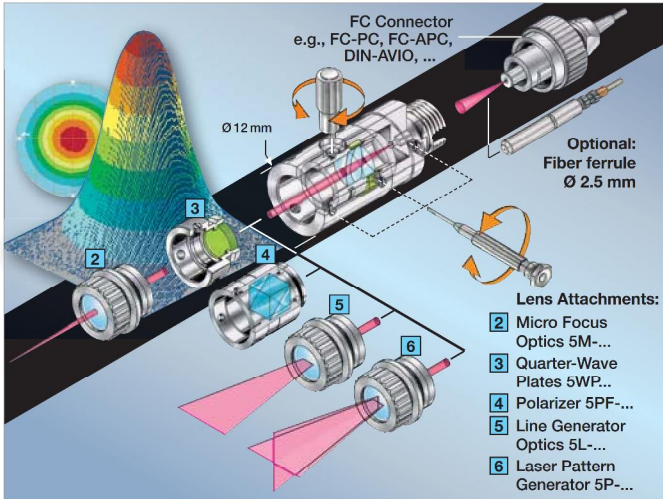


Fiber Collimators 60FC-...



- Focal lengths from 2.7 to 20 mm (for Fiber Collimators with a longer focal length see 60FC-L-..., Table 6)
- Beam diameters from 0.5–3.6 mm (1/e²-value of Gaussian intensity distribution)
- Amagnetic collimators made from Titanium on request
- Front connector accepts micro focus optics of the series 5M-... and polarizers of the series 5PF-...
- Numerous AR coatings for individual ranges covering 370 to 2300 nm
- Infrared optics made of chalcogenide glass for wavelengths >1000 nm (see Table 1, column 5, lens designed for $\lambda = 2.5 \mu\text{m}$)
- Integral focussing • Compact Ø 12 mm housing

A = asphere

The glass bi-aspheric lens type A shows a fine structure (concentric rings) in the projected Gaussian beam profile, but not in the focus. This lens type is suitable for **UH vacuum** applications.

M = laser monochromat or achromat

These lenses are corrected for spherical aberration (monochromat) or additionally chromatic aberration (achromat). Both exhibit an undisturbed Gaussian beam profile.

RGBV = RGBV coupling lens (apochromat)

Lenses of type RGBV are achromatically corrected RGBV coupling lenses designed for the simultaneous coupling of multiple wavelengths in the range 400 to 660 nm, see page 43.

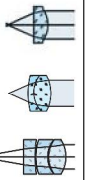


Table 1			Fiber Collimator 60FC-... with focal lengths 2.7–20 mm (housing Ø 12 mm)																									
row	curr. no		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 **	16	17	18	19	21	21					
1	Lens type		A2.7	A3.1	M3.1	M4	A4	A4.5S	M5	A6.2S	A7.5	A8	M8	M10	A11	M11	RGBV11	M12	M12NIR	A15	M15	A18	M20					
2	Focal length f'		2.75	3.1	3.1	4	4	4.5	5.1	6.16	7.5	8	8.1	10	11	11	11	12	12	15.4	15	18.4	20.1					
3	Numerical aperture NA		0.55	0.68	0.25	0.25	0.6	0.42	0.25	0.3	0.3	0.3	0.15	0.21	0.25	0.23	0.18	0.23	0.23	0.16	0.18	0.15	0.16					
4	Clear apert. max. [mm]		3.6	5	1.7	2	5	3.7	2.5	3.7	4.5	4.9	2.5	4.2	5.5	5	4	5.5	5.5	5	5.5	5.5	6.5					
5	Coll. beam [mm]*		0.49	0.56	0.56	0.72	0.72	0.81	0.90	1.12	1.35	1.44	1.44	1.80	1.98	1.98	1.98	2.16	2.16	2.77	2.7	3.31	3.61					
6	Beam diverg. [mrad]*		0.86	0.77	0.77	0.59	0.59	0.53	0.47	0.39	0.32	0.3	0.29	0.24	0.22	0.22	0.22	0.2	0.2	0.15	0.16	0.13	0.12					
7	Correction - achrom.				x	x			x				x	x		x			x		x							
Spectral range			Code no. of AR coating																									
			* Calculated for NAe² = 0.09 and λ = 670 nm ** For the RGBV lens see page 43 ***IR chalcogenide lens																									
8	350 - 460 nm	52					52	52																				
9	400 - 600 nm	01	01	01			01	01			01	01			01	01					01		01					
10	600 - 1050 nm	02	02	02			02	02			02	02			02	02					02		02					
11	1050 - 1550 nm	03	03	03			03	03			03	03				03					03		03					
12	1300 - 1750 nm	45	45	45				45			45				45						45		45					
13	1750 - 2150 nm	09		09				09			09	09				09					09		09					
14	390 - 670 nm	33				33			33					33					33					33				
15	630 - 980 nm	10							10					10					10	10				10				
16	980 - 1550 nm	08							08					08					08					08				
17	420 - 700 nm	26												26														
18	750 - 1550 nm	37																			26							
19	400 - 670 nm	51				51												47										
20	520 - 830 nm																											
21	650 - 1150 nm	07											07					18										
22	450 - 700 nm	04					04																					
23	1750 - 3000 nm	64					64***										64***											
24	for UH vacuum		x	x			x	x		x	x	x		x						x		x						
25	Dimensions		1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2					

Table 1.1		Beam divergence: beam expansion due to diffraction. Beam diameter as a function of the working distance A.																									
Collimated	Lens type Focal length f'	A2.7 2.75	A3 3.1	M3.1 3.1	M4 4	A4 4	A4.5S 4.5	M5 5.1	A6.2S 6.16	A7.5 7.5	A8 8	M8 8.1	M10 10	A11 11	M11 11	RGBV11 11	M12 12	M12NIR 12	A15 15.4	M15 15	A18 18.4	M20 20.1					
																											
29	Distance A	0.5 m	1.00	0.95	0.95	0.93	0.93	0.97	1.03	1.17	1.38	1.47	1.48	1.81	2.0	2.0	2.0	2.2	2.7	2.8	2.7	3.3	3.6				
30		1.0 m	1.80	1.63	1.63	1.39	1.39	1.33	1.31	1.35	1.49	1.55	1.6	1.86	2.0	2.0	2.0	2.2	2.7	2.8	2.7	3.3	3.6				
31		5.0 m	8.6	7.7	7.7	6.0	6.0	5.3	4.7	4.0	3.4	3.3	3.3	3.0	2.9	2.9	2.9	2.9	3.1	3.2	3.1	3.5	3.8				

Table 1.2		Diameter of focussed beam as a function of distance A. For spot Ø <100 µm, micro focus optics are used.																									
Focussed	Lens type	A2.7	A3	M3.1	M4	A4	A4.5S	M5	A6.2S	A7.5	A8	M8	M10	A11	M11	RGBV11	M12	M12NIR	A15	M15	A18	M20					
	Focal length f	2.75	3.1	3.1	4	4	4.5	5.1	6.16	7.5	8	8.1	10	11	11	11	12	12	15.4	15	18.4	20.1					
																											
34	Distance A	0.5 m	0.86	0.77	0.77	0.59	0.59	0.53	0.47	0.39	0.32	0.30	0.29	0.24	0.22	0.22	0.22	0.20	0.20	0.15	0.16	0.13	0.12				
35		1.0 m	1.73	1.53	1.53	1.19	1.19	1.06	0.93	0.77	0.63	0.59	0.59	0.48	0.43	0.43	0.43	0.40	0.40	0.31	0.32	0.26	0.24				
36		5.0 m	-	-	-	-	-	-	4.66	3.86	3.17	2.97	2.93	2.37	2.16	2.16	2.16	1.98	1.98	1.54	1.58	1.29	1.18				

Table 1.3		Pilot beam: approx. constant beam Ø across entire working range A, obtainable by fine adjustment. Position of beam waist at A2.									
Working range A	Distance A	Beam diameter [mm]									
		Tab. 1 No. 15: M12 / f' = 12.					Tab. 1 No. 20: M20 / f' = 20				
37	0.5 m	at A	at coll.	at waist	A2 [m]	at A	at coll.	at waist	A2 [m]	at A	at coll.
		2.18	2.18	2.17	0.25	3.61	3.61	3.61	0.25	3.61	3.61
		2.18	2.18	2.17	0.50	3.61	3.61	3.60	0.50	3.61	3.61
		2.18	2.18	2.14	1.00	3.61	3.61	3.60	1.00	3.61	3.61
		2.24	2.18	1.90	2.37	3.61	3.61	3.56	2.50	3.61	3.61
		4.07	2.18	2.09	1.50	3.61	3.61	3.38	5.00	3.61	3.61
42	20.0 m	7.93	2.18	2.09	0.80	5.06	3.61	3.37	5.10	3.61	3.61
		19.7	2.18	2.09	0.30	11.96	3.61	3.37	2.30	3.61	3.61

Order Options for fiber collimators 60FC-...

Fiber collimators 60FC-4-M5-33

Fiber connection: 4 = FC-APC connection (8°-polish)

0 = FC-PC connection (0°-polish)

Option: DIN-AVIO, ST, and F-SMA

Order Code

AR coating (see Table 1, row 8 – 23)

Lens type (see Table 1, row 1)

A = asphere

M = monochromat or achromat

Option:

Add **Ti** for titanium construction (amagnetic):

Example **Order Code** : 60FC-4-M5-33-Ti

Add **SS** for steel construction:

Example **Order Code** : 60FC-4-M5-33-SS