flux density in the core $\hat{B}$ < 0.6 mT

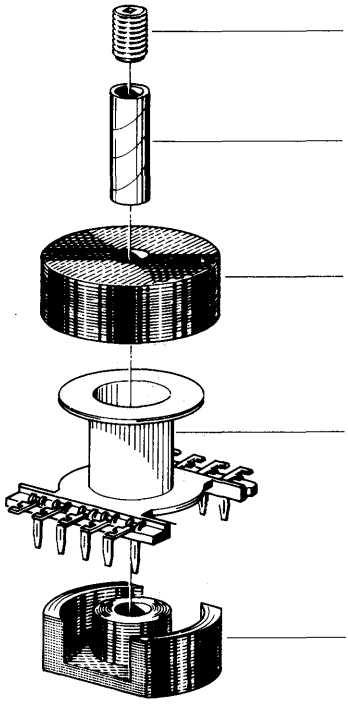


K 1
(typical values)
A_L = 40 nH



K 1
(typical values)
A_L = 63 nH

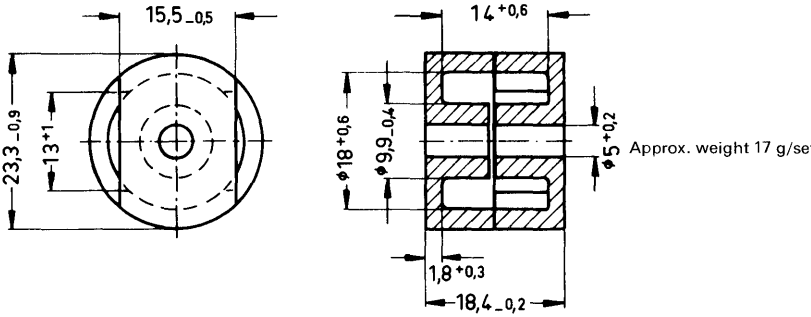
e.g. for use in telephone systems



Individual parts	Part No.	Page
Screw core	B63310	183
Sleeve	B65717	183
Pot core	B65716	182
Coil former, 1 section, with 10 pin connections	B65717	183
Pot core	B65716	182

e.g. for use in telephone systems

Pot cores, suitable e.g. for application in push-button telephone sets. Because of the large slots in the lower part a higher number of connections can be brought out.



Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	0.73	mm^{-1}
Effective length	l_e =	41	mm
Effective area	A_e =	56	mm^2
Effective volume	V_e =	2300	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	±3% ≙ A	N 22	0.32	145	B65716-A0250-A022
160		N 28	0.58	93	B65716-A0160-A028
250			0.32	145	B65716-A0250-A028
315			0.24	183	B65716-A0315-A028
400			0.18	232	B65716-A0400-A028
250		N 32	0.34	145	B65716-A0250-A032
270			0.31	157	B65716-A0270-A032
400			0.19	232	B65716-A0400-A032
without air gap					
2500	$^{+30}_{-20}$ % ≙ R	T 26			B65716-A0000-R026

Associated parts

Polyamide GV **coil former** (figure 1) with 10 pin connections.
Permissible soldering temperature 280 °C/536 °F, 1 sec.
Polyester-paper **sleeve** (figure 2), which is cemented into the pot core hole.
SIFERRIT N 22 **screw core** (figure 3) which cuts its own guiding thread into the cams of the sleeve.

Figure 1

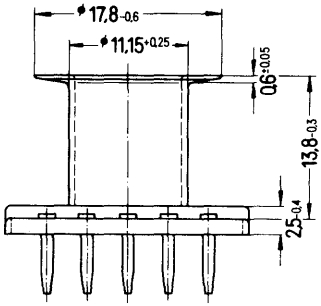
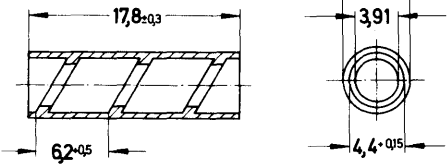
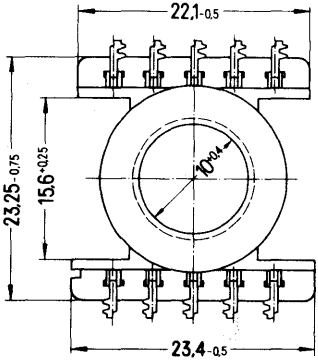


Figure 2





Hole arrangement
View in mounting direction

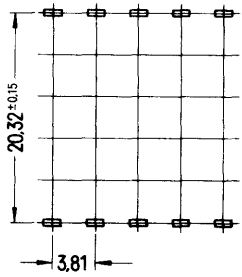
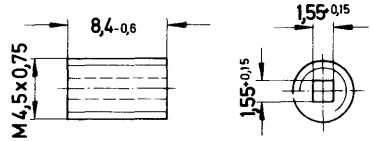


Figure 3

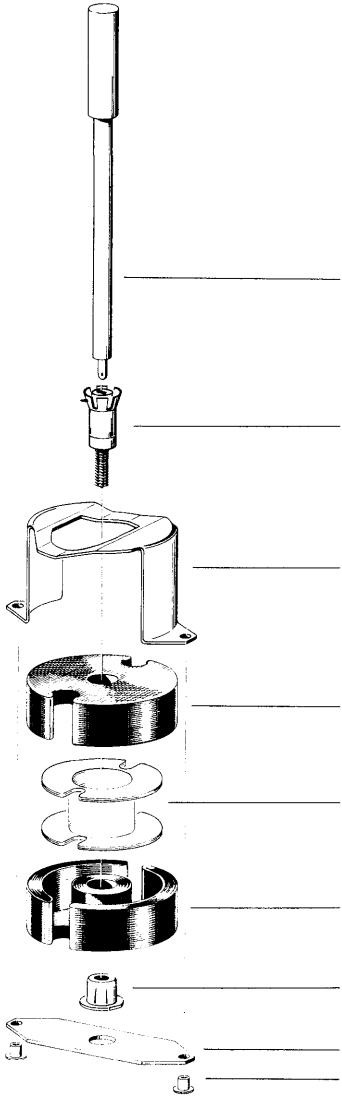


Dimensions in mm

Coil former					
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx weight g	**Ordering code**
1	35.6	44.8	43.4	1.3	B65717-A1001-D001
Sleeve				0.2	B65717-Z3001-X000
Screw core				1.0	B63310-A4020-X022

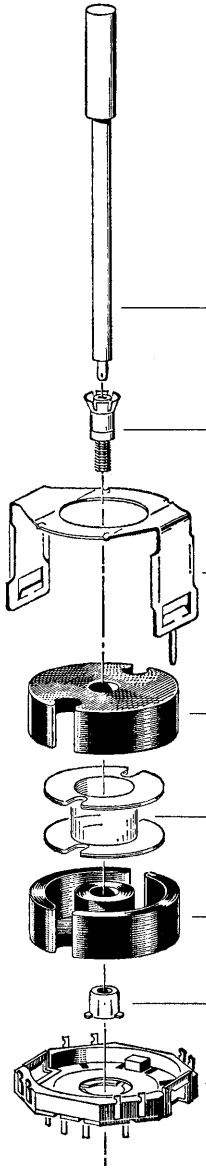
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Type for wired circuits



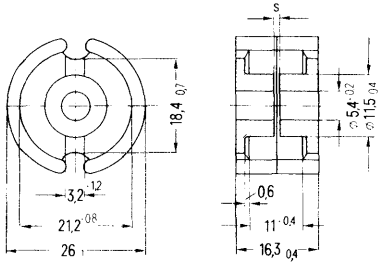
Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65679	191
or	B65579	193
screw core	B63310	193
Yoke	B65673	189
Pot core	B65671	187
Coil former with 1, 2 or 3 sections	B65672	188
Pot core	B65671	187
Threaded flange or	B65679	191
threaded sleeves	B65579	193
Base plate and		
2 tubular rivets	B65673	189

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw or screw core	B65679 B65579 B63310	191 193 193
Yoke	B65675	190
Pot core	B65671	187
Coil former with 1, 2 or 3 sections	B65672	188
Pot core	B65671	187
Threaded flange or threaded sleeve	B65679 B65579	191 193
Connecting board with 8 solder connections	B65675	190

Pot cores complying with DIN 41 293 or IEC publication 133.



Approx. weight 21 g/set

Dimensions in mm

Magnetic data

Core factor $\Sigma\ l/A$ = 0.4 mm^{-1} Effective area A_e = 94 mm^2

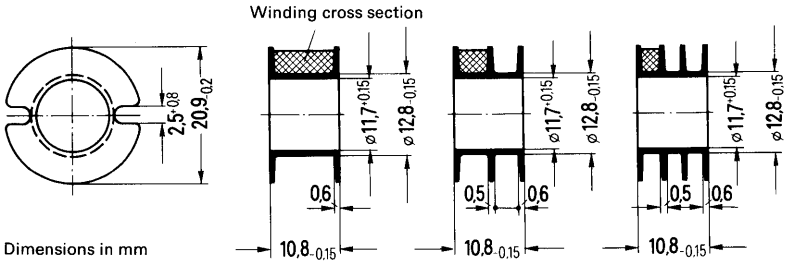
Effective length l_e = 37.5 mm Effective volume V_e = 3520 mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
63	± 3% △A	K 1	2.28	20	B65671-L0063-A001
100			0.90	31.9	B65671-L0100-A001
100		M 33	1.52	31.9	B65671-L0100-A033
160			0.78	51	B65671-L0160-A033
160		N 22	0.80	51	B65671-L0160-A022
250			0.40	79.5	B65671-L0250-A022
315			0.32	100	B65671-L0315-A022
400			0.22	127.5	B65671-L0400-A022
630			0.12	200	B65671-L0630-A022
315		N 28	0.34	100	B65671-L0315-A028
400			0.24	127.5	B65671-L0400-A028
630			0.15	200	B65671-L0630-A028
800			0.11	255	B65671-L0800-A028
1000	± 5% △J	T 26	0.10	319	B65671-L1000-J026
1600	±10% △K		0.05	510	B65671-L1600-K026
without air gap					
270	+30 −20 % △R	K 1 T 26 N 30			B65671-L0000-R001 B65671-L0000-R026 B65671-L0000-R030
4900					
9000					
20000	+40 −30 % △Y	T 38			B65671-L0000-Y038

The pot cores B65671-L****-A**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65671-**N******-****.

Coil former and insulating washers B 65672

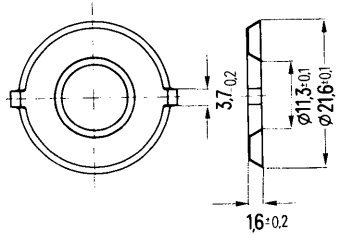
Polyacetal GV or polycarbonate coil former complying with DIN 41 294 or IEC publication 133.
For winding details see page 86.



Dimensions in mm

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	Material	Ordering code
	of one section mm²	total mm²	mm	μΩ	g		
1	32	32	52	55	0.4	Polyacetal GV Polycarbonate	B65672-A0000-H001 B65672-A0000-M001
2	15	30		59	0,5	Polyacetal GV Polycarbonate	B65672-A0000-H002 B65672-A0000-M002
3	9.6	28.8		61	0,6	Polyacetal GV Polycarbonate	B65672-A0000-H003 B65672-A0000-M003

0.06 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

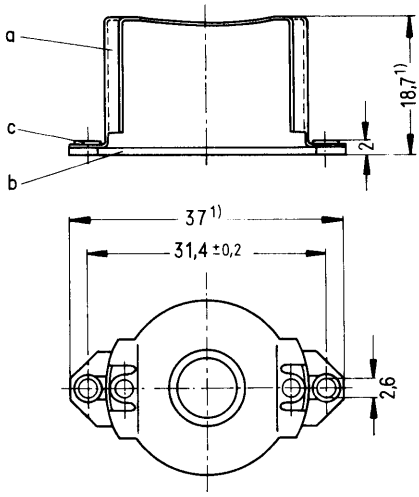
Ordering code B65672-A5000-X000

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assembly for wired circuits B 65673

Mounting assembly with metal base plate (b).
0.4 mm thick nickel-silver spring yoke (a).
Fixing by screws or rivets (c).

B65673-A0006-X000
(without solder connections)



Approx. weight 7 g

Dimensions in mm

1) Max. dimension

Ordering code B65673-A0006-X000
(complete mounting assembly without solder connections)

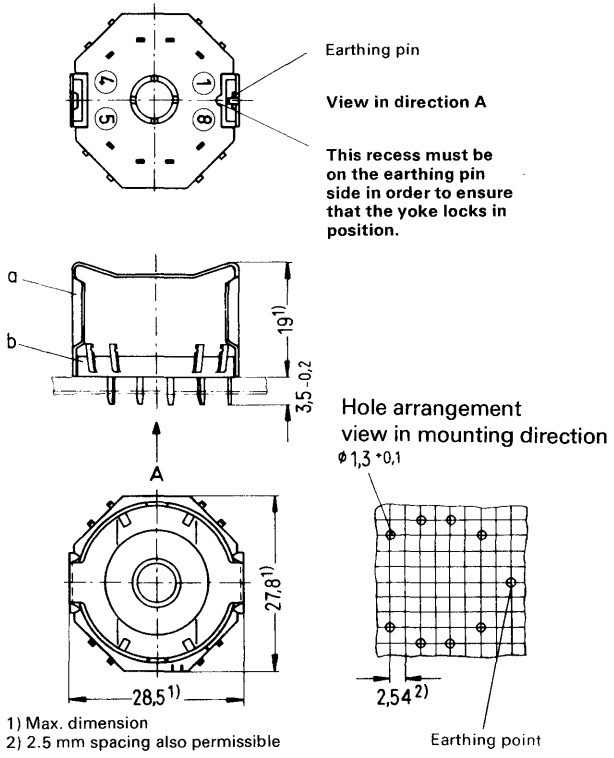
Mounting parts		Ordering code
a	1 yoke	C60358-B3181-C116
b	1 base plate	C60358-B3181-C117
c	2 tubular rivets	C60358-B3059-C106

Mounting assembly for printed circuits B 65675

Mounting assembly with snap-in connection.
Polycarbonate GV connecting board.
0.4 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 7 g

B65675-A0005-X000
(with 8 solder tags)



1) Max. dimension
2) 2.5 mm spacing also permissible

Ordering code B65675-A0005-X000
(Complete mounting assembly with 8 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035-A11-C2
b	1 connecting board (with 8 solder tags)	C61035-A11-B1

Drawing data for the assembly of mounting devices available on request.
Ordering code C61407-A4-A8.

Adjusting devices B 65679

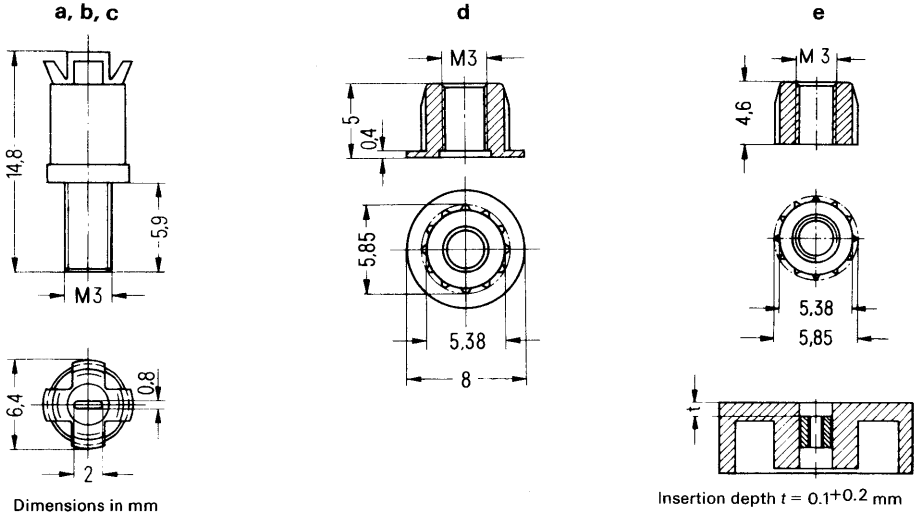
Adjusting screw (a, b, c) B65679-B0$_{***}$-X$_{***}$, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and a spring crown serving as core brake;
fits:

11 polyamide GV **threaded flange** (d) B65679-J0001-X000

11 polyamide GV **threaded sleeve without flange** (e) B65679-J0002-X000

adjusting screw driver B63399-A0001-X000

Due to the limited distance between the adjusting core B65679-B0***-X*** and the internal borehole the total assembly must be centered accurately.



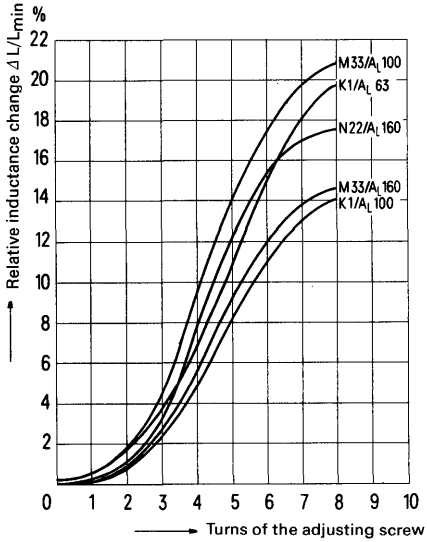
Dimensions in mm

Insertion depth $t = 0.1^{+0.2}$ mm

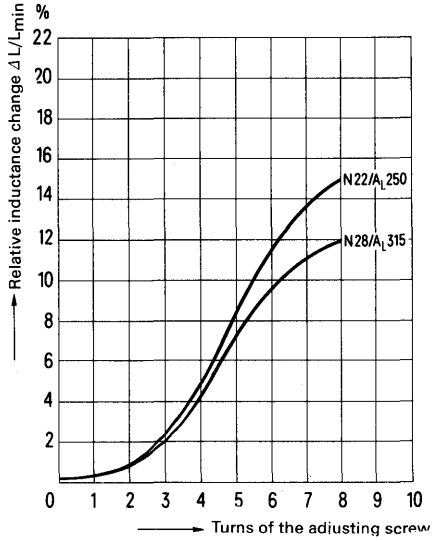
Pot cores B65671		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Tube core Material	Colour code	Ordering code
K 1	63	b	4.98 x 6.2	Si 1 s	yellow	B65679-B0002-X101
M 33. K 1	100					
M 33. N 22	160					
N 22	250	c	4.55 x 6.2	N 22	red	B65679-B0003-X022
	315					
N 22. N 28	400	b	4.98 x 6.2	N 22	black	B65679-B0002-X022
	630	a	5.15 x 6.2	N 22	white	B65679-B0001-X022
N 28	800					

Inductance adjustment curves

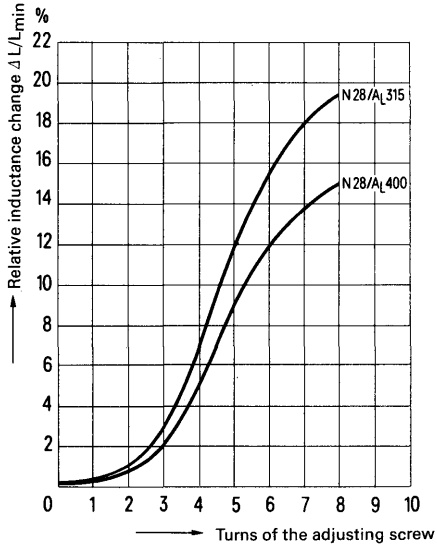
Adjusting screw B65679–B0002–X101
colour code yellow



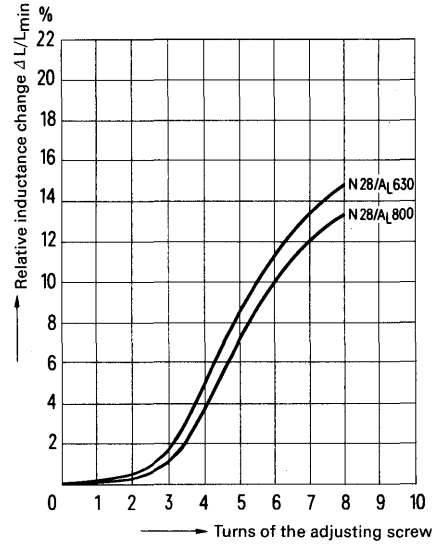
Adjusting screw B65679–B0003–X022
colour code red



Adjusting screw B65679–B0002–X022
colour code black



Adjusting screw B65679–B0001–X022
colour code white



0 ≙ at least two turns engaged.

Adjusting devices B 65 579

Adjusting screw (a, b, c) B65579–A0***–X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded.

fits:

polyester Gv **threaded sleeve** (d) B65579–K0001–X000 with slotted shank (core brake);

adjusting screw driver B63399–B0004–X000

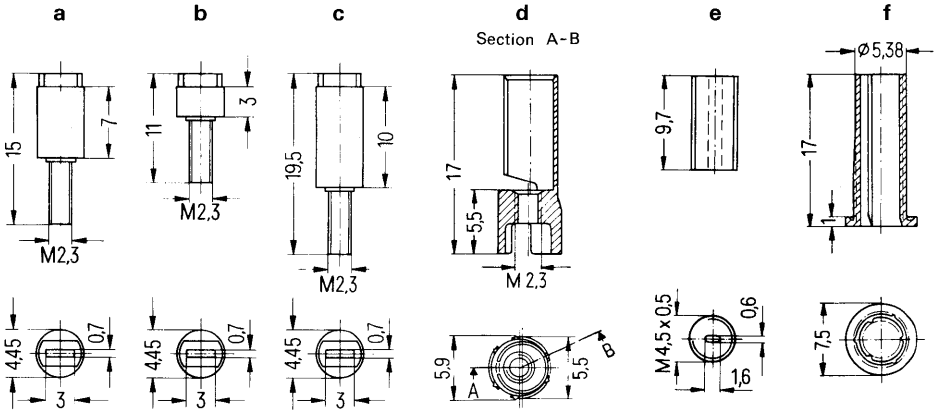
or as required

SIFERRIT **screw core** (e) B63310–A4001–X025, which cuts its own thread into the sleeve;

fits:

11 polyamide GV **threaded sleeve** (f) B65579–J0003–X000.

adjusting screw driver B63399–A0001–X000.

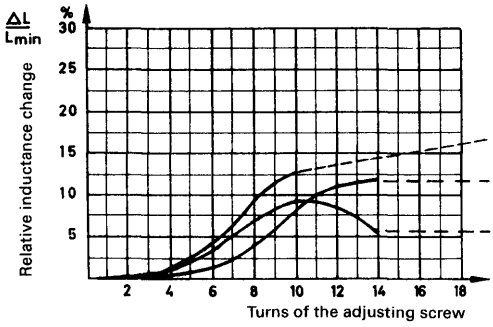


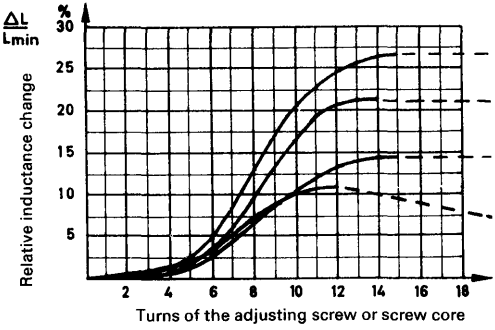
Dimensions in mm

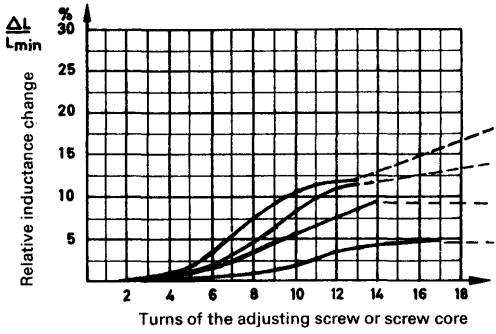
Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	d			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	a	K 1	violet	B65579–A0001–X001
	b	N 23[1)]	red	B65579–A0002–X023
	b	K 1	violet	B65579–A0002–X001
	c	N 23[1)]	red	B65579–A0003–X023
	c	K 1	violet	B65579–A0003–X001
Threaded sleeve	f			B65579–J0003–X000
Associated screw core	e	M 25	white	B63310–A4001–X025

1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves





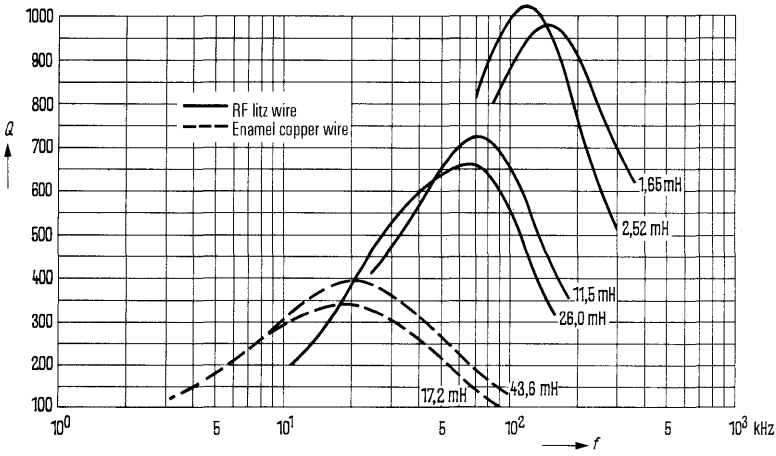


Pot core		Adjusting devices
Material	A_L value	Adjusting screw or screw core
M 33	100	b; B65579-A0002-X023
K 1	100	a; B65579-A0001-X001
K 1	63	b; B65579-A0002-X001
N 22	160	e; B63310-A4001-X025
M 33	160	e; B63310-A4001-X025
N 22	160	a; B65579-A0001-X023
M 33	160	a; B65579-A0001-X023
N 22	250	e; B63310-A4001-X025
N 22	250	a; B65579-A0001-X023
N 22	315	e; B63310-A4001-X025
N 22	315	c; B65579-A0003-X023
N 22	400	c; B65579-A0003-X023
N 22	630	c; B65579-A0003-X023

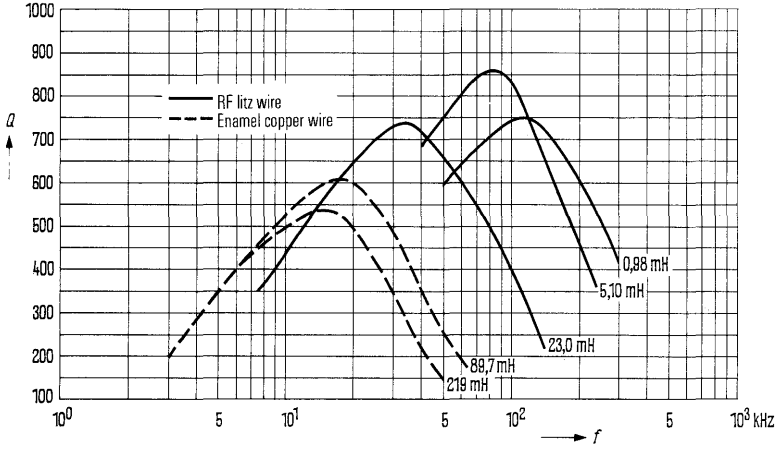
Q factor characteristics; material N 28

L (mH) for A_L = 315 nH	L (mH) for A_L = 630 nH	Turns	Wire; RF litz wire	Number of sections
–	219	600	0.20 CuL	1
43.6	89.7	385	0.27 CuL	1
17.2	–	235	0.35 CuL	1
26.0	–	290	1 x 20 x 0.05 CuLS	1
11.5	23.0	193	1 x 30 x 0.05 CuLS	1
2.52	5.10	90	3 x 30 x 0.04 CuLS	2
1.65	–	78	3 x 20 x 0.05 CuLS	3
–	0.98	39	3 x 20 x 0.07 CuLS	3

Flux density in the core $\hat{B} < 1.5$ mT



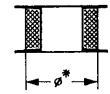
N 28
(typical values)
A_L = 315 nH



N 28
(typical values)
A_L = 630 nH

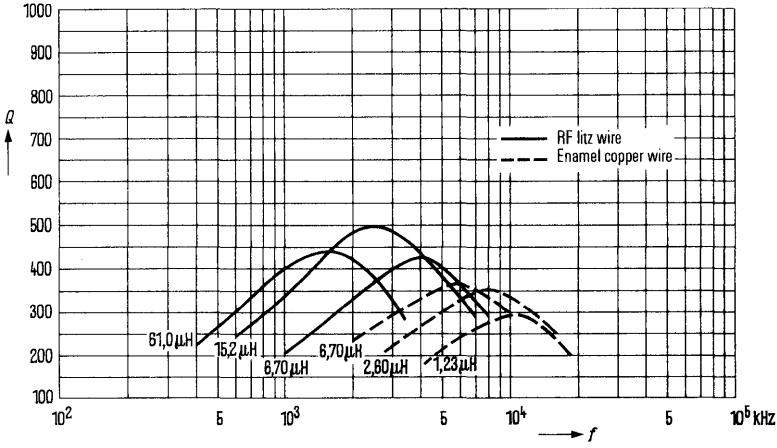
Q factor characteristics; material K 1

L (μH) for A_L = 63 nH	L (μH) for A_L = 100 nH	Turns	Wire; RF litz wire	Number of sections	mm diameter*
6.70	11.1	10	0.7 CuL	1	18.0
2.60	4.14	6	1.0 CuL	1	17.5
1.23	2.00	4	1.0 CuL	1	17.5
61.0	96.5	10+10+10	1 x 45 x 0.04 CuLS	3	18.5
15.2	24.1	15	3 x 30 x 0.04 CuLS	1	18.0
6.70	11.1	3+4+3	3 x 30 x 0.04 CuLS	3	18.0

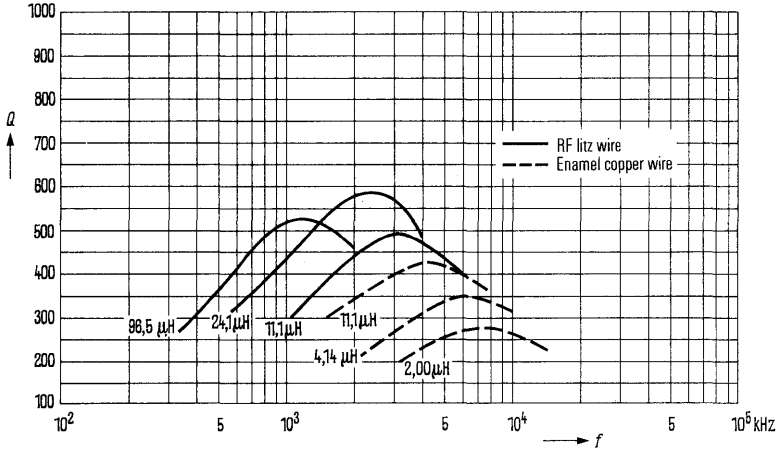


Pad of polystyrene tape up to the diameter* (valid for all sections)

Flux density in the core $\hat{B}$ < 0.6 mT

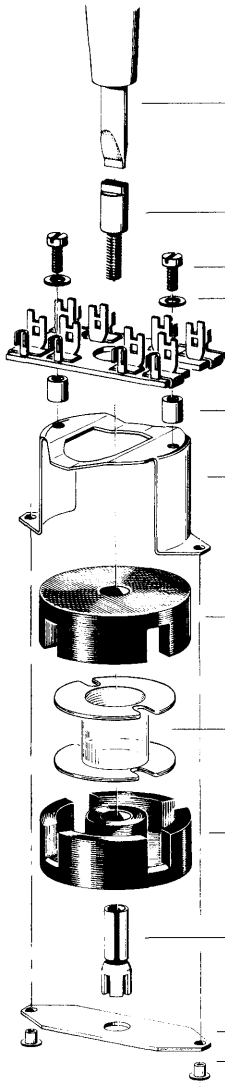


K 1
(typical values)
A_L = 63 nH



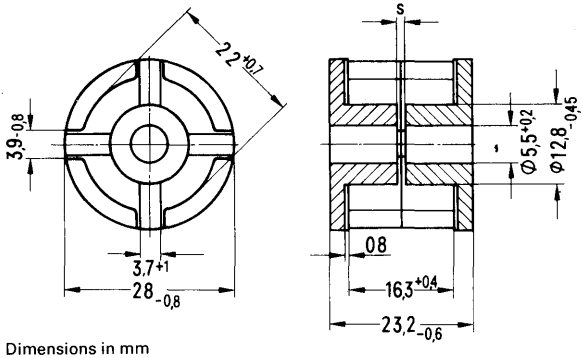
K 1
(typical values)
A_L = 100 nH

Type for wired circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	201 201
Cylindrical screws [1]		
Washers [1]		
Solder tag board as required	B65583	200
Threaded bushes (only for type with solder tag board)		
Yoke	B65583	200
Pot core	B65581	198
Coil former with 1 or 2 sections	B65582	199
Pot core	B65581	198
Threaded sleeve part "d" or "g"	B65579	201
Base plate with 2 tubular rivets	B65583	200

1) These parts are supplied for types with solder tag board.



Approx. weight 40 g/set

Dimensions in mm

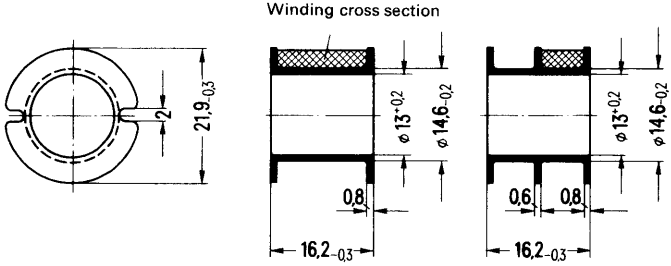
Magnetic data

Core factor	$\Sigma\, l/A$ =	0.384	mm^{-1}
Effective length	l_e =	49.3	mm
Effective area	A_e =	128	mm^2
Effective volume	V_e =	6320	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
40	± 3% △A	K 1	5.6	12.3	B65581-A0040-A001
63			3.4	19.3	B65581-A0063-A001
160		M 33	1.1	49	B65581-A0160-A033
250		N 22	0.6	77	B65581-A0250-A022
400			0.31	123	B65581-A0400-A022
630			0.19	193	B65581-A0630-A022
400		N 28	0.32	123	B65581-A0400-A028
630			0.2	193	B65581-A0630-A028
630	± 5% △J	T 26	0.2	193	B65581-A0630-J026
1000			0.1	306	B65581-A1000-J026
1600	±10% △K		0.05	490	B65581-A1600-K026
without air gap					
5400	+30 % △R	T 26			B65581-A0000-R026
9500	−20 %	N 30			B65581-A0000-R030

Coil former B 65 582

Polycarbonate coil former.
For winding details see page 87.



Dimensions in mm

Number of sections	Useful winding cross section A_N of one section mm²	Useful winding cross section A_N total mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	44.0	44.0	56	43	1.4	B65582-A0000-M001
2	20.8	41.6		46	1.6	B65582-A0000-M002

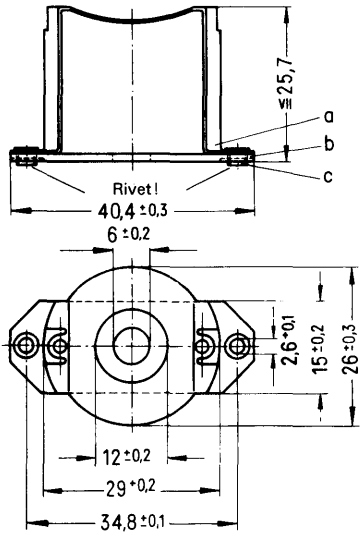
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for wired circuits B 65 583

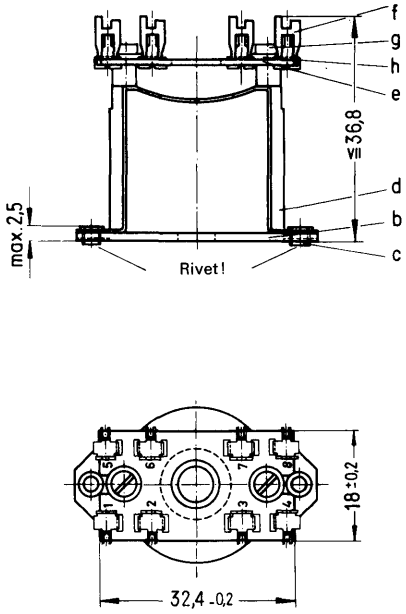
Mounting assemblies with metal base plate.
0.5 mm thick nickel-silver spring yoke.
Types with or without solder tag board.
Fixing by screws or rivets.

Approx. weight 11 g (without solder tag board)
13.5 g (with solder tag board)

B65583–A0001–X000
(without solder tag board)



B65583–A0004–X000
(with solder tag board)



Dimensions in mm

Ordering code B65583–A0001–X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65583–A0004–X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C60358–B3058–C108	b	1 base plate	C60358–B3058–C105
			c	2 tubular rivets	C60358–B3059–C106
b	1 base plate	C60358–B3058–C105	d	1 yoke compl.	C60358–B3058–B1
			e+f	1 solder tag board compl.	C60358–B3058–B2
c	2 tubular rivets	C60358–B3059–C106	g	2 cylindrical screws	D84–F30–M
			h	2 washers	D125–A18–M

Adjusting devices B 65 579

Adjusting screw (a, b, c) B65579–A0***–X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded.

fits:

polyester GV **threaded sleeve** (d) B65579–K0001–X000 with slotted shank serving as core brake;

adjusting screw driver B63399–B0004–X000

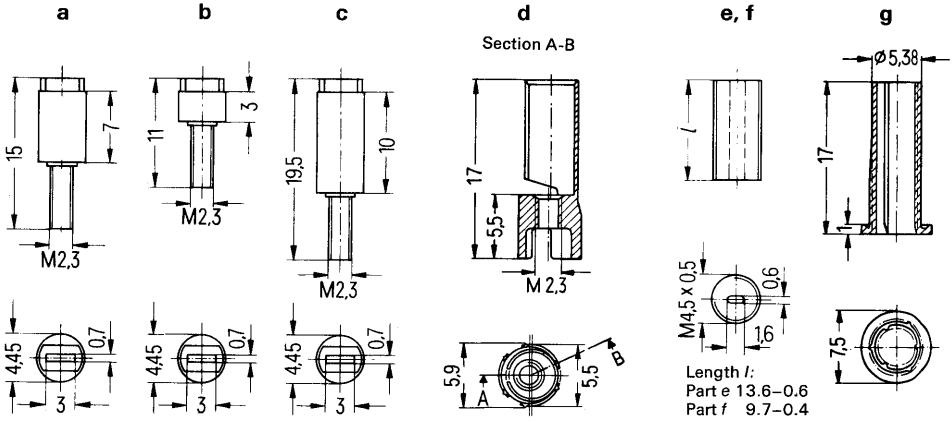
or as required

SIFERRIT **adjusting screw** (e, f) B63310–A4***–X***; this screw core cuts its own thread into the sleeve;

fits:

11 polyamide GV **threaded sleeve** (g) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.

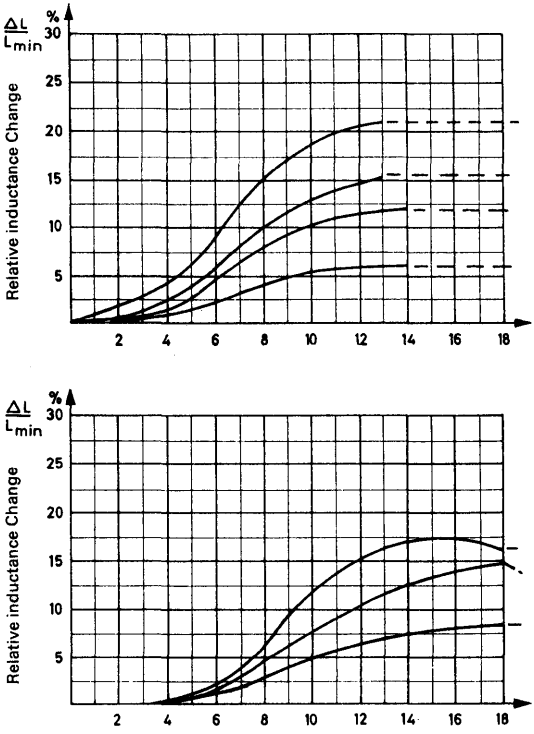


Dimensions in mm

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	d			B65579-K0001-X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579-A0001-X023
	a	K 1	violet	B65579-A0001-X001
	b	N 23[1)]	red	B65579-A0002-X023
	b	K 1	violet	B65579-A0002-X001
	c	N 23[1)]	red	B65579-A0003-X023
	c	K 1	violet	B65579-A0003-X001
Threaded sleeve	g			B65579-J0003-X000
Associated screw core as required	e	N 22	red	B63310-A4009-X022
	f	M 25	white	B63310-A4001-X025

1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

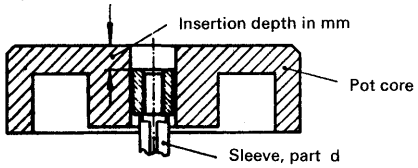


Pot core		Adjusting devices	
Material	A_L value	Adjusting screw or screw core	Insertion depth mm
M 33	160	a; B65579-A0001-X023	2
N 22	250	a; B65579-A0001-X023	2
N 22	400	c; B65579-A0003-X023	2
N 22	630	c; B65579-A0003-X023	2

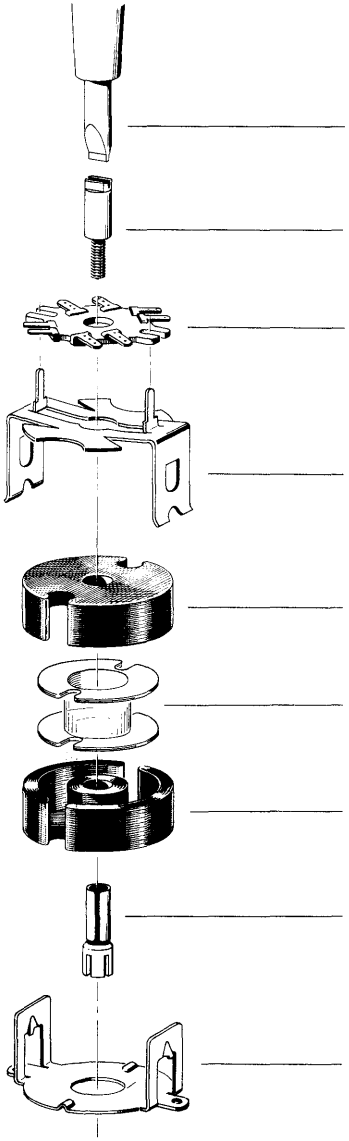
N 22	250	f; B63310-A4001-X025	
N 22	400	e; B63310-A4009-X022[1)]	
N 22	630	e; B63310-A4009-X022[1)]	

1) Initial position of the core is approx. 1.6 mm above the flange of the threaded sleeve.

Explanation of "insertion depth"

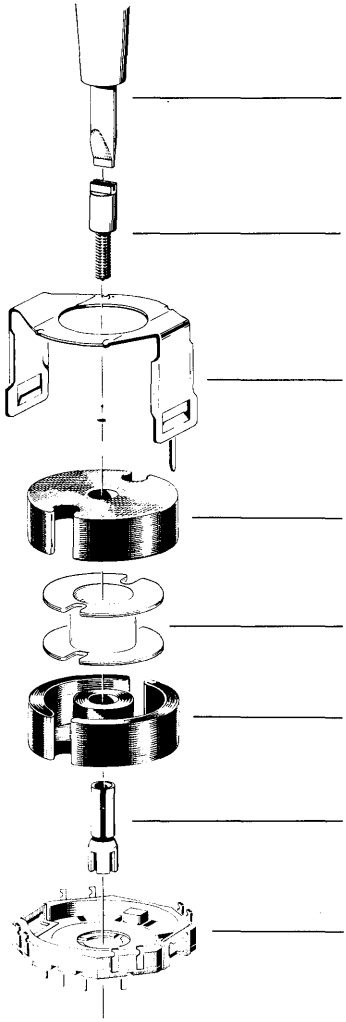


Type for wired circuits



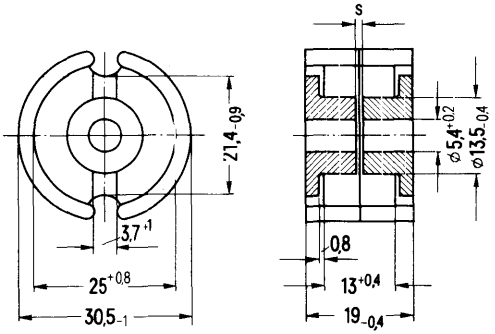
Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65679, B65579 B63310	209 211 211
Solder tag board with 8 solder connections as required	B65703	207
Yoke	B65703	207
Pot core	B65701	205
Coil former with 1, 2 or 3 sections	B65702	206
Pot core	B65701	205
Threaded sleeve part "d" or "g"	B65679 B65579	209 211
Base plate	B65703	207

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65679, B65579 B63310	209 211 211
Yoke	B65705	208
Pot core	B65701	205
Coil former with 1, 2 or 3 sections	B65702	206
Pot core	B65701	205
Threaded sleeve part "d" or "g"	B65679 B65579	209 211
Connecting board with 8 solder connections	B65705	208

Pot cores complying with DIN 41293 or IEC publication 133.



Approx. weight 36 g/set

Dimensions in mm

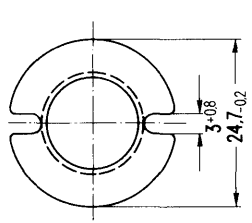
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.33	mm^{-1}
Effective length	l_e =	45	mm
Effective area	A_e =	136	mm^2
Effective volume	V_e =	6120	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% ≙ A	N 22	0.72	66	B65701-L0250-A022
400			0.40	105	B65701-L0400-A022
630			0.22	165.5	B65701-L0630-A022
1000			0.12	263	B65701-L1000-A022
400		N 28	0.41	105	B65701-L0400-A028
630			0.24	165.5	B65701-L0630-A028
1000			0.12	263	B65701-L1000-A028
1250	± 5% ≙ J	T 26	0.10	328	B65701-L1250-J026
2000	±10% ≙ K		0.05	525	B65701-L2000-K026
without air gap					
6200	+30 % ≙ R	T 26			B65701-L0000-R026
10500	−20 % ≙ R	N 30			B65701-L0000-R030
25000	+40 % ≙ Y	T 38			B65701-L0000-Y038
	−30 % ≙ Y				

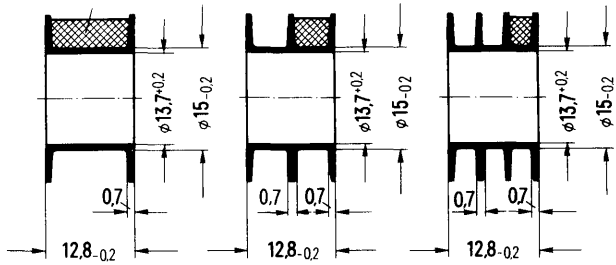
Coil former and insulating washers B65702

Polycarbonate coil formers complying with DIN 41294 or IEC publication 133.
For winding details see page 86.



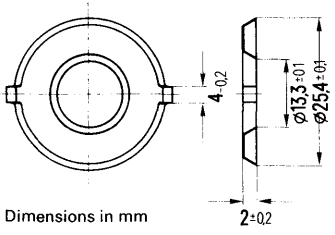
Dimensions in mm

Winding cross section



Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	48	48	60	46	0.6	B65702-A0000-M001
2	22.5	45		49	0.7	B65702-A0000-M002
3	14	42		51	0.8	B65702-A0000-M003

0.06 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65702-A5000-X000

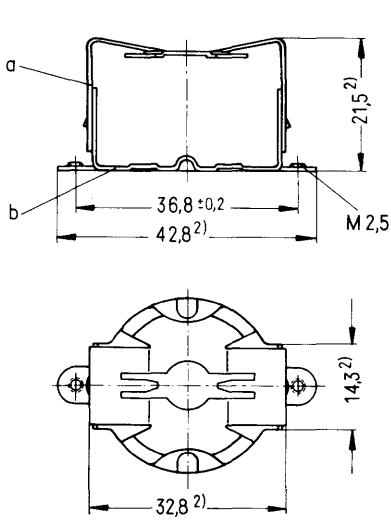
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for wired circuits B65703

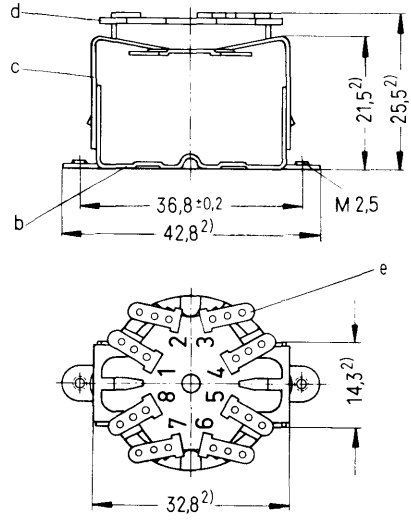
Mounting assemblies1) with metal base plate.
0.5 mm thick nickel-silver spring yoke.
Types with or without solder tag board.
Fixing by screws M 2.3.

Approx. weight 8 g (without solder tag board)
9.5 g (with solder tag board)

B65703-B0005-X000
(without solder tag board)



B65703-B0006-X000
(solder tag board with 8 solder tags)



Dimensions in mm

Ordering code B65703-B0005-X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65703-B0006-X000 (Complete mounting assembly with solder tag board and 8 solder tags)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C61035-A22-C3	c	1 yoke	C61035-A22-C4
b	1 base plate	C61035-A22-C2	b	1 base plate	C61035-A22-C2
			d	1 solder tag board complete	C40330-A74-B15

2 cylindrical screws AM 2.5 x 15 DIN 84-5 S (not included with the delivery).

1) The previous mounting assemblies B65703-A0001-X000 (without solder tags) and B65703-A0002-X000 (with 8 solder tags) are further available for a transition period.

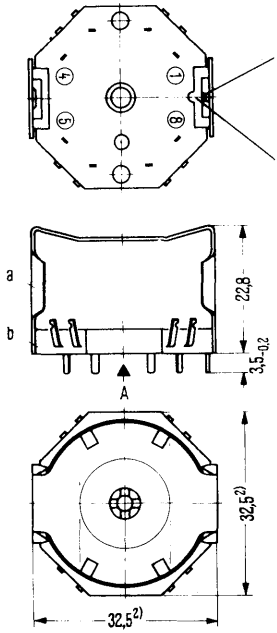
2) Max. dimension

Mounting assembly for printed circuits B 65 705

Mounting assembly1) with snap-in connection;
polycarbonate GV connecting board.
0.5 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 9 g

B65705–A0003–X000
(with 8 solder tags)



Ordering code B65705-A0003-X000
(Complete mounting assembly with 8 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035–A40–C4
b	1 connecting board (with 8 solder tags)	C61035–A40–B1

The 2.8 mm dia hole is only necessary for additional screw mounting with M 2.5.
Drawing details for the assembly of mounting devices available on request.

Ordering code C61407–A4–A9

1) The previous mounting assembly B65705–A0001–X000 (with 8 solder tags) is further available for a transition period.

Adjusting devices B 65 679

Adjusting screw (a, b, c) B65679–B0***–X***, consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and a spring crown serving as core brake;

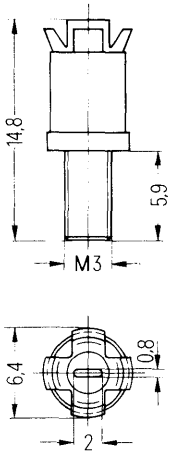
fits:

11 polyamide GV **threaded sleeve without flange** (d) B65679–J0002–X000

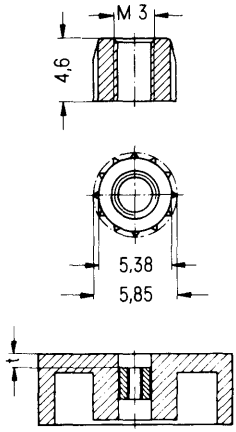
adjusting screw driver B63399–A0001–X000.

Due to the limited distance between the adjusting core B65679–B0***–X*** and the internal borehole, the total assembly must be centered accurately.

a, b, c



d



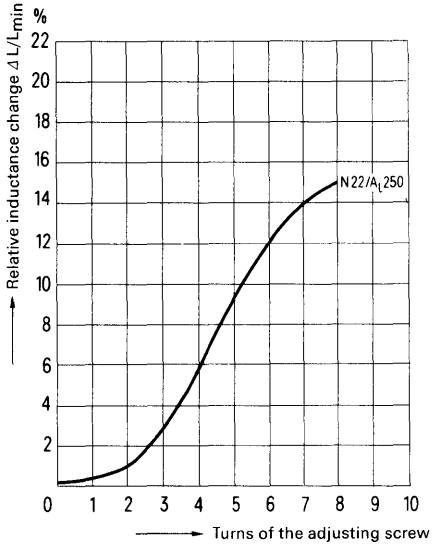
Dimensions in mm

Insertion depth t = 1.3 $^{+0.2}$ mm

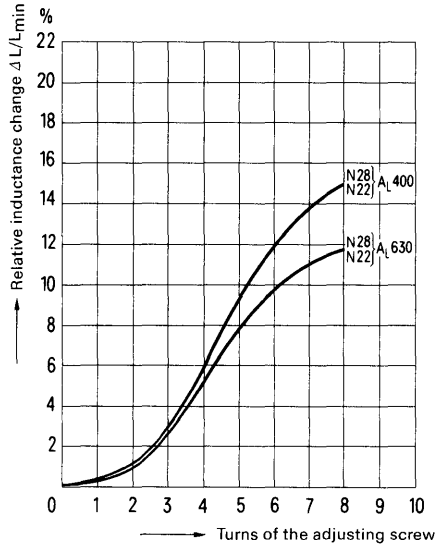
Pot core B65701		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	Ordering code
N 22	250	c	4.55 x 6.2	N 22	red	B65679–B0003–X022
N 22, N 28	400 630	b	4.98 x 6.2	N 22	black	B65679–B0002–X022
	1000	a	5.15 x 6.2	N 22	white	B65679–B0001–X022

Inductance adjustment curves

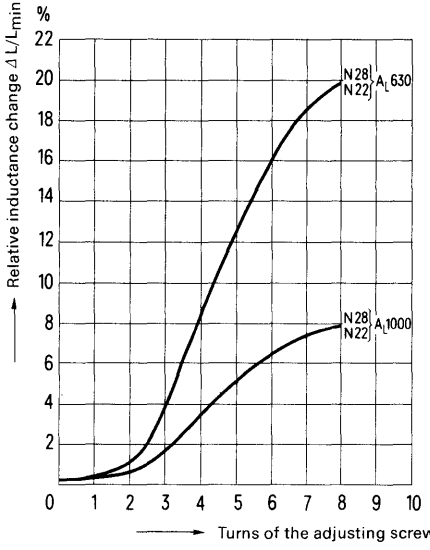
Adjusting screw B65679–B0003–X022
colour code red



Adjusting screw B65679–B0002–X022
colour code black



Adjusting screw B65679–B0001–X022
colour code white



0 ≙ at least two turns engaged.

Adjusting devices B 65579

Adjusting screw (a, b, c) B65579–A0***-X***, consisting of SIFERRIT tube core on which a thread of 11 polyamide GV is molded,

fits:

polyester GV **threaded sleeve** (d) B65579-K0001-X000 with slotted shank (core brake):

adjusting screw driver B63399–B0004–X000

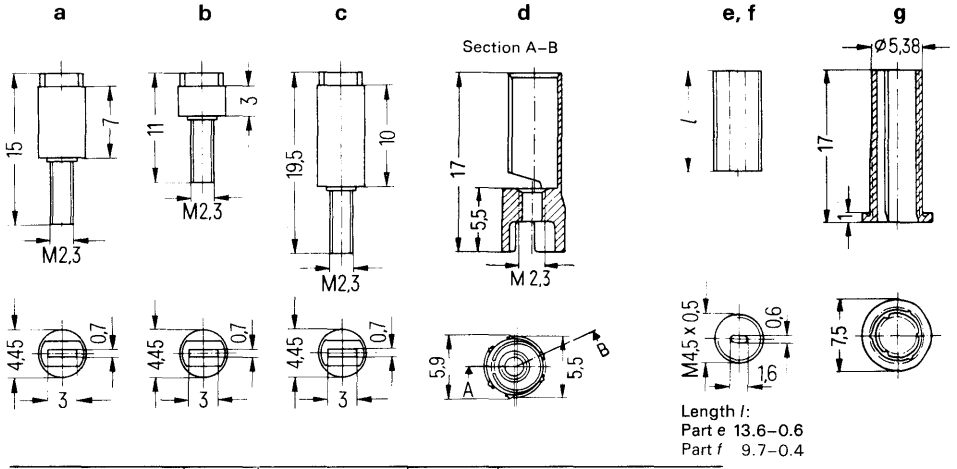
or as required

SIFERRIT **screw core** (e, f) B63310–A4***-X***, which cuts its own thread into the sleeve.

fits:

11 polyamide GV **threaded sleeve** (g) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.

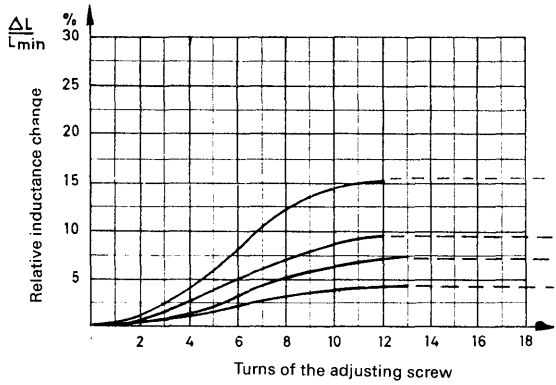


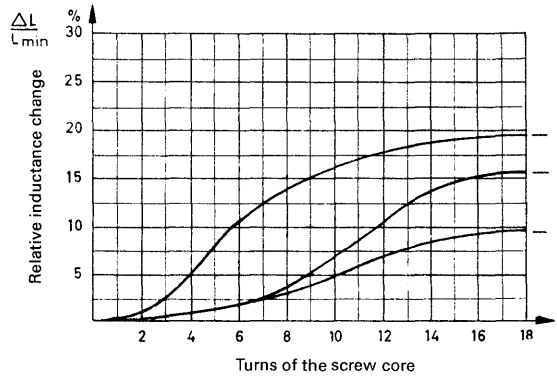
Length *l*:
Part e 13.6–0.6
Part *f* 9.7–0.4

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	d			B65579-K0001-X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579-A0001-X023
	a	K 1	violet	B65579-A0001-X001
	b	N 23[1)]	red	B65579-A0002-X023
	b	K 1	violet	B65579-A0002-X001
	c	N 23[1)]	red	B65579-A0003-X023
	c	K 1	violet	B65579-A0003-X001
Threaded sleeve	g			B65579-J0003-X000
Associated screw core as required	e	N 22	red	B63310-A4009-X022
	f	M 25	white	B63310-A4001-X025

1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves





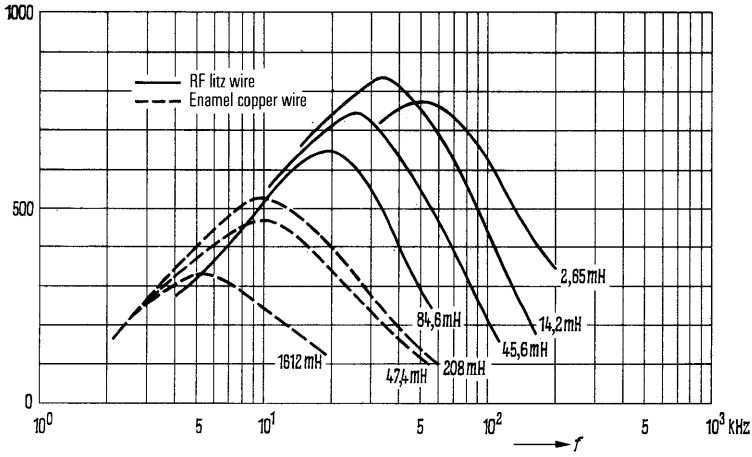
Pot core		Adjusting devices
Material	A_L value	Adjusting screw or screw core
N 22	250	a; B65579–A0001–X023
N 22	400	a; B65579–A0001–X023
N 22	630	c; B65579–A0003–X023
N 22	1000	c; B65579–A0003–X023
N 22	250	f; B63310–A4001–X025
N 28	400	e; B63310–A4009–X022[1)]
N 22	630	e; B63310–A4009–X022[1)]

1) Initial position of the core is approx. 4 mm above the flange of the threaded sleeve.

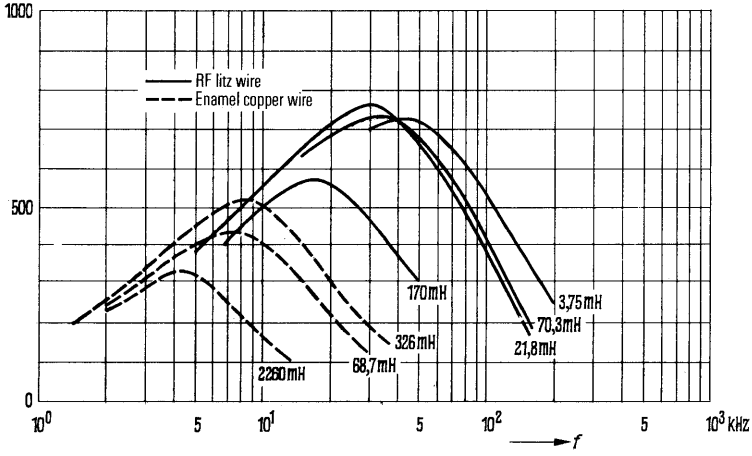
Q factor characteristics; material N 28

L (mH) for A_L = 630 nH	L (mH) for A_L = 1000 nH	Turns	Wire; RF litz wire	Number of sections
1612	2260	1600	0,15 CuL	1
208	326	570	0,25 CuL	1
47.4	68.7	350	0,40 CuL	1
–	170	420	1x12x0.04 CuLS	1
84.6	–	420	1x20x0.05 CuLS	1
45.6	70.3	270	1x30x0.05 CuLS	1
14.2	21.8	150	3x20x0.05 CuLS	1
2.65	3.75	65	3x20x0.07 CuLS	2

Flux density in the core $\hat{B}$ <1.5 mT

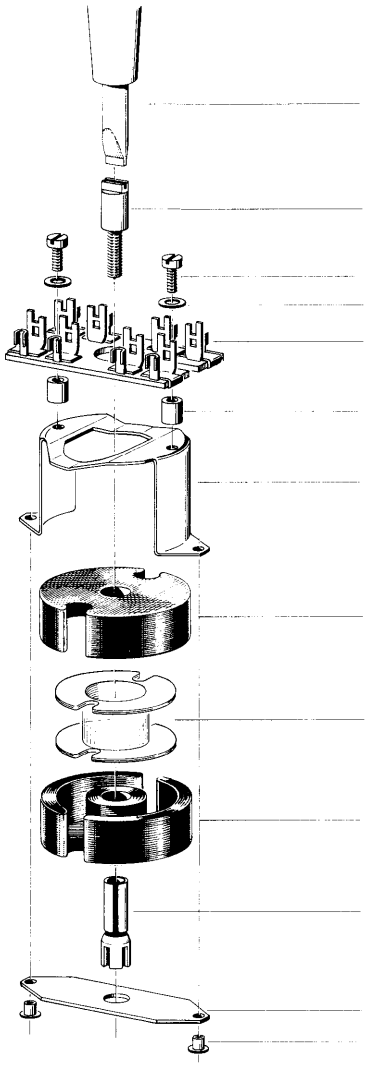


N 28
(typical values)
A_L = 630 nH



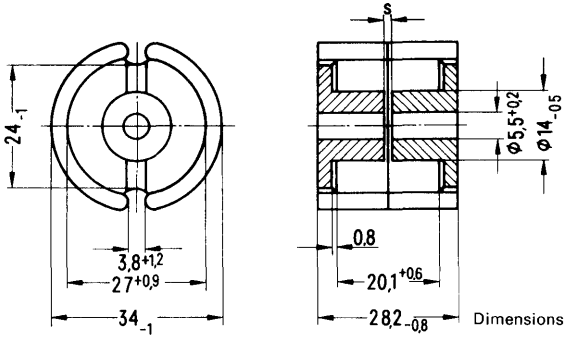
N 28
(typical values)
A_L = 1000 nH

Type for wired circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	219 219
Cylindrical screws [1] Washers [1]		
Solder tag board as required		
Threaded bushes (only for type with solder tag board)		
Yoke	B65593	218
Pot core	B65591	216
Coil former with 1 section	B65592	217
Pot core	B65591	216
Threaded sleeve part "c" or "e"	B65579	219
Base plate with 2 tubular rivets	B65593	218

1) These parts are supplied for types with solder tag board.



Approx. weight 65 g/set

Dimensions in mm

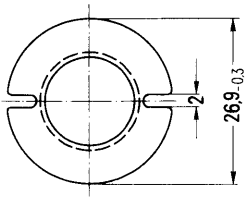
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.367	mm^{-1}
Effective length	l_e =	58.9	mm
Effective area	A_e =	160	mm^2
Effective volume	V_e =	9400	mm^3

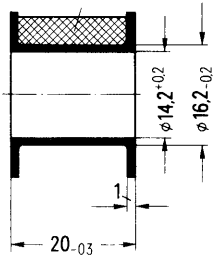
A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
160	± 3% △A	M 33	1.5	46.7	B65591-A0160-A033
250		N 22	0.8	73	B65591-A0250-A022
400			0.41	116.7	B65591-A0400-A022
630			0.24	184	B65591-A0630-A022
1000			0 12	292	B65591-A1000-A022
630	± 5% △J	T 26	0.2	184	B65591-A0630-J026
1250			0.1	364	B65591-A1250-J026
2000	±10% △K		0.05	584	B65591-A2000-K026
without air gap					
3800	+30 % △R	N 22			B65591-A0000-R022
5900	−20 % △R	T 26			B65591-A0000-R026

Coil former B 65592

Polycarbonate coil former.
For winding details see page 87.



Winding cross section



Dimensions in mm

Number of sections	Useful winding cross section A_N mm^2	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	84.5	66	27	2.4	B65592-A0000-M001

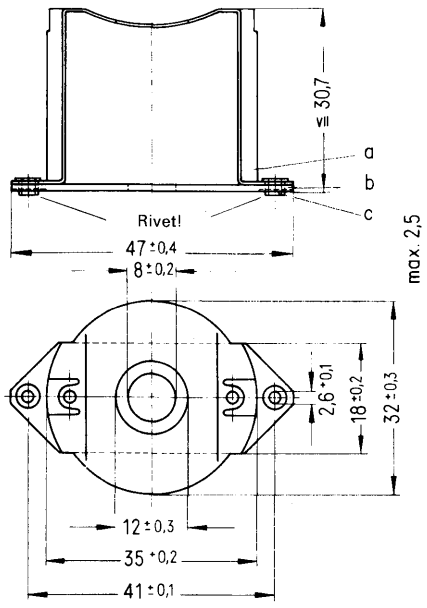
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor f_{Cu} = 0.5.

Mounting assemblies for wired circuits B 65 593

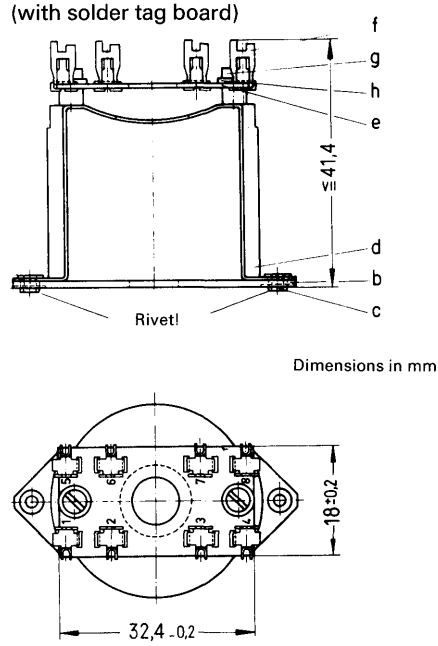
Mounting assemblies with metal base plate.
0.5 mm thick nickel-silver spring yoke.
Types with or without solder tag board.
Fixing by screws or rivets.

Approx. weight 14.5 g (without solder tag board)
17 g (with solder tag board)

B65593-A0001-X000
(without solder tag board)



B65593-A0004-X000
(with solder tag board)



Dimensions in mm

Ordering code B65593-A0001-X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65593-A0004-X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C60358-B3059-C108	b	1 base plate	C60358-B3059-C105
			c	2 tubular rivets	C60358-B3059-C106
b	1 base plate	C60358-B3059-C105	d	1 yoke complete	C60358-B3059-B1
			e+f	1 solder tag board complete	C60358-B3058-B2
c	2 tubular rivets	C60358-B3059-C106	g	2 cylindrical screws	D84-F30-M37
			h	2 washers	D125-A18-M37

Adjusting devices B 65 579

Adjusting screw (a, b) B65579–A0***–X*** consisting of a SIFERRIT tube core on which a thread of 11 Polyamide GV is molded;

fits:

polyester GV **threaded sleeve** (c) B65579–K0001–X000 with slotted shank (core brake).

adjusting screw driver B63399–B0004–X000

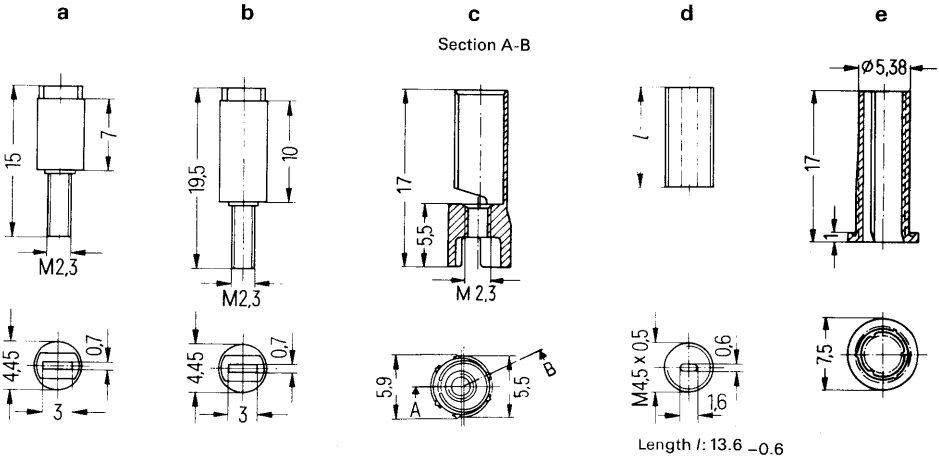
or as required

SIFERRIT **adjusting screw** (d) B63310–A4009–X022; this screw core cuts its own thread into the sleeve.

fits:

11 polyamide GV **threaded sleeve** (e) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.



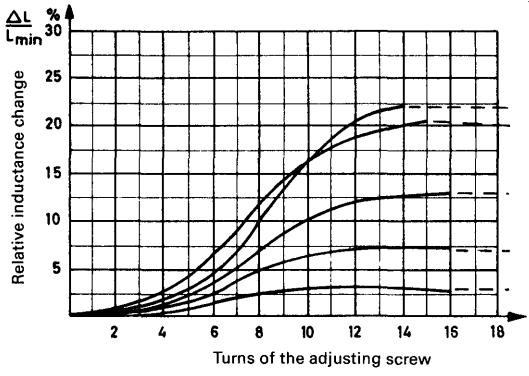
Length *l*: 13.6 $_{-0.6}$

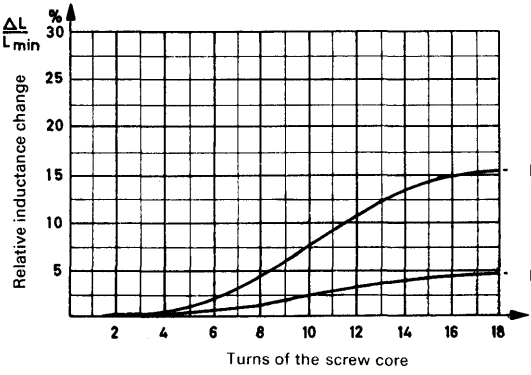
Dimensions in mm

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	c			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	b	N 23[1)]	red	B65579–A0003–X023
Threaded sleeve	e			B65579–J0003–X000
Associated screw core	d	N 22	red	B63310–A4009–X022

1) For adjusting cores the material N 23 is similar to material N 22.

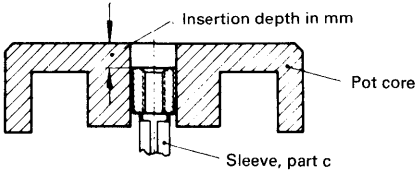
Inductance adjustment curves



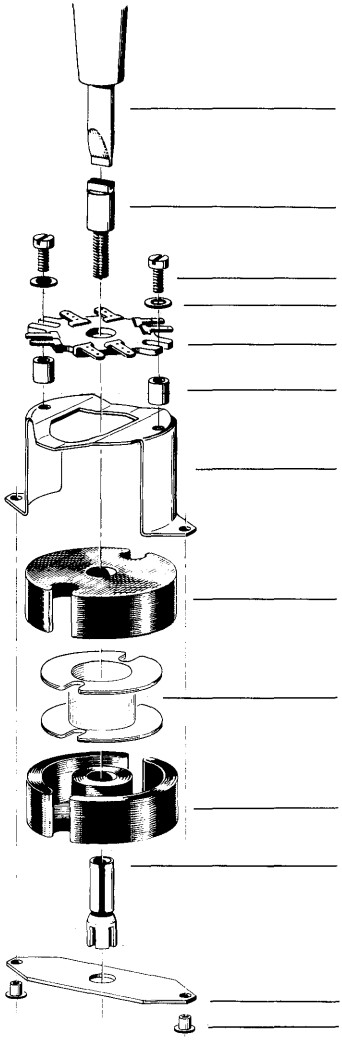


Pot core		Adjusting devices	
Material	A_L value	Adjusting screw or screw core	Insertion depth mm
M 33	160	a; B65579-A0001-X023	5
N 22	250	b; B65579-A0003-X023	4
N 22	400	b; B65579-A0003-X023	3
N 22	630	b; B65579-A0003-X023	3
N 22	1000	b; B65579-A0003-X023	3
N 22	400	d; B63310-A4009-X022	
N 22	1000	d; B63310-A4009-X022	

Explanation of "insertion depth"



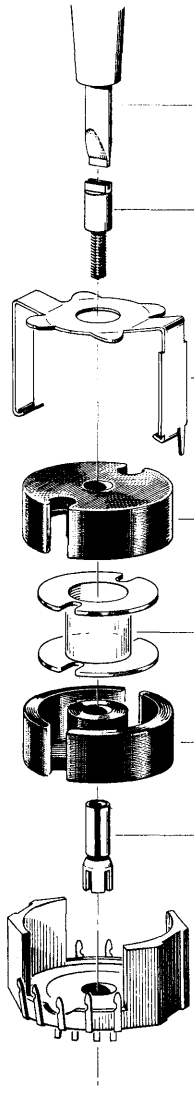
Type for wired circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	227 227
Cylindrical screws [1] Washers [1]		
Solder tag board as required	B65613	225
Threaded bushes (only for type with solder tag board)		
Yoke	B65613	225
Pot core	B65611	223
Coil former with 1, 2 or 3 sections	B65612	224
Pot core	B65611	223
Threaded sleeve part "c" or "e"	B65579	227
Base plate with 2 tubular rivets	B65613	225

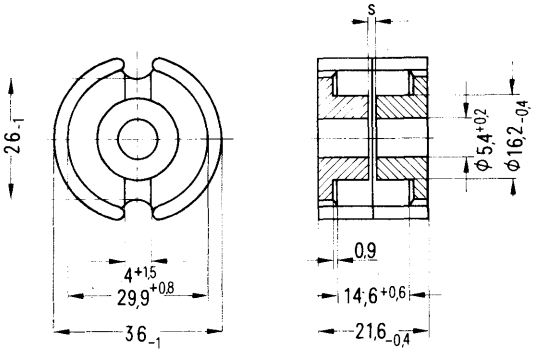
1) These parts are supplied for types with solder tag board.

Type for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	227 227
Yoke	B65615	226
Pot core	B65611	223
Coil former with 1, 2 or 3 sections	B65612	224
Pot core	B65611	223
Threaded sleeve part "c" or "e"	B65579	227
Connecting board with 10 solder connections	B65615	226

Pot cores complying with DIN 41 293 or IEC publication 133.



Approx. weight 57 g/set

Dimensions in mm

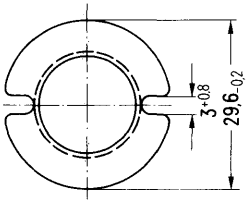
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.264	mm^{-1}
Effective length	l_e =	53	mm
Effective area	A_e =	201	mm^2
Effective volume	V_e =	10650	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% △ A	N 22	1.2	52,5	B65611-K0250-A022
400			0.62	84	B65611-K0400-A022
630			0.35	132	B65611-K0630-A022
1000			0.2	210	B65611-K1000-A022
1250			0.14	263	B65611-K1250-A022
630		N 28	0.36	132	B65611-K0630-A028
800			0.3	168	B65611-K0800-A028
900			0.26	189	B65611-K0900-A028
1000			0.22	210	B65611-K1000-A028
1250			0.16	263	B65611-K1250-A028
1000	± 5% △ J	T 26	0.2	210	B65611-K1000-J026
1600			0.1	336	B65611-K1600-J026
2500	±10% △ K		0.05	525	B65611-K2500-K026
without air gap					
7600	+30 % △ R	T 26			B65611-K0000-R026
13500	−20 % △ R	N 30			B65611-K0000-R030

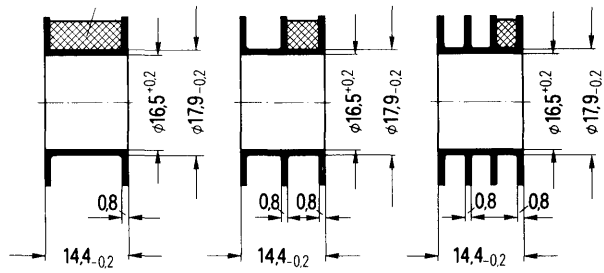
Coil former and insulating washers B 65 612

Polycarbonate coil formers complying with DIN 41 294 or IEC publication 133.
For winding details see page 86.



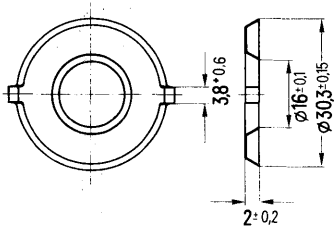
Dimensions in mm

Winding cross section



Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	63	63	73	39	1.4	B65612–A0000–M001
2	29.5	59		42	1.7	B65612–A0000–M002
3	18.3	55		44	1.9	B65612–A0000–M003

0.08 mm thick insulating Makrofol spring washers for insulation and tolerance balancing between coil winding and pot core. Delivery is provided in strips.



Dimensions in mm

Ordering code B65612–A5000–X000

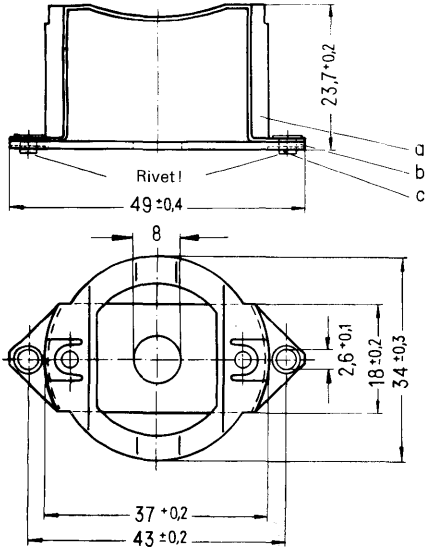
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$

Mounting assemblies for wired circuits B 65 613

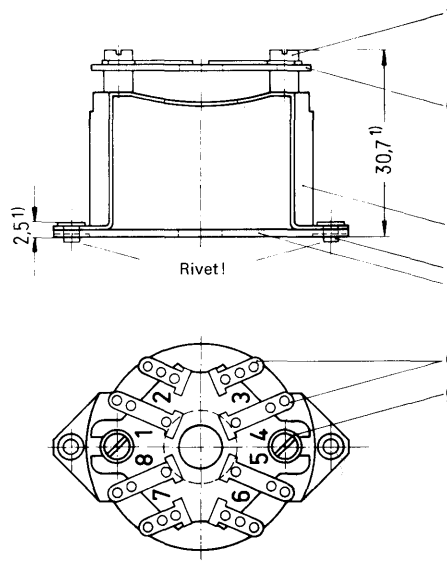
Mounting assemblies with metal base plate.
0.5 mm thick nickel-silver spring yoke.
Types with or without solder tag board.
Fixing by screws or rivets.

Approx. weight 14.5 g (without solder tag board)
17.5 g (with solder tag board)

B65613-A0001-X000
(without solder tag board)



B65613-A0005-X000
(with solder tag board)



Dimensions in mm
1) Max. dimension

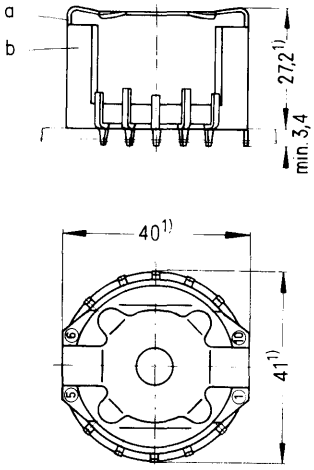
Ordering code B65613-A0001-X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65613-A0005-X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C40330-A78-C5	a	1 base plate	C40330-A78-C6
			b	1 yoke compl.	C40330-A78-B3
b	1 base plate	C40330-A78-C6	c	2 tubular rivets	C40330-A78-C9
			d+e	1 solder tag board compl.	C40330-A78-B7
c	2 tubular rivets	C60358-B3059-C106	f	2 cylindrical screws	D84-H40-M
			g	2 washers	D125-A25-M

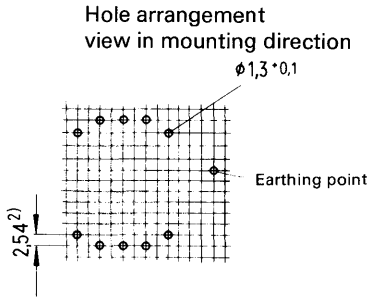
Mounting assembly for printed circuits B 65 615

Mounting assembly with 6.6 polyamide GV.
connecting board.
0.5 mm thick nickel-silver spring yoke.
Fixing by pins on the solder tags.

Approx. weight 11 g

B65615-A0001-X000
(with 10 solder tags)





Dimensions in mm

1) Max. dimension
2) 2.5 mm spacing also permissible

Ordering code B65615-A0001-X000
(Complete mounting assembly with 10 solder tags)

Mounting parts		Ordering code
a	1 yoke	C61035-A16-C102
b	1 connecting board (with 10 solder tags)	C61035-A16-B1

0.2 mm thick insulating plates are available on request for mounting in double-clad connecting boards.

Ordering code C61035-A16-C104

Adjusting devices B 65 579

Adjusting screw (a, b) B65579–A0***–X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded;

fits:

polyester GV **threaded sleeve** (c) B65579–K0001–X000 with slotted shank (core brake);

adjusting screw driver B63399–B0004–X000

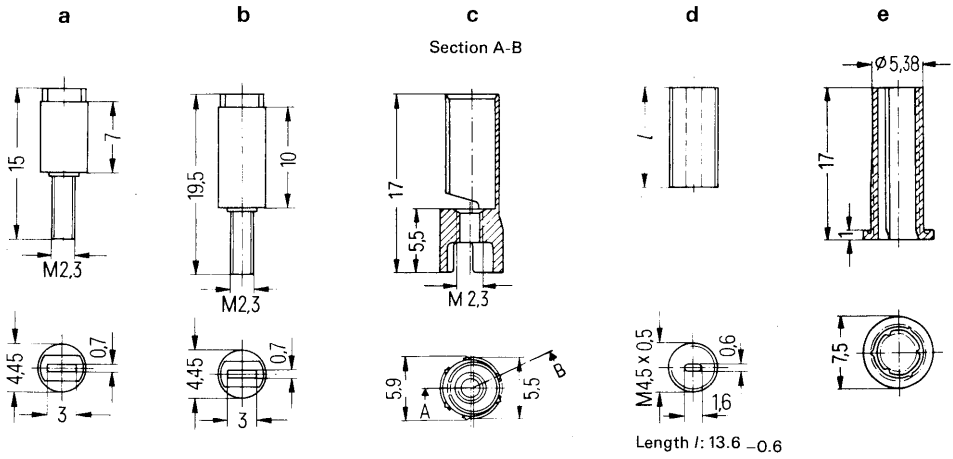
or as required

SIFERRIT **adjusting screw** (d) B63310–A4009–X022; this screw core cuts its own thread into the sleeve;

fits:

11 polyamide GV **threaded sleeve** (e) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.



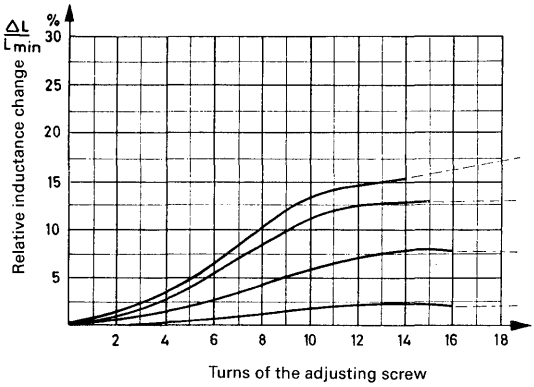
Length *l*: 13.6 $_{-0.6}$

Dimensions in mm

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	c			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	b	N 23[1)]	red	B65579–A0003–X023
Threaded sleeve	e			B65579–J0003–X000
Associated screw core	d	N 22	red	B63310–A4009–X022

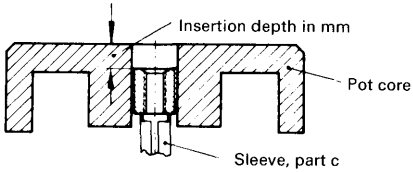
1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

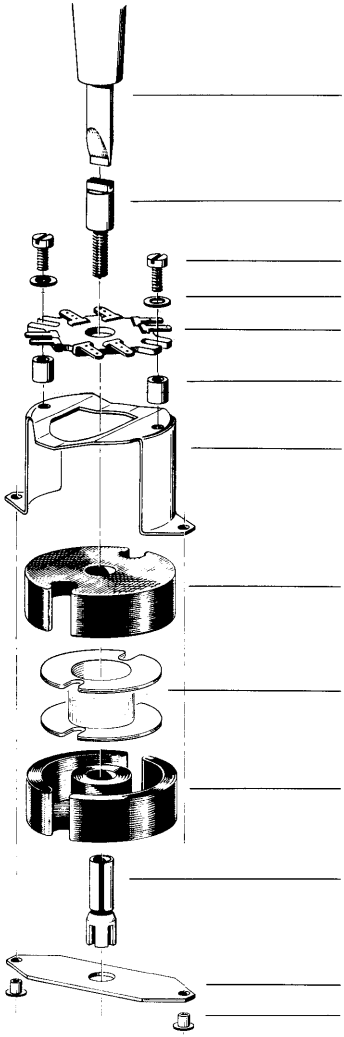


Pot core		Adjusting devices	
Material	A_L value	Adjusting screw	Insertion depth mm
N 22	250	a; B65579-A0001-X023	1
N 22	400	b; B65579-A0003-X023	1
N 22	630	b; B65579-A0003-X023	1
N 22	1250	b; B65579-A0003-X023	1

Explanation of "insertion depth"

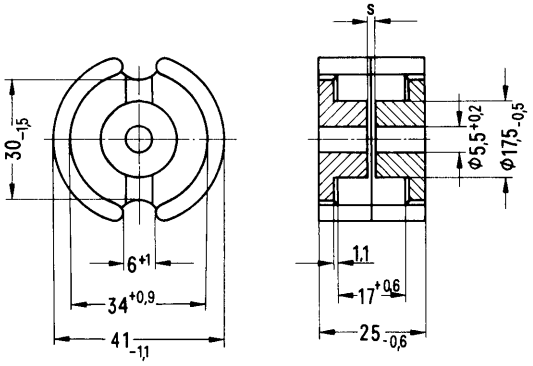


Type for wired circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	233 233
Cylindrical screws [1]		
Washers [1]		
Solder tag board as required	B65623	232
Threaded bushes (only for type with solder tag board)		
Yoke	B65623	232
Pot core	B65621	230
Coil former with 1, 2 or 3 sections	B65622	231
Pot core	B65621	230
Threaded sleeve part "c" or "e"	B65579	233
Base plate with 2 tubular rivets	B65623	232

1) These parts are supplied for types with solder tag board.



Approx. weight 90 g/set

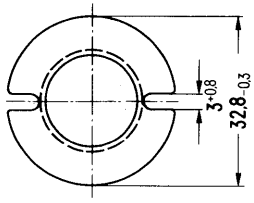
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.257	mm^{-1}
Effective length	l_e =	62.1	mm
Effective area	A_e =	242	mm^2
Effective volume	V_e =	15000	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% △A	N 27	1.35	51,2	B65621–J0250–A022
400			0.78	81.8	B65621–J0400–A022
630			0,43	129	B65621–J0630–A022
1250			0,18	256	B65621–J1250–A022
1250		N 28	0,2	256	B65621–J1250–A028
1250	± 5% △J	T 26	0,2	256	B65621–J1250–J026
2000			0.1	408	B65621–J2000–J026
3150	±10% △K		0,05	642	B65621–J3150–K026
without air gap					
8400	+30 % −20 % △R	T 26			B65621–J0000–R026

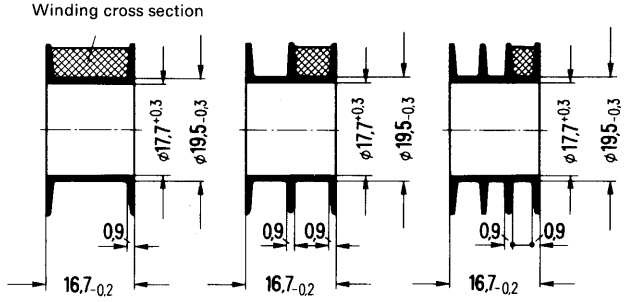
Coil former B 65 622

Polycarbonate GV coil former.
For winding details see page 87.



Dimensions in mm

Winding cross section



Number of sections	Useful winding cross section A_N of one section mm²	total mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	85	85	81	33	1.7	B65622-A0000-M001
2	40	80		35	2.0	B65622-A0000-M002
3	25	75		37	2.2	B65622-A0000-M003

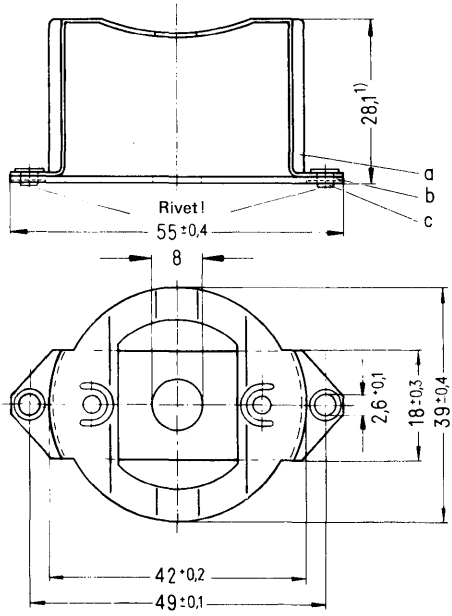
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for wired circuits B 65 623

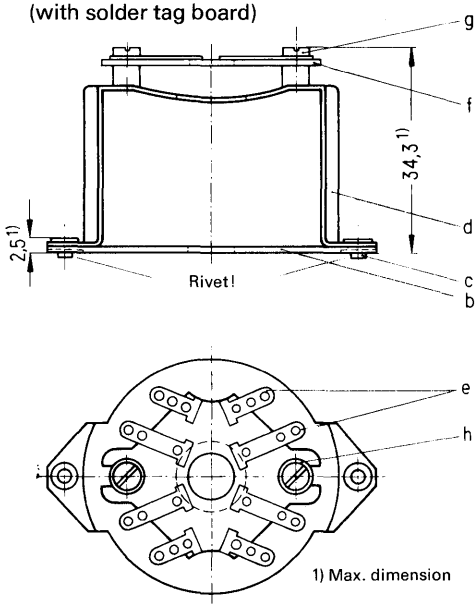
Mounting assemblies with metal base plate
0.5 mm thick nickel-silver spring yoke
Types with or without solder tag board
Fixing by screws or rivets

Approx. weight 17.5 g (without solder tag board)
20.5 g (with solder tag board)

B65623-A0001-X000
(without solder tag board)



B65623-A0005-X000
(with solder tag board)



1) Max. dimension

Dimensions in mm

Ordering code B65623-A0001-X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65623-A0005-X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C40330-A79-C7	b	1 base plate	C40330-A79-C8
			c	2 tubular rivets	C40330-A78-C9
b	1 base plate	C40330-A79-C8	d	1 yoke compl.	C40330-A79-B3
			e+f	1 solder tag board compl.	C40330-A78-B7
c	2 tubular rivets	C60358-B3059-C106	g	2 cylindrical screws	D84-H40-M37
			h	2 washers	D125-A25-M37

Adjusting devices B 65 579

Adjusting screw (a, b) B65579–A0***-X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded.

fits:

polyester GV **threaded sleeve** (c) B65579–K0001–X000 with slotted shank serving as core brake;

adjusting screw driver B63399–B0004–X000

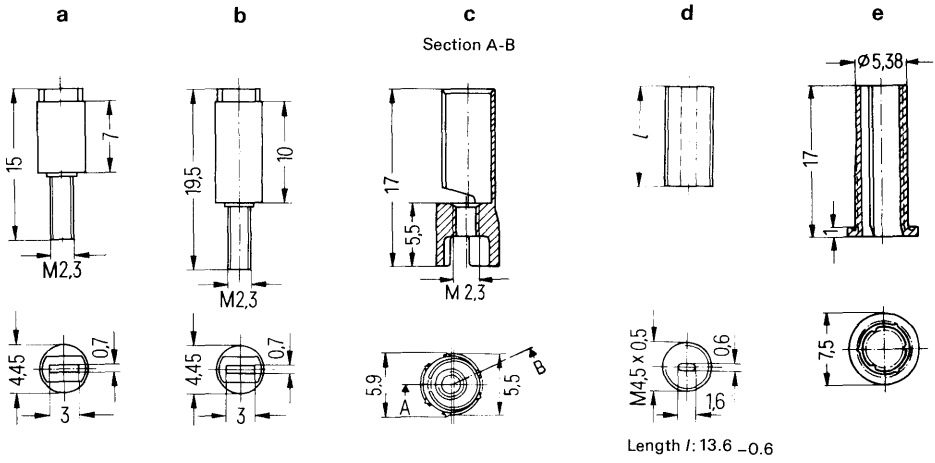
or as required

SIFERRIT **adjusting screw** (d) B63310–A4009–X022, this screw core cuts its own thread into the sleeve;

fits:

11 polyamide GV **threaded sleeve** (e) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.



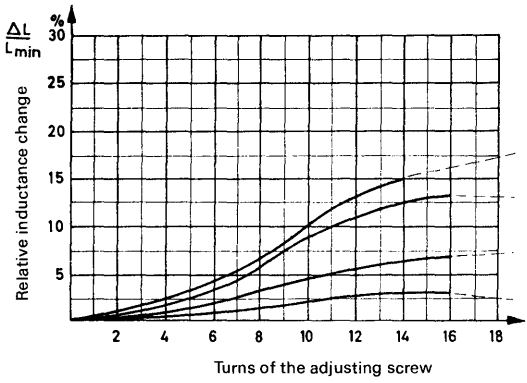
Length *l*: 13.6 $_{-0.6}$

Dimensions in mm

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	c			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	b	N 23[1)]	red	B65579–A0003–X023
Threaded sleeve	e			B65579–J0003–X000
Associated screw core	d	N 22	red	B63310–A4009–X022

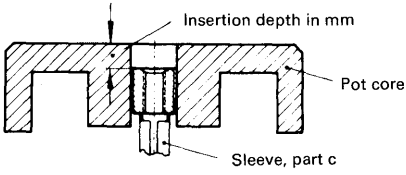
1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

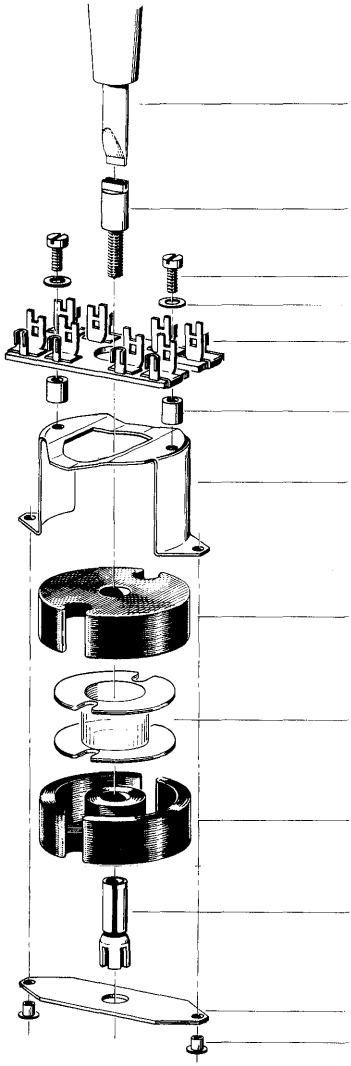


Pot core		Adjusting devices	
Material	A_L value	Adjusting screw	Insertion depth mm
N 22	250	a;B65579-A0001-X023	3
N 22	400	b;B65579-A0003-X023	3
N 22	630	b;B65579-A0003-X023	3
N 22	1250	b;B65579-A0003-X023	3

Explanation of "insertion depth"

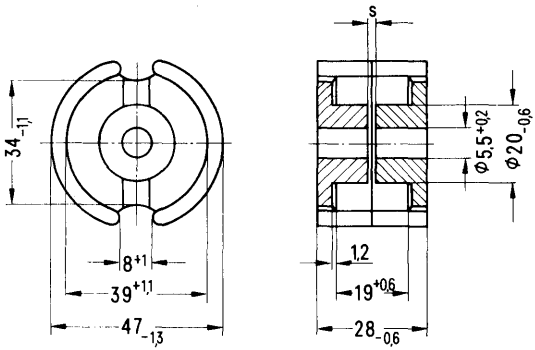


Type for wired circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Adjusting screw or screw core	B65579 B63310	239 239
Cylindrical screws [1] Washers [1]		
Solder tag board as required	B65633	238
Threaded bushes (only for type with solder tag board)		
Yoke	B65633	238
Pot core	B65631	236
Coil former with 1, 2 or 3 sections	B65632	237
Pot core	B65631	236
Threaded sleeve part "c" or "e"	B65579	239
Base plate with 2 tubular rivets	B65633	238

1) These parts are supplied for types with solder tag board.



Approx. weight 125 g/set

Dimensions in mm

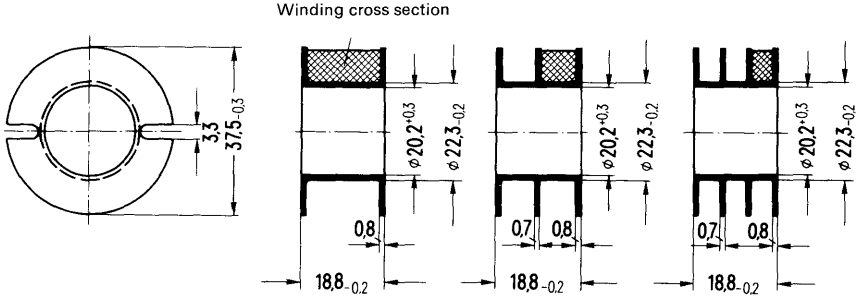
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.232	mm^{-1}
Effective length	l_e =	72.5	mm
Effective area	A_e =	312	mm^2
Effective volume	V_e =	22600	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% △A	N 22	1.9	46	B65631-J0250-A022
400			1.0	73,5	B65631-J0400-A022
630			0,58	116	B65631-J0630-A022
1250			0,22	231	B65631-J1250-A022
1250		N 28	0,28	231	B65631-J1250-A028
1600	± 5% △J	T 26	0.2	295	B65631-J1600-J026
2500			0.1	462	B65631-J2500-J026
4000	±10% △K		0.05	740	B65631-J4000-K026
without air gap					
9500	+30 % △R −20	T 26			B65631-J0000-R026

Coil former B 65 632

Polycarbonate GV coil former.
For winding data see page 87.



Dimensions in mm

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	115	115	93	28	2.3	B65632-A0000-M001
2	52	104		30	2.8	B65632-B0000-M002
3	33	99		32	3.3	B65632-A0000-M003

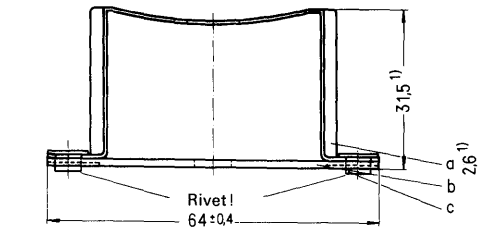
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for wired circuits B 65 633

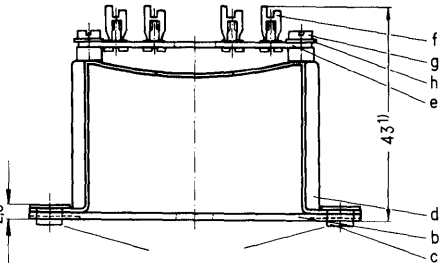
Mounting assemblies with metal base plate
0.6 mm thick nickel-silver spring yoke
Types with or without solder tag board
Fixing by screws or rivets

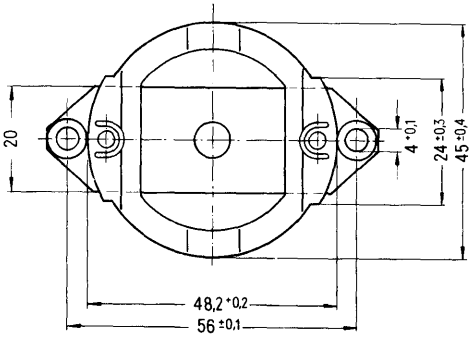
Approx. weight 29 g (without solder tag board)
33 g (with solder tag board)

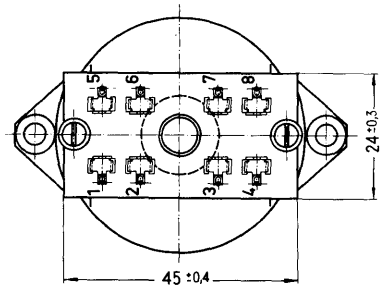
B65633-A0001-X000
(without solder tag board)



B65633-A0004-X000
(with solder tag board)







Dimensions in mm

Ordering code B65633-A0001-X000
(Complete mounting assembly without solder tag board)

Mounting parts		Ordering code
a	1 yoke	C40330-B11-C2
b	1 base plate	C40330-B11-C3
c	2 tubular rivets	D7340-Q30-M

Ordering code B65633-A0004-X000
(Complete mounting assembly with solder tag board)

Mounting parts		Ordering code
b	1 base plate	C40330-B11-C3
c	2 tubular rivets	D7340-Q30-M
d	1 yoke compl.	C40330-B11-B3
e+f	1 solder tag board compl.	C40330-B11-B38
g	2 cylindrical screws	D84-H40-M
h	2 washers	D125-A25-M

1) Max. dimension

Adjusting devices B 65 579

Adjusting screw (a, b) B65579–A0***–X***, consisting of a SIFERRIT tube core on which a thread of 11 polyamide GV is molded,

fits:

polyester GV **threaded sleeve** (c) B65579–K0001–X000 with slotted shank (core brake):

adjusting screw driver B63399–B0004–X000

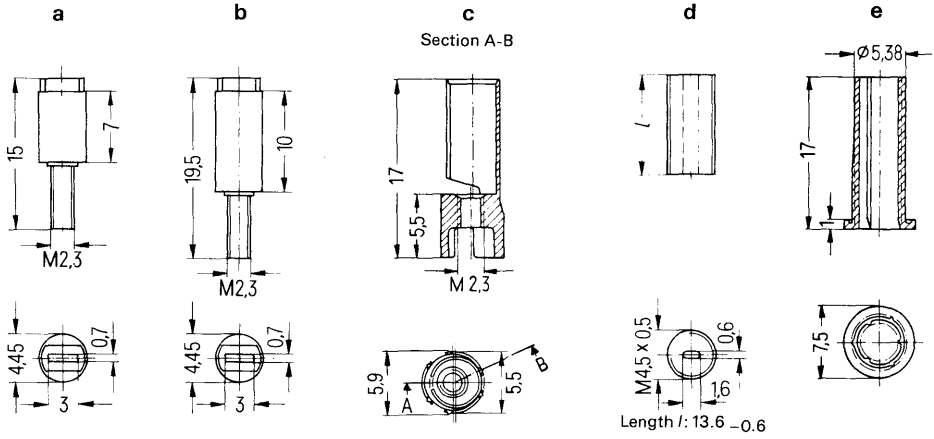
or as required

SIFERRIT **adjusting screw** (d) B63310–A4009–X022, this screw core cuts its own thread into the sleeve.

fits:

11 polyamide GV **threaded sleeve** (e) B65579–J0003–X000;

adjusting screw driver B63399–A0001–X000.

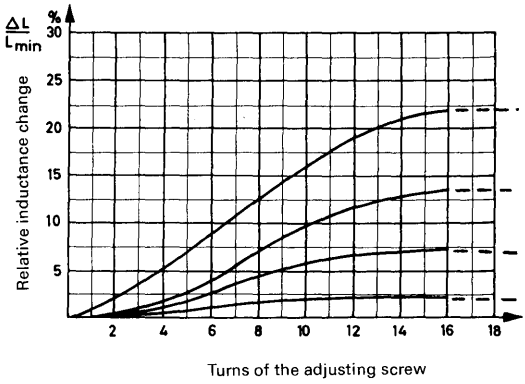


Dimensions in mm

Adjusting devices	Part	Material of the adjusting core	Colour code	Ordering code
Threaded sleeve	c			B65579–K0001–X000
Associated adjusting screw as required	a	N 23[1)]	red	B65579–A0001–X023
	b	N 23[1)]	red	B65579–A0003–X023
Threaded sleeve	e			B65579–J0003–X000
Associated screw core	d	N 22	red	B63310–A4009–X022

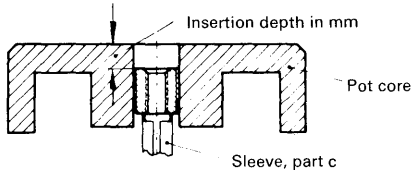
1) For adjusting cores the material N 23 is similar to material N 22.

Inductance adjustment curves

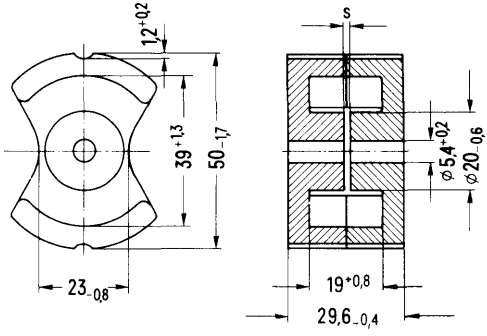


Pot core		Adjusting devices	
Material	A_L value	Adjusting screw	Insertion depth mm
N 22	250	b;B65579-A0003-X023	3
N 22	400	b;B65579-A0003-X023	3
N 22	630	b;B65579-A0003-X023	3
N 22	1250	b;B65579-A0003-X023	3

Explanation of "insertion depth"



Because of their large slots these cores are also suitable for power transformers. For design details of power transformers see page 71 to 79.



Approx. weight 130 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	0,25	mm^{-1}
Effective length	l_e =	76	mm
Effective area	A_e =	304	mm^2
Effective volume	V_e =	23100	mm^3

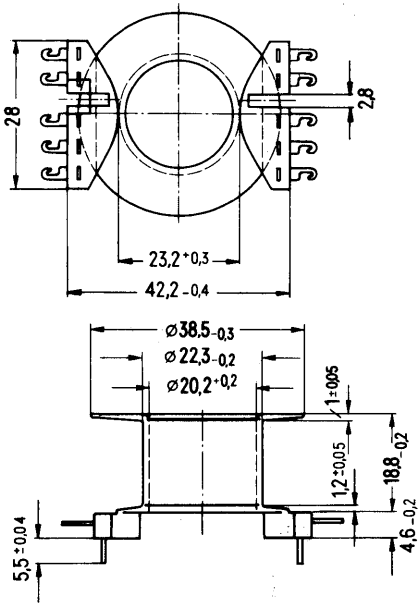
Associated parts

Coil former
Fixing yoke

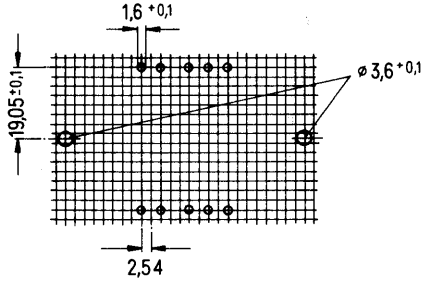
A_L value		SIFERRIT-material	**Ordering code**
nH	tolerance		
without air gap			
7500	+30 % −20 % △R	N 27	B65644-A0000-R027

Coil former B 65 645

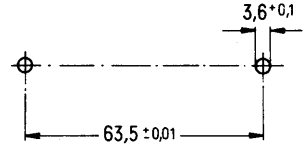
Polyamide GV coil former with 10 pin connections.
Permissible soldering temperature 280 °C/536 °F, 1 sec.
For winding details see page 87.



Hole arrangement for printed circuits
view in mounting direction



Hole arrangement for wired circuits
view in mounting direction



Dimensions in mm

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value [1] $\mu\Omega$	Approx. weight g	**Ordering code**
1	126	95	26	4,5	B65645-A1000-M001

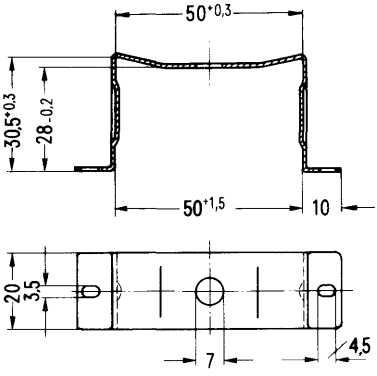
Coil formers without terminal pins according to page 237 can also be used.

[1] $R_{Cu} = A_R \times N^2$. Dc resistance = A_R x number of turns². The A_R value is valid for a copper factor $f_{Cu} = 0.5$

Fixing yoke for wired and printed circuits B 65 645

0.6 mm thick nickel-silver spring yoke. Fixing by screws. For wired circuits the coil former has to be mounted with the pins upward.

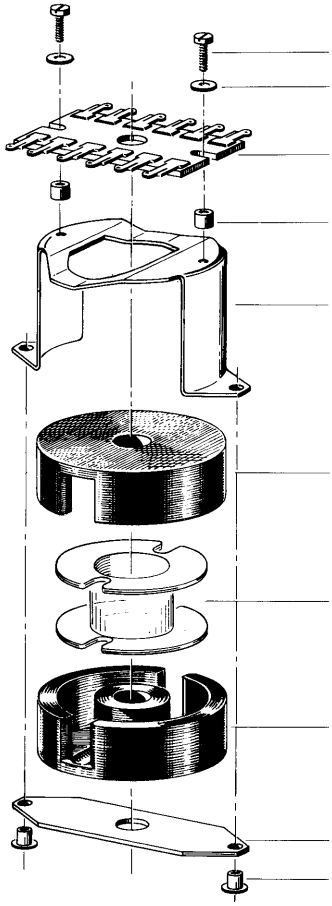
Approx. weight 18 g



Dimensions in mm

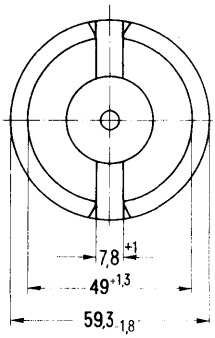
Ordering code B65645–A2000–X000

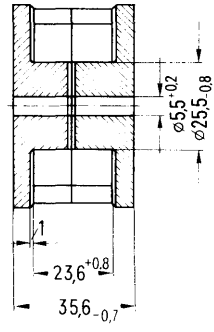
Type for wired circuits



Individual parts	Part No.	Page
Cylindrical screws [1]		
Washers [1]		
Solder tag board as required	B65693	248
Threaded bushes (only for type with solder tag board)		
Yoke	B65693	248
Pot core	B65691	246
Coil former with 1 or 2 sections	B65692	247
Pot core	B65691	246
Base plate with 2 tubular rivets	B65693	248

1) These parts are supplied for types with solder tag board.





Approx. weight 270 g/set

Dimensions in mm

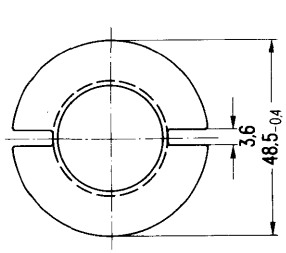
Magnetic data

Core factor	$\Sigma\ l/A$ =	0.181	mm^{-1}
Effective length	l_e =	88	mm
Effective area	A_e =	485	mm^2
Effective volume	V_e =	42600	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
1000	±3% △A	N 28	0.5	145	B65691-K1000-A028
1250			0.4	181	B65691-K1250-A028
1600			0.3	231	B65691-K1600-A028
without air gap					
12500	+30 −20 % △R	T 26			B65691-K0000-R026

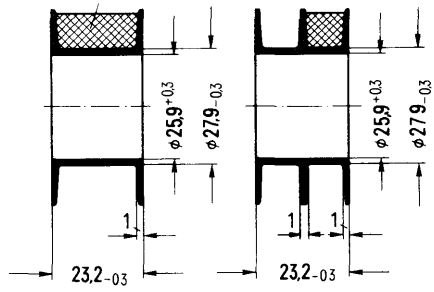
Coil former B 65 692

Polycarbonate GV coil former.
For winding details see page 87.



Dimensions in mm

Winding cross section



Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	203	203	120	20.0	5.5	B65692–A0000–M001
2	98	196	120	21.0	6.3	B65692–A0000–M002

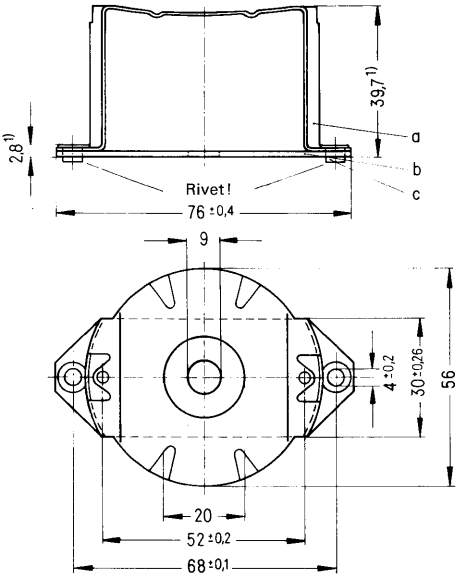
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies for wired circuits B 65 693

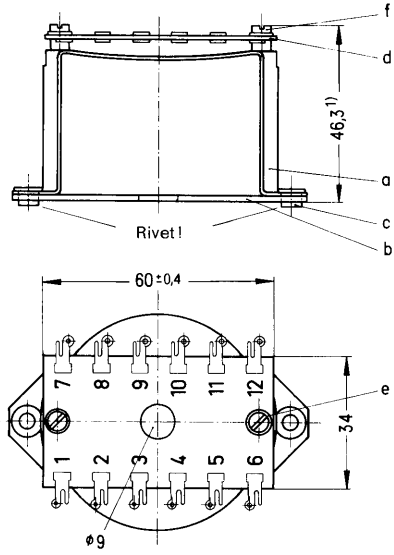
Mounting assemblies with metal base plate
0.6 mm thick nickel-silver spring yoke
Types with or without solder tag board
Fixing by screws or rivets

Approx. weight 45 g (without solder tag board)
52 g (with solder tag board)

B65693–A0001–X000
(without solder tag board)



B65693–A0002–X000
(with solder tag board)

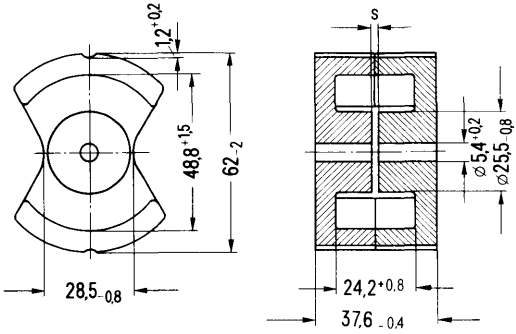


Dimensions in mm

Ordering code B65693-A0001-X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65693-A0002-X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C60358–B3180–C101	a	1 yoke complete	C60358–B3180–B1
			b	1 plate	C60358–B3180–C102
b	1 plate	C60358–B3180–C102	d	1 solder tag board compl.	C60358–B3180–B2
			c	2 tubular rivets	D7340–Q30–M37
c	2 tubular rivets	D7340–Q30–M	e	2 washers	D125–A25–M37
			f	2 cylindrical screws	D84–H40–M37

1) Max. dimension

Because of their large slots these cores are also suitable for power transformers. For design details of power transformers see page 71 to 79.



Approx. weight 250 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ =	0.195	mm^{-1}
Effective length	l_e =	96	mm
Effective area	A_e =	490	mm^2
Effective volume	V_e =	47000	mm^3

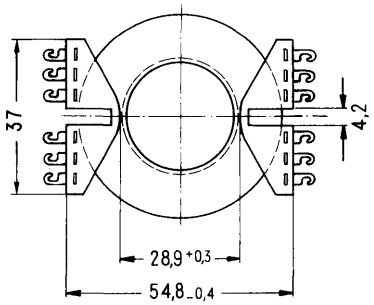
Associated parts

Coil former
Fixing yoke

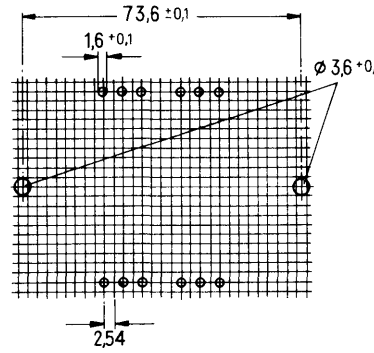
A_L value		SIFERRIT-material	**Ordering code**
nH	tolerance		
without air gap			
10000	+30 −20 %	N 27	B65694-A0000-R027

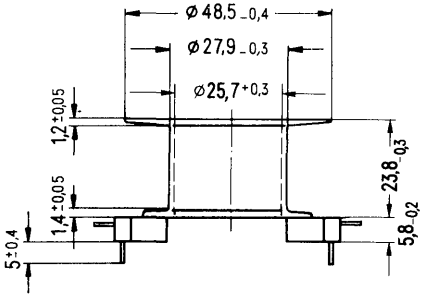
Coil former B 65 695

Polyamide GV coil former with 12 pin connections.
Permissible soldering temperature 280 °C/536 °F, 1 sec.
For winding details see page 87.

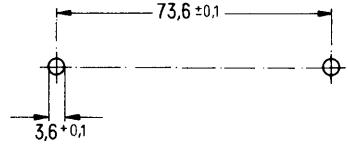


Hole arrangement for printed circuits
view in mounting direction





Hole arrangement for wired circuits
view in mounting direction



Dimensions in mm

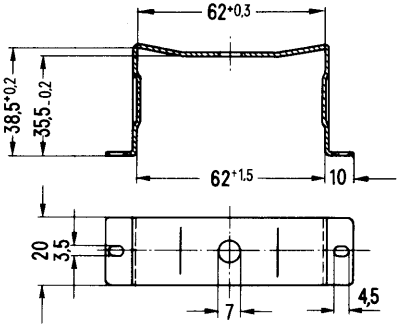
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	203	120	20	8,5	B65695-A1000-M001

Coil formers without terminal pins according to page 247 can also be used.

1) $R_{Cu} = A_R \times N^2$. Dc resistance = A_R x number of turns². The A_R value is valid for a copper factor f_{Cu} = 0.5.

Fixing yoke for wired and printed circuits B 65 695

0.6 mm thick nickel-silver spring yoke. Fixing by screws. For wired circuits the coil former has to be mounted with the pins upward.

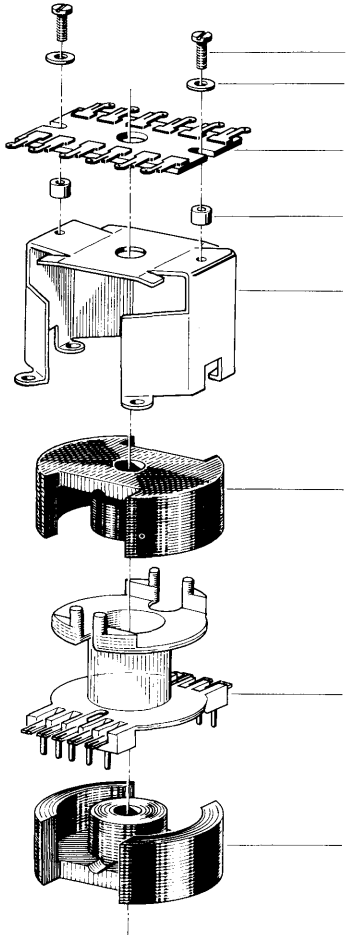


Approx. weight 25 g

Dimensions in mm

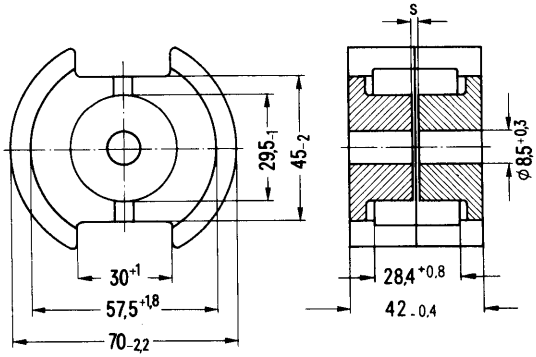
Ordering code B65695–A2000–X000

for wired and printed circuits



Individual parts	Part No.	Page
Cylindrical screws		
Washers		
Solder tag board as required	B65698	257
Threaded bushes (only for type with solder tag board)		
Yoke	B65698	257
Pot core	B65696-L	254
Coil former with 1 section; to be mounted in wired circuits with the connections upward	B65697-J	255
Coil former without connecting pins with 1 or 2 sections	B65697-A	256
Pot core	B65696-L	254

Because of their large slots these cores are also suitable for power transformers. For design details of power transformers see page 71 to 79.



Approx. weight 360 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ =	0.168	mm^{-1}
Effective length	l_e =	105	mm
Effective area	A_e =	625	mm^2
Effective volume	V_e =	65600	mm^3

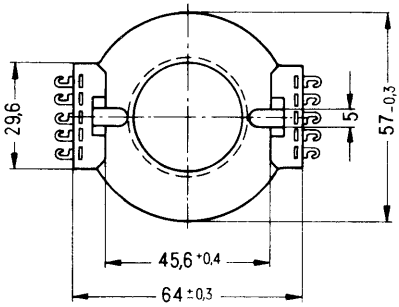
Associated parts

Coil former
Mounting assembly

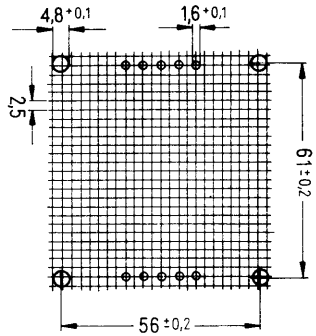
A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
1000	± 3% △A	N 28	0.4	120	B65696-L1000-A028
without air gap					
11500	+30 % −20 % △R	N 27			B65696-L0000-R027
15000		T 26			B65696-L0000-R026

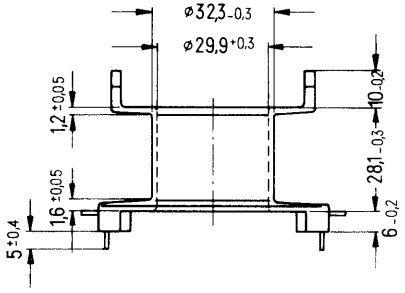
Coil former B 65 697–J

Polyamide GV coil former with 10 pin connections.
Permissible soldering temperature 280 °C/536 °F, 1 sec.
For winding details see page 87.

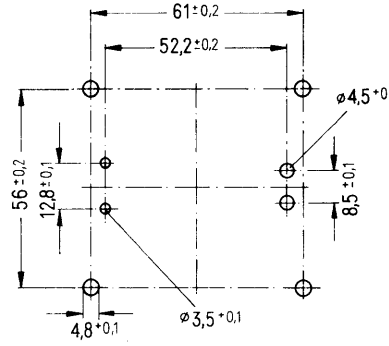


Hole arrangement for printed circuits
view in mounting direction





Hole arrangement for wired circuits
view in mounting direction



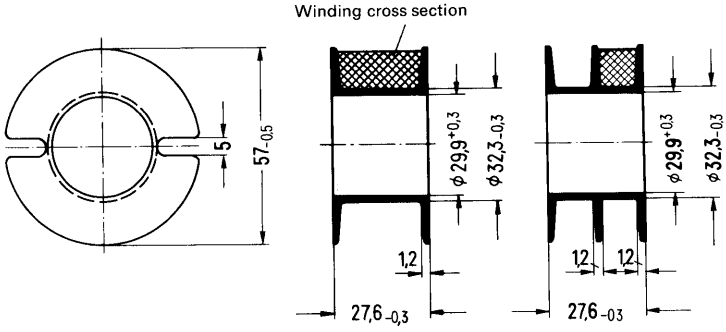
Dimensions in mm

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	290	140	16.6	15	B65697–J0000–M001

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Coil former B 65 697–A

Polycarbonate GV coil former.
For winding details see page 87.



Dimensions in mm

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 1)	Approx. weight	**Ordering code**
	of one section	total				
	mm^2	mm^2	mm	$\mu\Omega$	g	
1	290	290	140	16,6	9	B65697–A0000–M001
2	140	280		17	11	B65697–A0000–M002

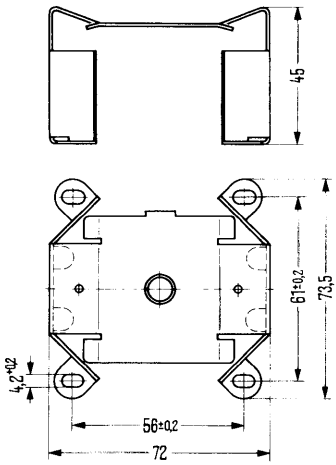
1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Mounting assemblies B 65698

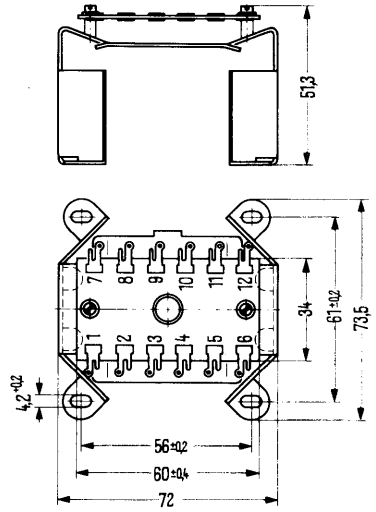
0.8 mm thick nickel silver spring yoke. Type with or without solder tag board. Fixing by screws. When the pot core B65696-L (page 250) and the coil former B65697-J (page 251) are used, the mounting assembly B65698–A0001–X000 is suitable for wired or printed circuits.
For wired circuits the coil former B65697-J has to be mounted with the pins upward.

Approx. weight 61 g (without solder tag board)
68 g (with solder tag board)

B65698–A0001–X000
(without solder tag board)



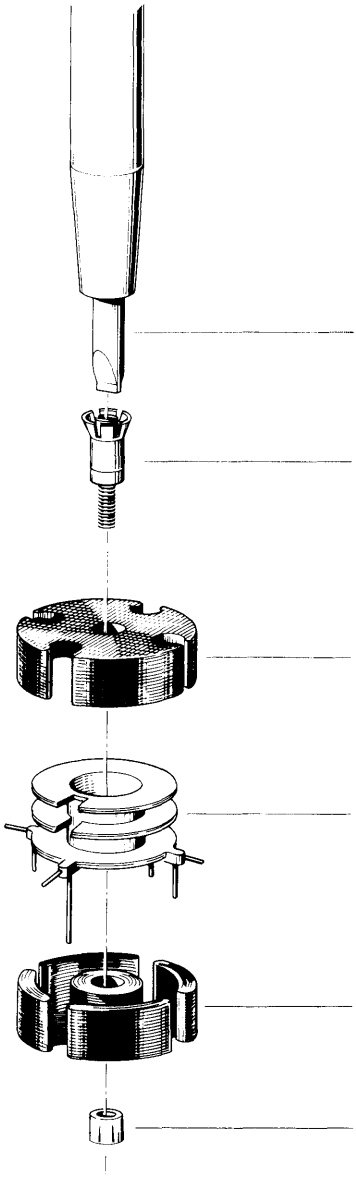
B65698–A0002–X000
(with solder tag board)



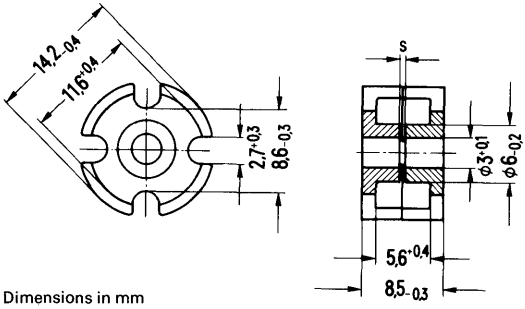
Dimensions in mm

Ordering code B65698–A0001–X000 (Complete mounting assembly without solder tag board)			**Ordering code** B65698–A0002–X000 (Complete mounting assembly with solder tag board)		
Mounting parts		Ordering code	Mounting parts		Ordering code
a	1 yoke	C61035–A9–C5	a	1 yoke	C61035–A9–C5
			b	1 solder tag board compl.	C60358–B3180–B2
			c	2 cylindrical screws	D84–H40–M37
			d	2 washers	D125–A25–M37

for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65549	134
Pot core	B65546	260
Coil former with 1 or 2 sections	B65547	261
Pot core	B65546	260
Theraded sleeve	B65808	134



Approx. weight 4 g/set

Dimensions in mm

Magnetic data

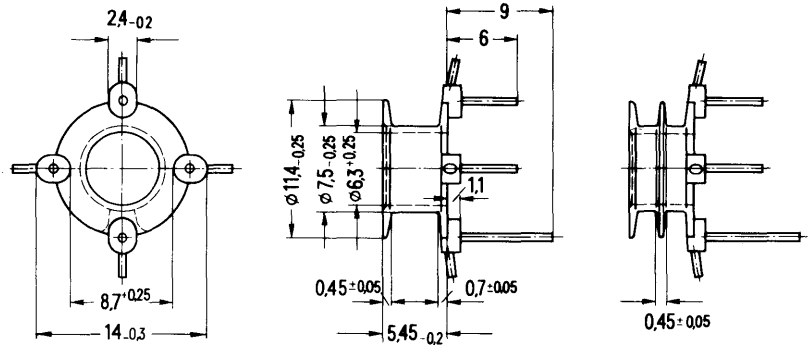
Core factor	$\Sigma\ l/A$ =	0.789	mm^{-1}
Effective length	l_e =	20	mm
Effective area	A_e =	25	mm^2
Effective volume	V_e =	500	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
40	± 3% △A	N 22	1.0	25.2	B65546-A0040-A022
100			0.31	63	B65546-A0100-A022
160			0.16	101	B65546-A0160-A022
160		N 28	0.17	101	B65546-A0160-A028
250			0.1	157	B65546-A0250-A028
315			0.08	198	B65546-A0315-A028
400			0.05	252	B65546-A0400-A028
160		N 48	0.17	101	B65546-A0160-A048
250			0.1	157	B65546-A0250-A048
315			0.08	198	B65546-A0315-A048
400			0.05	252	B65546-A0400-A048
without air gap					
2100	+30 % −20 % △R	T 26			B65546-A0000-R026
4200		N 30			B65546-A0000-R030
9000	+40 % −30 % △Y	T 38			B65546-A0000-Y038

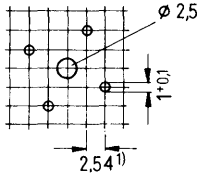
The pot cores B65546-A****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65546-**N******-****.

Coil former B 65547

Thermosetting plastic coil former with 4 pin connections Permissible soldering temperature 400 °C/752 °F, 2 sec.



Hole arrangement
View in mounting direction



Dimensions in mm

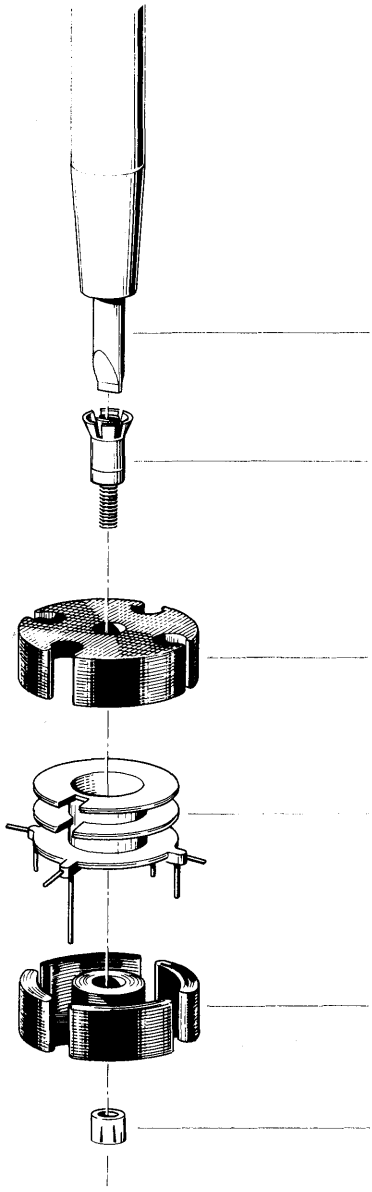
1) 2.5 mm spacing also permissible

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 2)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	7.5	7.5	29.3	134	0.28	B65547-A1001-D001
2	3.3	6.6		153	0.3	B65547-A1001-D002

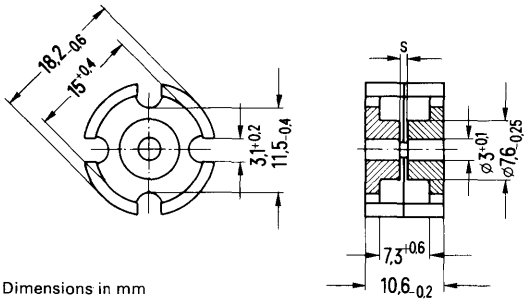
For adjusting screws, threaded sleeve, and adjustment curves see page 134, 135.

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig.2
Matching handle	B63399	275, fig.4
Adjusting screw	B65659	144
Pot core	B65656	264
Coil former with 1 or 2 sections	B65657	265
Pot core	B65656	264
Threaded sleeve	B65808	144



Approx. weight 6 g/set

Dimensions in mm

Magnetic data

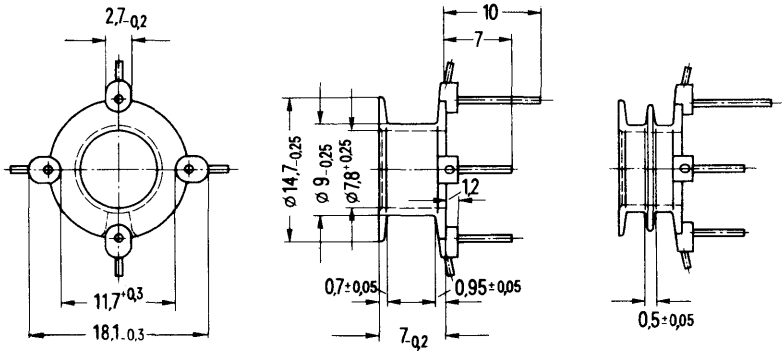
Core factor	$\Sigma\ l/A$ =	0.597	mm^{-1}
Effective length	l_e =	26	mm
Effective area	A_e =	44	mm^2
Effective volume	V_e =	1140	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
63	± 3% △A	N 22	1.3	30	B65656-A0063-A022
100			0.65	48	B65656-A0100-A022
160			0,32	76,7	B65656-A0160-A022
250			0,18	120	B65656-A0250-A022
250		N 28	0.2	120	B65656-A0250-A028
315			0,15	151	B65656-A0315-A028
400			0,1	192	B65656-A0400-A028
500			0,07	238	B65656-A0500-A028
250		N 48	0,2	120	B65656-A0250-A048
315			0.15	151	B65656-A0315-A048
400			0,1	192	B65656-A0400-A048
500			0.07	238	B65656-A0500-A048
without air gap					
2800	+30 −20 % △R	T 26 N 30			B65656-A0000-R026
5600					B65656-A0000-R030
12000	+40 −30 % △Y	T 38			B65656-A0000-Y038

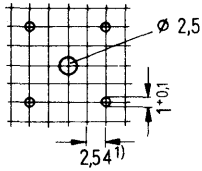
The pot cores B65656-A****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65656-**N******-****.

Coil former B 65657

Thermosetting plastic coil former with 4 pin connections. Permissible soldering temperature 400 °C/752 °F, 2 sec.



Hole arrangement
view in mounting direction



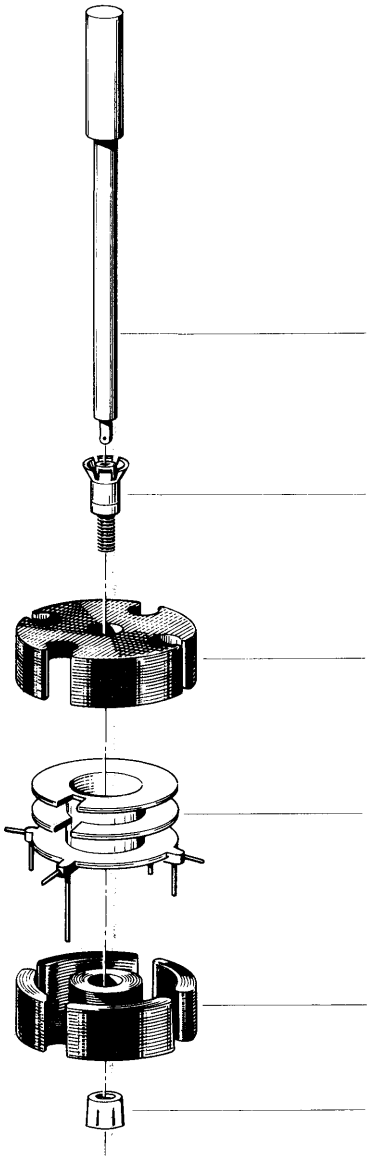
Dimensions in mm
1) 2.5 mm spacing also permissible

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 2)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	14	14	36.8	90.5	0.58	B65657-A1001-D001
2	6.1	12.2		104	0.6	B65657-A1001-D002

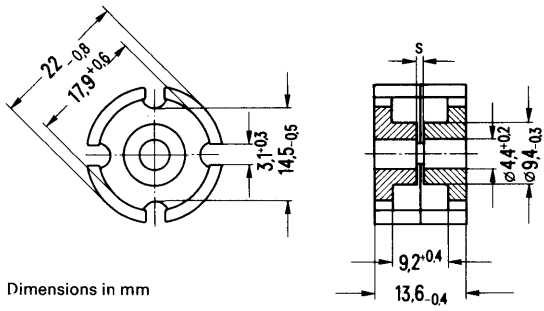
For adjusting screws, threaded sleeve, and adjustment curves see page 144 to 146.

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65669	167
Pot core	B65666	268
Coil former with 1 or 2 sections	B65667	269
Pot core	B65666	268
Threaded sleeve	B65669	167



Approx. weight 13 g/set

Dimensions in mm

Magnetic data

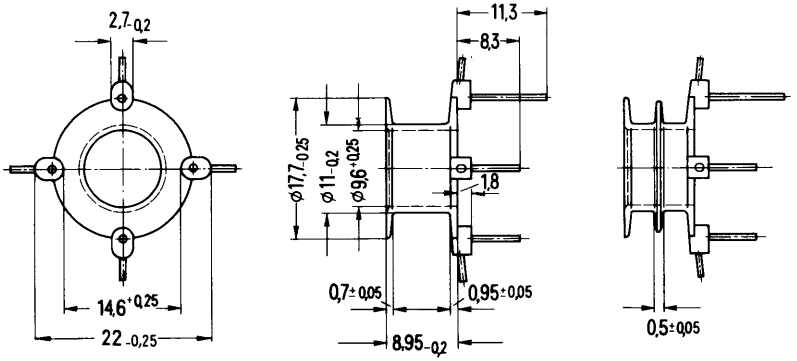
Core factor	$\Sigma l/A$ =	0.497	mm^{-1}
Effective length	l_e =	31.5	mm
Effective area	A_e =	63	mm^2
Effective volume	V_e =	1980	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
100	± 3% △A	N 22	1.0	39.8	B65666-A0100-A022
160			0.5	63.5	B65666-A0160-A022
250			0.26	99.5	B65666-A0250-A022
315			0.2	125	B65666-A0315-A022
400			0.14	159	B65666-A0400-A022
250		N 28	0.29	99.5	B65666-A0250-A028
315			0.22	125	B65666-A0315-A028
400			0.16	159	B65666-A0400-A028
630			0.1	250	B65666-A0630-A028
250		N 48	0.29	99.5	B65666-A0250-A048
315			0.22	125	B65666-A0315-A048
400			0.16	159	B65666-A0400-A048
630			0.1	250	B65666-A0630-A048
without air gap					
3800	+30 −20 % △R	T 26			B65666-A0000-R026
7000		N 30			B65666-A0000-R030
16000	+40 −30 % △Y	T 38			B65666-A0000-Y038

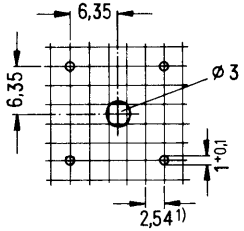
The pot cores B65666-A****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65666-**N******-****.

Coil former B 65 667

Thermosetting plastic coil former with 4 pin connections.
Permissible soldering temperature 400 °C/752 °F, 2 sec.



Hole arrangement
View in mounting direction



Dimensions in mm

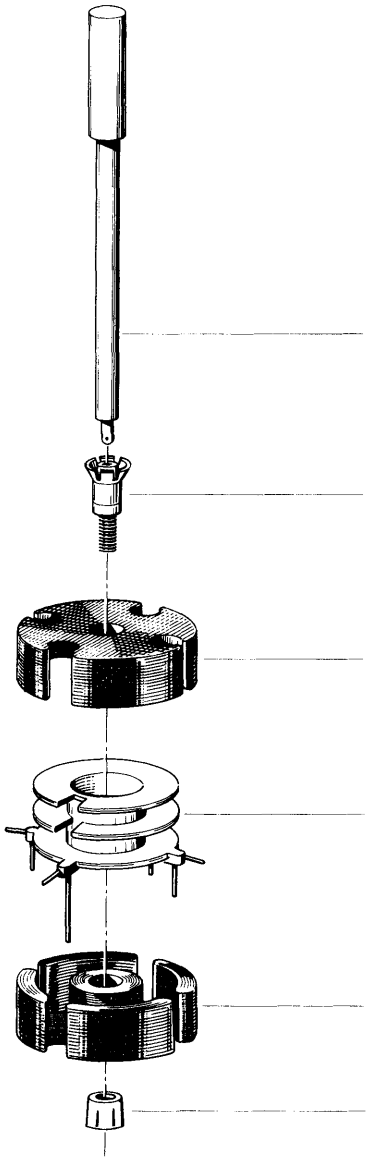
1) 2.5 mm spacing also permissible

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 2)	Approx. weight	**Ordering code**
	of one section	total				
	mm²	mm²	mm	μΩ	g	
1	23	23	44.6	66.7	0.92	B65667-A1001-D001
2	10,7	21,4		71.6	0.94	B65667-A1001-D002

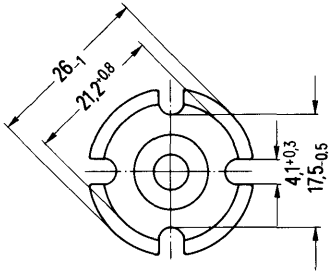
For adjusting screws, threaded sleeve, and adjustment curves see page 167 to 169.

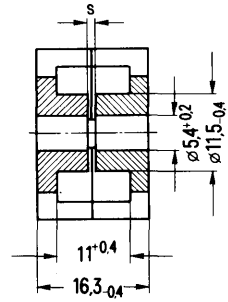
2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

for printed circuits



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65679	191
Pot core	B65676	272
Coil former with 1 or 2 sections	B65677	273
Pot core	B65676	272
Threaded sleeve	B65679	191





Approx. weight 21 g/set

Dimensions in mm

Magnetic data

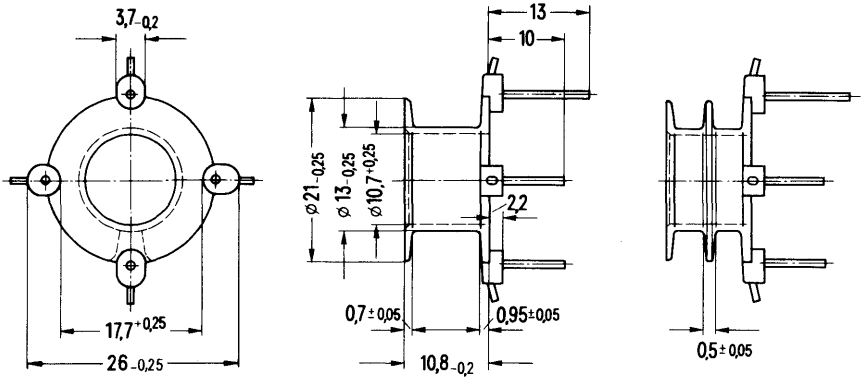
Core factor	$\Sigma\ l/A$ =	0.4 mm^{-1}
Effective length	l_e =	37.5 mm
Effective area	A_e =	94 mm^2
Effective volume	V_e =	3520 mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
160	± 3% △A	N 22	0,80	51	B65676-A0160-A022
250			0,40	79,5	B65676-A0250-A022
315			0,32	100	B65676-A0315-A022
400			0,22	127,5	B65676-A0400-A022
630			0.12	200	B65676-A0630-A022
315		N 28	0,34	100	B65676-A0315-A028
400			0,24	127,5	B65676-A0400-A028
630			0,15	200	B65676-A0630-A028
800			0.11	255	B65676-A0800-A028
without air gap					
4900	+30 % △R	T 26			B65676-A0000-R026
9000	−20 % △R	N 30			B65676-A0000-R030
20000	+40 −30 % △Y	T 38			B65676-A0000-Y038

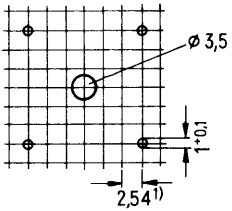
The pot cores B65676-A****-**** are also available with a flangeless threaded sleeve already cemented in position. **Ordering code** B65676-**N******-****.

Coil former B 65677

Thermosetting plastic coil former with 4 pin connections. Permissible soldering temperature 400 °C/752 °F, 2 sec.



Hole arrangement
View in mounting direction



Dimensions in mm
1) 2.5 mm spacing also permissible

Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 2)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	28	28	53	65	1.24	B65677-A1001-D001
2	13.2	26.4		69	1.26	B65677-A1001-D002

For adjusting screws, threaded sleeve, and adjustment curves see page 191, 192.

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

for pot, RM and miniature coil cores

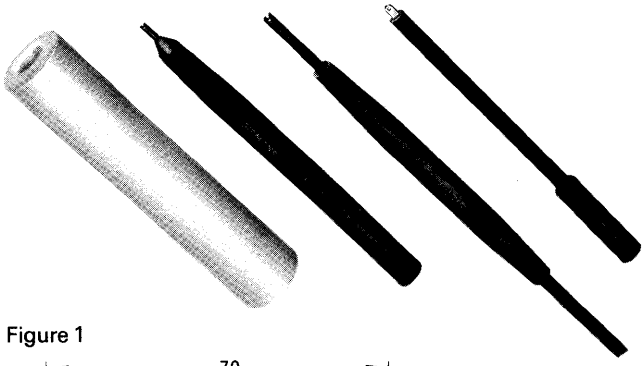
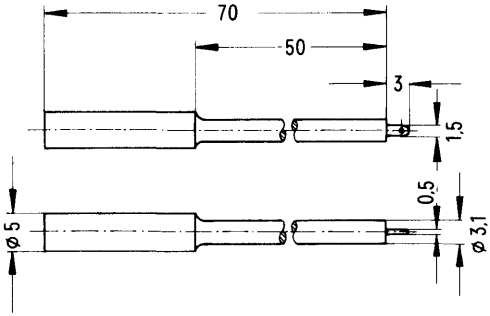


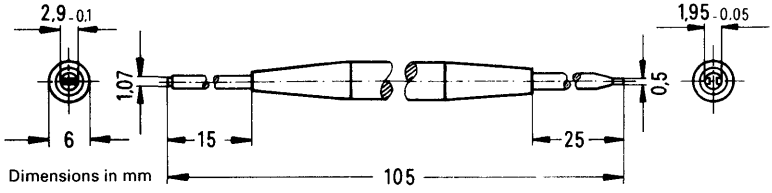
Figure 1



Thermosetting plastic adjusting screw driver with flat blade for threaded cores and adjusting devices, for pot core holes 4.4 mm and 5.5 mm
(Core sizes 22 dia x 13 to 47 dia x 28 and RM 8 cores).

Ordering code B63339–A0001–X000

Figure 2



Thermosetting plastic adjusting screw driver with a slot at the thinner end for miniature adjusting devices for 2 mm pot core holes.
(Core sizes 9 dia x 5; 9 dia x 7; 11 dia x 7 and RM 4 and RM 5 cores.)

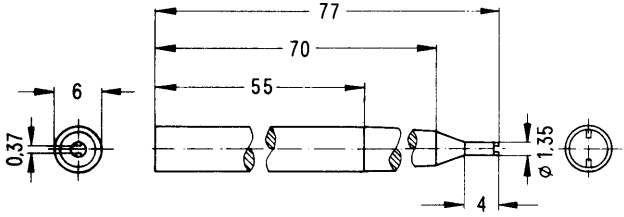
The other end is suitable for 3 mm pot core holes.
(Core sizes 14 dia x 8; 18 dia x 11; 18 dia x 14 and RM 6 cores.)

Can be fitted into the handle B63399–B0005–X000 (figure 4).

Ordering code B63399–B0004–X000

for pot, RM and miniature coil cores

Figure 3



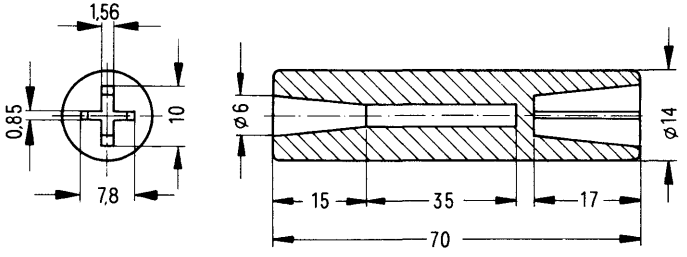
Thermosetting plastic adjusting screw driver with a slot at the thinner end for miniature adjusting devices of the pot core coil 7 x 4.

The other end is suitable for adjusting the miniature coil 4.6 x 5.2 with attachment cap.

The tapered end can be fitted in handle B63399–B0005–X000 (figure 4).

Ordering code B63399–A1007–X000

Figure 4



Dimensions in mm

Thermosetting plastic handle, fitting adjusting screw driver of figure 2 and 3.

Ordering code B63399–B0005–X000

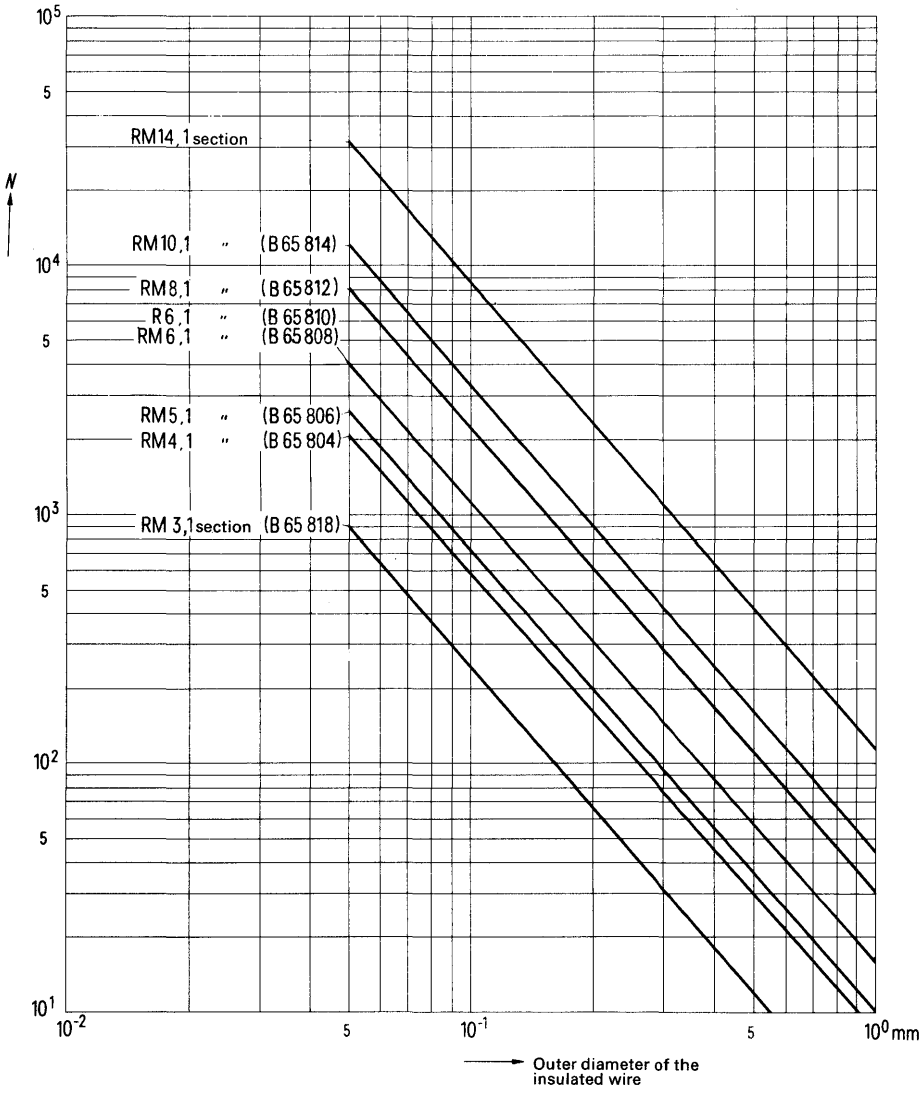
RM, Q, EP, X Cores
Miniature Coil Cores

RM, Q, EP, X Cores
Miniature Coil Cores

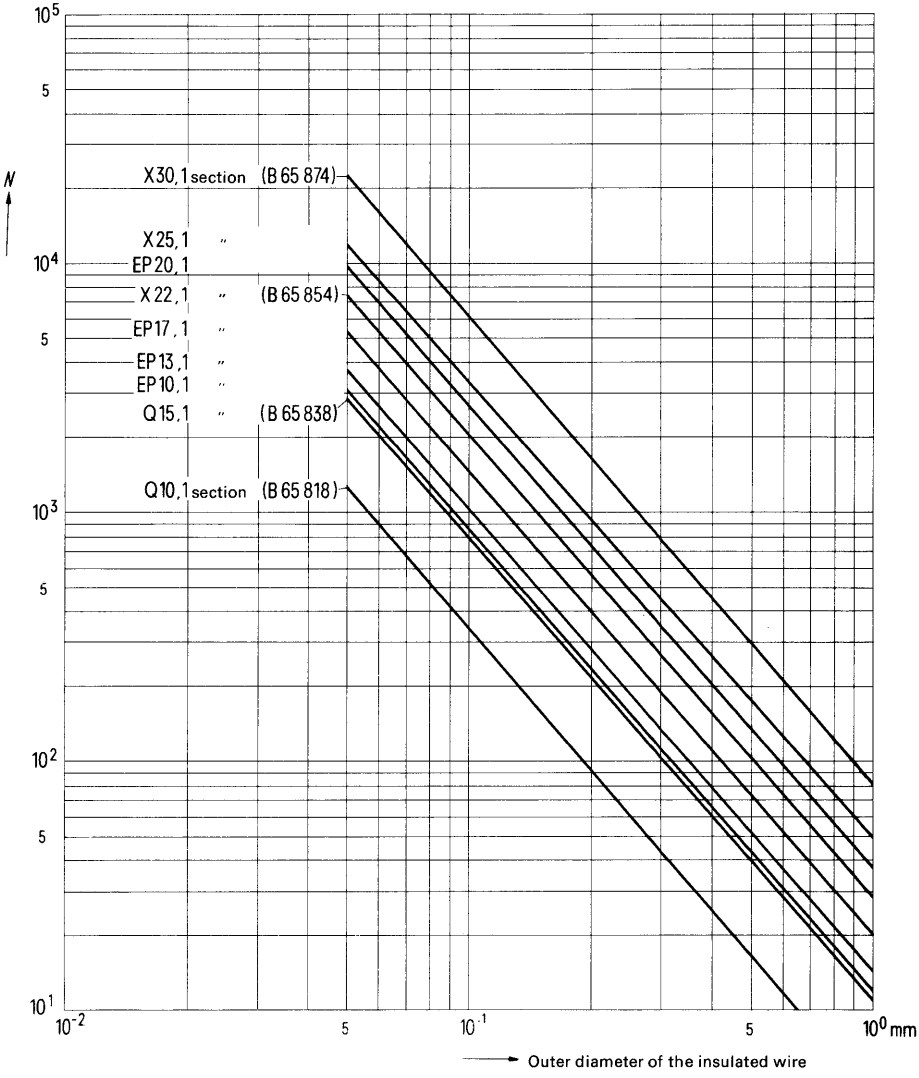
Summary

Type of core	Mounting volume basic area x height mm (approx.)	Drawing number	Type No.	Page
RM3 core	7.5^2 x 7.5	2 x C61035-A34-C2	B65817	282
RM4 core	10^2 x 10.5	2 x C61035-A32-C1	B65803	285
RM5 core	12.5^2 x 10.5	2 x C61035-A31-C8	B65805	290
RM6 core	15^2 x 12.5	2 x C61035-A26-C34	B65807	297
R6 core	15^2 x 12.5	2 x C61035-A43-C1	B65809	305
RM8 core	20^2 x 16.5	2 x C61035-A28-C6	B65811	311
RM10 core	25^2 x 19	2 x C61035-A50-C1	B65813	317
RM14 core	35^2 x 28.5	2 x C61035-A44-C1	B65887	321
Miniature coil cores	(5 x 5) x 6.5	C61036-A36-C1 C61036-A36-C2	B66430 B66433	325
Cube core Q 10	(11 x 9) x 11	2 x C61036-A16-C1	B65833	333
Cube core Q 15	(16 x 11) x 14	2 x C61036-A17-C1	B65837	337
EP 10 core	(14 x 12) x 12,5	2 x C61036-A34-C1	B65841	341
EP13 core	(15 x 15) x 13	2 x C61036-A43-C1	B65843	345
EP17 core	(21 x 20) x 15	2 x C61036-A44-C1	B65845	349
EP20 core	(27 x 23) x 21	2 x C61036-A33-C1	B65847	353
X core X 22	22^2 x 14	2 x C61036-A7-C2	B65851	357
X core X 25	25^2 x 16	2 x C61036-A9-C1	B65861	359
X core X 30	30^2 x 23	2 x C61036-A8-C1	B65871	361

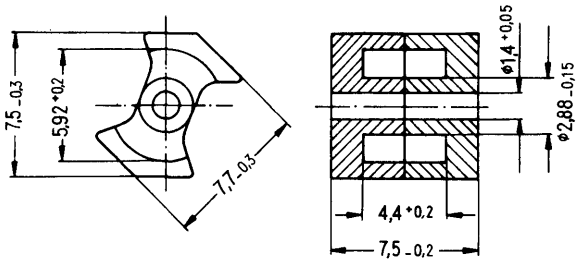
Maximum number of turns *N* for coil formers



Maximum number of turns *N* for coil formers



RM3 cores for use in printed circuits for transformer design with high packing density. The wire ends of the winding are connected directly to the solder pins of the coil former. When mounting the core it is advisable to cement the two core halves together (see page 80).



Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ = 2.1 mm^{-1}
Effective length	l_e = 13.8 mm
Effective area	A_e = 6.5 mm^2
Effective volume	V_e = 90 mm^3

Approx. weight 0.5 g/set

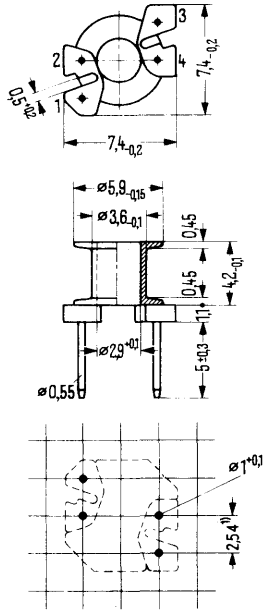
Associated parts

Coil former

A_L value nH	tolerance	SIFERRIT-material	**Ordering code**
without air gap			
600	+40 −30 % ≙ Y	T 26	B65817-A0000-Y026
1200		N 30	B65817-A0000-Y030

Coil former B 65 818

Thermosetting plastic coil former with 4 terminal pins
Permissible soldering temperature max. 400 °C/752 °F, 2s.
For winding details see page 280.



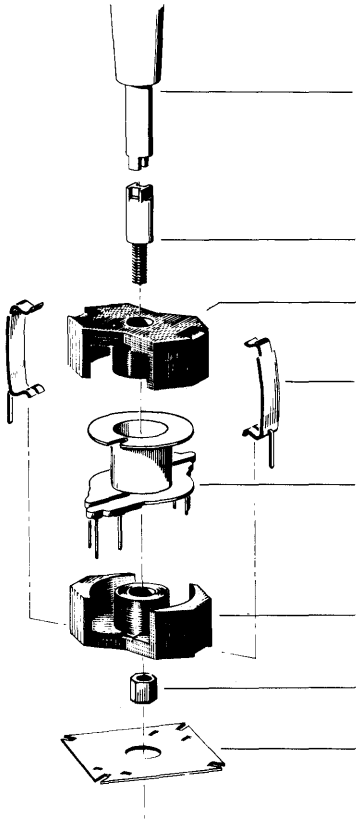
Hole arrangement
View in mounting direction

1) 2.5 mm spacing also permissible

Dimensions in mm

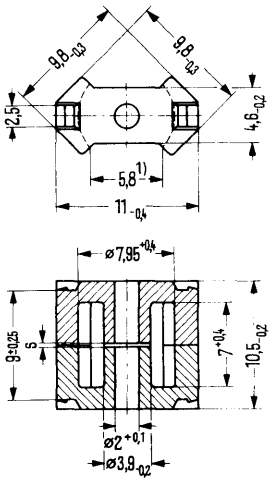
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	**Ordering code**
1	3,44	14,7	147	0,1	B65818-A1001-D001

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65539	288
Core	B65803	286
Clamps	B65806	287
Coil former	B65804	287
Core	B65803	286
Threaded sleeve	B65539	288
Insulating washer (in preparation)	B65804	287

RM4 cores for use in printed circuits in accordance with DIN 41 980 and IEC recommendation 51 (CO) 128 for filter coil and transformer design with high packing density.
The wire ends of the winding are connected directly to the solder pins of the coil former.
When mounting the core it is advisable to cement the two core halves together
(see page 80).



Magnetic data

Core factor	$\Sigma l/A$ =	1.9 mm^{-1}
Effective length	l_e =	21.2 mm
Effective area	A_e =	11 mm^2
Effective volume	V_e =	234 mm^3

Approx. weight 2 g/set

1) Min. dimension

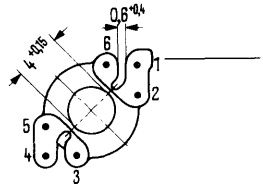
Dimensions in mm

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
16	± 3% △ A	K 1	1.0	24.2	B65803-A0016-A001
25			0.40	16.6	B65803-A0025-A001
40		M 33	0.36	60	B65803-A0040-A033
63			0.18	95	B65803-A0063-A033
63		N 28	0.16	95	B65803-A0063-A028
100			0.10	151	B65803-A0100-A028
160			0.06	242	B65803-A0160-A028

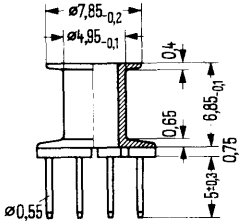
The RM core sets B65803-A****-**** are also available with inserted 11 polyamide GV threaded part. **Ordering code** B65803-**N** ****-****.

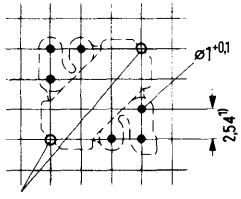
Coil former and clamps B65804, B65806

Thermosetting plastic **coil former** in accordance with DIN 41981 with 4, 5 or 6 terminal pins
Permissible soldering temperature max. 400 °C/752 °F, 2 sec. For winding details see page 280.
Spring steel **clamps** with earth connection.



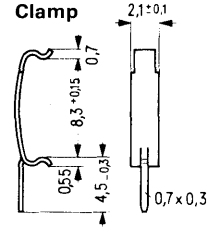
Pin 1 identified by a dip in the lower flange and a slot in the upper flange





Hole arrangement
View in mounting direction

Earthing points 1 + o.1 mm dia



Dimensions in mm

1) 2.5 mm spacing also permissible

Coil former					Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	
1	7.7	20	85	0.25	B65804-A1001-D001
Clamp (approx. weight 0.1 g; ordering code for each clamp, 2 required)					B65806-B2001-X000

Drawing details for the assembly of mounting devices: **Ordering code** C61407-A3-A3.
Insulating washer for double clad PC boards (in preparation):
Ordering code B65804-A2005-X000

2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns², copper factor $f_{Cu} = 0.5$.

Adjusting devices B 65 539

Adjusting screw (a, b) B65539–A1***–X*** consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and 4 cam profiles, serving as core brake;

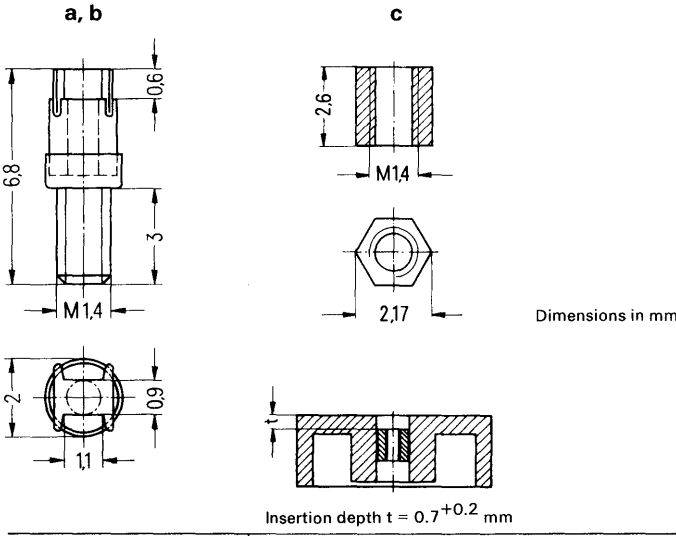
fits:

11 polyamide GV **threaded sleeve without flange** (c) B65539–J1002–X000, colour code white;

or as required

RM4 core sets B65803-**N******–X*** with inserted 11 polyamide GV threaded part (see page 286)

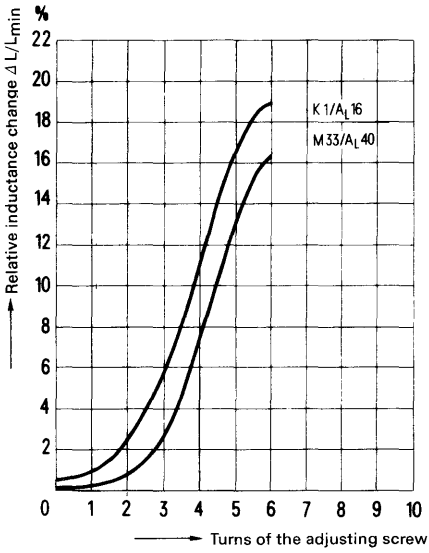
Adjusting screw driver B63399–B0004–X000



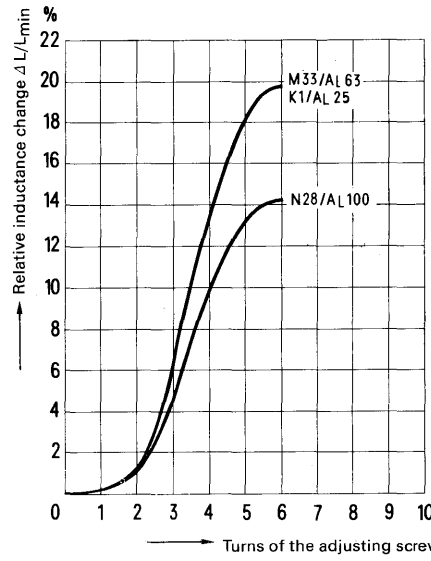
Pot core B65803		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 1	16	a	1,81 x 2.0	Si 1 s	black	B65539–A1003–X101
	25			K 1	yellow	B65539–A1003–X001
M 33	40			Si 1 s	black	B65539–A1003–X101
	63			K 1	yellow	B65539–A1003–X001
N 28	63			Si 1 s	black	B65539–A1003–X101
	100			K 1	yellow	B65539–A1003–X001
	160	b	1,81 x 2,7	N 22	red	B65539–A1002–X022

Inductance adjustment curves

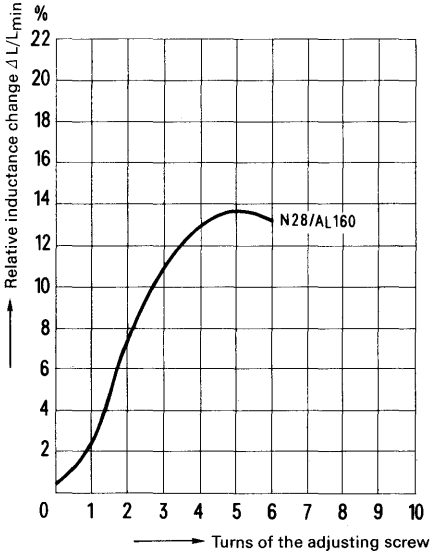
Adjusting screw B65539–A1003–X101
colour code black



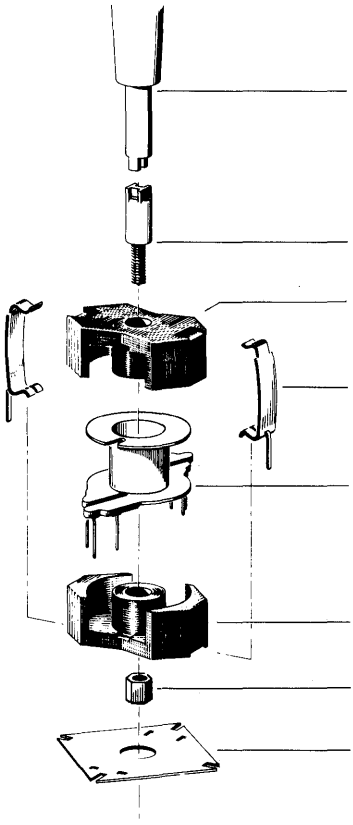
Adjusting screw B65539–A1003–X001
colour code yellow



Adjusting screw B65539–A1002–X022
colour code red



0 ≙ at least one turn engaged.

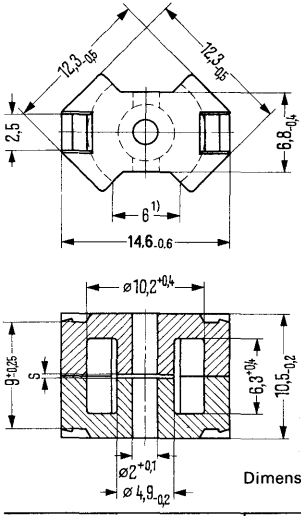


Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65539	293
Core	B65805	291
Clamps	B65806	292
Coil former [1]	B65806	292
Core	B65805	291
Threaded sleeve	B65539	293
Insulating washer	B65806	292

[1] Coil formers with bent solder tags (for thick wires) are available upon request. Ordering code: B65806-J1001-D001

RM5 cores for use in printed circuits in accordance with DIN 41980 and IEC recommendation 51 (CO) 128 for filter coil and transformer design with high packing density.

When mounting the core, it is advisable to cement the two core halves together (see page 80).



Dimensions in mm

1) Min dimension

Magnetic data

Core factor	$\Sigma\, l/A$ =	1.02 mm^{-1}
Effective length	l_e =	21.4 mm
Effective area	A_e =	21.2 mm^2
Effective volume	V_e =	454 mm^3

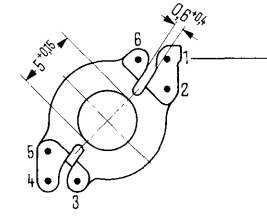
Approx. weight 3.1 g/set

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
25	± 3% ≙ A	K 1	1.0	20.3	B65805-C0025-A001
40			0.4	32.5	B65805-C0040-A001
63		M 33	0.4	51	B65805-C0063-A033
100		N 22	0.25	81	B65805-C0100-A022
160		N 48	0.12	130	B65805-C0160-A048
250			0.06	203	B65805-C0250-A048
315			0.03	256	B65805-C0315-A048
160		N 28	0.12	130	B65805-C0160-A028
250			0.06	203	B65805-C0250-A028
315			0.03	256	B65805-C0315-A028
without air gap					
1600	+30 −20 % ≙ R	T 26			B65805-C0000-R026
3200		N 30			B65805-C0000-R030
4800		T 35			B65805-C0000-R035
6000	+40 −30 % ≙ Y	T 38			B65805-C0000-Y038

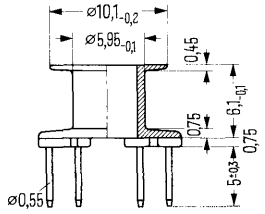
The RM core sets B65805-C****-**** are also available with inserted 11 polyamide GV threaded part. **Ordering code** B65805-**N******-****.

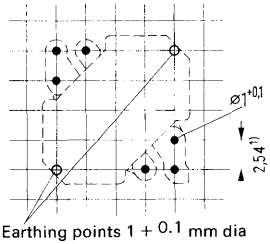
Coil former and clamps B 65 806

Thermosetting plastic **coil former** in accordance with DIN 41981 with 6 terminal pins. Permissible soldering temperature max. 400 °C/752 °F, 2 sec. For winding details see page 280. Spring steel **clamps** with earth connection.



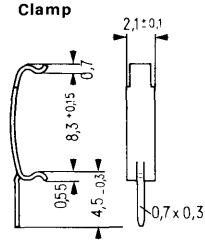
Pin 1 identified by a dip in the lower flange and a slot in the upper flange.





Hole arrangement
View in mounting direction

Clamp



Dimensions in mm

1) 2.5 mm spacing also permissible

Coil former					Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value2) $\mu\Omega$	Approx. weight g	
1	9.5	25	90	0.3	B65806-B1001-D001
Clamp (Approx. weight 0.1 g; ordering code for each clamp, two required)					B65806-B2001-X000

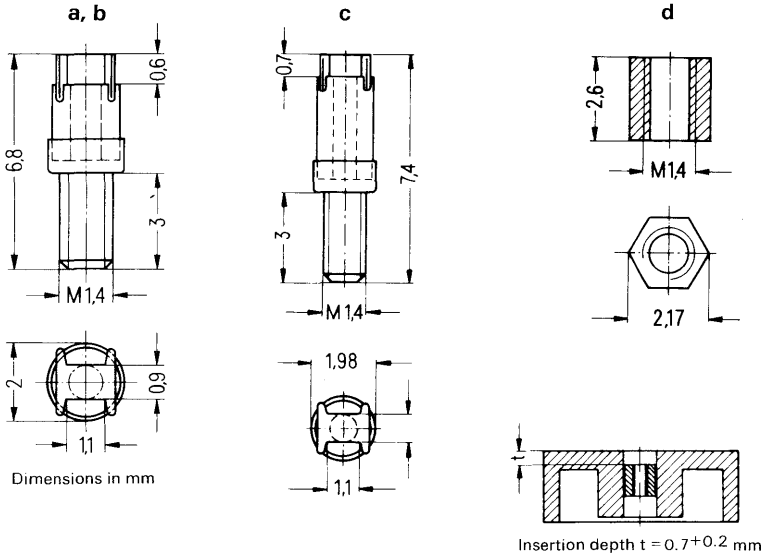
Drawing details for the assembly of mounting devices: **Ordering code** C61407-A3-A4. Insulating washer for double clad PC boards. **Ordering code** B65806-A2005-X000

2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).

Adjusting devices B 65 539, B 65 806

Adjusting screws (a, b) B65539–A1***–X*** and (c) B65806–A3001–X022 consisting of a SIFERRIT or SIRUFER tube core on which a polyacetal thread is molded and 4 cam profiles, serving as core brake;

fits:
11 polyamide GV **threaded sleeve without flange** (d) B65539–J1002–X000, colour code white;
or as required
RM5 core sets B65805–**N******–X*** with inserted 11 polyamide GV threaded part (see page 291)
Adjusting screw driver B63399–B0004–X000



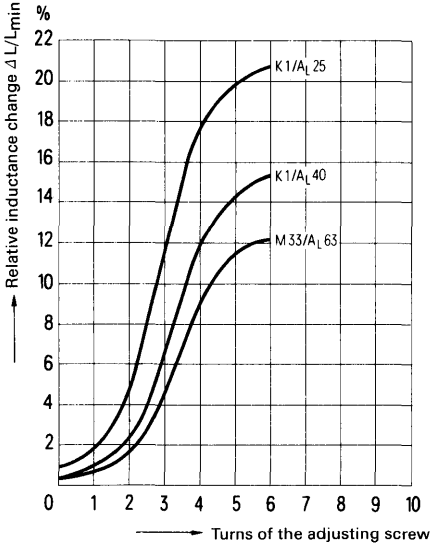
Dimensions in mm

Insertion depth $t = 0.7^{+0.2}$ mm

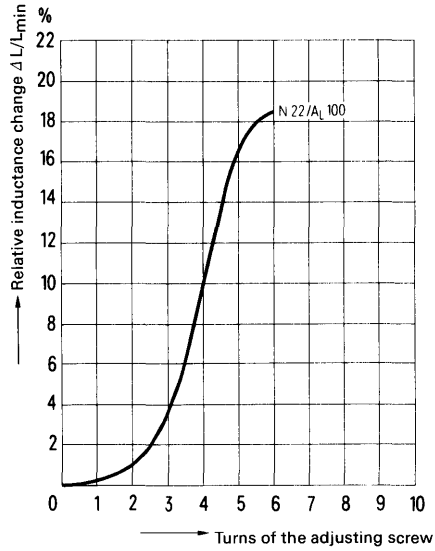
Pot core B65805		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 1	25	a	1.81 x 2.0	Si 1 s	black	B65539–A1003–X101
M 33	40 63					
N 22	100			K 1	yellow	B65539–A1003–X001
N 28, N 48	160	b	1.81 x 2.7	N 22	red	B65539–A1002–X022
	250	c	1.85 x 3.4		green	B65806–A3001–X022
	315					

Inductance adjustment curves

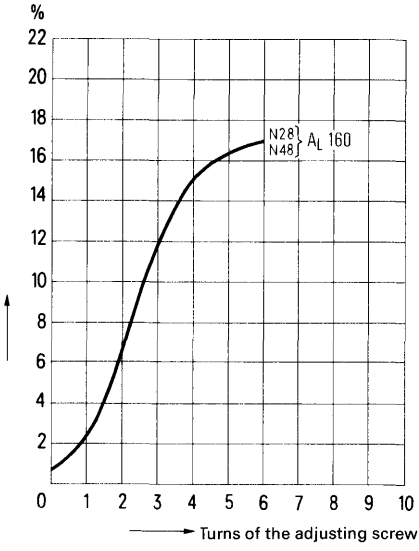
Adjusting screw B65539–A1003–X101
colour code black



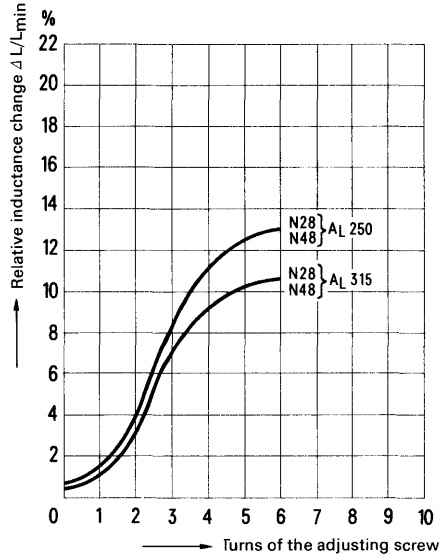
Adjusting screw B65539–A1003–X001
colour code yellow



Adjusting screw B65539–A1002–X022
colour code red



Adjusting screw B65806-A3001-X022
colour code green

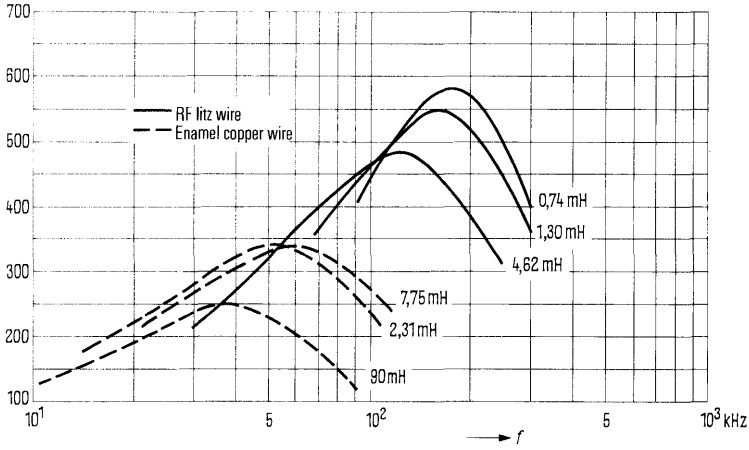


0≙ at least one turn engaged.

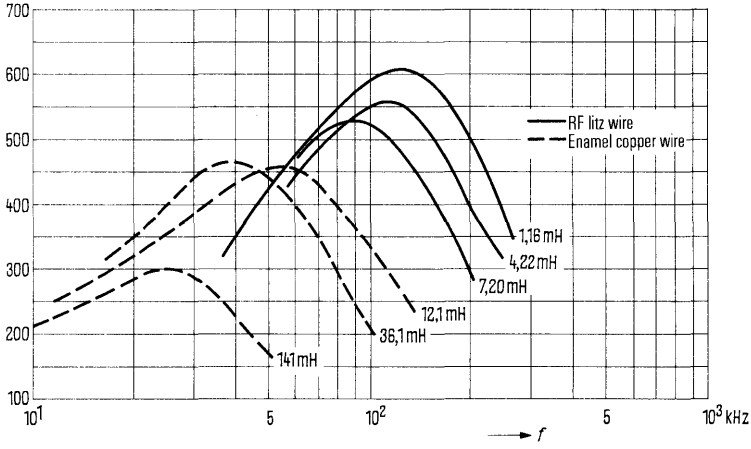
Q factor characteristics; material N 28

L (mH) for A_L = 160 nH	L (mH) for A_L = 250 nH	Turns	Wire; RF litz wire	Number of sections
90	141	750	0.1 CuL	1
23.1	36.1	380	0.14 CuL	1
7.75	12.1	220	0.18 CuL	1
4.62	7.20	170	10 x 0.05 CuLS	1
–	4.22	130	20 x 0.04 CuLS	1
1.30	–	90	30 x 0.04 CuLS	1
0.74	1.16	68	45 x 0.04 CuLS	1

Flux density in the core $\hat{B}$ < 2 mT



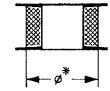
N 28 (typical values)
A_L = 160 nH



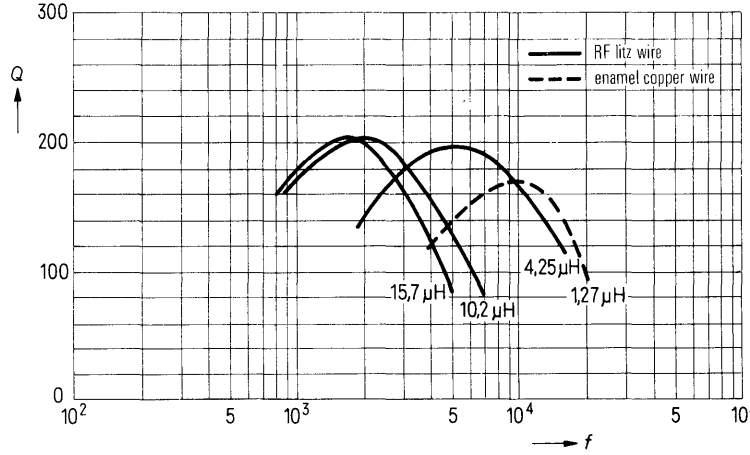
N 28 (typical values)
A_L = 250 nH

Q factor characteristics; material K 1

L [μH] for A_L = 25 nH	L [μH] for A_L = 40 nH	Turns	Wire; litz wire	Ø mm*
1.27	1.96	7	0.6 CuL	8.5
4.25	6.75	13	30 x 0.04 CuLS	9.0
15.7	25.0	25	30 x 0.04 CuLS	8.4
10.2	16.0	20	45 x 0.04 CuLS	8.2

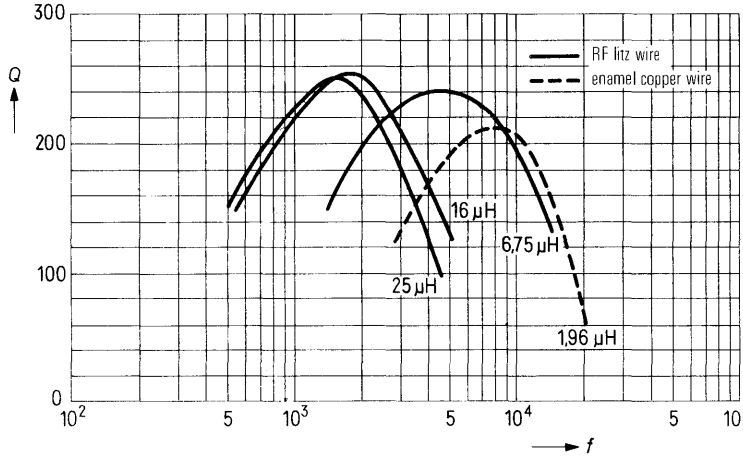


Pad of polystyrene tape up to the diameter Ø* (valid for 1 section)



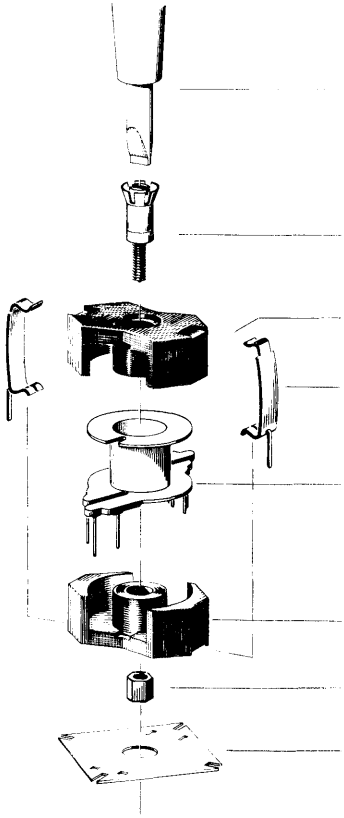
K 1 (typical values)
A_L = 25 nH

Flux density in the core
$\hat{B}$ < 0.5 mT



K 1 (typical values)
A_L = 40 nH

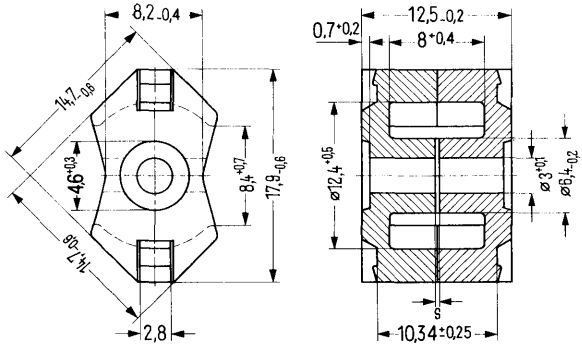
Flux density in the core
$\hat{B}$ < 0.6 mT



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65659	300
Core	B65807	298
Clamps	B65808	299
Coil former[1] with 1 or 2 sections, 4, 5 or 6 pins	B65808	299
Core	B65807	298
Threaded sleeve or	B65808	300
threaded flange	B65569	300
Insulating washer	B65808	299

1) Coil formers with bent solder tags (for thick wires) are available upon request. Ordering code B65808-J1003-D001

RM 6 cores for printed circuits in accordance with DN 41980 and IEC recommendadtion 51 (CO) 128.



Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A = 0.86\ \text{mm}^{-1}$
Effective length	$l_e = 27\ \text{mm}$
Effective area	$A_e = 31\ \text{mm}^2$
Effective volume	$V_e = 840\ \text{mm}^3$

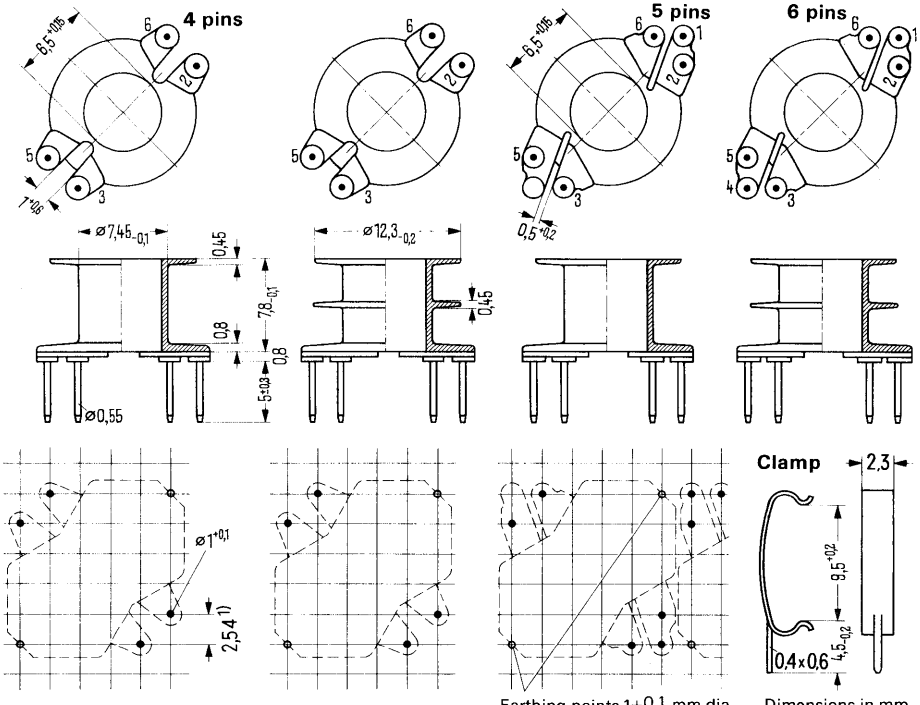
Approx. weight 4.5 g/set

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
40	± 3% △A	K 1	0.80	27.4	B65807-C0040-A001
63		M 33	0.60	43.2	B65807-C0063-A033
100			0.38	68.5	B65807-C0100-A033
160		N 22	0.20	110	B65807-C0160-A022
250			0.11	171	B65807-C0250-A022
160		N 28	0.20	110	B65807-C0160-A028
200			0.16	137	B65807-C0200-A028
250			0.11	171	B65807-C0250-A028
315			0.08	216	B65807-C0315-A028
400			0.05	274	B65807-C0400-A028
500			0.03	343	B65807-C0500-A028
200		N 48	0.16	137	B65807-C0200-A048
250			0.11	171	B65807-C0250-A048
315			0.08	216	B65807-C0315-A048
400			0.05	274	B65807-C0400-A048
160		N 32	0.20	110	B65807-C0160-A032
200			0.16	137	B65807-C0200-A032
250			0.11	171	B65807-C0250-A032
1000	±10% △K	T 26	0.006	685	B65807-C1000-K026
1250			0.005	855	B65807-C1250-K026
without air gap					
4000	+30 −20 % △R	N 30			B65807-C0000-R030
5700		T 35			B65807-C0000-R035
8000	+40 −30 % △Y	T 38			B65807-C0000-Y038

The RM core sets B65807-C****-**** are also available with inserted 11 polyamide GV threaded part M 2. **Ordering code** B65807-**N******-****.

Coil former and clamps B 65 808

Thermosetting plastic **coil former** in accordance with DIN 41981 with 4, 5 or 6 terminal pins. Permissible soldering temperature max. 400 °C/752 °F, 2 sec. For winding details see page 280. Spring steel **clamps** with earth connection.



1) 2.5 mm spacing also permissible

Coil former						Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	Number of pins	
1	15	30	67	0.4	4	B65808-B1003-D001
					5	B65808-B1002-D001
					6	B65808-B1001-D001
2	14		73	0.6	4	B65808-B1003-D002
					5	B65808-B1002-D002
					6	B65808-B1001-D002
Clamp (approx. weight 0.12 g; ordering code for each clamp, two required)						B65808-C2002-X000

Drawing details for the assembly of mounting devices: **Ordering code** C61407-A3-A2.
Insulating washer for double clad PC boards. **Ordering code** B65808-A2005-X000

2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns², copper factor $f_{Cu} = 0.5$.)

Adjusting devices B 65 659

Adjusting screw (a, b, c) B65659–C0***–X***, consisting of a SIFERRIT tube core onto which a polyacetal thread is molded and a spring crown serving as core brake;

fits:

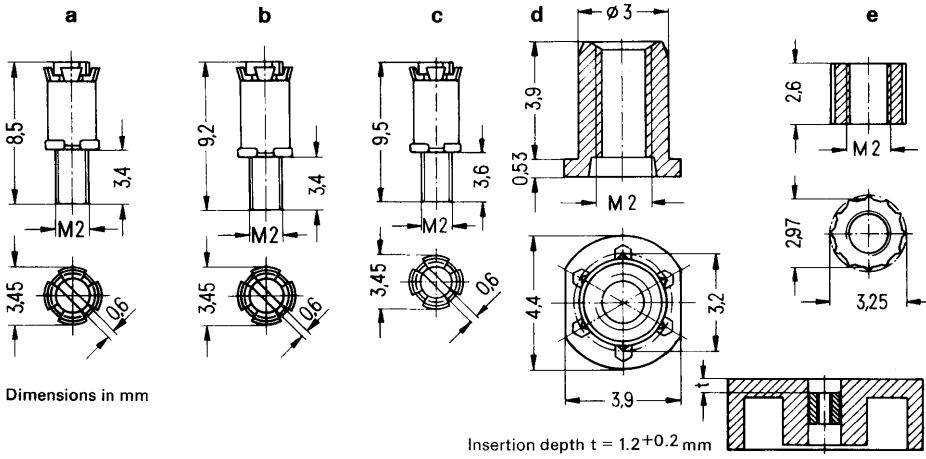
11 polyamide GV **threaded flange** (d) B65569–K0002–X000, colour code white;

11 polyamide GV **threaded sleeve without flange** (e) B65808–J3001–X000

or as required

RM 6 core sets B65807–N****–**** with inserted 11 polyamide GV threaded part (see page 298)

Adjusting screw driver B63399–B0004–X000



Dimensions in mm

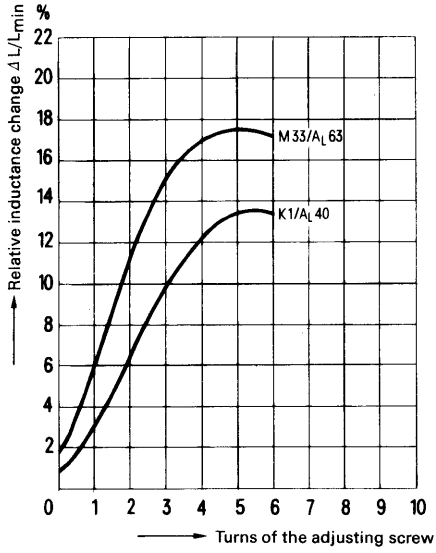
Insertion depth $t = 1.2^{+0.2}$ mm

Pot core B65807		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
K 1	40	a	2,6 x 3,7	Si 1 s	white	B65659–C0001–X101
M 33	63					
	100	c	2,82 x 4,4		brown	B65659–C0004–X101
N 22, N 28, N 32, N 48	160	a	2,6 x 3,7	N 23[1]	red	B65659–C0001–X023
N 28, N 32	200					
N 22, N 28, N 32, N 48	250					
N28, N32, N48	315	b	2,75 x 4,4		black	B65659–C0003–X023
N 28	400					
	500	c	2,82 x 4,4		yellow	B65659–C0004–X023

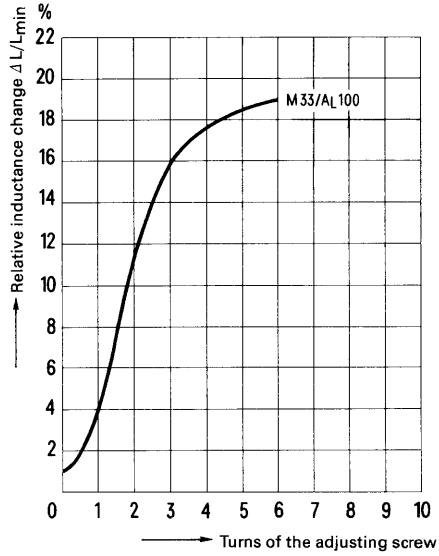
[1]) For adjusting cores the material N 23 is similar to material N 22

Inductance adjustment curves

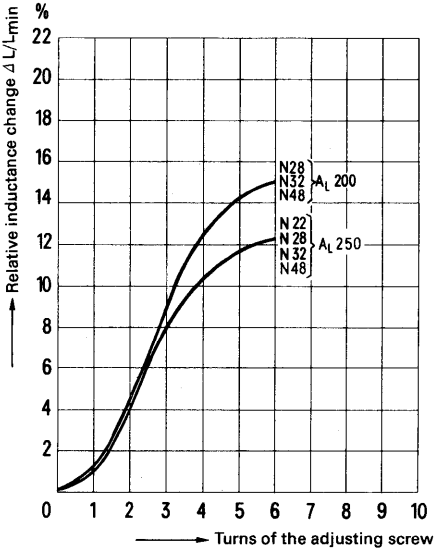
Adjusting screw B65659–C0001–X101
colour code white



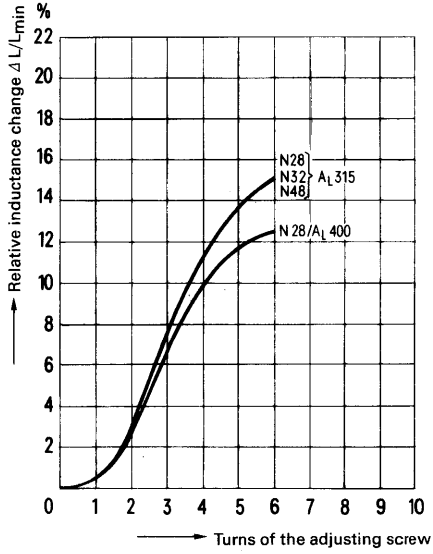
Adjusting screw B65659–C0004–X101
colour code brown



Adjusting screw B65659–C0001–X023
colour code red



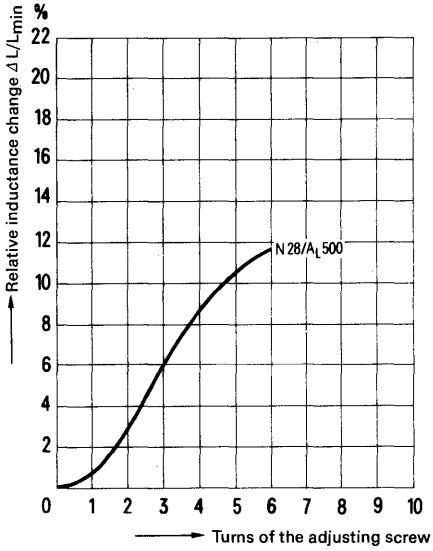
Adjusting screw B65659–C0003–X023
colour code black



0 △ at least one turn engaged.

Inductance adjustment curves

Adjusting screw B65659–C0004–X023
colour code yellow

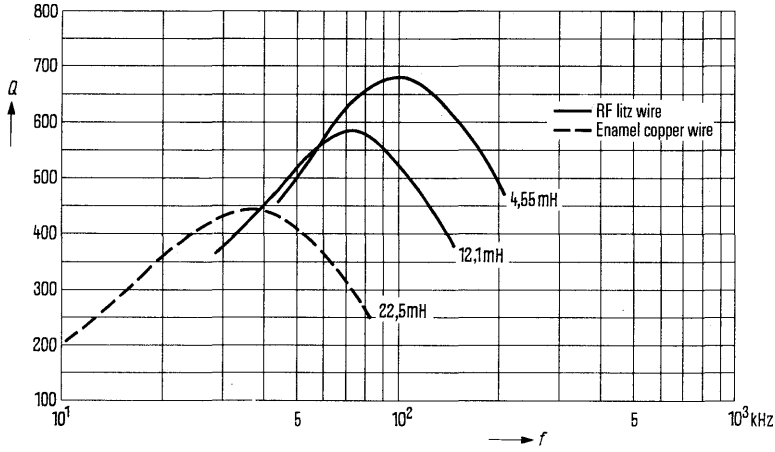


0 ≙ at least one turn engaged.

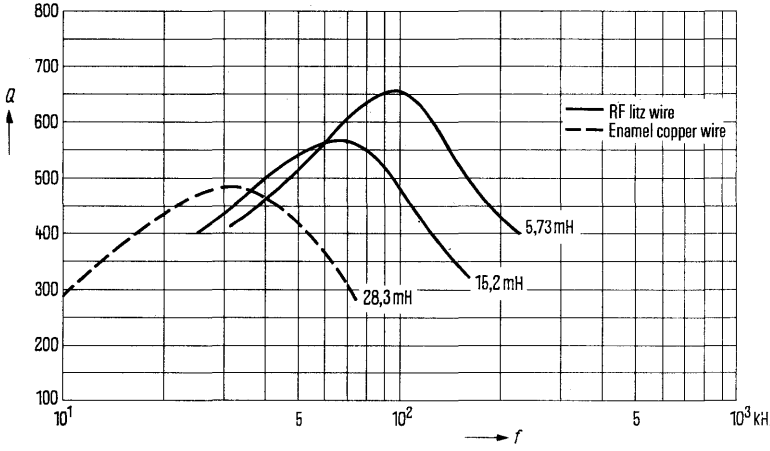
Q factor characteristics; material N 28

L (mH) for A_L = 250 nH	L (mH) for A_L = 315 nH	Turns	Wire; RF litz wire	Number of sections
22.5	28.3	300	0.20 CuL	1
12.1	15.2	220	6 x 0.07 CuLS	1
4.55	5.73	135	20 x 0.05 CuLS	1

Flux density in the core $\hat{B} < 2$ mT



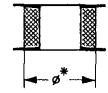
N 28
(typical values)
A_L = 250 nH



N 28
(typical values)
A_L = 315 nH

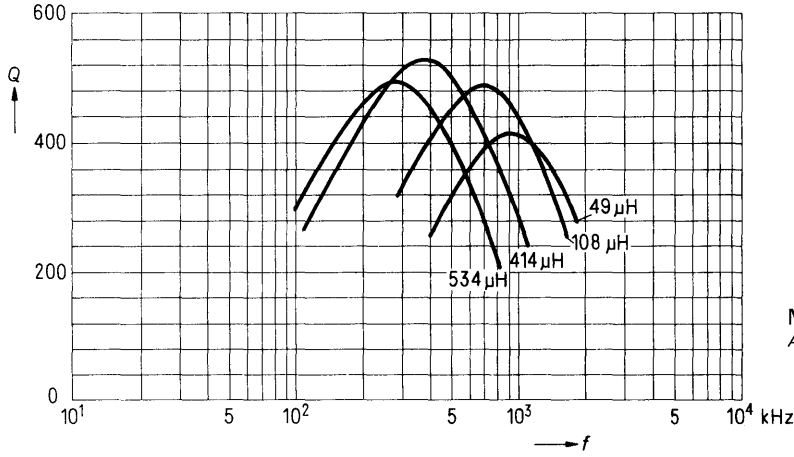
Q factor characteristics, material M 33

L [μH] for A_L = 63 nH	A_L = 100 nH	Turns	Wire	Sections	Ø mm*
534	847	92	45 x 0,04 CuLS	1	–
414	657	81	45 x 0.04 CuLS	2	–
108	168	41	45 x 0.04 CuLS	2	9.8
49	75	27	45 x 0.04 CuLS	2	10.6

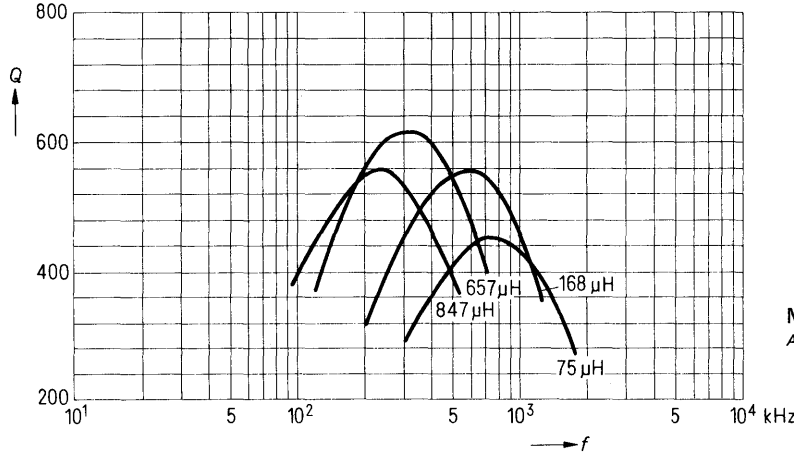


Pad of polystyrene tape up to the diameter Ø* (valid for all sections)

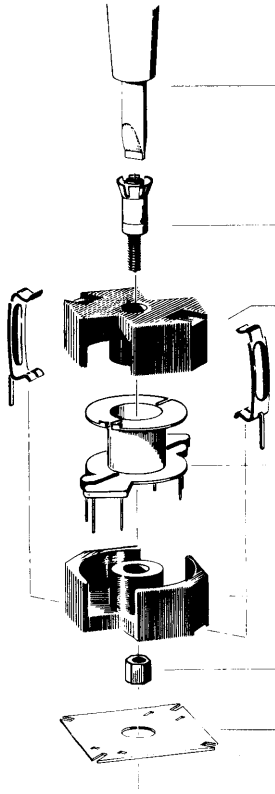
Flux density in the core $\hat{B} < 2$ mT



M 33 (typical values)
A_L = 63 nH

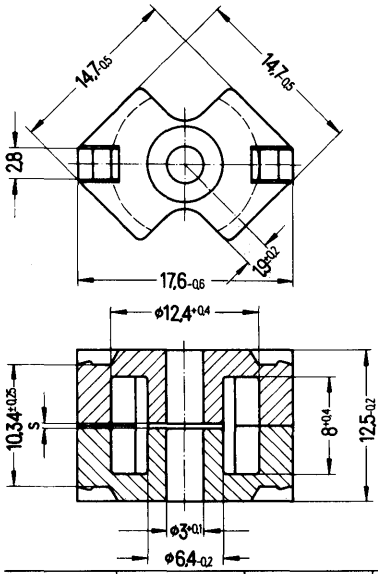


M 33 (typical values)
A_L = 100 nH



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 2
Matching handle	B63399	275, fig. 4
Adjusting screw	B65810	308
Core	B65809	306
Clamps	B65808	307
Coil former 4, 5 or 6 pins	B65810	307
Core	B65809	306
Threaded sleeve	B65810-J	308
Insulating washer	B65808	307

R 6 cores for use in printed circuits for filter coil and transformer design at high packing density. When mounting the core it is advisable to cement the two core halves together (see page 80).



Magnetic data

Core factor	$\Sigma\, l/A$ =	0.81	mm^{-1}
Effective length	l_e =	26.5	mm
Effective area	A_e =	32	mm^2
Effective volume	V_e =	840	mm^3

Approx. weight 5.1 g/set

Dimensions in mm

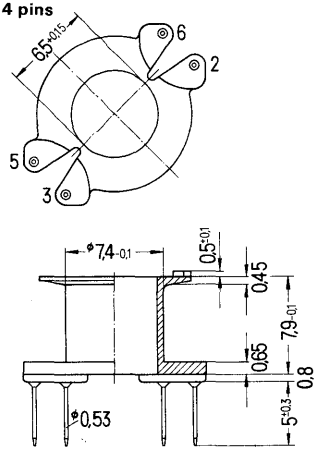
A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
63	± 3% △A	M 33	0.60	41	B65809-A0063-A033
100			0.38	65	B65809-A0100-A033
160		N 28	0.20	103	B65809-A0160-A028
200			0.16	129	B65809-A0200-A028
250			0.11	161	B65809-A0250-A028
315			0.08	203	B65809-A0315-A028
400			0.05	258	B65809-A0400-A028
630	± 5% △J		0.02	407	B65809-A0630-J028
without air gap					
2000	+30 −20 % △R	T 26			B65809-A0000-R026
2000		N 28			B65809-A0000-R028
4000		N 30			B65809-A0000-R030
5700		T 35			B65809-A0000-R035
8000	+40/−30% △Y	T 38			B65809-A0000-Y038

The R core sets B65809-A****-**** are also available with inserted 11 polyamide GV threaded part M 1.7. **Ordering code** B65809-**F******-****.

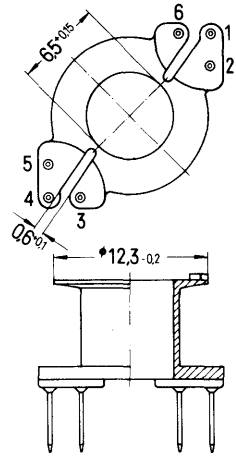
Coil formers and clamps B 65 810, B 65 808

Thermosetting plastic **coil former** with 4, 5 or 6 terminal pins;
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
Spring steel **clamps** with earth connection.

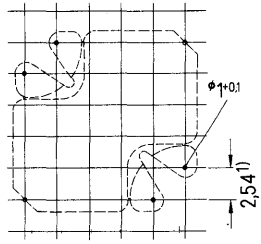
4 pins



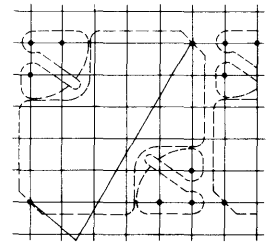
5 pins or 6 pins
(version with 5 pins without pin 4)



Two-section coil former with 5 or 6 pins also available upon request.

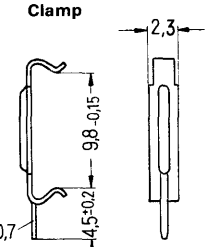


Hole arrangement
View in mounting direction



Earthing points 1 +0.1 mm dia 0,4 x 0,7

Clamp



1) 2.5 mm spacing also permissible Dimensions in mm

Coil former						**Ordering code**
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	Number of pins	
1	15.5	30.0	67	0.4	4	B65810-B1003-D001
					5	B65810-A1002-D001
					6	B65810-A1001-D001
Clamp (Approx. weight 0.12 g; ordering code for each clamp, 2 required)						B65808-B2003-X000

Drawing data for the assembly of mounting devices are available on request. **Ordering code** C61407-A3-A2.
Insulating washer for double-clad PC boards: **Ordering code** B65808-A2005-X000.

2) $R_{Cu} = A_R \times N^2$ (dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$)

Adjusting devices B 65 810

Adjusting screw (a, b), consisting of a SIFERRIT tube core onto which a polyacetal thread is molded and a spring crown serving as core brake;

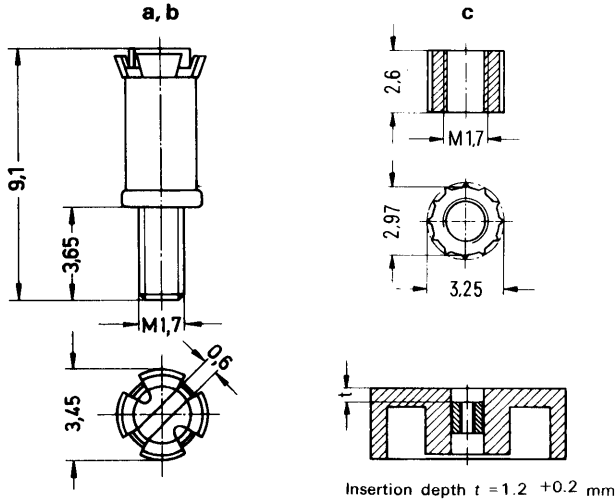
fits:

11 polyamide GV **threaded sleeve without flange** (c) B65810-J3001-X000 (colour code yellow)

or as required.

R6 core sets B65809-F****-**** with inserted 11 polyamide GV threaded part (see page 306)

Adjusting screw driver B63399-B0004-X000



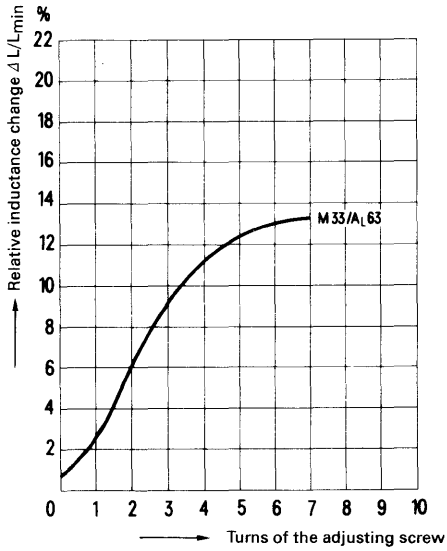
Dimensions in mm

Insertion depth $t = 1.2\ ^{+0.2}$ mm

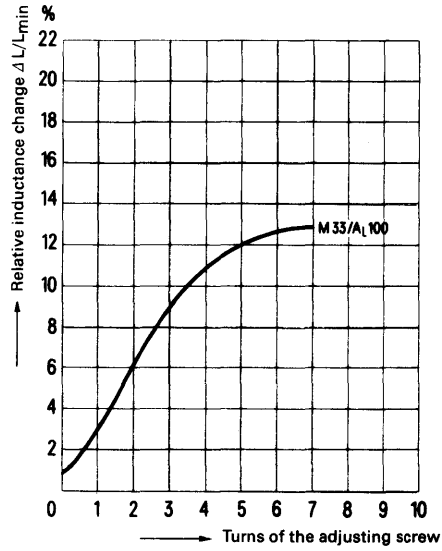
R 6 cores		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
M 33	63	b	2.85 x 4	Si 35	green	B65810-A3001-X135
	100	a	2.73 x 4	Si 31	red	B65810-A3002-X131
N 28	160			Si 1 s	yellow	B65810-A3002-X101
	200	b	2.85 x 4		white	B65810-A3001-X101
	250	a	2.73 x 4	N 22	black	B65810-A3002-X022
	315					
	400					
	630	b	2.85 x 4	N 22	grey	B65810-A3001-X022

Inductance adjustment curves

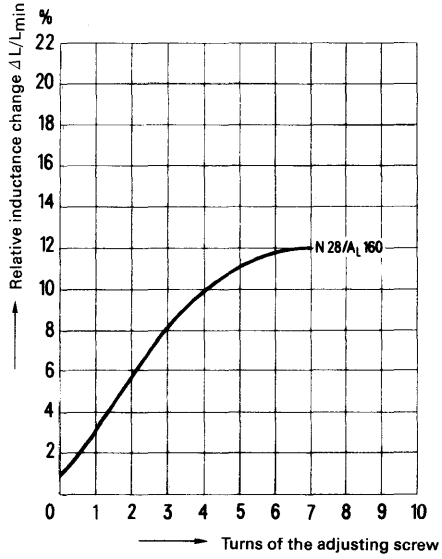
Adjusting screw B65810–A3001–X135
colour code green



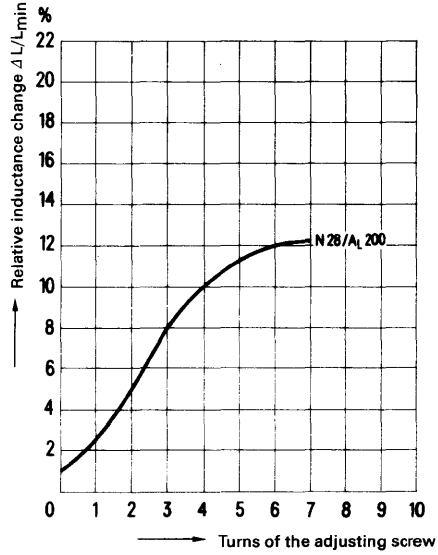
Adjusting screw B65810–A3002–X131
colour code red



Adjusting screw B65810–A3002–X101
colour code yellow



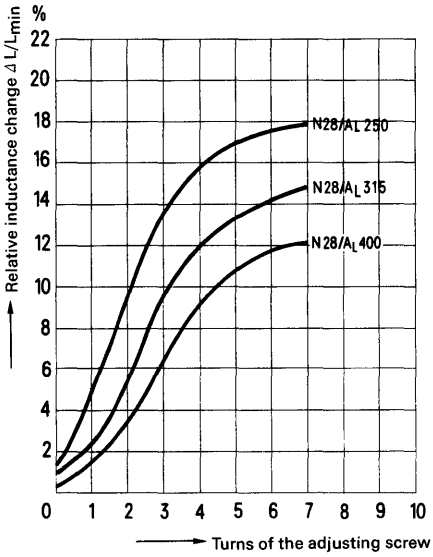
Adjusting screw B65810–A3001–X101
colour code white



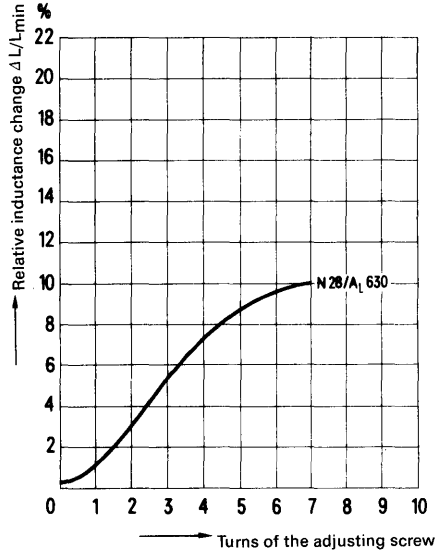
0 ≙ at least one turn engaged.

Inductance adjustment curves

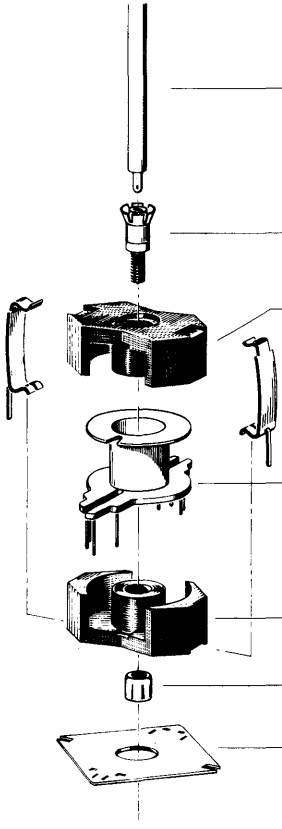
Adjusting screw B65810–A3002–X022
colour code black



Adjusting screw B65810–A3001–X022
colour code grey

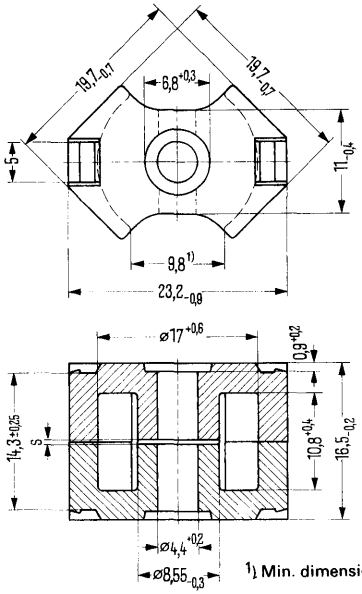


0 ≙ at least one turn engaged.



Individual parts	Part No.	Page
Adjusting screw driver (for assembly only)	B63399	274, fig. 1
Adjusting screw	B65669	314
Core	B65811	312
Clamps	B65812	313
Coil former with 1 or 2 sections 5 or 8 pins	B65812	313
Core	B65811	312
Threaded flange or threaded sleeve	B65669	314
Insulating washer	B65812	313

RM 8 cores for use in printed circuits in accordance with DIN 41980 and IEC recommendation 51 (CO) 128 for filter coil and transformer design with high packing density.
When mounting the core, it is advisable to cement the two core halves together (see page 80)



1) Min. dimension

Magnetic data

Core factor	$\Sigma\ l/A$ =	0,67	mm^{-1}
Effective length	l_e =	35	mm
Effective area	A_e =	52,4	mm^2
Effective volume	V_e =	1820	mm^3

Approx. weight 10.3 g/set

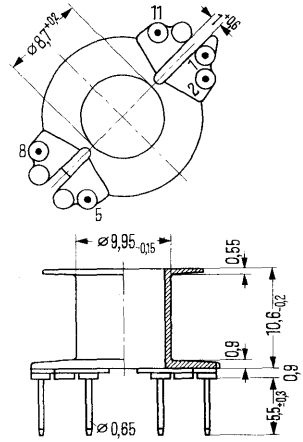
Dimensions in mm

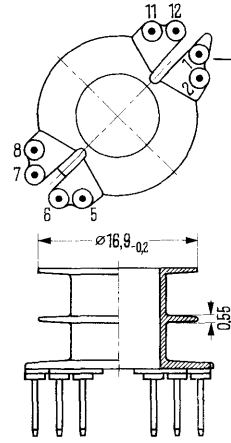
A_L value nH	Tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% △A	N 28	0.23	133	B65811-D0250-A028
315			0.18	168	B65811-D0315-A028
400			0,14	213	B65811-D0400-A028
500			0.12	267	B65811-D0500-A028
630			0.1	336	B65811-D0630-A028
250		N 32	0.23	133	B65811-D0250-A032
315			0.18	168	B65811-D0315-A032
1600	±10% △K	T 26	0.04	853	B65811-D1600-K026
without air gap					
2500	+30 −20 % △R	T 26			B65811-D0000-R026
5000		N 30			B65811-D0000-R030
11000	+40 −30 % △Y	T 38			B65811-D0000-Y038

The RM core sets B65811-D****-**** are also available with inserted 11 polyamide GV threaded part. **Ordering code** B65811-**N******-****.
Cores without flange recess (6.8 mm dia) in preparation.

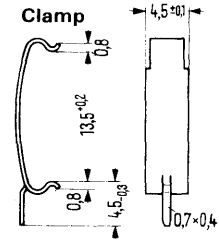
Coil formers and clamps B 65 812

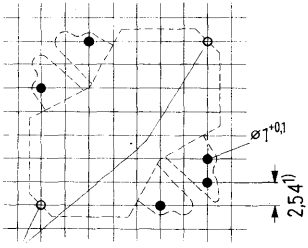
Thermosetting plastic **coil former** in accordance with DIN 41981 with 5 or 8 terminal pins. Permissible soldering temperature max. 400 °C/752 °F, 2 sec. For winding details see page 280. Spring steel **clamps** with earth connection.



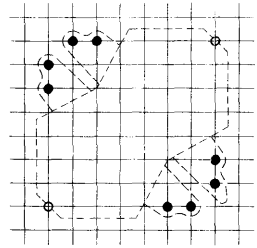


Pin 1 identified by a dip in the lower flange and a slot in the upper flange





Earthing points 1 + 0.1 mm dia



Dimensions in mm

Hole arrangement
View in mounting direction

1) 2.5 mm spacing also permissible

Coil former							Ordering code
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value2)	Approx. weight	Number of pins	
	of one section mm²	total mm²	mm	μΩ	g		
1	30	30	42	47	0.8	5	B65812-B1002-D001
						8	B65812-B1001-D001
2	14.2	28.4		50	0.9	5	B65812-B1002-D002
						8	B65812-B1001-D002
Clamp (Approx. weight 0.13 g; ordering code for each clamp; two required)							B65812-B2001-X000

2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns², copper factor $f_{Cu} = 0.5$)

Drawing data for the assembly of mounting devices: **Ordering code** C61407-A3-A5
Insulating washer for double-clad PC boards: **Ordering code** B65812-A2005-X000.

Adjusting devices B 65 669

Adjusting screw (a, b, c) B65669–X****–X***, consisting of a SIFERRIT tube core on which a polyacetal thread is molded and a spring crown serving as core brake;

fits:

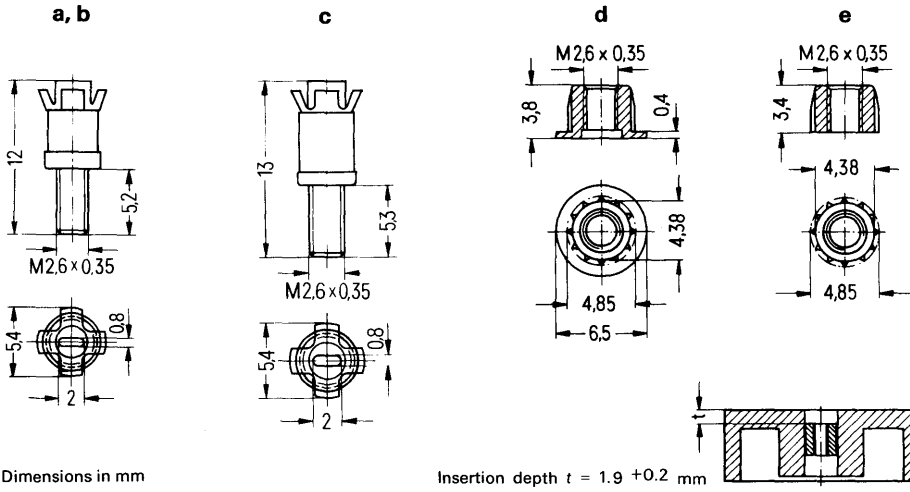
11 polyamide GV **threaded flange** (d) B65669–J0002–X000;

11 polyamide GV **threaded sleeve without flange** (e) B65669–J0003–X000

or as required

RM 8 core sets B65811–N****–X*** with inserted 11 polyamide GV threaded part (see page 312)

Adjusting screw driver B63399–A0001–X000



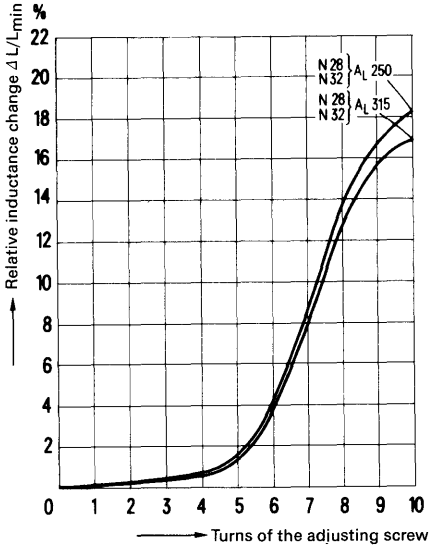
Dimensions in mm

Insertion depth t = 1.9 $^{+0.2}$ mm

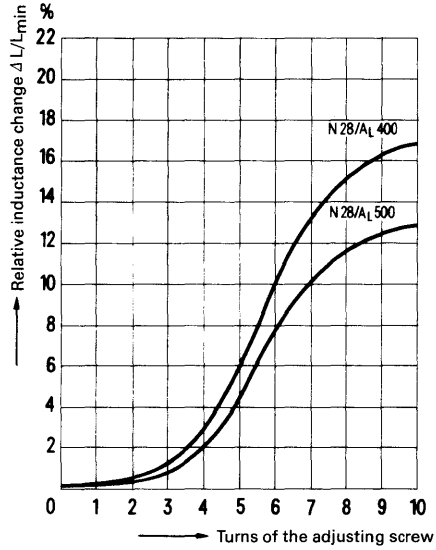
Pot cores B 65 811		Adjusting screw				
Material	A_L value nH	Part	Tube core dia x length	Material	Colour code	**Ordering code**
N 28, N 32	250	a	4.1 x 3,5	K 1	yellow	B65669–B0011–X001
	315					
N 28	400	b	4.1 x 4,3	N 22	red	B65669–B0007–X022
	500					
	630	c	4.18 x 5		white	B65669–C0006–X022

Inductance adjustment curves

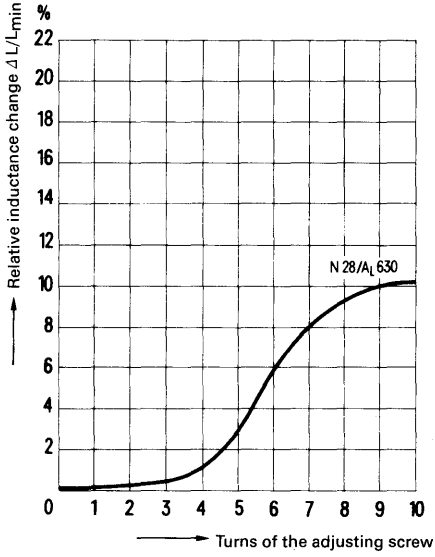
Adjusting screw B65669–B0011–X001
colour code yellow



Adjusting screw B65669–B0007–X022
colour code red



Adjusting screw B65669–C0006–X022
colour code white

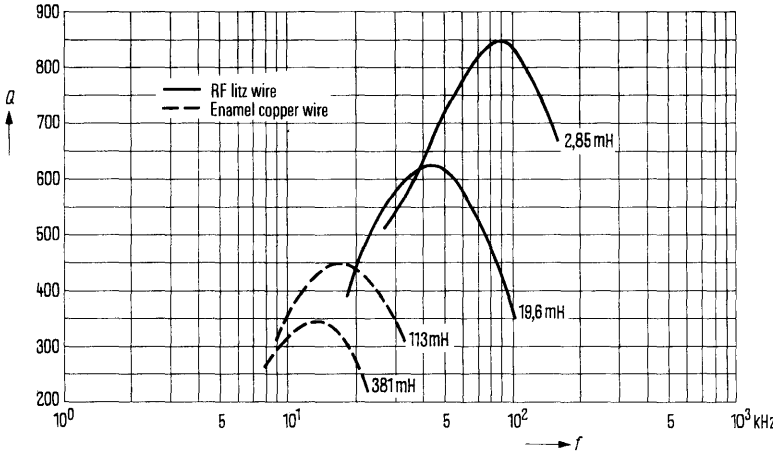


0 △ at least two turns engaged.

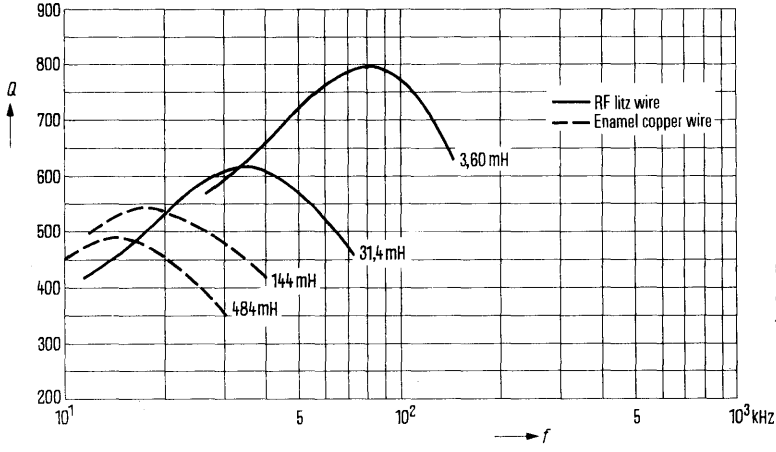
Q factor characteristics; material N 28

L (mH) for A_L = 315 nH	L (mH) for A_L = 400 nH	Turns	Wire; RF litz wire	Number of sections
381	484	1100	0.15 CuL	1
113	144	600	0.2 CuL	1
19.6	31.4	280	20 x 0.05 CuLS	1
2.85	3.60	95	60 x 0.05 CuLS	1

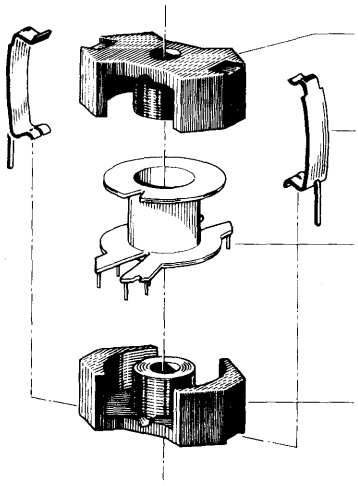
Flux density in the core $\hat{B} < 2$ mT



N 28
(typical values)
A_L = 315 nH



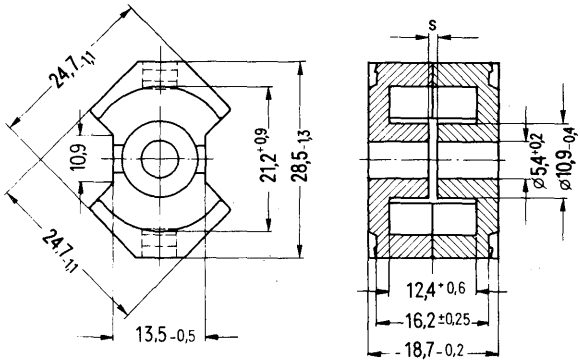
N 28
(typical values)
A_L = 400 nH



Individual parts	Part No.	Page
Core	B65813	318
Clamps	B65814	319
Coil former with 1 or 2 sections 11 or 12 pins [1]	B65814	319
Core	B65813	318

[1] Sliding-on solder clip for soldering thick wires: **Ordering code** B 65814–A2004–X000

RM 10 cores for use in printed circuits in accordance with DIN 41980 and IEC recommendation 51 (CO) 128 for filter coil and transformer design with high packing density.
When mounting the core, it is advisable to cement the two core halves together (see page 80).



Approx. weight 20 g/set

Dimensions in mm

Magnetic data

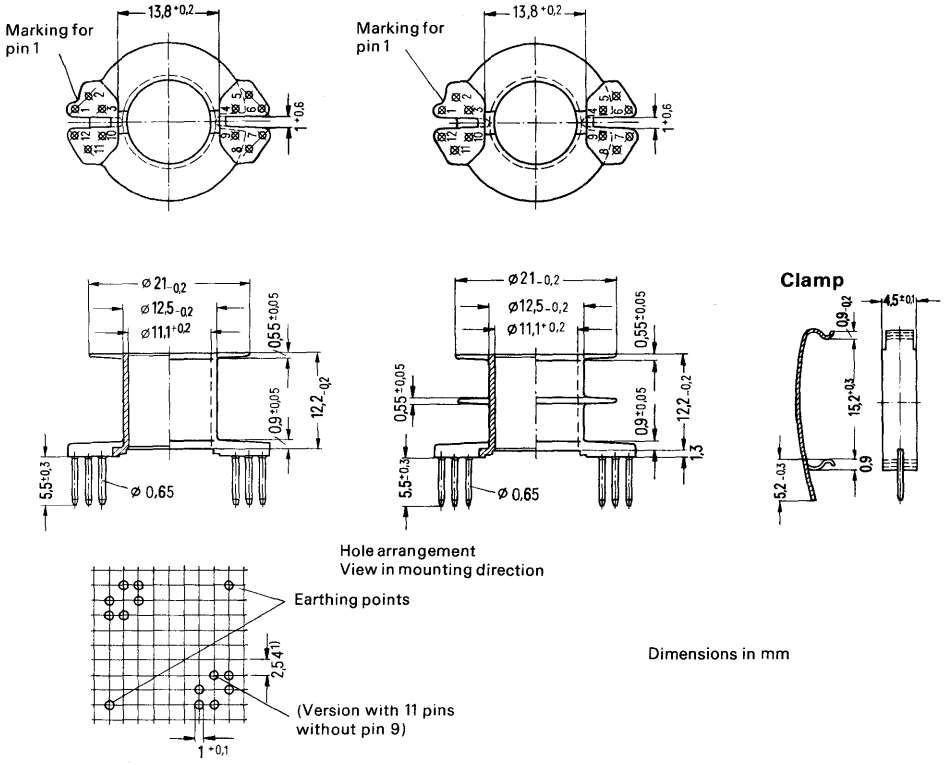
Core factor	$\Sigma\, l/A$ =	0.50	mm^{-1}
Effective length	l_e =	41.7	mm
Effective area	A_e =	83.2	mm^2
Effective volume	V_e =	3470	mm^3

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
400	± 3% ≙ A	N 28	0,21	160	B65813-A0400-A028
630			0,13	250	B65813-A0630-A028
without air gap					
3400	+30 −20 % ≙ R	N 27			B65813-A0000-R027
6700		N 30			B65813-A0000-R030
9000		T 35			B65813-A0000-R035
14500	+40 −30 % ≙ Y	T 38			B65813-A0000-Y038

The RM core sets B65813-A****-**** are also available with inserted 11 polyamide GV threaded part. **Ordering code** B65813-N****-****.

Coil formers and clamps B 65 814

Thermosetting plastic **coil former** in accordance with DIN 41 981 with 11 or 12 terminal pins. Permissible soldering temperature max. 400 °C/752 °F, sec. For winding details see page 280. Spring steel **clamps** with earth connection.

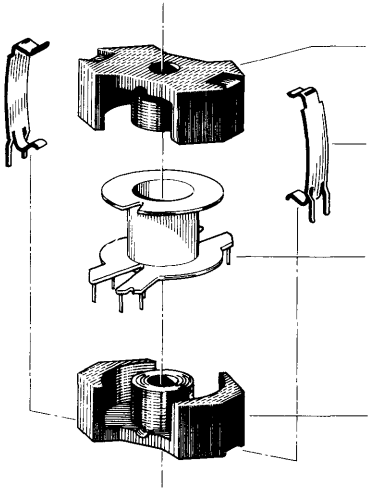


Dimensions in mm

1) 2.5 mm spacing also permissible

Coil formers							Ordering code
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 2)	Approx. weight	Number of pins	
	of one section mm²	total mm²	mm	μΩ	g		
1	41.5	41.5	52	43	1.5	11	B65814-J1002-D001
						12	B65814-J1001-D001
2	19.5	39		46	1.7	11	B65814-J1002-D002
						12	B65814-J1001-D002
Clamp (Approx. weight 0.3 g; ordering code for each clamp, two required)							B65814-A2001-X000

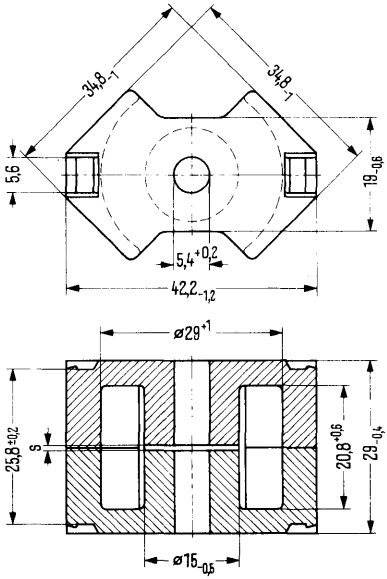
2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns², copper factor $f_{Cu} = 0.5$).



Individual parts	Part No.	Page
Core	B65887	322
Clamps	B65888	323
Coil former with 1 section, 10 or 12 pins[1)]	B65888	323
Core	B65887	322

[1)] Sliding-on solder clip for soldering thick wires: **Ordering code B65888–A2004–X000**

RM 14 cores for use in printed circuits in accordance with DIN 41980 (sheet 10) and IEC recommendation 51 (CO) 128 for filter coil and transformer design at high packing density. When mounting the core it is advisible to cement the two core halves together (see page 80). Because of their large winding apertures, RM 14 cores are also suitable for power transformers. For power transformer design see also page 71 to 79.



Dimensions in mm

Magnetic data

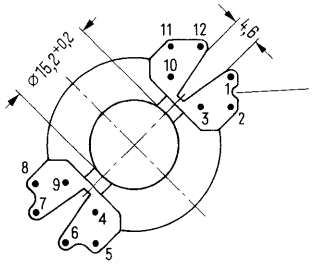
Core factor	$\Sigma\, l/A$ =	0.39	mm^{-1}
Effective length	l_e =	70	mm
Effective area	A_e =	178	mm^2
Effective volume	V_e =	12400	mm^3

Approx. weight 65 g/set

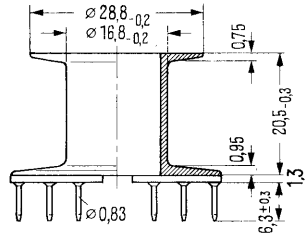
A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
250	± 3% ≙ A	N 27	0.85	78	B65887-A0250-A027
1600	± 5% ≙ J		0.07	500	B65887-A1600-J027
2500	±10% ≙ K		0.04	780	B65887-A2500-K027
without air gap					
5500	+30 −20 % ≙ R	N 27			B65887-A0000-R027

Coil former and clamps B 65888

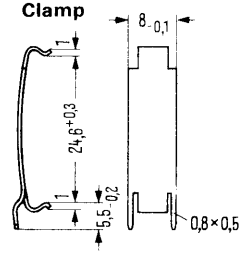
Thermosetting plastic **coil former** with 10 or 12 terminal pins.
Permissible soldering temperature 400 °C/752 °F, 2 sec.
Tinned spring steel **clamps** with earth connections.



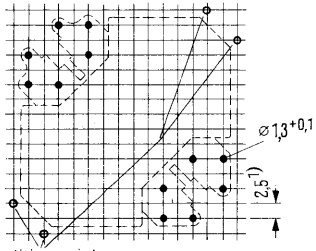
Marking groove
for pin 1
For the 10 pin-version
pins No. 5 and 8 are
not engaged.



Clamp



Dimensions in mm



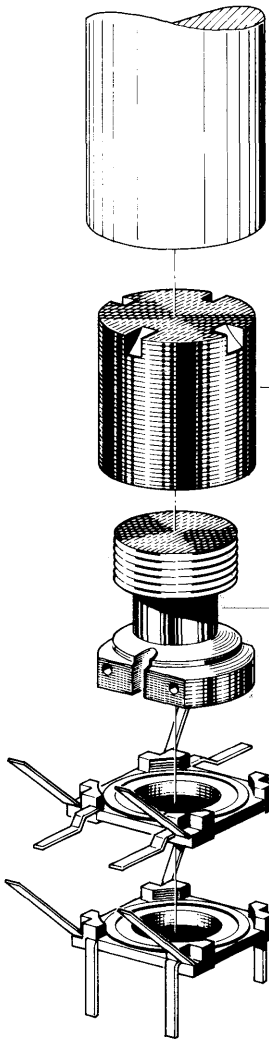
Hole arrangement
View in mounting direction

Earthing points

1) 2.54 mm spacing also permissible

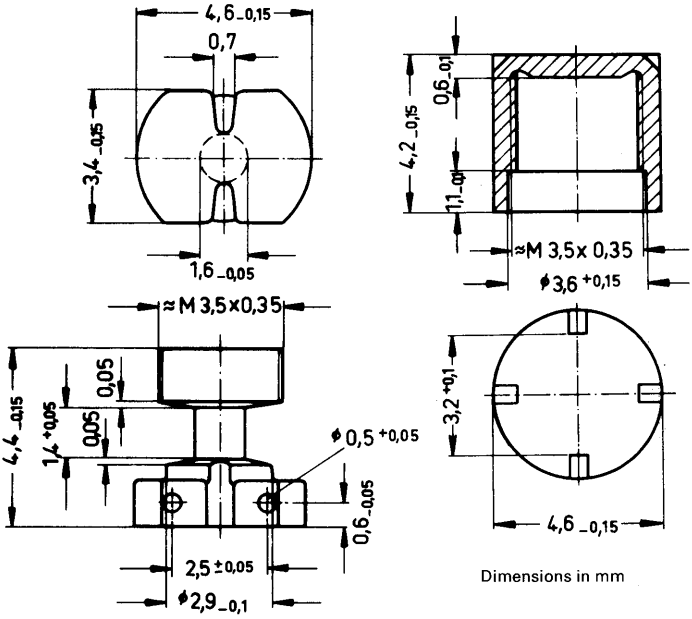
Coil former						Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value2) $\mu\Omega$	Approx. weight g	Number of pins	
1	107	71.5	23	3	10	B65888-B1001-D001
					12	B65888-B1002-D001
Clamp (Approx. weight 0.12 g; ordering code for each clamp, two required)						B65888-A2001-X000

2) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns², copper factor $f_{Cu} = 0.5$).



Individual parts	Part No.	Page
Adjusting screw driver	B63399	275, fig. 3
Cup core	B66433	326
Drum core	B66430	326
Connecting board for film circuits	B65496	332
or		
connecting board for PC boards	B65496	332

SIFERRIT cores for adjustable miniature coil design in resonant circuits and for transformers and chokes.
The drum core, carrying the winding, is screwed with the cup core, thus resulting in a compact structural form suitable for dip-soldering on the connecting board.



Dimensions in mm

Approx. weight
Drum core 0.15 g
Cup core 0.15 g

Magnetic data[1]

Core factor $\Sigma\, l/A$ = 1.44 mm^{-1};
Effective length l_e = 8.0 mm;
Effective area A_e = 5.55 mm^2
Effective volume V_e = 44.4 mm^3

A_L value nH	SIFERRIT material	**Ordering code**	A_L value nH	SIFERRIT-material	**Ordering code**
Drum core without cup core			Drum core with cup core[1]		
7.5	U 17	B66430-A0001-X017	> 9	U 17	B66433-A0000-X017
16	K 1	B66430-A0001-X001	> 10	U 17/K 5	B66433-A0017-X005
20	N 22	B66430-A0001-X022	> 55	K 1	B66433-A0000-X001
			> 160	N 22	B66433-A0000-X022

Adjusting key for cup core coil: B63399-A1007-X000

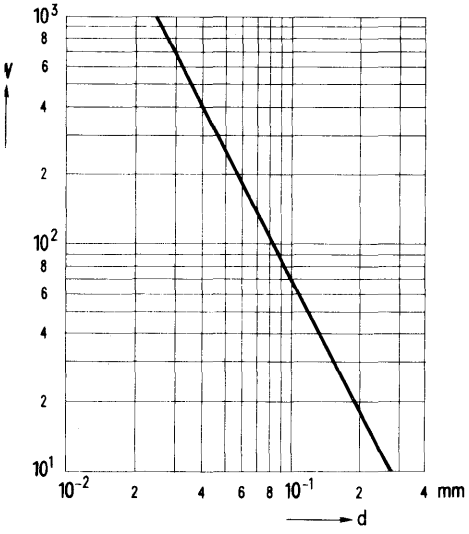
[1] With completely screwed cup

In order to eliminate the play of the thread it is recommended after having wound the drum core to apply a drip of non-corrosive elastic material (e.g. Sil rubbers 3144 RFV of Messrs. Dow Corning) on the thread of the drum core, and to screw the associated cup core. Subsequent adjusting of the coil by turning the cup core is possible any time.

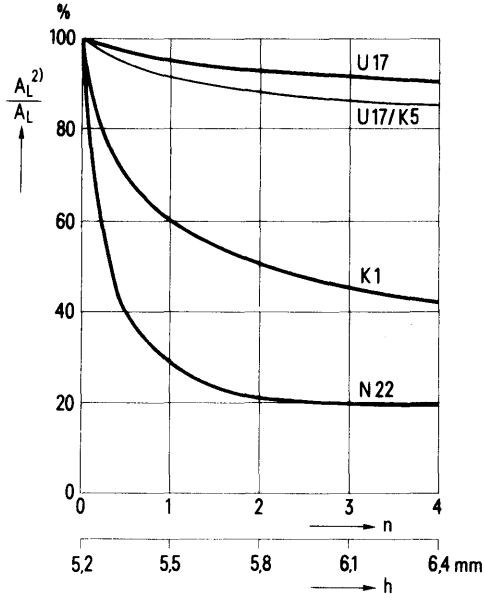
Winding data

Useful winding cross section A_N	Average length of turn l_N	A_R value[1]
mm^2	mm	$\mu\Omega$
0.84	6.9	280

Maximum number of turns N as a function of the diameter d of the insulated wire.



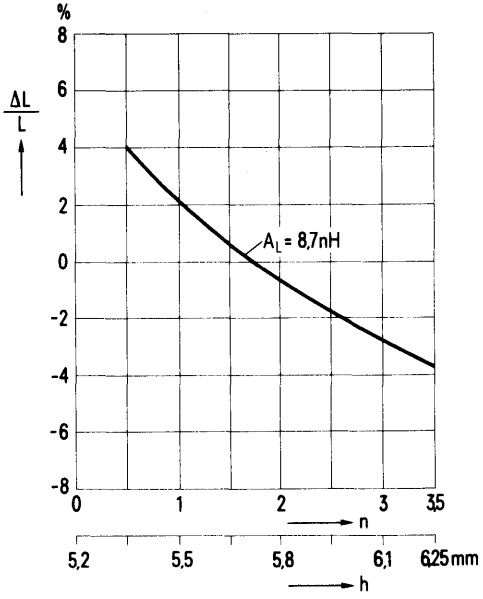
Adjusting range and corresponding core height *"h"* at *"n"* turns of the cup core.



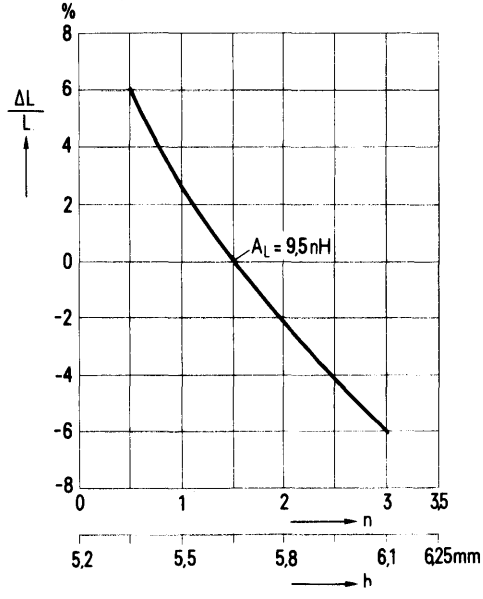
1) $R_{Cu} = A_R \times N^2$, dc resistance = A_R x number of turns^2, the A_R value is valid for a copper factor $f_{Cu} = 0.5$.
2) 100% ≙ completely screwed cup.

Inductance change and core height *"h"* as a function of turns *"n"* of the cup core.

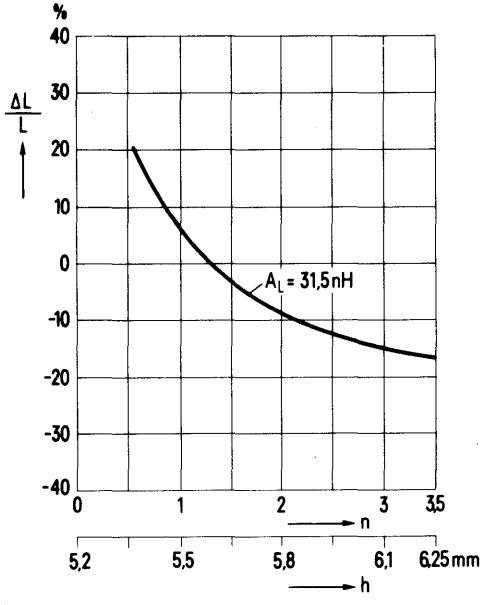
U 17



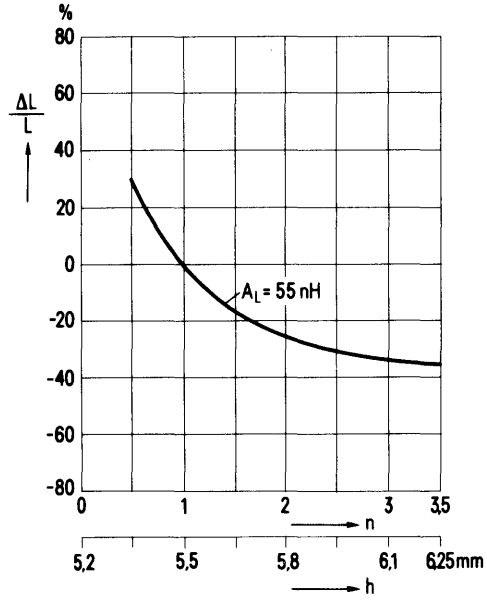
U 17/K 5



K 1

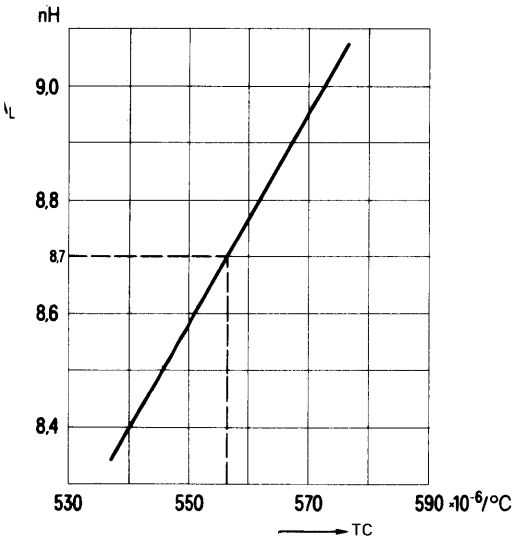


N 22

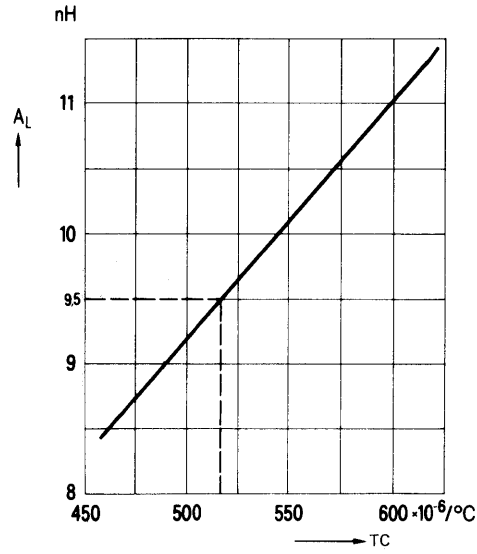


Temperature Coefficient as a function of A_L value at 25 °C to 55 °C (77 °F to 131 °F).

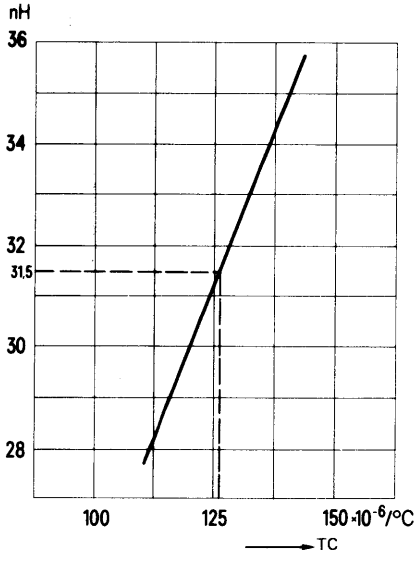
U 17



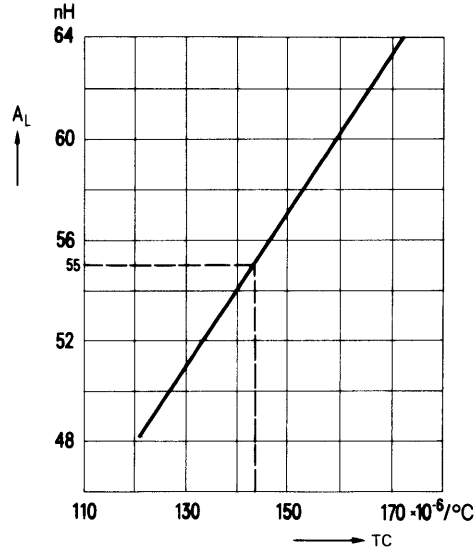
U 17/K 5



K 1



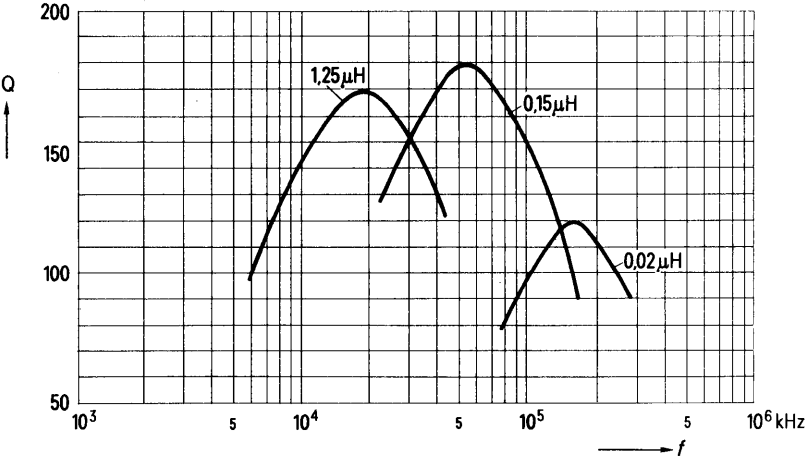
N 22



Q factor characteristics

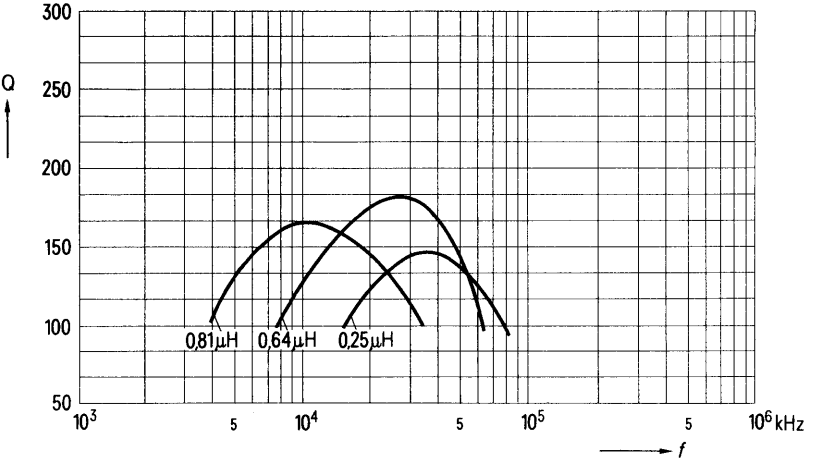
Material: **U 17**

L (μH)	Wire	Turns	Layers
1,25	0.18 CuL	14	2
0.15	0.23 CuL	4	1
0.020	0.23 CuL	1	–



Material: **U 17/K 5**

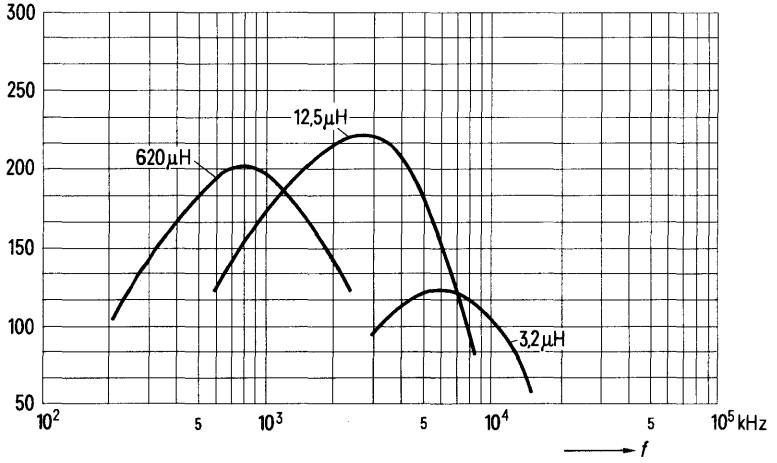
L (μH)	Wire, RF litz wire	Turns	Layers
0,81	32 x 0.025 LS	9	2
0,64	0.18 CuL	8	1
0,25	0.23 CuL	5	1



Q factor characteristics

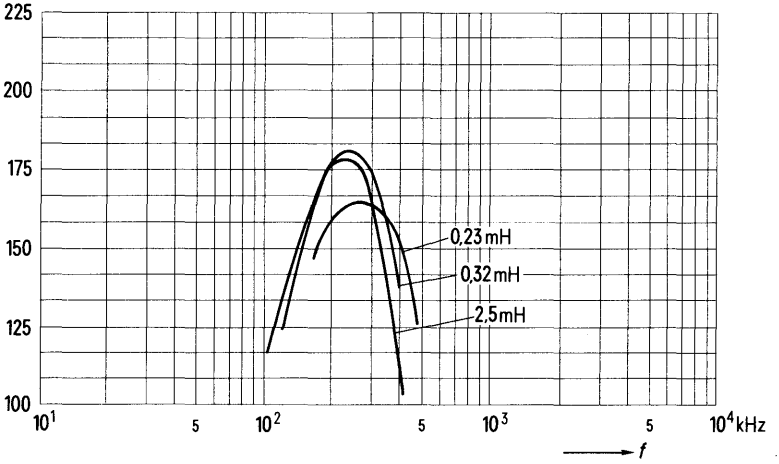
Material: **K 1**

L (μH)	Wire, RF litz wire	Turns
620	0.04 CuL	140
12.5	12 x 0.04 CuL	20
3.2	0.20 CuL	10



Material: **N 22**

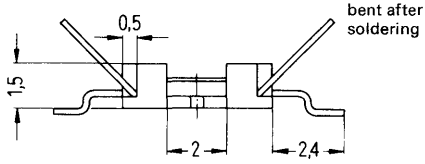
L (mH)	Wire	Turns
2.5	0.05 CuL	200
0.32	0.09 CuL	72
0.23	0.10 CuL	60



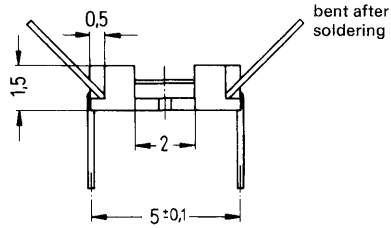
Connecting board B 65 496

Thermosetting plastic connecting board with horizontally shaped solder tags for film circuits (B65496–A2001–X000) or rectangularly bent down solder tags for PC boards (B65496–A2002–X000).
The drum core is cemented on the connecting board.

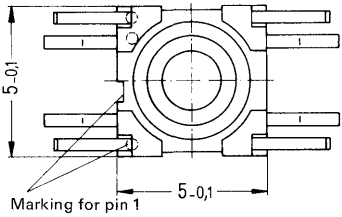
B65496–A2001–X000



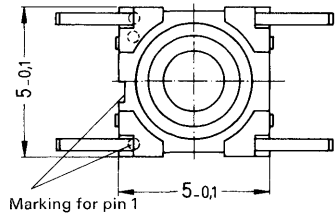
B65496–A2002–X000



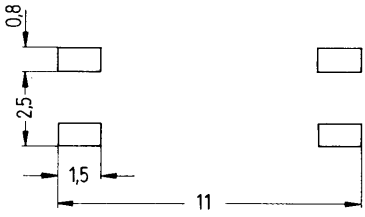
Dimensions in mm



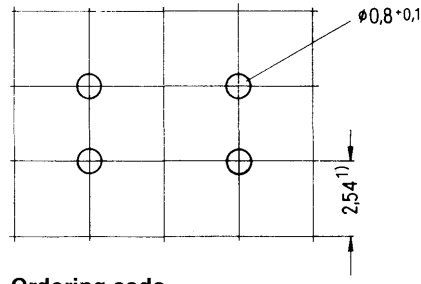
Solder tags on film circuits



Hole arrangement on PC boards
View in mounting direction

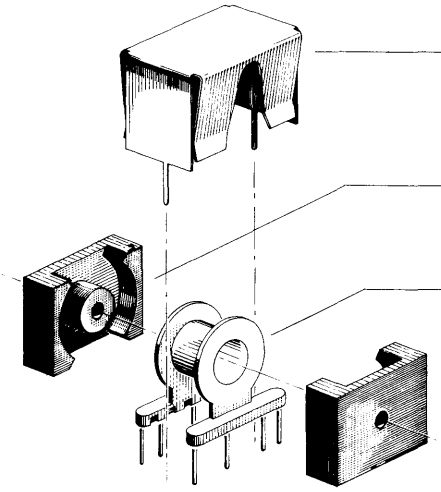


Ordering code
B65496–A2001–X000



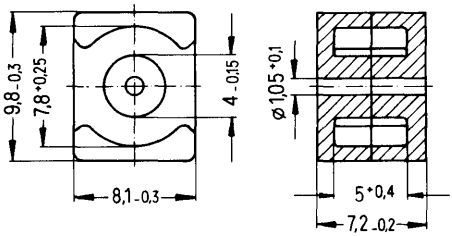
Ordering code
B65496–A2002–X000

1) 2.5 mm spacing also permissible



Individual parts	Part No.	Page
Cover	B65834	335
Cube core	B65833	334
Coil former	B65834	335
Cube core	B65833	334

Compact cube cores of high permeability materials are suitable for the design of high inductance coils at high packing density. They are especially suitable for transformers in printed circuits with up to 7 connections. The wire ends of the winding are connected directly to the solder pins of the coil former.



Approx. weight 1.5 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	1.25	mm^{-1}
Effective length	l_e =	16.5	mm
Effective area	A_e =	13.2	mm^2
Effective volume	V_e =	217	mm^3

A_L value without air gap nH	tolerance	SIFERRIT material	**Ordering code**
1400	$^{+30}_{-20}$ % ≙ R	T 26	B65833-A0000-R026
4000		T 35	B65833-A0000-R035
5000	$^{+40}_{-30}$ % ≙ Y	T 38	B65833-A0000-Y038

Coil formers and cover B 65 834

Thermosetting plastic **coil former** (fig. 1) with 7 terminal pins.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 281.

Polycarbonate coil formers without terminal pins are also available (fig. 2).

Figure 1

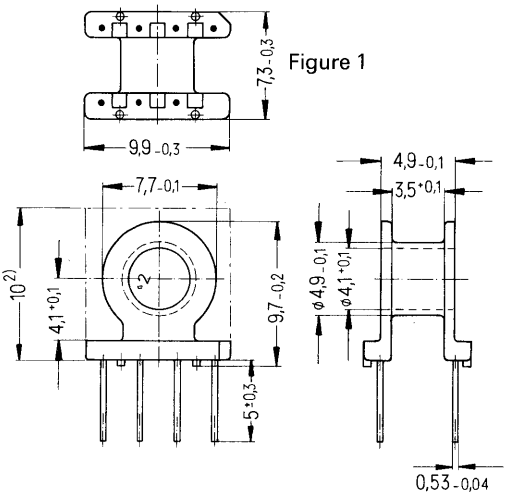


Figure 2

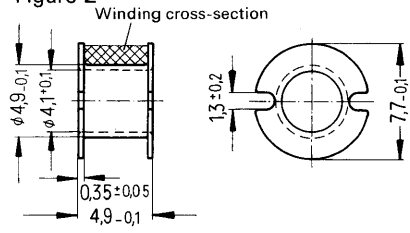
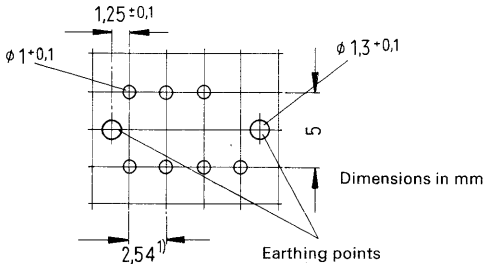
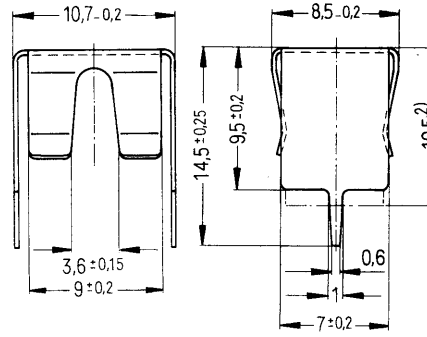


Figure 3

0.3 mm thick nickel-silver **cover**
for cube cores Q 10 (fig. 3)
Ordering code B65834-A2000-X000

Hole arrangement
View in mounting direction

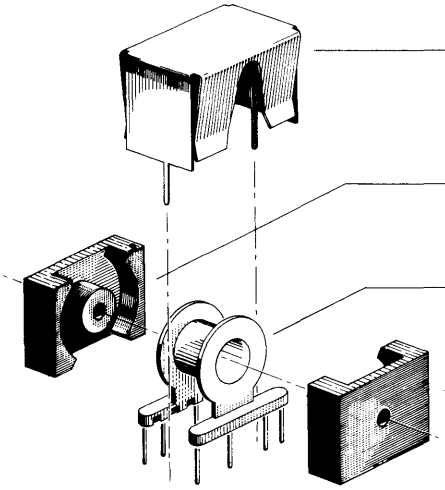




1) 2.5 mm spacing also permissible
2) Max. coil height (with core)

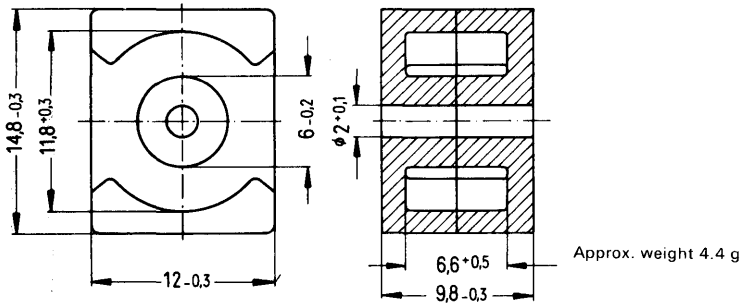
Figure	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 3) $\mu\Omega$	Approx. weight g	**Ordering code**
1	4.7	19	143	0.25	B65834-A1001-D001
2				0.1	B65834-A1002-M001

3) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).



Individual parts	Part No.	Page
Cover	B65838	339
Cube core	B65837	338
Coil former	B65838	339
Cube core	B65837	338

Compact cube cores of high permeability materials are suitable for the design of high inductance coils at high packing density. They are especially suitable for transformers in printed circuits with up to 8 connections. The wire ends of the winding are connected directly to the solder pins of the coil former.



Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	0.8 mm^{-1}
Effective length	l_e =	22.9 mm
Effective area	A_e =	28.6 mm^2
Effective volume	V_e =	656 mm^3

A_L value without air gap nH	tolerance	SIFERRIT material	Ordering code
2100	+30 −20 % △R	T 26	B65837-A0000-R026
6300		T 35	B65837-A0000-R035
8500	+40 −30 % △Y	T 38	B65837-A0000-Y038

Coil formers and cover B 65 838

Thermosetting plastic **coil former** (fig. 1) with 8 terminal pins.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 281.

Polycarbonate coil formers without terminal pins are also available (fig. 2)

Figure 1

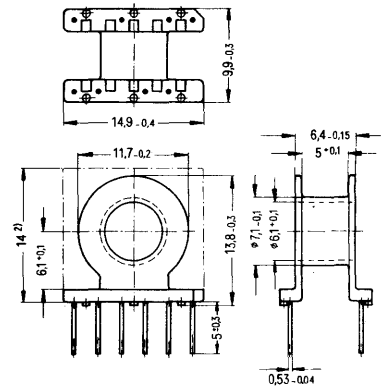


Figure 2

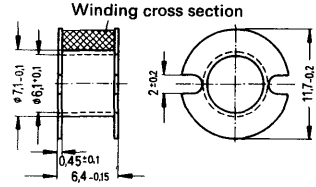
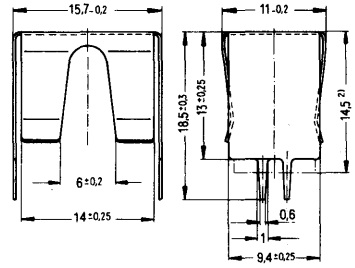


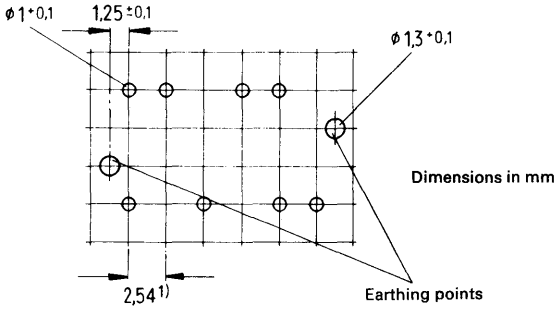
Figure 3

0.3 mm thick nickel silver **cover** for cube cores Q 15 (fig. 3)

Ordering core B65838–A2000–X000



Hole arrangement
View in mounting direction

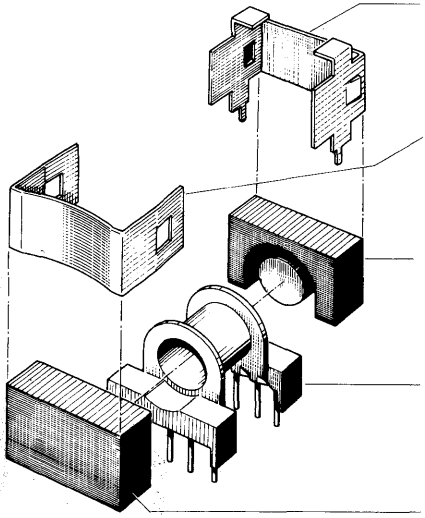


Dimensions in mm

1) 2.5 mm spacing also permissible
2) Maximum coil height (with core)

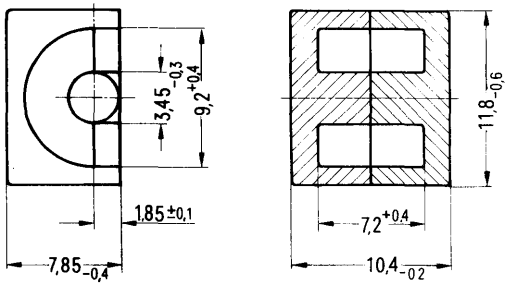
Figure	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 3) $\mu\Omega$	Approx. weight g	**Ordering code**
1	11,0	29	92	0,52	B65838–A1001–D001
2				0,2	B65838–A1002–M001

3) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).



Individual parts	Part No.	Page
Yoke	B65842	344
Clamp	B65842	344
Core	B65841	342
Coil former with 1 or 2 sections, 8 pins	B65842	343
Core	B65841	342

EP 10 cores of high permeability materials are suitable for the design of high inductance coils at high packing density. They are particularly suitable for transformers in printed circuits with up to 8 connections. The wire ends of the winding are connected directly to the solder pins of the coil former.



Dimensions in mm

Approx. weight 2.75 g/set

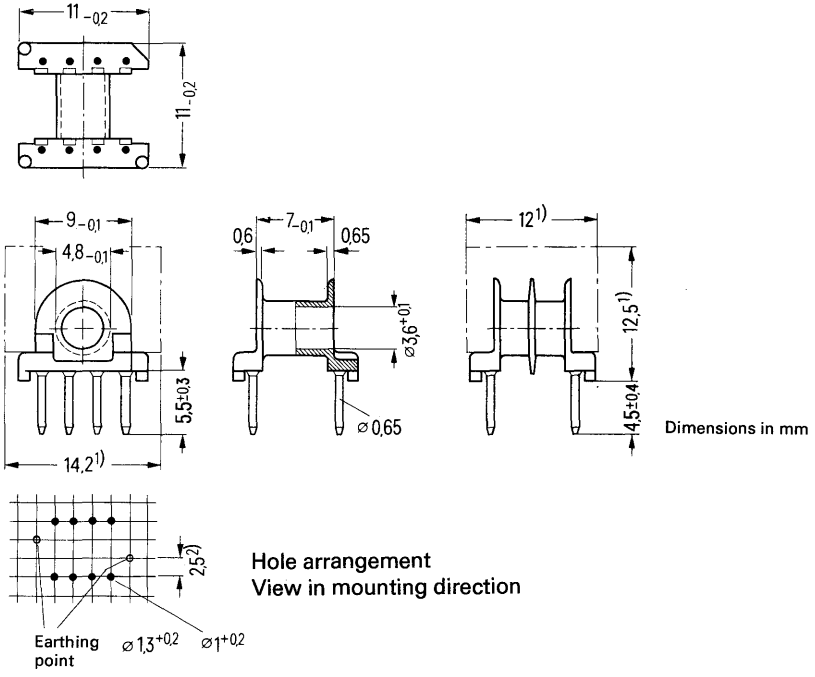
Magnetic data

Core factor	$\Sigma\ l/A$ =	1.63 mm^{-1}
Effective length	l_e =	17.6 mm
Effective area	A_e =	10.8 mm^2
Effective volume	V_e =	190 mm^3

A_L value without air gap nH	Tolerance	SIFERRIT material	**Ordering code**
2000	+30 −20 % △R	N 30	B65841-A0000-R030
3200		T 35	B65841-A0000-R035
4800	+40 −30 % △Y	T 38	B65841-A0000-Y038

Coil former B 65 842

Thermosetting plastic coil former with 8 terminal pins with one or two sections as required. Permissible solder temperature max. 400 °C/752 °F, 2 sec.



1) Built-in dimension for the transformer
2) 2.54 mm spacing also permissible

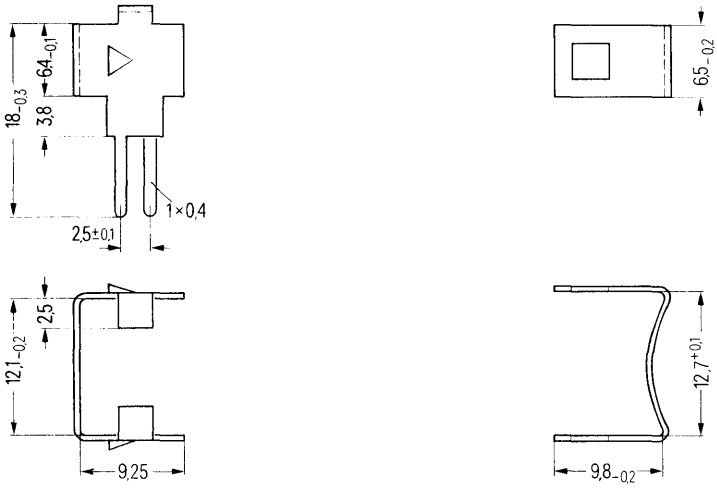
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 3)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	11,4	11,4	21,5	65	0.6	B65842-A1000-D001
2	10,0	5,0		74	0.65	B65842-A1000-D002

3) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).

Mounting assembly B 65 842

consisting of a yoke and a spring clamp.

Approx. weight (yoke and clamp) 1.4 g

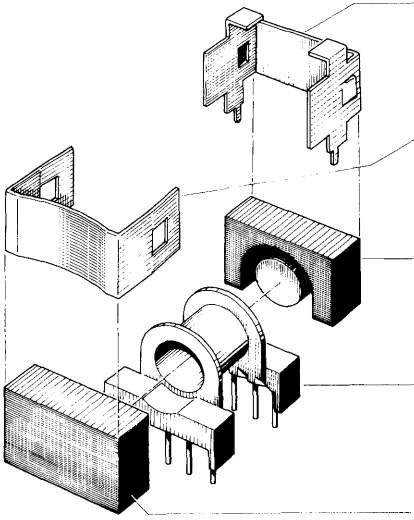


Dimensions in mm

Yoke
out of 0.4 mm thick nickel silver

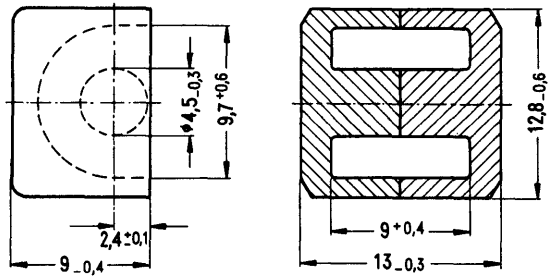
Clamp
out of 0.3 mm thick nickel silver

Ordering code (complete assembly) B65842–A2000–X000



Individual parts	Part No.	Page
Yoke	B65844	348
Clamp	B65844	348
Core	B65843	346
Coil former with 1 or 2 sections 10 pins	B65844	347
Core	B65843	346

EP 13 cores made of high permeability materials, are suitable for the design of high inductance coils at high packing density. These cores are particularly suitable for transformers in printed circuits with up to 10 connections. The wire ends of the windings are connected directly to the solder pins of the coil former.



Dimensions in mm

Approx. weight 5.10 g/set

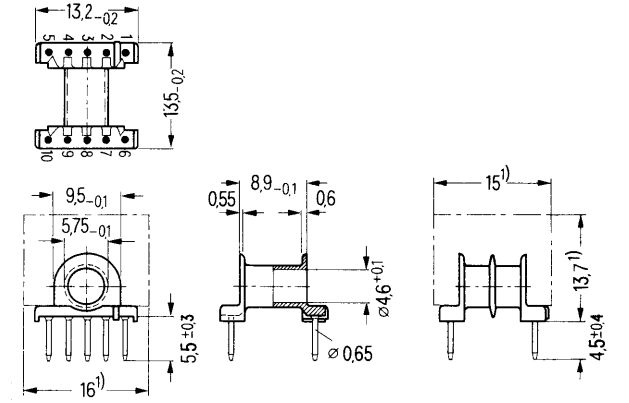
Magnetic data

Core factor	$\Sigma\ l/A$ =	1.18	mm^{-1}
Effective length	l_e =	28	mm
Effective area	A_e =	24	mm^2
Effective volume	V_e =	680	mm^3

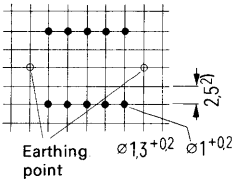
A_L value without air gap nH	Tolerance	SIFERRIT material	**Ordering code**
2800	+30 −20 % ≙ R	N 30	B65843-A0000-R030
4400		T 35	B65843-A0000-R035
7000	+40 −30 % ≙ Y	T 38	B65843-A0000-Y038

Coil former B 65 844

Thermosetting plastic coil former with 10 terminal pins with one or two sections as required. Permissible solder temperature max. 400 °C/752 °F, 2 sec.



Dimensions in mm



Hole arrangement
View in mounting direction

¹) Built-in dimension for the transformer
²) 2.54 mm spacing also permissible

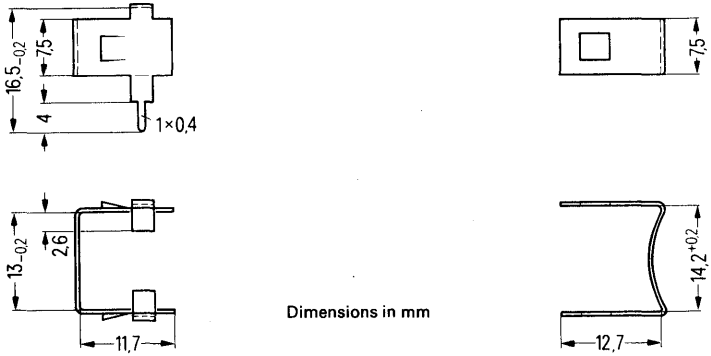
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value³)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	13.8	13.8	23.8	59.4	0.5	B65844-A1000-D001
2	6.5	13.0		63.2	0.6	B65844-A1000-D002

³) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).

Mounting assembly B 65 844

Mounting assembly consisting of a yoke and a spring clamp.

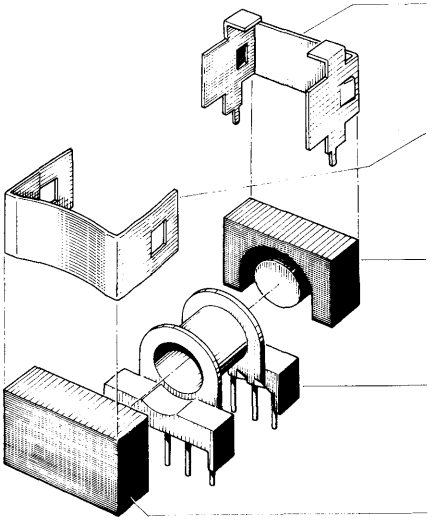
Approx. weight (yoke and clamp) 1.9 g



Yoke
out of 0.4 mm thick nickel silver

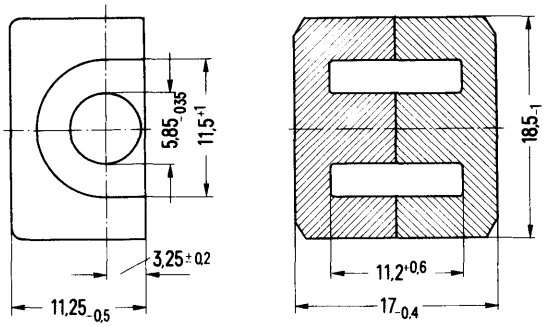
Clamp
out of 0.4 mm thick nickel silver

Ordering code (complete assembly) B65844–A2000–X000



Individual parts	Part No.	Page
Yoke	B65846	352
Clamp	B65846	352
Core	B65845	350
Coil former with 1 or 2 sections 8 pins	B65846	351
Core	B65845	350

EP 17 cores of high permeability materials are suitable for the design of high inductance coils at high packing density. They are especially suitable for transformers in printed circuits with up to 8 connections. The wire ends are connected directly to the solder pins of the coil former.



Approx. weight 11.1 g/set

Dimensions in mm

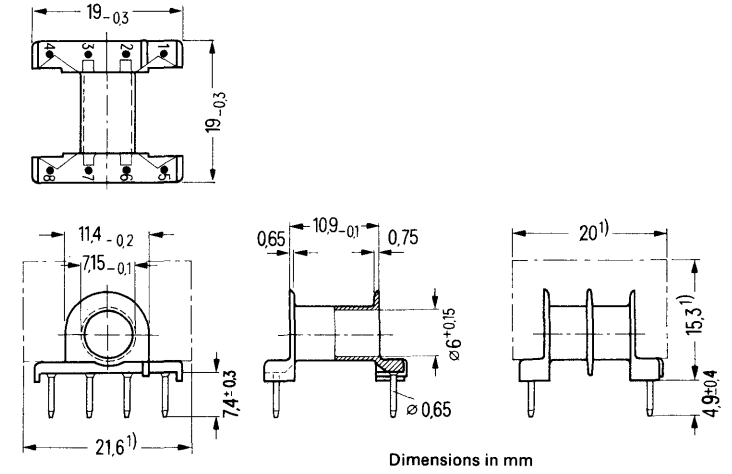
Magnetic data

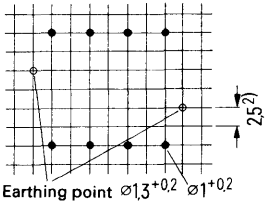
Core factor	$\Sigma\ l/A$ =	0.8	mm^{-1}
Effective length	l_e =	34	mm
Effective area	A_e =	43	mm^2
Effective volume	V_e =	1500	mm^3

A_L value without air gap nH	Tolerance	SIFERRIT material	**Ordering code**
4300	+30 % −20 % ≙ R	N 30	B65845-J0000-R030
6900		T 35	B65845-J0000-R035
11400	+40 % −30 % ≙ Y	T 38	B65845-J0000-Y038

Coil former B 65 846

Thermosetting plastic coil former with 8 terminal pins with one or two sections as required. Permissible solder temperature max. 400 °C/752 °F, 2 sec.





Hole arrangement
View in mounting direction

1) Built-in dimension for the transformer
2) 2.54 mm spacing also permissible

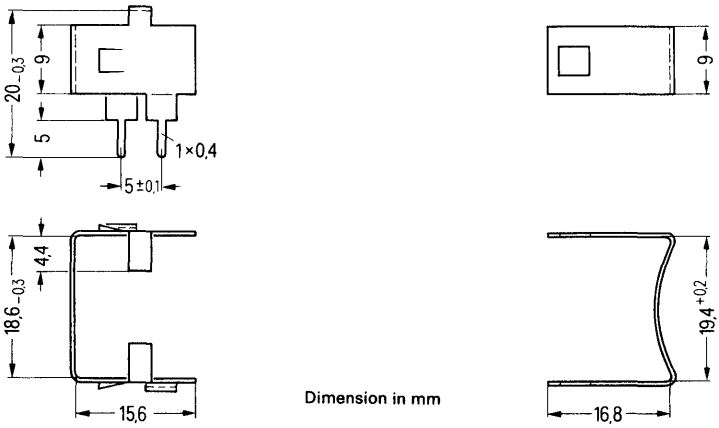
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 3)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	18.8	18.8	28,8	52.7	1.3	B65846-K1000-D001
2	8.85	17.7		55.9	1.4	B65846-K1000-D002

3) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).

Mounting assembly B 65 846

Mounting assembly consisting of a yoke and a spring clamp.

Approx. weight (yoke and clamp) 3.6 g

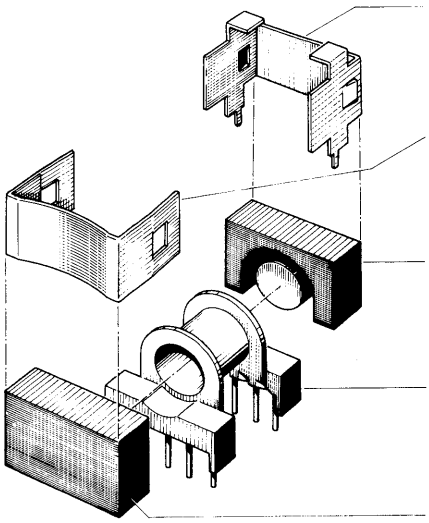


Dimension in mm

Yoke
out of 0.4 mm thick nickel silver

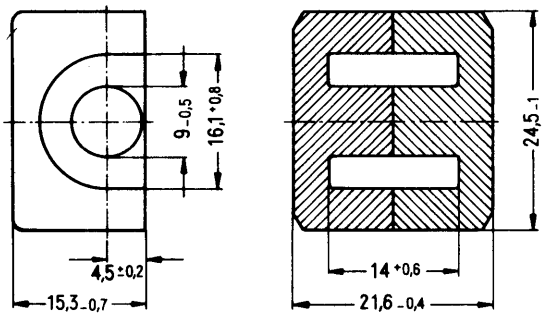
Clamp
out of 0.3 mm thick nickel silver

Ordering code (complete assembly) B65846–J2000–X000



Individual parts	Part No.	Page
Yoke	B65848	356
Clamp	B65848	356
Core	B65847	354
Coil former with 1 or 2 sections 10 pins	B65848	355
Core	B65847	354

EP 20 cores of high permeability materials are suitable for the design of high inductance coils at high packing density. They are especially suitable for transformers in printed circuits with up to 10 connections. The wire ends are connected directly to the solder pins of the coil former.



Approx. weight 28.2 g/set

Dimensions in mm

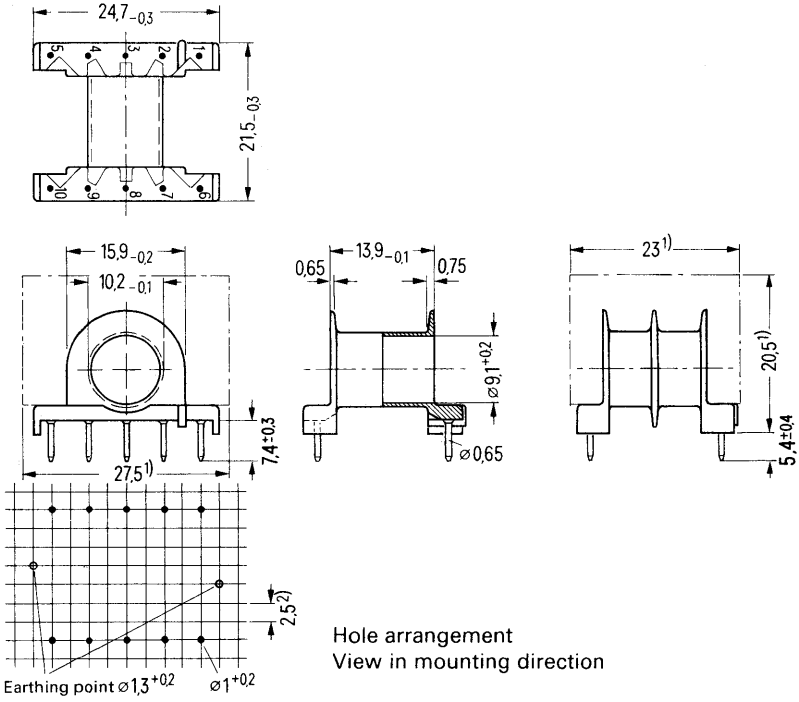
Magnetic data

Core factor	$\Sigma l/A$ =	0.50	mm^{-1}
Effective length	l_e =	45	mm
Effective area	A_e =	84	mm^2
Effective volume	V_e =	3800	mm^3

A_L value without air gap nH	Tolerance	SIFERRIT material	**Ordering code**
6700	$^{+30}_{-20}$ % △R	N 30	B65847-A0000-R030
11200		T 35	B65847-A0000-R035
19300	$^{+40}_{-30}$ % △Y	T 38	B65847-A0000-Y038

Coil former B 65 848

Thermosetting plastic coil former with 10 terminal pins with one or two sections as required.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.



Dimensions in mm

1) Built-in dimension for the transformer
2) 2.54 mm spacing also permissible

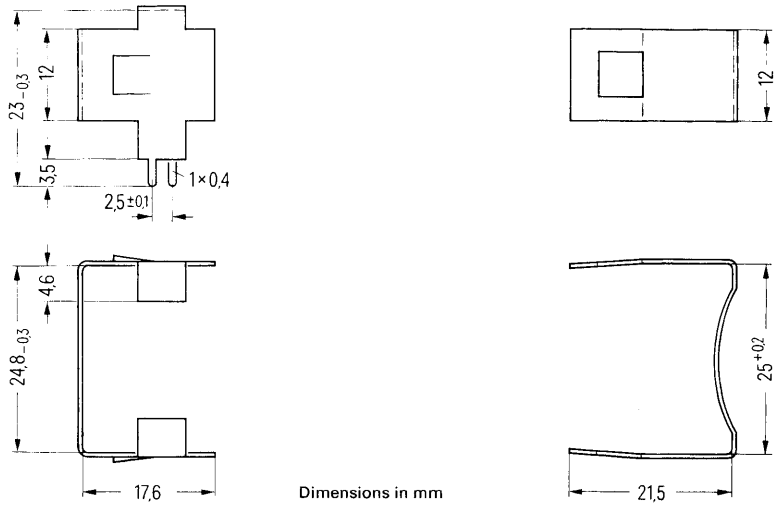
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value 3)	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	33.8	33.8	38.9	39.6	1.6	B65848-B1001-D001
2	15.9	31.8		42.1	1.7	B65848-B1001-D002

3) $R_{Cu} = A_R \times N^2$ (Dc resistance = A_R x number of turns²; copper factor $f_{Cu} = 0.5$).

Mounting assembly B 65 848

Mounting assembly consisting of a yoke and a spring clamp.

Approx. weight (yoke and clamp) 5.7 g



Dimensions in mm

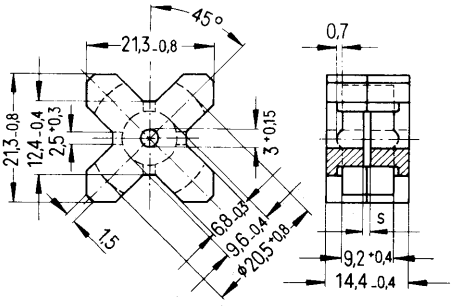
Yoke
out of 0.4 mm thick nickel silver

Clamp
out of 0.4 mm thick nickel silver

Ordering code (complete assembly) B65848–A2002–X000

In accordance with DIN 41299, sheet 1, and IEC publication 226.

X 22 cores are particularly suitable for transformers used in printed circuits, and are provided with up to 8 fixed connections. The lead ends may be connected directly to the coil former pins.



Approx. weight 12.5 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ =	0.58	mm^{-1}
Effective length	l_e =	38	mm
Effective area	A_e =	66	mm^2
Effective volume	V_e =	2500	mm^3

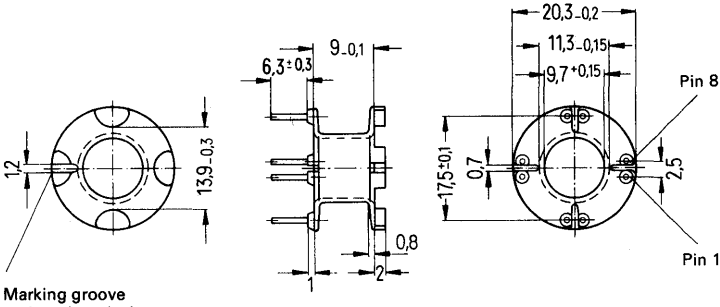
Associated parts

Coil former

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
1000	±10% ≙ K	N 22	0,05	462	B65851-A1000-K022
1250		T 26	0,05	577	B65851-A1250-K026
without air gap					
2400	+30 % ≙ R	N 22			B65851-A0000-R022
3200	−20	T 26			B65851-A0000-R026
5000		N 30			B65851-A0000-R030

Coil former B 65 854

Thermosetting plastic coil former complying with DIN 41277 and IEC publication 226.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 281.



Marking groove
assigned to pin 1
pin diameter 0.83 mm

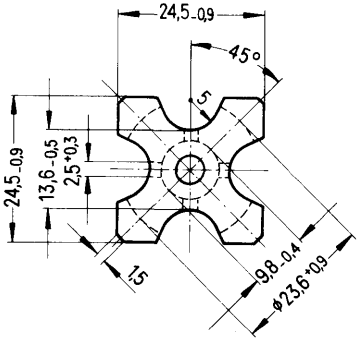
Dimensions in mm

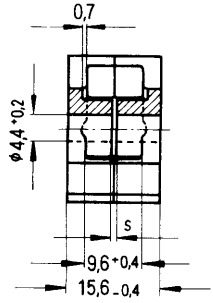
Number of sections	Useful winding cross section A_N mm^2	Average length of turn l_N mm	A_R value 1) $\mu\Omega$	Approx. weight g	**Ordering code**
1	30	49	56	1	B65854-A0000-C001

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

In accordance with DIN 41299, sheet 1, and IEC publication 226.

X 25 cores are particularly suitable for transformers used in printed circuits, and are provided with up to 8 fixed connections. The lead ends may be connected directly to the coil former pins.





Approx. weight 16.5 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	0.57	mm^{-1}
Effective length	l_e =	41.5	mm
Effective area	A_e =	73	mm^2
Effective volume	V_e =	3030	mm^3

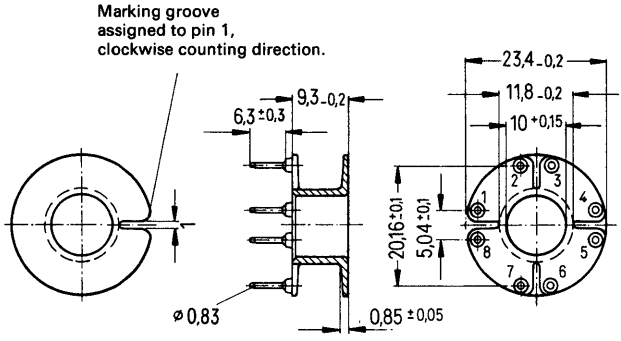
Associated parts

Coil former

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
1000	±10% ≙ K	T 26	0.05	455	B65861–J1000–K026
1600			0.04	725	B65861–J1600–K026
without air gap					
3300	+30 % ≙ R	T 26			B65861–J0000–R026
5500	−20 %	N 30			B65861–J0000–R030

Coil former B 65 864

Thermosetting plastic coil former complying with DIN 41277 and IEC publication 226.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 281.



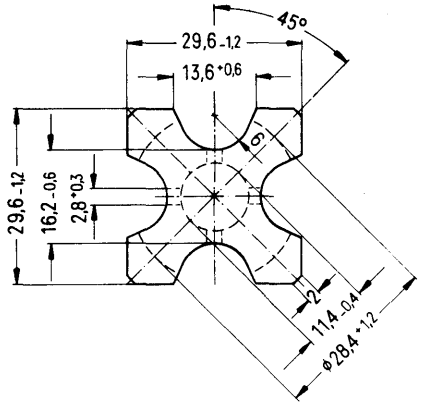
Dimensions in mm

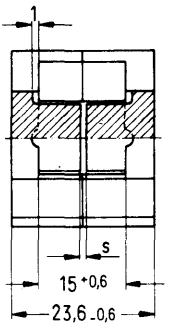
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value [1] $\mu\Omega$	Approx. weight g	**Ordering code**
1	41	55	46	1.5	B65864-A0000-C001

[1] $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

In accordance with DIN 41299, sheet 1, and IEC publication 226.

X 30 cores are particularly suitable for transformers used in printed circuits, and are provided with up to 12 fixed connections. The lead ends may be connected directly to the coil former pins.





Approx. weight 39 g/set

Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ =	0.49	mm^{-1}
Effective length	l_e =	55	mm
Effective area	A_e =	115	mm^2
Effective volume	V_e =	6300	mm^3

Associated parts

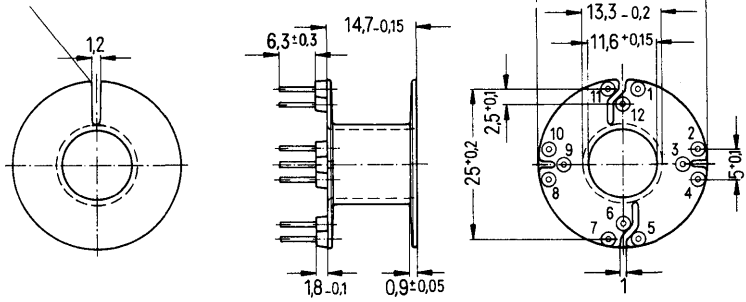
Coil former

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code**
with air gap					
1000	±10% △K	N 22	0.09	421	B65871-A1000-K022
2000		T 26	0.04	822	B65871-A2000-K026
without air gap					
3000	+30 % △R −20	N 22			B65871-A0000-R022
4200		T 26			B65871-A0000-R026
6000		N 30			B65871-A0000-R030

Coil former B 65874

Thermosetting plastic coil former in accordance with DIN 41277 and IEC publication 226.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 281.

Marking groove assigned to pin 1



Dimensions in mm

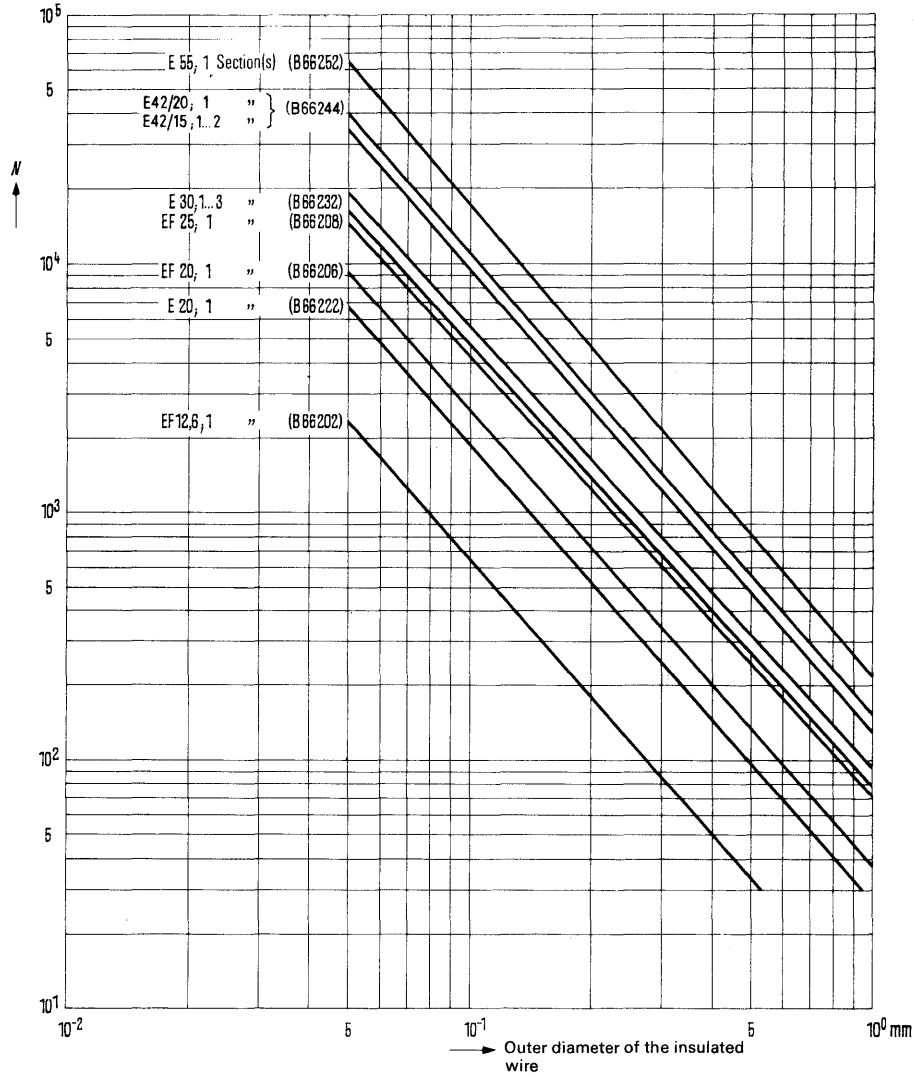
Coil former with 12 pins, pin diameter 0.83 mm

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value[1] $\mu\Omega$	Approx. weight g	**Ordering code**
1	81	64	26	3	B65874-B0000-C001

[1] $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

E Cores

Maximum number of turns *N* for coil formers



E Cores

General

For characteristic data, definitions and symbols, see page 15 to 28 and "SIFERRIT materials, characteristics and application" page 31 to 55.

1. Core shape, material

E cores are made out of the SIFERRIT materials N 27, T 26 and N 30 and are available with or without a ground air gap.
The following types specified below comprise E cores complying with DIN 41295 (tent. standard) with dimensions according to the laminations type M to DIN 41302 and EF cores complying with DIN 41985 (tent. standard) with dimensions according to laminations type EE to DIN 41302. The cores manufactured out of the material N 27 featuring high saturation magnetization and low power loss (see page 46 and 47) are particularly suitable for use in dc converters in electronic flash devices, as voltage converter in switching networks and as transductors, e.g. for pincushion distortion or for regulating transductors in thyristorized horizontal final stages in TV sets (see also data on the design of power transformers, page 71).
The core EI 25 is mainly produced out of the new SIFERRIT material N 41. Because of its high saturation magnetization and its low temperature dependance up to 100 °C/212 °F together with a remarkably high permeability this material is particularly suitable for variable inductances by dc premagnetization (current-regulated transductors).
For details refer to the appropriate data sheets, page 379 and 380.

2. E cores without an air gap

Even with the best grinding methods known today, a certain degree of roughness on ground surfaces cannot be avoided, so that the usual term "without air gap" does not in fact imply no air gap at all. The A_L values quoted allow for a certain amount of roughness of the ground faces. The tolerance on the A_L value of E cores without air gap is $^{+30}_{-20}$ %.

3. E cores with an air gap

E cores with air gap are supplied in pairs (sets) with toleranced A_L values. Since E cores are also available individually with partial air gap data, the air gap as a function of the A_L value has been indicated on the appropriate pages.

4. Winding design

A nomogram for the number of turns, inductance and A_L values is given on page 63 to 65, the data on the usual normal and litz wires is tabulated on page 61 and 62. The maximum number of turns for coil formers is indicated on page 365 and data on winding cross sections and average lengths of turns for coil formers on the appropriate pages.

5. Characteristic magnetic data $\Sigma l/A$, l_e, A_e, V_e

The appropriate pages indicate the characteristic data used for calculating the field strength, flux density and hysteresis losses for E core sets.

For instance

$$\mu_e = \frac{A_L \times \Sigma l/A}{\mu_0}$$ (see also DIN specification 41290, and IEC publication 218).

General

6. Comparison between E cores and pot cores

Generally, pot cores are preferred to E cores due to their smaller space requirements better screening, simpler mounting. The following diagram gives a comparison between both core types, each of SIFERRIT T 26 and N 30 (without an air gap).

The reciprocal dc time constant R_{Cu}/L (see page 28) which – as is generally known – should be as low as possible for a coil, is plotted against the volume.

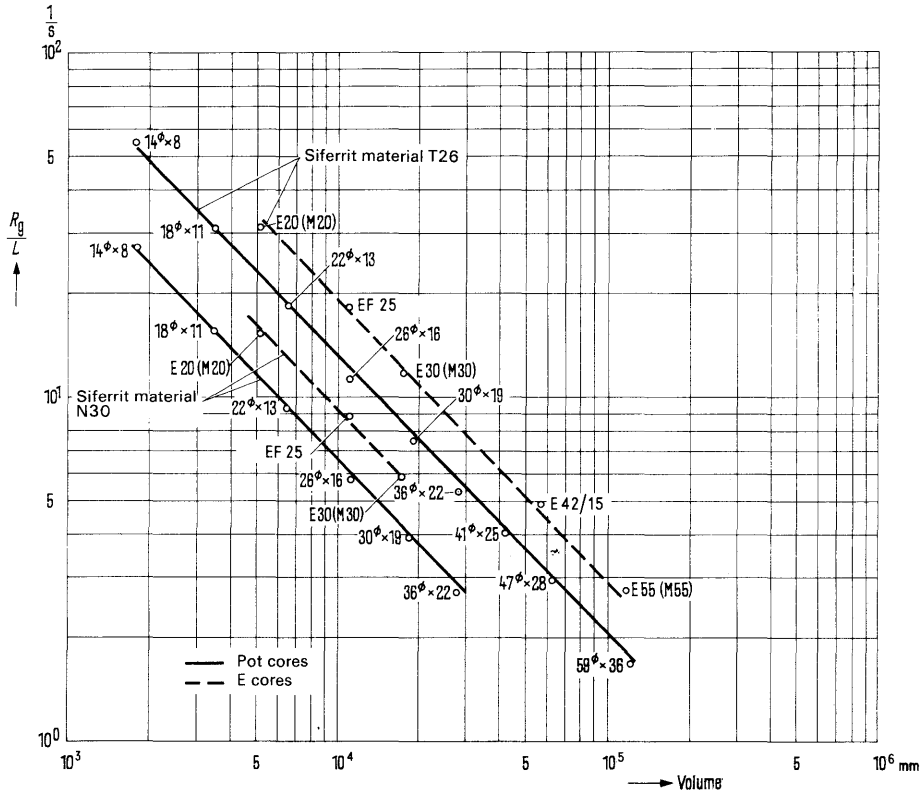
Here the following core volumes are valid:

for E cores: the square described about the E core set and the coil former (without, fixing parts)

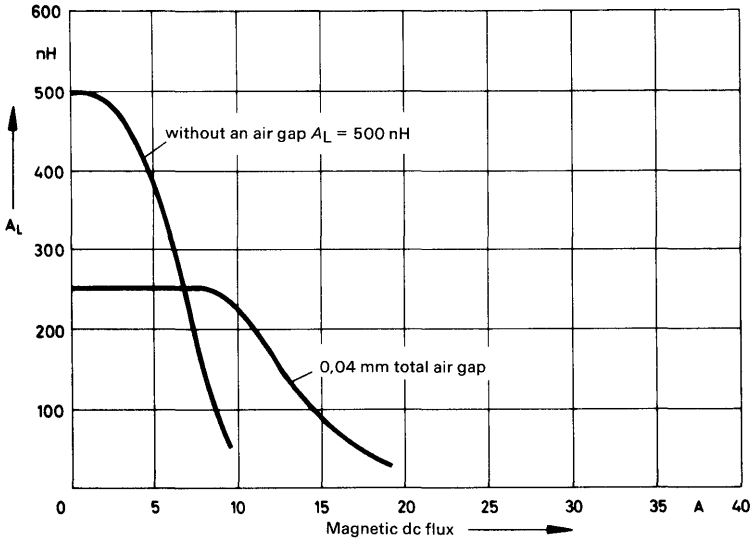
for pot cores: the square described about the pot core set (without fixing parts).

Single section, fully wound coil formers are used as a basis; a copper factor f_{Cu} of 0.5 is assumed for the winding.

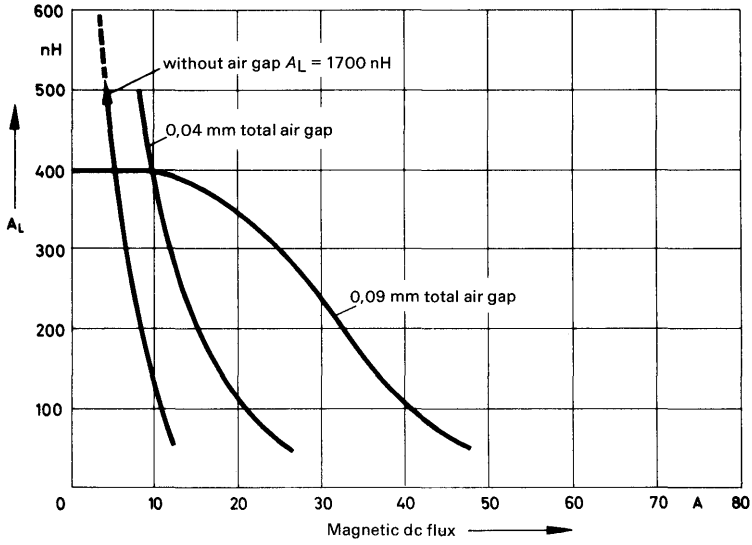
Reciprocal dc time constant as a function of volume
(size comparison between pot and E cores for T 26 and N 30 materials).



Dc premagnetization; material T 26



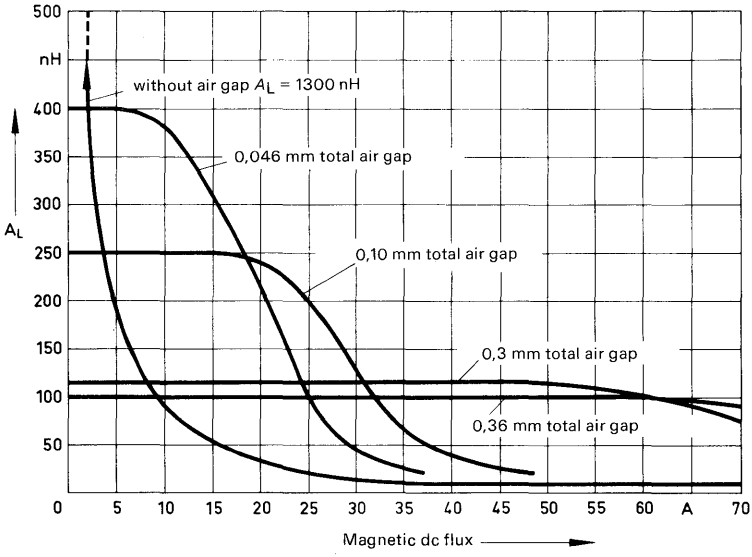
EF 12,6
B66201



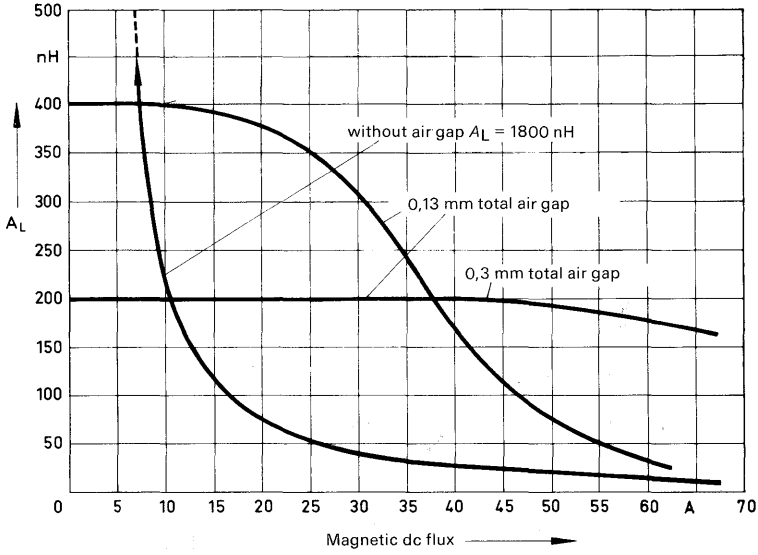
EF 25
B66207

Measuring flux density $\hat{B} < 1$ mT

Dc premagnetization; material T 26



E 20 (M 20)
B66221

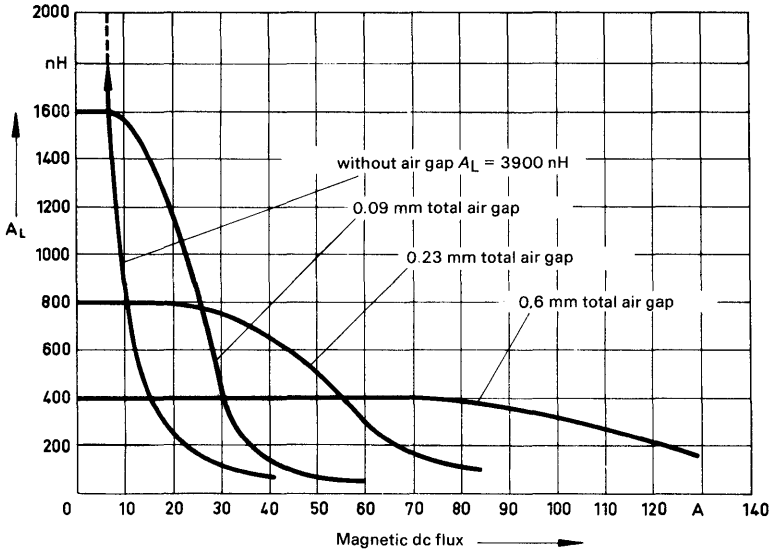


E 30 (M 30)
B66231

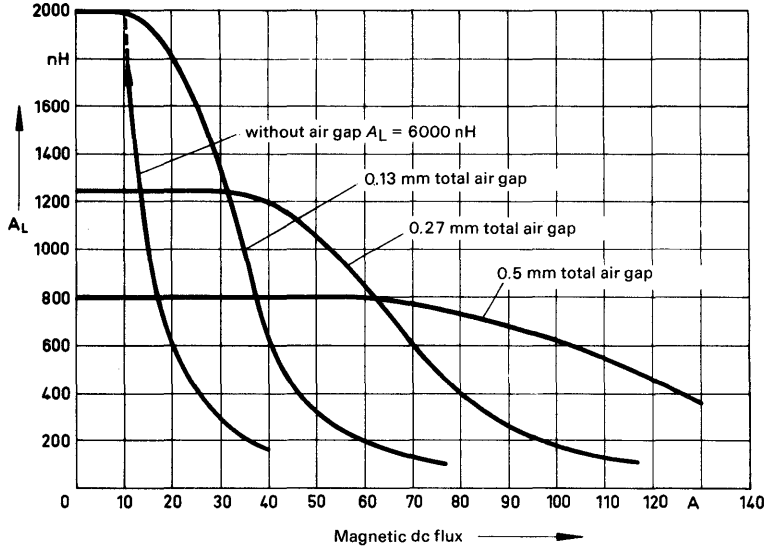
Measuring flux density $\hat{B} < 1$ mT

For a rough determination of the curve shapes for other A_L values and other SIFERRIT materials the data on pages 66 to 68 is valid using the l_e and μ_e values of the appropriate E core.

Dc premagnetization; material T 26



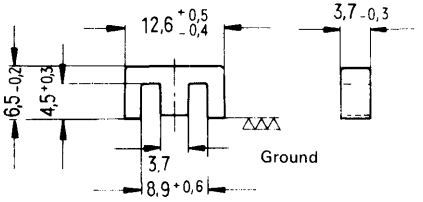
E 42/15
B66244



E 55
B66251

Measuring flux density $\hat{B}$ < 1 mT

in accordance with DIN 41985, tent. standard (corresponding to the electrical sheet-steel lamination EE 12.6)



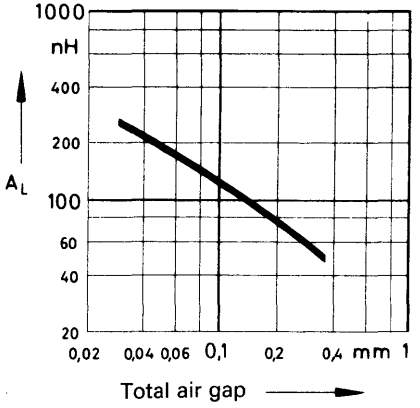
Dimensions in mm

Magnetic data

Core factor	$\Sigma\, l/A$ =	2.28	mm^{-1}
Effective length	l_e =	29.6	mm
Effective area	A_e =	13.0	mm^2
Effective volume	V_e =	384	mm^3

Approx. weight 1.7 g/set

A_L value as a function of air gap (SIFERRIT T 26)



Associated parts

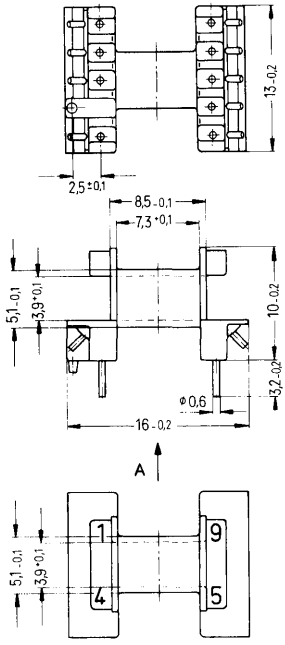
Coil former
Yoke

A_L value nH	tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** for E core sets (1 set ≙ 2 E cores)
with air gap					
250	±15% ≙ L	T 26	0.04	454	B66201-A0250-L026
without air gap					
500	+30 % −20 % ≙ R	T 26			B66201-A0000-R026
800		N 30			B66201-A0000-R030

Coil former and yoke B 66 202

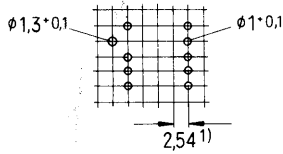
Polycarbonate GV **coil former** with 9 pin terminals.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 365.
0.2 mm thick nickel silver spring **yoke**.

Coil former



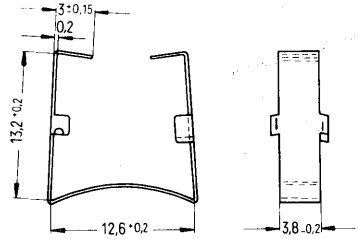
View in direction A

Hole arrangement
view in mounting direction



Dimensions in mm

Yoke

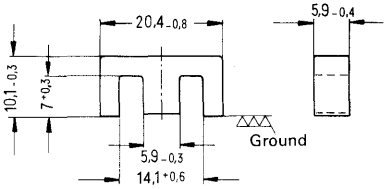


1) 2.5 mm spacing also permissible

Coil former					Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value2) $\mu\Omega$	Approx. weight g	
1	9.8	25	88	0.7	B66202-A1001-M001
Yoke				0.5	B66202-A2001-X000

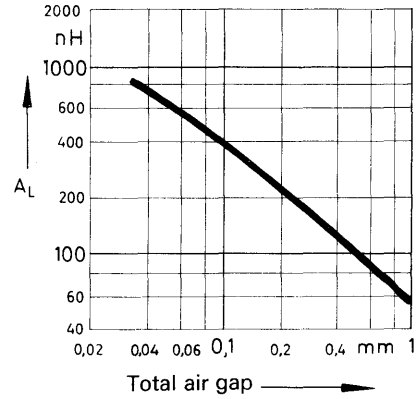
2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41985, tent. standard (corresponding to the electrical sheet steel lamination EE 20)



Dimensions in mm

A_L value as a function of air gap (SIFERRIT T 26)



Magnetic data

Core factor	$\Sigma l/A$ =	1.34	mm^{-1}
Effective length	l_e =	44.9	mm
Effective area	A_e =	33.5	mm^2
Effective volume	V_e =	1500	mm^3

Approx. weight 7.3 g/set

Associated parts

Coil former
Yoke

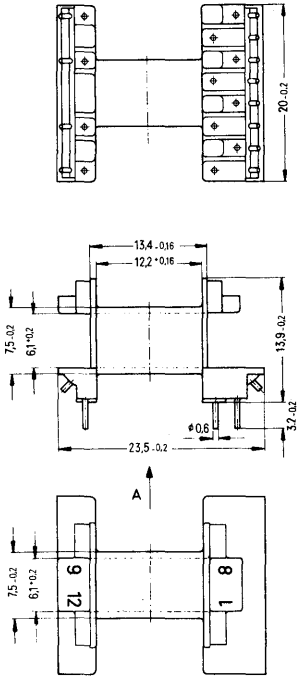
A_L value nH	tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** (for E core sets) (1 set = 2 E cores)
with air gap					
250	±15% △ L	T 26	0.17	268	B66205-A0250-L026
400	±20% △ M		0.1	429	B66205-A0400-M026
without air gap					
1300	+30 % △ R	N 27			B66205-A0000-R027
1300	−20	T 26			B66205-A0000-R026
2500		N 30			B66205-A0000-R030

Coil former and yoke B 66206

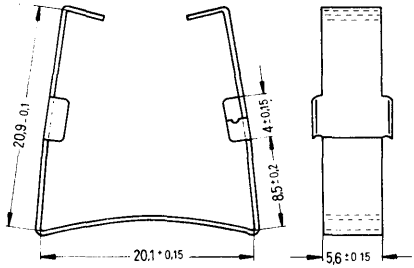
Polycarbonate GV coil former with 12 terminal pins.
Permissible solder temperature max. 400 °C/752 °F, 2 sec.
For winding details see page 365.

0.3 mm thick nickel-silver spring yoke

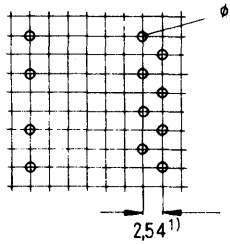
Coil former



Yoke



Hole arrangement
view in mounting direction



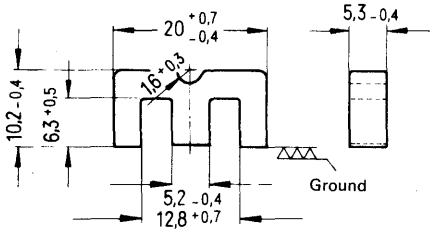
1) 2.5 mm spacing also permissible

Dimensions in mm

Coil former					Ordering code
Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	
1	34	41.2	42	1.6	B66206-A1001-M001
Yoke				2.2	B66206-A2001-X000

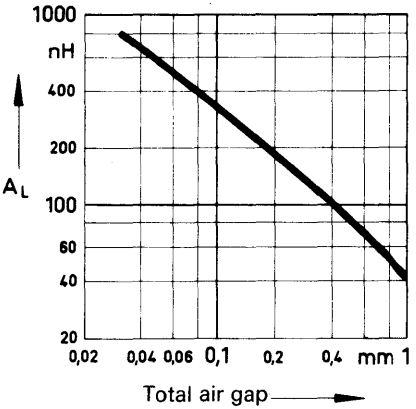
2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41295, tent. standard (corresponding to the electrical sheet-steel lamination M 20)



Dimensions in mm

A_L value as a function of air gap (SIFERRIT T 26)



Magnetic data

Core factor	$\Sigma\, l/A$ =	1.38	mm^{-1}
Effective length	l_e =	43	mm
Effective area	A_e =	31	mm^2
Effective volume	V_e =	1340	mm^3

Approx. weight 7.5 g/set

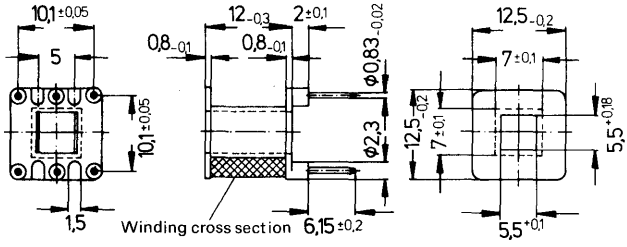
Associated parts

Coil former

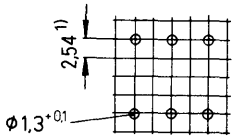
A_L value nH	tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
with air gap					
100	±10% ≙ K	T 26	0.4	109	B66221-A0100-K026
250	±15% ≙ L		0.14	273	B66221-A0250-L026
400	±20% ≙ M		0.08	436	B66221-A0400-M026
without air gap					
1300	+30 % ≙ R −20	N 27			B66221-A0000-R027
1300		T 26			B66221-A0000-R026
2500		N 30			B66221-A0000-R030

Coil former B 66222

Thermosetting plastic coil former with 6 terminal pins.
For winding details see page 365.



Hole arrangement
view in mounting direction



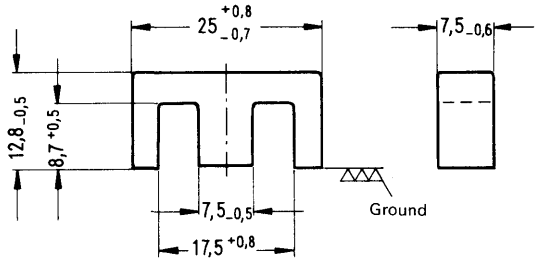
Dimensions in mm

1) 2.5 mm spacing also permissible

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	**Ordering code**
1	25	30	41	0.3	B66222-B0000-D001

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41985, tent. standard (corresponding to the electrical sheet steel lamination EE 25)



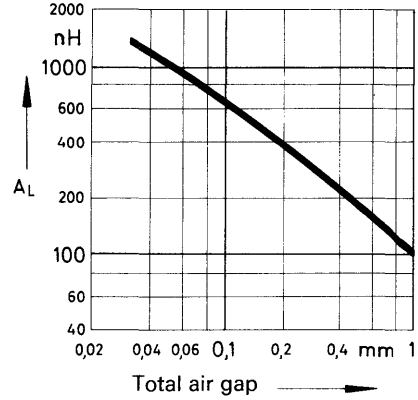
Dimensions in mm

Magnetic data

Core factor	$\Sigma l/A$ =	1.09	mm^{-1}
Effective length	l_e =	57.5	mm
Effective area	A_e =	52.5	mm^2
Effective volume	V_e =	3020	mm^3

Approx. weight 16 g/set

A_L value as a function of air gap (SIFERRIT T 26)



Associated parts

Coil formers
Yoke

A_L value nH	tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
with air gap					
400	±15% ≙ L	T 26	0.17	370	B66207-A0400-L026
630	±20% ≙ M		0.09	580	B66207-A0630-M026
without air gap					
1750	+30 −20 % ≙ R	N 27			B66207-A0000-R027
1750		T 26			B66207-A0000-R026
3100		N 30			B66207-A0000-R030

Coil formers and yoke B 66208

6-polyamide GV **coil former,** vertical, (fig. 1) with 6 terminal pins.
Matching **yoke** (fig. 2) with 2 earthing connections of 0.3 mm thick nickel-silver.
6-polyamide GV **coil former,** horizontal, (fig. 3) with 8 terminals pins.
Yoke available on request.
Permissible solder temperature max. 280 °C, 536 °F, 0.5 sec.
For winding details see page 365.

Fig. 1

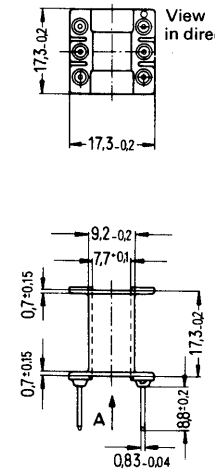
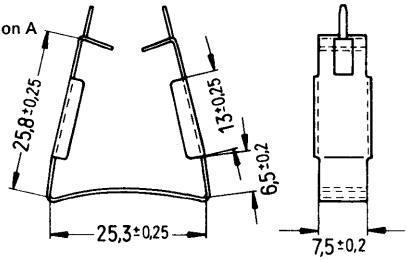


Fig. 2

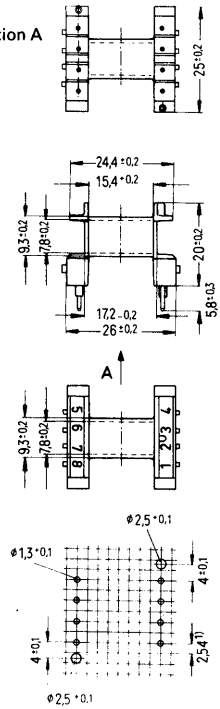


Length of pins provided for mounting 3.5 mm

Hole arrangement
view in mounting direction

Earthing points

Fig 3



1) 2.5 or 1.25 mm spacing also permissible

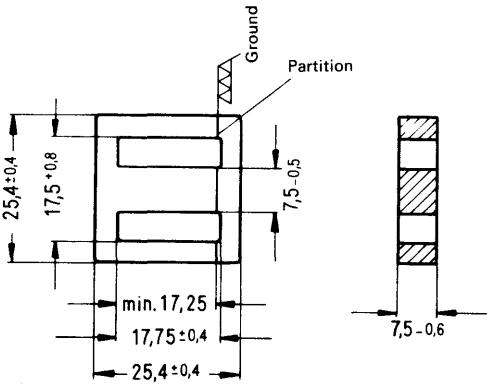
Dimensions in mm

Coil former						Ordering code
Figure	Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	
1	1	56	52	32	1.5	B66208-A1001-R001
3					3	B66208-A1003-R001
Yoke						
2					2.5	B66208-A2001-X000

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41986, tent. standard, (corresponding to the electrical sheet-steel lamination EE 25).

E core sets EI 25 are preferably suitable for use as transductors in colour TV sets.
The air gap can freely be set by inserting a foil.
For a center leg winding coil former and yoke in accordance with B66208, page 378, are fitting.



Dimensions in mm

Magnetic data

Core factor	$\Sigma l/A$ =	1.09	mm^{-1}
Effective length	l_e =	57.5	mm
Effective area	A_e =	52.5	mm^2
Effective volume	V_e =	3020	mm^3

Approx. weight 16 g/set

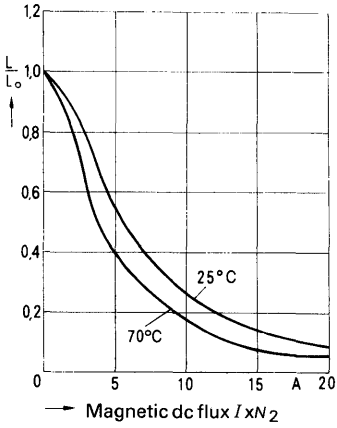
SIFERRIT material	Temperature ϑ [° C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	**Ordering code** for EI core sets
N 41[2]	20 100	400 330	≦180 ≦200	≧1800 ≧1300	B66217-A0000-R041
N 27	20 100	400 330	≦240 ≦260	≧1330 ≧1000	B66217-A0000-R027

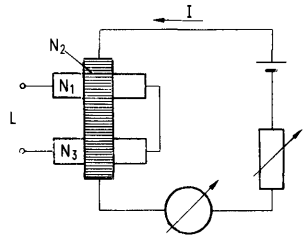
[1]) For the measuring process see DIN 41296, tent. standard, sheet 10
[2]) For further material data see page 34.

Material data for SIFERRIT N 41

Initial permeability	μ_i	2500 ±20%
Curie temperature	ϑ_C	>230° C
Coercivity	Hc	20 A/m
Flux density $\hat{B}$ at $\hat{H}$ = 3000 A/m		470 mT

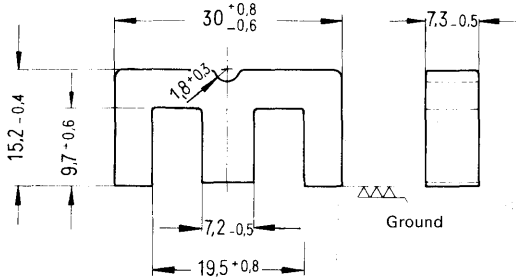
Characteristic curves and measuring arrangement for a transductor with SIFERRIT N 41 EI 25 cores





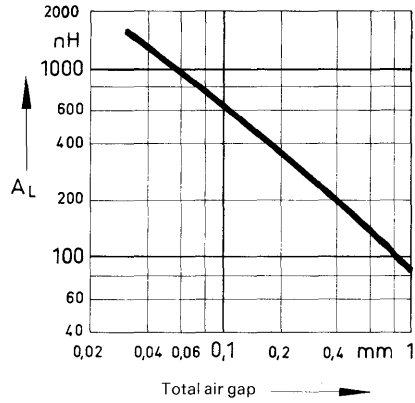
Measuring flux density $\hat{B} \leq 1$ mT

in accordance with DIN 41295, tent. standard (corresponding to the electrical sheet-steel lamination M 30)



Dimensions in mm

A_L value as a function of air gap (SIFERRIT T 26)



Magnetic data

Core factore	$\Sigma\ l/A$ =	1.12	mm^{-1}
Effective length	l_e =	67	mm
Effective area	A_e =	60	mm^2
Effective volume	V_e =	4000	mm^3

Approx. weight 22 g/set

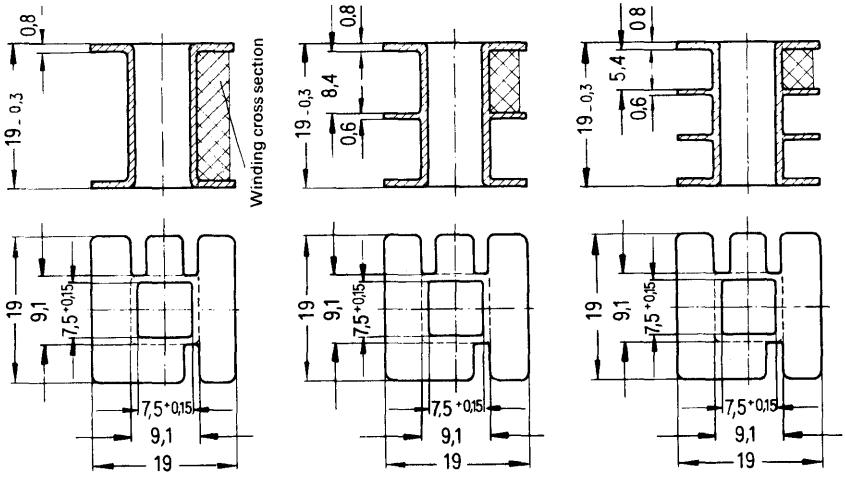
Associated parts

Coil formers

A_L value nH	tolerance	SIFERRIT material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** for E core sets (1 set ≙ 2 E cores)
with air gap					
200	±10% ≙ K	T 26	0.4	179	B66231-A0200-K026
400	±15% ≙ L		0.17	353	B66231-A0400-L026
630	±20% ≙ M		0.10	562	B66231-A0630-M026
without air gap					
1800	+30 −20 % ≙ R	N 27			B66231-A0000-R027
1800		T 26			B66231-A0000-R026
3300		N 30			B66231-A0000-R030

Coil former B 66232

Polycarbonate coil formers
For winding details see page 365.

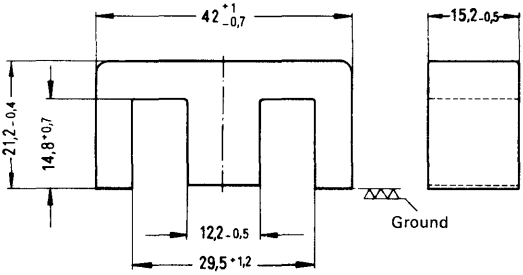


Dimensions in mm

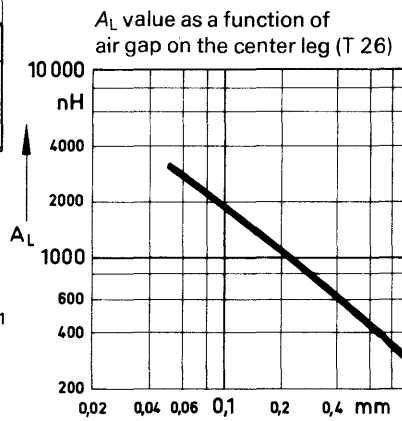
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value[1]	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	73	73	46	21	1.1	B66232-A0000-M001
2	35	70		22	1.2	B66232-A0000-M002
3	22	66		24	1.3	B66232-A0000-M003

[1] $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41295, tent. standard



Dimensions in mm



Magnetic data

Core factor	$\Sigma\, l/A$ =	0.535	mm^{-1}
Effective length	l_e =	97	mm
Effective area	A_e =	181	mm^2
Effective volume	V_e =	17600	mm^3

Approx. weight 80 g/set

Associated parts

Coil former

Ferrite plate for the center leg 15 x 12 x 2.5 mm to set an air gap on the two outer legs.
Ordering code B66244–J0004–X027

A_L value nH	tolerance	SIFERRIT-material	Total air gap s in mm approx.	Effective permeability μ_e	**Ordering code** for E core sets (1 set ≙ 2 E cores)
with air gap					
400	±10% ≙ K	T 26	0.65	170	B66244–A0400–K026
800	±15% ≙ L		0.3	340	B66244–A0800–L026
1600	±20% ≙ M		0.12	680	B66244–A1600–M026
without air gap					
3500	+30 −20 % ≙ R	N 27			B66244–A0000–R027
3900		T 26			B66244–A0000–R026

Test data for material N 27

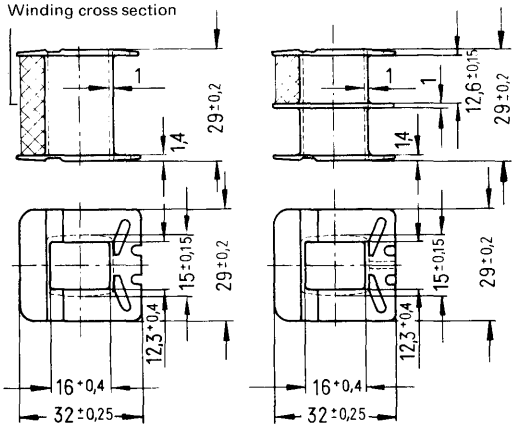
SIFERRIT-material	Temperature ϑ [°C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	Power loss [W/set]	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
N 27	20	400	≦ 240	≧ 1330	–	B66244–A0000–R027
	100	330	≦ 260	≧ 1000	–	
	60...100	200	–	–	≦ 2.1	

[1]) For measuring process see DIN 41296, sheet 10 (tent. standard)

The previous E core type B66241 with a notch on the center leg is available with the same data for a transition period.
Ordering code B66241-A····-····
see table

Coil former B 66242-A...

Polycarbonate GV coil formers without terminal pins.
For winding details see page 365.



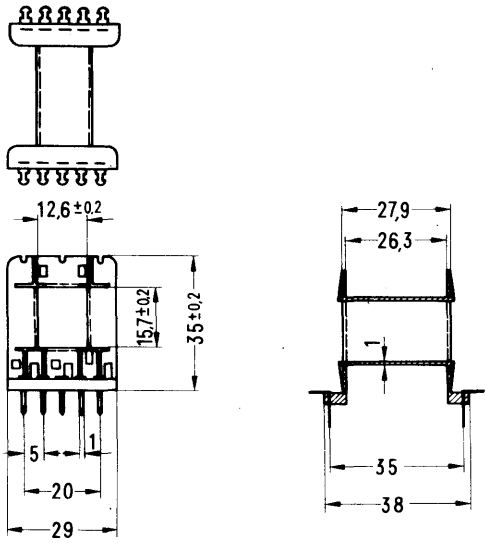
Dimensions in mm

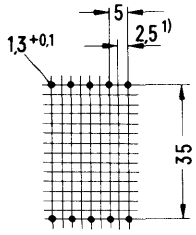
Number of sections	Useful winding cross section A_N		Average length of turn l_N	A_R value [1]	Approx. weight	**Ordering code**
	of one section mm²	total mm²	mm	μΩ	g	
1	157	157	87	19	4.5	B66242-A0000-M001
2	75	150		20	5.3	B66242-A0000-M002

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Coil former B 66242–J...

Coil former with 10 Durethan BKV solder tags.
For winding details see page 365.





Hole arrangement
view in mounting direction

Dimensions in mm

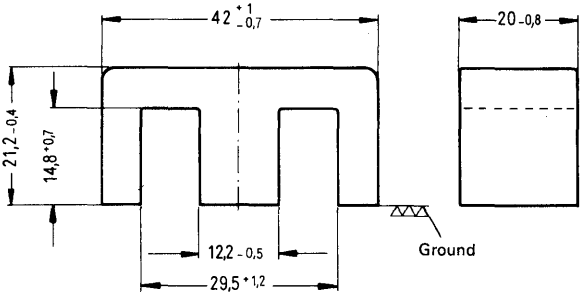
1) 2.54 mm spacing also permissible

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	**Ordering code**
1	157	87	19	7,5	B66242–J1000–D001

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

in accordance with DIN 41295, tent. standard

E core sets E 42/20 with a larger magnetic cross-section are mainly used for deflection circuits in colour TV sets.



Dimensions in mm

Magnetic data

Core factor	$\Sigma l/A$ =	0.405	mm^{-1}
Effective length	l_e =	97	mm
Effective area	A_e =	240	mm^2
Effective volume	V_e =	23300	mm^3

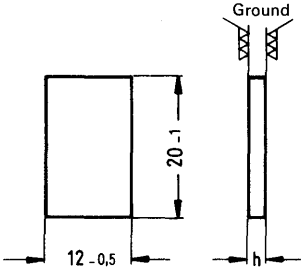
Approx. weight 116 g/set

Associated parts

Coil former

SIFERRIT-material	Temperature ϑ [°C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	Power loss [W/set]	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
N 27	20 100 60...100	400 330 200	≦ 240 ≦ 260 –	≧ 1330 ≧ 1000 –	– – ≦ 2.8	B66244-J0000-R027

In order to set an air gap on both outer legs, spacers for the center leg are available in the same SIFERRIT material.



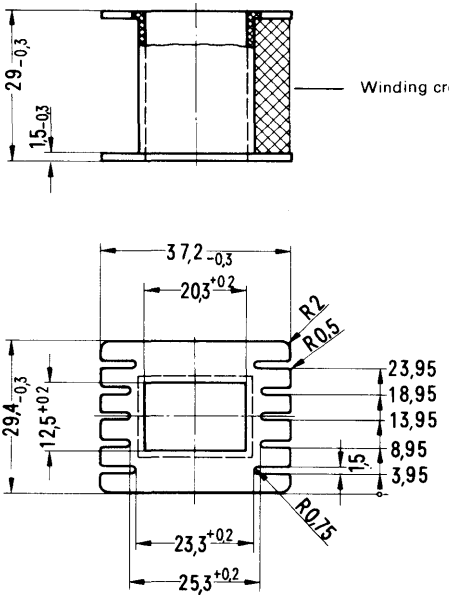
Dimensions in mm

h	**Ordering code**
2,5-0.15	B66244-J0003-X027
3-0.2	B66244-J0002-X027

[1]) For the measuring process see DIN 41296, sheet 10 (tent. standard)

Coil former B 66243-A...

Polycarbonate coil former
For winding details see page 365.



Dimensions in mm

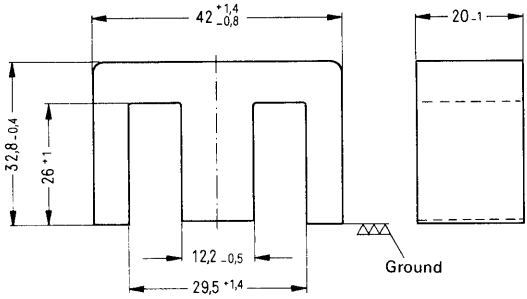
Number of sections	Useful winding cross section A_N mm^2	Average lenght of turn l_N mm	A_R value[1] $\mu\Omega$	Approx. weight g	**Ordering code**
1	157	105	23	3	B66243-A1000-M001

A pin plate with 12 terminals is also available upon request.
Ordering code B66243-J1000-X000

1) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns^2
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

E Cores, mainly for switching networks

For design data on power transformers see page 71 to 79.



Dimensions in mm

Magnetic data

Core factor	$\Sigma l/A$ =	0.59	mm^{-1}
Effective length	l_e =	142	mm
Effective area	A_e =	240	mm^2
Effective volume	V_e =	34000	mm^3

Approx. weight 175 g/set

SIFERRIT material	Temperature ϑ [° C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	Power loss [W/set]	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
N 27	20	400	≦ 240	≧ 1330	–	B66244–N0000–R027
	100	330	≦ 260	≧ 1000	–	
	60...100	200	–	–	≦ 4,2	

The above mentioned E cores E 42/20/32 with longer legs are frequently combined with the E core 42/20/21 (page 386). For this combination the following data applies:

Magnetic data

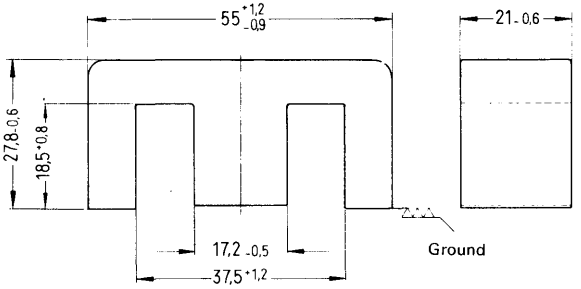
Core factor	$\Sigma l/A$ =	0.50	mm^{-1}
Effective length	l_e =	120	mm
Effective area	A_e =	240	mm^2
Effective volume	V_e =	28800	mm^3

Approx. weight 146 g/set

SIFERRIT-material	Temperature ϑ [°C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	Power loss [W/set]	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
N 27	20	400	≦ 240	≧ 1330	–	B66244–M0000–R027
	100	330	≦ 260	≧ 1000	–	
	60...100	200	–	–	≦ 3,5	

[1]) For measuring process see DIN 41296, sheet 10

in accordance with DIN 41295, tent. standard (corresponding to the sheet-steel lamination M 55)



Dimensions in mm

Magnetic data

Core factor	$\Sigma\ l/A$ =	0.34	mm^{-1}
Effective length	l_e =	120	mm
Effective area	A_e =	354	mm^2
Effective volume	V_e =	42500	mm^3

Approx. weight 215 g/set

Associated parts

Coil former

A_L value nH	tolerance	SIFERRIT material	**Ordering code** for E core sets (1 set ≙ 2 cores)
without air gap			
6000	+30 % ≙ R	N 27	B66251-A0000-R027
6000	−20 % ≙ R	T 26	B66251-A0000-R026
10000	−20 % ≙ R	N 30	B66251-A0000-R030

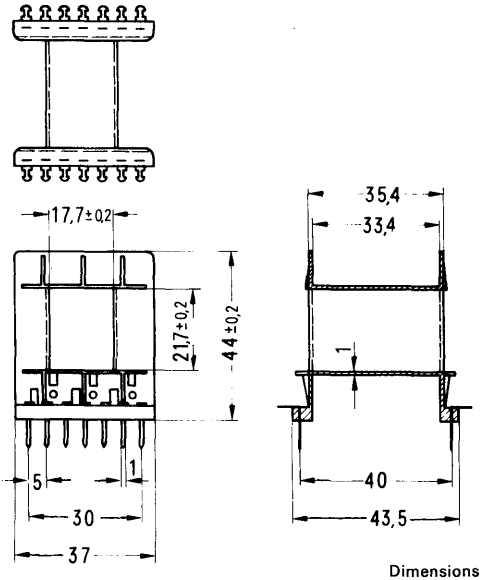
Test data for material N 27

SIFERRIT-material	Temperature ϑ [°C]	Flux density $\hat{B}$ [mT]	Field strength $\hat{H}$ [A/m]	Amplitude permeability[1]	Power loss [W/set]	**Ordering code** (for E core sets) (1 set ≙ 2 E cores)
N 27	20	400	≦ 240	≧ 1330	–	B66251-A0000-R027
	100	330	≦ 260	≧ 1000	–	
	60...100	200	–	–	≦ 5,0	

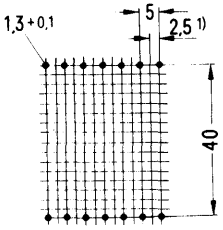
[1]) For measuring process see DIN 41296, sheet 10

Coil former B 66252

Coil former with 14 Durethan BKV solder tags.
For winding details see page 365.



Dimensions in mm



Hole arrangement
view in mounting direction

1) 2.54 mm spacing also permissible

Number of sections	Useful winding cross section A_N mm²	Average length of turn l_N mm	A_R value 2) $\mu\Omega$	Approx. weight g	**Ordering code**
1	238	113	16	10.0	B66252-B0000-M001

2) $R_{Cu} = A_R \times N^2$
Dc resistance = A_R x number of turns²
The A_R value is valid for a copper factor $f_{Cu} = 0.5$.

Toroids

Characteristic data and definitions

Toroids for pulse transformers

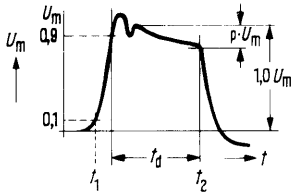


Fig. 1 Voltage shape of a primary pulse

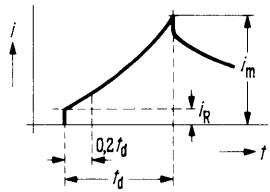


Fig. 2 Current shape of a primary pulse

Pulse permeability

$$\mu_p = \frac{1}{\mu_o} \times \frac{\Delta B}{\Delta H}$$

$$\Delta B = \frac{\int_{t_1}^{t_2} U \times d_t}{N \times A_e} \approx \frac{U_m \times t_d}{N \times A_e}$$

$$\Delta H = \frac{\Delta i \times N}{l_e}$$

$$L_p = \mu_p \times \mu_o \times \frac{N^2 \times A_e}{l_e} = \frac{U_m \times t_d}{\Delta i}$$

From this definition one obtains μ_p as permeability determined by flux density and field strength deviations at pulse operation. The magnetizing current pulse – shown in fig. 2 – has in its initial and final part a current step, generated by the core losses, and an inductive current step $i_m - i_R$ with an approx. linearly rising characteristic.

Since in many cases the current step i_R can be neglected for pulse permeability calculations, the peak value of the magnetizing current i_m can be introduced as the current difference Δi when the field strength deviation ΔH should be calculated.

When the value of ΔB increases, mainly at higher pulse repetition frequencies and an increasing pulse duty factor, the current step i_R – as a proportion of the whole current – may be of greater importance.

Figure 5 shows therefore $\mu_{p\,0.2}$ referred to a flux density ΔB during the interval $t_d - 0.2\ t_d$ and an accordingly increasing magnetizing current $\Delta i = i_m - i_{0.2}\ t_d$ (disregarding the current step at the beginning of the pulse).

Characteristic data and definitions

Measuring circuit

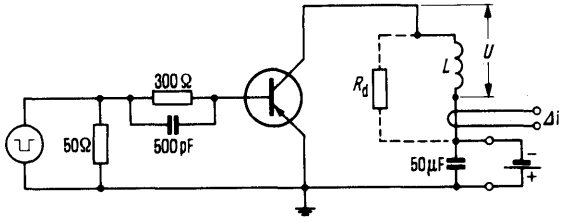


Fig. 3

Test conditions

For a specified material, the pulse permeability is dependent upon the flux density deviation, the pulse repetition frequency and the core temperature. Preferred test operation conditions are as follows:

ϑ = 25° C (77 °F)

f_p	10 kHz	100 kHz	1 MHz
t_d	1 µs	1 µs	0.5 µs

The time constant of the circuit (fig. 3) has been determined such that the pulse current of the preceding pulse has approximately decayed to zero when the next pulse starts to rise. The resistance R_d causes the voltage peak value to decrease when the current has been disconnected. The core heating mainly depends on the heat conductive medium, e.g. copper winding, mounting, encapsulation etc. The data in the test curve for continuous operation and short term measurement refers to 6 mm diameter ring cores with N approx. 20/CuL, freely suspended. [1]

Toroids for chokes and wideband transformers for ac voltages

The materials and core shapes listed on pages 398 to 400 are also suitable for use in chokes and wideband transformers.

Materials of lower permeability are applicable at frequencies above 1 MHz; R 5.8 ring cores are preferably available (see page 399).

Material	μ_i	A_L-value (nH) ±25%	**Ordering code**
U 60	8	1.58	B64290-A0056-X060
K 1	80	15.8	B64290-A0056-X001
M 33	600	119.0	B64290-A0056-X033

[1] For pulse transformer design see also the essays by Robert Schmitt and Attila J. Roos "Pulse Transformers with Ferrite Cores" published in Siemens Electronic Components Bulletin 5 and 6-70.

Material data

Pulse permeability as a function of flux density deviation

N 30

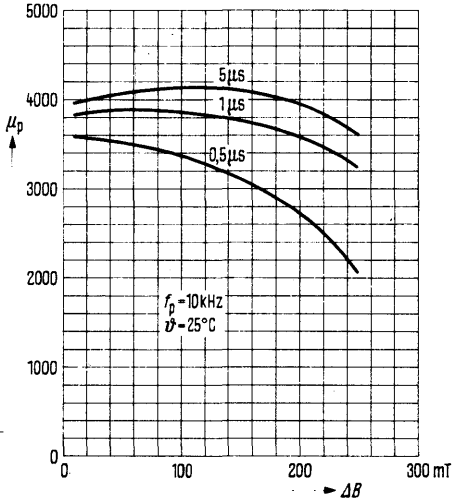


Fig. 4

N 30

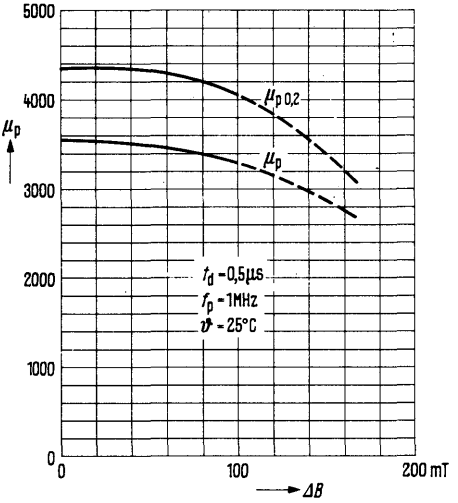


Fig.5 – – – only intermittent operation possible (dependent on the heat conductivity)

Variation of pulse permeability with temperature at different flux density deviations

N 30

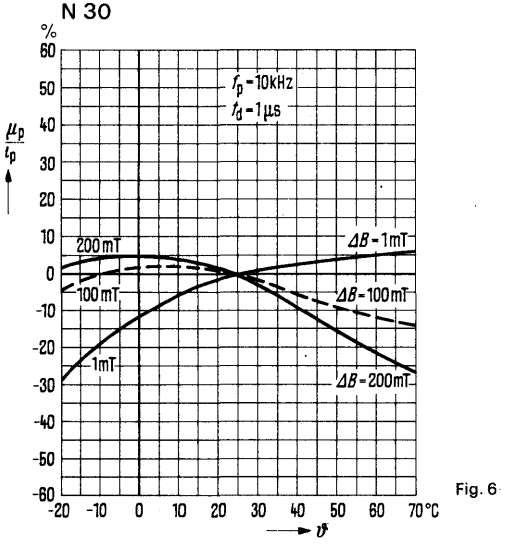


Fig. 6

Material data – calculation

Pulse permeability as a function of flux density deviation

T 38

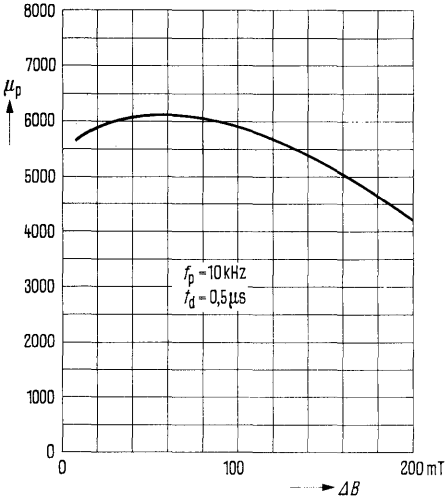


Fig. 7

T 38

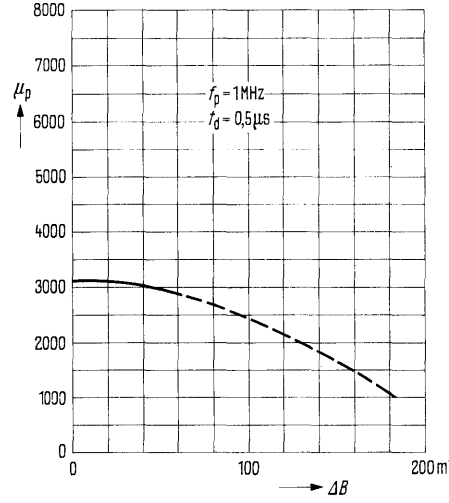


Fig. 8 – – – only intermittent operation possible (dependent on the heat conductivity)

Example

The required secondary pulses must have an amplitude I_2 = 120 mA, a length t_d = 0.5 μs and a maximum droop of p = 5%. The terminating resistance R_2 is 50 Ω, the source resistance R_i = 200 Ω and the turns ratio n = 2:1. The maximum core temperature is 70 °C. (158 °F) (Definitions in accordance with DIN 41284).

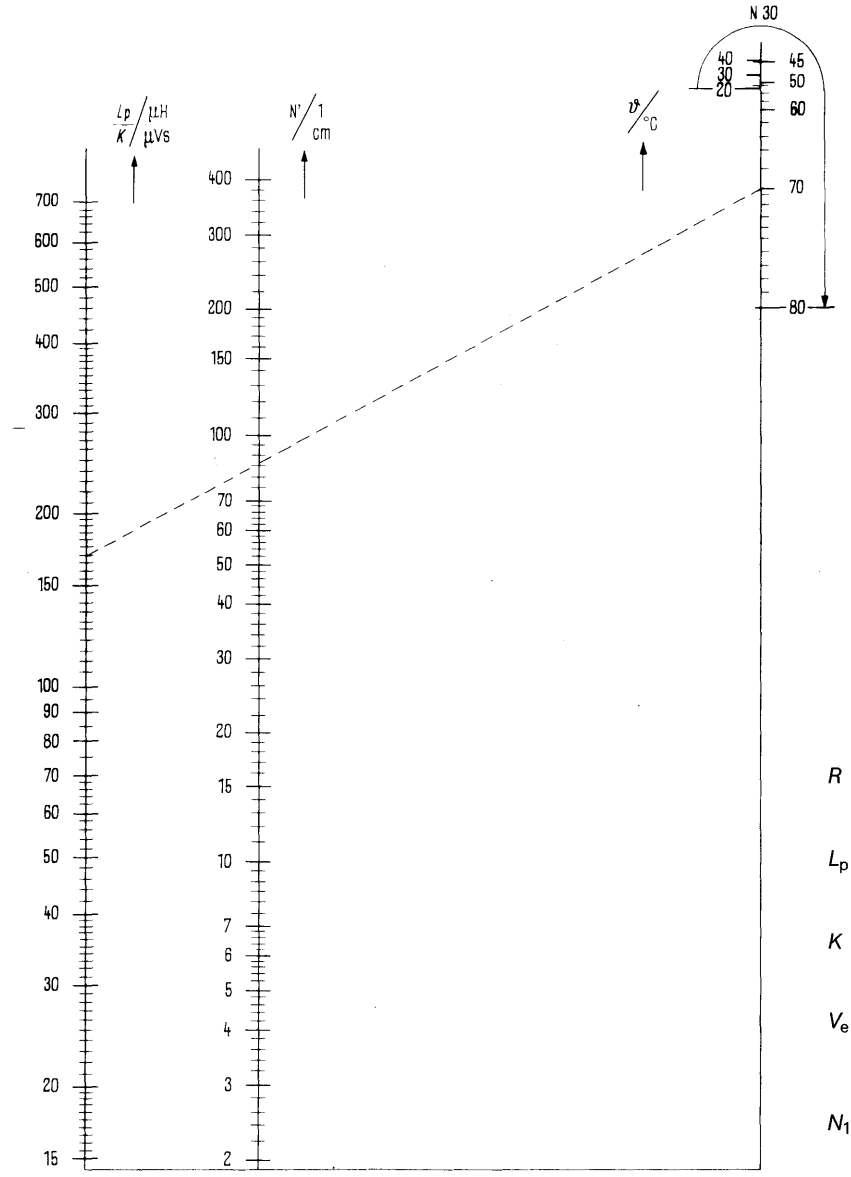
The material provided is SIFERRIT N 30

Equation (1) yields R = 100 Ω, equation (2) L_p = 1000 μH and equation (3) K = 6.0μVs and hence L_p/K = 167 μH/μVs. From the nomogram one obtains N' = 85 cm^{-1}. As shown in fig. 4 a permeability μ of approx. 1800 can be assumed for SIFERRIT N 30 at t_d = 0.5 μ_s. Equation (4) yields V_e = 0.006 cm^3, i.e. one can chose the ring core R 4 having a V_e = 12.3 mm^3. N_1 = 58 is computed from equation (5). The magnetic field constant $\mu_0 = 4\pi \cdot 10^{-9}$ Vs/Acm.

Hence the transformer can be designed as follows:

SIFERRIT toroidal core R 4, of N 30 material, N_1 = 58, N_2 = 29.

Nomogram for the calculation of pulse transformers



$$R = \frac{n^2 R_i R_2}{R_i + n^2 R_2} \quad (1)$$

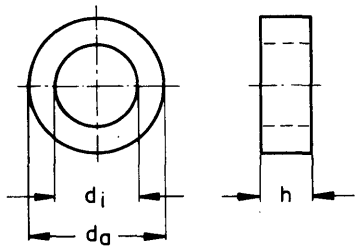
$$L_p \geqq \frac{t_d R}{p} \quad (2)$$

$$K = n I_2 R_2 t_d \quad (3)$$

$$V_e \geqq \frac{L_p}{\mu \mu_o N'^2} \quad (4)$$

$$N_1 \geqq \sqrt{\frac{L_p \cdot l_e}{\mu \mu_o A_e}} \quad (5)$$

Summary of types



SIFERRIT toroids are mainly used for transformer (e.g. pulse, wideband and matching transformers).

The higher permeability of the magnetically closed circuit results in high flux densities at low volume; the stray field is negligible.

Type	Dimensions			Approx. weight	Technical data			
	d_a	d_i	h		l_e/A_e	l_e	A_e	V_e
	mm			g	mm^{-1}	mm	mm^2	mm^3
R 2.5	2.5±0,12	1.5±0,1	1.0±0,1	0.02	12.2	6.1	0.5	3.0
R 4	4.0±0,15	2.4±0,15	1.6±0,1	0.07	7.65	9.7	1.27	12.3
R 6.3	6.3±0,2	3.8±0,15	2.5±0,12	0.3	4.95	15.3	3.1	47.5
R 10	10 ±0,25	6.0±0,15	4.0±0,15	0.9	3.06	24.5	8.0	196
R 3.9	3.94±0,15	2.24±0,15	1.3 ±0,15	0,045	8.57	9.32	1.07	9.8
R 5.8	5.84±0,20	3.05±0,15	1.52±0,15	0,127	6.37	13.0	2.0	26.5
R 9.5	9.53±0,25	4.75±0,20	3.17±0,20	0,703	2.85	20.69	7.26	150.0
R 12.5	12.5±0,3	7.5±0,2	5 ±0,15	2	2.45	30.4	12.0	380
R 16	16 ±0,4	9.6±0,3	6.3±0,2	3	1.95	38.7	20.0	770
R 25	25 ±0,6	15 ±0,5	10 ±0,3	13	1.23	60.2	49.0	2950
R 34	34 ±0,7	20.5±0,5	12.5±0,3	31	0.99	82.0	83.0	6780
R 42	41.8±1	26.2±0,6	12.5±0,3	45	1.08	102.5	95.0	9750
R 58	58.3±1	40.8±0,8	17.6±0,4	110	1.00	153.0	153.0	23400

Surface protection	Ordering code
without surface protection	B64290–**A******
lacquer protected, thickness of layer < 0.1 mm	B64290–**J******
plastic coated, thickness of coat < 0.2 mm	B64290–**K******

The appropriate surface available is indicated for the individual types.

Measuring flux density < 1 mT

Material	Type	A_L value in nH		Ordering code	
		lower limit	upper limit	unlacquered	lacquered
T 26	μ_i = 2200, A_L tolerance ±25%				
	R 12.5	850 ...	1440	B64290-A0044-X026	B64290-K0044-X026
	R 16	1060 ...	1780	B64290-A0045-X026	B64290-K0045-X026
	R 25	1680 ...	2800	B64290-A0046-X026	B64290-J0046-X026
	R 34	2080 ...	3490	B64290-A0048-X026	B64290-J0048-X026
	R 42	1920 ...	3220	B64290-A0022-X026	B64290-J0022-X026
	R 58	2070 ...	3450	B64290-A0040-X026	B64290-J0040-X026
N 30	μ_i = 4300, A_L tolerance ±25%				
	R 2.5	330 ...	550	B64290-A0035-X830	B64290-J0035-X830
	R 4	535 ...	885	B64290-A0036-X830	B64290-K0036-X830
	R 6.3	815 ...	1365	B64290-A0037-X830	B64290-K0037-X830
	R 10	1320 ...	2200	B64290-A0038-X830	B64290-K0038-X830
	R 3,9	470 ...	785	B64290-A0061-X830	B64290-K0061-X830
	R 5,8	635 ...	1060	B64290-A0056-X830	B64290-K0056-X830
	R 9,5	1420 ...	2370	B64290-A0062-X830	B64290-K0062-X830
	R 12.5	1660 ...	2770	B64290-A0044-X830	B64290-J0044-X830
	R 16	2070 ...	3470	B64290-A0045-X830	B64290-J0045-X830
	R 25	3280 ...	5500	B64290-A0046-X830	B64290-J0046-X830
	R 34	4080 ...	6850	B64290-A0048-X830	B64290-J0048-X830
	R 42	3750 ...	6250	B64290-A0022-X830	B64290-J0022-X830
	R 58	4050 ...	6750	B64290-A0040-X830	B64290-J0040-X830
T 35	μ_i = 6000, A_L tolerance ±25%[1]				
	R 2.5	460 ...	780	B64290-A0035-X035	B64290-J0035-X035
	R 4	740 ...	1230	B64290-A0036-X035	B64290-K0036-X035
	R 6.3	1140 ...	1900	B64290-A0037-X035	B64290-K0037-X035
	R 10	1840 ...	3100	B64290-A0038-X035	B64290-K0038-X035
	R 3.9	660 ...	1100	B64290-A0061-X035	B64290-K0061-X035
	R 5.8	890 ...	1480	B64290-A0056-X035	B64290-K0056-X035
	R 9.5	2000 ...	3300	B64290-A0062-X035	B64290-K0062-X035
T 38	μ_i = 10000, A_L tolerance ±30%[2]				
	R 2.5	720 ...	1340	B64290-A0035-X038	B64290-J0035-X038
	R 4	1150 ...	2135	B64290-A0036-X038	B64290-J0036-X038
	R 6.3	1770 ...	3300	B64290-A0037-X038	B64290-K0037-X038
	R 10	2870 ...	5340	B64290-A0038-X038	B64290-K0038-X038
	R 3.9	1025 ...	1910	B64290-A0061-X038	B64290-J0061-X038
	R 5.8	1385 ...	2565	B64290-A0056-X038	B64290-K0056-X038
	R 9.5	3090 ...	5735	B64290-A0062-X038	B64290-K0062-X038

1) The A_L values of the plastic coated version (B64290-K•••) are by 10% lower.

2) The A_L values of the plastic coated version (B64290-K•••) are by 20% lower.

Measuring flux density < 1 mT

Material	Type	A_L value in nH		Ordering code
		lower limit	upper limit	
U 60[1]	μ_i = 8, A_L tolerance ±25%			
	R 4	0.98 ...	1.6	B64290-A0036-X060
	R 5.8	1.2 ...	1.9	B64290-A0056-X060
	R 10	2.4 ...	4.1	B64290-A0038-X060
K 1[1]	μ_i = 80, A_L tolerance ±25%			
	R 4	9.8 ...	16	B64290-A0036-X001
	R 5.8	12 ...	20	B64290-A0056-X001
	R 10	24 ...	41	B64290-A0038-X001
M 33	μ_i = 600, A_L tolerance ±25%			
	R 4	75 ...	125	B64290-A0036-X033
	R 5.8	89 ...	150	B64290-A0056-X033
	R 10	184 ...	306	B64290-A0038-X033

[1] For toroidal cores in U 60 and K 1 materials all geometric dimensions stated on page 398 are approx. 10% larger.

Aerial Rods
Cylindrical, Tube, Screw, Multi-Aperture Cores

round, slotted

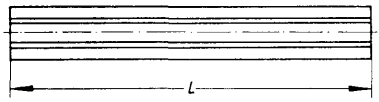
Round slotted aerial rods complying with IEC publication 223 are only available in the SIFERRIT material M 25.

As well as the advantages of a high Q factor and high permeability, this material has a low temperature coefficient. For instance, for a rod 10 dia x 152 with a centrally placed coil of 40 turns, it is approx. $+230 \times 10^{-6}/°C$.

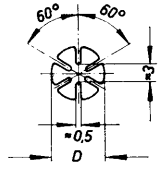
The deviation of the rods can be up to 1% of the length. This can be checked with tubular gauges of the following dimensions:

For rods with D = 8 dia tubular gauge = 8.64 dia + 0.02 x 80 + 0.1
for rods with D = 10 dia tubular gauge = 10.64 dia + 0.02 x 80 + 0.1

Permissible μ_{app} tolerance, measured with standard coil Sp 97 in accordance with DIN 41291, sheet 3.



Dimensions in mm



Rod length mm	Permissible μ_{app} tolerance %
90 to 140	±6
> 140 to 170	±7
> 170 to 200	±8

Permissible Q factor tolerance: ±20% at 1.5 MHz, measured with standard coil Sp 25 in accordance with DIN 41291, sheet 3. It is recommended to use reference cores, supplied by the plant.

Diameter D mm	Length L mm	Approx. weight g/mm	**Ordering code**
8–0.4	112 ± 2,2	0.2	B61610–A8015–X025
	125 ± 2,5		B61610–A8006–X025
	140 ± 2,8		B61610–A8001–X025
	160 ± 3,2		B61610–A8002–X025
10–0.5	140 ± 2,8	0.3	B61610–J1017–X025
	160 ± 3,2		B61610–J1022–X025
	180 ± 3,6		B61610–J1008–X025
	200 ± 4		B61610–J1004–X025

SIFERRIT cylindrical cores complying with IEC publication 220 are available in the following preferred materials[1]: U 17, K 1, M 25.
For core diameters and core lengths to be preferred see page 405.

Tolerance of the apparent permeability μ_{app}: ±5% (typical value);
closer μ_{app}-tolerance on request.

The μ_{app} tolerance can be up to ±10% for ferrites of lower permeability ($\mu_i < 40$) and a high size ratio ($l:d > 5$).

The deviation of longer unground cores can be up to 1% of the core length.

These cores can be checked with tubular gauges of the following dimensions:

Gauge diameter = D_{max} + 1% of core length

Gauge length ≧ core length

Core length *l* mm	Tolerance mm
5 to 6.3	−0.4
> 6.3 to 8	−0.5
> 8 to 10	−0.6
> 10 to 12.5	−0.7
> 12,5 to 16	−0.8
> 16 to 20	−0.9
> 20	−4%

d[1]	Coarse (unground)		Medium (ground)		Fine (ground)	
	Tolerance for *d*	Core lengths *l*	Tolerance for *d*	Core lengths *l*	Tolerance for *d*	Core lengths *l*
mm	mm		mm		mm	
1.6	−0.2	5 to 25	−0.05	5 to 8	−0.03	5 to 8
2	−0.2	5 to 30	−0.05	5 to 10	−0.03	5 to 10
2.5	−0.25	5 to 40	−0.05	5 to 12.5	−0.03	5 to 12.5
3	−0.25	5 to 40	−0.1	5 to 25	−0.05	5 to 16
4	−0.3	6 to 50	−0.1	6 to 30	−0.05	6 to 20
5	−0.3	8 to 60	−0.1	8 to 40	–	–
6	−0.3	10 to 80	−0.1	10 to 50	–	–
8	−0.4	10 to 80	−0.1	10 to 50	–	–
10	−0.5	10 to 80	−0.1	10 to 50	–	–

Ordering number example

B61110 K1 2.5 x 18 coarse
(61110 △ type; K 1 △ material; 2.5 x 18 △*d x l* in mm;
coarse, medium or fine △ diameter tolerance).

[1] At minimum acceptance of 10000 items also the materials U 60, K 12, N 22, as well as other core diameters (up to 15 mm) and core lengths are available.

Preferred types

Preferred core types are available in the following sizes and in the materials U 17, K 1, M 25 (small quantities in stock)

d x l mm	Ordering code	*d x l* mm	Ordering code
$1{,}6_{-0{,}05}$ x $7{,}5_{-0{,}5}$	B61110-A1023-X0**	$5_{-0{,}3}$ x $15_{-0{,}8}$	B61110-A5002-X0**
$1{,}6_{-0{,}2}$ x $12{,}5_{-0{,}7}$	B61110-A1031-X0**	$5_{-0{,}3}$ x $20_{-0{,}9}$	B61110-A5005-X0**
$1{,}6_{-0{,}2}$ x $15_{-0{,}8}$	B61110-A1035-X0**	$5_{-0{,}3}$ x 25_{-1}	B61110-A5013-X0**
		$5_{-0{,}3}$ x $30_{-1{,}2}$	B61110-A5012-X0**
$2_{-0{,}2}$ x $10_{-0{,}6}$	B61110-A2045-X0**	$5_{-0{,}3}$ x $45_{-1{,}8}$	B61110-A5011-X0**
$2_{-0{,}2}$ x $15_{-0{,}8}$	B61110-A2050-X0**		
$2_{-0{,}2}$ x $20_{-0{,}9}$	B61110-A2009-X0**	$6_{-0{,}3}$ x $15_{-0{,}8}$	B61110-A6007-X0**
		$6_{-0{,}3}$ x $30_{-1{,}2}$	B61110-A6003-X0**
$2{,}5_{-0{,}25}$ x $10_{-0{,}6}$	B61110-A2051-X0**	$6_{-0{,}3}$ x $45_{-1{,}8}$	B61110-A6010-X0**
$2{,}5_{-0{,}25}$ x $15_{-0{,}8}$	B61110-A2006-X0**		
$2{,}5_{-0{,}25}$ x $20_{-0{,}9}$	B61110-A2005-X0**	$8_{-0{,}4}$ x $20_{-0{,}9}$	B61110-A8007-X0**
		$8_{-0{,}4}$ x $30_{-1{,}2}$	B61110-A8008-X0**
$3_{-0{,}25}$ x $10_{-0{,}6}$	B61110-A3008-X0**	$8_{-0{,}4}$ x $40_{-1{,}6}$	B61110-A8009-X0**
$3_{-0{,}25}$ x $15_{-0{,}8}$	B61110-A3021-X0**	$8_{-0{,}4}$ x $60_{-2{,}4}$	B61110-A8010-X0**
$3_{-0{,}25}$ x $20_{-0{,}9}$	B61110-A3022-X0**		
		$10_{-0{,}5}$ x $20_{-0{,}9}$	B61110-J1001-X0**
$4_{-0{,}3}$ x $10_{-0{,}6}$	B61110-A4005-X0**	$10_{-0{,}5}$ x 25_{-1}	B61110-J1008-X0**
$4_{-0{,}3}$ x $15_{-0{,}8}$	B61110-A4007-X0**	$10_{-0{,}5}$ x $30_{-1{,}2}$	B61110-J1004-X0**
$4_{-0{,}3}$ x $20_{-0{,}9}$	B61110-A4030-X0**	$10_{-0{,}5}$ x $40_{-1{,}6}$	B61110-J1002-X0**
$4_{-0{,}3}$ x $30_{-1{,}2}$	B61110-A4016-X0**	$10_{-0{,}5}$ x $60_{-2{,}4}$	B61110-J1005-X0**
$4_{-0{,}3}$ x $45_{-1{,}8}$	B61110-A4033-X0**		

** Here the symbol for the desired SIFERRIT material must be inserted.
U 17 ≙ 17; K 1 ≙ 01; M 25 ≙ 25.

SIFERRIT tube cores complying with IEC publication 220 are available in the following preferred materials[1]: **U 17, K 1, M 25.**

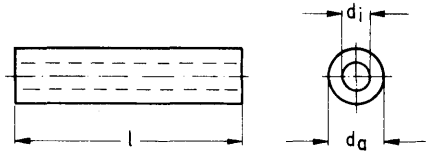
Tolerance of the apparent permeability μ_{app}: ± 5% (typical value);
closer μ_{app} tolerance on request.

The μ_{app} tolerance can be up to ±10% with ferrites of lower permeability ($\mu_i < 40$) and cores with a high size ratio ($l:d > 5$).

The deviation of unground cores can be up to 1% of the core length.

These cores can be checked with tubular gauges of the following dimensions:

Gauge diameter = $d_{a\,max}$ + 1% of core length
Gauge length ≧ core length



Core length *l* mm	Tolerance mm
6 to 8	−0,5
> 8 to 10	−0,6
> 10 to 12,5	−0,7
> 12,5 to 16	−0,8
> 16 to 20	−0,9
> 20	−4%

d_a	d_i		Coarse (unground)		Medium (ground)		Fine (ground)	
	Rated dimension	Tolerance	Tolerance for d_a	Core lengths *l*	Tolerance for d_a	Core lengths *l*	Tolerance for d_a	Core lengths *l*
mm	mm		mm		mm		mm	
3,5	1.6	+0.15	−0.3	6 to 30	−0.1	6 to 25		6 to 25
4	1.6	+0.15	−0.3	6 to 50	−0.1	6 to 30	−0.05	6 to 30
5	2	+0.2	−0.3	6 to 50	−0.1	6 to 40		6 to 30
6	3	+0.2	−0.3	10 to 60	−0.1	10 to 50		–
8	4	+0.3	−0.4	10 to 80	−0.1	10 to 50		–
10	6	+0.3	−0.5	10 to 80	−0.1	10 to 50		–

Ordering number example

B62110 K 1 5 x 2 x 30 coarse
(B62110 ≙ type; K 1 ≙ material; 5 x 2 x 30 ≙ core dimensions: d_a x d_i x *l* in mm; coarse, medium or fine ≙ diameter tolerance)

[1] At minimum acceptance of 10000 items also the materials U 60, K 12, N 22, as well as other core diameters (up to 15 mm) and core lengths are available.

Preferred types

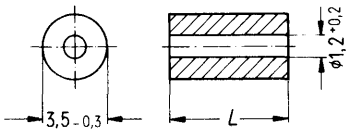
Cores of the following sizes in the materials U 17, K 1, M 25 are preferably available (small quantities in stock):

d_a	d_i	l	Ordering code
	mm		
$3{,}5_{-0,3}$	$1{,}6^{+0,15}$	$5_{-0,4}$ $10_{-0,6}$ $18_{-0,9}$ 25_{-1}	B62110-A3048-X0** B62110-A3049-X0** B62110-A3050-X0** B62110-A3051-X0**
$4_{-0,3}$	$1{,}6^{+0,15}$	$6_{-0,4}$ $10_{-0,6}$ $18_{-0,9}$ 25_{-1} $40_{-1,6}$	B62110-A4045-X0** B62110-A4046-X0** B62110-A4047-X0** B62110-A4048-X0** B62110-A4049-X0**
$5_{-0,3}$	$2^{+0,2}$	$6_{-0,4}$ $10_{-0,6}$ $18_{-0,9}$ $30_{-1,2}$ 50_{-2}	B62110-A5028-X0** B62110-A5024-X0** B62110-A5025-X0** B62110-A5026-X0** B62110-A5027-X0**
$6_{-0,3}$	$3^{+0,2}$	$10_{-0,6}$ $18_{-0,9}$ $30_{-1,2}$ 50_{-2}	B62110-A6020-X0** B62110-A6021-X0** B62110-A6022-X0** B62110-A6023-X0**
$8_{-0,4}$	$4^{+0,3}$	$10_{-0,6}$ $18_{-0,9}$ $30_{-1,2}$ 50_{-2}	B62110-A8015-X0** B62110-A8017-X0** B62110-A8018-X0** B62110-A8006-X0**
$10_{-0,5}$	$6^{+0,3}$	$10_{-0,6}$ $18_{-0,9}$ $30_{-1,2}$ 50_{-2}	B62110-J1019-X0** B62110-J1020-X0** B62110-J1021-X0** B62110-J1022-X0**

** Here the symbol for the desired SIFERRIT material must be inserted.
U 17 ≙ 17; K 1 ≙ 01; M 25 ≙ 25.

Damping pearls are made of SIFERRIT N 22 and are suitable for use in the short-wave range as well as up to the ultrashort-wave range.

Slipped over a conductor, the pearls generate a damping effect, which increases with the number of pearls. Premagnetization of the pearls reduces the damping effect.



Dimensions in mm

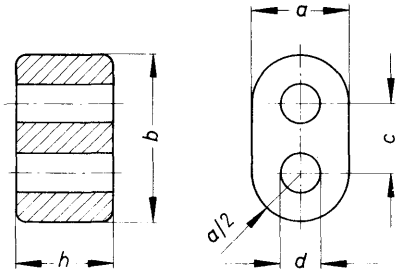
L mm	**Ordering code**
3.3–0.5	B62110-A3011-X022
5.2–0.5	B62110-A3007-X022
8–0.6	B62110-A3063-X022
16–0.8	B62110-A3064-X022

Double aperture cores are used for wideband transformers up to high frequencies, e.g. in the materials

SIFERRIT K 1 for matching and balance-to-unbalance transformers up to 250 MHz in antenna feeders or in input circuits of VHF and TV receivers

SIFERRIT U 60 for the same applications up to 800 MHz

SIFERRIT N 30 for lower frequencies and pulse applications



Dimensions					Approx. weight	Material	**Ordering code**
h	*b*	*a*	*c*	*d*			
mm					g		
14.5_{-1}[1]	14.5_{-1}	8.5_{-05}	5.85 ± 0.25	$3.4^{+0.8}$	4.0	U 60 K 1	B62152-A0001-X060 B62152-A0001-X001
$8.3_{-0.6}$[1]	14.5_{-1}	$8.5_{-0.5}$	5.85 ± 0.25	$3.4^{+0.6}$	2.5	U 60 K 1 N 30	B62152-A0004-X060 B62152-A0004-X001 B62152-A0004-X030
$6.2_{-0.5}$[1]	$7.25_{-0.5}$	$4.2_{-0.4}$	2.9 ± 0.15	$1.7^{+0.3}$	0.4	U 60 K 1 N 30	B62152-A0007-X060 B62152-A0007-X001 B62152-A0007-X030
2.5_{-03}	$3.6_{-0.3}$	$2.1_{-0.2}$	1.45 ± 0.1	$0.8^{+0.15}$	0.1	U 60 N 30 U 17	B62152-A0008-X060 B62152-A0008-X030 B62152-A0008-X017

[1]) in accordance with DIN 41279, shape G

Six aperture cores in the material SIFERRIT N 22 are preferably used for choke coils to reduce radio interference, e.g. in small motors and switches as well as in high frequency appliances.

Six aperture cores are also available on request with winding as complete chokes (see data book 1974/75, "RFI Suppression Components", page 192 to 194).

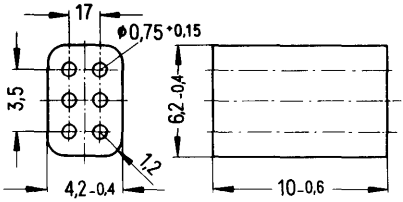


Figure 1

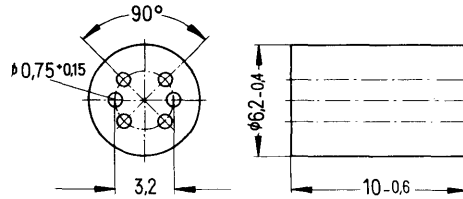


Figure 2

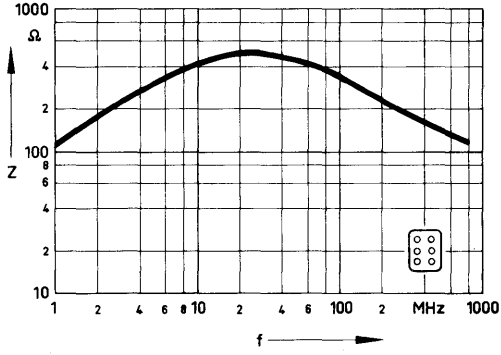
Dimensions in mm

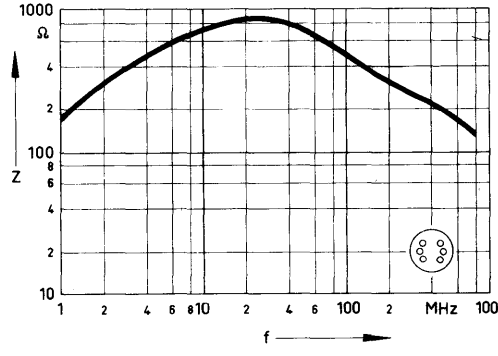
Figure	SIFERRIT material	Approx. weight g	**Ordering code**
1	N 22	0.9	B62152-A0005-X022
2	N 22	1.1	B62152-A0006-X022

Impedance characteristics of choke coils

with 2.5 turns at low field strength (< 10 mA/cm)
(typical values)

SIFERRIT material N 22

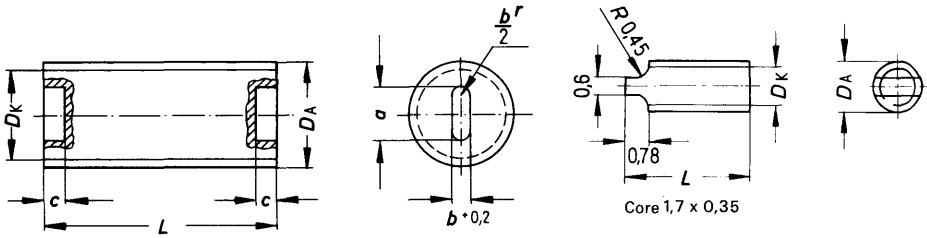




Ground thread

SIFERRIT screw cores are available in the following preferred materials[1]: **U 17, K 1, M 25.** For preferred core lengths see table.

Tolerance of the apparent permeability μ_{app}: ±5% (typical value); lower μ_{app} tolerance upon request.



Core 1,7 x 0,35

Dimensions in mm

Screw core suitable for nut-thread DIN 13, 518; 519	Core length[1] L	Thread limit dimensions			Slot dimensions		
		D_A max.	D_A min.	D_K max.	a	b	c min. dimension
	mm	mm			mm		
1.7 x 0.35	$4.2_{-0.3}$	1.73	1.70	1.37	–	–	–
3 x 0.5	$6.3_{-0.6}$	2.7	2.65	2.25	$1.3^{+0.2}$	0.5	1
	$8.3_{-0.6}$						
3.5 x 0.5	$6.3_{-0.6}$	3.20	3.15	2.75	$1.7^{+0.2}$	0.6	1,2
	$8.3_{-0.6}$						
	$10.3_{-0.6}$						
4 x 0.5	$6.3_{-0.6}$	3.7	3.65	3.20	$2^{+0.2}$	0.7	1.2
	$8.3_{-0.6}$						
	$10.3_{-0.6}$						
	$12.3_{-0.6}$						
5 x 0.75	$8.3_{-0.6}$	4.6	4.55	3.9	$2.5^{+0.3}$	1	1.2
	$13.3_{-0.6}$						
6 x 0.75	$13.3_{-0.6}$	5.6	5.55	4.9	$3^{+0.3}$	1	1.2
7 x 0.75	22.5_{-1}	6.6	6.55	5.9	$3.5^{+0.3}$	1	2)
7 x 1	$12.3_{-0.6}$	6.6	6.5	5.55	$3.5^{+0.3}$	1	2)
	$17.4_{-0.8}$						
8 x 0.75	$17.4_{-0.8}$	7.6	7.55	6.9	$4^{+0.4}$	1	2)
	28.5_{-1}						
9 x 1	$33.6_{-1.2}$	8.6	8.5	7.55	$4.5^{+0.5}$	1.3	2)

1) At minimum acceptance of 10000 items also the materials U 60, K 12, N 22, as well as other core lengths are available.
2) Through slots.

Ground thread

The screw cores comply with DIN 41286.

The thread dimensions include the usual elastic inserts (core brake) between nut thread and screw core.

The screw cores are also available on request with core brake (elastic material which clings to the core). **Ordering code:** (code letter 9 in the 9th position of the ordering code) e.g. B63310–B2908–X0**.

To avoid damaging the slot, the insulating screw driver B63399–A0001–X000 (with flat blade, see page 274) must be used.

Screw core ordering codes and weights

Screw core suitable for nut thread DIN 13, 518, 519	Core length *L* mm	Approx. weight g	**Ordering code**
1.7 x 0.35	$4.2_{-0.3}$	0.2	B63310–A1001–X0**
3 x 0.5	$6.3_{-0.6}$	0.25	B63310–B2009–X0**
	$8.3_{-0.6}$	0.3	B63310–B2008–X0**
3.5 x 0.5	$6.3_{-0.6}$	0.3	B63310–B3028–X0**
	$8.3_{-0.6}$	0.33	B63310–B3029–X0**
	$10.3_{-0.6}$	0.35	B63310–B3021–X0**
4 x 0.5	$6.3_{-0.6}$	0.35	B63310–B3030–X0**
	$8.3_{-0.6}$	0.4	B63310–B3020–X0**
	$10.3_{-0.6}$	0.45	B63310–B3019–X0**
	$12.3_{-0.6}$	0.6	B63310–B3018–X0**
5 x 0.75	$8.3_{-0.6}$	0.75	B63310–B4017–X0**
	$13.3_{-0.6}$	1.1	B63310–B4018–X0**
6 x 0.75	$13.3_{-0.6}$	2.4	B63310–B5019–X0**
7 x 0.75	22.5_{-1}	1.3	B63310–A6008–X0**
7 x 1	$12.3_{-0.6}$	1.9	B63310–A6009–X0**
	$17.4_{-0.8}$	2.6	B63310–A6007–X0**
8 x 0.75	$17.4_{-0.8}$	3.4	B63310–A7002–X0**
	28.5_{-1}	5.6	B63310–A7008–X0**
9 x 1	$33.6_{-1.2}$	8	B63310–A8001–X0**

** Here the symbol for the desired SIFERRIT material must be inserted:
U 60 ≙ 60; U 17 ≙ 17; K 12 ≙ 12; K 1 ≙ 01; M 25 ≙ 25 ; N 22 ≙ 22.

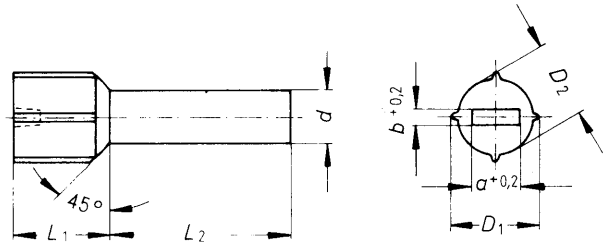
with threaded nipple

SIFERRIT adjusting cores with threaded nipple are available in the following materials: **K 1** (colour code blue) and **M 25** (colour code red).

The tolerance of the apparent permeability μ_{app}: ±5% (typical value), closer μ_{app} tolerance on request.

The thermosetting plastic nipple is provided with four elastic straps, into which the threaded profile presses itself when screwing the core into the nut thread.

For SIRUFER adjusting cores with threaded nipple see page 438 (B69040).

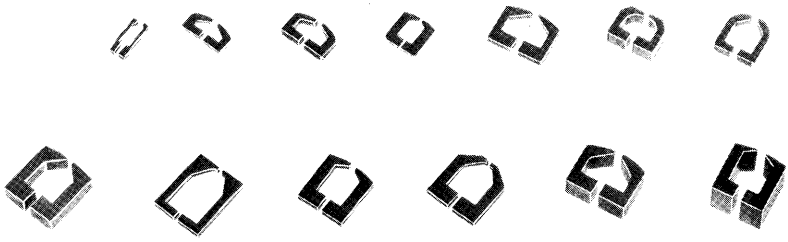


Dimensions in mm

Suitable for nut thread	SIFERRIT material	D_1	D_2	d	L_1	L_2	a	b	**Ordering code**
		mm							
M 3	K 1 M 25	2.8	2.3	1.8	3.5	5	1.8	0.5	B63320-A3005-X0••
M 4		3.9	3.05	2.3	4	6.8	2.1	0.7	B63320-A3001-X0••

•• Here the symbol for the desired SIFERRIT material must be inserted:
K 1 ≙ 01; M 25 ≙ 25.

Magnetic Head Cores, Microwave SIFERRIT



Materials

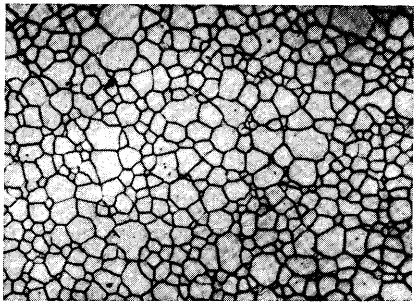
Some special materials are available to meet the varoius requirements of audio, video and computer applications. The material data can be obtained from the following tables and curves. Data on the material N 22 is contained in the material table on pages 34/35. This material has a wide range of applications, e.g. for erasing heads in tape recorders. The materials T 9 (NiZn ferrite) and T 51 (MnZn ferrite) show a low degree of porosity (referred to the ideal density) required for narrow-spaced air gaps in recording and play-back heads (1 to 2 μ m). The corresponding materials T 8 and T 10 the porosity of which being higher in some degree also have a versatile field of successful applications.

Core shapes

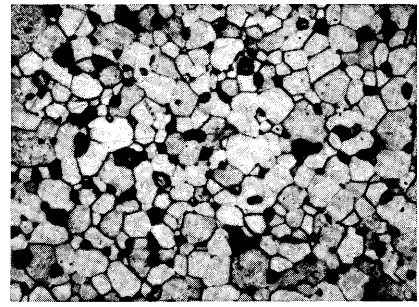
Apart from the core shapes listed on page 420 (cores according to fig. 1 and fig. 2 preferably in the material N 22) other core shapes can be supplied to special order. Special machines for precision grinding processes are provided for cores the dimensions of which are required to be very closely tolerated.

Comparison in structure of ferrite materials for magnetic heads

High density SIFERRIT material
1 cm ≙ 30 μ m



Standard SIFERRIT material
1 cm ≙ 30 μ m

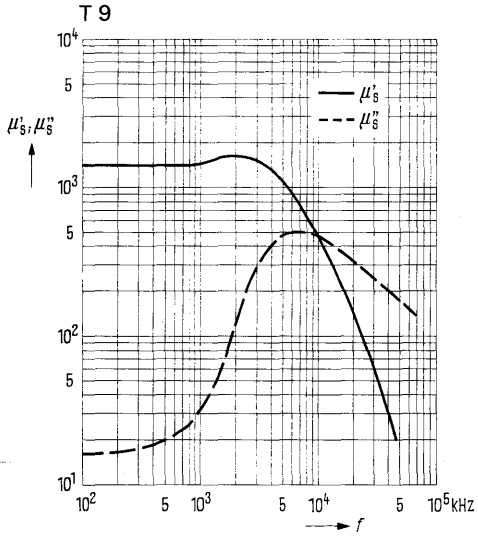


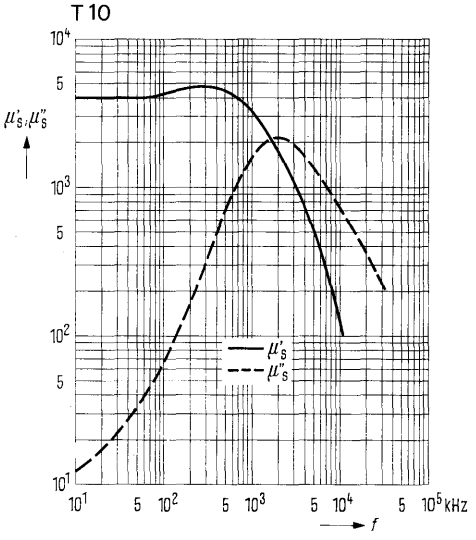
Material table

SIFERRIT material		N 22	T 8	T 9	T 10	T 51	T 52	T 53
Ferrite material		MnZn	NiZn	NiZn	MnZn	MnZn	NiZn	MnZn
Initial permeability μ_i		1800 ± 30%	1000 ± 20%	1400 ± 20%	4400 ± 20%	5000 ± 20%	1	1
Curie temperature	°C	> 145	> 140	> 140	> 150	> 150	−70	−50
Coercivity H_C	A/m	30	30	18	10	8	–	–
Flux density $\hat{B}$ at H = 1000 A/m, 23 °C (73.4 °F)	mT	370	350	350	400	410	–	–
Dc resistivity ϱ	Ωm	1	10^4	10^6	2	2	–	–
Hysteresis coefficient η_B (IEC) at f = 10 kHz at $\hat{B}$ = 1.5 and 3 mT	$\frac{10^{-6}}{mT}$	1	15	15	0,5	0,5	–	–
Relative temperature coefficient α/μ_i for +20 to +70 °C (+68 to +158 °F)	10^{-6}/K	1,1	10	6	1	1	–	–
Density	kg/m^3	4800	5100	5300	4900	5000	5200	>5000
Vickers hardness (HV_{15})	N/mm^2	7500	9500	9500	8000	8000	9000	8000
Porosity	%	< 6	< 4	< 0,4	< 1,5	< 0,6	< 0,5	< 0,5
Linear coefficient of expansion for +20 to +70 °C	10^{-6}/K	10	9,4	9,4	≈ 10	≈ 10	8	7,8
Application		preferably erase heads for tape recorders	computer, erase heads, audio	recording and play-back, audio, video, computer	computer	recording and play-back, audio, video, computer	non-magnetic ferrites	

Materials T 9 and T 10

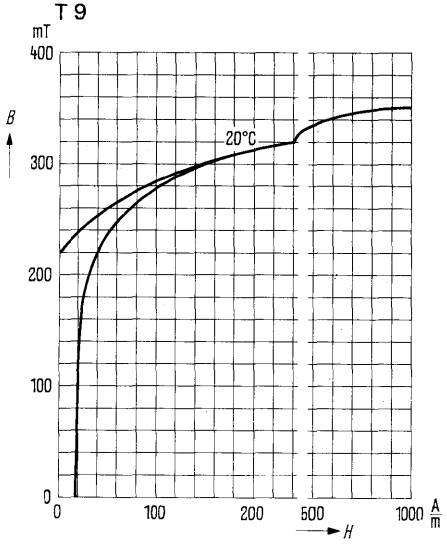
Complex permeability as a function of frequency

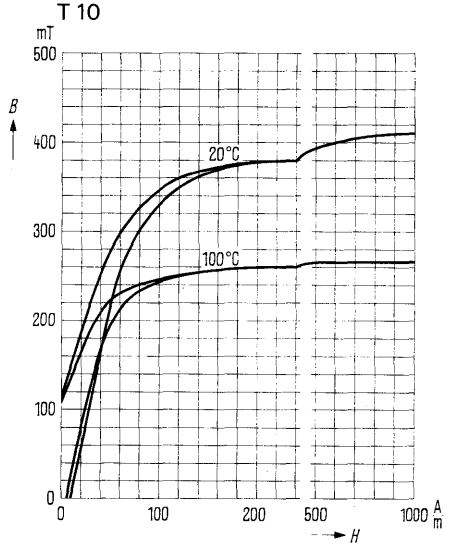




Sample core dimensions: D_A = 10 mm, d_i = 6 mm, h = 4 mm

Static magnetization curves





Preferred types

The following graphs show preferred core shapes; other core shapes on request.

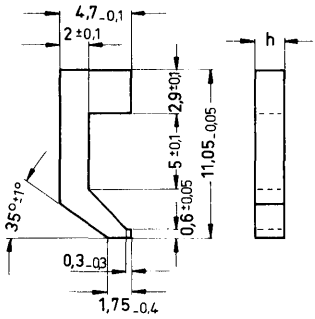


Fig. 1
(DIN 41298, Form A2)

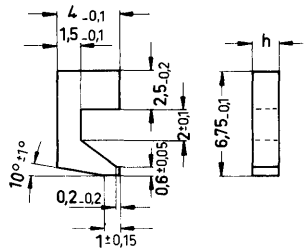


Fig. 2
(DIN 41298, Form C)

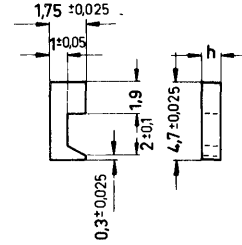


Fig. 3

Dimensions in mm

Outline drawing	Height *h* mm	**Ordering code**
Fig. 1	1.4 ±0.05	B63406–B0013–X0••
	3.45 ±0.05	B63406–B0016–X0••
	6.5 ±0.05	B63406–B0017–X0••
Fig. 2	2.15 ±0.05	B63425–B0009–X0••
Fig. 3	0.55 ±0.05	B63426–B0003–X0••

•• Here the symbol for the desired SIFERRIT material must be inserted.
N 22 ≙ 22; T 8 ≙ 08

Application and material data

Microwave ferrites are suitable for use in radar and radio link systems. They act as circulators, phase shifters and isolators in the dm and cm frequency band. The materials X 252 to X 254 are especially suitable for isolators with a large forward to reverse ratio. Because of the low loss of materials X 257 and X 258 at low temperatures (4.2 °K) they can be used as isolators in helium cooled amplifiers such as are used in satellite ground stations.

Spinel ferrites B 67510 . . .

Material	Ferrite	Saturation polarization[1] I_s (20° C) mT	Coercive force H_c A/m	Half width 2 ΔH A/m	Curie temperature ϑ_c °C	Resistivity p Ω m	Density kg/m³
X 252	FeMgMn	240	190	21500	310	$\geqq 10^6$	4200
X 253	FeMgMnAl	170	140	12000	220	$\geqq 10^6$	4200
X 254	FeMgMnAl	195	170	14500	250	$\geqq 10^6$	4200
X 255	FeNiMgMnCu	230	800	40000	420	$\geqq 10^3$	4700
X 256	FeNiMgMnCu	280	480	32000	500	$\geqq 10^4$	5000

Garnet ferrites B 67521 . . .

X 257	FeCaVBi	53[2]	70	7000	230	$\geqq 10^6$	4100
X 258	FeCaVBi	40	360	10500	240	$\geqq 10^6$	4200
X 261	FeY	180	80	5000	280	$\geqq 10^8$	5100
X 262	FeYGdAl	55	230	6700	220	$\geqq 10^8$	5500
X 263	FeYAl	100	125	3500	215	$\geqq 10^8$	4700
X 264	FeYGd	100	250	8000	290	$\geqq 10^8$	5700

The dielectric losses of the microwave ferrites listed above are sufficiently low for use where extremely low transmission losses are important ($\tan\delta\varepsilon < 10^{-3}$), as long as the resistivity is $>10^4$ Ωm.

Damping parts (Internal resistors)

For nearly reflection-free terminations of waveguides and coaxial systems, different shapes of internal resistors are available. The material consists of carbonyl iron mixed with a special resin (material code X 199). The ferrite material K 1 is also suitable for this application.

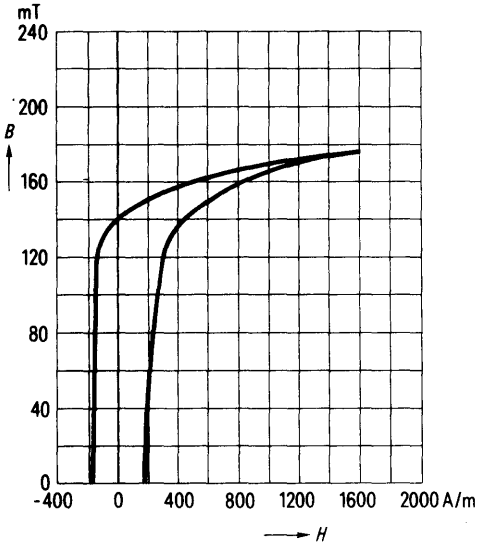
Designs and data on damping characteristics are available on request.

1) $I_S = 4\pi Ms$
2) At 4° K, I_S = 56 mT

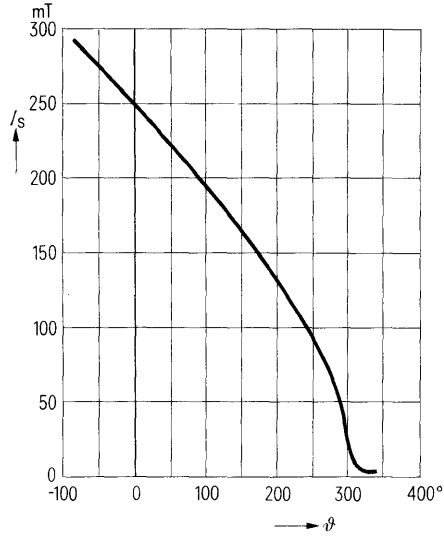
Material data for SIFERRIT material X 252

Ferrite	Spinel ferrite		FeMgMn
Saturation polarization	I_s at 20 °C/68 °F	=	240 mT
Coercive force	H_c	=	190 A/m
Half width	$2\ \Delta H$	=	21500 A/m
Curie temperature	ϑ_c	=	310 °C/590 °F
Resistivity	ϱ	=	$\geqq 10^6\ \Omega$m
Density		=	4200 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



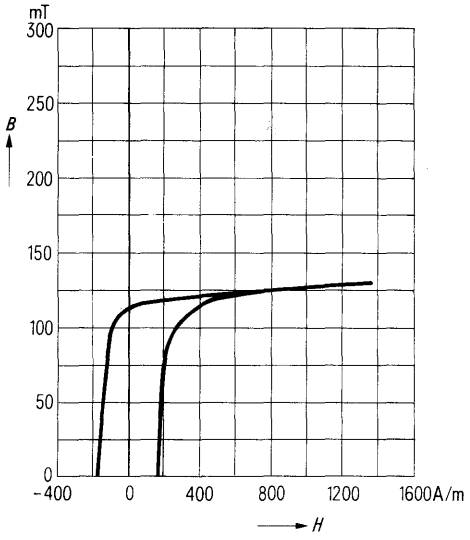
Saturation polarization
as a function of temperature



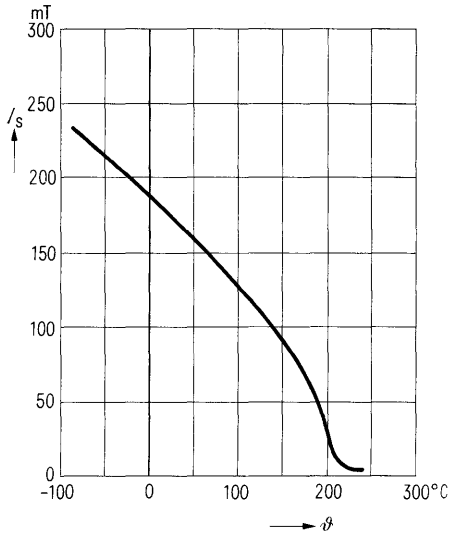
Material data for SIFERRIT material X 253

Ferrite	Spinel ferrite		FeMgMnAl
Saturation polarization	I_s at 20 °C/68 °F	=	170 mT
Coercive force	H_c	=	140 A/m
Half width	$2\ \Delta H$	=	12000 A/m
Curie temperature	ϑ_c	=	220 °C/428 °F
Resistivity	ϱ	=	$>10^6\ \Omega$m
Density		=	4200 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



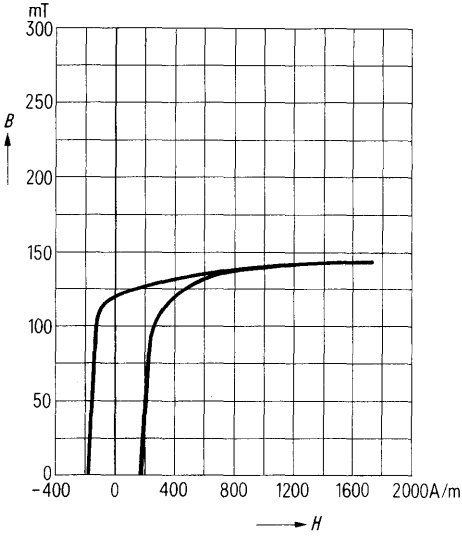
Saturation polarization
as a function of temperature



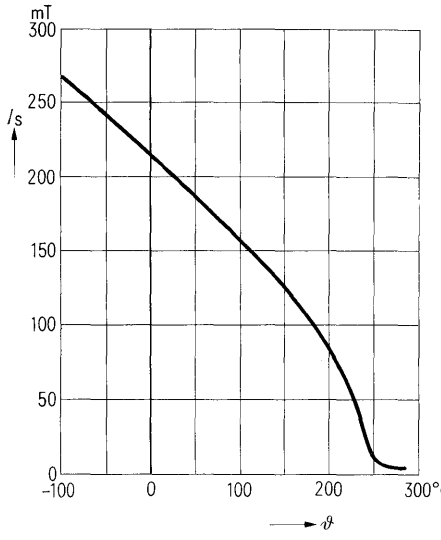
Material data for SIFERRIT material X 254

Ferrite	Spinel ferrite		FeMgMnAl
Saturation polarization	I_s at 20 °C/68 °F	=	195 mT
Coercive force	H_c	=	170 A/m
Half width	$2\ \Delta H$	=	14500 A/m
Curie temperature	ϑ_c	=	250 °C/482 °F
Resistivity	ϱ	=	$\geqq 10^6\ \Omega$m
Density		=	4200 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



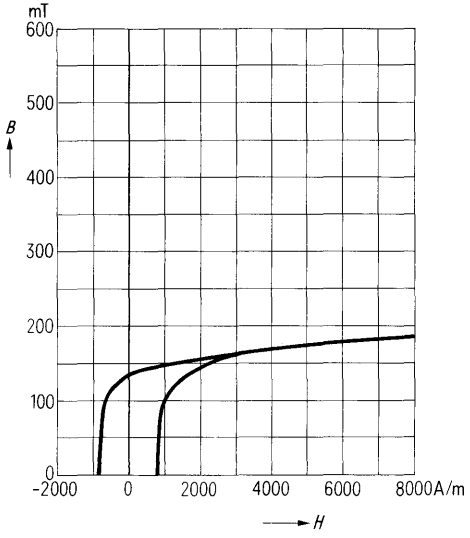
Saturation polarization
as a function of temperature



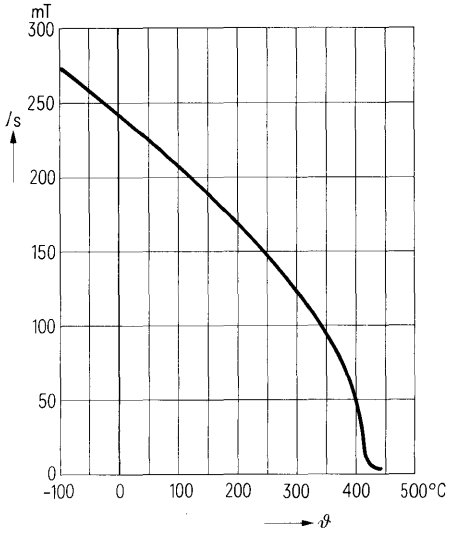
Material data for SIFERRIT material X 255

Ferrite	Spinel ferrite		FeNiMgMnCu
Saturation polarization	I_s at 20 °C/68 °F	=	230 mT
Coercive force	H_c	=	800 A/m
Half width	$2\ \Delta H$	=	40000 A/m
Curie temperature	ϑ_c	=	420 °C/788 °F
Resistivity	ϱ	=	$>10^3$ Ωm
Density		=	4700 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



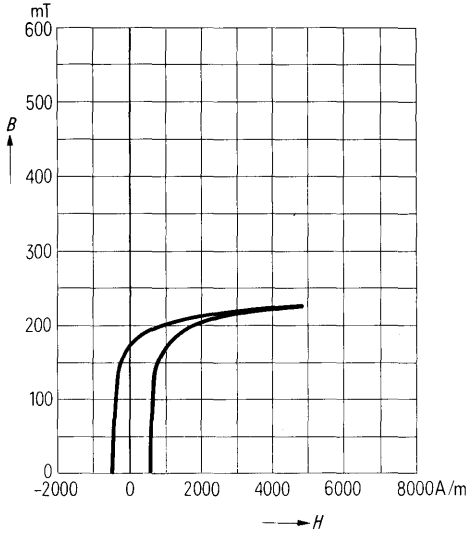
Saturation polarization
as a function of temperature



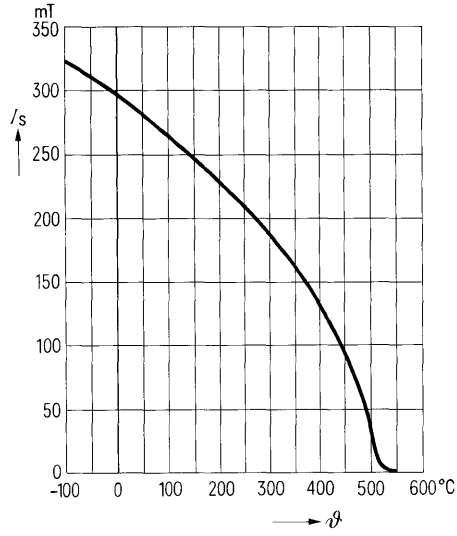
Material data for SIFERRIT material X 256

Ferrite	Spinel ferrite		FeNiMgMnCu
Saturation polarization	I_s at 20 °C/68 °F	=	280 mT
Coercive force	H_c	=	480 A/m
Half width	2 ΔH	=	32000 A/m
Curie temperature	ϑ_c	=	500 °C/932 °F
Resistivity	ϱ	=	$>10^4$ Ωm
Density		=	5000 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



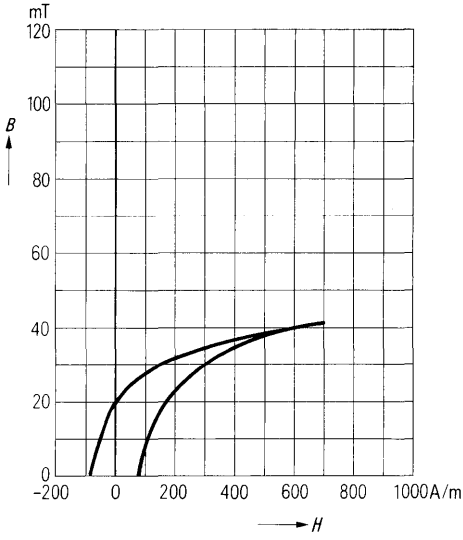
Saturation polarization
as a function of temperature



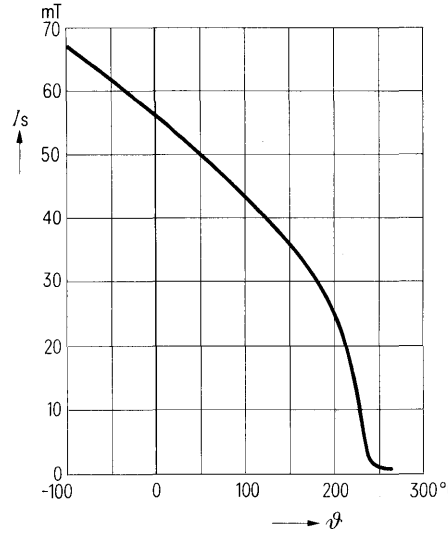
Material data for SIFERRIT material X 257

Ferrite	Garnet ferrite		FeCaVBi
Saturation polarization	I_s at 20 °C/68 °F	=	53[1]) mT
Coercive force	H_c	=	70 A/m
Half width	2 ΔH	=	7000 A/m
Curie temperature	ϑ_c	=	230 °C/446 °F
Resistivity	ϱ	=	$\geqq 10^6$ Ωm
Density		=	4100 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



Saturation polarization
as a function of temperature

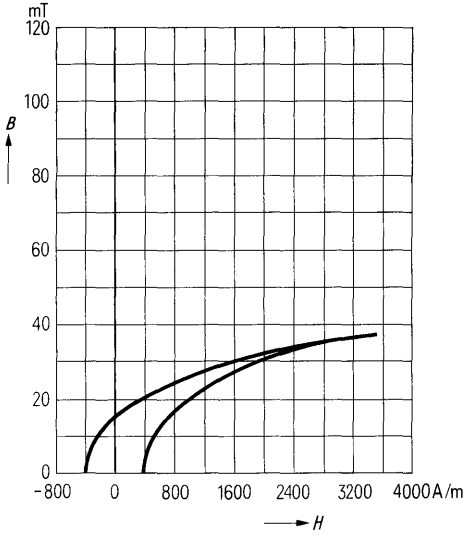


1) At 4 °K: I_S = 56 mT

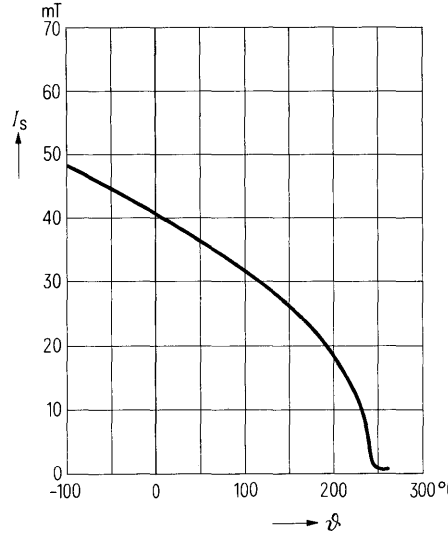
Material data for SIFERRIT material X 258

Ferrite	Garnet ferrite		FeCaVBi
Saturation polarization	I_s at 20 °C/68 °F	=	40 mT
Coercive force	H_c	=	360 A/m
Half width	$2\ \Delta H$	=	10500 A/m
Curie temperature	ϑ_c	=	240 °C /464 °F
Resistivity	ϱ	=	$\geqq 10^6\ \Omega$m
Density		=	4200 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



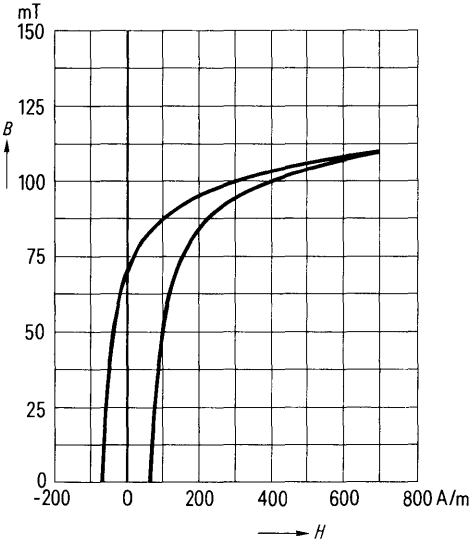
Saturation polarization
as a function of temperature



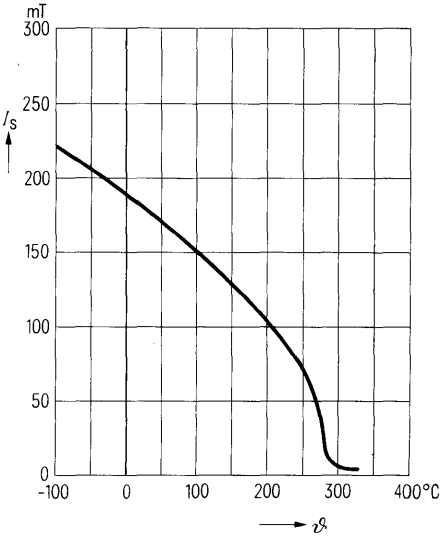
Material data for SIFERRIT material X 261

Ferrite	Garnet ferrite		FeY
Saturation polarization	I_s at 20 °C/68 °F	=	180 mT
Coercive force	H_c	=	80 A/m
Half width	2 ΔH	=	5000 A/m
Curie temperature	ϑ_c	=	280 °C/536 °F
Resistivity	ϱ	=	$\geqq 10^8$ Ωm
Density		=	5100 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



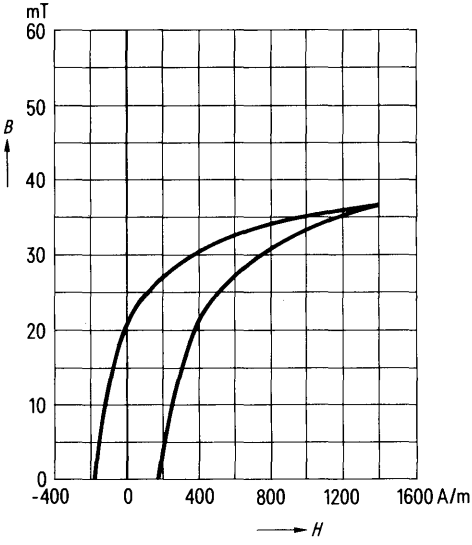
Saturation polarization
as a function of temperature



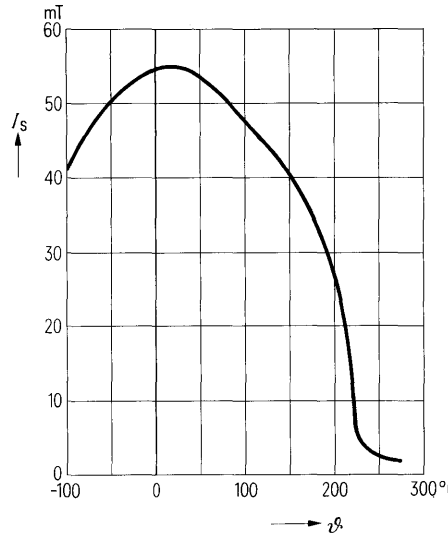
Material data for SIFERRIT material X 262

Ferrite	Garnet ferrite		FeYGdAl
Saturation polarization	I_s at 20 °C/68 °F	=	55 mT
Coercive force	H_c	=	230 A/m
Half width	$2\ \Delta H$	=	6700 A/m
Curie temperature	ϑ_c	=	220 °C/428 °F
Resistivity	ϱ	=	$\geqq 10^8\ \Omega$m
Density		=	5500 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



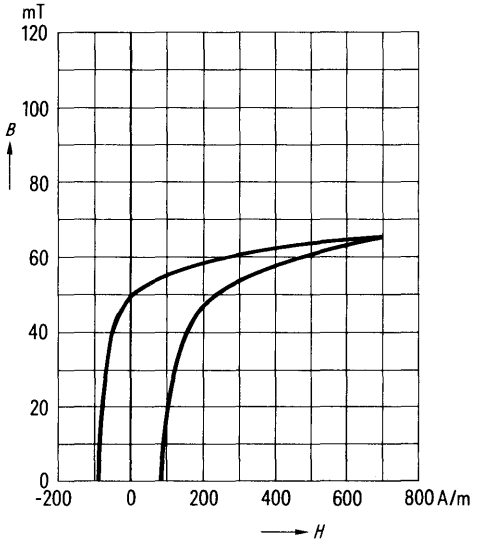
Saturation polarization
as a function of temperature



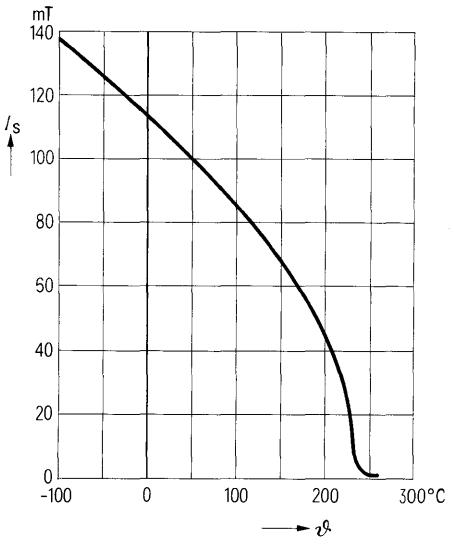
Material data for SIFERRIT material X 263

Ferrite	Garnet ferrite		FeYAl
Saturation polarization	I_s at 20 °C/68 °F	=	100 mT
Coercive force	H_c	=	125 A/m
Half width	2 ΔH	=	3500 A/m
Curie temperature	ϑ_c	=	215 °C/419 °F
Resistivity	ϱ	=	$\geqq 10^8\ \Omega$m
Density		=	4700 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



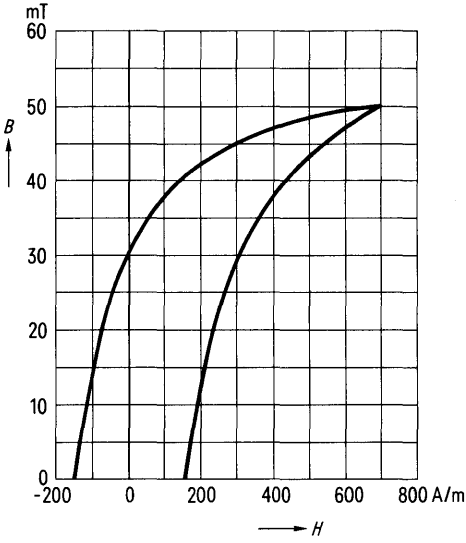
Saturation polarization
as a function of temperature



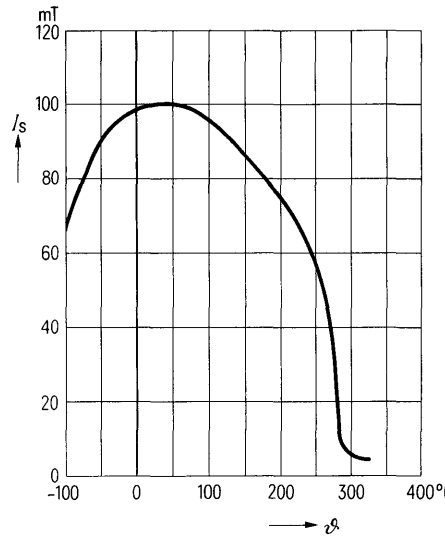
Material data for SIFERRIT material X 264

Ferrite	Garnet ferrite		FeYGd
Saturation polarization	I_s at 20 °C/68 °F	=	100 mT
Coercive force	H_c	=	250 A/m
Half width	$2\ \Delta H$	=	8000 A/m
Curie temperature	ϑ_c	=	290 °C/554 °F
Resistivity	ϱ	=	$\geqq 10^8\ \Omega$m
Density		=	5700 kg/m^3

Flux density
as a function of field strength
Measuring frequency = 50 Hz



Saturation polarization
as a function of temperature



SIRUFER Cores

Material characteristics

In addition to SIFERRIT material, various types of communication equipment still require SIRUFER (**S**iemens-**R**undfunk-**Ferr**um).

The SIRUFER materials consist of very fine carbonyl iron mixed with bonding agents.

The maximum operating temperature is approximately + 100 °C (212 °F) and is limited by the behaviour of the bonding agent at high temperatures.

Due to the interdependence between core shape and material density (possible compression force) as well as the magnetic characteristics e.g. permeability, it is recommended to use reference cores, supplied by the plant.

SIRUFER material characteristics

SIRUFER material		**Si 1**	**Si 31**
Material symbols		101	131
Colour code		white	red
Initial permeability μ_i		11	8
Optimum frequency range $f_{min...}$ f_{max}	MHz	0,15 10	1,5 100
Relative dissipation factor tan δ/μ_i $f_{min...}$ f_{max}	10^{-6}	50 2000	80 2000
Relative temperature coefficient for 20 to 55 °C (68 to 131°F)	10^{-6}/K	−3 to +6	−3 to +6
Specific gravity	kg/m^3	5200	4900
Core shapes		Cylindrical, tube, screw, choke cores	Cylindrical, tube, screw, choke cores

SIRUFER cylindrical cores are available in the following materials:
Si 1; Si 31

For core diameters and core lengths to be preferred see table below.

Tolerance of the apparent permeability μ_{app}: ± 5% (typical value);
closer μ_{app} tolerance on request.

d[1]	Coarse (unground)		Medium (ground)		Fine (ground)	
	Tolerance for d	Core lengths $l_{-0.5}$	Tolerance for d	Core lengths $l_{-0.5}$	Tolerance for d	Core lengths $l_{-0.5}$
mm	mm		mm		mm	
1.6	−0.2	5 to 25	−0.05	5 to 8	−0.03	5 to 8
2		5 to 30	−0.05	5 to 10	−0.03	5 to 10
2.5		5 to 40	−0.05	5 to 12.5	−0.03	5 to 12.5
3		5 to 40	−0.1	5 to 25	−0.05	5 to 16
4		6 to 50	−0.1	5 to 30	−0.05	5 to 20
5		8 to 60	−0.1	8 to 40	–	–
6		10 to 80	−0.1	10 to 45	–	–

1) Other diameters (up to 25 mm) and other core lengths on request.

Ordering number example

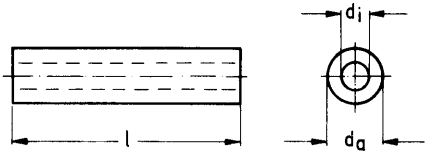
SIRUFER cylindrical core B69021 Si 1; 2.5 x 18 coarse
(B69021 = type; Si 1 = material; 2.5 x 18 ≙ d x l in mm; coarse, medium or fine ≙ diameter tolerance).

Preferred types

d x l mm	Ordering code	d x l mm	Ordering code
$1.6_{-0.05}$ x $7.5_{-0.5}$	B69021-A1015-X•••	$4_{-0.3}$ x $10_{-0.6}$	B69021-A4010-X•••
$1.6_{-0.2}$ x $12.5_{-0.7}$	B69021-A1019-X•••	$4_{-0.3}$ x $15_{-0.8}$	B69021-A4004-X•••
$1.6_{-0.2}$ x $15_{-0.8}$	B69021-A1004-X•••	$4_{-0.3}$ x $20_{-0.9}$	B69021-A4002-X•••
		$4_{-0.3}$ x $30_{-1.2}$	B69021-A4001-X•••
$2_{-0.2}$ x $10_{-0.6}$	B69021-A2021-X•••		
$2_{-0.2}$ x $15_{-0.8}$	B69021-A2002-X•••	$5_{-0.3}$ x $15_{-0.8}$	B69021-A5006-X•••
$2_{-0.2}$ x $20_{-0.9}$	B69021-A2003-X•••	$5_{-0.3}$ x $20_{-0.9}$	B69021-A5005-X•••
		$5_{-0.3}$ x $30_{-1.2}$	B69021-A5007-X•••
$2.5_{-0.25}$ x $10_{-0.6}$	B69021-A2009-X•••	$5_{-0.3}$ x $45_{-1.8}$	B69021-A5008-X•••
$2.5_{-0.25}$ x $15_{-0.8}$	B69021-A2024-X•••		
$2.5_{-0.25}$ x $20_{-0.9}$	B69021-A2025-X•••	$6_{-0.3}$ x $15_{-0.8}$	B69021-A6004-X•••
		$6_{-0.3}$ x $30_{-1.2}$	B69021-A6003-X•••
$3_{-0.25}$ x $10_{-0,6}$	B69021-A3012-X•••	$6_{-0.3}$ x $45_{-1.8}$	B69021-A6005-X•••
$3_{-0.25}$ x $15_{-0,8}$	B69021-A3003-X•••		
$3_{-0.25}$ x $20_{-0,9}$	B69021-A3004-X•••		

••• Here the symbol for the desired SIRUFER material must be inserted:
Si 1 ≙ 101, Si 31 ≙ 131

SIRUFER tube cores are available in the following materials: **Si 1; Si 31**
For core diameters and core lengths to be preferred see table below.
Tolerance of the apparent permeability μ_{app}: ± 5% (typical value);
closer μ_{app} tolerance on request.



d_a[1]	d_i Toler-ance		Coarse (unground) Toler-ance for d_a	Core lengths l–0.5	Medium (ground) Toler-ance for d_a	Core lengths l–0.5	Fine (ground) Toler-ance for d_a	Core lengths l–0.5
mm	mm		mm		mm		mm	
3.5	1.6	+0.2	–0.2	6 to 30	–0.1	6 to 25	–0.05	6 to 25
4	2			6 to 50		6 to 30		6 to 30
5	2			6 to 50		10 to 40		6 to 30
6	3			10 to 60		10 to 50		–

1) Other diameters and other core lengths on request. The wall thickness may be ≥ 1 mm.

Ordering number example

SIRUFER tube core B69030 Si 1; 5 x 2 x 30 coarse
(B69030 ≙ type; Si 1 ≙ material; 5 x 2 x 30 ≙ core dimensions: d_a x d_i x l in mm;
coarse, medium or fine ≙ diameter tolerance).

Preferred types

d_a	d_i	l	Ordering code
mm	mm		
3.5–0.3	1.6+0.15	5–0.4	B69030–A3014–X•••
		10–0.6	B69030–A3015–X•••
		18–0.9	B69030–A3016–X•••
		25–1	B69030–A3017–X•••
4–0.3	1.6+0.15	6–0.4	B69030–A4008–X•••
		10–0.6	B69030–A4009–X•••
		18–0.9	B69030–A4010–X•••
		25–1	B69030–A4011–X•••
		40–1.6	B69030–A4012–X•••
5–0.3	2+0.2	6–0.4	B69030–A5019–X•••
		10–0.6	B69030–A5020–X•••
		18–0.9	B69030–A5021–X•••
		30–1.2	B69030–A5022–X•••
		50–2	B69030–A5023–X•••
6–0.3	3+0.2	10–0.6	B69030–A6020–X•••
		18–0.9	B69030–A6021–X•••
		30–1.2	B69030–A6022–X•••
		50–2	B69030–A6023–X•••

••• Here the symbol for the desired SIRUFER material must be inserted:
Si 1 ≙ 101, Si 31 ≙ 131.

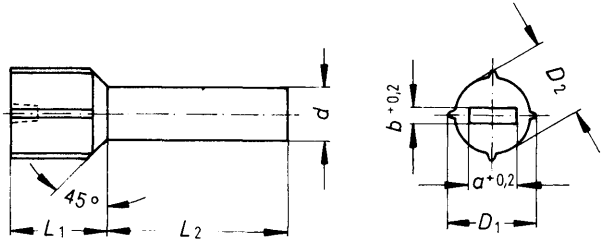
with threaded nipple

SIRUFER adjusting cores with threaded nipple are available in the following materials: **Si 1** (colour code black); **Si 31** (colour code green).

The tolerance of the apparent permeability μ_{app}: ± 5% (typical value);
closer μ_{app} tolerance on request.

The thermosetting plastic nipple is provided with four elastic straps, into which the threaded profile presses itself when screwing the core into the nut thread.

For SIFERRIT adjusting cores with threaded nipple see page 413 (B63320).



Dimensions in mm

Suitable for nut thread	D_1	D_2	d	L_1	L_2	a	b	**Ordering code**
	mm							
M 3	3	2.3	1.8	3,5	5	1,8	0,5	B69040–A3005–X•••
M 4	3,9	3.05	2,3	4	6,8	2,1	0,7	B69040–A3001–X•••

••• Here the symbol for the desired SIRUFER material must be inserted:
Si 1 ≙ 101; Si 31 ≙ 131.

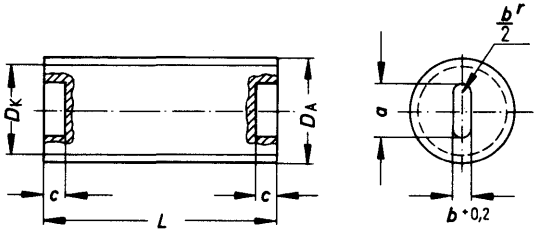
Ground thread

SIRUFER screw cores are available in the following materials: **Si 1; Si 31**

The thread dimensions include the usual elastic inserts (core brake) between nut thread and threaded core.

The threaded cores are also available on request with core brake (elastic material which clings to the core). Ordering code: (code letter 9 in the 9th position of the ordering code) e.g. B69045–B2906–X***.

To avoid damaging the slot, the insulating screw driver B63399–A0001–X000 (with flat blade) must be used.



Dimensions in mm

Screw core suitable for nut-thread DIN 13, 518; 519	Core length 1) L	Thread limit dimensions D_A max	D_A min	D_K max	Slot dimensions a 2)	b	c min. dim.	Approx. weight	Ordering code
	mm	mm			mm			g	
3 x 0.5	6.3–0.6	2.7	2.65	2.25	1.3+0.2	0.5	1	0.3	B69045–B2007–X•••
	8.3–0.6							0.35	B69045–B2006–X•••
3.5 x 0.5	6.3–0.6	3.2	3.15	2.75	1.7+0.2	0.6	1.2	0.35	B69045–B3025–X•••
	8.3–0.6							0.4	B69045–B3026–X•••
	10.3–0.6							0.45	B69045–B3020–X•••
4 x 0.5	6.3–0.6	3.7	3.65	3.20	2 +0.2	0.7	1.2	0.35	B69045–B3027–X•••
	8.3–0.6							0.4	B69045–B3021–X•••
	10.3–0.6							0.45	B69045–B3019–X•••
	12.3–0.6							0.4	B69045–B3022–X•••
5 x 0.75	8.3–0.6	4.6	4.55	3.9	2.5+0.3	1	1.2	0.75	B69045–B4017–X•••
	13.3–0.6							1.1	B69045–B4018–X•••
6 x 0.75	13.3–0.6	5.6	5.55	4.9	3 +0.3	1	1.2	2.4	B69045–B5015–X•••

••• Here the symbol for the desired SIRUFER material must be inserted:
Si 1 ≙ 101; Si 31 ≙ 131

1) Other core lengths are available when larger quantities are ordered.
2) Up to the slot base the dimension a decreases by 0.5 mm.

B 69310

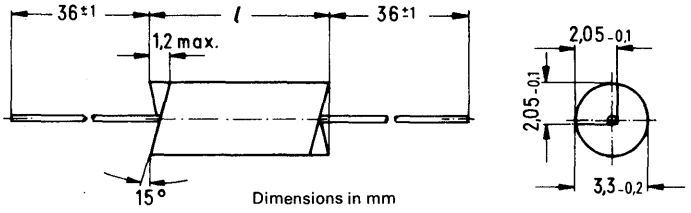
SIRUFER choke cores with pressed-in leads (0.65 mm dia, tinned) are available in the material **Si 1.**

The tolerance of the apparent permeability μ_{app} = ± 5% according to reference cores.

Completely wound chokes with insulating sleeve coating are also available upon request.

Tensile strength of the leads in an axial direction ≥ 4 kp ≥ 40. N. See also data book 1974/75 "RFI suppression components", page 171, B82501.

Other dimensions on request.



Dimensions in mm

Core length *l*	Approx. weight	**Ordering code**
mm	g	Material Si 1
8.2-0.8	0.7	B69310-A0001-X101
9.2-0.8	0.7	B69310-A0003-X101
10.3-0.8	0.7	B69310-A0004-X101
13.0-1	0.8	B69310-A0002-X101
14.0-1	0.9	B69310-A0005-X101

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SIRUFER Cores

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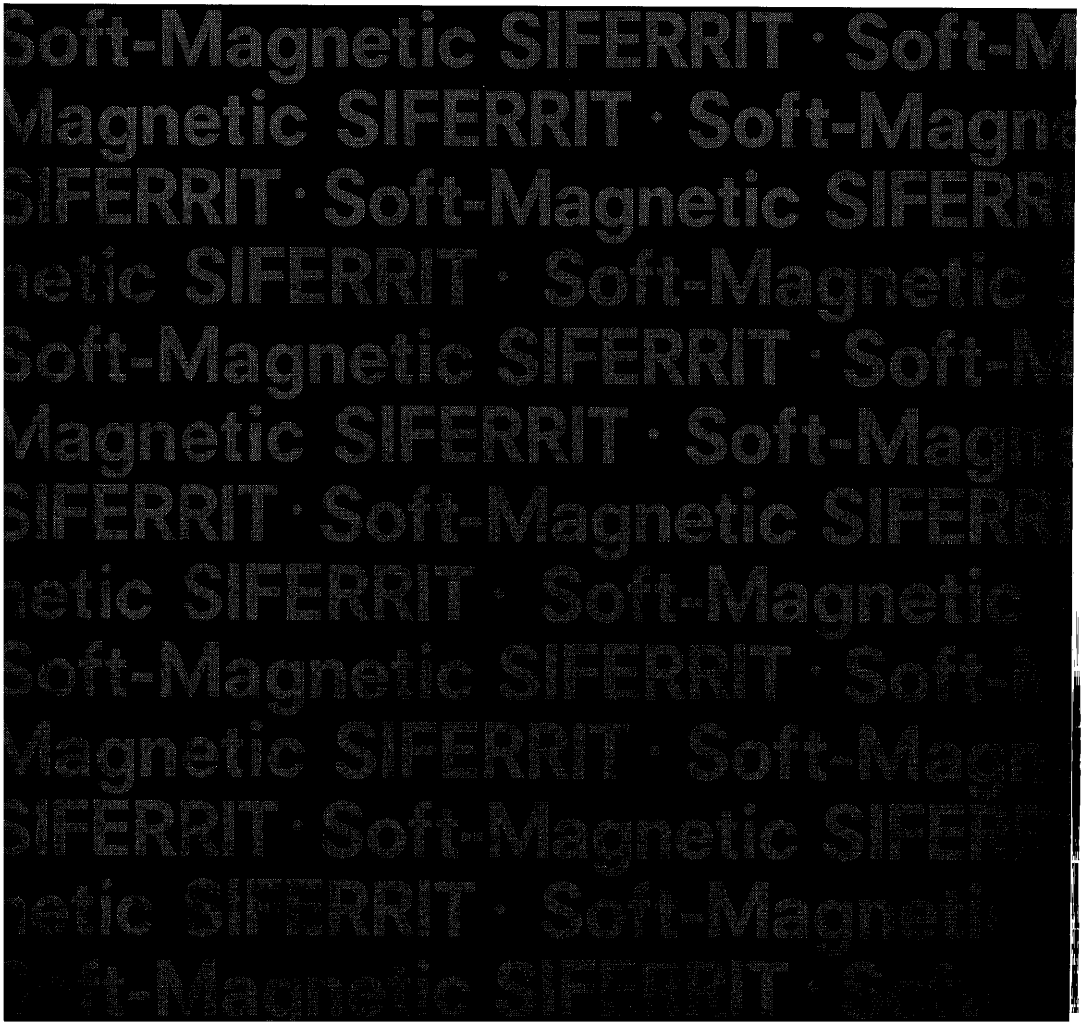
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