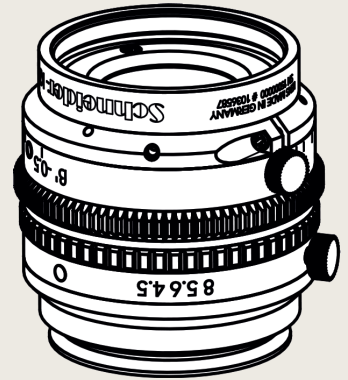


# Macro Varon 4.5/85

The Macro Varon lens has been designed for high resolution 12k line scan cameras with 3.5  $\mu\text{m}$  pixel pitch. They are optimized for an optical magnification range of 0.5x to 2.0x. CAS-lens technology produces uniform high performance over the entire magnification range. A special design ensures a constant focal length at any magnification. Complete elimination of inherent vignetting effects yields to homogeneous intensity over the entire field. The Macro Varon lens is designed for industrial machine vision applications and improves the overall system performance of high resolution inspection processes. A lockable iris adjustment mechanism ensures system stability, even in the presence of vibration. This lens is efficient for many web and other surface inspection applications as FPD and PCB inspection. A 3.5x magnification version with beam splitter is also available.



Macro Varon 4.5/85

## Key features

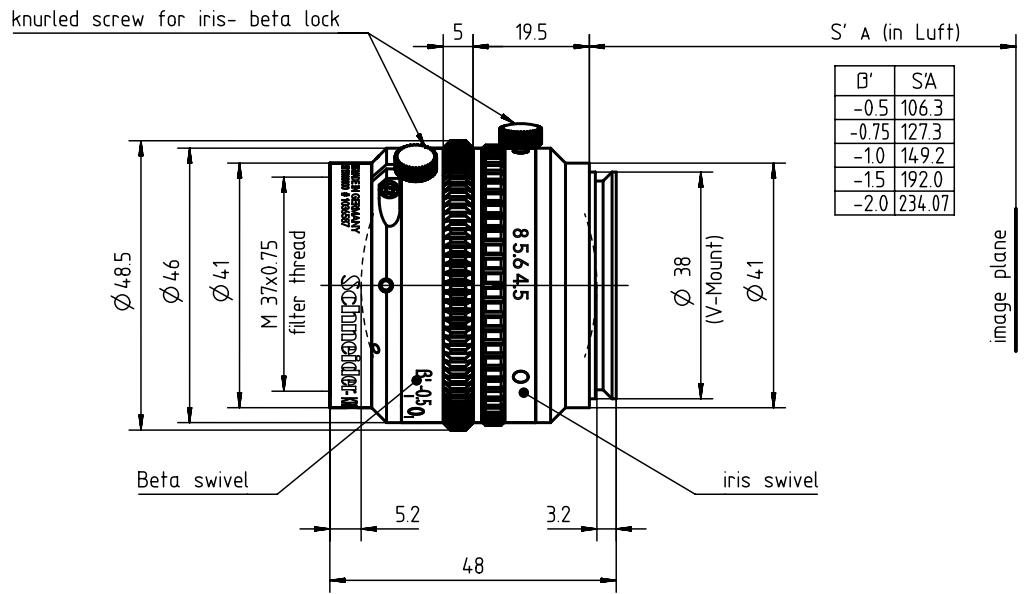
- For 12k line scan sensors with 3.5  $\mu\text{m}$  pixel sizes
- Magnification range using a single lens from 0.5x to 2.0x
- CAS – Continuous Aberration Suppression
- Maintains diffraction-limited performance over the entire magnification range
- Low distortion
- 400 nm to 1000 nm broadband AR coating
- V-Mount connection

Name	Macro Varon 4.5/85
Type	-0018
Focal Length [mm]	85
Magnification	-1
Image circle [mm]	62
Resolution [ $\mu\text{m}$ ]	5
F/# range	4.5 ... 8
NA	0.11
Interface	V38-Mount
Working distance [mm]	103
AoV [°]	40
Focus control	manual
Transmission [nm]	400 - 1000
Filter thread [mm]	M37 x 0.75
Dimensions L x D [mm]	48.0 x 48.5

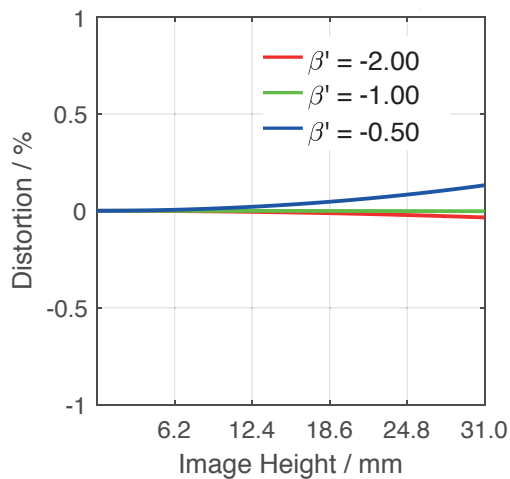
## Applications

- Web and surface inspections
- FPD inspection
- PCB inspection
- OLED inspection
- Line scan applications

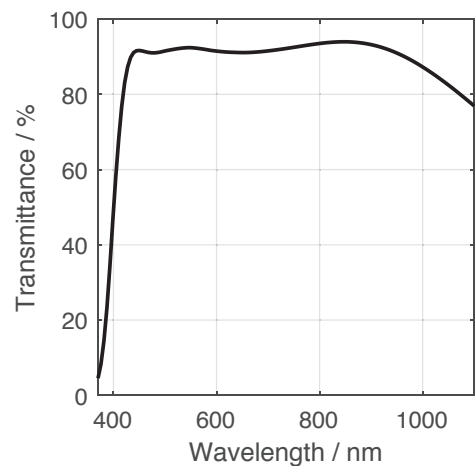
Name	Macro Varon 4.5/85
Weight [g]	270
Storage temperature [°C]	-25 ... +70
$f'_{\text{eff}}$ [mm]	85.13
$S_F$ [mm]	-62.44
$S'_F$ [mm]	63.38
HH' [mm]	-4.91
$\beta'_P$	1.008
$S_{EP}$ [mm]	22.02
$S'_{AP}$ [mm]	-22.62
$\Sigma d$ [mm]	39.52
ID	1072517



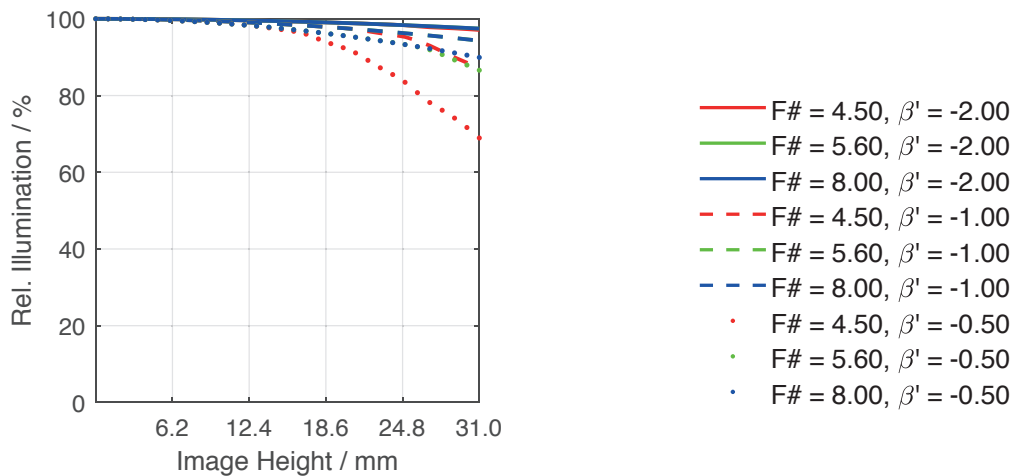
## Distortion vs. Image Height



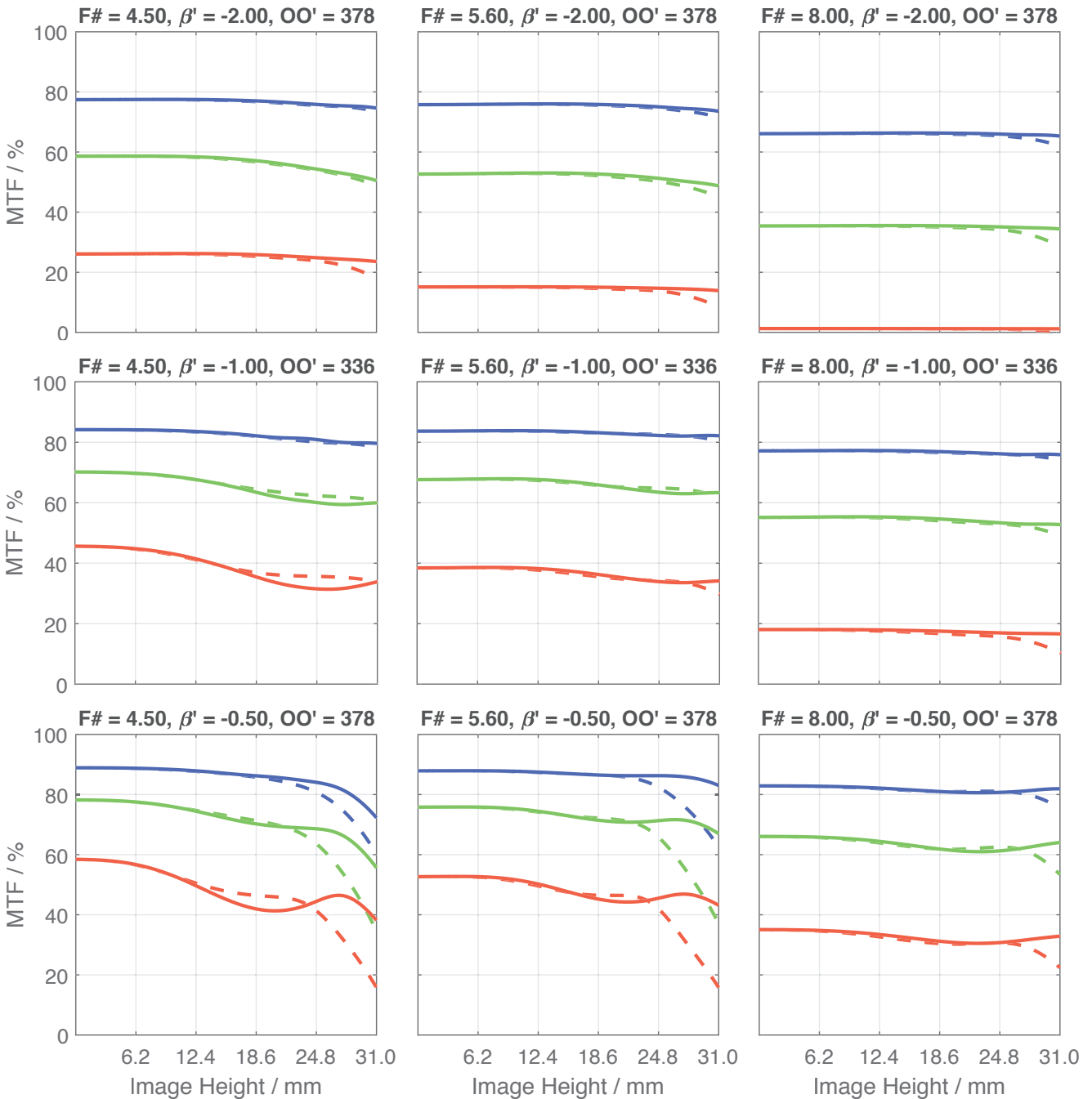
## Transmittance vs. Wavelength



## Relative Illumination vs. Image Height



Spectrum Name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Weights	8	16	23	22	19	13



- - - 20.0 lp/mm, tangential    - - - 40.0 lp/mm, tangential    - - - 80.0 lp/mm, tangential  
 ——— 20.0 lp/mm, radial        ——— 40.0 lp/mm, radial        ——— 80.0 lp/mm, radial

Accessories	Mount	Length	ID
Macro	UNIFOC 12 V38 / V38	-	11726
	UNIFOC 7 V38 / V38	-	1001041
	UNIFOC 7 V38 / M58 x 0.75	-	1054532
Ext. Tube	T2 / T2	6 mm	41643
	M58 x 0.75	8 mm	13051
	M58 x 0.75	10 mm	13050
	M72 x 0.75	25 mm	1072420
	M72 x 0.75	50 mm	1072421
	M72 x 0.75	75 mm	26406
Adapter	V38 / C-Mount	-	20052
	V38 / C-Mount Hub	19.2 - 24.2 mm	1011634
	V38 / Leica (M39 x 26 Gg.)	-	20054
	V38 / T2 (M42 x 0.75)	-	20053
	V38 / M42 x 1	-	20059
	V38 / M42 x 1	35 mm	1001692
	V38 / M58 x 0.75	-	1018385
	V38 / Nikon F-Mount	-	21610

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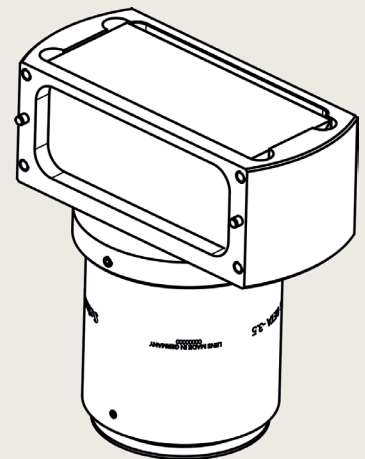
# Macro Varon 4.5/85

With beam splitter



The Macro Varon 4.5/85 with beam splitter is designed to be used in line scan applications where coaxial illumination is required. The 60 mm beam splitter cube offers the opportunity to create an in-line illumination for high reflective objects. Coaxial illumination is ideal for demanding circuit boards and other high resolution applications where a bright, diffuse uniform illumination is needed. This lens offers a high optical performance at a 3.5x magnification over the entire field.

The lens design considers the optical glass path of the high quality beam splitter to achieve a top performance. Lens and beam splitter assembly are precisely aligned to each other, so that a maximum of light is captured and directed to the image plane of 12 k cameras with 5µm pixel size, with almost no loss at the image edges. Also available without beam splitter with 0.5x to 2.0x variable magnification.



Macro Varon 4.5/85

## Key features

- Optimized for 12 k cameras with 5 µm pixel sizes
- 3.5x magnification
- Separate azimuth alignment of beam splitter and lens
- V-Mount connection

## Applications

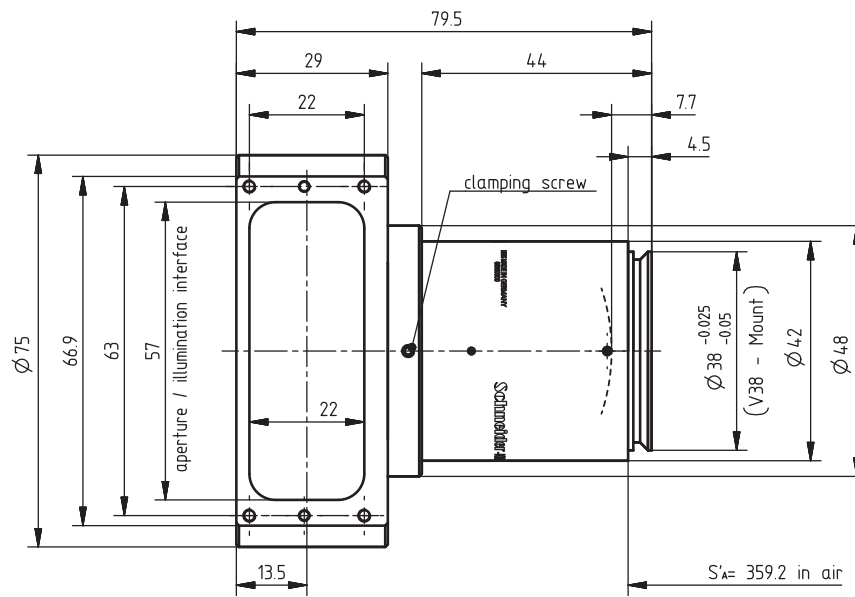
- BCB inspection
- Flat glass inspection
- Wafer inspection
- Line scan applications

Name	Macro Varon 4.5/85
Type	-0017
Focal Length [mm]	85
Magnification	-3.5
Image circle [mm]	62
Resolution [µm]	-
F/# range	4.5 ... 8
NA	0.03
Interface	V38-Mount
Working distance [mm]	95
AoV [°]	9
Focus control	manual
Transmission [nm]	400 - 1000
Filter thread [mm]	-
Dimensions L x D [mm]	79.5 x 75.0

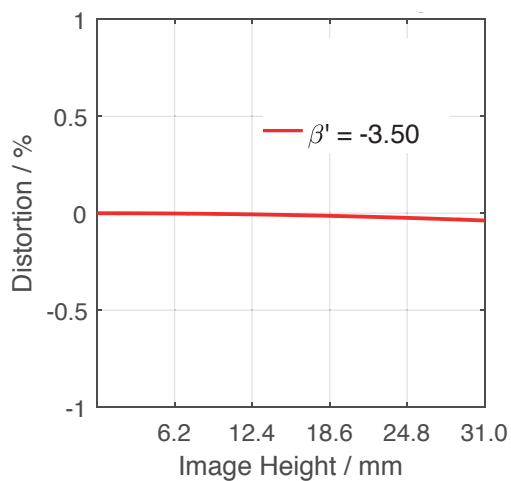
Name	Macro Varon 4.5/85
Weight [g]	410
Storage temperature [°C]	-25 ... +70
$f'_{\text{eff}}$ [mm]	85.18
$S_F$ [mm]	-68.85
$S'_{F'}$ [mm]	64.36
HH' [mm]	3.13
$\beta'_p$	1.037
$S_{EP}$ [mm]	48.28
$S'_{AP}$ [mm]	-24.20
$\Sigma d$ [mm]	40.28
ID	1069837

# Macro Varon 4.5/85

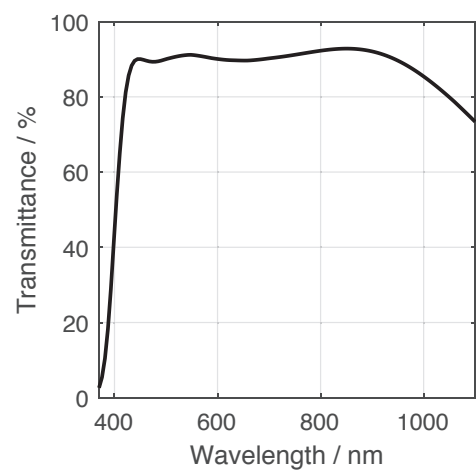
With beam splitter



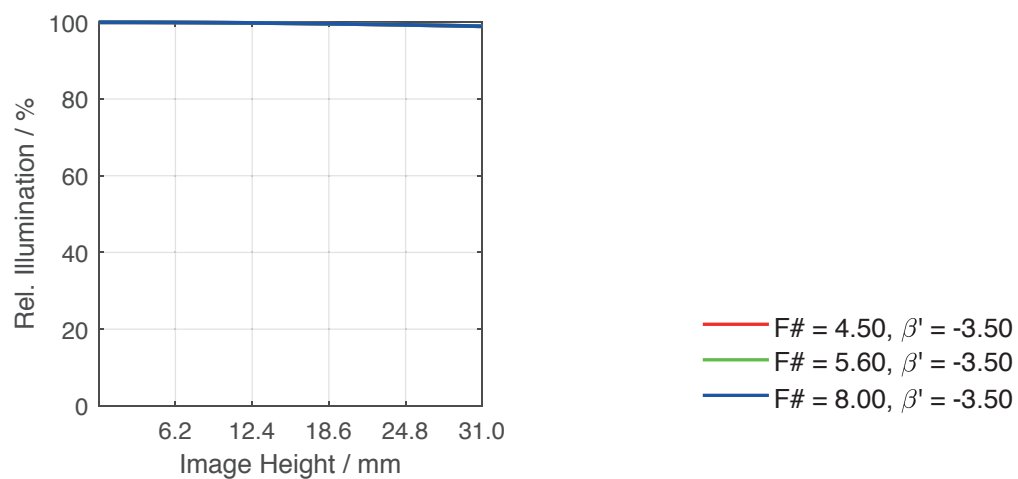
## Distortion vs. Image Height



## Transmittance vs. Wavelength



## Relative Illumination vs. Image Height

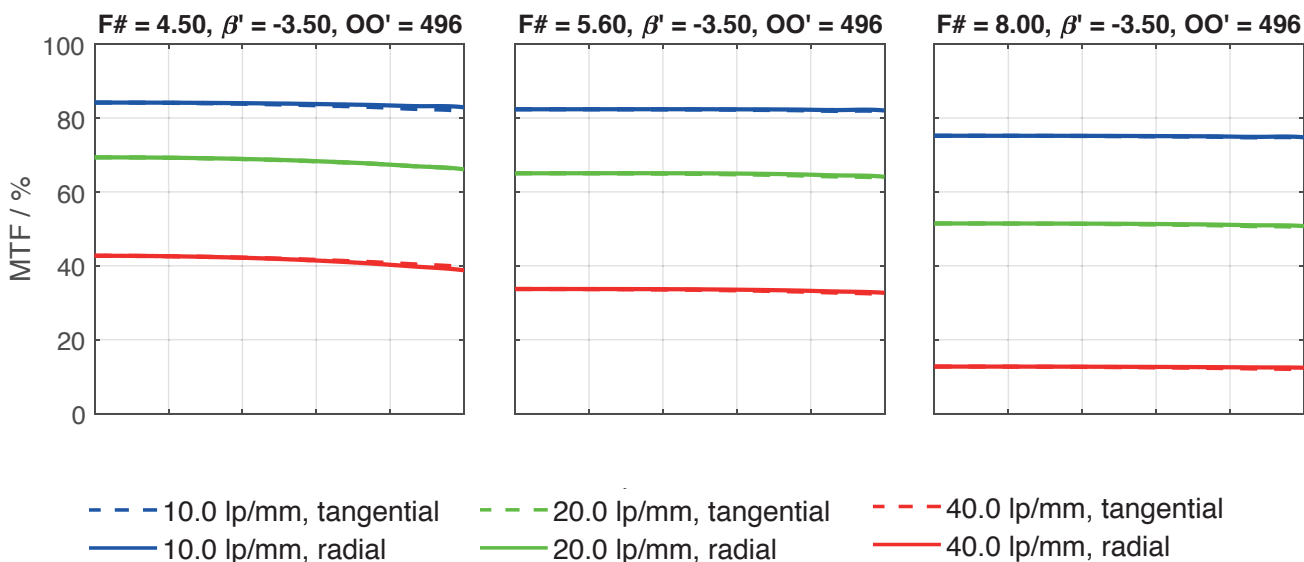


# Macro Varon 4.5/85

With beam splitter



Spectrum Name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Weights	8	16	23	22	19	13





# Macro Varon 4.5/85

With beam splitter



Accessories	Mount	Length	ID
Makro	UNIFOC 12 V38/V38	-	11726
	UNIFOC 7 V38/V38	-	1001041
	UNIFOC 7 (M58 x 0.75)	-	1054532
Ext. Tube	V38 / V38	6 mm	20176
	V38 / V38	8 mm	20177
	V38 / V38	10 mm	20178
	V38 / V38	25 mm	20179
	V38 / V38	50 mm	20154
	V38 / V38	75 mm	20155
Adapter	V38 / C-Mount	-	20052
	V38 / C-Mount Hub 19.2 - 24.2 mm	-	1011634
	V38 / Leica (M39 x 26 Gg.)	-	20054
	V38 / T2 (M42 x 0,75)	-	20053
	V38 / M42 x 1	-	20059
	V38 / M42 x 1 - Length 35 mm	-	1001692
	V38 / M58 x 0,75	-	1018385
	V38 / Nikon F-Mount	-	21610

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