



Cadmium lamp for Zeeman effect

09050.20

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Operating Instructions



The unit complies with the corresponding EC guidelines.



Fig. 1: Cadmium lamp for Zeeman effect 09050.20.

1 SAFETY PRECAUTIONS



- Carefully read these operating instructions completely before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Only use the instrument in dry rooms in which there is no risk of explosion.
- Do not start up this instrument in case of visible signs of damage to it.
- Only use the instrument for the purpose for which it was designed.
- The Cadmium lamp for Zeeman effect is only to be used with the operating unit intended for this purpose (Power supply for spectral lamps, article no. 13662.9X*).
- **Never connect the two 4 mm plugs of the connecting lead directly to the electric mains (230 V)!**
- Only operate the lamp in the vertical position.
- Only look directly at the lamp through the optical set-up intended for this.

2 PURPOSE AND CHARACTERISTICS

The Cd-lamp serves, together with the PHYWE Fabry-Perot interferometer, for the observation and measurement of normal and the anomalous Zeeman effects.

The lamp holder is so designed that it can be mounted either directly between the axially drilled pole pieces of the PHYWE electromagnet (article no. 06480.01) or to the adjustable magnetic system (article no. 06327.00). Adjustment to the different systems is made by removing the three clamping feet. Allen screws (with the key for hexagon socket screws supplied), so that this feet can be turned to the particular fitting position. The milled screw must be subsequently fitted from the correct side (outer side).

This arrangement allows observation of both the longitudinal and the transverse Zeeman effect.

3 FUNCTIONAL AND OPERATING ELEMENTS

The Cd light source is equipped with a gas discharge lamp that is equipped with a thermionic cathode. When warmed up, a stable arc discharge burns in it. The plasma consists of an inert gas and Cd-vapour.

The lamp is held contact-safe in a housing with an integrated starter and permanently fixed connecting leads. A milled screw enables the lamp to be so mounted on the yoke of the magnet and adjusted, that the discharge tube is between the pole pieces without touching them.

The lamp can be moved sideways between the pole pieces on a guide rail so that it can be rapidly moved into and out of the magnetic field. This also allows a quick demonstration of spectral line splitting with the permanent magnet system. The stopping point of this movement can be offset by about 15 mm by unscrewing the two milled screws which hold the guide rail.

Caution! When using electromagnet 06480.01 and as the lamp must never be allowed to touch the pole pieces, it is essential to ensure that the pole pieces are firmly tightened so that they do not change their position under the applied electromagnet coil current. It is purposeful to check that this is so in a preliminary test without the Cd-lamp.

The discharge tube is far brighter, and also far hotter, when the magnetic field is switched on. To conserve it, therefore, never keep the magnetic field switched on for longer than necessary.

Only use the lamp together with the operating unit (article no. 13662.9X*) which is intended for this purpose.

4 NOTES ON OPERATION

This high-quality instrument fulfills all of the technical requirements that are compiled in current EC guidelines. The characteristics of this product qualify it for the CE mark.

This instrument is only to be put into operation under specialist supervision in a controlled electromagnetic environment in research, educational and training facilities (schools, universities, institutes and laboratories).

A defect lamp is only to be replaced by our customer service department. Do not open the lamp housing.

5 TECHNICAL SPECIFICATIONS

Operating temperature range 5...40°C
Relative humidity < 80%

Supply voltage	Only via Power supply for spectral lamps, 13662.9X*
Protective class	II
Electric power	
without magnetic field	approx. 17 W
with max. magnetic field	approx. 22 W
Spectral lines used	$\lambda = 643.8$ nm (red, normal Zeeman-Effekt) $\lambda = 508.6$ nm (green, anomalous Zeeman effect)
Connecting lead	$l = 110$ cm, pair of 4 mm plugs
Dimensions	(160 x 130 x 52) mm
Weight	approx. 0.5 kg

6 LITERATURE REFERENCE

Handbook Laboratory Experiments Physics Experiment	16502.32 P2511001
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7 LIST OF EQUIPMENT

Main components for the Zeeman effect

Fabry-Perot interferometer	09050.02
Cadmium lamp for Zeeman effect	09050.20
Power supply for spectral lamps	13662.9X*

Magnetic systems

Electromagnet without pole pieces	06480.01
Pole pieces, drilled, conical	06480.03
Rotating table for heavy loads	02077.00

or

Magnetic system, adjustable	06327.00
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* Voltage and frequency (see type plate) depending on local power grid.

xxxxx.91 = 115 V/60 Hz

xxxxx.92 = 115 V/50 Hz

xxxxx.94 = 230 V/60 Hz

xxxxx.97 = 230 V/50 Hz

Special voltages and fixed frequencies on request.

8 NOTES ON THE GUARANTEE

We guarantee the instrument supplied by us for a period of 24 months within the EU, or for 12 months outside of the EU. This guarantee does not cover natural wear nor damage resulting from improper handling.

The manufacturer can only be held responsible for the function and technical safety characteristics of the instrument, when maintenance, repairs and changes to the instrument are only carried out by the manufacturer or by personnel who have been explicitly authorized by him to do so.

9 WASTE DISPOSAL

The packaging consists predominately of environmental compatible materials that can be passed on for disposal by the local recycling service.

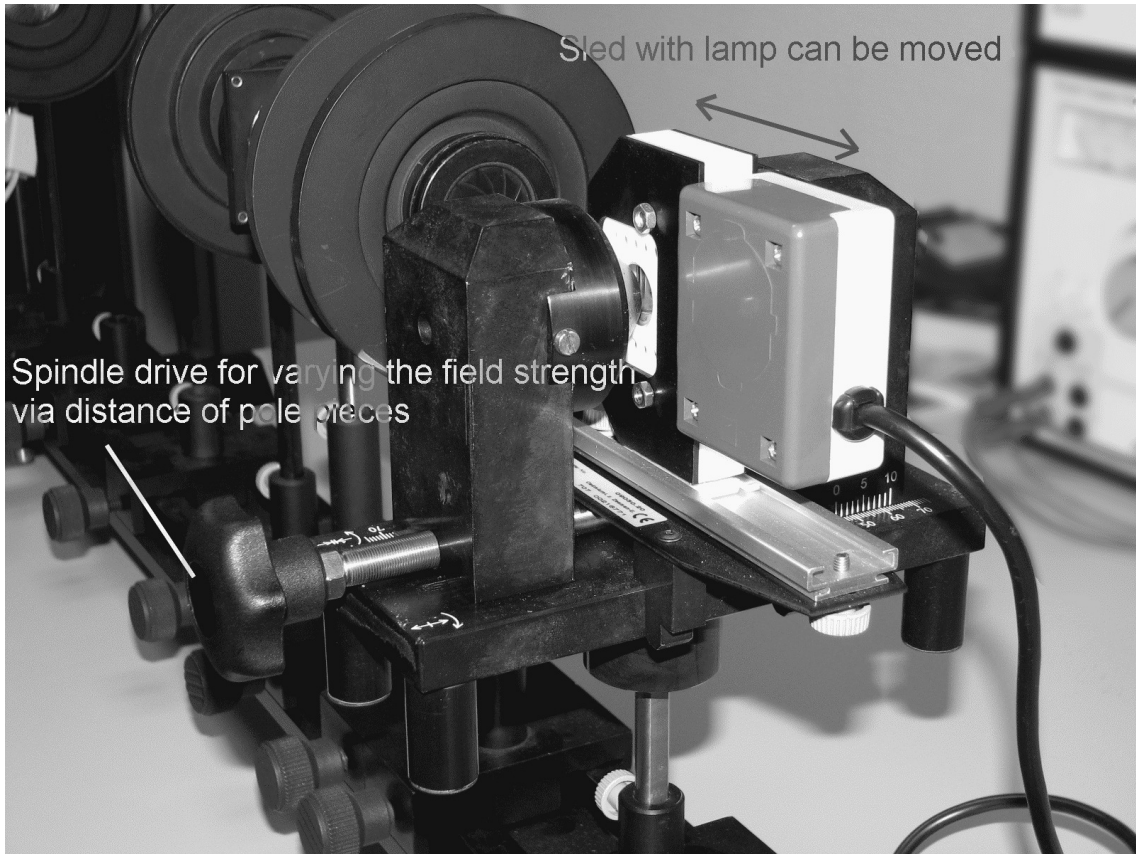


Should you no longer require this product, do not dispose of it with the household refuse. Please return it to the address below for proper waste disposal.

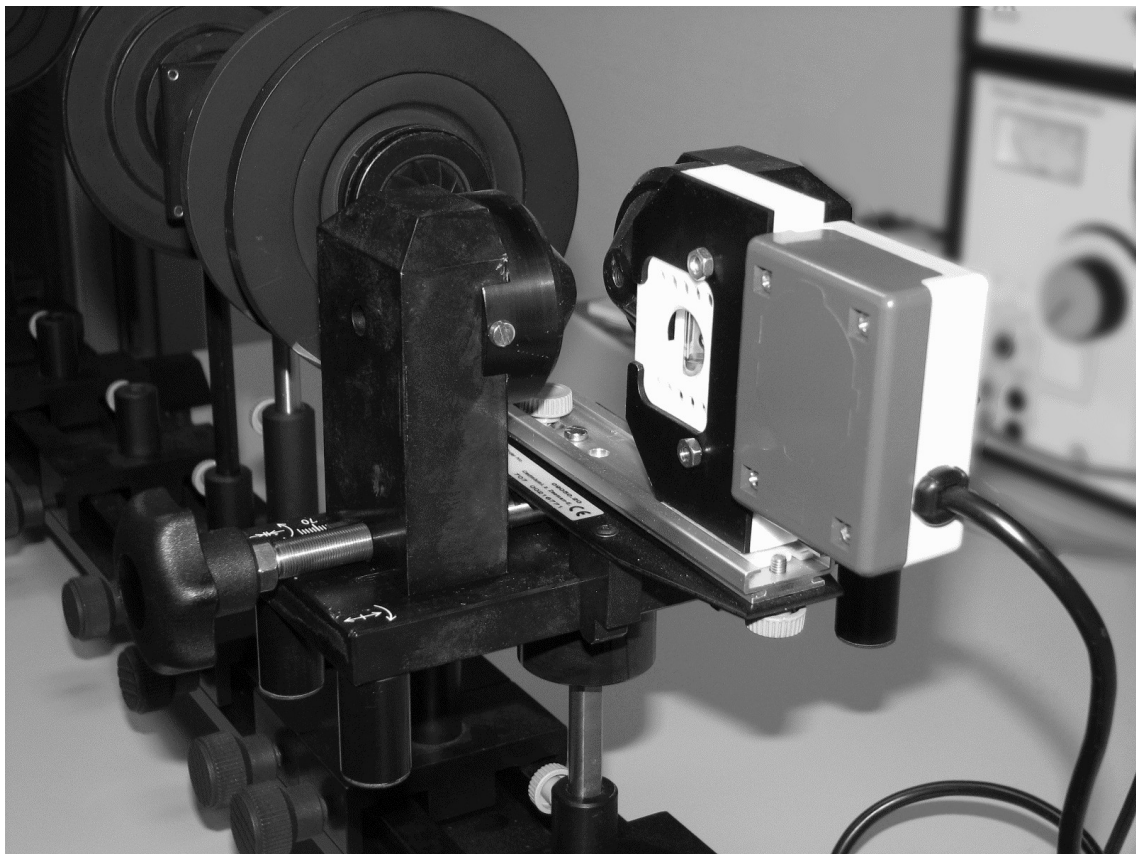
PHYWE Systeme GmbH & Co. KG
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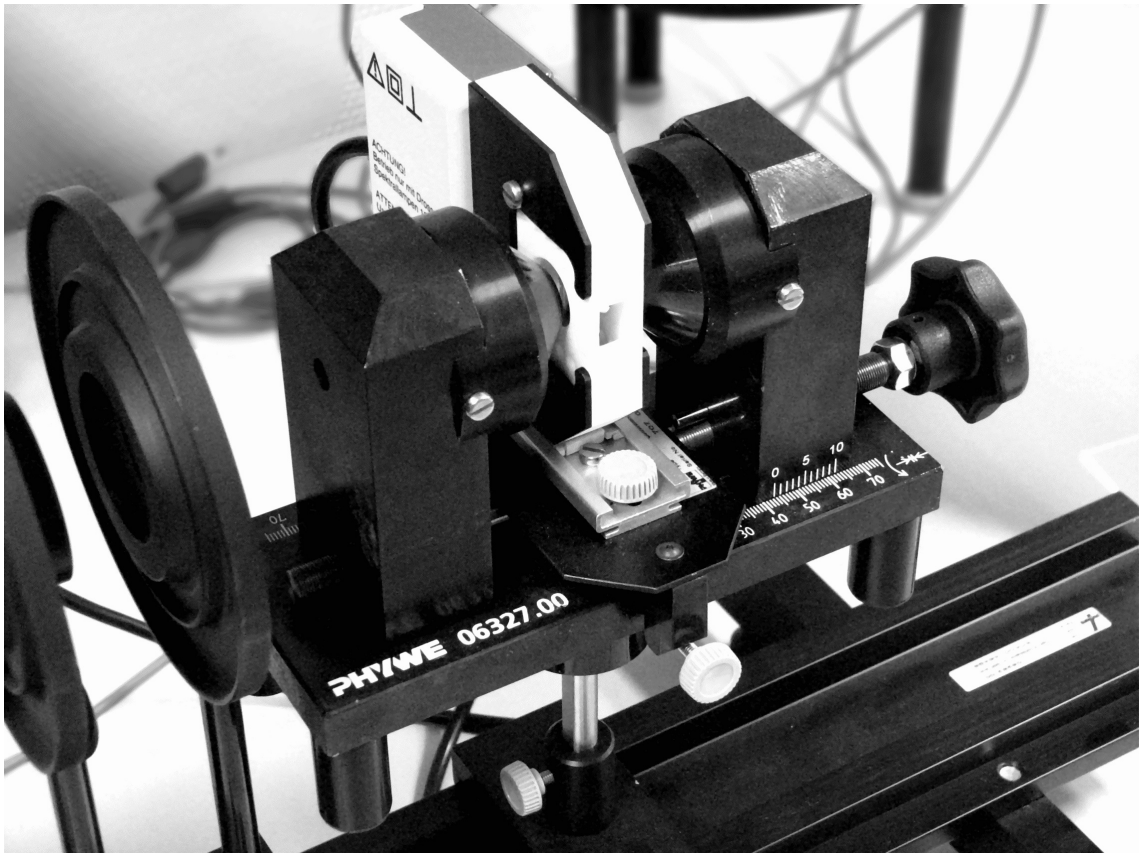
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For the use of the Zeeman effect apparatus with the variable magnetic system, the magnetic system is placed on a slide mount for the optical profile bench. Then the cadmium lamp is mounted on the magnetic system as seen.



In transversal observation of the discharge the magnetic field strength can be varied by either moving the lamp in and out of the field or by varying the spacing between the magnets.





Here the longitudinal observation of the Zeeman effect can be seen.