



Micro Detectors

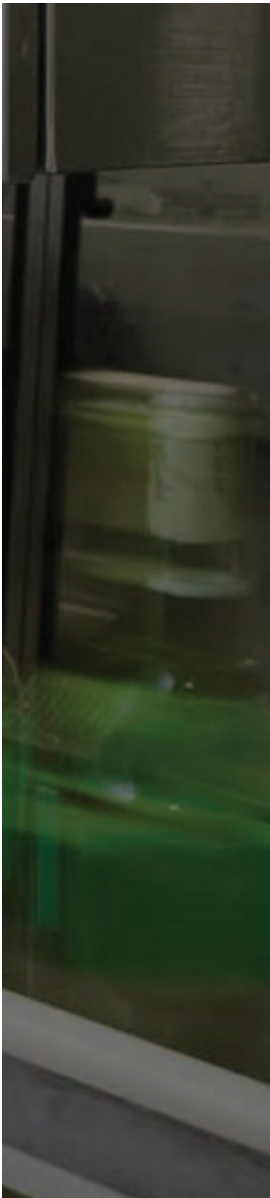
Italian Sensors Technology



Catalogue

short form

Edition 01/2013



Photoelectric Sensors

— Cylindrical

— M18 short housing

— IP69K

— Cubic

— With remote amplifier

— Amplifiers for optical fibers

— Special

— Forks



Photoelectric

Cylindrical

H8	HE	DG	DM
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dimensions	M8	M8	ø 10 mm	M12
background suppression	—	—	—	—
diffuse short distance	—	—	—	100 mm / 200 mm
diffuse long distance	—	—	—	300 mm
retroreflective	—	—	—	—
polarized	—	—	—	2 m
retroreflective for transparents	—	—	—	—
through beam	80 mm	0...1 m (10 kHz) 0...2 m (1 kHz)	2 m	4 m
switching frequency	50 kHz	1 kHz - 10 kHz	40 Hz	400 Hz - 250 Hz
LED emission	IR	IR	IR	IR / red (pol)
LASER emission	—	—	—	—
axial optic	•	•	•	•
90° optic	—	—	—	—
power supply	Vdc	•	•	•
	Vac	—	—	—
output type	NPN - NO	•	•	—
	NPN - NC	•	•	—
	PNP - NO	•	•	—
	PNP - NC	•	•	—
	NPN - NO / NC	—	—	•
	PNP - NO / NC	—	—	•
	NPN - NO + NC	—	—	—
	PNP - NO + NC	—	—	—
	DECOU®	—	—	—
	relay	—	—	—
	SCR	—	—	—
temperature range	-25°C...+70°C	-25°C...+70°C	-25°C...+70°C	-25°C...+70°C
protection degree	IP67	IP67	IP67	IP67
housing material	stainless steel	stainless steel	plastic	nickel plated brass
active head material	PMMA	PMMA	PC	PMMA
output	cable	•	•	•
	plug	—	—	•
	pig-tail	—	—	—
ATEX	—	—	—	II3GD
other certifications	CE	CE	CE	UL US LISTED CE

	FA	FA	FAL	FAL	SS/SP
					
	M18 axial	M18 90°	M18 axial	M18 90°	M18
	30...130 mm	—	20-100 (cl.1) 30-150 (cl.2)	25 - 130 (cl.2)	50 mm / 100 mm
	100 mm	100 mm	400 mm	300 mm	100 mm
	400 mm / 1 m	400 mm / 800 mm	—	—	400 mm / 800 mm
	4 m	4 m	—	—	4 m
	3 m	2 m	30 m (RL201)	30 m (RL201)	3 m
	100...1,000 mm	100...1,000 mm	—	—	—
	20 m	15 m	50 m	50 m	14 m
	250 Hz - 1 kHz	250 Hz	800 Hz -1 kHz - 1.5 kHz	800 Hz -1 kHz 1.5 kHz	800 Hz -1 kHz 250 Hz
	red / IR	red / IR	red laser	red laser	red / IR
	—	—	•	•	—
	•	—	•	—	•
	—	•	—	•	•
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	—	—	•	—	•
	—	—	•	—	•
	•	•	•	•	—
	•	•	•	•	—
	—	—	—	—	—
	—	—	—	—	—
	—25°C...+70°C	—25°C...+70°C	—15°C...+55°C	—15°C...+55°C	—25°C...+70°C
	IP67	IP67	IP67	IP67	IP67
	plastic / metallic	plastic / metallic	plastic / metallic	plastic / metallic	plastic / metallic
	PC / PMMA	PC / PMMA	glass / PMMA	glass / PMMA	PMMA
	•	•	•	•	•
	•	•	•	•	•
	—	—	—	—	—
	II3GD	II3GD	II3GD	II3GD	II3GD
					



Photoelectric

Cylindrical

		MS/MP	SA	MV/MQ
				
dimensions		M18	M18	M18
background suppression		50 mm / 100 mm	—	50 mm / 100 mm
diffuse short distance		100 mm / 200 mm	150 mm	100 mm / 200 mm
diffuse long distance		400 mm	400 mm	400 mm / 800 mm
retroreflective		4 m	6 m	4 m
polarized		3 m	3 m	3 m
retroreflective for transparents		—	—	—
through beam		16 m / 32 m	—	16 m / 32 m
switching frequency		1 kHz - 80 - 30 Hz	1 kHz	25 Hz
LED emission		red / IR	red / IR	IR / red
LASER emission		—	—	—
axial optic		•	•	•
90° optic		•	—	•
power supply	Vdc	•	•	—
	Vac	—	—	•
output type	NPN - NO	—	—	—
	NPN - NC	—	—	—
	PNP - NO	—	—	—
	PNP - NC	—	—	—
	NPN - NO / NC	—	•	—
	PNP - NO / NC	—	•	—
	NPN - NO + NC	—	—	—
	PNP - NO + NC	—	—	—
	DECOUT	•	—	—
	relay	—	—	—
	SCR	—	—	•
temperature range		-25°C...+70°C	-25°C...+70°C	-25°C...+70°C
protection degree		IP67	IP65	IP67
housing material		plastic / metallic	plastic / metallic	plastic
active head material		PMMA	PMMA	PMMA
output	cable	•	•	•
	plug	•	•	•
	pig-tail	—	—	—
ATEX		II3GD	—	—
other certifications				

M18 short housing		IP69K	
FQ		FF	
			
M18		M18	
—		30...130 mm	
100 mm		100 mm	
0.4 / 1.2 m (1m-90°)		400 mm / 800 mm	
5 m		—	
4 m		4 m	
100...1,000 mm		100...1,000 mm	
20 m (16 m - 90°)		20 m	
250 Hz		1 kHz - 500 Hz - 400 Hz - 250 Hz	
—		—	
red / IR		red / IR	
●		●	
●		—	
●		—	
—		—	
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—		—	
—		—	
—		●	
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●		●	
●		●	
—		—	
—		—	
—		—	
-25°C...+70°C		-25°C...+80°C	
IP67		IP68/IP69K	
plastic / metallic		stainless steel AISI 316L	
PMMA/PC		PMMA	
●		—	
●		●	
—		—	
—		II3GD	
CE		   	



Photoelectric Cubic



		QM	FE	QX	PS
dimensions		21x12.8x31.2 mm	11x20x31 mm	15x23x40 mm	15x26x49 mm
background suppression		30...200 mm	15...500 mm	—	—
diffuse short distance		100 mm	—	—	100 mm / 200 mm
diffuse long distance		400 mm / 1,000 mm	800 mm	300 mm	—
retroreflective		—	—	4 m	2 m
polarized		5 m	4 m	2.5 m	—
retroreflective for transparents		0.4... 4 m 0.05... 1.5 m	—	—	—
through beam		20 m	12 m	8 m	4 m
switching frequency		1 kHz / 2kHz	1 kHz	500 Hz / 750 Hz	25 Hz / 100 Hz
LED emission		red	red	red / IR	IR
LASER emission		—	—	—	—
axial optic		—	—	•	—
90° optic		•	•	•	•
power supply	Vdc	•	•	•	•
	Vac	—	—	—	—
output type	NPN - NO	—	—	•	•
	NPN - NC	—	—	•	•
	PNP - NO	—	—	•	•
	PNP - NC	—	—	•	•
	NPN - NO / NC	•	•	—	•
	PNP - NO / NC	•	•	—	•
	NPN - NO + NC	—	—	—	—
	PNP - NO + NC	—	—	—	—
	DECOU [®]	—	—	—	—
	relay	—	—	—	—
	SCR	—	—	—	—
temperature range		-25°C...+70°C	-25°C...+55°C	-25°C...+70°C	-25°C...+70°C
protection degree		IP67	IP67	IP65	IP65
housing material		plastic	plastic	ABS	plastic
active head material		PMMA	PC	acrilic	PMMA
output	cable	•	•	•	•
	M8 plug	M8 and M8 pig-tail	•	•	—
	M12 pig-tail	(pig-tail)	—	•	•
ATEX		—	—	—	—
other certifications					

	BS	BV	Q5	FG	RX
				 Improved model	
	15x37x70 mm	15x37x70 mm	18x50x50 mm	20x43x65 mm	26x50x80 mm
	—	—	—	90...310 mm 110...600 mm	50...300 mm 250...1,000 mm
	100 mm / 200 mm	100 mm / 200 mm	300 mm	—	—
	400 mm / 1,600 mm	400 mm / 1,600 mm	—	—	1,000 mm / 2,000 mm
	8 m	8 m	6 m	—	12 m
	—	—	4 m	12 m	6 m
	—	—	—	—	—
	—	—	10 m	50 m	16 m / 32 m
	80 Hz	25 Hz	33 Hz - 250 Hz	33 Hz - 250 Hz - 1 kHz	25 Hz - 500 Hz
	IR	IR	IR / red	red	IR / red
	—	—	—	—	—
	—	—	•	•	•
	•	•	—	•	—
	•	—	•	•	•
	—	•	•	•	•
	—	—	—	—	—
	—	—	—	—	—
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	—	—	—	—	—
	—	—	—	•	—
	—	—	—	•	—
	—	—	—	—	—
	—	—	•	—	—
	•	—	•	—	•
	—	—	—	•	•
	—	•	•	—	—
	-25°C...+70°C	-25°C...+70°C	-25°C...+55°C	-25°C...+55°C	-25°C...+70°C
	IP65	IP65	IP64	IP67	IP65
	ABS	ABS	ABS	plastic	PC
	acrylic	acrylic	PMMA	PMMA	PMMA
	•	•	•	•	—
	—	—	—	—	—
	•	•	—	•	•
	—	—	—	—	—
	CE	CE	CE	UL CE	CE



Photoelectric

With remote amplifier

Fiber optic

UR



DG



SSF



UR		DG		SSF
dimensions		32x67x90 mm	ø 10 mm / M12	M18
relay output amplifier		•	—	—
plastic fibers amplifier		—	—	•
glass fibers amplifier		—	—	•
DIN rail amplifier		—	—	—
timer functions		•	—	—
Teach-in		—	—	•
frequency		10 Hz	—	800 Hz
emission		—	IR	red
sensing distance		—	up to 75 m	depending on the used fiber
power supply	Vdc	•	—	—
	Vda	•	—	—
output type	relay	•	—	—
	PNP - NO / NC	—	—	•
	NPN - NO / NC	—	—	•
temperature range		-10°C...+50°C	-20°C...+60°C	-25°C...+70°C
protection degree		IP20	IP67	IP67
housing material		plastic	plastic / metallic	plastic / metallic
optic material		—	PC - glass	plastic fibers, glass fibers
output	cable	—	•	•
	M12 plug	—	—	•
	M8 plug	—	—	—
ATEX		—	—	—
other certifications		CE	CE	UL US LISTED CE

amplifiers

FS1	FX3	FX4	F1/F2	F6
				
15x26x66 mm	10x31x60 mm	10x31x60 mm	10x32x70 mm	10x32x70 mm
—	—	—	—	—
•	•	•	•	•
•	•	•	•	•
—	•	•	•	•
—	—	•	—	•
—	—	•	—	•
1 kHz	1.5 kHz	1.5 kHz	2 kHz / 20 kHz	1 kHz
red	red	red	red	red
depending on the used fiber	depending on the used fiber	depending on the used fiber	depending on the used fiber	depending on the used fiber
—	•	•	•	•
—	—	—	—	—
—	—	—	—	—
•	•	•	•	•
•	•	•	•	•
-25°C...+70°C	-25°C...+55°C	-25°C...+55°C	-25°C...+55°C	-25°C...+55°C
IP65	IP64	IP64	IP50	IP50
PA	PBT	PBT	PBT / PC	PBT / PC
plastic fibers, glass fibers	plastic fibers, glass fibers	plastic fibers, glass fibers	plastic fibers, glass fibers	plastic fibers, glass fibers
•	•	•	•	•
•	—	—	—	—
—	•	•	—	—
—	—	—	—	—
CE	CE	CE	CE	CE

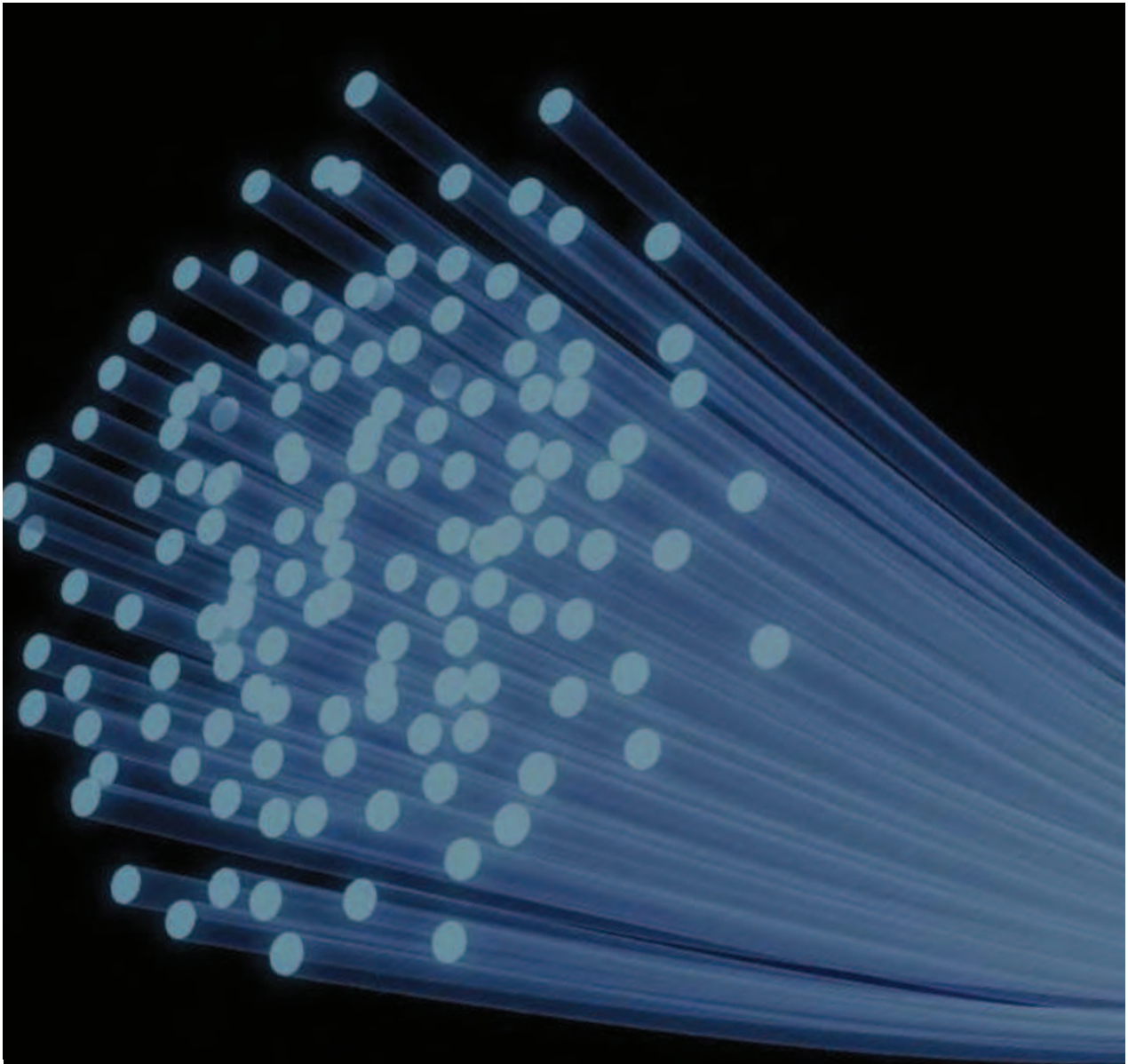


Photoelectric

Special

		LTB \ LDLU	LDLV	FC3	FC4
					
dimensions		M18	M30	26x75x90 mm	26x83x162 mm
contrast scanner		• (LTB)	—	—	—
luminiscent scanner		• (LDLU)	•	•	—
sensing distance Sn		—	—	—	—
slot sensor for control edge detection		—	—	—	•
slot sensor for object detection		—	—	—	—
slot sensor for labels detection		—	—	—	—
sensing distance		12 mm (STF12) 25 mm (STF25)	30 mm	h = 38 mm	h = 43 mm
depth detection slot		—	—	—	—
minimum object dimension		—	—	—	—
emission		white (LTB), UV (LDLU)	UV	IR	IR
switching frequency		10 kHz	400 Hz	25 Hz	25 Hz
supply voltage	Vdc	•	•	•	•
	Vac	—	—	—	—
output type	NPN - NO	—	—	—	—
	NPN - NC	—	—	—	—
	PNP - NO	—	—	—	—
	PNP - NC	—	—	—	—
	NPN - NO / NC	•	•	—	—
	PNP - NO / NC	•	•	—	•
	NPN/PNP - NO/NC	—	—	—	—
	SCR	—	—	•	—
temperature range		-5°C...+55°C	-5°C...+55°C	-25°C...+50°C	-25°C...+55°C
protection degree		IP65	IP65	IP64	IP64
housing material		PBT	nickel plated brass	PCB	PC
head material		plexiglass	plexiglass	PCB	PC
output	cable	•	vetro	—	—
	plug	M12	M12	M12	M12 pig-tail
ATEX		—	—	—	—
other certifications		CE	CE	CE	CE

Forks				Ultrasonic	
FC5	New series	FC6I	New series	FC6L	New series
					
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
50, 80, 120 mm	30, 50, 80, 120 mm	30, 50, 80, 120 mm	3 mm	3 mm	
—	—	—	—	—	—
•	•	•	—	—	—
—	—	—	•	•	—
—	—	—	—	—	—
60, 124 mm	42, 59 mm	42, 59 mm	42 mm	69 mm	
0.8 mm	0.2 mm	0.05 mm	—	—	—
red	IR	laser (classe 1)	IR	ultrasonic	
4 kHz	10 kHz	10 kHz	10 kHz	1,5 kHz	
•	•	•	•	•	
—	—	—	—	—	
•	—	—	—	—	
•	—	—	—	—	
•	—	—	—	—	
•	—	—	—	—	
—	—	—	•	•	
—	—	—	•	•	
—	•	•	—	—	
—	—	—	—	—	
-10°C...+60°C	-20°C...+60°C	-20°C...+50°C	-20°C...+60°C	-5°C...+55°C	
IP67	IP65	IP65	IP65	IP65	
painted aluminium	painted aluminium	painted aluminium	termoplastic (PA12)	painted aluminium	
—	—	—	—	—	
—	—	—	—	—	
M8 3 pin	M8 4 pin	M8 4 pin	M8 4 pin	M8 4 pin	
—	—	—	—	—	
	 	 	 	 	





Fiber optics



- CF plastic fiber optics
- AF modular fiber optics
- CV glass fiber optics up to 200°C
- Accessories for fiber optics CF
- CV glass fiber optics up to 250°C
- Accessories for fiber optics CV



CF plastic fiber optics

model (1)	type	SSF (EX.G.=1)	FS1 (EX.G.=1)	FX3 (EX.G.=1)	FX4 (EX.G.=1)	ø optical fiber core	cuttable	length (2)	head shape	lenses
CF / CA1 - 20	scanner	60 mm	60 mm	140 mm	140 mm	0.5	yes	2 m	M5	yes
CF / CA2 - **	scanner	15 mm	15 mm	70 mm	110 mm	0.5	no	0,5 - 1 m	M4	no
CF / CA4 - **	scanner	15 mm	15 mm	60 mm	80 mm	0.5	no	0,5 - 1 m	M4+sleave	no
CF / RA4 - **	P/R	30 mm	30 mm	150 mm	250 mm	0.5	no	0,5 - 1 m	M4+sleave	no
CF / RA7 - **	P/R	30 mm	30 mm	150 mm	250 mm	0.5	no	0,5 - 1 m	M3	no
CF / CB1 - **	scanner	50 mm	50 mm	200 mm	300 mm	1	yes	1 - 2 m	M6	no
CF / CB3 - **	scanner	50 mm	50 mm	200 mm	300 mm	1	yes	1 - 2 m	M6	no
CF / CB3 - **	scanner	50 mm	50 mm	200 mm	300 mm	1	yes	1 - 2 m	M6+sleave	no
CF / RB3 - 20	P/R	120 mm	120 mm	700 mm	700 mm	1	yes	2 m	M4	no
CF / RB4 - **	P/R	120 mm	120 mm	600 mm	900 mm	1	yes	1 - 2 m	M4+sleave	no
CF / RB6 - **	P/R	120 mm	120 mm	600 mm	900 mm	1	yes	1 - 2 m	M4	no
CF / RB9 - **	P/R	1,200 mm	1,200 mm	8,000 mm	10,000 mm	1	yes	1 - 2 m	ø 6 mm	no
CF / RBA - **	P/R	1,200 mm	1,200 mm	8,000 mm	10,000 mm	1	yes	1 - 2 m	M7	no
CF / CC1 - 20	scanner	15 mm	15 mm	70 mm	100 mm	1	no	2 m	M6	yes
CF / CRC6 - 20	P/R	100 mm	100 mm	500 mm	500 mm	1	no	2 m	M4	no
CF / CRC9 - 20	P/R	1,000 mm	1,000 mm	6,000 mm	8,000 mm	1	no	2 m	ø 6 mm	yes
CF / RCA - 20	P/R	1,000 mm	1,000 mm	6,000 mm	8,000 mm	1	no	2 m	M7	yes

(1) = the last two bits of the code show the fiber length (in dm) (2) = standard length. Special lengths available on request.

model	F1		F2		F6	
	ON 90%	OFF 90%	ON 90%	OFF 90%	ON 90%	OFF 90%
CF - CA1	0	0	0	0	0	0
CF - CA2	40 mm	47 mm	15 mm	18 mm	100 mm	115 mm
CF - CA4	40 mm	47 mm	15 mm	18 mm	100 mm	115 mm
CF - RA4	100 mm	130 mm	60 mm	68 mm	300 mm	350 mm
CF - RA7	100 mm	130 mm	60 mm	68 mm	300 mm	350 mm
CF - CB1	150 mm	180 mm	70 mm	90 mm	300 mm	345 mm
CF - CB3	150 mm	180 mm	70 mm	90 mm	300 mm	345 mm
CF - RB3	410 mm	500 mm	200 mm	240 mm	800 mm	925 mm
CF - RB4	410 mm	500 mm	200 mm	240 mm	800 mm	925 mm
CF - RB6	410 mm	500 mm	200 mm	240 mm	800 mm	925 mm
CF - RB9	> 4,000 mm	> 4,000 mm	2,400 mm	2,800 mm	> 4,000 mm EX.G.=12	> 4,000 mm EX.G.=12
CF - RBA	> 4,000 mm	> 4,000 mm	2,400 mm	2,800 mm	> 4,000 mm EX.G.=12	> 4,000 mm EX.G.=12
CF - CC1	50 mm	58 mm	20 mm	25 mm	90 mm	115 mm
CF - RC6	350 mm	400 mm	190 mm	220 mm	600 mm	690 mm
CF - RC9	2,200 mm	2,600 mm	1,600 mm	1,900 mm	> 4,000 mm EX.G.=3	> 4,000 mm EX.G.=3
CF - RCA	2,200 mm	2,600 mm	1,600 mm	1,900 mm	> 4,000 mm EX.G.=3	> 4,000 mm EX.G.=3

AF modular fiber optics

model	type	accessory type	SSF (EX.G.=1)	FS1 (EX.G.=1)	FX3 (EX.G.=1)	FX4 (EX.G.=1)	ø optical fiber core	fiber model	head shape	lenses
AF/C	—	cutter	—	—	—	—	1	—	—	—
AF/15	—	cuttable fibers	—	—	—	—	1	—	—	—
AF/ER4	P/R	collimated lenses	600 mm	600 mm	2,000 mm	3,000 mm	1	AF/15	—	yes
AF/ER5	P/R	collimated lenses	1,000 mm	1,000 mm	3,000 mm	5,000 mm	1	AF/15	—	yes
AF/ER6	P/R	collimated lenses	3,500 mm	3,500 mm	6,000 mm	8,000 mm	1	AF/15	—	yes
AF/ER7	P/R	collimated lenses	1,000 mm	1,000 mm	6,000 mm	8,000 mm	1	AF/15	—	yes

model	F1	F2	F6
	Sn	Sn	Sn
AF / ER4	1,500 mm	700 mm	3,000 mm
AF / ER5	2,200 mm	1,000 mm	4,500 mm
AF / ER6	4,500 mm	2,000 mm	6,000 mm
AF / ER7	4,500 mm	2,000 mm	6,000 mm

CV glass fiber optics 200°C

model (1)	type	SSF (EX.G.=1)	FS1 (EX.G.=1)	FX3 (EX.G.=1)	FX4 (EX.G.=1)	ø optical fiber core	cuttable	length (2)	head shape	lenses
CV/CB1- **	scanner	50 mm	50 mm	150 mm	150 mm	1	no	1 - 2 m	M4	no
CV/CB3- **	scanner	50 mm	50 mm	150 mm	150 mm	1	no	1 - 2 m	M4+slieve	no
CV/RB4- **	P/R	90 mm	90 mm	600 mm	900 mm	1	no	1 - 2 m	M4+slieve	no
CV/RB6- **	P/R	90 mm	90 mm	600 mm	900 mm	1	no	1 - 2 m	M4	no

(1) = the last two bits of the code show the fiber length (in dm) (2) = standard length. Special lengths available on request

model	F1		F2		F6	
	ON 90%	OFF 90%	ON 90%	OFF 90%	ON 90%	OFF 90%
CV / CB1	**	**	70 mm	90 mm	**	**
CV / CB3	**	**	70 mm	90 mm	**	**
CV / RB4	410 mm	500 mm	200 mm	240 mm	800 mm	925 mm
CV / RB6	410 mm	500 mm	200 mm	240 mm	800 mm	925 mm



Accessories for fiber optics CF

model	F1	F1	F1	fiber model
	Sn	Sn	Sn	Sn
AF / ER9	400 mm	200 mm	800 mm	CF - RB3 - 20
ST28	1,500 mm	1,000 mm	3,000 mm	CF - RBA-**. CF - RCA - 20

CV glass fiber optics up to 250°C

model (1)	type	SSF (EX.G.=1)	FS1 (EX.G.=1)	FX3 (EX.G.=1)	FX4 (EX.G.=1)	ø optical fiber core	cuttable	length (2)	head shape	lenses
CV / CB1- **ME	scanner	50 mm	50 mm	150 mm	150 mm	1	no	1-2 m	M4	no
CV / CB3- **ME	scanner	50 mm	50 mm	150 mm	150 mm	1	no	1-2 m	M4+sleeve	no
CV / RB4- **ME	P / R	90 mm	90 mm	600 mm	900 mm	1	no	1-2 m	M4+sleeve	no
CV / RB6- **ME	P / R	90 mm	90 mm	600 mm	900 mm	1	no	1-2 m	M4	no

(1) = the last two bits of the code show the fiber length (in dm)

(2) = standard length. Special lengths available on request.

Accessories for fiber optics CV

model(1)	type	accessory type	SSF (EX.G.=1)	FS1 (EX.G.=1)	FX3 (EX.G.=1)	FX4 (EX.G.=1)	ø optical fiber core	fiber model	head shape	lenses
AF/FC1	scanner	focusing device	25 mm	25 mm	30 mm	30 mm	1	CV/CB1-**. CV/CB3-**. CV/RB4-**. CV/RB6-**. CV/ER1. CV/ER2. CV/ER3. CV/ST28	ø 6.5 mm	yes
AF/FC2	scanner	focusing device	45 mm	45 mm	50 mm	50 mm	1	CV/CB1-**. CV/CB3-**. CV/RB4-**. CV/RB6-**. CV/ER1. CV/ER2. CV/ER3. CV/ST28	ø 6.5 mm	yes
AF/ER1	P / R	additional lense	1,000 mm	1,000 mm	4,000 mm	4,000 mm	1	CV/RB6-**. CV/ST28	ø 5 mm	yes
AF/ER2	P / R	additional lense	3,000 mm	3,000 mm	8,000 mm	10,000 mm	1	CV/RB6-**. CV/ST28	ø 8.5 mm	yes
AF/ER3	P / R	additional lense	3,000 mm	3,000 mm	14,000 mm	16,000 mm	1	CV/RB6-**. CV/ST28	13x13 mm	yes

model	F1	F2	F6
	Sn	Sn	Sn
AF / FC1	**	20 mm	**
AF / FC2	**	30 mm	**
AF / ER1	3,000 mm	2,000 mm	6,000 mm
AF / ER2	4,000 mm	3,000 mm	8,000 mm
AF / ER3	10,000 mm	8,000 mm	14,000 mm