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Heat resistant (130°C or below)

Related products

Fiber units
Heat resistant
(180 to 200°C)
P.80Fiber units
Heat resistant
(250 to 350°C)
P.85

Fiber units for ambient temperatures of 130°C or below

This heat resistant series offers most models in the industry at 30 models (according to in-house survey)

Non-protruding cables Space-saving

Because the cables of NF25-DH and NF25-TH heat resistant nut type fiber units do not protrude even when mounted to the conveyor side, no extra space is needed. Also, they eliminate worries regarding cable breakage caused by snagging on tools during work.

Straight type Extra space needed



Nut type Non-protruding cables



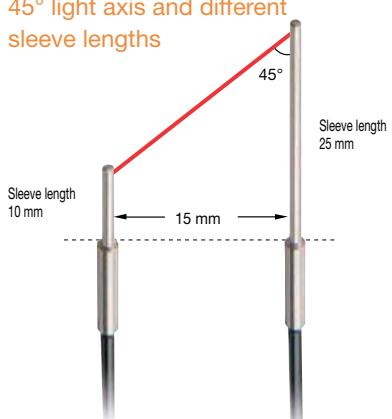
Low cost nut type→P.35
Flexible R2 mm nut type→P.58

Fiber units with 45° angle light axis and different sleeve lengths

An angled light axis is needed when mounting workpieces for detecting transparent glass substrates with through-beam type fibers. The light axis of the NF-TH06 is angled at 45° and the sleeve lengths for the emitting and receiving fibers differ, making it possible to simplify the mounting jig and installation.

NF-TH06

45° light axis and different sleeve lengths



Angle detection using conventional fiber units

Vertical mounting

The light passes through the glass and detection is unstable when installed vertically to a glass substrate.

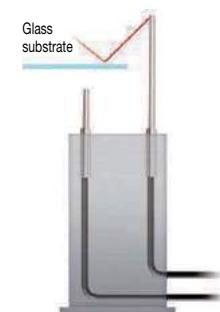


Angled mounting

Although the detection is stable, mounting bracket with a complex shape is needed when mounting at an angle.



NF-TH06 provides stable detection and simple mounting



Ramco Innovations

800-280-6933
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Photoelectric Sensors

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Laser Displacement Sensors

Fiber Units

Easy mounting

Thread type

Cylindrical type

Sleeve type

Flexible R4/R2

Flexible R1/R2

Retro-reflective

Small object detection

Screen/Array

Limited diffuse

Narrow view/wafer mapping

Heat resistant

Chemical resistant

Vacuum resistant

Liquid level/liquid leakage/water detection

Lens for through-beam type

Correct use

Fiber units Heat resistant (130°C or below)

Heat resistant <130°C or below> fiber units (through-beam type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model	
		D3RF	D2RF	BRF				
105°C	Nut type, Free cut 	7-EL 2,000 6-UL 1,100 5-PL 1,000 4-LG 900 3-ST 600 2-FS 300 1-HS 90	Long 750 Std 500 Fast 170	300	-40 to +105°C	R25	NF25-TH Space-saving	
	Side view, Free cut 	7-EL 3,500 6-UL 2,300 5-PL 2,000 4-LG 1,800	3-ST 1,200 2-FS 600 1-HS 170	Long 1,300 Std 700 Fast 400	500	-40 to +105°C	R10	NF-TS22M
	Narrow view, Side view, Free cut 	7-EL 2,300 6-UL 1,200 5-PL 1,100 4-LG 950	3-ST 600 2-FS 300 1-HS 100	Long 600 Std 300 Fast 100	200	-40 to +105°C	R10	NF-TS25
	o1 sleeve: 25 mm long and 10 mm long, 45° angle light axis, Heat resistant, Free cut 	7-EL 100 6-UL 55 5-PL 50 4-LG 40 3-ST 30 2-FS 10 1-HS 4	Long 28 Std 20 Fast 15	16	-40 to +105°C	R10	NF-TH06	
100°C	Lens attachable (P.98), Free cut 	7-EL 2,400 6-UL 1,400 5-PL 1,000 4-LG 900	3-ST 700 2-FS 300 1-HS 100	Long 700 Std 400 Fast 200	300	-40 to +100°C (Note)	R25	NF-TH01 Low cost

● Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Note: Light intensity retention rate of 90% or above after 2000 continuous work hours.

Heat resistant <130°C or below> fiber units (diffuse type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Diffuse type	105°C Free cut	7-EL 650 6-UL 350 5-PL 280 4-LG 240 3-ST 175 2-FS 100 1-HS 25	Long 120 Std 80 Fast 25	15	-40 to +105°C	R25	NF25-DH Space-saving
		7-EL 950 6-UL 500 5-PL 450 4-LG 400	3-ST 250 2-FS 130 1-HS 40	160	-40 to +105°C	R25	FD-3SD1(100) Standard item
	100°C Free cut	7-EL 850 6-UL 550 5-PL 450 4-LG 375	3-ST 275 2-FS 170 1-HS 55	110	-40 to +100°C (Note)	R25	NF-DH02 Low cost

●The sensing distances for the diffuse type fiber units are values on 500 × 500 mm white paper (1000 × 1000 mm white paper for NF25-DH).

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Note: Light intensity retention rate of 85% or above after 1000 continuous work hours.

Heat resistant reflector

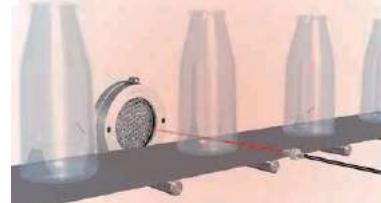
Possible to detect as retro-reflective type if the SW50 heat resistant reflector is used for the heat resistant diffuse type fiber. Demonstrates its strength in transparent object detection under high temperatures.

Reflector heat resistant to 300°C



SW50
ø80 × 20 mm (ø50 mm reflective surface)

Glass bottle detection under high temperatures



Photoelectric Sensors

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Laser Displacement Sensors

Fiber Units

Easy mounting

Thread type

Cylindrical type

Sleeve type

Flexible R4/R2

Flexible R1/R2

Retro-reflective

Small object detection

Screen/Array

Limited diffuse

Narrow view/wafer mapping

Heat resistant

Chemical resistant

Vacuum resistant

Liquid level/liquid leakage/water detection

Lens for through-beam type

Correct use

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Heat resistant (180 to 200°C)

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Heat resistant
(130°C or below)
P.77Fiber units
Heat resistant
(250 to 350°C)
P.85

Fiber units for ambient temperatures of 180 to 200°C

| New concept joint type also available

| This heat resistant series offers the most models in the industry at 30 models (according to in-house survey)

Various selection

Selection is possible from among 13 types of fiber units for ambient temperatures of 180 to 200°C. A wide variation of through-beam types is available to fix customer's applications, including standard and joint types, as well as straight view and side view types.

Through-beam type (standard types)

Straight view			Side view	
NF-TH10	NF-TH11	NF-TH02	NF-TH04S-27V2	NF-TH05S-A
Heat resistant to 200°C Lens attachable	Heat resistant to 200°C Lens attachable	Heat resistant to 180°C Free cut	Heat resistant to 200°C ø1 sleeve	Heat resistant to 200°C ø1.5 sleeve

Through-beam type (joint types)

Straight view			Side view	
NF-TH12	NF-TH13	NF-TH14	NF-TH15	NF-TH16
Heat resistant to 200°C Ordinary temperature fiber section is free cut	Heat resistant to 200°C Ordinary temperature fiber section is free cut	Heat resistant to 200°C Ordinary temperature fiber section is free cut	Heat resistant to 200°C Ordinary temperature fiber section is free cut	Heat resistant to 200°C Ordinary temperature fiber section is free cut

Diffuse type

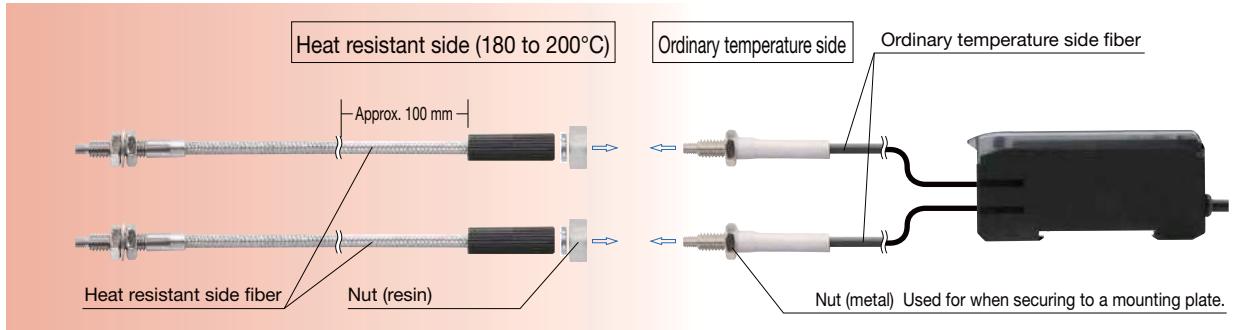
Coaxial	Standard
NF-DH07	NF-DH01
Heat resistant to 200°C Metal sheath	Heat resistant to 200°C Free cut

Limited diffuse reflective type

Glass substrate detection
NF-DH08
Heat resistant to 180°C Free cut

New concept joint type

By using joints for the free cut ordinary temperature fiber and heat resistant fiber, it is easy to attach/remove the fibers, and makes it possible to adjust the fiber length.



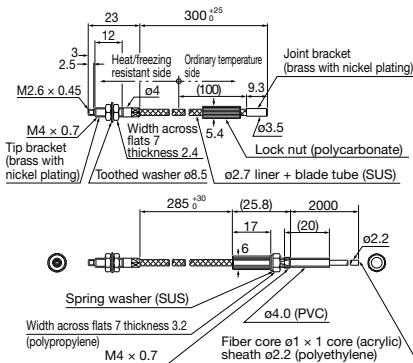
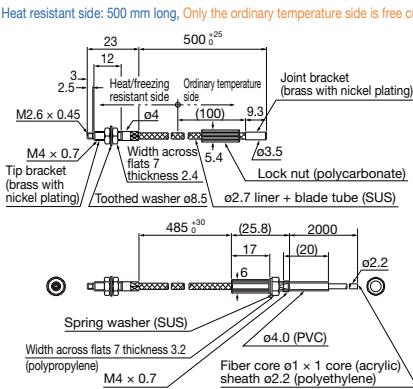
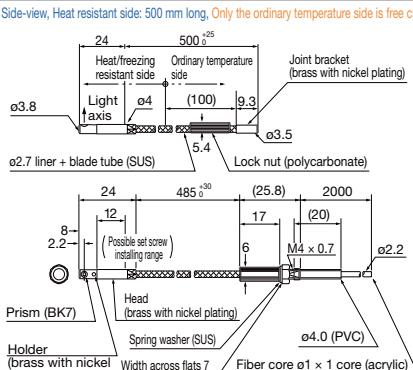
Heat resistant <180 to 200°C or below> fiber units (through-beam type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Through-beam type	Lens attachable (P.98) 	7-EL 570 6-UL 540 5-PL 460 4-LG 410 3-ST 270 2-FS 160 1-HS 45	Long 350 Std 180 Fast 85	110	-60 to +200°C	R10	NF-TH10
	Lens attachable (P.98) 	7-EL 1,350 6-UL 1,260 5-PL 1,130 4-LG 990 3-ST 630 2-FS 360 1-HS 110	Long 750 Std 450 Fast 220	280	-60 to +200°C	R25	NF-TH11 Standard item
	Lens attachable (P.98), Heat resistant side: 200 mm long Only the ordinary temperature side is free cut 	7-EL 1,080 6-UL 990 5-PL 900 4-LG 790 3-ST 510 2-FS 290 1-HS 90	Long 550 Std 350 Fast 170	220	-60 to +200°C	Heat resistant side R18 Ordinary temperature side R25	NF-TH12

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Fiber units Heat resistant (180 to 200°C)

Heat resistant <180 to 200°C or below> fiber units (through-beam type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Through-beam type 200°C	Heat resistant side: 300 mm long, Only the ordinary temperature side is free cut 	7-EL 1,080 6-UL 990 5-PL 900 4-LG 790 3-ST 510 2-FS 290 1-HS 90	Long 550 Std 350 Fast 170	220	-60 to +200°C	Heat resistant side R18 Ordinary temperature side R25	NF-TH13
Through-beam type 200°C	Heat resistant side: 500 mm long, Only the ordinary temperature side is free cut 	7-EL 1,080 6-UL 990 5-PL 900 4-LG 790 3-ST 510 2-FS 290 1-HS 90	Long 550 Std 350 Fast 170	220	-60 to +200°C	Heat resistant side R18 Ordinary temperature side R25	NF-TH14
Side-view, Heat resistant side: 500 mm long, Only the ordinary temperature side is free cut 200°C		7-EL 900 6-UL 870 5-PL 760 4-LG 660 3-ST 430 2-FS 260 1-HS 80	Long 500 Std 300 Fast 150	150	-60 to +200°C	Heat resistant side R18 Ordinary temperature side R25	NF-TH15

● Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Heat resistant <180 to 200°C or below> fiber units (through-beam type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model	
		D3RF	D2RF	BRF				
Through-beam type	<p>Side-view, Heat resistant side: 800 mm long, Only the ordinary temperature side is free cut</p> <p>Dimensions (mm): Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p> <p>Key components: Joint bracket (brass with nickel plating) Lock nut (polycarbonate) Light axis Prism (BK7) Holder (brass with nickel plating) Spring washer (SUS) Head (brass with nickel plating) Holder (brass with nickel plating) Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p>	7-EL 900 6-UL 870 5-PL 760 4-LG 660 3-ST 430 2-FS 260 1-HS 80	Long 500 Std 300 Fast 150	150	-60 to +200°C	Heat resistant side R18 Ordinary temperature side R25	NF-TH16	
	<p>ø1 sleeve: 27 mm long, Side view</p> <p>Dimensions (mm): Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p> <p>Key components: Caulking Note 2</p>	7-EL 450 6-UL 260 5-PL 240 4-LG 200 3-ST 140 2-FS 70 1-HS 20	Long 120 Std 80 Fast 50	50	-40 to +200°C	R30	NF-TH04S-27V2 <small>Made-to-order products</small>	
	<p>ø1.5 sleeve: 25 mm long, Side view</p> <p>Dimensions (mm): Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p> <p>Key components: Caulking Note 2</p>	7-EL 1,600 6-UL 850 5-PL 800 4-LG 600 3-ST 400 2-FS 200 1-HS 60	Long 350 Std 250 Fast 150	150	-40 to +200°C	R30	NF-TH05S-A <small>Made-to-order products</small>	
	<p>ø1 sleeve: 8 mm long, Side view</p> <p>Dimensions (mm): Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p> <p>Key components: Caulking Note 2</p>	7-EL 300 6-UL 160 5-PL 150 4-LG 100	3-ST 90 2-FS 40 1-HS 14	Long 125 Std 60 Fast 30	50	-40 to +200°C	R50	NF-TH07
	<p>Free cut</p> <p>Dimensions (mm): Width across flats 7 Thickness 3.2 Fiber core ø1 x 1 core (acrylic) sheath ø2.2 (polyethylene)</p>	7-EL 4,000 6-UL 2,200 5-PL 1,700 4-LG 1,500	3-ST 1,000 2-FS 550 1-HS 180	Long 700 Std 350	600	-40 to +180°C (Note)	R35	NF-TH02 <small>Standard item</small>

● Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Note: Light intensity retention rate of 85% or above after 1000 continuous work hours.

Photoelectric Sensors

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Laser Displacement Sensors

Fiber Units

Easy mounting

Thread type

Cylindrical type

Sleeve type

Flexible R4/R2

Flexible R1/R2

Retro-reflective

Small object detection

Screen/Array

Limited diffuse

Narrow view/wafer mapping

Heat resistant

Chemical resistant

Vacuum resistant

Liquid level/liquid leakage/water detection

Lens for through-beam type

Correct use

Fiber units Heat resistant (180 to 200°C)

Heat resistant <180 to 200°C or below> fiber units (diffuse type)

Type	Features/dimensions (mm)		Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model	
	D3RF	D2RF	BRF						
Diffuse type	200°C			7-EL 1,280 6-UL 1,200 5-PL 1,050 4-LG 920 3-ST 600 2-FS 230 1-HS 59	Long 850 Std 320 Fast 100	200	-60 to +200°C	R25	NF-DH07
				7-EL 1,100 6-UL 840 5-PL 750 4-LG 650	3-ST 450 2-FS 300 1-HS 100	Long 450 Std 250 Fast 150	210	-40 to +180°C (Note)	R35

●The sensing distances for the diffuse type fiber units are values on 500 × 500 mm white paper.

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Note: Light intensity retention rate of 85% or above after 1000 continuous work hours.

Heat resistant <180 to 200°C or below> fiber units (limited diffuse reflective type)

Type	Features/dimensions (mm)		Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model	
	D3RF	D2RF	BRF						
Limited diffuse reflective type	180°C			7-EL 0 to 35 6-UL 0 to 28 5-PL 0 to 25 4-LG 0 to 22 3-ST 0 to 20 2-FS 0 to 9 1-HS 3 to 4	Long 0 to 20 Std 0 to 10 Fast 0 to 8	10	-60 to +180°C	R25	NF-DH08

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Note: Light intensity retention rate of 85% or above after 1000 continuous work hours.

Heat resistant reflector

Possible to detect as retro-reflective type if the SW50 heat resistant reflector is used for the heat resistant diffuse type fiber.

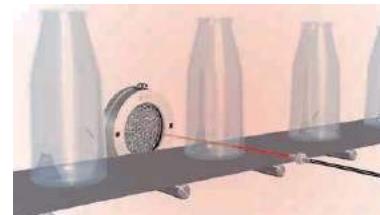
Demonstrates its strength in transparent object detection under high temperatures.

Reflector heat resistant to 300°C



SW50
ø80 × 20 mm (ø50 mm reflective surface)

Glass bottle detection under high temperatures

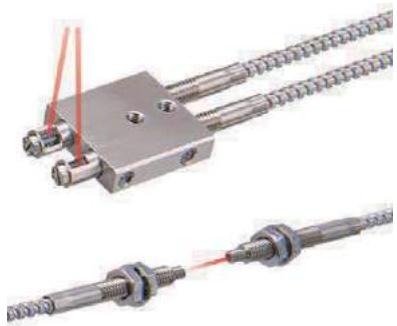


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Heat resistant (250 to 350°C)

[Related products](#)

 Fiber units
 Heat resistant (130°C or below)
 ▶ P.77

 Fiber units
 Heat resistant (180 to 200°C)
 ▶ P.80


Fiber units for ambient temperatures of 250 to 350°C

- | Limited diffuse reflective types are optimal for glass substrate alignment
- | This heat resistant series offers the most models in the industry at 30 models (according to in-house survey)

Through-beam type/Diffuse type/Limited diffuse reflective type

Two through-beam types, three diffuse types, and three limited diffuse reflective types are available. We offer a total of 8 variations to suit any high-temperature application.

Through-beam type

Standard	60 mm sleeve
NF-TH08	NF-TH09

Diffuse type

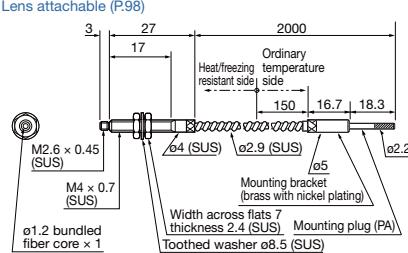
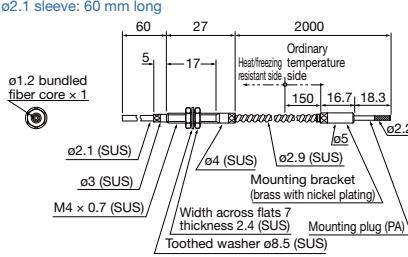
Coaxial	60 mm sleeve	90 mm sleeve
NF-DH03	NF-DH04	NF-DH05

Limited diffuse reflective type

Glass substrate detection	Glass substrate alignment	
NF-DH06	NF-DH10	NF-DH11

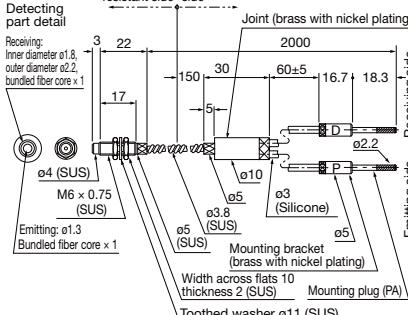
Fiber units Heat resistant (250 to 350°C)

Heat resistant <250 to 350°C or below> fiber units (through-beam type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Through-beam type 350°C	 <p>Lens attachable (P98) M2.6 x 0.45 (SUS) M4 x 0.7 (SUS) ø1.2 bundled fiber core x 1 ø2.9 (SUS) ø5 ø2.2 Mounting bracket (brass with nickel plating) Toothed washer ø8.5 (SUS) Width across flats 7 thickness 2.4 (SUS) Mounting plug (PA)</p>	7-EL 1,440 6-UL 1,350 5-PL 1,240 4-LG 1,080 3-ST 710 2-FS 430 1-HS 130	Long 750 Std 450 Fast 220	300	-30 to +350°C or -60 to +200°C	R25	NF-TH08 Standard item
	 <p>ø2.1 sleeve: 60 mm long ø1.2 bundled fiber core x 1 ø2.1 (SUS) ø3 (SUS) M4 x 0.7 (SUS) ø4 (SUS) ø2.9 (SUS) ø5 ø2.2 Mounting bracket (brass with nickel plating) Toothed washer ø8.5 (SUS) Width across flats 7 thickness 2.4 (SUS) Mounting plug (PA)</p>	7-EL 1,350 6-UL 1,260 5-PL 1,120 4-LG 900 3-ST 630 2-FS 410 1-HS 120	Long 750 Std 450 Fast 220	300	-30 to +350°C or -60 to +200°C	Fiber R25 Sleeve R10	NF-TH09

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Heat resistant <250 to 350°C or below> fiber units (diffuse type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Diffuse type 350°C	 <p>Coaxial Detecting part detail Receiving: Inner diameter ø1.8, outer diameter ø2.2, bundled fiber core x 1 Emitting: ø1.3 M6 x 0.75 (SUS) ø4 (SUS) ø5 (SUS) ø3.8 (SUS) ø5 (Silicone) ø10 ø5 ø2.2 Mounting bracket (brass with nickel plating) Toothed washer ø11 (SUS) Width across flats 10 thickness 2 (SUS) Mounting plug (PA)</p>	7-EL 940 6-UL 890 5-PL 770 4-LG 670 3-ST 440 2-FS 190 1-HS 50	Long 650 Std 250 Fast 80	150	-30 to +350°C or -60 to +200°C	R25	NF-DH03 Standard item

●The sensing distances for the diffuse type fiber units are values on 500 x 500 mm white paper.

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Heat resistant <250 to 350°C or below> fiber units (diffuse type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
Diffuse type	<p>o2.1 sleeve: 90 mm long</p> <p>Width across flats 7 thickness 2.4 (SUS)</p> <p>Emitting: $\phi 50 \mu m \times 380$</p> <p>Bendable range</p> <p>Detecting part detail</p> <p>Receiving: $\phi 50 \mu m \times 380$</p> <p>Toothed washer $\phi 8.5$ (SUS)</p> <p>Liner + blade tube (SUS)</p> <p>M4 x 0.7 (SUS)</p> <p>Joint</p> <p>Plastic plug (PA)</p> <p>o2.1 (SUS)</p> <p>o3</p> <p>o4</p> <p>o5</p> <p>o10</p> <p>o2.9</p> <p>o2.2</p> <p>o3.1</p> <p>o2.8 sleeve: 60 mm long</p> <p>Heat/freezing resistant side</p> <p>Ordinary temperature side</p> <p>Joint (brass with nickel plating)</p> <p>(emitter/receiver divided half)</p> <p>o1.8 bundled fiber core x 1</p> <p>o2.8 (SUS)</p> <p>o4 (SUS)</p> <p>M6 x 0.75 (SUS)</p> <p>Toothed washer o11 (SUS)</p> <p>Width across flats 10 thickness 2 (SUS)</p> <p>Mounting bracket (brass with nickel plating)</p> <p>Mounting plug (PA)</p> <p>o5 (SUS)</p> <p>o3.8 (SUS)</p> <p>o3 (Silicone)</p> <p>o10</p> <p>o2.2</p> <p>o5</p> <p>o2.8 sleeve: 60 mm long</p>	<p>7-EL 1,110 6-UL 1,050 5-PL 910 4-LG 800 3-ST 520 2-FS 190 1-HS 50</p> <p>Long 750 Std 250 Fast 80</p>	200	-30 to +350°C or -60 to +200°C	Fiber R25 Sleeve R10	NF-DH05	
		<p>7-EL 950 6-UL 900 5-PL 780 4-LG 680 3-ST 450 2-FS 200 1-HS 59</p> <p>Long 650 Std 250 Fast 80</p>	300	-30 to +350°C or -60 to +200°C	Fiber R25 Sleeve R10	NF-DH04	

●The sensing distances for the diffuse type fiber units are values on 500 × 500 mm white paper.

●Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.

Heat resistant reflector

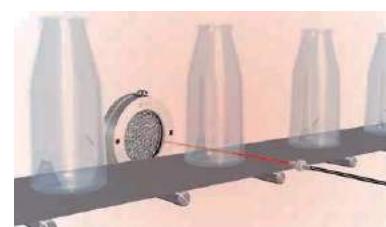
Possible to detect as retro-reflective type if the SW50 heat resistant reflector is used for the heat resistant diffuse type fiber.

Demonstrates its strength in transparent object detection under high temperatures.

Reflector heat resistant to 300°C



Glass bottle detection under high temperatures



Fiber units Heat resistant (250 to 350°C)

Heat resistant <250 to 350°C or below> fiber units (limited diffuse reflective type)

Type	Features/dimensions (mm)	Sensing distance (mm)			Ambient temperature	Bending radius (mm)	Model
		D3RF	D2RF	BRF			
300°C	Glass substrate detection Flat ON 	7-EL 0 to 40 6-UL 0 to 34 5-PL 0 to 22 4-LG 0 to 18 3-ST 0 to 17 2-FS 0 to 9 1-HS 0 to 4	Long Std Fast	0 to 15 0 to 10 0 to 8	-30 to +300°C or -60 to +200°C	R25	NF-DH06
	Glass substrate alignment Flat ON 	7-EL 2 to 28 6-UL 2 to 24 5-PL 2 to 23 4-LG 3 to 23 3-ST 3 to 20 2-FS 3 to 18 1-HS 4 to 11	Long Std Fast	4 to 20 4 to 20 4 to 17	-20 to +250°C (Ordinary temperature side: -20 to +70°C)	R25	NF-DH10
250°C	Glass substrate alignment Flat ON 	7-EL 2 to 45 6-UL 3 to 40 5-PL 3 to 39 4-LG 3 to 38 3-ST 4 to 35 2-FS 6 to 28 1-HS 8 to 19	Long Std Fast	6 to 38 7 to 30 8 to 25	-20 to +250°C (Ordinary temperature side: -20 to +70°C)	R25	NF-DH11

● Install with an ambient humidity between 35 and 85%. In the case of 85% RH, the ambient temperature should be between 0 and 40°C.