

Zeiss Industrial Telecentric Optics

Telecentric VISIONMES® Lens Systems and Module (TVM)
for industrial image processing



Content

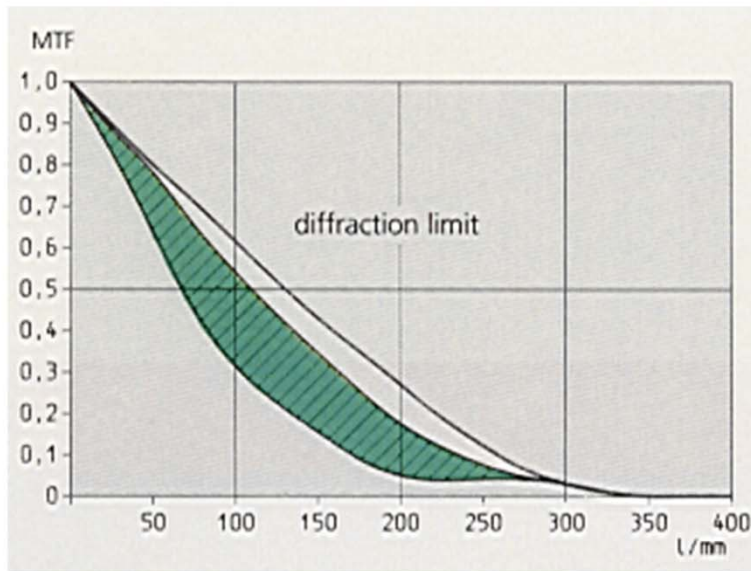
Telecentric VISIONMES® lenses

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General Information

Telecentric VISIONMES[®] lenses

The polychromatic MTF curves of all VISIONMES lenses covers the hatched area.



Spectral range:
480 nm...690 nm

Imaging performance:
Excellent, close to diffraction limit

Camera mounts:
C-mount for image fields up to 18 mm
(1/2", 2/3", 1")

Distortion (image side)
The distortion is $\leq 3\mu\text{m}$ for the total image field for lens types ≤ 150 mm object field

The distortion is $\leq 5\mu\text{m}$ for the total image field for lens types 150 mm, 225 mm, 300 mm object field.

Temperature range of operation
 $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($\sim 70^{\circ}\text{F} \pm 10^{\circ}\text{F}$)

Definition of Telecentric Range:

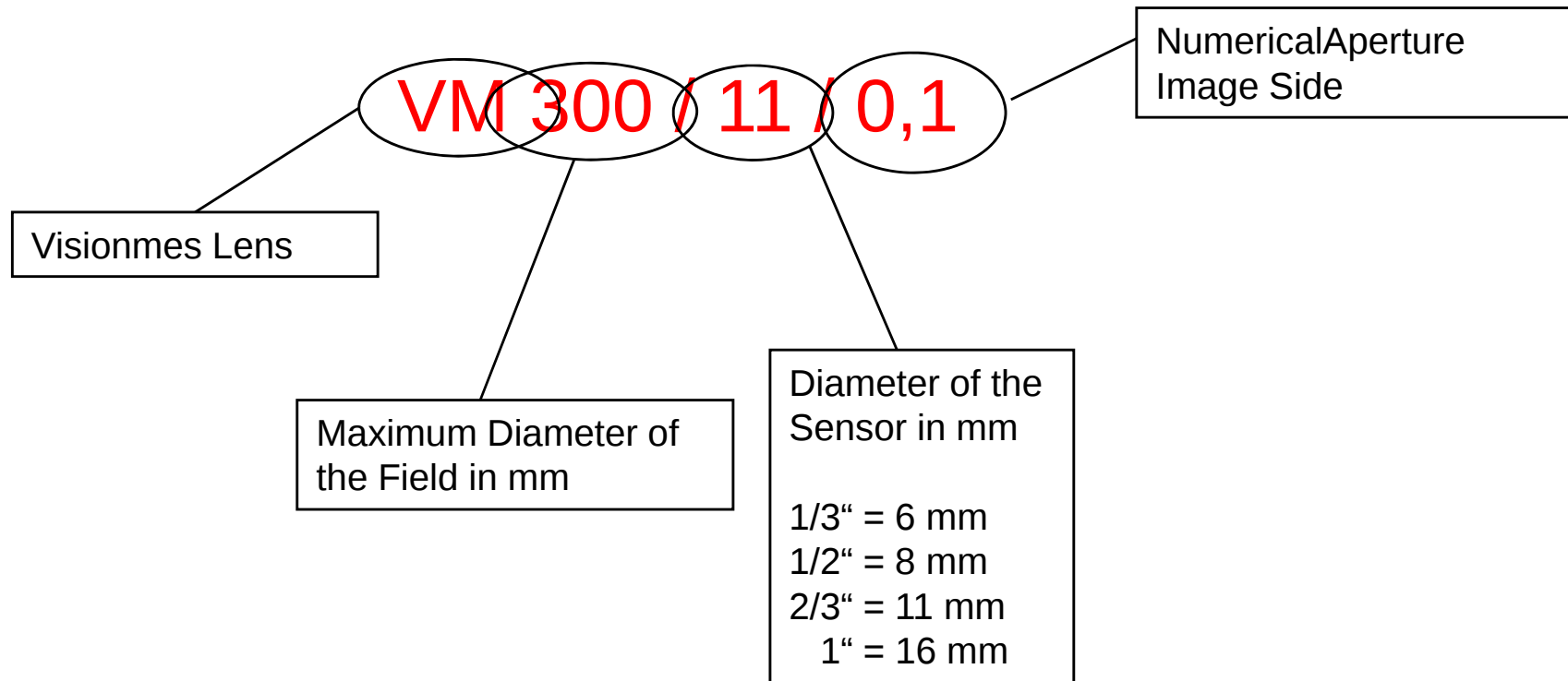
Range of axial displacement causing a variation in image size by less than $1\mu\text{m}$

Calculation of Depth of Field:

Assuming Circle of Confusion of $50\mu\text{m}$

Nomenclature

Telecentric VISIONMES® lenses



General Overview

Telecentric VISIONMES® lenses

Carl Zeiss Telecentric Visionmes Lenses

Lens Name			CCD	Free WD ¹⁾	Telecentric Range (2)	Depth of Field (1)	Imaging Scale	Mag.	WD OO' ¹⁾	Max. imaged Object Size / Measured Field (Calculated)		Distorsion [%]	Sensible Pixel size (Calc.) [µm]
Object Field Ø	Image Field Ø	Image Aperture	Chip Size	S [mm]	T [mm]	[mm]		IF : OF	[mm]	Height [mm]	Width [mm]		
18 /	6 /	0,1	1/3"	66	± 10	± 3	1 : 3,0	0,33	300.0	10,8 x 14,4		0,05%	4,8
35 /	6 /	0,1	1/3"	67	± 2.5	± 7.5	1 : 5,8	0,17	188.0	21 x 28		0,05%	2,4
70 /	6 /	0,1	1/3"	113	± 13	± 25	1 : 11,7	0,09	339.0	42 x 56		0,05%	2,4
105 /	6 /	0,1	1/3"	183	± 16	± 50	1 : 17,5	0,06	487.5	63 x 84		0,05%	2,4
11 /	8 /	0,01	1/2"	160	± 9	± 6	1 : 1,4	0,73	288.5	6,6 x 8,8		0,04%	24
35 /	8 /	0,1	1/2"	64	± 2	± 4	1 : 4,4	0,23	192.0	21 x 28		0,04%	2,4
70 /	8 /	0,1	1/2"	103	± 10.5	± 16	1 : 8,8	0,11	335.4	42 x 56		0,04%	2,4
105 /	8 /	0,1	1/2"	171	± 12	± 33	1 : 13,1	0,08	484.0	63 x 84		0,04%	2,4
150 /	8 /	0,1	1/2"	228	± 35	± 75	1 : 18,8	0,05	527.0	90 x 120		0,06%	2,4
225 /	8 /	0,1	1/2"	342	± 55	± 165	1 : 28,1	0,04	807.0	135 x 180		0,06%	2,4
300 /	8 /	0,1	1/2"	456	± 75	± 300	1 : 37,5	0,03	1126	180 x 240		0,06%	2,4
11 /	11 /	0,02	2/3"	54	± 2.5	± 1.25	1 : 1,0	1,00	187.3	6,6 x 8,8		0,03%	12
13 /	11 /	0,01	2/3"	66	± 2	± 1	1 : 1,2	0,85	188.8	7,8 x 10,4		0,03%	24
22 /	11 /	0,05	2/3"	66	± 2.5	± 2	1 : 2,0	0,50	263.0	13,2 x 17,6		0,03%	4,8
22 /	11 /	0,05	2/3"	56	± 5	± 2	1 : 2,0	0,50	218.7	13,2 x 17,6		0,03%	4,8
35 /	11 /	0,1	2/3"	59	± 1.4	± 2	1 : 3,2	0,31	192.0	21 x 28		0,03%	2,4
70 /	11 /	0,1	2/3"	75	± 8	± 9	1 : 6,4	0,16	311.0	42 x 56		0,03%	2,4
105 /	11 /	0,1	2/3"	121	± 10	± 20	1 : 9,5	0,10	436.5	63 x 84		0,03%	2,4
150 /	11 /	0,1	2/3"	168	± 25	± 38	1 : 13,6	0,07	472.0	90 x 120		0,05%	2,4
225 /	11 /	0,1	2/3"	252	± 40	± 90	1 : 20,5	0,05	721.0	135 x 180		0,05%	2,4
300 /	11 /	0,1	2/3"	335	± 55	± 150	1 : 27,3	0,04	1009	180 x 240		0,05%	2,4
70 /	16 /	0,1	1"	55	± 4	± 4	1 : 4,4	0,23	291.0	42 x 56		0,02%	2,4
150 /	16 /	0,1	1"	113	± 20	± 17	1 : 9,4	0,11	420.0	90 x 120		0,03%	2,4
225 /	16 /	0,1	1"	175	± 30	± 40	1 : 14,1	0,07	643.5	135 x 180		0,03%	2,4
300 /	16 /	0,1	1"	230	± 40	± 60	1 : 18,8	0,05	907.0	180 x 240		0,03%	2,4
8 /	16 /	0,08	1"	50	± 1	± 0.1	2 : 1	2,00	263.0	4,5 x 6		0,02%	3,0
16 /	16 /	0,1	1"	92	± 2	± 0.2	1 : 1	1,00	365.0	9,5 x 12,5		0,03%	2,4
32 /	16 /	0,1	1"	78	± 4	± 0.8	2 : 1	2,00	263.0	19 x 25		0,03%	2,4
6 /	18 /	0,029	-	85	± 1	± 0.1	3 : 1	3,00	331.8	4 x 4		0,02%	8,2

a) Lens will be manufactured on request, minimum volume necessary

b) Available with 90° bended view

c) Lenses with variable aperture stop

(1) Valid at focal distance 17,52 mm (C-Mount) / Calculated for 50 µm Circle of Confusion

(2) Max. change of image size within T is 1 µm.

Spectral Range for all lenses 480 - 690 nm

Telecentric Lenses

Available from Stock

Zeiss Telecentric Visionmes Lenses

Lens Name			CCD	Free WD ¹⁾	Telecentric Range (2)	Depth of Field (1)	Imaging Scale	Mag.	WD OO' ¹⁾	Max. imaged Object Size / Measured Field (Calculated)		Distorsion [%]	sensible Pixel size (Calc.) [µm]
Object Field Ø	Image Field Ø	Image Aperture	Chip Size	S [mm]	T [mm]	[mm]		IF : OF	[mm]	Height [mm]	Width [mm]		
18 /	6	/ 0,1	1/3"	66	± 10	± 3	1 : 3,0	0,33	300.0	10,8 x 14,4		0,05%	4,8
35 /	6	/ 0,1	1/3"	67	± 2.5	± 7.5	1 : 5,8	0,17	188.0	21 x 28		0,05%	2,4
70 /	6	/ 0,1	1/3"	113	± 13	± 25	1 : 11,7	0,09	339.0	42 x 56		0,05%	2,4
35 /	8	/ 0,1	1/2"	64	± 2	± 4	1 : 4,4	0,23	192.0	21 x 28		0,04%	2,4
70 /	8	/ 0,1	1/2"	103	± 10.5	± 16	1 : 8,8	0,11	335.4	42 x 56		0,04%	2,4
105 /	8	/ 0,1	1/2"	171	± 12	± 33	1 : 13,1	0,08	484.0	63 x 84		0,04%	2,4
150 /	8	/ 0,1	1/2"	228	± 35	± 75	1 : 18,8	0,05	527.0	90 x 120		0,06%	2,4 c)
11 /	11	/ 0,02	2/3"	54	± 2.5	± 1.25	1 : 1,0	1,00	187.3	6,6 x 8,8		0,03%	11,9
35 /	11	/ 0,1	2/3"	59	± 1.4	± 2	1 : 3,2	0,31	192.0	21 x 28		0,03%	2,4
70 /	11	/ 0,1	2/3"	75	± 8	± 9	1 : 6,4	0,16	311.0	42 x 56		0,03%	2,4
105 /	11	/ 0,1	2/3"	121	± 10	± 20	1 : 9,5	0,10	436.5	63 x 84		0,03%	2,4
150 /	11	/ 0,1	2/3"	168	± 25	± 38	1 : 13,6	0,07	472.0	90 x 120		0,05%	2,4 c)

c) Lenses with variable aperture stop

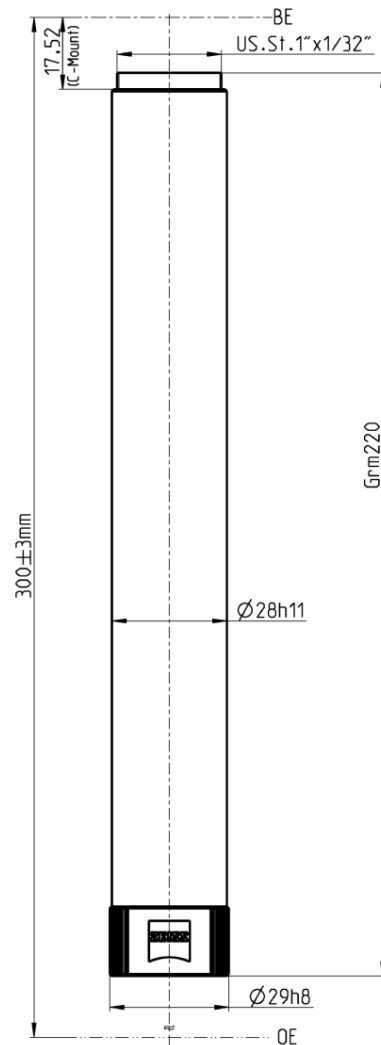
(1) Valid at focal distance 17,52 mm (C-Mount) / Calculated for 50 µm Circle of Confusion

(2) Max. change of image size within T is 1 µm.

Spectral Range for all lenses 480 - 690 nm

ZEISS Telecentric lens

VISIONMES® 18 / 6 / 0.05

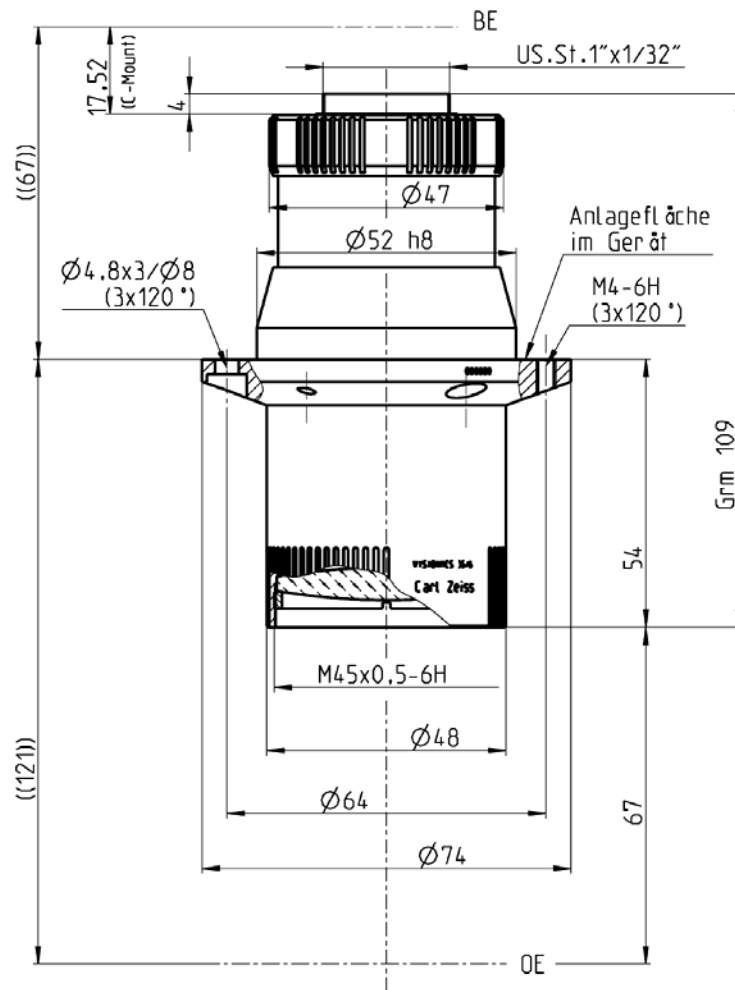


order number

000000-1374-648

Telecentric lens

VISIONMES® 35 / 6 / 0.1

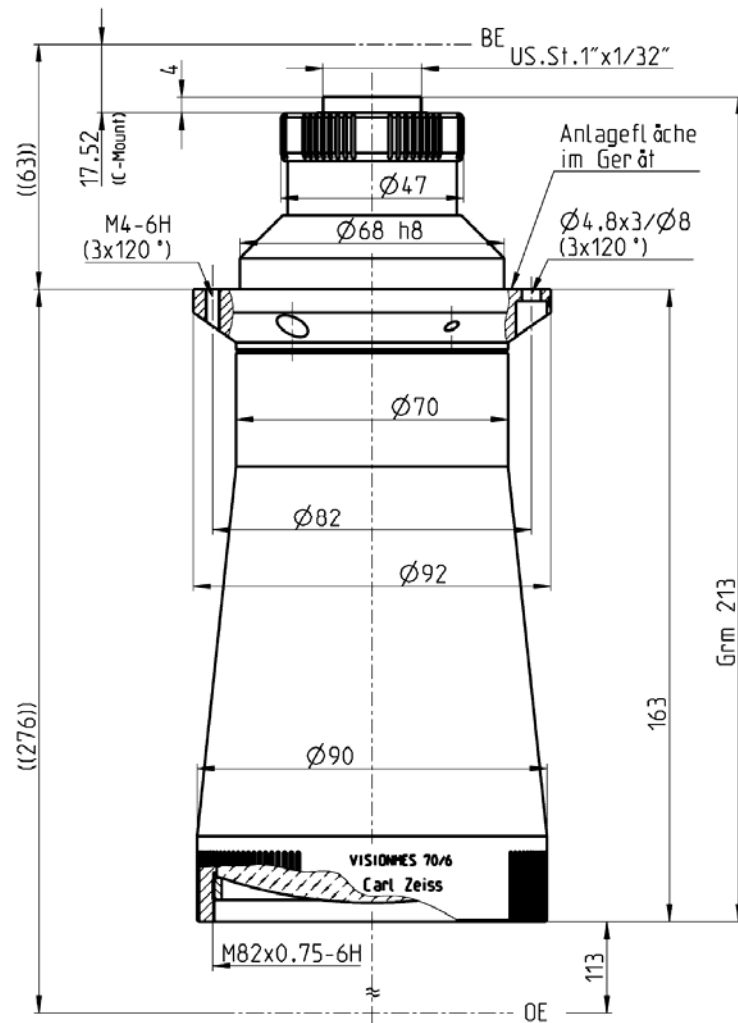


order number

265442-3861-726

Telecentric lens

VISIONMES® 70 / 6 / 0.1

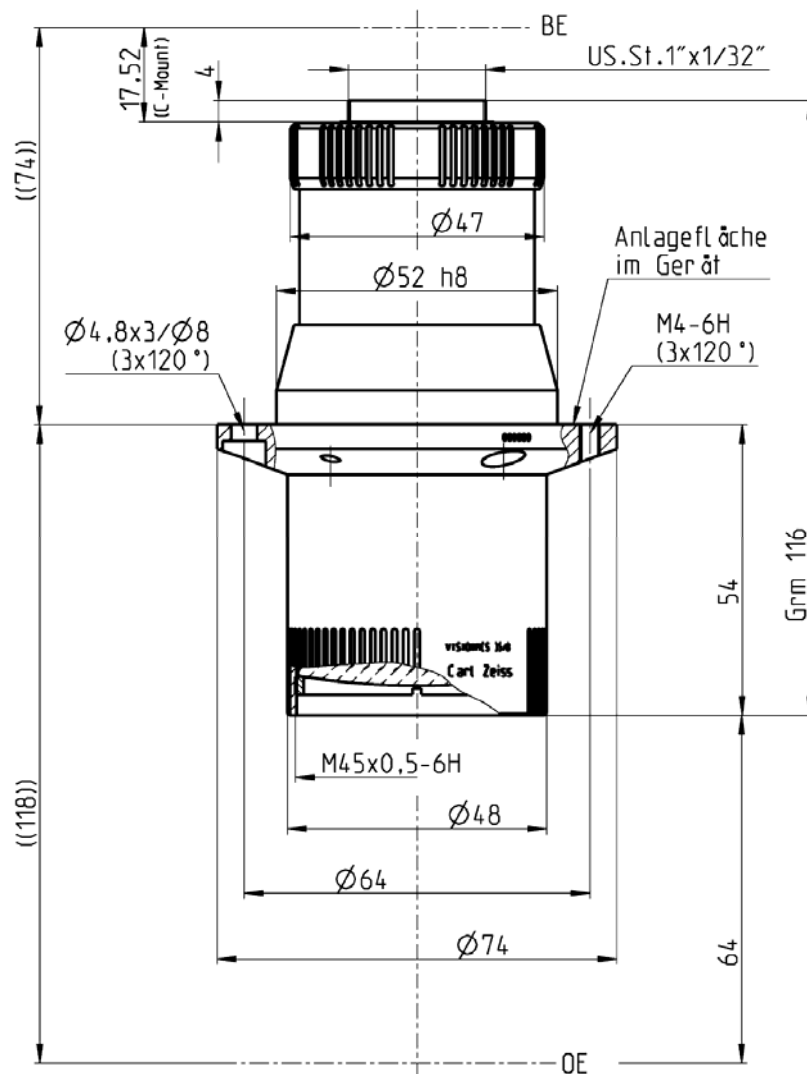


order number

265442-3851-726

Telecentric lens

VISIONMES® 35 / 8 / 0.1

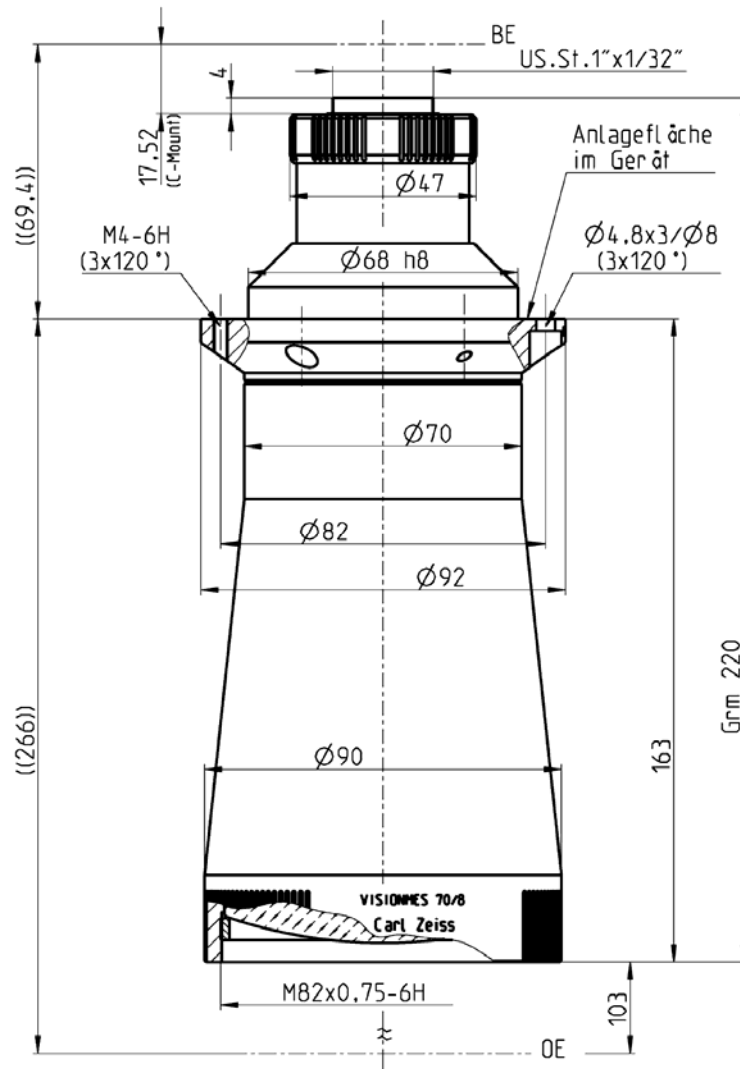


order number

265442-3861-626

Telecentric lens

VISIONMES® 70 / 8 / 0.1



order number

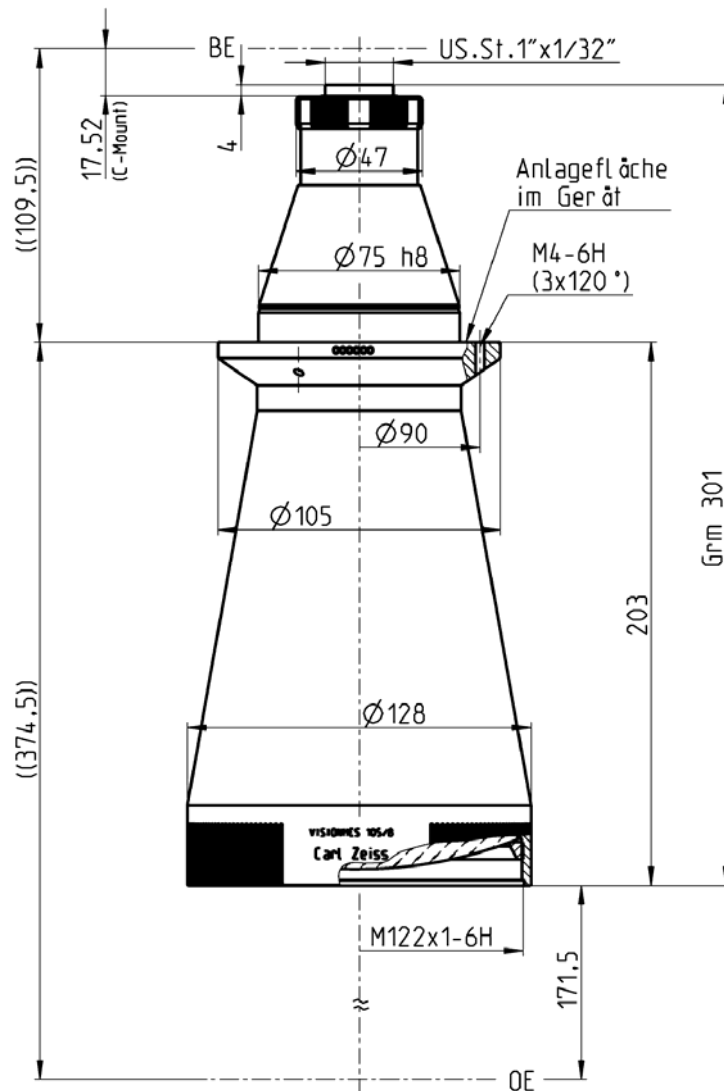
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Telecentric lens

VISIONMES® 105 / 8 / 0.1

order number

265442-3841-626

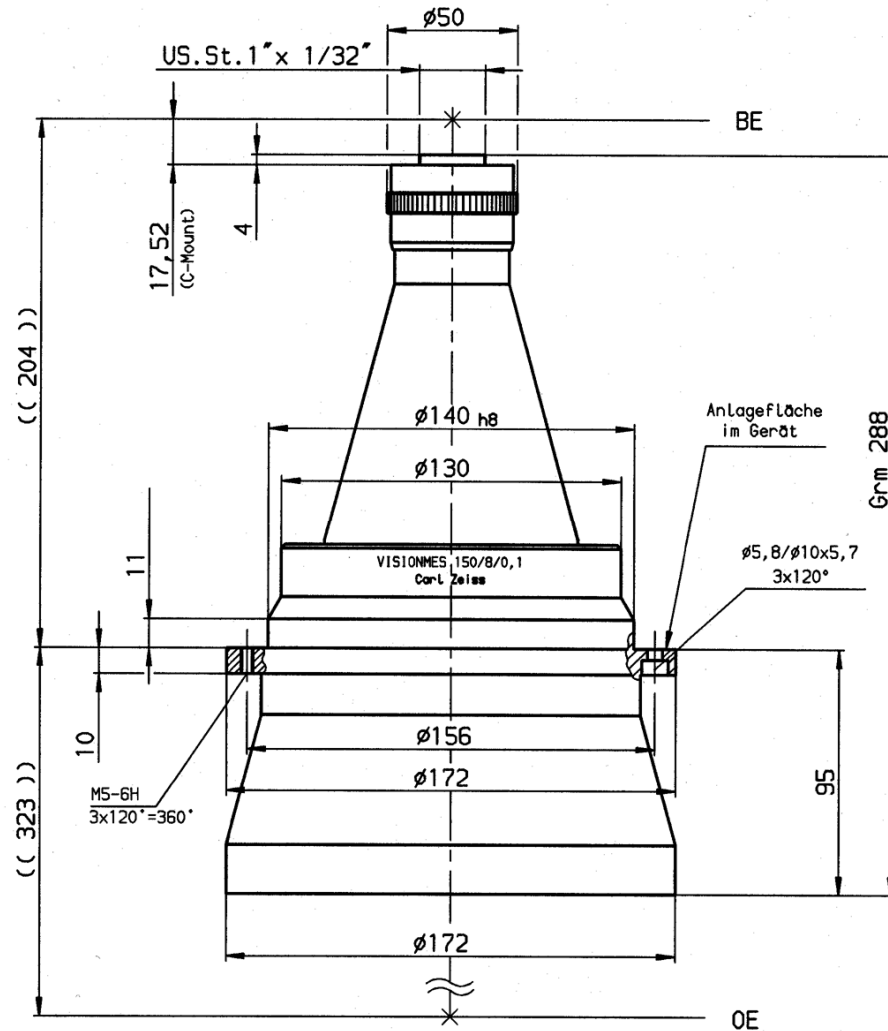


Telecentric lens

VISIONMES® 150 / 8 / 0.1

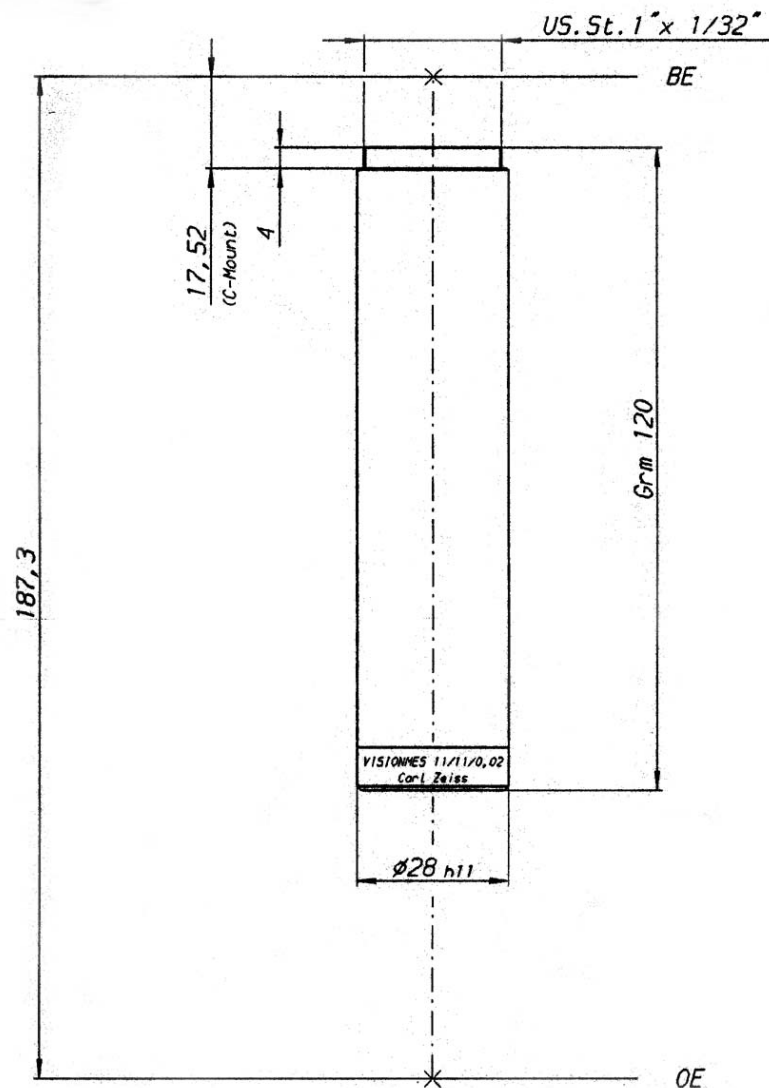
order number

265442-3830-326



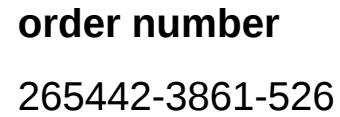
Telecentric lens

VISIONMES® 11 / 11 / 0.02

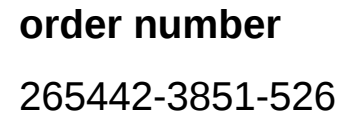


order number

265442-3903-126

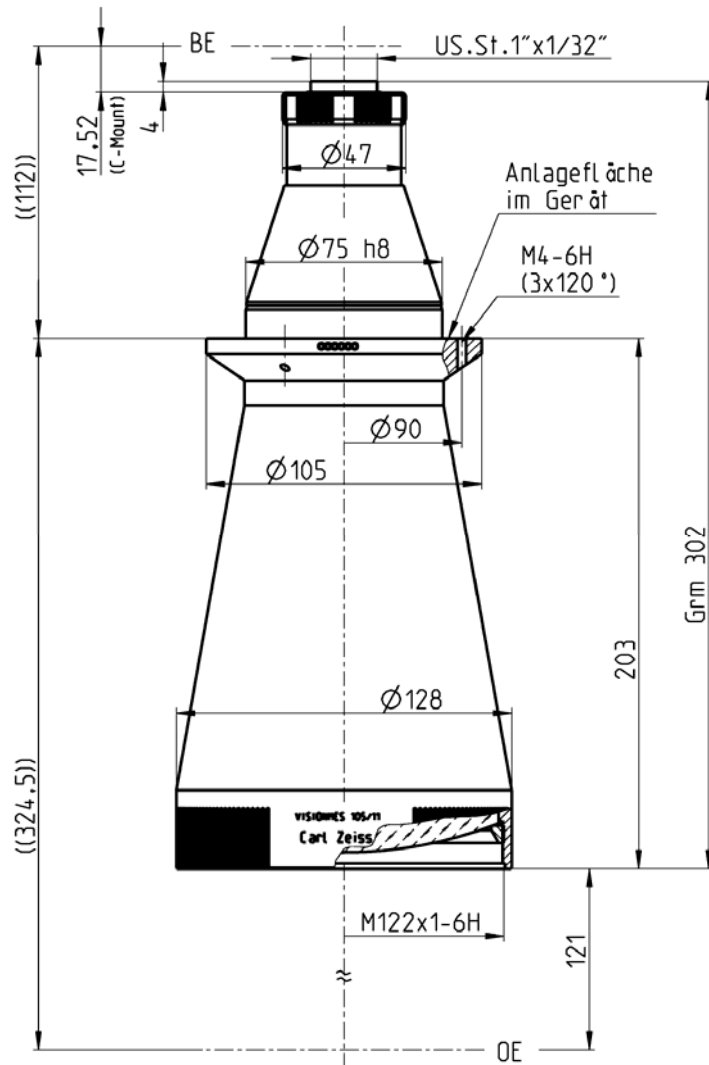


order number
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Telecentric lens

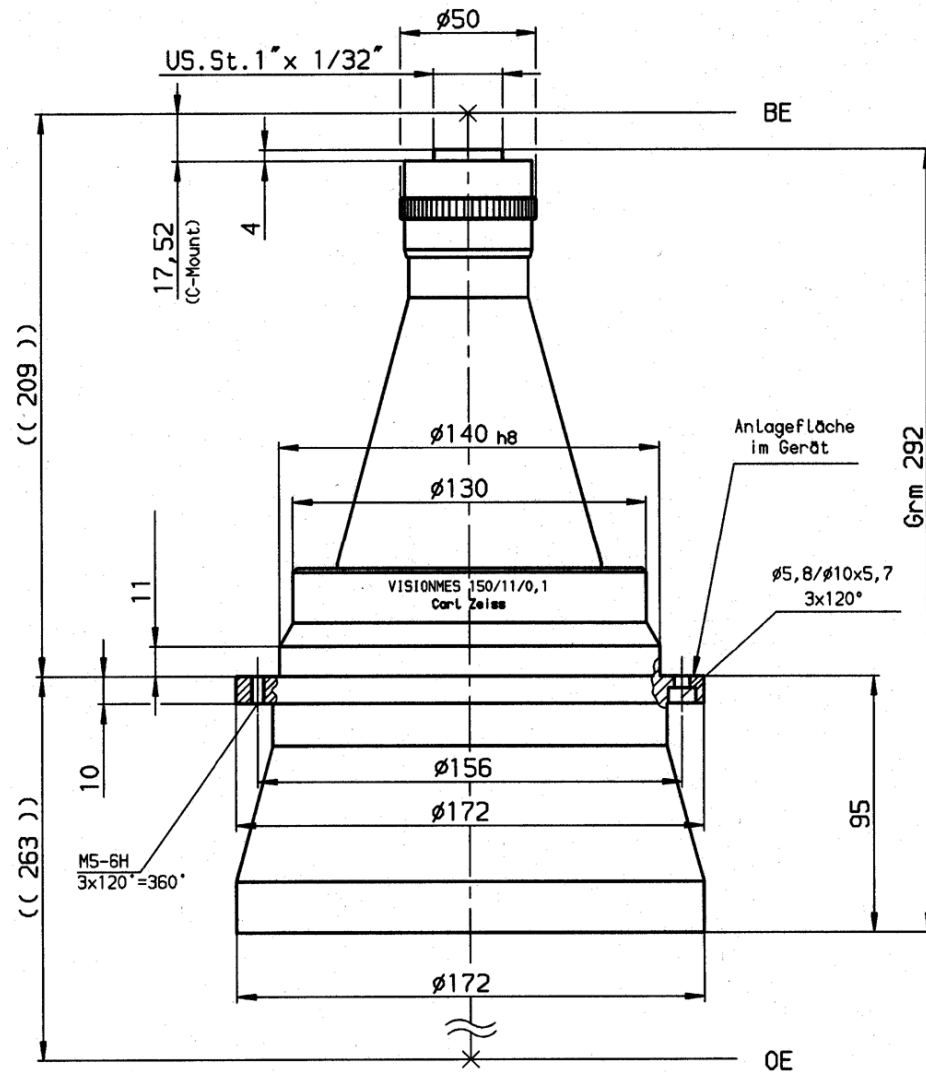
VISIONMES® 105 / 11 / 0.1



order number

265442-3841-526

265442-3830-226



Telecentric Lenses

Available only on special request

Zeiss Telecentric Visionmes Lenses

Lens Name			CCD Chip Size	Free WD ¹⁾ S [mm]	Telecentric Range (2) T [mm]	Depth of Field (1) [mm]	Imaging Scale	Mag. IF : OF	WD ¹⁾ [mm]	Max. imaged Object Size / Measured Field (Calculated)		Distorsion [%]	sensible Pixel size (Calc.) [µm]	
Object Field Ø	Image Field Ø	Image Aperture								Height [mm]	Width [mm]			
105 /	6	/ 0,1	1/3"	183	± 16	± 50	1 : 17,5	0,06	487.5	63 x 84		0,05%	2,4	a)
11 /	8	/ 0,01	1/2"	160	± 9	± 6	1 : 1,4	0,73	288.5	6,6 x 8,8		0,04%	24	b) a)
225 /	8	/ 0,1	1/2"	342	± 55	± 165	1 : 28,1	0,04	807.0	135 x 180		0,06%	2,4	c) a)
300 /	8	/ 0,1	1/2"	456	± 75	± 300	1 : 37,5	0,03	1126	180 x 240		0,06%	2,4	c) a)
13 /	11	/ 0,01	2/3"	66	± 2	± 1	1 : 1,2	0,85	188.8	7,8 x 10,4		0,03%	24	a)
22 /	11	/ 0,05	2/3"	66	± 2.5	± 2	1 : 2,0	0,50	263.0	13,2 x 17,6		0,03%	4,8	a)
22 /	11	/ 0,05	2/3"	56	± 5	± 2	1 : 2,0	0,50	218.7	13,2 x 17,6		0,03%	4,8	b) a)
225 /	11	/ 0,1	2/3"	252	± 40	± 90	1 : 20,5	0,05	721.0	135 x 180		0,05%	2,4	c) a)
300 /	11	/ 0,1	2/3"	335	± 55	± 150	1 : 27,3	0,04	1009	180 x 240		0,05%	2,4	c) a)
70 /	16	/ 0,1	1"	55	± 4	± 4	1 : 4,4	0,23	291.0	42 x 56		0,02%	2,4	a)
150 /	16	/ 0,1	1"	113	± 20	± 17	1 : 9,4	0,11	420.0	90 x 120		0,03%	2,4	c) a)
225 /	16	/ 0,1	1"	175	± 30	± 40	1 : 14,1	0,07	643.5	135 x 180		0,03%	2,4	c) a)
300 /	16	/ 0,1	1"	230	± 40	± 60	1 : 18,8	0,05	907.0	180 x 240		0,03%	2,4	c) a)
8 /	16	/ 0,08	1"	50	± 1	± 0.1	2 : 1	2,00	263.0	4,5 x 6		0,02%	3,0	c) a)
16 /	16	/ 0,1	1"	92	± 2	± 0.2	1 : 1	1,00	365.0	9,5 x 12,5		0,03%	2,4	c) a)
32 /	16	/ 0,1	1"	78	± 4	± 0.8	2 : 1	2,00	263.0	19 x 25		0,03%	2,4	c) a)
6 /	18	/ 0,029	-	85	± 1	± 0.1	3 : 1	3,00	331.8	4 x 4		0,02%	8,2	c) a)

a) Lenses only available on special request, minimum order volume necessary

b) Lenses available with 90° bended view

c) Lenses with variable aperture stop

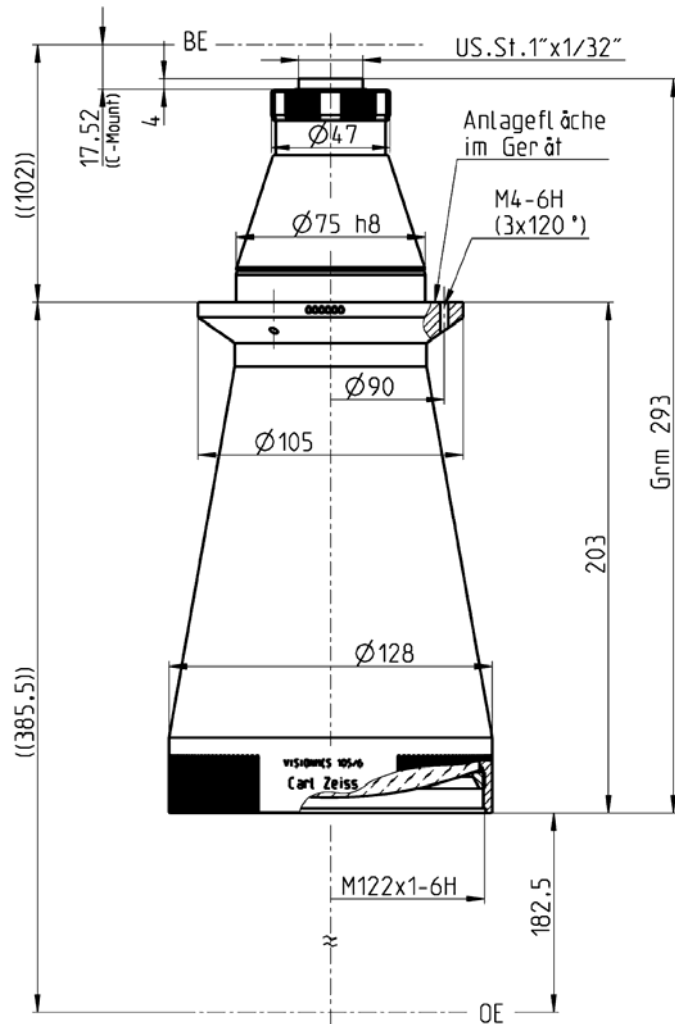
(1) Valid at focal distance 17,52 mm (C-Mount) / Calculated for 50 µm Circle of Confusion

(2) Max. change of image size within T is 1 µm.

Spectral Range for all lenses 480 - 690 nm

Telecentric lens

VISIONMES® 105 / 6 / 0.1

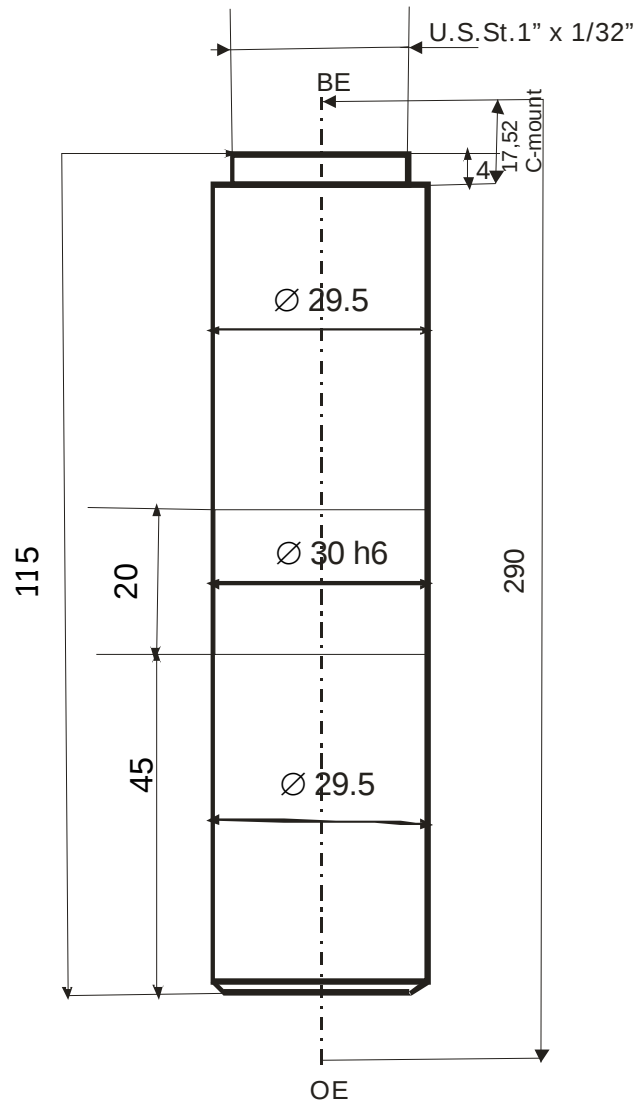


order number

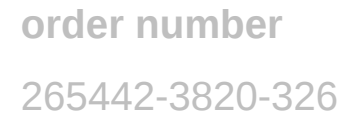
265442-3841-726

Telecentric lens

VISIONMES® 11 / 8 / 0.01



order number
265444-3620-124

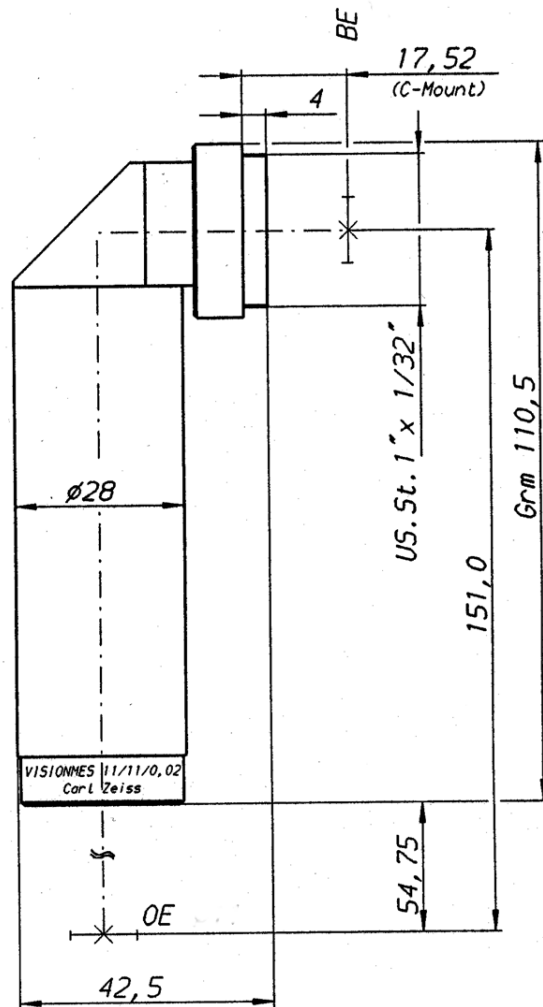




265442-3810-326

Telecentric lens

VISIONMES® 11 / 11 / 0.02 (on lens image side 90° angled)

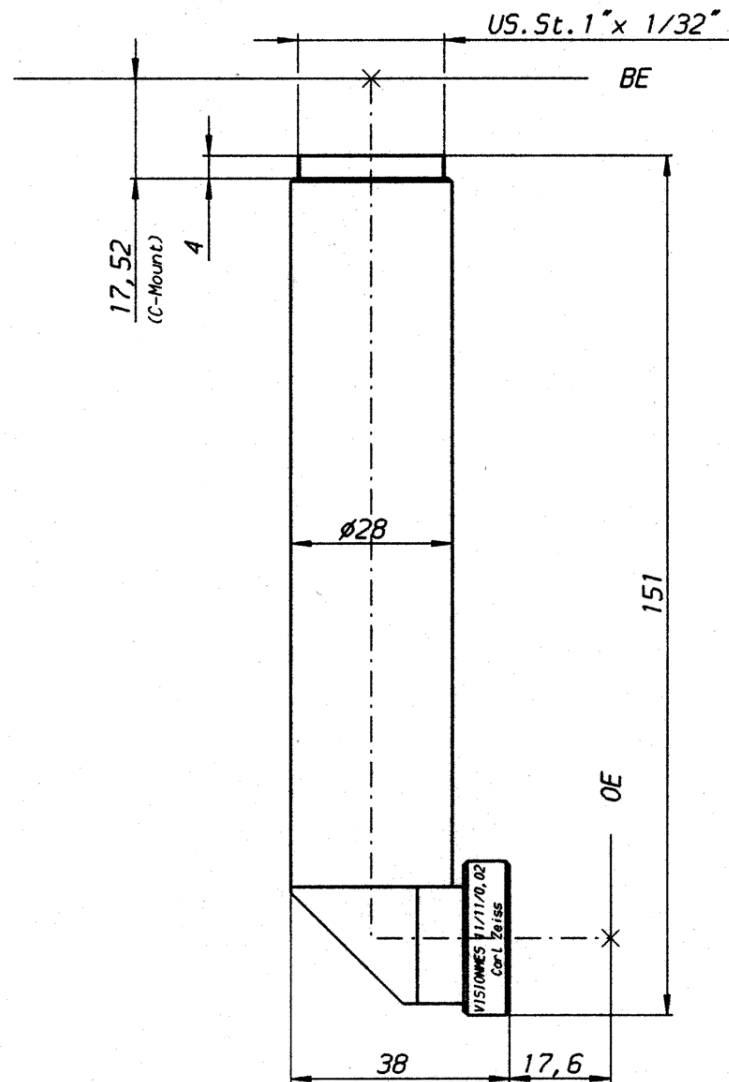


order number

265442-3913-126

Telecentric lens

VISIONMES® 11 / 11 / 0.02 (on lens object side 90° angled)

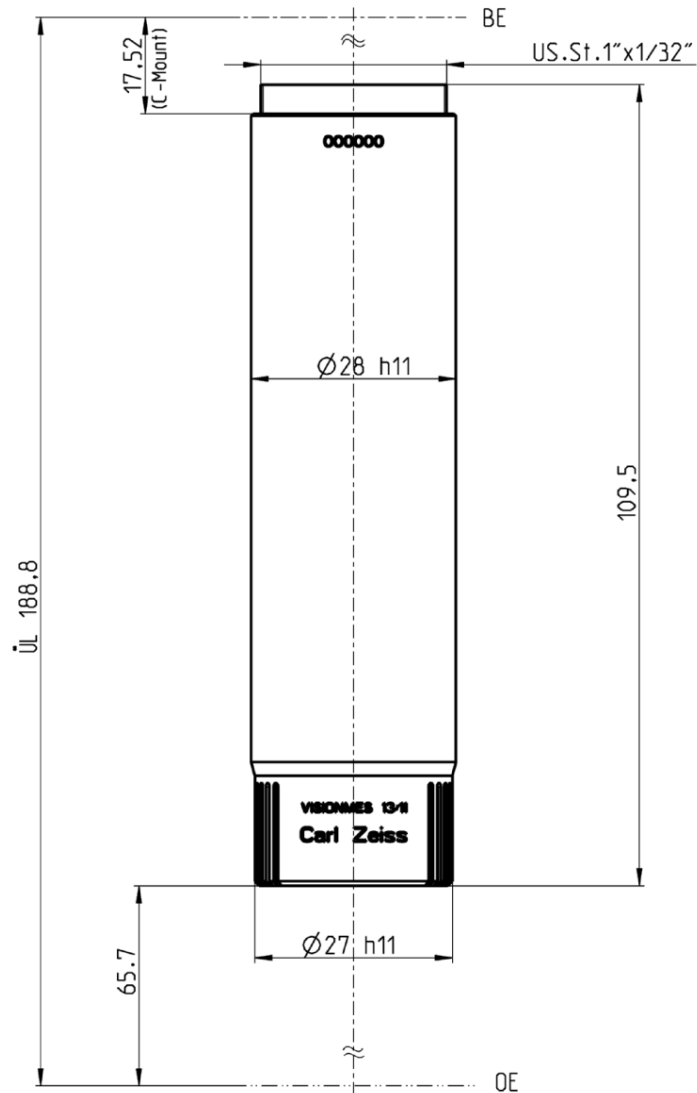


order number

265442-3923-126

Telecentric lens

VISIONMES® 13 / 11 / 0.01

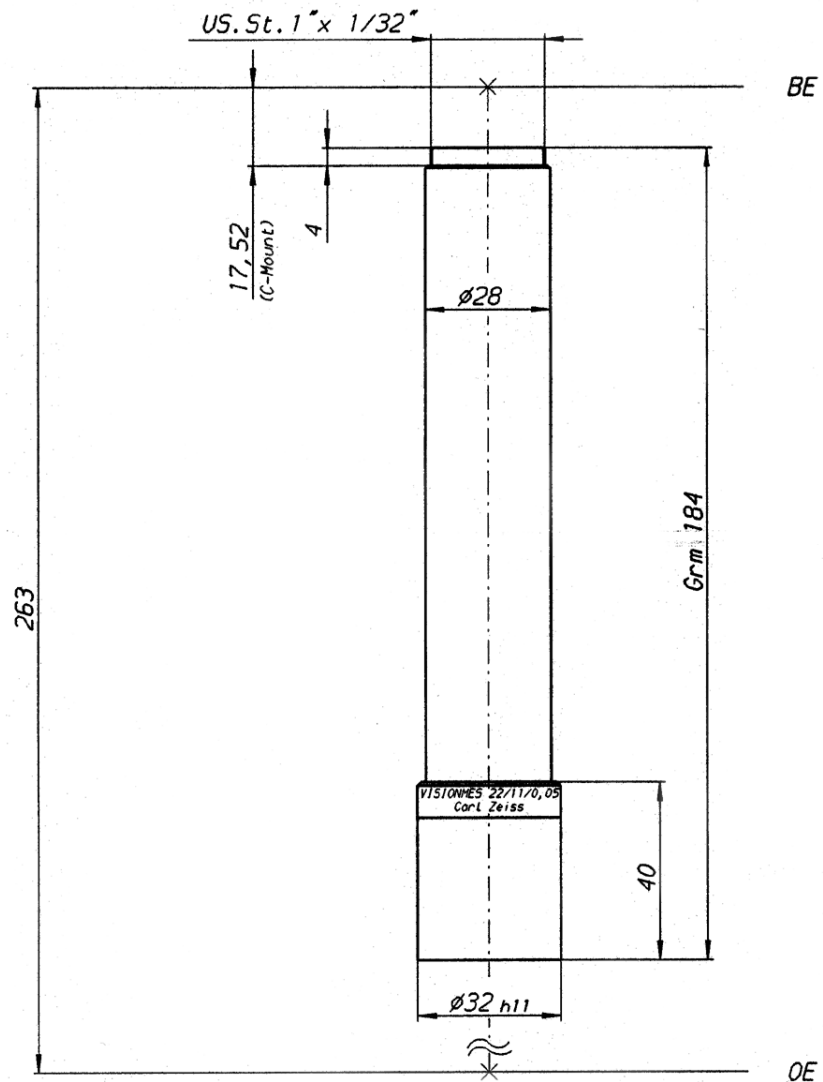


order number

000000-1422-360

Telecentric lens

VISIONMES® 22 / 11 / 0.05

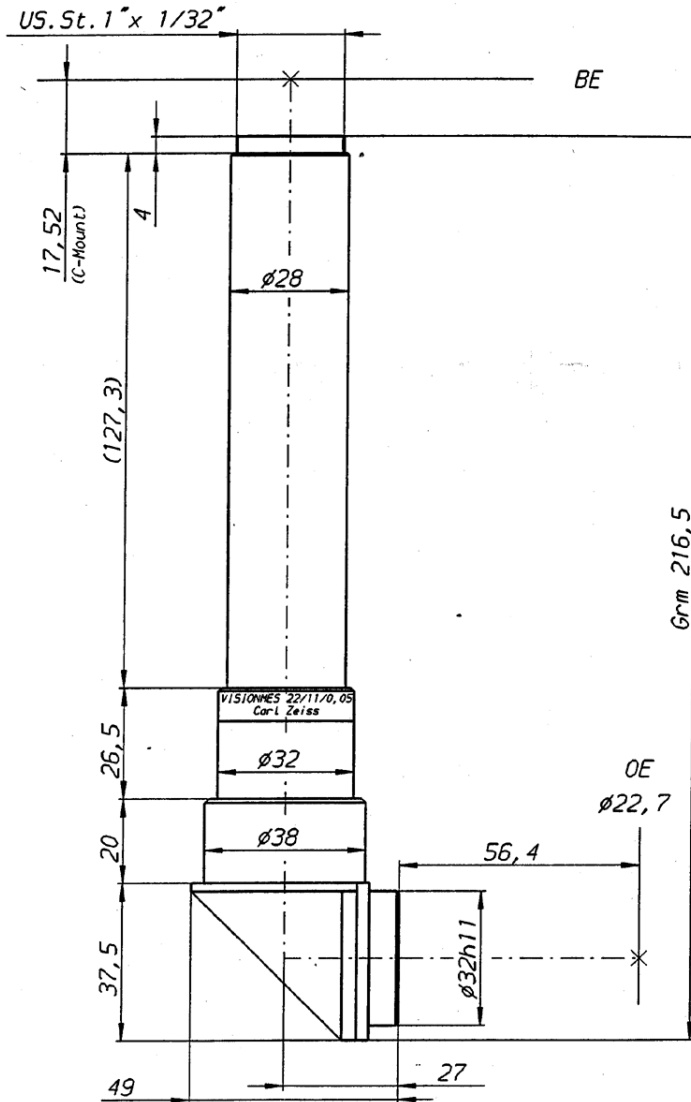


order number

265442-3903-326

Telecentric lens

VISIONMES® 22 / 11 / 0.05 (on lens object side 90° angled)



order number

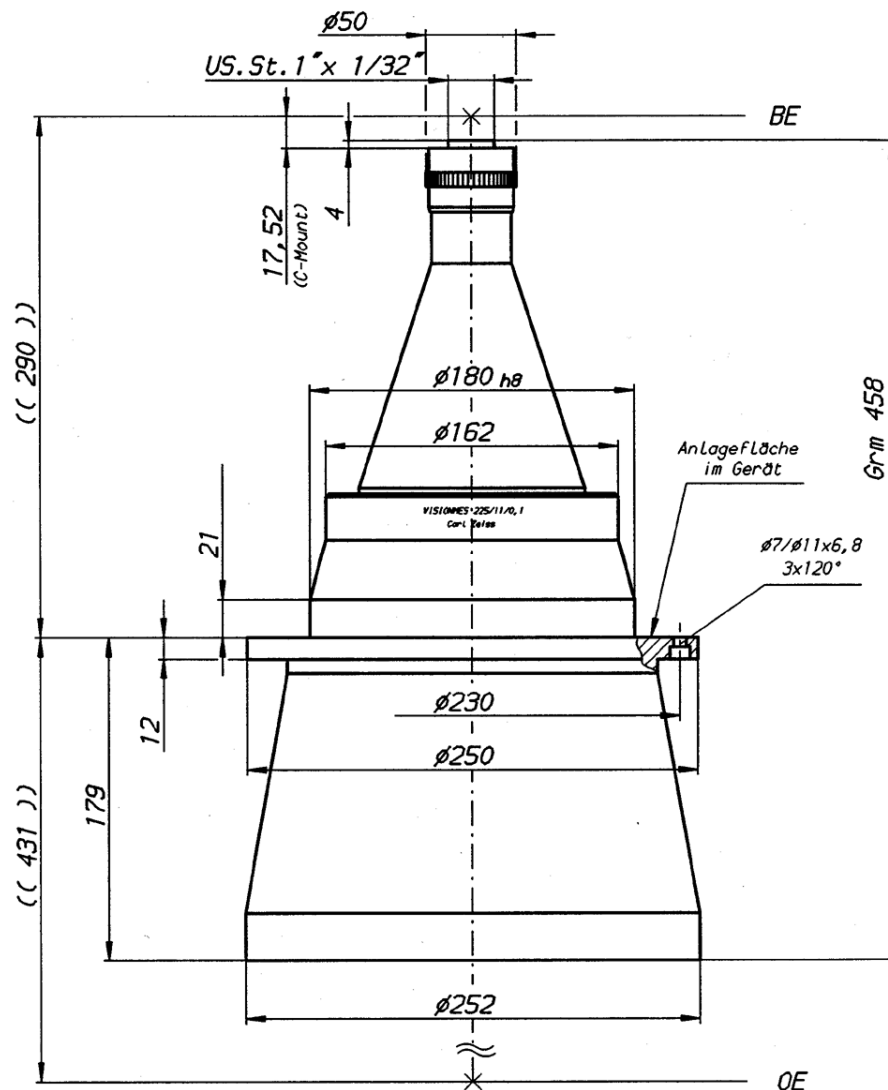
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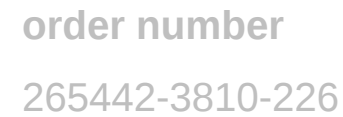
Telecentric lens

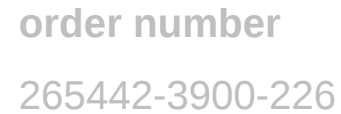
VISIONMES® 225 / 11 / 0.1

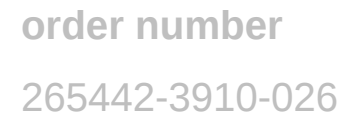
order number

265442-3820-226



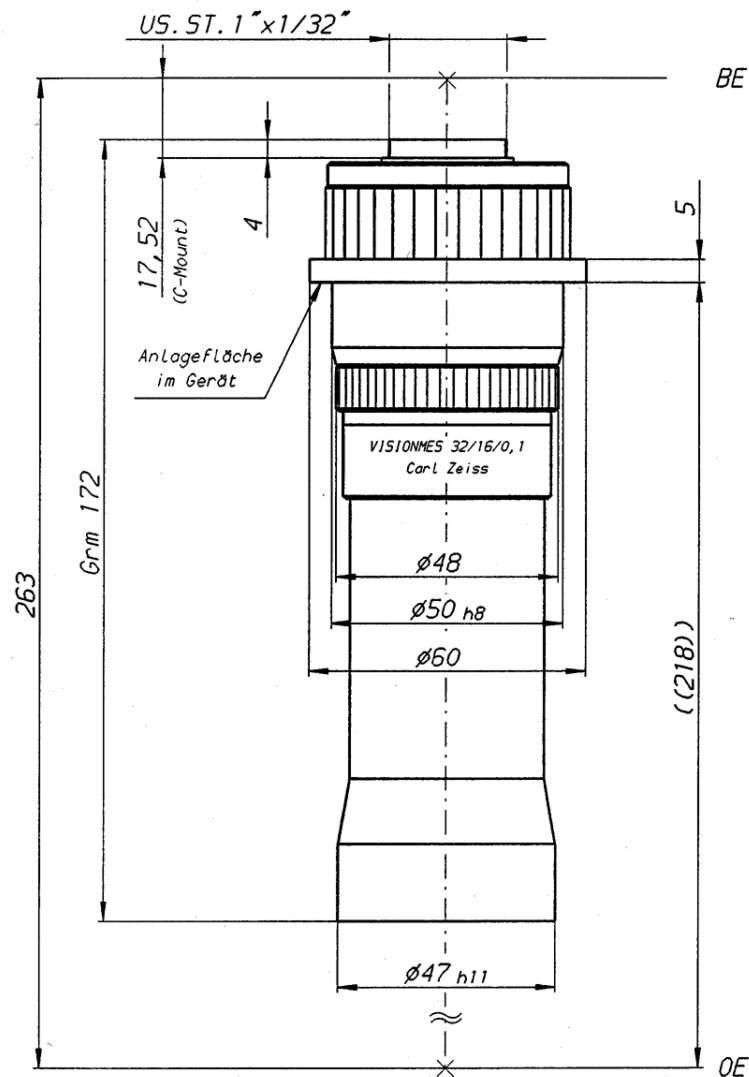






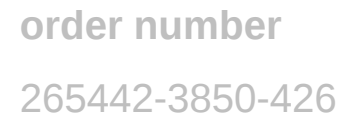
Telecentric lens

VISIONMES® 32 / 16 / 0.1



order number

265442-3900-326





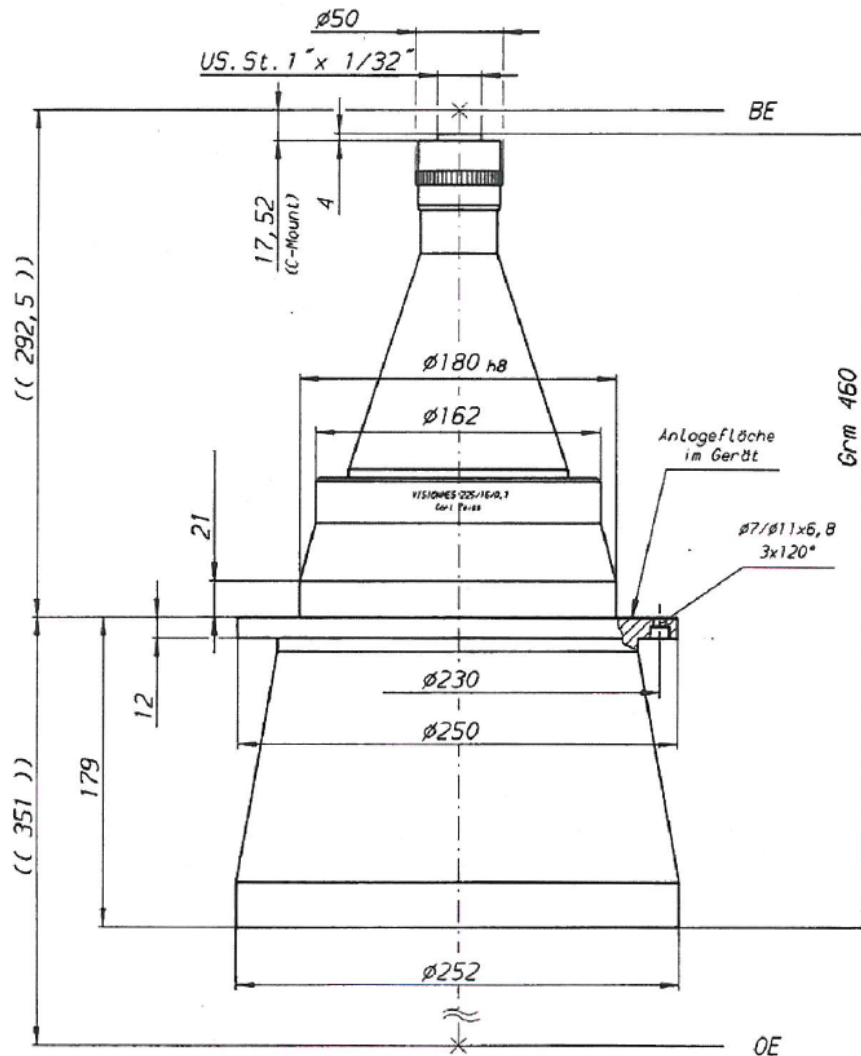
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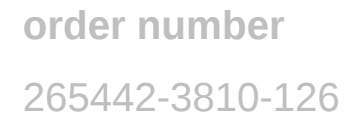
Telecentric lens

VISIONMES® 225 / 16 / 0.1

order number

265442-3830-126



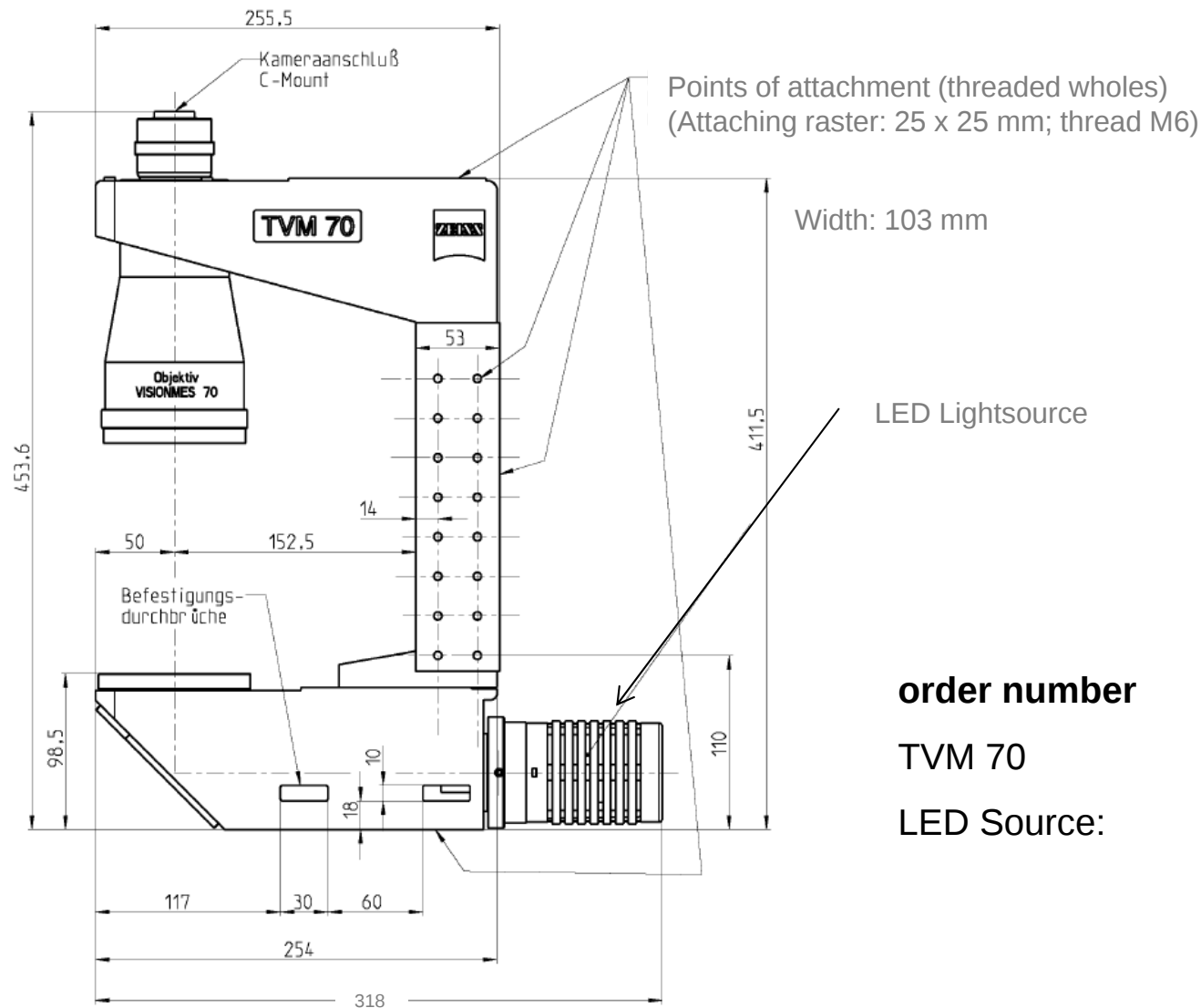


265442-3810-126



Telecentric Illumination Module for 70 mm FoV VISIONMES® module (TVM 70)

TVM 70



order number

TVM 70

000000-1192-425

LED Source:

000000-1294-202

Customised Lenses and Modules

As the leading innovator in the world of optics Zeiss possesses the most sophisticated tools and the experienced people for optical design and production.

Please ask for your customised solution tailored to your demands and take advantage from our expertise.





Where to buy...

Telecentric VISIONMES® lenses

Please contact:

Carl Zeiss AG
Camera Lens Departement

Tel. **+49 7364 20 5590**
Email: ***lenses4industry@zeiss.de***

Website: ***www.zeiss.com/lenses4industry***