



# compact - system optics



Geometric optics set for experiments on the lab bench using a 12 V 20 W halogen lamp, experiment manual included

## DL990-4L Optics Basic "compact"

Qty.	Item No.	Description
1	P5110-1G	Light source 12V/20W Halogen, for use directly on the table or on the optical bench; with built-in condenser lens for a parallel beam. Aluminium body, fitted with plastics moulded end-caps, for fixing shutters with 1 and 2, or 3 and 5 slits. Acrylic bodies, polished, one side painted in white colour, length of the bodies approx. 63 mm.
1	P5520-1F	Prism acrylic, trapezoid
1	P5520-1A	Lens acrylic, semicircular
1	P5520-1E	Prism acrylic, right angle
2	P5520-1B	Lens acrylic, plano-convex
1	P5520-1C	Lens acrylic, plano-concave
1	P5620-1A	Optical disc, white plastics, with graduation (silk-screened)
1	P5610-5C	Screen, white plastics, squared
1	P5600-5A	Mirror plane, on aluminium block
1	P5600-5B	Mirror, concave/convex, adjustable into circular or parabolic position
1	P5405-1A	Shutter SE, single and double slit
1	P5405-1B	Shutter SE, triple and quintuple slit
1	P5710-1B	Hollow tank, plastics, white bottom
1	P5205-1A	Colour mixing set for Optics 1

The set consists of:  
 1 triple colour slide with additive colours,  
 3 mirrors, and  
 3 plastics colour filters

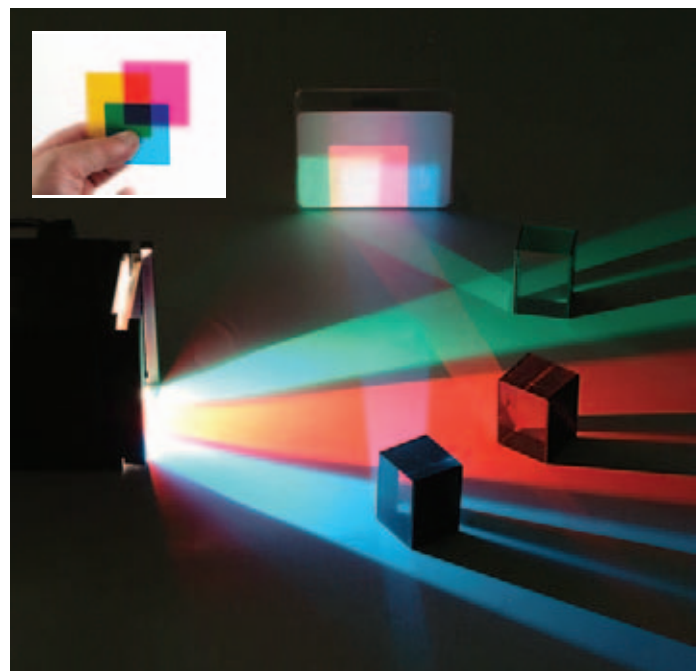
### Storage:

1	P7806-4G	Box-insert Optics 1, plastics, exactly pre-fitted
1	P7806-1A	Plastic box small, with cover

With the aid of platform on support DL101-1A, the combination experiment lamp SE may also be used on the optics bench.

### DL101-1A Platform on support

Metal platform on support (D=10 mm), especially designed for mounting combination experiment lamp SE P5110-1G or magnetic panel lamp DL100-1XL or DL100-1XR on a support stand or the optics bench  
 Dimensions: 150x60 mm



Additive mixture of colours

# compact - system optics



## PROPAGATION OF LIGHT

### 1. LICHTAUSBREITUNG:

- OPS 1.1 Light propagates rectilinearly
- OPS 1.2 Shadow

### 2. MIRRORS:

- OPS 2.1 Reflection on a plane mirror
- OPS 2.2 Images on a plane mirror
- OPS 2.3 Reflection on a concave mirror
- OPS 2.4 Construction of images for a concave mirror
- OPS 2.5 Image of point by means of a concave mirror
- OPS 2.6 Reflection on a convex mirror
- OPS 2.7 Construction of images for a convex mirror
- OPS 2.8 Image of point by means of a convex mirror

### 3. REFRACTION:

- OPS 3.1 Refraction on a plane-parallel plate
- OPS 3.2 Refraction coefficient of glass
- OPS 3.3 Refraction at the transition from air into water
- OPS 3.4 Angle of incidence and angle of refraction
  - OPS 3.4.1 Index of refraction of solid matters
  - OPS 3.4.2 Calculation of the parallel displacement of the plane-parallel plate
- OPS 3.5 The transition from glass into air
- OPS 3.6 Deviating and inverting prism
- OPS 3.7 Refraction at a prism

### 4. LENSES:

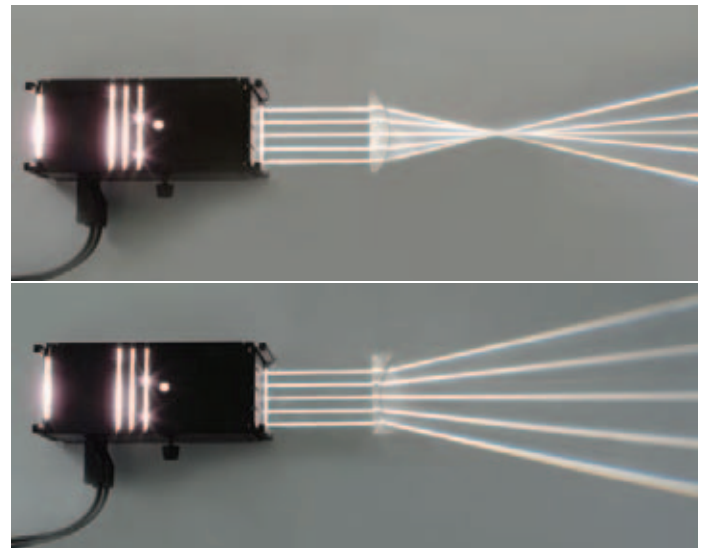
- OPS 4.1 Refraction at convex lenses
- OPS 4.2 Marginal beams
- OPS 4.3 Construction of convex lens images
- OPS 4.4 Image of a point by means of a convex lens
- OPS 4.5 Refraction at a concave lens
- OPS 4.6 Construction of concave lens images
- OPS 4.7 Image of a point by means of a concave lens

### 5. COLOURS

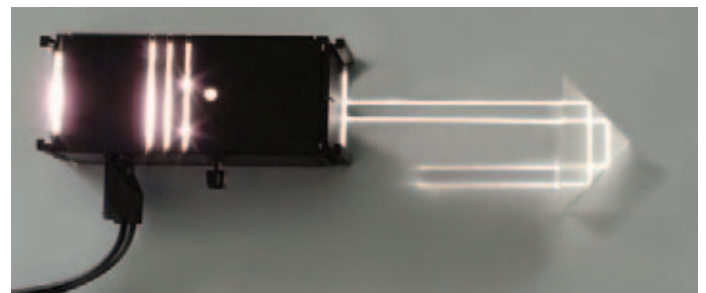
- OPS 5.1 Colour dispersion
- OPS 5.3 Additive colour mixing
- OPS 5.4 Subtractive colour mixing
- OPS 5.5 Body colours

### 6. THE EYE

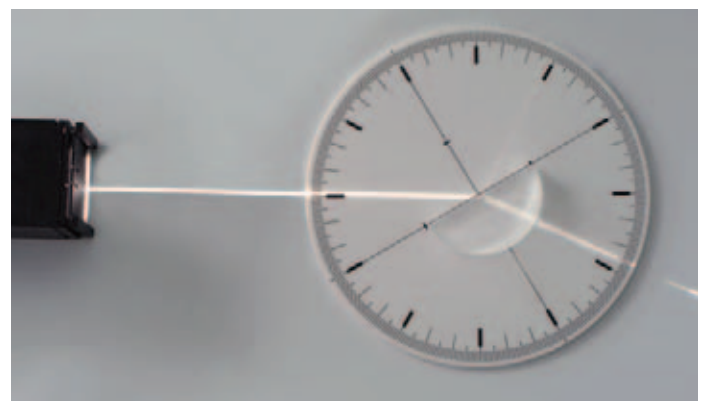
- OPS 6.1 The normal sighted eye
- OPS 6.2 Short sightedness
- OPS 6.3 Far-sightedness
- OPS 6.4 Presbyopia



Experiment: Convex lens, Concave lens



Experiment: Deviating and inverting prism



Experiment: Angle of incidence and angle of refraction



**P3130-7A** Fixed voltage transformer  
12 V/1,67 A used to drive the student lamps P5110-1G and P5110-1F.



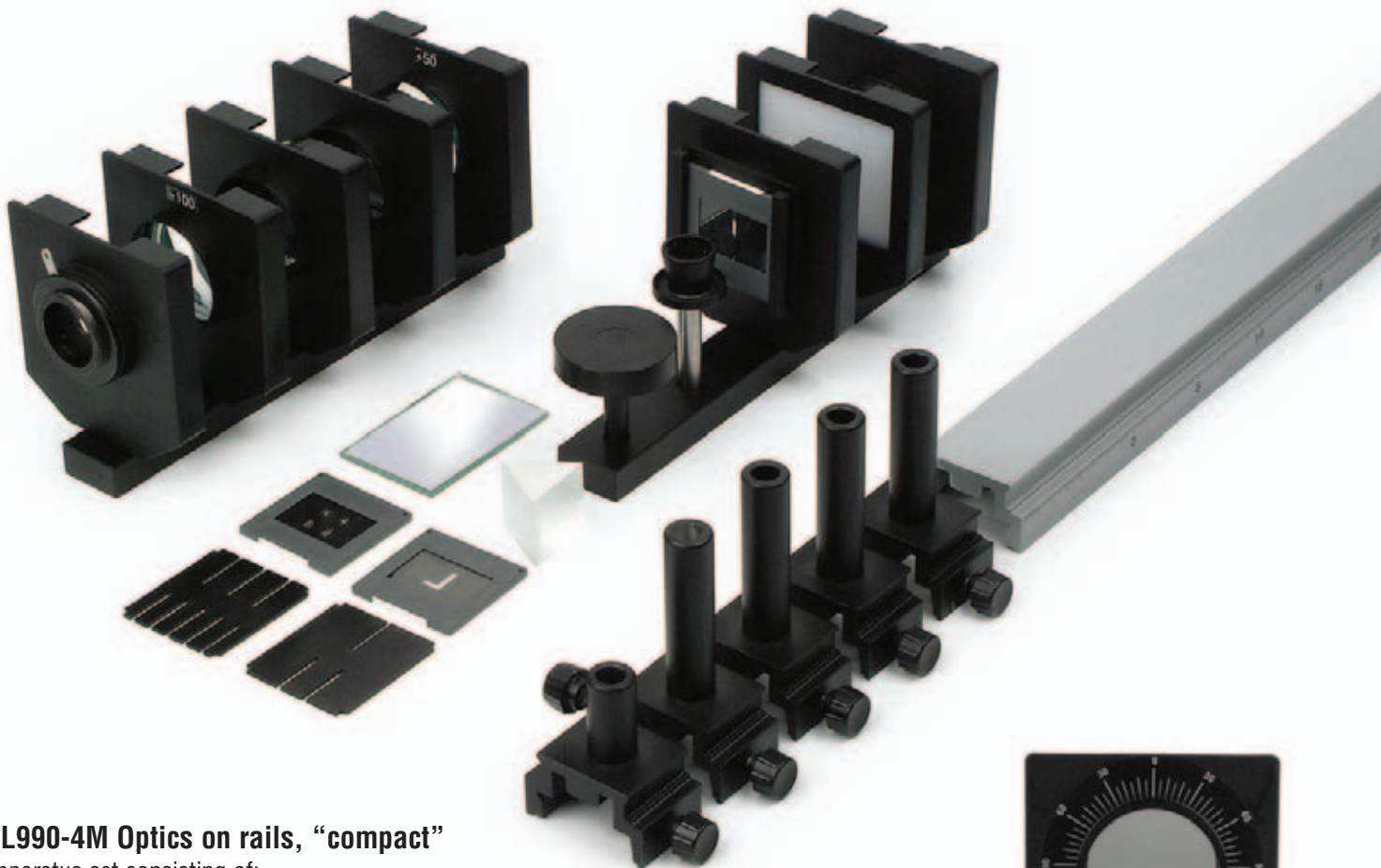
**P3320-1R** Replacement bulb for Light source 12V/20W Halogen

### Ordering information for OPTICS Basic "compact"

- DL990-4L Optics Basic "compact"
- P9100-4GE Manual Optics
- P3130-7A Fixed voltage transformer



# optics compact system



## DL990-4M Optics on rails, "compact"

Apparatus set consisting of:

DL150-1A	1x Optics bench, L=100 cm
DL151-1S	1x Sliding saddle with clamp socket, short; socket height: 35 mm
DL151-2S	4x Sliding saddle with clamp socket, long; socket height: 75 mm
P5310-2A	4x Lens and screen holder
DL300-1F	2x Slide and screen holder, plug-in
P5510-2A	1x Lens in mount, $f = +50$ mm
P5510-3B	1x Lens in frame, $f = +100$ mm
P5510-3C	1x Lens in frame, $f = +300$ mm
P5510-2L	1x Lens in mount, $f = -100$ mm
P5600-3C	1x Convex mirror in frame
P5600-3B	1x Concave mirror in frame
P5600-3P	1x Planar mirror, 75x50 mm
P5310-2I	1x Iris diaphragm in mount
P5610-5A	1x Transparent screen in mount
P5610-8A	1x Prism table
DL515-2P	1x Prism, flint glass
P5405-1A	1x Screen with 1 and 2 slits, black
P5405-1B	1x Screen with 3 and 5 slits, black
P5400-1V	1x Slide with adjustable slit
P5400-1F	1x Slide
P5400-1E	1x Slide with "L"
DL101-1K	1x Candle holder on support
P5310-5A	2x Assembly board

## DL990-4P Polarization supplement, "compact"

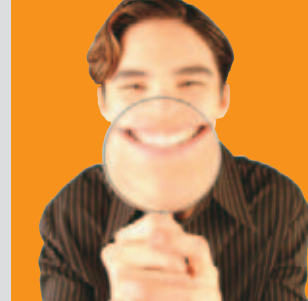
P5420-1A	2x Polarization filter, D=50 mm, in frame
P5420-1B	2x Polarization filter mount
P5710-1A	1x Cell SE, 85x45x43 mm
P5420-3A	1x Object for photoelastics

### Additionally required:

Light source e.g.:  
 DL100-1E Lamp for experiments, xenon, 50 W, with fan; or  
 DL100-1XL Lamp for magnetic panel, xenon, connectors at left; or  
 P5110-1G Combination experiment lamp SE,  
 with platform on support DL101-1A



# optics compact system



## Experiments with optics on rails

### 1. PROPAGATION OF LIGHT

OPC 1.7 Camera aperture

### 2. MIRRORS:

OPC 2.6 Images in a concave mirror

OPC 2.10 Images in a convex mirror

### 4. LENSES:

OPC 4.4.1 Images through a converging lens

OPC 4.4.2 Law for images through a converging lens

OPC 4.7.1 Images through a diverging lens

OPC 4.8 Spherical aberration of a lens

OPC 4.9 Chromatic aberration of a lens

### COLOURS:

OPC 5.2 Colour dispersion of light by a prism and recombination

### 6. THE EYE:

OPC 6.1.1 Model of the eye

OPC 6.5 Vision defects and correction

### 7. OPTICAL INSTRUMENTS:

OPC 7.1 Magnifying glass

OPC 7.2 Slide projector

OPC 7.3 Microscope

OPC 7.4 Telescope

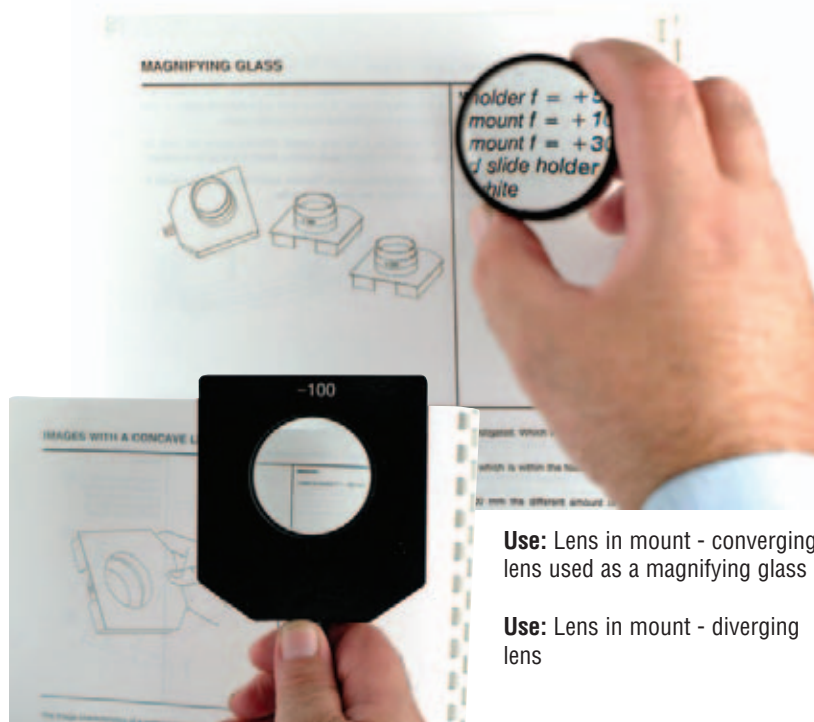
OPC 7.5 Camera

Experiments possible with the supplementary polarization set:

OPC 8.3 Polarization with filters

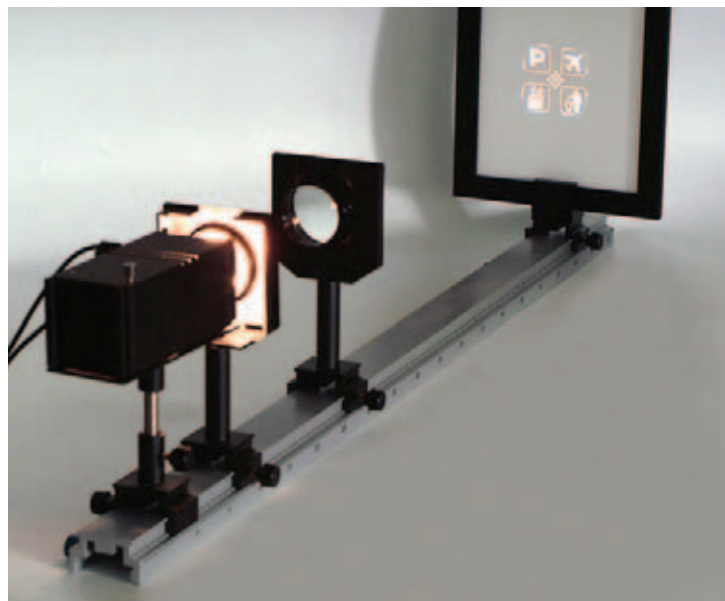
OPC 8.5 Model of a saccharimeter

OPC 8.6 Photoelastics



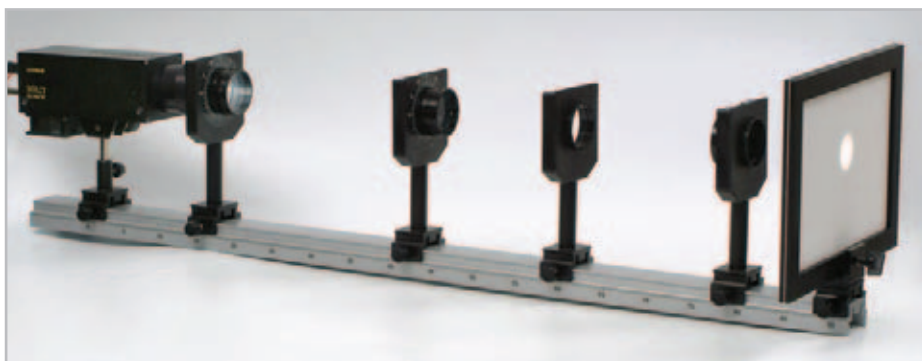
**Use:** Lens in mount - converging lens used as a magnifying glass

**Use:** Lens in mount - diverging lens



**Experiment:** Slide projector

**Experiment:** Polarization



### Ordering information for the "compact" optics system

DL990-4L	Optics basics, "compact"
DL990-4M	Optics on rails, "compact"
DL101-1A	Platform on support
DL990-4P	Polarization supplement, "compact"
P9100-4GE	Experiment manual for optics