



## Accessories for Technoscopes

- Light Sources • Light Guides • Light Rods • Adapters
- Optical Attachments • Photographic and Video Documentation Equipment • Grasping Devices
- Supporting Arm • Transport and Storage Cases



Accessories for Technoscopes

# Light Sources



## **RICHARD WOLF: Progress and Achievement in industrial Inspection Equipment**

The highest quality without compromise can only be achieved when a company is permanently open to new ideas and innovations. Richard Wolf has been manufacturing a wide range of industrial and medical endoscopes for over 80 years with outstanding quality. Technoscopes – borescopes manufactured by Richard Wolf – are precision inspection tools designed for technical applications and provide unsurpassed illumination and image-quality. To help you get the most out of your WOLF Technoscopes we have a comprehensive range of accessories tailor-made for our instruments. These accessories provide the support necessary for critical inspections day-to-day work whether on the shop floor or in the aerospace industry.

## **Light Sources**

WOLF light sources (specifically designed for fiber illuminated Technoscopes) have a reinforced metal chassis and comply with CE regulations and IEC standards. They are equipped with halogen or arc lamps whose light is concentrated via condenser systems to provide an optimum light intensity.

## **Brightness control**

WOLF light sources cover a wide range of lamp powers for visible and UV applications. The intensity of all Wolf light sources can be controlled manually. Some models offer additional features like remote brightness control or automatic light intensity adjustment. With the automatics activated, the brightness is controlled by the video signal of CCD-camera attached to the Technoscope. By this, il-

lumination is kept at an optimum level at all times.

## **Lamp Replacement**

All WOLF light sources have a modular system allowing fast and simple lamp replacement.

## **Note on safety**

Light sources must not be used in areas with potential explosion hazards.

# Technical Data

## 20 watts with rechargeable battery

Light source model 4024 with rechargeable battery and one light outlet. 20 W halogen reflector lamp, can be operated with 230 V power supply or with integrated exchangeable battery, with 3-levels brightness controller. The battery can be changed while in the light source without the use of an external charger. The light source can also be fitted with a shoulder strap.

## 150 watts

Standard light source model TLH-1, 150 W halogen reflector lamp, one light outlet with a switch for brightness reduction of 60% (long life mode), carrying handle, vertical case design, powerful cooling fan, increased light output.

## 250 watts (portable model)

Portable light source model 1.40171 with 250 W halogen lamp, integrated spare lamp for immediate changeover, continuous intensity control with lamp switch, condenser sys-

tem. An ideal light source for inspections or different sites.

## TLP-1 175 watts Xenon

This model TLP-1 is the ideal heavy duty light source for the industrial environment: 175 watts Xenon high pressure short arc lamp (module) with integrated operating hours counter, robust rubber shock absorbing frames on front and rear side, wide angle illumination, constant colour temperature, long lamp life, universal voltage input (100-240 VAC / 50-400 Hz self adjusting), operation in all positions, rotatable light socket for all standard light guide makes, sealed control panel. LED display, light weight, portable, incl. remote cable brightness control and carrying handle.

## 300 watts Xenon (video automatic)

Super-performance light source model 5131 with video automatic, special 300 watts Xenon high pressure short arc lamp (mod-

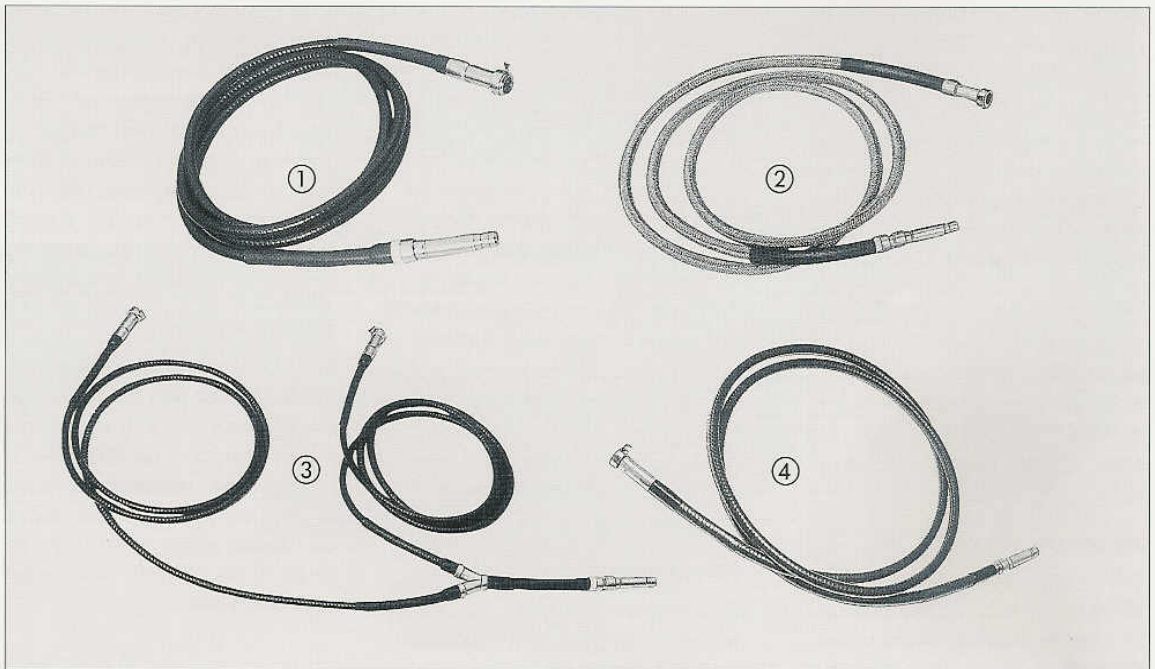
ule) with integrated operating hours counter, extremely bright, wide angle illumination, long lamp life, universal voltage input (100-240 VAC / 50-60 Hz self adjusting), constant colour temperature, rotatable light socket for all standard light guide makes, sealed control panel, LED display, brightness control (1% - 100%) manually and by video automatic (integral or spot measurement selectable), constant colour temperature, compact size.

## 200 watts Mercury UV

High performance Superlite UV source with selectable UVA and white light mode for special applications, 200 watts Mercury super pressure short arc lamp. DC-operated for flare-free video observation, continuous brightness control, constant colour temperature, universal voltage input (90-250 VAC 50-60 Hz self adjusting), automatic light output safety shutter.

Model	Lamp (Order no.)	Voltage Frequency	Power rating	Weight	Dimensions W x H x D	Colour temperature	Accessories	Order no.
4024	8 V / 20 W (1.24220.08)	230 V 50/60 Hz	30 VA	3 kg	19 x 7 x 18 cm	3000 K	Shoulder strap Spare accumulator Recharging unit	1.40240.01 1.40240.98 1.40240.90 1.40240.95
TLH-1	15 V / 150 W (2426.15)	230 V 50 - 60 Hz	230 VA	6.8 kg	25 x 12 x 22 cm	3200 K	incl. carrying handle	2.42150.001
		115 V 50 - 60 Hz						2.42150.006
1.40171	24 V / 250 W (2416.00)	115/230 V 50/60 Hz	350 VA	7.8 kg	17 x 23 x 30 cm	3200 K	Shoulder strap on request	1.40171.00
TLP-1	175 W Xenon Module (2412.112) Exchange module (2412.113)	100 - 240 V 50 - 400 Hz	400 VA	8 kg	35 x 13 x 31 cm	5600 K	Remote control (cable) for intensity included	1.51210.001
5131 (small illustr. left)	300 W Xenon Module (2431.101) Exchange module (2431.102)	100 - 240 V 50/60 Hz	700 VA	10 kg	33 x 16 x 38 cm	5600 K	incl. BNC video cable	5131.001
SUPERLITE UV (no illustr.)	200 W Mercury Module (1.24201.001) Exchange module (1.24216.001)	90 - 250 V 50/60 Hz	450 VA	7.5 kg	34 x 16 x 31 cm	-	Foot switch on request	1.40303.001

# Flexible Light Guides



WOLF glass fiber light guides are designed for WOLF Technoscopes and WOLF light sources. They ensure optimum light transmission and therefore excellent illumination of objects or cavities.

All WOLF light guides are light and extremely flexible without sacrificing strength.

### How a Light Guide Functions

A glass fiber light guide consists of a bundle of single fibers ( $\varnothing < 100 \mu\text{m}$ ) the ends of which are fixed in a collar. Each individual fiber conducts light by means of total reflection at the boundary between the core of the fiber and the coating applied to it.

### Transmission Characteristics

The amount of light transmitted with a glass fiber light guide increases with its cross-sectional area. The following table lists the dia-

eters recommended for the different Technoscopes.

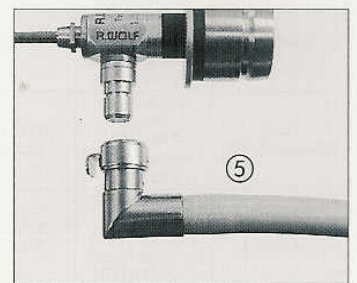
Glass fiber light guides transmit the light with practically no angle deviation. The input angle of the light source must therefore be at least as large as the field of view of the connected Technoscope, otherwise the field will not be completely illuminated. This should be kept in mind when using light sources from other manufacturers.

### Connections

Some 15-20% of the light is lost when two glass fiber light guides are connected. This is because the individual fibers never quite match up exactly. It is therefore not advisable to connect short light guides together when an extension is required.

For extreme situations where normal illumina-

tion proves inadequate, WOLF produces some Technoscopes with fixed continuous light guides. Since there is no connection necessary with these Technoscopes, the light is conducted from the light source to the light outlet on the Technoscope without any significant loss of light.

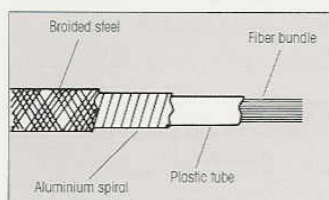
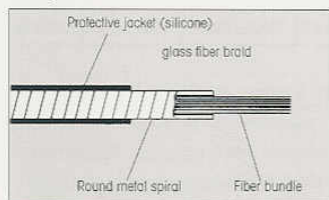


# Technical Data

Number	For Technoscopes Ø	Aktive Ø	Light cable Ø	Cable length	Order no.
①	up to 5 mm	2.5 mm	8 mm	1800 mm	1.40610.25
	up to 8 mm	3.5 mm	8 mm	1800 mm	1.40610.35
				2300 mm	1.40630.35
① <sub>a</sub>	all	3.5 mm fused	9 mm	2300 mm	8063.353
①	longer than 8 mm	4.5 mm	9 mm	1800 mm	1.40610.45
		5.0 mm	9 mm	2300 mm	1.40630.50
				3000 mm	1.40633.50
②	all	4.5 mm	10 mm	1800 mm	1.40650.45
		5.0 mm		2300 mm	1.40652.50
③	up to 8 mm	2 x 3.5 mm	2 x 8 mm	2 x 1800 mm	1.40620.35
④	all	4.0 mm	9,5 mm	1800 mm	1.40690.45
				3600 mm	1.40690.453
⑤	all	4.5 mm	10 mm	2300 mm	8062.451

### Structure of the Light Guide

The glass fiber bundles in the guide are embedded in a thin plastic tube which is then inserted into a light metal spiral tube. This is covered by a strong but extremely flexible silicone jacket.



For an even stronger light guide ②, the light metal tube is replaced by an aluminium spiral tube which is covered by a braided stainless steel jacket.

### Types of Light Guide

Various types of light guide can be selected depending on the diameter of the Technoscopes. For the thin Technoscopes, a cable with only a small cross-section is necessary. (The cables suitable for the diameter of the Technoscopes can be seen in the table).

If only one cable is intended to be used with several different Technoscopes, it is advisable to select the light guide suitable for the largest diameter Technoscope being used.

A double light guide (Y form ③) can be used to operate two Technoscopes simultaneously on one light source (up to Ø 8 mm Technoscopes without loss of light).











For the use with high intensity light sources we recommend light guides with fused fiber input and output ①<sub>a</sub>. Due to the fused fiber tips, light coupling losses are minimized and heat resistance is enhanced.

For special situations, liquid light guides ④ are available. This is particularly suitable for transmitting ultra-violet light but can also be used for white light. The advantage is the low transmission loss compared with glass fibers. The liquid light guides are stiffer than the glass fiber light guides and due to their special quality also somewhat more expensive.

When a video camera is used often a sideways stuck out light guide will be hindering. The light guide ⑤ (see picture page 4 below) turn away the cable connection about 90°. Therefore both cables, the light guide and the camera cable will be lead in the same direction for better handling.

# Light Rods and Adapters

## Adapters for connecting light sources of other manufacturers

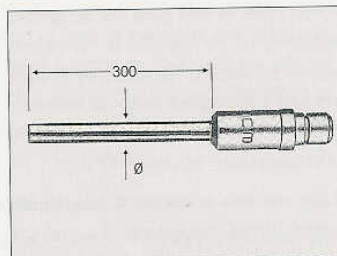
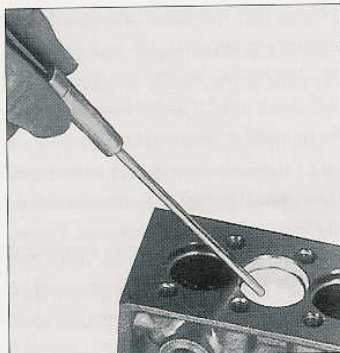
 <p>WOLF 8095.07 unscrew</p>	ACM (US standard)		
	Classen & Co	8083.10	
	Henke-Sass-Wolf (HSW)		
	Olympus	8096.811	
	Model Lux	1.80830.12	
	Fort		
	Model EF	1.80831.12	
	Eitrolec	1.80830.13	
	Fiberoplik		
Streppel			
Volpi	1.80830.14		
Schöllly			
Schoff	1.80830.15		
Storz	no adapter required		
Lumatec	1.80830.16		

## Light Rods

Light rods are used to illuminate cavities or objects which are difficult to light using conventional methods.

The light rods do not have an optical system. The light generated in the light source is

transmitted to the light rod via a light guide. The light emitted from its tip is cold.



Ø mm	Fiber bundle Ø mm	Order no.
3.7	2.7	1.03730.00
4.7	3.7	1.04730.00
5.7	4.7	1.05730.00

Ø mm	Fiber bundle Ø mm	Total length in mm	Light rod length in mm	Beam angle	Order no.
6	5.2	1800	400	70°	1.00640.07
6	5.2	1800	400	140°	1.00640.14

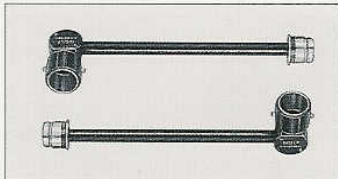
The light rods with fixed light guides are used to illuminate cavities where a considerable amount of light is necessary. The diameter of the fiber bundle is 5.2 mm.

To illuminate tube walls, a light rod with a beam angle of 140° is ideal.

# Optical Attachments

## Angled Attachments

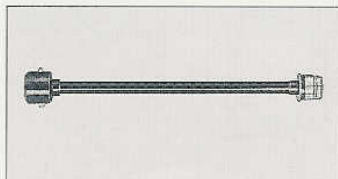
Angled attachments are used to change the angle at which the observer looks into the WOLF Technoscope when the normal viewing position is awkward or impossible. They are plugged onto the eyepiece of the WOLF Technoscope. A ball connection makes it possible to turn the Technoscope within the angled attachment. Documentation systems (photography, video etc.) can also be adapted to the eyepiece of the attachment.



Angle	Working length	Order no.
60°	110 mm	1.58000.60
	260 mm	1.38001.60
90°	110 mm	1.58000.90
	260 mm	1.38000.90
	830 mm	1.83000.90

## Extension Attachments

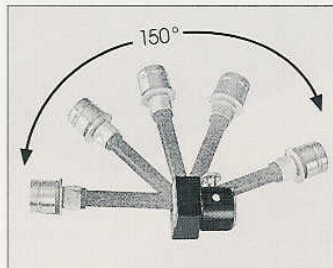
The extension attachments can be connected to all WOLF Technoscope and angled attachments.



Working length	Order no.
110 mm	1.58000.00
260 mm	1.38000.00

## Adjustable Angled Attachment

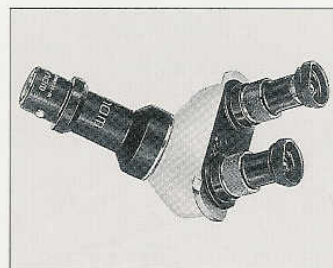
The angled attachment with the adjustable viewing tube can be adjusted from 0° to 150°. This allows viewing from practically any angle. The rotation of the image can be adjusted and corrected back to the original position with an adjustment ring on the eyepiece.



Working length	Order no.
130 mm	1.48000.96

## Binocular Attachment

The binocular attachment can be fitted to all WOLF Technoscopes (without magnification). The monocular image of the Technoscope is split between the two eyepieces (the image is not stereoscopic).



Order no.	Order no.
	1.32380.20

## Magnifying Attachment

The magnifying attachment further magnifies the intrinsic enlargement of the Technoscope 2.2-fold. It can be attached to all WOLF Technoscopes and has a separate focus control on the eyepiece.



Working length	Order no.
75 mm	1.50200.00

The magnifying attachment is also available with an integrated scale in 0.1 mm divisions.

Working length	Order no.
75 mm	1.50210.00

## Eyecups

The eyecup is made of black rubber and metal and can be plugged onto all WOLF Technoscopes and optical attachments.



Design	Order no.
round	1.28000.00

Accessories for Technoscopes

# Documentation - Video / Photography

(This is a sample from the WOLF video documentation program. Ask for the latest technical information.)



## WOLF Documentation Systems

Documentation of inspections and their results is indispensable for correcting faults or repairing damage. In such situations the comprehensive WOLF Technoscope documentation system can prove invaluable.

### We supply the following:

Endo lenses and adapters for almost all commercially available reflex cameras, digital cameras and accessories, video cameras (monochrome and colour), CCD-ENDOCAM miniature cameras, video zoom lenses, monitors, video recorders and video printers. Ask us about suitable configurations.

### BNC video cable (BAS + FBAS)

3 metres long, order no. ....103.13

### Y/C video cable (S-video)

2.5 metres long, order no. ....103.501

## TECAM-1

### CCD-Colour-Videocamera with digital signal processing and micro-lens technology

- High sensitivity (3 lx at  $f = 1.4$ )
- Extremely user friendly design
- Automatic brightness control
- PAL and NTSC TV standards
- Integrated colour bar test picture
- Electronic automatic shutter

## Camera Controller

Colour plus digital signal processing  
Automatic brightness control at 3 levels.  
Manual adjustment of colour

### Technical Data

Image sensor: .....1/2" CCD  
Pixels (h x v): .....752 x 582  
Light sensitivity: .....3 lux /  $f = 1.4$   
Resolution (h/v): .....470 / 420 lines  
Objective lens mount: .....C-mount  
OUTPUTS:  
2 x Video (BNC): .....1.0 Vp-p / 75  $\Omega$   
2 x S-Video (Y/C): .....mini DIN 4-pin  
Y: .....1.0 Vp-p / 75  $\Omega$   
C: .....0.3 Vp-p / 75  $\Omega$

Power supply: .....100-240 V ac, 50/60 Hz  
CE safety tests:

EMC complying with: .....89/336/EEC

Electrical safety: .....73/23/EEC

DIMENSIONS (W x H x D):

Controller: .....225 x 80 x 275 mm

Camera head: ..... $\varnothing$  27 x 70 mm

Camera cable: .....3.80 Meters

WEIGHTS:

Controller: .....2 kg

Camera head: .....approx. 80 g

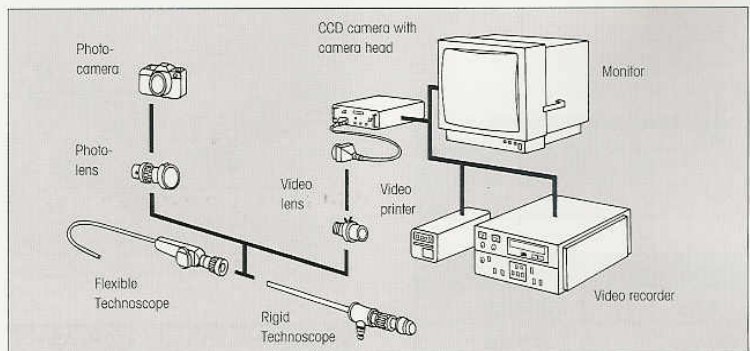
Camera cable: .....approx. 250 g

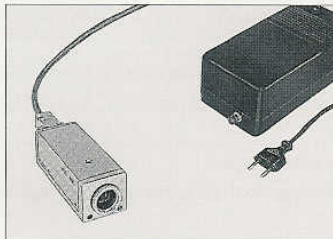
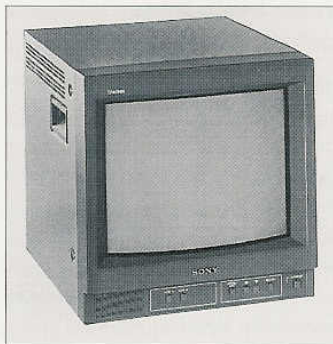
### TECAM-1 CCD-colour video camera

Camera head with C-mount and 3.8 m cable, camera control unit, BNC video cable, Y/C-video cable, remote control cable, and power cable, compl. (without obj. lens):

PAL colour system: .....1.55110.001

NTSC colour system: .....1.55110.601





**High-resolution CCD Colour Camera with:**

- 1/2" CCD image sensor
- 440.000 pixels (752 h x 582 v)
- PAL (BNC) and Y/C outputs (S-VHS)
- 460 horizontal lines resolution
- 5 lux sensitivity (f=1.4)
- 15 dB additional gain
- automatic or manual white balance
- C-mount connector
- 12 V direct current (without power unit)

<b>Order no.</b>	1.53520.00
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Desk-top power unit 12 V direct current, 230 V / 50 Hz, video signal and power supply via one cable (video signal output to monitor on desk-top power unit)

<b>Order no.</b>	1.53520.95
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**36 cm Colour Monitor, High Resolution, (SONY PVM 14N1) with Fine-pitch Trinitron Tube**

The tube provides an extremely sharp and stable picture without colour distortion, integrated speakers.

- Resolution:**  
500 lines
- Inputs:**  
BNC (PAL), Y/C (S-VHS)
- Colour Standards:**  
PAL/SECAM/NTSC
- Colour Temperature:**  
6500 K

- Power Supply:**  
100-240 V/50/60 Hz
- Dimensions:**  
346 x 340 x 414 mm (W x H x D)
- Weight:** 15 kg
- Viewing Distance:**  
approx. 1.2 - 1.6 m

<b>Order no.</b>	5370.371
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**Video Lenses**

RIWO lens with focus adjustment and C-mount connector



Focal distance	Order no.
f = 38 mm	4.85261.382
f = 32 mm	4.85261.322
f = 27 mm	4.85261.272
f = 24 mm	4.85261.242
f = 21 mm	4.85261.212
f = 17 mm	4.85261.172

RIWO zoom lens with focus adjustment, C-mount connector.



Focal distance	Order no.
f = 27 - 36 mm	4.85261.501

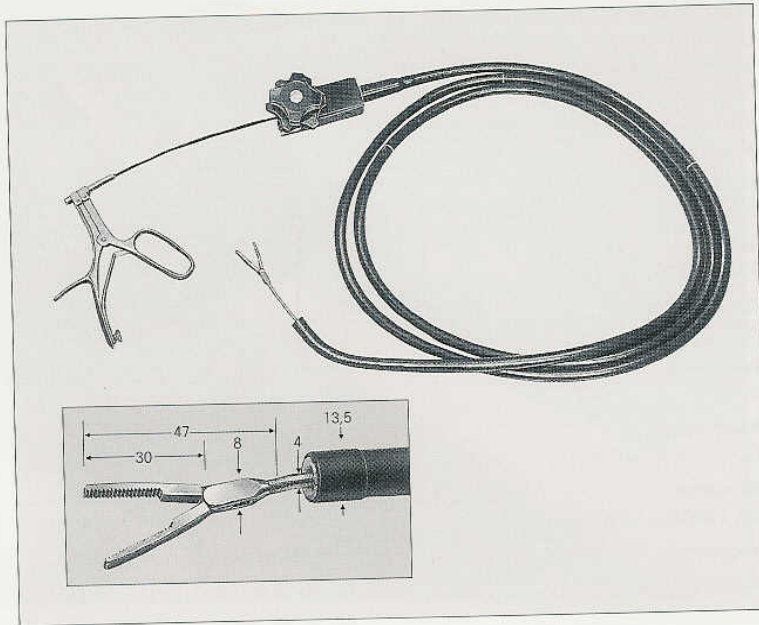
**Filter Thread Adapter**

For connection of all WOLF-Borescopes on any camera with a filter thread mount on the objective lens.



Filter thread mount	Order no.
28 mm	1.52091.28
37 mm	1.52091.37
43 mm	1.52091.43
49 mm	1.52091.49
52 mm	1.52091.52
55 mm	1.52091.55
58 mm	1.52091.58

# Grasping Devices, Supporting Arm



## Flexible Grasping Devices

(without optic)

These flexible grasping devices consist of a flexible control section and a flexible grasper. The device is used to grasp and retrieve objects at a distance in inaccessible locations. The tip of the device can be steered in four directions up-down and left right each 90° using the control handle. The flexible grasper can be moved 250 mm backwards or forwards in the control device. Due to the long diameter of the grasper, it is, however, not possible to pull it through the outer jacket.

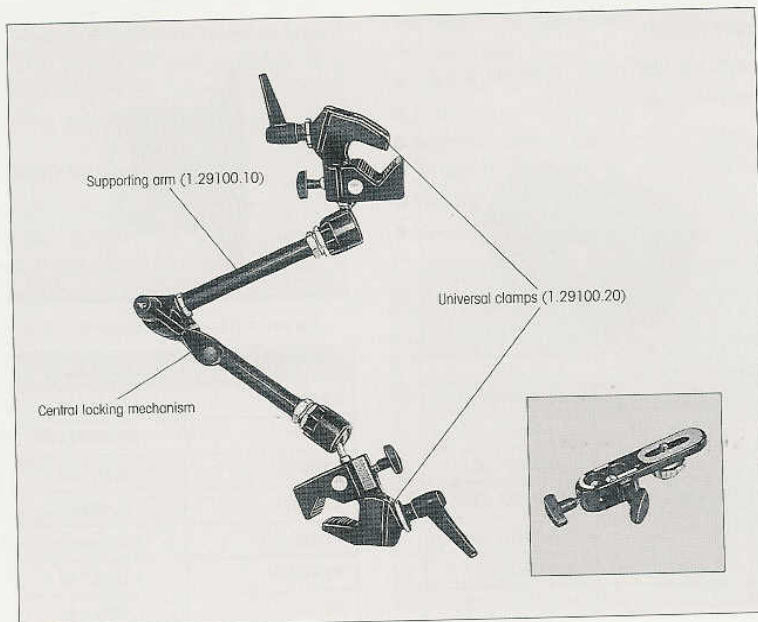
Flexible control device, working length 6000 mm, diameter 13.5 mm ..... 1.14600.00

Flexible grasper, working length 6500 mm ..... 1.50650.08

Flexible control device, working length 4000 mm, diameter 13.5 mm ..... 1.14400.00

Flexible grasper, working length 4500 mm ..... 1.50450.08

Further graspers for flexible Technoscopes available on request.



## Supporting Arm

Supporting arm with central locking device for three joints, incl. two universal clamps (can be clamped to objects from 6 to 55 mm wide), incl. rubber protector in each jaw, complete ..... 1.29100.00

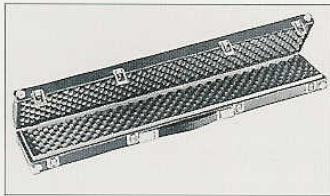
## Camera Mounting Device

For the supporting arm above, instead of a universal clamp, to mount a camera with a 1/4" screw thread ..... 1.29100.30

# Transport and Storage Cases

## Transport and Storage Cases

for Technoscopes, angled attachments, lenses or cables, lockable. Exterior black imitation leather, interior foam rubber inlays.



Inner dimensions LxWxH mm	Order no.
500 x 120 x 60	3.13000.05
850 x 120 x 60	3.13000.07
1150 x 120 x 60	3.13000.11
1500 x 120 x 60	3.13000.15
1800 x 120 x 60	3.13000.18

## Transport and Storage Case

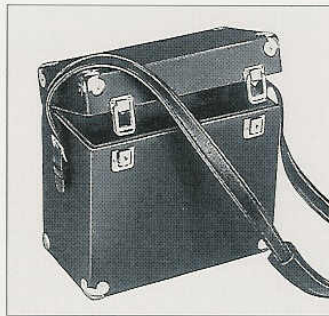
for maximum of three Technoscopes, 1 angled attachment, light source and cable. Exterior plastic with aluminium reinforced edges and corners, interior foam rubber, lockable.



for Technoscopes	Order no.
up to 300 mm long	3.13000.03
up to 500 mm long	3.13000.06
up to 500 mm long	3.13000.09
up to 715 mm long	3.13000.08

## Shoulder Case

for light sources. Exterior black imitation leather with metal corner protectors, strap, inner case for light guide, lockable.



For light sources	Order no.
1.40230.00	3.40150.90

## Transport and Storage Case

for light sources, lockable. Exterior aluminium or imitation leather with metal corners.



For light sources	Order no.
1.40171.00	3.40171.90
TLP-1	3.51210.90

## Transport and Storage Case

for flex. Technoscope TF, light sources, angled attachment and support arm.



For light sources	Order no.
1.40230.00	
1.40171.00	3.13002.07
TLP-1	

Cases for your special equipment on request.

**VisionScope Technologies**  
IMAGING & INSPECTION CONSULTANTS

Inspection Optics Ltd

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TECHNOSCOPE

**JOEL**

**MORITEX**  
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