



Electromagnet with work-locating fixture

06480.01

Operating Instructions



1. FUNCTION AND DESCRIPTION

The electromagnet 06480.01 is used in conjunction with the pole shoes 06482.02, 06480.03 or 06497.00 to produce strong magnetic fields. The air gap can be varied sensitively with the aid of the worm drive of the work-locating fixture. The electromagnet is particularly suitable e. g. for the Stern-Gerlach experiment, for experiments on diamagnetism and paramagnetism, the Zeeman effect, the Hall effect, and many others.

The magnet consists of a U-shaped iron core with coils which can optionally be connected in parallel or in series. When the coil current is switched off, the field energy in the coil flanges is nullified so that only a slight excess voltage occurs on the coil terminals.

A smoothed direct voltage is not required to operate the electromagnet. As the source of energy we recommend the direct voltage output of the variable-ratio transformer with rectifier 25 V AC/20 V DC, 13531.93.

2. MOUNTING THE POLE SHOES

To mount the pole shoes 06480.02 and 06497.00, loosen both holding screws on the spindle supports of the magnet and remove the support; the locking bolts remain on the magnet.

Each pole shoe is screwed onto a spindle support. The pole shoe is then inserted through the iron core of the magnet coil so that one of the two locking bolts lies between the guide pins of the pole shoe and thus prevents the latter from rotating. The spindle support is finally clamped with the two screws on the locking bolts.

The position of the shoes, and hence the size of the air gap, can be optimized according to the experimental conditions with the aid of the knurled-head screws.

In order to mount the conical, pierced pole shoes 06480.03, the retaining bolts must be removed from the magnet. To loosen the bolts, it is advisable to use universal pliers. The pole shoes are passed through the holes in the iron core of the magnet, until the fixing flanges come against the core. It must then be checked, whether the air gap between the pole shoes is wide enough. To correct the air gap, the clamping screws of the fixing flanges are loosened and the flanges are shifted as required. The clamping screws must then be well tightened, as otherwise the cores might be pulled together due to magnetic forces, which may cause the destruction of parts placed in the air gap.

Warning! Owing to the strong magnetic forces, the size of the air gap is reduced slightly when the magnetic field is switched on. Glass apparatus arranged in the air gap can thus be damaged if placed too close to the pole shoes.

Damage such as this can be avoided by switching on the magnetic field before the glass apparatus has been inserted, setting the maximum coil current required for the experiment, and introducing the glass apparatus between the pole shoes only after the current has been switched on.

3. TECHNICAL DATA

Coil terminals	4 mm sockets
Number of turns per coil	842
Resistance of each coil	2.66 Ω
Maximum current intensity	5 A (short-time duty 20 min.)
Permissible continuous current	4 A
Flux density ($I = 5$ A) with pole shoes 06480.02:	
Width of gap	2.5 mm ca. 1.3 T
	5.0 mm ca. 1.1 T
	10.0 mm ca. 0.7 T
	20.0 mm ca. 0.45 T
Dimensions	with 350 mm, depth 140 mm, height 180 mm
Weight	ca. 17 kg