

ULTIMATE SENSOR SELECTION GUIDE

Find the Perfect Solution
for Any Sensing Problem



KEYENCE

CE

KEYENCE is the fiber sensor leader
known for creating the world's smallest
and fastest products.

Whatever your application need, you'll find
the right sensor solution here.



To choose by product feature such as size
or durability, please open here

SEARCH BY
PRODUCT

Product Category Sensor Selection Guide

Tough + Durable > P8-11

40 types of rugged fiber units including 8 stainless steel types.



Space Saving > P12-13

27 types of space-saving, ultra-thin or super-small fiber units to choose from depending on your application.



Easy Installation > P14

Quickly and easily install with a single nut or other simple method.



Laser Beam > P15

Sensor heads featuring a small beam spot and long detecting distance specific to laser optic sensors.



Environment-Proof > P16

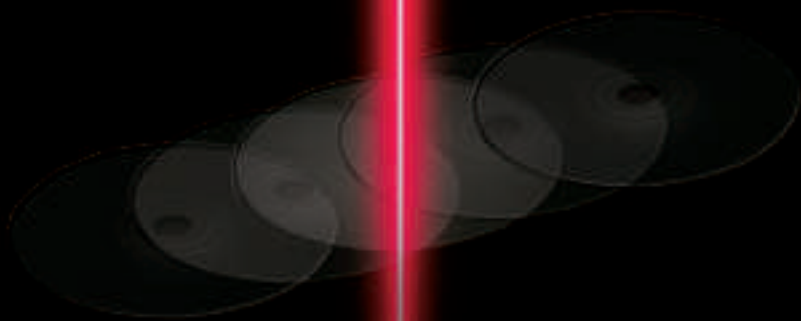
For applications requiring resistance to heat, chemicals, dust, or water.



Area Detection > P17

For applications requiring stable area detection with wide beam spots.





To choose by application, such as high-speed
or liquid level detection, please open here

SEARCH BY
APPLICATION

Application Category Sensor Selection Guide

General Detection > P18

General-purpose fiber units for passage confirmation or presence/absence detection.



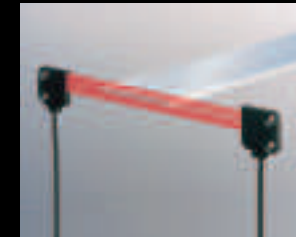
Versatile, thru-beam type



Adjustable small beam spot type



Long detecting distance, high-power type



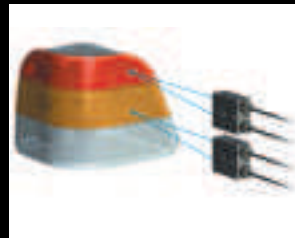
Area detection, thru-beam type



Versatile, reflective type

Color Detection > P19

CZ Series provides reliable color detection with 3-color RGB LEDs.



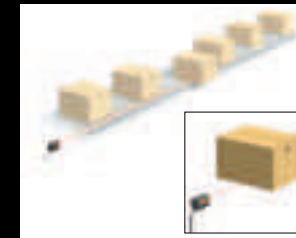
Differentiation wafers of tail lamp type



Differentiation of connector type

Long Distance Detection > P20

Sensors offering long detecting distance of up to 164.0' (50 m).



Detecting improper positioning of cardboard boxes



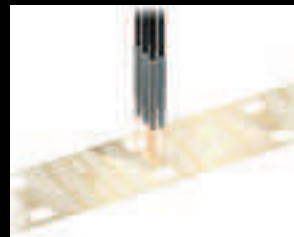
Detecting car parking positions

Highly Precise Detection > P21

For applications requiring high precision. Beam spot can be as small as 2.0 Mil (50 μm) in diameter.



Detecting wafers



Detecting the silver paste on the lead frame

Transparent Target Detection > P22

Special sensor heads for detecting transparent objects such as transparent film or plastic bottles.



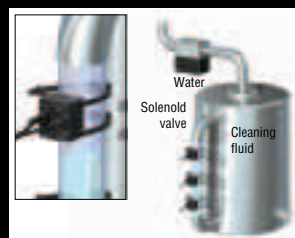
Detecting transparent films



Detecting improperly placed PET bottles

Liquid Level Detection > P23

Range of fiber units specially designed for liquid level detection.



Detecting cleaning fluid and water level



Detecting ABS oil level

High-Speed Detection > P34

Response speed as fast as 20 μs. Up to 25,000 targets can be detected per second.



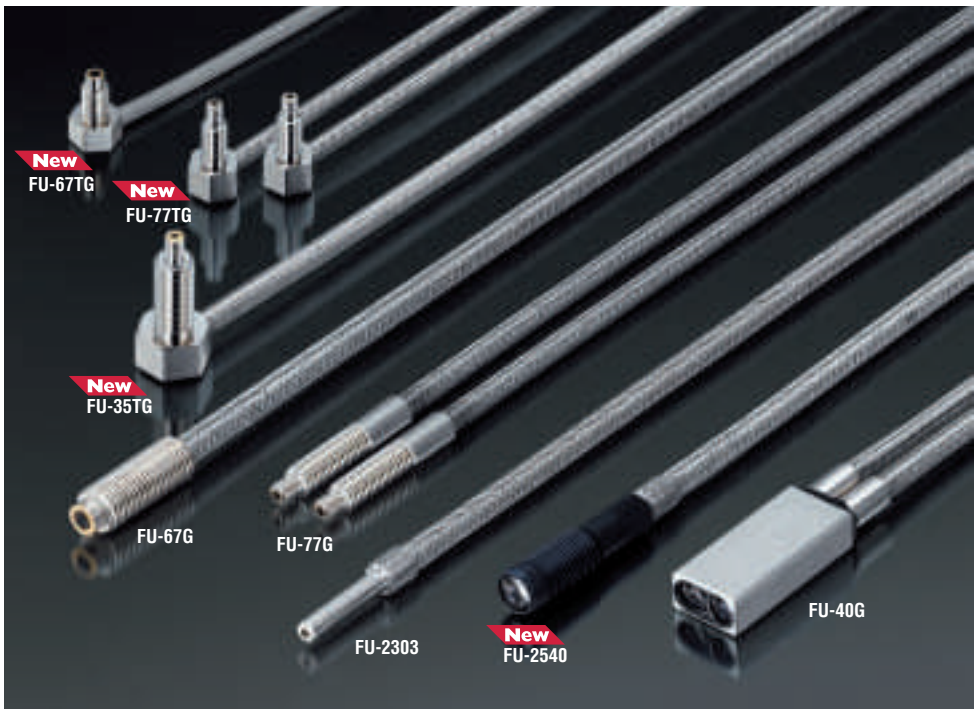
Detecting register marks moving at high speed



Measuring high speed disk rotation

Tough+Durable

40 types of rugged fiber units including 8 stainless steel types.



FEATURE

90°-angled, Hex-Shaped

Easy cable routing and space saving design

With conventional models, the fiber cable protrudes from the rear of the fiber unit, making an arc. This Hex-shaped unit allows easy cable routing in a minimal amount of space.

No protrusion

Because the cable can be mounted at a 90° angle, the possibility of snagging the cable with a tool can be minimized.

Conventional problem



Stainless steel armor

Resistant to pulling & impact

The fiber cable is armored with a stainless steel jacket. This unique structure features a small bend radius and strength against impact. These features prevent the cable from breaking easily, even if it is pulled or hit with a tool during work.



Stainless jacket structure



The outer braided shield adds strength against pulling, and the inner flexible spiral shield increases the strength against side impact.

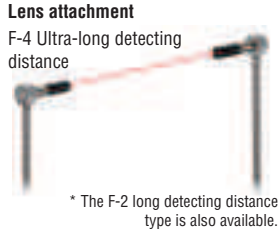
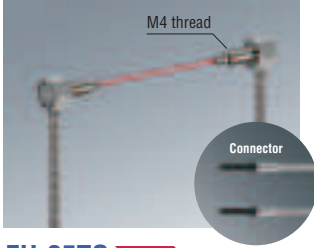


Conventional cable

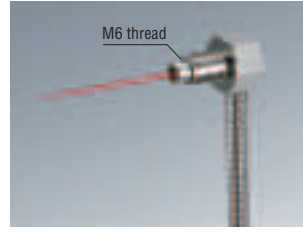
The conventional cable cannot be bent sharply, resulting in the need for more mounting space and making routing difficult.

8 variations of the armored G Series, stainless steel armored fiber units

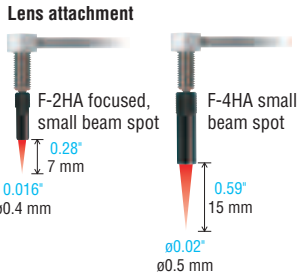
FU-77TG **New** 90° hex-shaped thrubeam with lens attachment option



FU-67TG **New** 90° hex-shaped reflective type

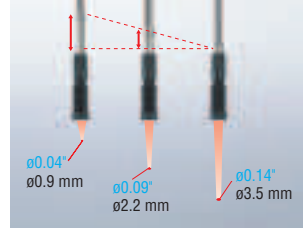


FU-35TG **New** Small beam spot, reflective type with various lens attachment



The FU-35TG can be used for various applications by changing the lens attachment mounted at the tip.

FU-2540 **New** Adjustable beam spot



Spot Diameter Adjustment
Spot diameter varies according to the fiber unit insertion depth.

FU-40G Long distance, high-power type

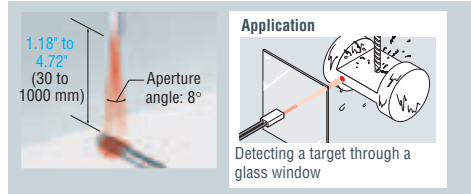


High-power reflective type unaffected by dust

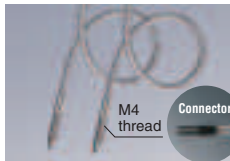
This high-power fiber unit offers a detecting distance of 3.3' (1 m). The dual lens structure ensures stable detection even when some dust adheres to the lens surface.

Narrow beam focuses onto targets

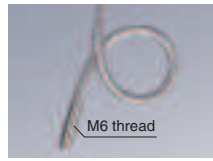
The aperture angle is narrowed to 8°. Unnecessary light dispersion is eliminated.



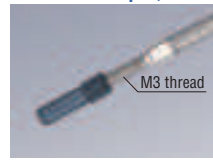
FU-77G Standard thrubeam



FU-67G Standard reflective



FU-2303 Small beam spot, coaxial, reflective



SPECIFICATIONS

Type		Shape/detecting distance (inch mm) ¹	Model
Thrubeam	Hex-shaped	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-77TG New
	Long distance	47.24"/22.44"/18.11"/9.06" 1200/570/460/230	FU-77G
Reflective	Long distance	14.17"/7.09"/5.12"/2.56" 360/180/130/65	FU-67G
	Hex-shaped	12.6"/6.3"/4.72"/2.36" 320/160/120/60	FU-67TG New
	Long distance	1.18" to 39.37"/1.18" to 12.6"/1.18" to 8.66"/1.18" to 4.72" 30 to 1000/30 to 320/30 to 220/30 to 120	FU-40G
	Adjustable beam spot	0.39" to 1.18" 10 to 30 with beam spot diameter of 0.04" to 0.14" 0.9 to 3.5	FU-2540 New
Reflective + lens attachment	Coaxial	4.72"/2.36"/1.65"/0.91" 120/60/42/23	FU-35TG New
	Long detecting distance, parallel beam	1.26"/1.06"/0.91" 32/27/23	New FU-35TG+F-3HA
	Small beam spot	Beam spot diameter of 0.02" 0.4 within a distance of 0.28 ±0.08" 7 ±2	New FU-35TG+F-2HA
	Long detecting distance, small beam spot	Beam spot diameter of 0.02" 0.5 within a distance of 0.59 ±0.08" 15 ±2	New FU-35TG+F-4HA

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

Tough+Durable

40 types of rugged fiber units including 8 stainless steel types.



TECH

Conventional fiber Minimum bending radius : R0.98" 25 mm

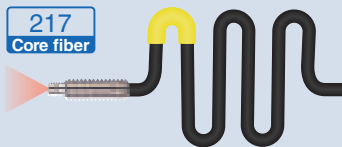


Single-core fiber

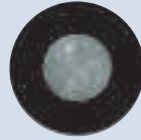


A single-core fiber that is exposed to excessive bending will easily break.

ToughFlex fiber Minimum bending radius : R0.08" 2 mm



217
Core fiber

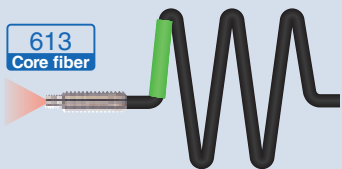


217-core fiber



A 217-core fiber is hardly affected by excessive bending.

Super ToughFlex fiber Minimum bending radius : R0.02" 0.5 mm



613
Core fiber

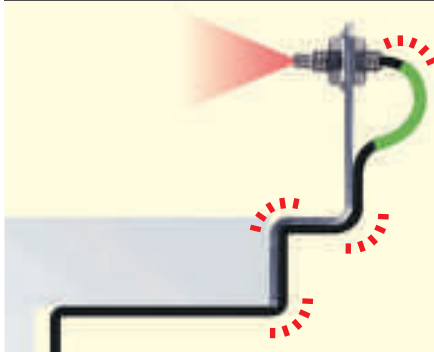


613-core fiber



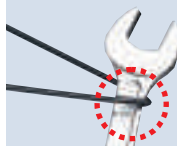
A 613-core fiber offers the best performance.

Super ToughFlex



PROBLEM

An accidental snag will cause a standard fiber to break.



SOLUTION

Super ToughFlex fiber has a bend radius of 0.02" (0.5 mm).

It can practically bend at a right angle and still performs with only a minimum decrease in light intensity.

ToughFlex + Hex-shaped



New
FU-35TZ

Easy cable routing and space saving

With conventional models, the fiber cable protrudes from the rear of the fiber unit, making an arc. This Hex-shaped unit allows easy cable routing.

High Flex

FU-49X

FU-69X

FU-48

FU-68

FU-59



A flexible fiber unit that can be mounted on a moving part. Ideal for use on moving machines, like robotic arms. Highly durable, up to a million repeated bends. Minimum bendable radius of 0.16" (4 mm).

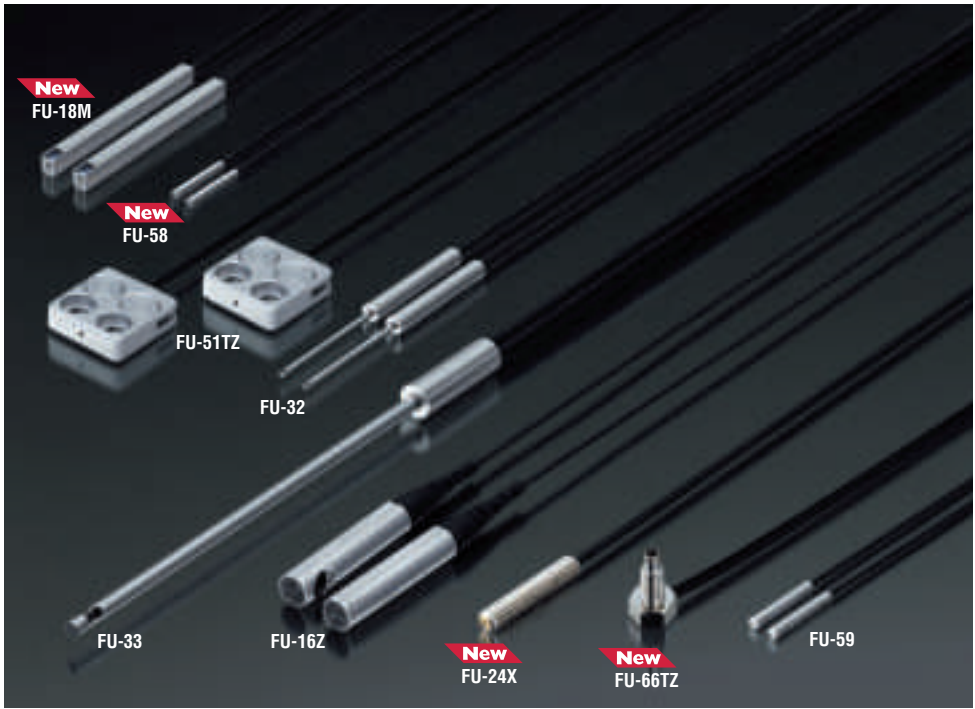
SPECIFICATIONS

Type	Size	Shape/Detecting Distance (inch/mm) ¹	Model	
Super ToughFlex	Thrubeam	0.14" x 0.16" 3.6 x 4	141.73"/141.73"/141.73"/70.87" 3600/3600/3600/1800	FU-50 New
		M4	47.24"/22.44"/18.11"/9.06" 1200/570/460/230	FU-77V
	Reflective	ø 0.16" ø4 mm	78.74"/0.43.31"/31.50"/19.69" 2000/1100/800/500	FU-16Z
ToughFlex	Thrubeam	M4	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-77TZ New
		M6	70.87"/35.43"/27.56"/13.78" 1800/900/700/350	FU-71Z
		0.79" x 0.79" 20 x 20	47.24"/39.37"/31.50"/23.62" 1200/1000/800/600	FU-12
	Reflective	0.83 x 0.37" x 0.20" 21 x 9.5 x 5.2	1.18" to 39.37"/1.18" to 12.60"/1.18" to 8.66"/1.18" to 4.72" 30 to 1000/30 to 320/30 to 220/30 to 120	FU-40
		M3	4.72"/12.36"/1.65"/0.91" 120/60/42/23	FU-35TZ New
		M6	12.60"/6.30"/4.72"/2.36" 320/160/120/60	FU-67TZ New
		M4	9.06"/4.72"/2.76"/1.57" 230/120/70/40	FU-66TZ New
		M6	19.69"/11.81"/7.87"/3.93" 500/300/200/100	FU-61Z
		M4	10.24"/5.12"/3.15"/1.77" 260/130/80/45	FU-66Z
		M3	5.12"/2.56"/1.77"/0.98" 130/65/45/25	FU-35FZ
High-flex	Thrubeam	ø0.04" ø1	3.94"/1.97"/1.57"/0.98" 100/50/40/25	FU-58 New
		ø0.06" ø1.5	15.75"/8.66"/7.87"/3.94" 400/220/200/100	FU-59
	Reflective	ø0.06" ø1.5	1.97"/0.98"/0.79"/0.59" 50/25/20/15	FU-49X
		M3	1.97"/0.98"/0.79"/0.59" 50/25/20/15	FU-69X
		M4	4.33"/2.17"/1.57"/0.98" 110/55/40/25	FU-68
		ø0.12" ø3 mm	4.33"/2.17"/1.57"/0.98" 110/55/40/25	FU-48

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

Space Saving

27 types of space-saving, ultra-thin or super-small fiber units to choose from depending on your application.



APPLICATION



Sheet material positioning



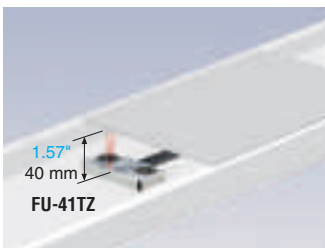
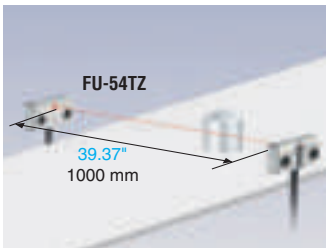
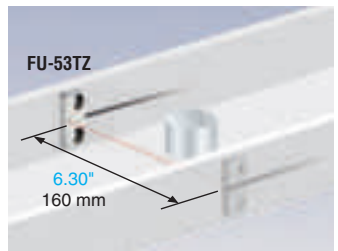
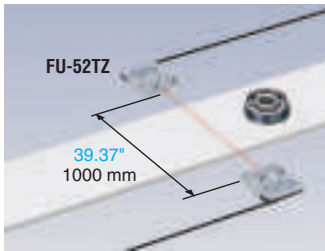
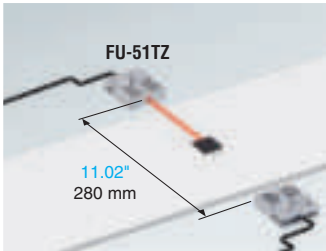
Counting pins



Roller positioning

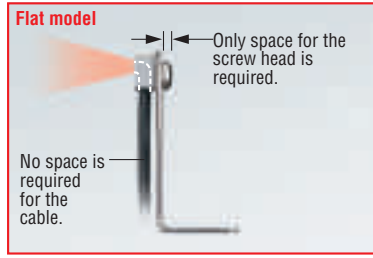
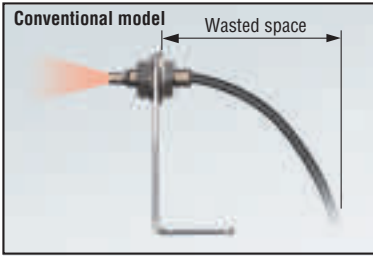
FEATURE

Thin & Flat type



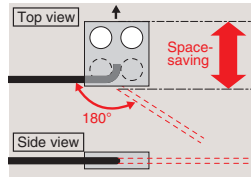
TECH

Flat Design



Protection

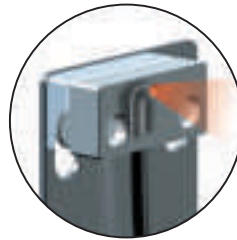
With a thin-profile head, the FU-51TZ/52TZ emits a beam from its side. The flexible cable routing facilitates mounting. Two models are available: FU-51TZ featuring a super-small head of 0.39" x 0.39" (10 x 10 mm), and FU-52TZ offering a long detecting distance of 19.69" (500 mm).



Internal structure

Patent-pending

The tip of the fiber unit is made of an unbreakable fiber so that it can be bent at a right angle like a periscope, resulting in no wasted space.



SPECIFICATIONS

Type	Size	Shape/Detecting Distance (inch/mm) ¹	Model	
Side-view	Thrubeam	0.08" x 0.06" x 0.79" 2 x 1.5 x 20	23.62"/11.81"/9.84"/7.87" 600/300/250/200	FU-18M New
		ø0.03"/ø0.10" ø0.82/ø2.5	7.87"/3.15"/2.36"/1.18" 200/80/60/30	FU-32
		ø0.05"/ø0.12" ø1.2/ø3	15.75"/9.84"/7.87"/3.94" 400/250/200/100	FU-34
	Reflective	ø0.08"/ø0.19" ø2.1/ø4.8	4.72"/2.36"/1.57"/0.79" 120/60/40/20	FU-33
		ø0.08"/ø0.11" ø2.0/ø2.8	2.13"/1.06"/0.79"/0.51" 54/27/20/13	FU-31
Hex-shaped	Reflective	M4	9.06"/4.72"/2.76"/1.57" 230/120/70/40	FU-66TZ New
Thin-sleeve	Reflective	ø0.02"/ø0.06" ø0.5/ø1.5	0.39"/0.28"/0.20"/0.08" 10/7/5/2	FU-46 New
		ø0.08"/M4 ø2/M4	3.54"/1.77"/1.38"/0.79" 90/45/35/20	FU-63Z
ToughFlex	Thrubeam	ø0.16" x 0.67" ø44 x 17	78.74"/43.31"/31.50"/19.69" 2000/1100/800/500	FU-16Z
High-flex	Thrubeam	ø0.06" ø1.5	15.75"/8.66"/7.87"/3.94" 400/220/200/100	FU-59
		ø0.04" ø1	3.94"/1.97"/1.57"/0.98" 100/50/40/25	FU-58 New
	Reflective	ø0.06" ø1.5	1.97"/0.98"/0.79"/0.59" 50/25/20/15	FU-49X
Thin&Flat	Thrubeam	0.39" x 0.39" 10 x 10	11.02"/5.91"/4.72"/2.36" 280/150/120/60	FU-51TZ
		0.55" x 0.55" 14 x 14	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-52TZ
		0.28" x 0.52" 7 x 13	6.30"/3.94"/3.15"/1.57" 160/100/80/40	FU-53TZ
	0.28" x 0.59" 7 x 15	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-54TZ	
	Reflective	ø0.16" x 0.28" ø4 x 17	0.04" to 7.87"/0.04" to 3.93"/0.04" to 2.36"/0.04" to 1.18" 1 to 200/1 to 100/1 to 60/1 to 30	FU-42TZ New
		ø0.06" ø1.65	4.72"/2.76"/1.97"/1.18" 120/70/50/30	FU-63T
		0.28" x 0.59" 7 x 15	0.08" to 1.57"/0.08" to 0.79"/0.08" to 0.63"/0.08" to 0.31" 2 to 40/2 to 20/2 to 16/2 to 8	FU-41TZ

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

Easy Installation

Quickly and easily install with a single nut or other simple method.



FEATURE

Unbreakable fiber

The cable features an unbreakable fiber with the tip of the fiber bent at a right angle, like a periscope. This design requires far less space than conventional models. (Patent pending)

Easy mounting





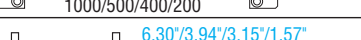
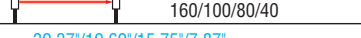

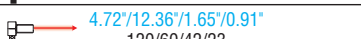

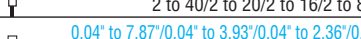

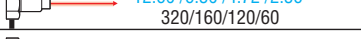
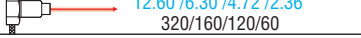
Secure the unit with a single nut. Your current, standard fiber unit can be replaced without additional preparation or modification.

Space-saving, trouble-free

All FU-TZ Series fiber units allow neat cable routing and require less space for installation. This eliminates problems such as entangled cables.

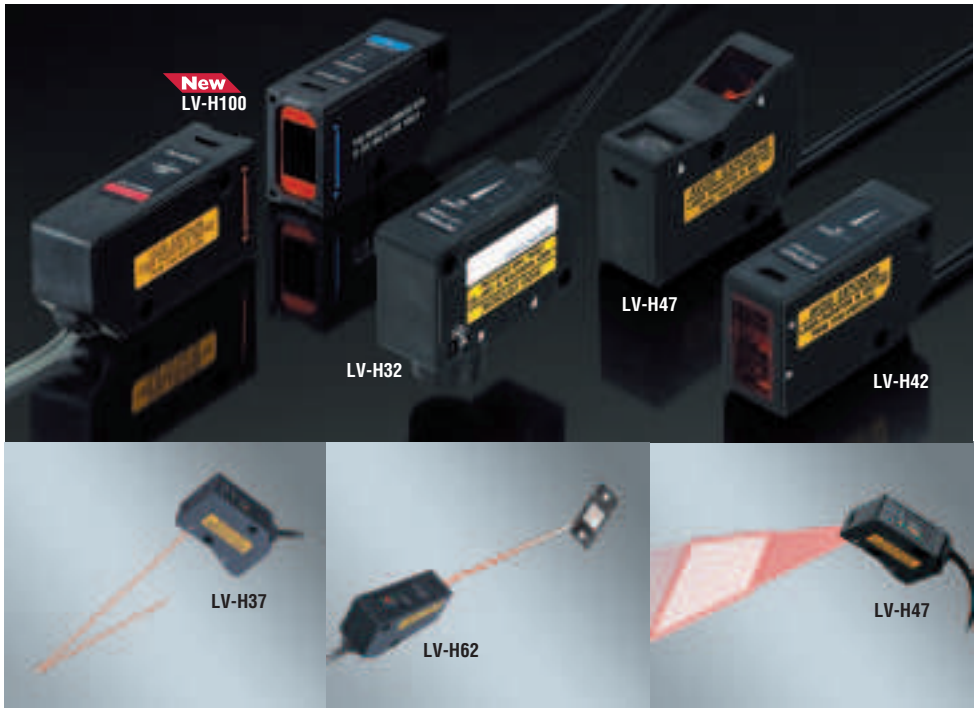


SPECIFICATIONS

Type	Shape / Detecting distance (inch mm) ¹ :	Minimum bend radius	Model
Thrubeam	 39.37"/19.69"/15.75"/7.87" 1000/500/400/200	R2	FU-77TZ New
	 39.37"/19.69"/15.75"/7.87" 1000/500/400/200	R10	FU-77TG New
	 11.02"/5.91"/4.72"/2.36" 280/150/120/60	R2	FU-51TZ
	 39.37"/19.69"/15.75"/7.87" 1000/500/400/200	R2	FU-52TZ
	 6.30"/3.94"/3.15"/1.57" 160/100/80/40	R2	FU-53TZ
	 39.37"/19.69"/15.75"/7.87" 1000/500/400/200	R2	FU-54TZ
Reflective	 4.72"/12.36"/1.65"/0.91" 120/60/42/23	R2	FU-35TZ New
	 4.72"/12.36"/1.65"/0.91" 120/60/42/23	R10	FU-35TG New
	 0.08" to 1.57"/0.08" to 0.79"/0.08" to 0.63"/0.08" to 0.31" 2 to 40/2 to 20/2 to 16/2 to 8	R2	FU-41TZ
	 0.04" to 7.87"/0.04" to 3.93"/0.04" to 2.36"/0.04" to 1.18" 1 to 200/1 to 100/1 to 60/1 to 30	R2	FU-42TZ New
	 12.60"/6.30"/4.72"/2.36" 320/160/120/60	R2	FU-67TZ New
	 12.60"/6.30"/4.72"/2.36" 320/160/120/60	R10	FU-67TG New
	 9.06"/4.72"/2.76"/1.57" 230/120/70/40	R2	FU-66TZ New

Laser Beam

Sensor heads featuring a small beam spot and long detecting distance specific to laser optic sensors.



FEATURE

World's smallest size
The volume is reduced to a quarter of our previous model.

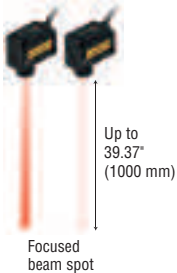
Detecting distance: **78.74" (2,000 mm)**

New LV-H300

Linear area beam
Even when the detecting distance varies, the beam area width hardly changes.

LV-H32 Long-distance, adjustable beam spot

The flexible beam spot can be focused on a small target



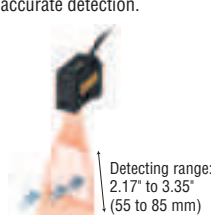
LV-H37 Ultra-small beam spot

Ultra-small beam spot of 1.95 Mil (50 µm)



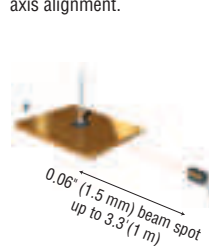
LV-H47 Area detection, definite-reflective

The area detection sensor enables stable and highly accurate detection.



LV-H62 Straight beam, retro-reflective

The high-performance sensor allows easy optical axis alignment.

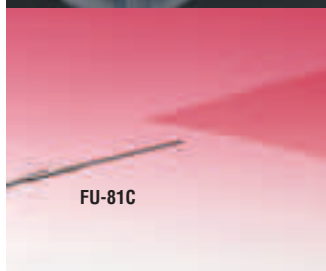
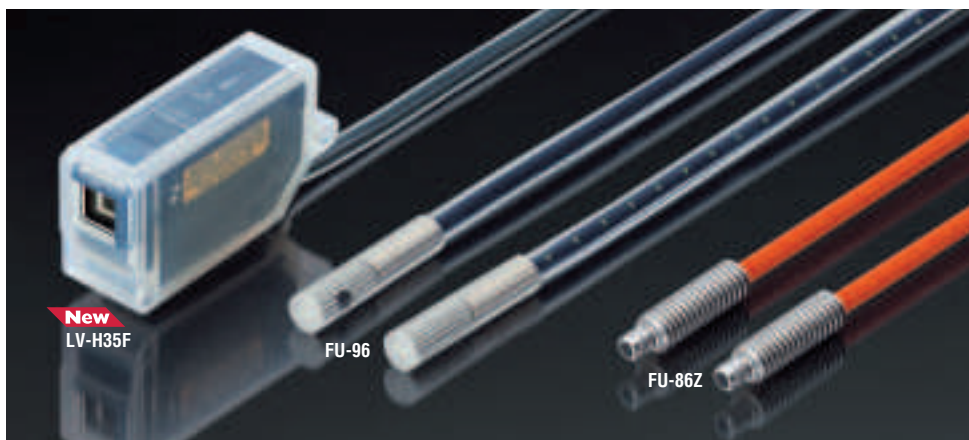


SPECIFICATIONS

Shape	Detecting distance			Beam spot shape	Model	
	FINE	TURBO	SUPER		Sensor head	Amplifier
		78.74" 2000 mm		Area width: approx. 0.39" (10 mm) Smallest detectable object: 0.004" (0.1 mm) dia. (LV-H100 only) opaque material (Detecting distance: 19.69" (500 mm) max.)	New LV-H100/H110	LV-51M(P)/ LV-52(P)
		78.74" 2000 mm		Area width: approx. 1.18" (30 mm) Smallest detectable object: 0.01" (0.3 mm) dia. opaque material (Detecting distance: 19.69" (500 mm) max.)	New LV-H300	
	5.91" 150 mm	11.81" 300 mm	23.62" 600 mm	Spot diameter: approx. 0.08" (2 mm)		LV-H35
		2.76" ±0.57" 70 ±15 mm		Spot diameter: approx. 1.95 Mil (50 µm) (Detecting distance: 2.76" (70 mm))		LV-H37
	1.18" to 9.84" 30 to 250 mm	1.18" to 19.69" 30 to 500 mm	1.18" to 39.37" 30 to 1000 mm	Spot diameter: approx. 0.03" (0.8 mm) max. (Detecting distance: 11.81" (300 mm) max.)		LV-H32
	65.6" 20 m	98.4" 30 m	98.4" 30 m	Spot diameter: approx. 0.06" (1.5 mm) (Detecting distance: 3.3' (1 m) max.)		LV-H67
	6.6" 2 m	16.4" 5 m	23.0" 7 m		LV-H62	
		2.76" ±0.57" 70 ±15 mm		Area width: approx. 0.67" to 0.91" (17 to 23 mm) (Detecting distance: 2.17" to 3.35" (55 to 85 mm)) (without slit)		LV-H47
	9.84" 250 mm	19.69" 500 mm	39.37" 1000 mm	LV-H42 Area width: approx. 1.46" (37 mm) Thickness: 0.04" (1 mm) max. (Detecting distance: 5.91" (150 mm))		LV-21A(P)/ LV-22A(P)/ LV-11A
				LV-H41 Area width: approx. 1.50" (38 mm) Thickness: 0.05" (1.3 mm) max. (Detecting distance: 5.91" (150 mm))		

Environment-Proof

For applications requiring resistance to heat, chemicals, dust, or water.



APPLICATION



Heat resistant



Detecting drill breakage



Detecting threading on metal parts

SPECIFICATIONS

Type		Detecting distance	FDA	Model
Laser	Retro-Reflective	4.9'/11.5'/16.4' 1.5 m/3.5 m/5 m	Class II	LV-H62F New
	Small-spot reflective	3.94'/7.87'/17.72' 100 mm /200 mm /450 mm	Class II	LV-H35F New

Type		Dimensions	Detecting distance (inch/mm) ¹	Model
FEP sheathed fiber	Reflective	0.18" dia. 4.5 mm dia.	8.66"/4.33"/3.35"/2.36" 220/110/85/60	FU-91
		0.20" dia. 5.0 mm dia.	141.73"/98.43"/86.61"/43.31" 3600/2500/2200/1100	FU-92
	Thrubeam	0.20" dia. 5.0 mm dia.	70.87"/34.25"/27.56"/13.78" 1800/870/700/350	FU-96

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

Type	Dimensions	Detecting distance (inch/mm) ¹	Ambient temperature	Model	
Heat resistant	Reflective	ø0.08" 14.17"/7.09"/4.72"/2.36" 360/180/120/60	-22 to +662°F (-30 to +350°C) ²	FU-81C	
		ø2.1 mm/M4 16.54"/8.27"/5.51"/2.76" 420/210/140/70	-40 to +572°F (-40 to +300°C) ²	FU-82C	
		M4 16.54"/8.27"/5.51"/2.76" 420/210/140/70	-40 to +572°F (-40 to +300°C) ²	FU-83C	
		M4 19.69"/11.81"/7.87"/3.94" 500/300/200/100	-40 to +221°F (-40 to +105°C)	FU-85	
		M6 14.17"/7.09"/5.12"/2.56" 360/180/130/65	-40 to +212°F (-40 to +100°C)	FU-85Z	
		M6 16.54"/8.27"/5.51"/2.76" 420/210/140/70	-76 to +356°F (-60 to +180°C) ³	FU-87	
	Thrubeam	M4	23.62"/14.57"/11.81"/5.91" 600/370/300/150	-40 to +572°F (-40 to +300°C) ²	FU-84C
			47.24"/29.92"/25.20"/12.60" 1200/760/640/320	-40 to +221°F (-40 to +105°C)	FU-86
			39.37"/27.56"/19.69"/9.84" 1000/700/500/250	-40 to +212°F (-40 to +100°C)	FU-86Z
			31.50"/19.69"/15.75"/7.87" 800/500/400/200	-76 to +356°F (-60 to +180°C) ³	FU-88

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

2. Ambient temperature varies depending on the distance from the fiber end. Please refer to the general catalog.

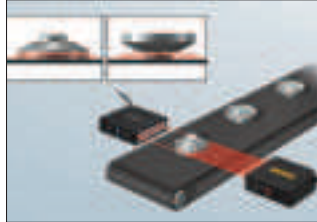
3. The ambient temperature for the FU-87 and 88 is in dry conditions.

Area Detection

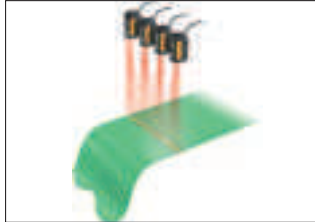
For applications requiring stable area detection with wide beam spots.



APPLICATION



Differentiation between front and back sides



Detecting flaws on sheet material



Detecting ring-shape part rejection

TECH

0.39" (10-mm) and 1.18" (30-mm) types are available.



SPECIFICATIONS

Type		Shape/Detecting distance (inch/mm)	FDA	Model
Laser	Area detection, thrubeam	78.74" 2000	Class II	LV-H300 New
		78.74" 2000		New New LV-H100/H110
	Long-distance, area detection	39.37" 1000	Class II	LV-H42
	Area detection, definite-reflective	2.17" to 3.35" 55 to 85	Class I	LV-H41
			Class II	LV-H47

Type		Dimensions	Shape/Detecting distance (inch/mm)	Model
Fiber optic	Thrubeam	0.79" x 0.92" x 0.17" 20 x 23.3 x 4.2	47.24"/39.37"/31.50"/23.62" ^{1.} 1200/1000/800/600 ^{1.}	FU-12
	Reflective	0.59" x 1.10" x 0.28" 15 x 28 x 7	0.20" to 6.30"/0.20" to 5.12"/0.20" to 3.54" ^{2.} 5 to 160/5 to 130/5 to 90 ^{2.}	FU-11

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

2. When using SUPER TURBO mode/TURBO mode/FINE mode

General Detection

General-purpose fiber units for passage confirmation or presence/absence detection.



SPECIFICATIONS

Type		Size	Shape/Detecting Distance (inch/mm) ¹	Model
Super ToughFlex	Thrubeam	M4	47.24"/22.44"/18.11"/9.06" 1200/570/460/230	FU-77V
	Reflective	M6	14.17"/7.09"/5.12"/2.56" 360/180/130/65	FU-67V
ToughFlex	Thrubeam	M4	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-77TZ New
		0.79" x 0.79" 20 x 20	47.24"/39.37"/31.50"/23.62" 1200/1000/800/600	FU-12
		M6	70.87"/35.43"/27.56"/13.78" 1800/900/700/350	FU-71Z
		ø 0.16" ø4 mm	78.74"/43.31"/31.50"/19.69" 2000/1100/800/500	FU-16Z
	Reflective	0.16" x 0.28" 4 x 17	0.04" to 7.87"/0.04" to 3.93"/0.04" to 2.36"/0.04" to 1.18" 1 to 200/1 to 100/1 to 60/1 to 30	FU-42TZ New
		M3	4.72"/12.36"/1.65"/0.91" 120/60/42/23	FU-35TZ New
		M6	12.60"/6.30"/4.72"/2.36" 320/160/120/60	FU-67TZ New
		M4	9.06"/4.72"/2.76"/1.57" 230/120/70/40	FU-66TZ New
		M6	19.69"/11.81"/7.87"/3.93" 500/300/200/100	FU-61Z
		0.83" x 0.37" x 0.20" 21 x 9.5 x 5.2	1.18" to 39.37"/1.18" to 12.60"/1.18" to 8.66"/1.18" to 4.72" 30 to 1000/30 to 320/30 to 220/30 to 120	FU-40
M3	5.12"/2.56"/1.77"/0.98" 130/65/45/25	FU-35FZ		
Adjustable beam spot	Reflective	M0.24 x 0.99" M6 x 25.2	0.39" to 1.18" 10 to 30 with beam spot diameter of 0.04" to 0.14" 0.9 to 3.5	FU-10
Thin&Flat	Thrubeam	0.39" x 0.39" 10 x 10	11.02"/5.91"/4.72"/2.36" 280/150/120/60	FU-51TZ
		0.55" x 0.55" 14 x 14	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-52TZ
		0.28" x 0.52" 7 x 13	6.30"/3.94"/3.15"/1.57" 160/100/80/40	FU-53TZ
		0.28" x 0.08" 7 x 2	39.37"/19.69"/15.75"/7.87" 1000/500/400/200	FU-54TZ
	Reflective	0.28" x 0.08" 7 x 2	0.08" to 1.57"/0.08" to 0.79"/0.08" to 0.63"/0.08" to 0.31" 2 to 40/2 to 20/2 to 16/2 to 8	FU-41TZ

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

Color Detection

CZ Series provides reliable color detection with 3-color RGB LED.

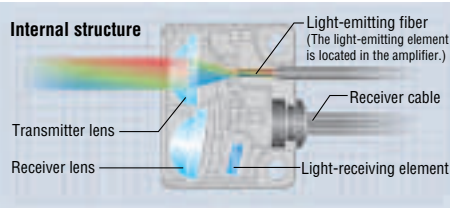


TECH

Extremely high power

Utilizes the world's first hybrid structure

The SUPER RGB sensor was developed by a dramatic redesign of the sensor head structure to improve overall performance. The transmitter uses an optical fiber, which creates an incredibly uniform beam spot and helps reduce the size of the sensor head. The light-receiving circuit is built into the sensor head, enhancing its detection ability and improving stability.



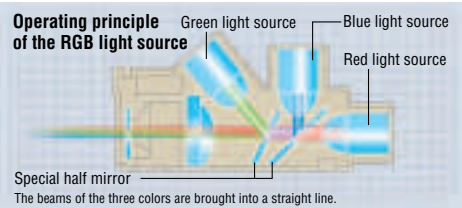
World's first

RGB light source for triple 16-bit calculation

First-in-its-class

Three-color light source for accurate target recognition

The SUPER RGB sensor incorporates three separate color LED's. The signal from each color is converted into 16-bit data in the receiver to enable color recognition. This ensures accurate detection regardless of target vibration.



SPECIFICATIONS

Type	Detecting distance (inch/mm)	Beam spot diameter (inch/mm)	Model
Area beam spot, reflective	0.20" to 0.79" 5 to 20	ø0.59" 15 (at 0.39" to 0.59" 10 to 15 distance)	CZ-12 1. New
Transparent object differentiation, retro-reflective	Reflector: R2= 1.58" to 39.37" 40 to 1000	—	CZ-60 1. New
Small size adjustable beam spot	0.39" to 1.18" 10 to 30	ø0.04" to ø0.14" ø0.9 to ø3.5	CZ-10 1.
Small size, side-view adjustable beam spot	0.12" to 0.59" 3 to 15	ø0.04" to ø0.06" ø0.9 to ø1.5	CZ-11 1.
Long detecting distance type	2.76" ±0.79" 70 ±20	ø0.24" ø6	CZ-40 1.
Small beam spot type	0.63" ±0.16" 16 ±4	ø0.04" ø1	CZ-41 1.
Adjustable spot	1.97" to 3.74" 50 to 95	ø0.12" to ø0.22" ø3 to ø5.5	CZ-H32 2. New
Luster cancel	1.10" to 2.05" 28 to 52	0.18" 4.5 dia. at distance of 1.57" 40	CZ-H35S 2. New
Luster-cancel, small beam spot	0.43" to 0.79" 11 to 20	0.04" 1 dia. at distance of 0.63" 16	CZ-H37S 2. New
Fluorescence detection UV	0.98" to 2.17" 25 to 55	0.39" 10 dia. at distance of 0.98" 25	CZ-H52 2. New

1. Applicable amplifier: CZ-K1(P)
2. Applicable amplifier: CZ-V21(P)/V22(P)

Long Distance Detection

Sensors offering long detecting distance of up to 164.0' (50 m).



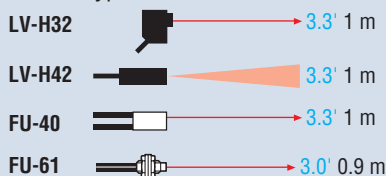
FEATURE

Detecting distance ranking

Thrubeam/Retro-reflective type



Reflective type



SPECIFICATIONS

Type		Detecting distance ^{1, 2}	Model
Thrubeam	Laser	78.74" 2000 mm	LV-H100 New
	ToughFlex	141.73"/141.73"/141.73"/70.87" 3600 mm/3600 mm/3600 mm/1800 mm	FU-50 New
		70.87"/35.43"/27.56"/13.78" 1800 mm/900 mm/700 mm/350 mm	FU-71Z
	Side-view	125.98"/66.93"/51.18"/31.50" 3200 mm/1700 mm/1300 mm/800 mm	FU-16
Standard	70.87"/43.31"/35.43"/17.72" 1800 mm/1100 mm/900 mm/450 mm	FU-71	
Reflective	Laser	39.37"/19.69"/9.84" 1000 mm/500 mm/250 mm	LV-H32
		39.37"/19.69"/9.84" 1000 mm/500 mm/250 mm	LV-H42
	ToughFlex	39.37"/12.60"/18.66"/14.72" 1000 mm/320 mm/220 mm/120 mm	FU-40
		19.69"/11.81"/7.87"/3.93" 500 mm/300 mm/200 mm/100 mm	FU-61Z
Standard	35.43"/17.72"/11.81"/5.91" 900 mm/450 mm/300 mm/150 mm	FU-61	
Retro-reflective	Laser	23.0"/16.4"/6.6' 7 m/5 m/2 m	LV-H62
		164 ³ "/98.4"/65.6' 50 m ³ /30 m/20 m	LV-H67

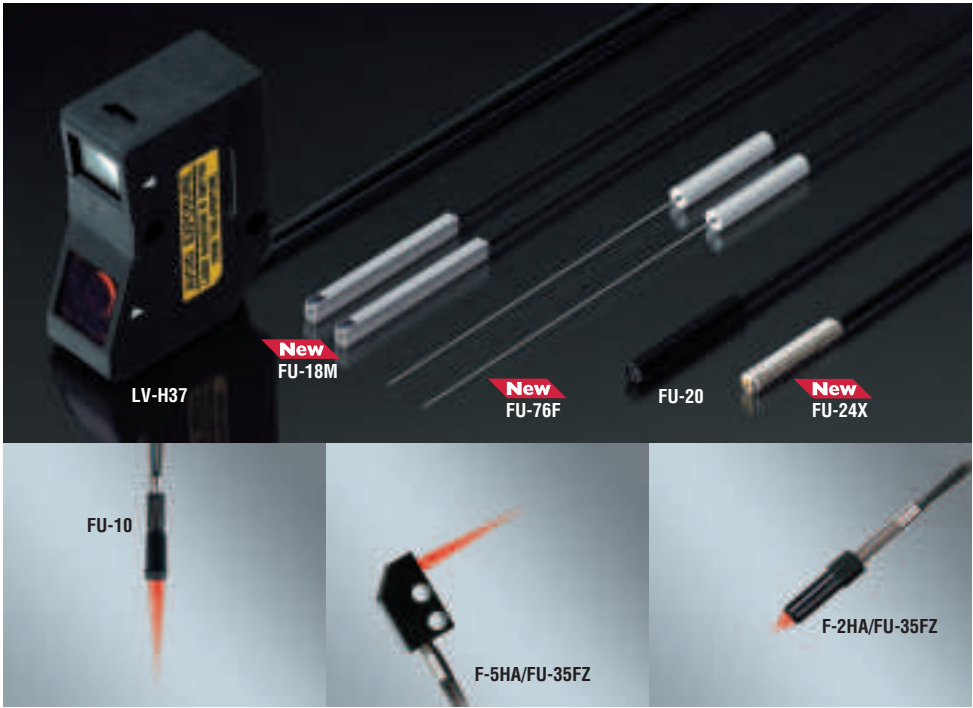
1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

2. "141.7" 3600" is assumed as maximum because the fiber cable has a length of 6.6' 2 m.

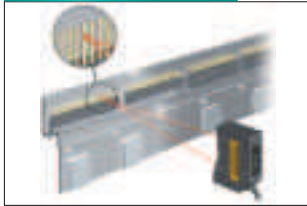
3. Use OP-42198

Highly Precise Detection

For applications requiring high precision. Beam spot can be as small as 2.0 Mil (50 µm) in diameter.



APPLICATION



Counting connector pins



Detecting chip component orientation



Detecting registration mark

SPECIFICATIONS

Type		Applicable fibre unit	Detecting distance ¹	Beam spot diameter	Smallest detectable object	Model
Reflective	Coaxial	—	1.42°/0.71°/0.47°/0.24° 36/18/12/6	ø0.004" ø0.1 mm (F-2HA)	ø0.0002" ø0.005mm (gold wire)	FU-24X New
Thru-beam	Thin-sleeve	—	3.94°/1.97°/1.57°/0.98° 100/50/40/25	—	ø0.0002" ø0.005mm (gold wire)	FU-76F New
Thru-beam	Side-view	—	23.62°/11.81°/9.84°/7.87° 600/300/250/200	—	ø0.0008" ø0.02 mm	FU-18M New
Reflective	Laser	—	1.18° to 9.84°/ 1.18° to 19.69°/ 1.18° to 39.37° 30 to 1000/30 to 500/ 30 to 250	ø0.03" ø0.8 mm	—	LV-H32
Reflective	Small spot (built-in lens)	—	0.20" 5 mm	0.004" ø0.1 mm	—	FU-20
Reflective	Adjustable small-spot	—	0.39" to 1.18" 10 to 30 mm	ø0.035" to ø0.138" ø0.9 to ø3.5 mm	—	FU-10
Reflective	Adjustable small-spot, side-view lens	FU-35FA (Z)	0.32" to 1.18" 8 to 30 mm	ø0.02" to ø0.118" ø0.5 to ø3.0 mm	ø0.002" to ø0.118" ø0.5 to ø3.0 mm	F-5HA
Reflective	Focusing lens	FU-21X	0.27" ±0.08" 7 ±2 mm	ø0.008" ø0.2 mm	ø0.0004" ø0.01 mm	F-2HA
		FU-35FA (Z)	2.56°/2.17°/1.77° 65/55/45 mm ²	ø0.157" ø4.0 mm	ø0.002" ø0.05 mm	F-3HA
		FU-35FZ	1.38°/1.18°/0.98° 35/30/25 mm ²	ø0.02" ø0.5 mm	ø0.001" ø0.03 mm	F-4HA
		F-35FA (Z)	0.59" ±0.079" 15 ±2 mm	ø0.04" ø1.0 mm	ø0.001" ø0.03 mm	F-6HA
		FU-21X	1.38" ±0.12" 35 ±3 mm	ø0.08" ø2.0 mm	—	—
		FU-35FA(Z)	2.76" ±0.59" 70 ±15 mm	Approx. 2.0 Mil/50 µm	—	—
Reflective	Small-spot, definite-reflective, laser	—	2.76" ±0.59" 70 ±15 mm	Approx. 2.0 Mil/50 µm	—	LV-H37

1. When using ULTRA TURBO mode/SUPER TURBO mode/TURBO mode/FINE mode

2. When using SUPER TURBO mode/TURBO mode/FINE mode

Transparent Target Detection

Special sensor heads for detecting transparent objects such as transparent film or plastic bottles.



LV-H62



FU-38S

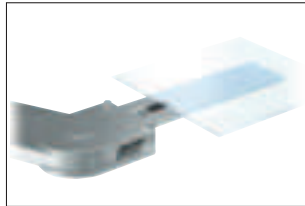


CZ-60

APPLICATION



Detecting remaining glass plates



Detecting glass circuit board (dry condition)

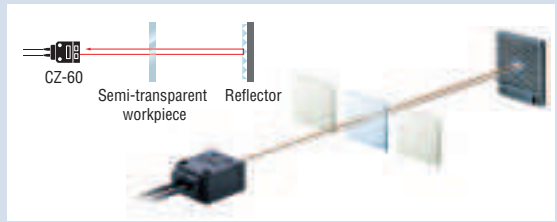


Detecting PET bottle

FEATURE

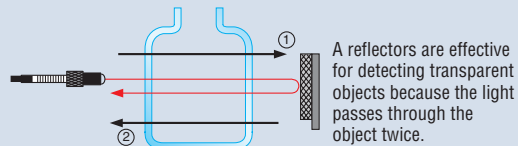
Transparent object differentiation (Retro-reflective type)

Transparent objects with only slight color differences can be differentiated due to high precision RGB light sources. Its retro-reflective operating principle sends emitted light through the workpiece twice, increasing light attenuation.



TECH

By using a reflector and a high-resolution amplifier, accurate detection of transparent objects from long distances are reliably achieved.



A reflectors are effective for detecting transparent objects because the light passes through the object twice.

SPECIFICATIONS

Type	Unit Size (inch mm)	Model	Type	Detecting distance (inch mm)	Model
Definite Reflective	0.57" x 0.75" x 0.20" 14.4 x 19 x 5.0	FU-37	Retro-reflective	Super small	0.39' to 1.81' 10 to 300
	0.47" x 0.75" x 0.16" 12 x 19 x 4.0	FU-38		Square shape, long-distance	3.94' to 78.74' 100 to 2000
	0.81" x 1.14" x 0.14" 20.5 x 29 x 3.6	New FU-38S		RGB	R2: 1.57' to 39.37' R2: 40 to 1000
	0.47" x 0.75" x 0.17" 12 x 19 x 4.3	FU-38V		Straight-beam laser	23.0' 7 m
	0.87" x 1.16" x 0.15" 22 x 29 x 3.8	FU-38R			
					FU-13 New
					FU-15 New
					CZ-60 New
					LV-H62

Liquid Level Detection

Range of fiber units specially designed for liquid level detection.



APPLICATION



Detecting the operating oil level for a press



Checking for pouring engine oil

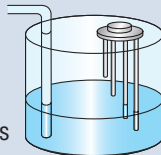


Detecting resist level

TECH

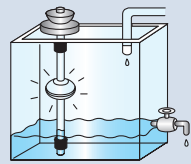
PROBLEM 1

An electrode level switch only detects a limited number of liquids because some liquids cause corrosion. A fixed-length bar makes product changeovers difficult.



PROBLEM 2

A float switch may clog and fail due to dust.



SOLUTION 1

The external-mount FU-95Z is easy to attach to the target. Level detection through a pipe is available for any type of liquid.

SOLUTION 2

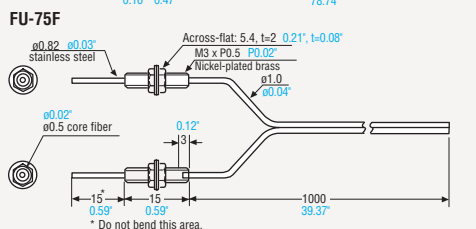
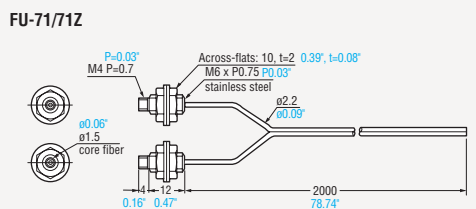
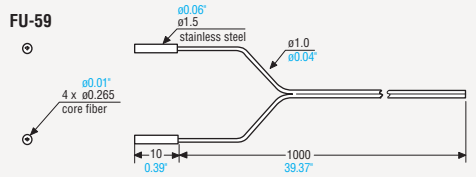
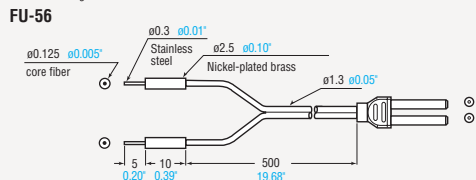
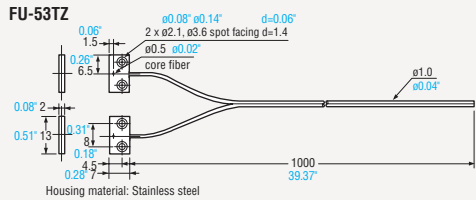
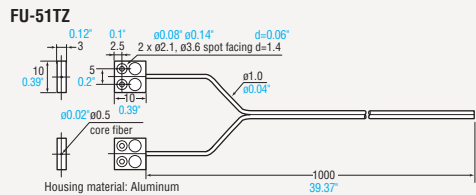
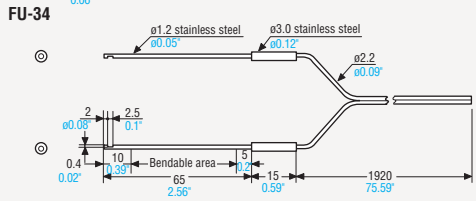
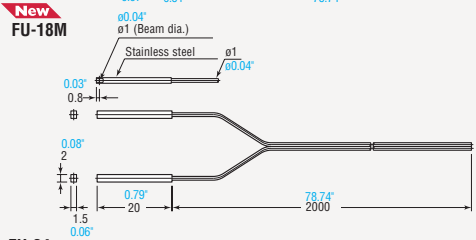
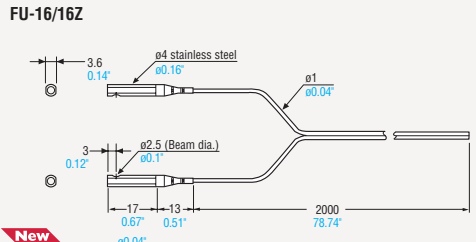
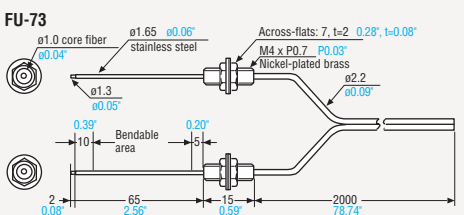
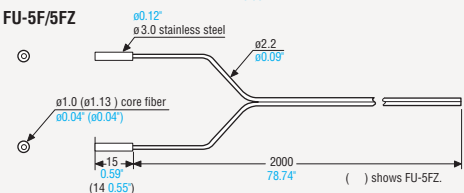
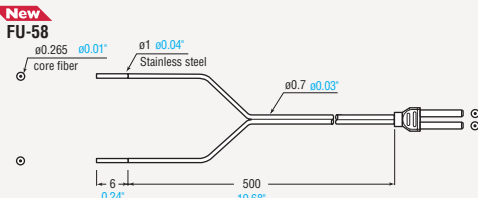
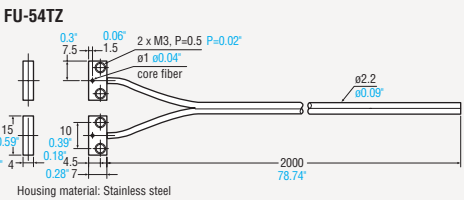
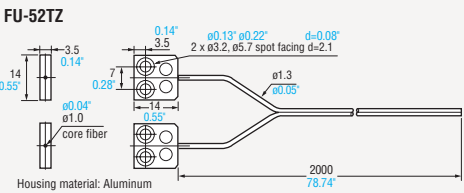
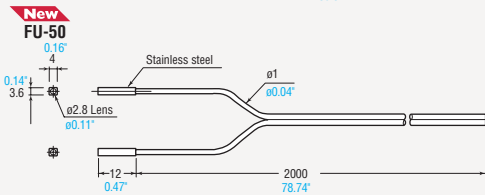
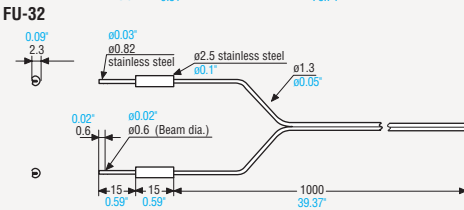
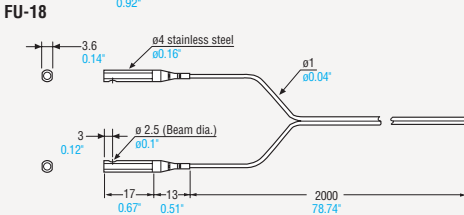
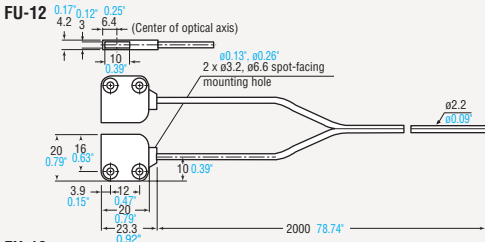
The FU-93Z has no moving parts and is fully PFA coated, ensuring stable operation all the time.

SPECIFICATIONS

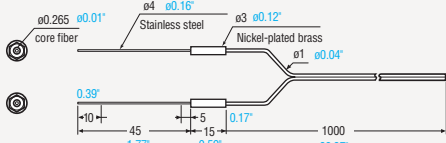
Type	Unit size (inch mm)	Detecting pipe (inch mm)	Model
Liquid level detection	0.79" x 0.61" x 0.85" 21 x 16.4 x 21.6	ø0.16" to ø1.02" ø4 to ø26 (transparent)	FU-95S New
	0.79" x 0.61" 20 x 15.4		FU-95/95Z
	ø0.24" ø6	—	FU-95H New (Heat resistance: 221°F (105°C)) FU-93/93Z

Dimensions

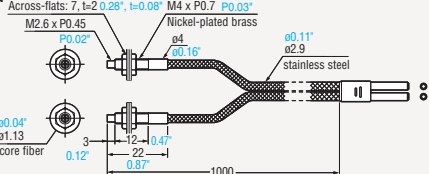
Thrubeam Type



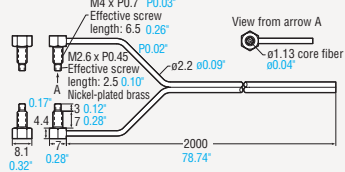
New
FU-76F



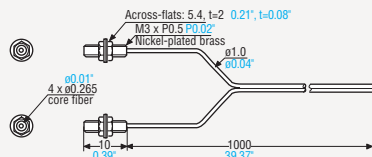
FU-77G



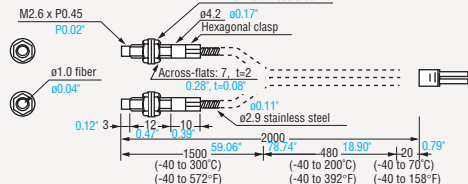
New
FU-77TZ



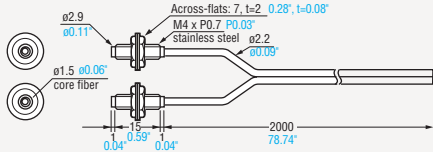
FU-79



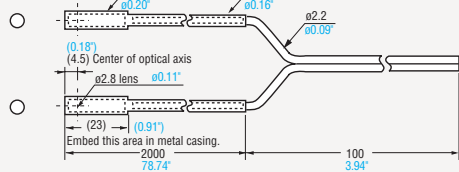
FU-84C



FU-88

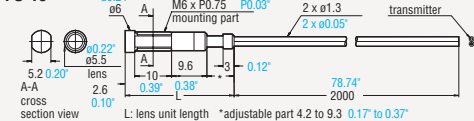


FU-96

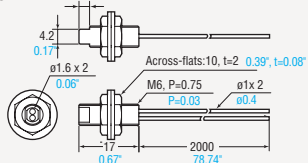


Reflective Type

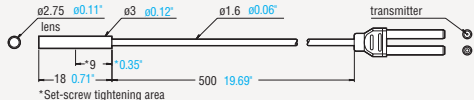
FU-10



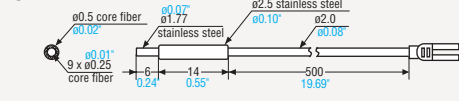
New
FU-13



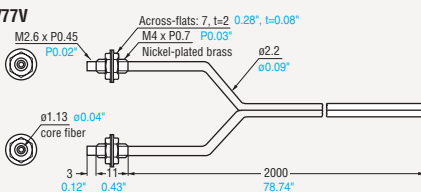
FU-20



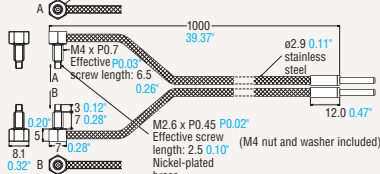
FU-22X



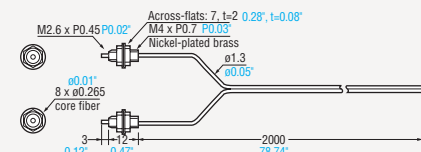
FU-77/77V



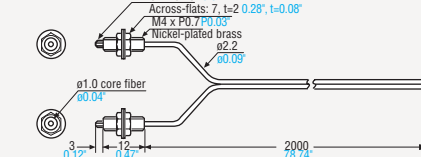
New
FU-77TG



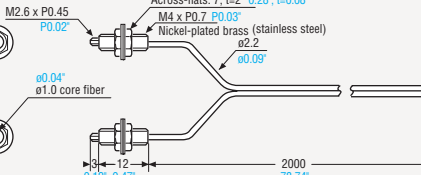
FU-78



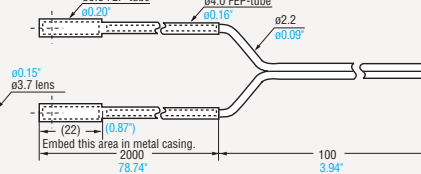
FU-7F



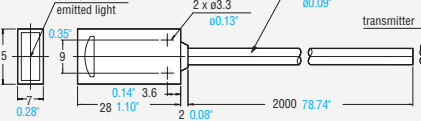
FU-86/86Z



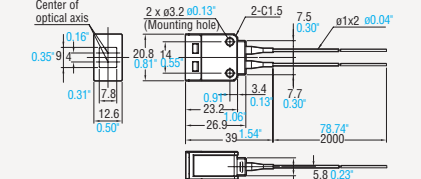
FU-92



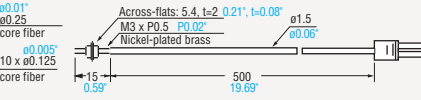
FU-11



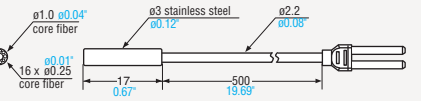
New
FU-15



FU-21X

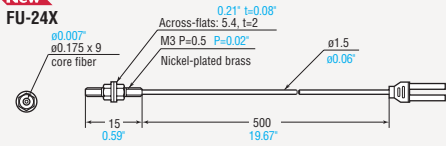


FU-23X

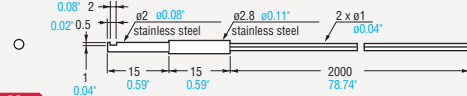


Dimensions

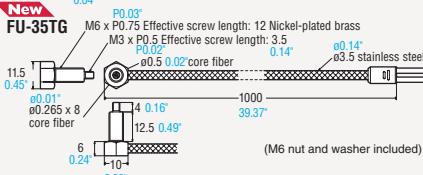
New
FU-24X



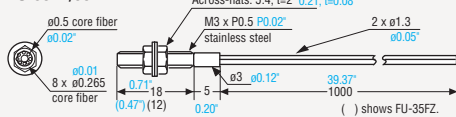
FU-31



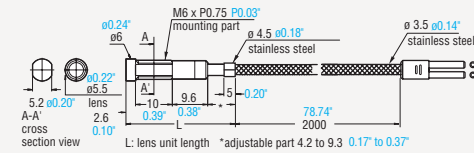
New
FU-35TG



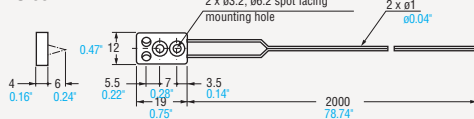
FU-35FA/35FZ



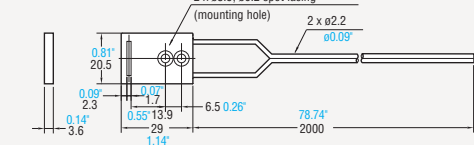
New
FU-2540



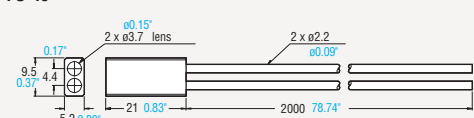
FU-38



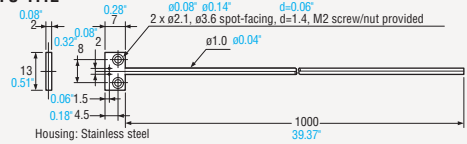
New
FU-38S



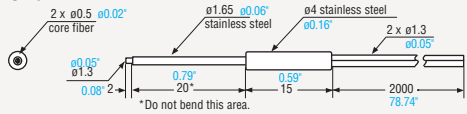
FU-40



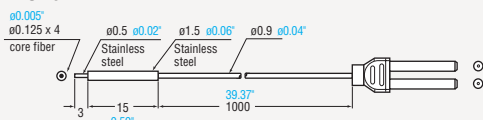
FU-41TZ



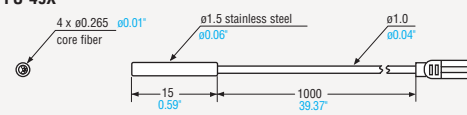
FU-43



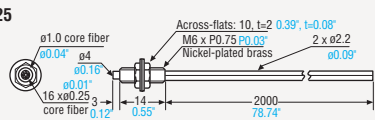
New
FU-46



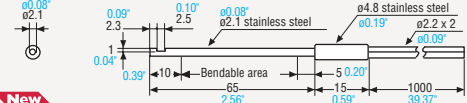
FU-49X



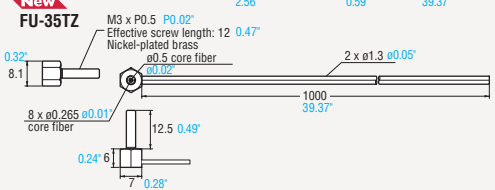
FU-25



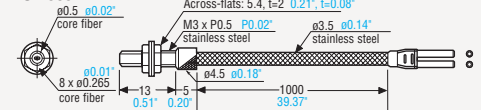
FU-33



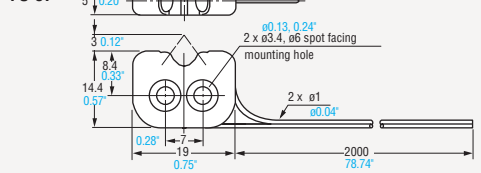
New
FU-35TZ



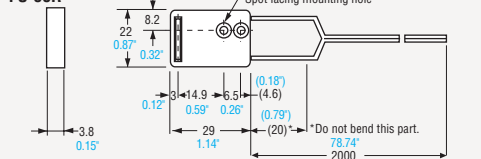
FU-2303



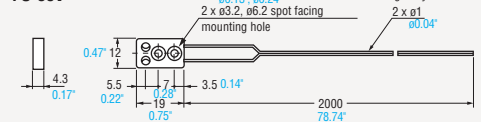
FU-37



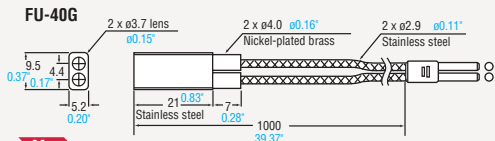
FU-38R



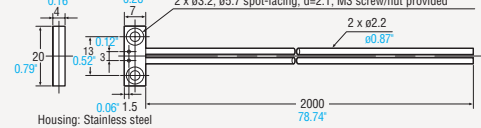
FU-38V



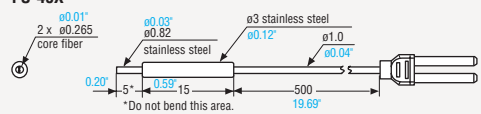
FU-40G



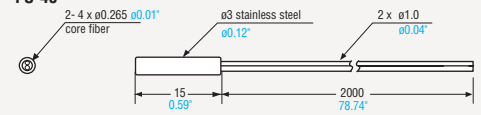
New
FU-42TZ



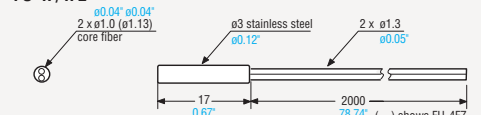
FU-45X



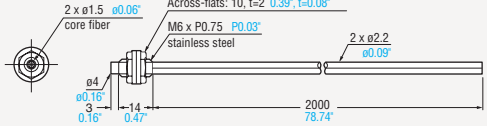
FU-48



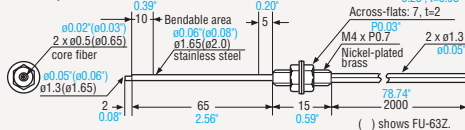
FU-4F/4FZ



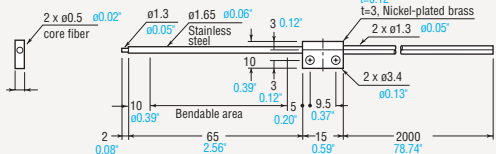
FU-61/61Z



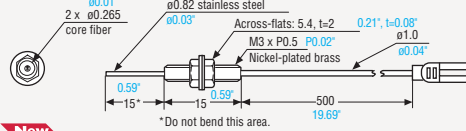
FU-63/63Z



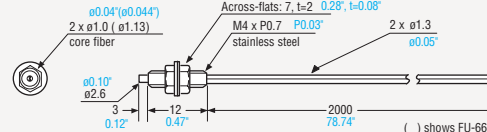
FU-63T



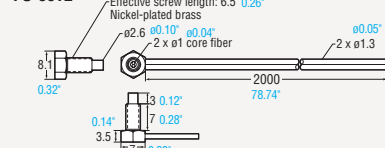
FU-65X



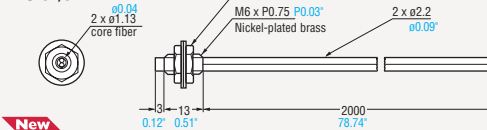
FU-66/66Z



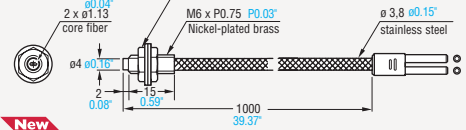
New FU-66TZ



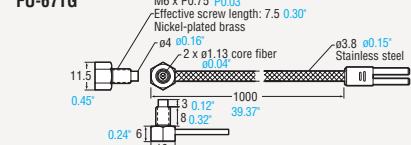
FU-67/67V



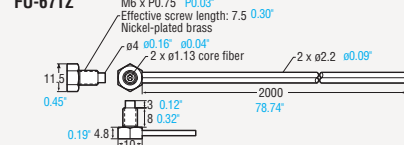
FU-67G



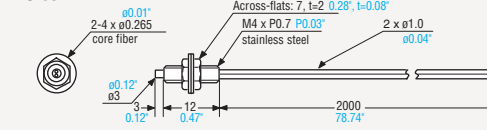
New FU-67TG



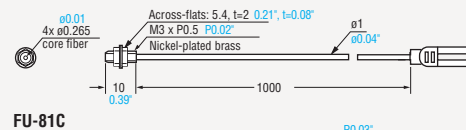
New FU-67TZ



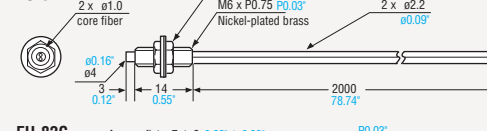
FU-68



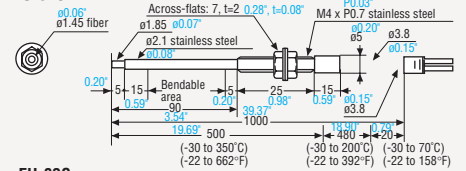
FU-69X



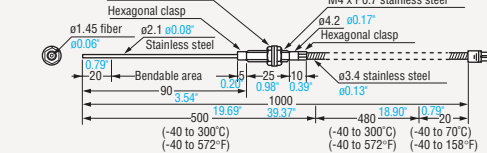
FU-6F



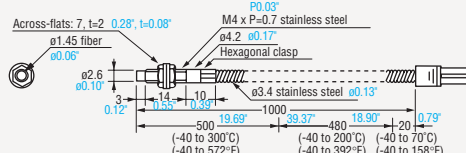
FU-81C



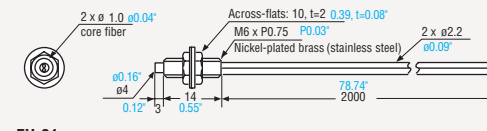
FU-82C



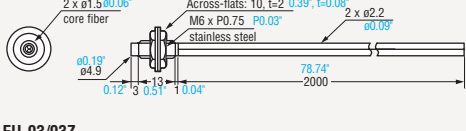
FU-83C



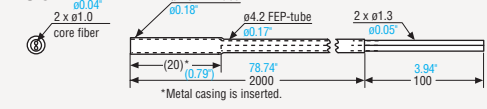
FU-85/85Z



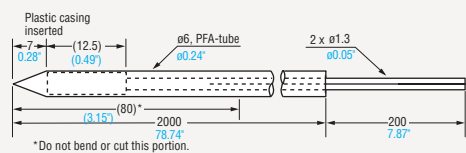
FU-87



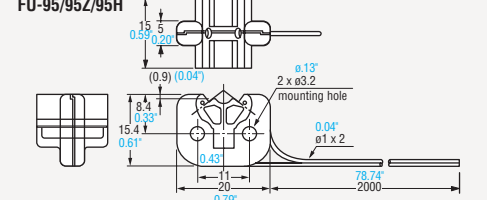
FU-91



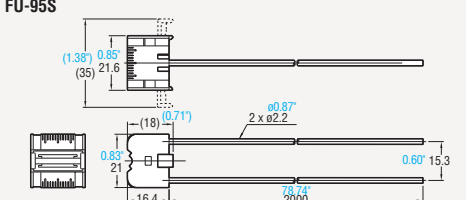
FU-93/93Z



New FU-95/95Z/95H



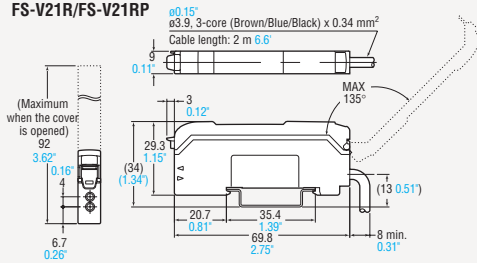
New FU-95S



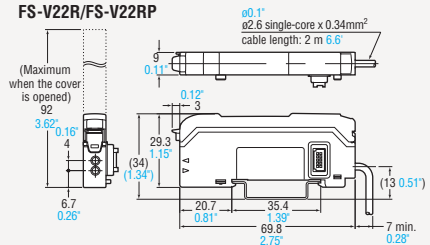
Dimensions

Amplifier

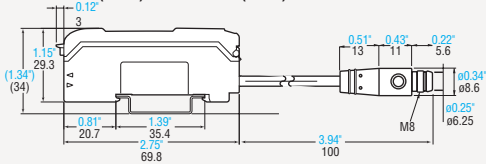
FS-V21R/FS-V21RP



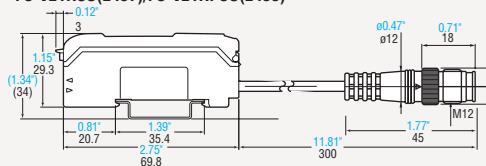
FS-V22R/FS-V22RP



FS-V21RSO(2435)/FS-V21RPSO(2436)



FS-V21RSO(2437)/FS-V21RPSO(2438)

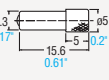


Attachment

F-1



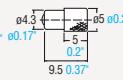
F-2HA



F-2



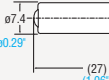
F-3HA



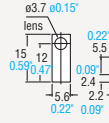
F-4



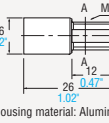
F-4HA



F-5HA



F-6HA

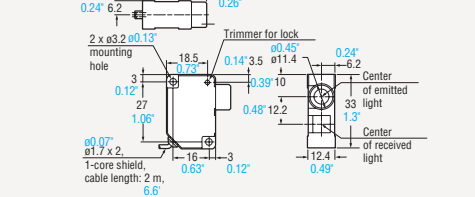


Housing material: Aluminum

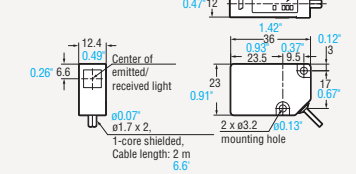
LV Series

Sensor heads

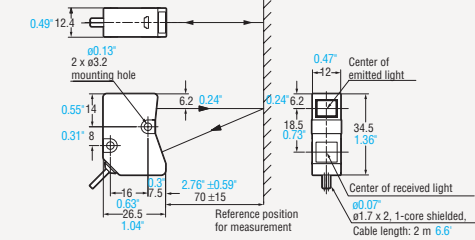
LV-H32



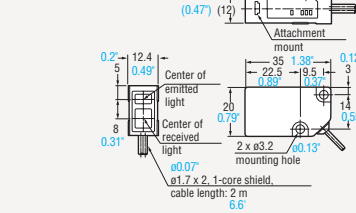
LV-H35



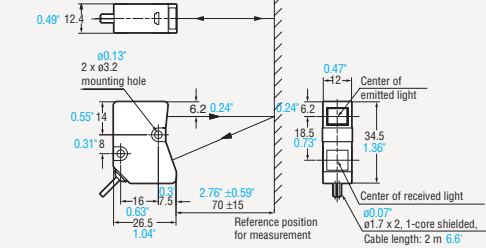
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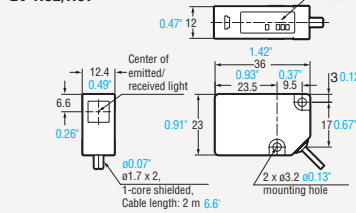
LV-H41/H42



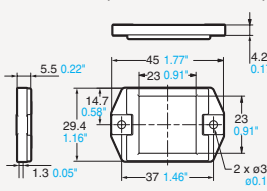
LV-H47



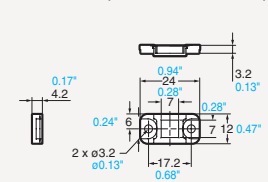
LV-H62/H67



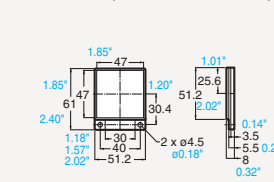
Reflector R-6 (included with LV-H62)



Reflector R-7 (included with LV-H62)

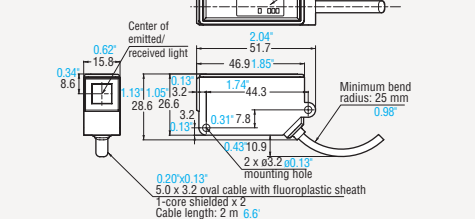


Reflector R-2 (included with LV-H67)

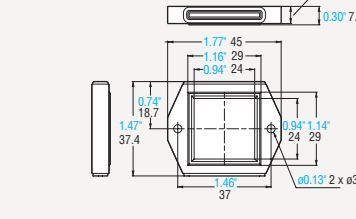


New New

LV-H35F/H62F



Reflector R-8 (included with LV-H62F)



Search by Specification

Thrubeam Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Detecting distance ¹ : [unit: inch/mm]		Model
	ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
	141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 118.11 ² (94.49) ² 3000 ² (2400)	(47.24) ² (1200) (39.37) ² (1000)	FU-7F + F-4
	141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 70.87 ² (55.12) ² 1800 ² (1400)	(28.35) ² (720) (25.39) ² (650)	FU-7F + F-2
	141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 70.87 ² (55.12) ² 1800 ² (1400)	(28.35) ² (720) (25.39) ² (650)	New FU-50
	141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 141.73 ² (141.73) ² 3600 ² (3600) ² 70.87 ² (55.12) ² 1800 ² (1400)	(17.32) ² (440) (11.81) ² (300)	FU-92
	125.98 ² (102.36) ² 3200 ² (2600) 68.93 ² (51.18) ² 1700 ² (1300) 51.18 ² (39.37) ² 1300 ² (1000) 31.50 ² (25.20) ² 800 ² (640)	(12.60) ² (320) (9.06) ² (230)	FU-16
	78.74 ² (62.99) ² 2000 ² (1600) 43.31 ² (34.65) ² 1100 ² (880) 31.50 ² (25.20) ² 800 ² (640) 19.69 ² (15.75) ² 500 ² (400)	(7.87) ² (200) (7.09) ² (180)	FU-16Z
	78.74 ² (62.99) ² 2000 ² (1600) 51.18 ² (39.37) ² 1300 ² (1000) 25.20 ² (19.69) ² 800 ² (640) 25.39 ² (20.47) ² 650 ² (520)	(11.02) ² (280) (9.06) ² (230)	FU-18
	70.87 ² (59.06) ² 1800 ² (1500) 43.31 ² (34.65) ² 1100 ² (880) 35.43 ² (28.35) ² 900 ² (720) 17.72 ² (14.17) ² 450 ² (360)	(7.09) ² (180) (6.30) ² (160)	FU-71
	70.87 ² (59.06) ² 1800 ² (1500) 35.43 ² (28.35) ² 900 ² (720) 27.56 ² (22.05) ² 700 ² (560) 13.78 ² (11.02) ² 350 ² (280)	(5.91) ² (150) (5.12) ² (130)	FU-71Z
	70.87 ² (55.12) ² 1800 ² (1400) 34.25 ² (27.36) ² 870 ² (700) 27.56 ² (22.05) ² 700 ² (560) 13.78 ² (11.02) ² 350 ² (280)	(5.91) ² (150) (3.94) ² (100)	FU-96
	59.06 ² (39.37) ² 1500 ² (1000) 29.92 ² (25.20) ² 760 ² (640) 25.20 ² (19.69) ² 640 ² (500) 12.60 ² (9.84) ² 320 ² (250)	(5.12) ² (130) (3.74) ² (95)	FU-5F
	59.06 ² (39.37) ² 1500 ² (1000) 29.92 ² (23.62) ² 760 ² (600) 25.20 ² (19.69) ² 640 ² (500) 12.60 ² (9.84) ² 320 ² (250)	(4.92) ² (125) (3.74) ² (95)	FU-73
	59.06 ² (39.37) ² 1500 ² (1000) 29.92 ² (25.20) ² 760 ² (640) 25.20 ² (19.69) ² 640 ² (500) 12.60 ² (9.84) ² 320 ² (250)	(5.12) ² (130) (3.74) ² (95)	FU-7F
	47.24 ² (37.80) ² 1200 ² (960) 29.92 ² (23.62) ² 760 ² (600) 25.20 ² (19.69) ² 640 ² (500) 12.60 ² (9.84) ² 320 ² (250)	(5.12) ² (130) (3.74) ² (95)	FU-86
	47.24 ² (37.80) ² 1200 ² (960) 39.37 ² (31.50) ² 1000 ² (800) 31.50 ² (25.20) ² 800 ² (640) 23.62 ² (18.90) ² 600 ² (480)	(9.45) ² (240) (5.91) ² (150)	FU-12
	47.24 ² (37.80) ² 1200 ² (960) 22.44 ² (17.72) ² 570 ² (450) 18.11 ² (14.17) ² 460 ² (360) 9.06 ² (7.09) ² 230 ² (180)	(3.78) ² (96) (3.15) ² (80)	FU-77G
	47.24 ² (37.80) ² 1200 ² (960) 22.44 ² (17.72) ² 570 ² (450) 18.11 ² (14.17) ² 460 ² (360) 9.06 ² (7.09) ² 230 ² (180)	(3.78) ² (96) (3.15) ² (80)	FU-77/77V
	47.24 ² (37.80) ² 1200 ² (960) 22.44 ² (17.72) ² 570 ² (450) 18.11 ² (14.17) ² 460 ² (360) 9.06 ² (7.09) ² 230 ² (180)	(3.78) ² (96) (3.15) ² (80)	FU-5FZ
	39.37 ² (31.50) ² 1000 ² (800) 27.56 ² (22.05) ² 700 ² (560) 19.69 ² (15.75) ² 500 ² (400) 9.84 ² (7.87) ² 250 ² (200)	(3.78) ² (96) (3.54) ² (90)	FU-86Z
	39.37 ² (31.50) ² 1000 ² (800) 19.69 ² (15.75) ² 500 ² (400) 15.75 ² (12.60) ² 400 ² (320) 7.87 ² (6.30) ² 200 ² (160)	(3.15) ² (80) (2.76) ² (70)	FU-54TZ
	39.37 ² (31.50) ² 1000 ² (800) 19.69 ² (15.75) ² 500 ² (400) 15.75 ² (12.60) ² 400 ² (320) 7.87 ² (6.30) ² 200 ² (160)	(3.15) ² (80) (2.76) ² (70)	FU-52TZ
	39.37 ² (31.50) ² 1000 ² (800) 19.69 ² (15.75) ² 500 ² (400) 15.75 ² (12.60) ² 400 ² (320) 7.87 ² (6.30) ² 200 ² (160)	(3.15) ² (80) (2.76) ² (70)	New FU-77TZ
	39.37 ² (31.50) ² 1000 ² (800) 19.69 ² (15.75) ² 500 ² (400) 15.75 ² (12.60) ² 400 ² (320) 7.87 ² (6.30) ² 200 ² (160)	(3.15) ² (80) (2.76) ² (70)	New FU-77TG
	31.50 ² (25.20) ² 800 ² (640) 19.69 ² (15.75) ² 500 ² (400) 15.75 ² (12.60) ² 400 ² (320) 7.87 ² (6.30) ² 200 ² (160)	(3.15) ² (80) (3.15) ² (80)	FU-88
	27.56 ² (22.05) ² 700 ² (560) 11.81 ² (9.45) ² 300 ² (240) 5.91 ² (4.72) ² 150 ² (120)	(2.52) ² (64) (2.36) ² (60)	FU-78
	23.62 ² (18.90) ² 600 ² (480) 14.57 ² (11.81) ² 370 ² (300) 11.81 ² (9.45) ² 300 ² (240) 5.91 ² (4.72) ² 150 ² (120)	(2.52) ² (64) (2.36) ² (60)	FU-84C
	23.62 ² (23.62) ² 600 ² (600) 11.81 ² (11.81) ² 300 ² (300) 9.84 ² (9.84) ² 250 ² (250) 7.87 ² (7.87) ² 200 ² (200)	(3.94) ² (100)	New FU-18M
	15.75 ² (12.60) ² 400 ² (320) 9.84 ² (7.87) ² 250 ² (200) 7.87 ² (6.30) ² 200 ² (160) 3.94 ² (3.15) ² 100 ² (80)	(1.57) ² (40) (1.57) ² (40)	FU-34
	15.75 ² (12.60) ² 400 ² (320) 9.84 ² (7.87) ² 220 ² (175) 7.87 ² (6.30) ² 200 ² (160) 3.94 ² (3.15) ² 100 ² (80)	(1.57) ² (40) (1.18) ² (30)	FU-59
	15.75 ² (12.60) ² 400 ² (320) 9.84 ² (7.87) ² 220 ² (175) 7.87 ² (6.30) ² 200 ² (160) 3.94 ² (3.15) ² 100 ² (80)	(1.57) ² (40) (1.18) ² (30)	FU-79
	11.81 ² (9.45) ² 300 ² (240) 5.91 ² (4.72) ² 150 ² (120) 4.72 ² (3.78) ² 120 ² (96) 2.95 ² (2.36) ² 75 ² (60)	(1.18) ² (30) (0.79) ² (20)	FU-75F

1. Each detecting distance in parentheses shows the data when the S-APC function is ON. S-APC will be always turned ON when the high-resolution or high-speed mode is selected.

2. 141.73² (3600mm) is assumed as maximum because the fiber cable has a length of 6.6' (2m).

Thrubeam Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Detecting distance ¹ : [unit: inch/mm]		Model
	ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
	11.02"(8.66") 290(220) 5.91(4.72) 150(120) 4.72(3.78) 120(96) 2.36(1.89) 60(48)	(0.94") (24) (0.79") (20)	FU-51TZ 3.3' 1m Free cut
Do not bend sleeve. 	7.87(6.30) 200(160) 3.15(2.52) 80(64) 2.36(1.89) 60(48) 1.18(0.94) 30(24)	(0.47") (12) (0.39") (10)	FU-32 3.3' 1m Free cut
	6.30(4.72) 160(120) 3.94(3.15) 100(80) 3.15(2.52) 80(64) 1.57(1.26) 40(32)	(0.63") (16) (0.59") (15)	FU-53TZ 3.3' 1m Free cut
	3.94(3.15) 100(80) 1.97(1.57) 50(40) 1.57(1.26) 40(32) 0.98(0.79) 25(20)	(0.39") (10) (0.35") (9)	New FU-58 1.97' 50cm
Min. bend radius of sleeve: 0.39" 10 	3.94(3.15) 100(80) 1.97(1.57) 50(40) 1.57(1.26) 40(32) 0.98(0.79) 25(20)	(0.39") (10) (0.32") (8)	New FU-76F 3.3' 1m Free cut
Do not bend sleeve. 	0.63(0.51) 16(13) 0.47(0.39) 12(10) 0.31(0.24) 8(6) 0.16(0.12) 4(3)	—	FU-56 1.97' 50cm

1. Each detecting distance in parentheses shows the data when the S-APC function is ON. S-APC will be always turned ON when the high-resolution or high-speed mode is selected.

Reflective Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Detecting distance ^{1, 2} : [unit: inch/mm]		Model
	ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
Thickness: 0.50" 12.6 	3.94" to 79.74" 100 to 2000 3.94" to 29.53" 100 to 750 3.94" to 19.69" 100 to 500	3.94" to 15.75" 100 to 400	New FU-15 6.6' 2m Free cut
Thickness: 0.20" 5.2 	1.18" to 39.37"(1.18" to 31.50") 30 to 1000(30 to 800) 1.18" to 12.60"(1.18" to 10.24") 30 to 320(30 to 260) 1.18" to 8.66"(1.18" to 7.09") 30 to 220(30 to 180) 1.18" to 4.72"(1.18" to 3.74") 30 to 120(30 to 95)	—	FU-40 6.6' 2m Free cut
Thickness: 0.20" 5.2 	1.18" to 39.37"(1.18" to 31.50") 30 to 1000(30 to 800) 1.18" to 12.60"(1.18" to 10.24") 30 to 320(30 to 260) 1.18" to 8.66"(1.18" to 7.09") 30 to 220(30 to 180) 1.18" to 4.72"(1.18" to 3.74") 30 to 120(30 to 95)	—	FU-40G 3.3' 1m
	35.43"(28.35") 900(720) 11.81"(9.45") 300(240) 7.87(6.30) 200(160) 5.91(4.72) 150(120)	(2.36") (60) (2.36") (60)	FU-61 6.6' 2m Free cut
	11.81(9.45) 300(240) 7.87(6.30) 200(160) 3.94(3.15) 100(80)	(1.57") (40) (1.57") (40)	FU-6F/85 6.6' 2m Free cut
	11.81(9.45) 300(240) 7.87(6.30) 200(160) 3.94(3.15) 100(80)	(1.57") (40) (1.57") (40)	FU-4F 6.6' 2m Free cut
	11.81(9.45) 300(240) 7.87(6.30) 200(160) 3.94(3.15) 100(80)	(2.36") (60) (2.36") (60)	FU-66 6.6' 2m Free cut
	11.81(9.45) 300(240) 7.87(6.30) 200(160) 3.94(3.15) 100(80)	(1.57") (40) (1.57") (40)	FU-61Z 6.6' 2m Free cut
	11.81(9.45) 300(240) 7.87(6.30) 200(160) 3.94(3.15) 100(80)	(1.57") (40) (1.57") (40)	FU-23X 1.97' 50cm
	18.90"(14.96") 480(380) 9.45(7.48") 240(190) 6.30(5.12) 160(130) 3.15(2.56) 80(65)	(1.26") (32) (1.26") (32)	FU-25 6.6' 2m Free cut
Min. bend radius of sleeve: 0.39" 10 	16.54"(13.39") 420(340) 8.27(6.30) 210(160) 5.51(4.33) 140(110) 2.76(2.17) 70(55)	(1.10") (28) (0.98") (25)	FU-82C 3.3' 1m
	16.54"(13.39") 420(340) 8.27(6.30) 210(160) 5.51(4.33) 140(110) 2.76(2.17) 70(55)	(1.10") (28) (0.98") (25)	FU-83C 3.3' 1m
	16.54"(13.39") 420(340) 8.27(6.69) 210(170) 5.51(4.33) 140(110) 2.76(2.17) 70(55)	(1.10") (28) (0.98") (25)	FU-87 6.6' 2m Free cut
	14.17"(11.02") 360(280) 7.09(5.51) 180(140) 5.12(3.94) 130(100) 2.56(1.97) 65(50)	(0.94") (24) (0.94") (24)	FU-85Z 6.6' 2m Free cut
	14.17"(11.02") 360(280) 7.09(5.51) 180(140) 5.12(3.94) 130(100) 2.56(1.97) 65(50)	(0.94") (24) (0.94") (24)	FU-67/67V 6.6' 2m Free cut
	14.17"(11.02") 360(280) 7.09(5.51) 180(140) 5.12(3.94) 130(100) 2.56(1.97) 65(50)	(0.94") (24) (0.94") (24)	FU-67G 3.3' 1m
Min. bend radius of sleeve: 0.39" 10 	14.17"(11.02") 360(280) 7.09(5.51) 180(140) 4.72(3.54) 120(90) 2.27(1.97) 60(50)	(0.94") (24) (0.79") (22)	FU-81C 3.3' 1m
	12.60"(9.84") 320(250) 6.30(4.72) 160(120) 4.72(3.54) 120(90) 2.36(1.77) 60(45)	(0.87") (22) (0.87") (22)	New FU-67TG 3.3' 1m
	12.60"(9.84") 320(250) 6.30(4.72) 160(120) 4.72(3.54) 120(90) 2.36(1.77) 60(45)	(0.87") (22) (0.87") (22)	New FU-67TZ 6.6' 2m Free cut
	0.39" to 11.81(9.45) 10 to 300(240) 0.39" to 5.91(4.72) 10 to 150(120)	—	New FU-13 6.6' 2m Free cut
	10.24"(7.87") 260(200) 5.12(3.94) 130(100) 3.15(2.52) 80(64) 1.77(1.42) 45(36)	(0.63") (16) (0.63") (16)	FU-4FZ 6.6' 2m Free cut
	10.24"(7.87") 260(200) 5.12(3.94) 130(100) 3.15(2.52) 80(64) 1.77(1.42) 45(36)	(0.63") (16) (0.63") (16)	FU-66Z 6.6' 2m Free cut

1. Each detecting distance in parentheses shows the data when the S-APC function is ON. S-APC will be always turned ON when the high-resolution or high-speed mode is selected. 2. Standard target: White matte paper.

Search by Specification

Reflective Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Detecting distance ^{1,2} [unit: m/dm]		Model
	ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
	9.06'(6.93) ³ 230 (180) 4.72'(3.54) ³ 120 (90) 2.76'(2.36) ³ 70 (60) 1.57'(1.18) ³ 40 (30)	(0.55')(14) (0.55')(14)	New FU-66TZ 6.6' 2m Free cut
	8.66'(6.93) ³ 220 (180) 4.33'(3.54) ³ 110 (90) 3.35'(2.76) ³ 85 (70) 2.27'(1.97) ³ 60 (50)	(0.94')(24) (0.91')(23)	FU-91 6.6' 2m Free cut
	8.66'(6.93) ³ 220 (176) 4.33'(3.46) ³ 110 (88) 2.76'(2.20) ³ 70 (56) 1.38'(1.10) ³ 35 (28)	(0.47')(12) (0.47')(12)	Lens F-2HA, F-3HA, F-4HA, F-5HA, F-6HA FU-35FA 3.3' 1m Free cut
	0.04' to 6.30'(0.20' to 5.12') ³ 5 to 160(5 to 130) ³ 0.04' to 3.94'(0.04' to 3.15') ³ 1 to 100(1 to 80) 0.04' to 2.36'(0.04' to 1.97') ³ 1 to 60(1 to 50) 0.04' to 1.18'(0.04' to 0.95') ³ 1 to 30(1 to 25)	(0.04' to 0.47')(1 to 12) (0.04' to 0.47')(1 to 12)	New FU-42TZ 6.6' 2m Free cut
	0.20' to 6.30'(0.20' to 5.12') ³ 5 to 160(5 to 130) ³ 0.20' to 5.12'(0.20' to 3.94') ³ 5 to 130(5 to 100) ³ 0.20' to 3.54'(0.20' to 2.83') ³ 5 to 90(5 to 72) ³	(0.20' to 1.42')(5 to 36) (0.20' to 1.42')(5 to 36)	FU-11 6.6' 2m Free cut
	5.12'(3.94) ³ 130 (100) 2.56'(2.05) ³ 65 (52) 1.77'(1.42) ³ 45 (36) 0.98'(0.79) ³ 25 (20)	(0.39')(10) (0.39')(10)	Lens F-2HA, F-3HA, F-4HA, F-5HA, F-6HA FU-35FZ 3.3' 1m Free cut
	5.12'(3.94) ³ 130 (100) 2.56'(2.05) ³ 65 (52) 1.77'(1.42) ³ 45 (36) 0.98'(0.79) ³ 25 (20)	(0.39')(10) (0.39')(10)	Lens F-2HA, F-3HA, F-4HA, F-5HA, F-6HA FU-2303 3.3' 1m
	4.72'(3.54) ³ 120 (100) 2.76'(2.20) ³ 70 (56) 1.87'(1.57) ³ 50 (40) 1.18'(0.94) ³ 30 (24)	(0.47')(12) (0.47')(12)	FU-43 6.6' 2m Free cut
	4.72'(3.94) ³ 120 (100) 2.76'(2.20) ³ 70 (56) 1.97'(1.57) ³ 50 (40) 1.18'(0.94) ³ 30 (24)	(0.47')(12) (0.47')(12)	FU-63 6.6' 2m Free cut
	4.72'(3.94) ³ 120 (100) 2.76'(2.20) ³ 70 (56) 1.97'(1.57) ³ 50 (40) 1.18'(0.94) ³ 30 (24)	(0.47')(12) (0.47')(12)	FU-63T 6.6' 2m Free cut
	4.72'(3.78) ³ 120 (96) 2.36'(1.89) ³ 60 (48) 1.57'(1.26) ³ 40 (32) 0.79'(0.63) ³ 20 (16)	(0.31')(8) (0.31')(8)	FU-33 3.3' 1m Free cut
	4.72'(3.54) ³ 120 (90) 2.63'(1.97) ³ 60 (50) 1.65'(1.34) ³ 42 (34) 0.91'(0.71) ³ 23 (18)	(0.35')(9) (0.35')(9)	Lens F-2HA, F-3HA, F-4HA FU-35TG 3.3' 1m New
	4.72'(3.54) ³ 120 (90) 2.36'(1.97) ³ 60 (50) 1.65'(1.34) ³ 42 (34) 0.91'(0.71) ³ 23 (18)	(0.35')(9) (0.35')(9)	Lens F-2HA, F-3HA, F-4HA, F-6HA FU-35TZ 3.3' 1m New
	4.33'(3.54) ³ 110 (90) 2.17'(1.73) ³ 55 (44) 1.57'(1.26) ³ 40 (32) 0.98'(0.79) ³ 25 (20)	(0.31')(8) (0.31')(8)	FU-48 6.6' 2m Free cut
	4.33'(3.54) ³ 110 (90) 2.17'(1.73) ³ 55 (44) 1.57'(1.26) ³ 40 (32) 0.98'(0.79) ³ 25 (20)	(0.31')(8) (0.31')(8)	FU-68 6.6' 2m Free cut
	3.54'(2.76) ³ 90 (70) 1.77'(1.42) ³ 45 (32) 1.38'(1.10) ³ 35 (28) 0.79'(0.63) ³ 20 (16)	(0.31')(8) (0.31')(8)	FU-63Z 6.6' 2m Free cut
	2.20'(1.77) ³ 56 (45) 1.10'(0.87) ³ 28 (22) 0.79'(0.63) ³ 20 (16) 0.47'(0.39) ³ 12 (10)	—	Lens F-2HA, F6-HA FU-21X 1.97' 50cm
	2.13'(1.69) ³ 54 (43) 1.05'(0.87) ³ 27 (22) 0.79'(0.63) ³ 20 (16) 0.51'(0.39) ³ 13 (10)	(0.16')(4) (0.16')(4)	FU-31 6.6' 2m Free cut
	1.97'(1.57) ³ 50 (40) 0.98'(0.79) ³ 25 (20) 0.79'(0.63) ³ 20 (16) 0.59'(0.47) ³ 15 (12)	(0.16')(4) (0.16')(4)	FU-49X 3.3' 1m
	1.97'(1.57) ³ 50 (40) 0.98'(0.79) ³ 25 (20) 0.79'(0.63) ³ 20 (16) 0.59'(0.47) ³ 15 (12)	(0.16')(4) (0.16')(4)	FU-69X 3.3' 1m
	0.08' to 1.57'(0.08' to 1.42') ³ 2 to 40 (2 to 36) 0.08' to 0.79'(0.08' to 0.63') ³ 2 to 20 (2 to 16) 0.08' to 0.63'(0.08' to 0.51') ³ 2 to 16 (2 to 13) 0.08' to 0.31'(0.08' to 0.20') ³ 2 to 8 (2 to 5)	—	FU-41TZ 3.3' Free cut
	1.42'(1.18) ³ 36 (30) 0.47'(0.39) ³ 12 (10) 0.39'(0.31) ³ 10 (8) 0.31'(0.24) ³ 6 (5)	—	FU-22X 1.97' 50cm
	1.42'(1.14) ³ 36 (29) 0.71'(0.55) ³ 18 (14) 0.47'(0.39) ³ 12 (10) 0.24'(0.20) ³ 6 (5)	—	Lens F-2HA FU-24X 1.97' 50cm New
	0.39' to 1.18' with beam spot diameter of ø0.04' to ø0.14' 10 to 30 with beam spot diameter of ø0.9 to ø3.5	—	New FU-2540 6.6' 2m Free cut
	0.39' to 1.18' with beam spot diameter of ø0.04' to ø0.14' 10 to 30 with beam spot diameter of ø0.9 to ø3.5	—	FU-10 6.6' 2m Free cut
	1.10'(0.87) ³ 28 (22) 0.55'(0.43) ³ 14 (11) 0.39'(0.31) ³ 10 (8) 0.24'(0.20) ³ 6 (5)	—	FU-45X 1.97' 50cm
	1.10'(0.87) ³ 28 (22) 0.55'(0.43) ³ 14 (11) 0.39'(0.31) ³ 10 (8) 0.24'(0.20) ³ 6 (5)	—	FU-65X 1.97' 50cm
	0' to 0.55'(0' to 0.55') ³ 0 to 14(0 to 14)	(0' to 0.55')(0 to 14)	FU-38R 6.6' 2m Free cut
	0.39'(0.32) ³ 10 (8) 0.28'(0.24) ³ 7 (6) 0.20'(0.16) ³ 5 (4) 0.08'(0.08) ³ 2 (2)	—	New FU-46 3.3' 1m
	0' to 1.02' 0 to 26	—	New FU-38S 6.6' 2m Free cut
	0.24' (Center of detecting distance) 6 (Center of detecting distance)	(0.24') (Center of detecting distance) (6) (Center of detecting distance)	FU-38 6.6' 2m Free cut
	0.20'±0.04' with beam spot diameter of 0.004' 5±1 with beam spot diameter of 0.1	—	FU-20 1.97' 50cm

1. Each detecting distance in parentheses shows the data when the S-APC function is ON. S-APC will be always turned ON when the high-resolution or high-speed mode is selected. 2. Standard target: White matte paper. 3. FU-11 cannot be used in ULTRA Turbo mode.

Reflective Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Detecting distance ^{1, 2} . [unit: inch/mm]		Model
	ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
	0' to 0.16'(0' to 0.16')	0 to 4(0 to 4)	FU-38V 6.6' 2m New Free cut
	0.12' (Center of detecting distance) 3 (Center of detecting distance)	0.12' (Center of detecting distance) (3) (Center of detecting distance)	FU-37 6.6' 2m New Free cut
	Liquid (except for milky white liquids)	—	FU-93/93Z 6.6' 2m Free cut
	Transparent tube of 0.16' to 1.02' dia. Transparent tube of 4 to 26 dia.	—	FU-95H New 6.6' 2m Free cut FU-95/95Z Free cut
	Transparent tube of 0.16' to 1.02' dia. Transparent tube of 4 to 26 dia.	—	New FU-95S 6.6' 2m Free cut

Lenses for Reflective Type

■ ULTRA TURBO
 ■ SUPER TURBO
 ■ TURBO
 ■ FINE
 ■ HIGH RESOLUTION
 ■ HIGH SPEED

Shape	Applicable fiber units	Detecting distance ^{1, 2} . [unit: inch/mm]		Model
		ULTRA TURBO, SUPER TURBO, TURBO, FINE	HIGH RESOLUTION, HIGH SPEED	
Front edge $\phi 0.17$ 04.3 Beam spot diameter 0.02" 0.4 (with FU-35FA/35FZ) Beam spot diameter 0.008" 0.2 (with FU-21X) Beam spot diameter 0.004" 0.1 (with FU-24X)	FU-35FA FU-35FZ	0.28' $\pm 0.08'$ (0.28' $\pm 0.08'$)	7 ± 2 (7 ± 2)	F-2HA ³
	FU-21X	0.28' $\pm 0.08'$ (0.28' $\pm 0.08'$)	7 ± 2 (7 ± 2)	
	FU-24X	0.28' $\pm 0.08'$ (0.28' $\pm 0.08'$)	7 ± 2 (7 ± 2)	
		—	—	
Front edge $\phi 0.29$ 07.4 Beam spot diameter 0.02" 0.5	FU-35FA FU-35FZ	0.59' $\pm 0.08'$ (0.59' $\pm 0.08'$)	15 ± 2 (15 ± 2)	F-4HA
		0.59' $\pm 0.08'$ (0.59' $\pm 0.08'$)	15 ± 2 (15 ± 2)	
Front edge $\phi 0.17$ 04.3 Beam spot diameter 0.16" 4 (within the detecting distance of 0' to 0.79' 0 to 20')	FU-35FA	0.59' $\pm 0.08'$ (0.59' $\pm 0.08'$)	15 ± 2 (15 ± 2)	F-3HA ³
	FU-35FZ	0.59' $\pm 0.08'$ (0.59' $\pm 0.08'$)	15 ± 2 (15 ± 2)	
		0.47' (12)	0.47' (12)	
		0.39' (10)	0.39' (10)	
Front edge $\phi 0.34$ 08.7 Thickness: 0.22" 5.6 Beam spot diameter 0.02" 0.12" 0.5 to 3.0	FU-35FA FU-35FZ	0.31" to 1.18" (0.31" to 1.18")	8 to 30 (8 to 30)	F-5HA ³
		0.31" to 1.18" (0.31" to 1.18")	8 to 30 (8 to 30)	
	FU-21X	0.31" to 1.18" (0.31" to 1.18")	8 to 30 (8 to 30)	
		—	—	
Front edge $\phi 0.42$ 10.6 Beam spot diameter 0.08" 2.0 (with FU-35FA/35FZ) 0.04" 1.0 (with FU-21X)	FU-35FA FU-35FZ FU-21X	1.38' $\pm 0.12'$ (1.38' $\pm 0.12'$)	35 ± 3 (35 ± 3)	F-6HA
		1.38' $\pm 0.12'$ (1.38' $\pm 0.12'$)	35 ± 3 (35 ± 3)	
		1.38' $\pm 0.12'$ (1.38' $\pm 0.12'$)	35 ± 3 (35 ± 3)	
		1.38' $\pm 0.12'$ (1.38' $\pm 0.12'$)	35 ± 3 (35 ± 3)	

1. Each detecting distance in parentheses shows the data when the S-APC function is ON. S-APC will be always turned ON when the high-resolution or high-speed mode is selected. 2. Standard target: White matte paper. 3. F-2HA/3HA/5HA cannot be used in ULTRA Turbo mode. (except F-5HA with FU-21X)

Laser Sensors

■ SUPER TURBO
 ■ TURBO
 ■ FINE

Shape	Detecting distance	Model
	78.84" x 0.39" 2000 mm x 10 mm	LV-H100 New
	78.84" x 0.39" 2000 mm x 10 mm	LV-H110 New
	78.74" x 1.18" 2000 mm x 30 mm	LV-H300 New
	1.18" to 39.37" 30 to 1000 mm	LV-H32
	1.18" to 9.84" 30 to 250 mm	
	1.18" to 39.37" 30 to 1000 mm	LV-H41/H42
	1.18" to 9.84" 30 to 250 mm	
	23.0' 7 m	LV-H62
	6.6' 2 m	
	164' 50 m*	LV-H67
	65.6' 20 m	
	2.76" $\pm 0.59"$ 70 mm ± 15 mm	LV-H37
	2.17" to 3.35" 55 mm to 85 mm	LV-H47
	23.62" 600 mm	LV-H35
	11.81" 300 mm	
5.91" 150 mm		
17.72" 450 mm	LV-H35F New	
7.87" 200 mm		
3.94" 100 mm		
16.40' 5 m	LV-H62F New	
4.92" 1.5 m		
11.48" 3.5 m		

* Use OP-42198

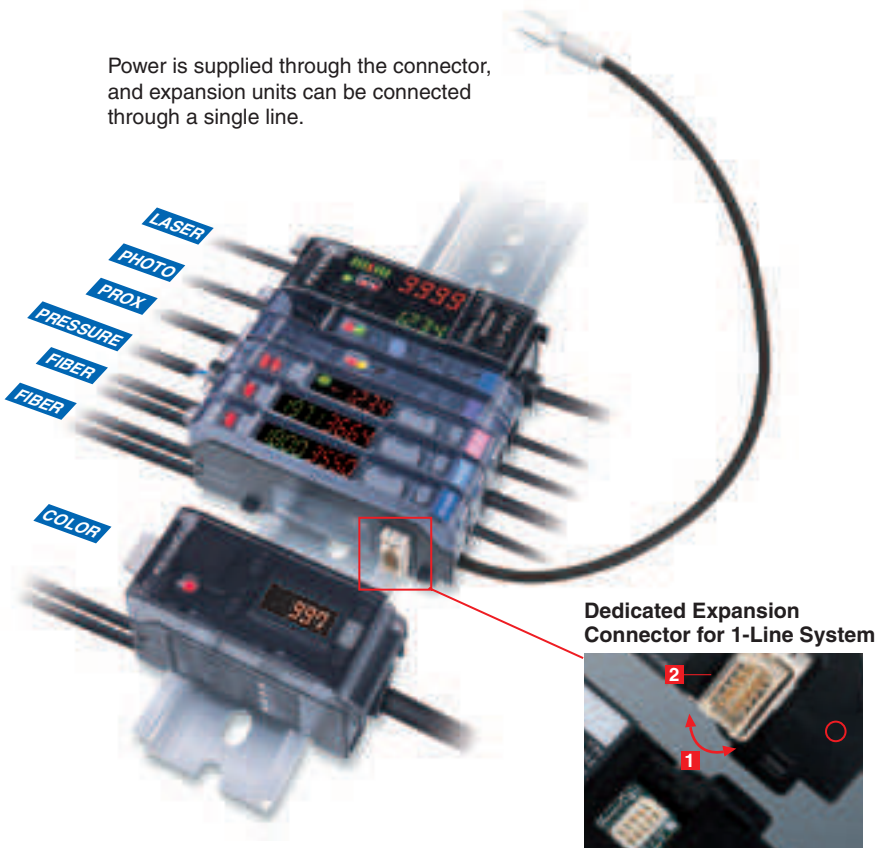
RGB Color Sensors

Shape	Detecting distance [unit: inch/mm]	Model
	0.39" to 1.18" 10 to 30	CZ-10
	0.12" to 0.59" 3 to 15	CZ-11
	0.20" to 0.79" 5 to 20	New CZ-12
	1.58" to 39.37" 40 to 1000 (with R-2)	New CZ-60
	1.97" to 3.74" 50 to 95 (Recommended: 2.76" 70)	New CZ-H32
	1.10" to 2.05" (28 to 52) (Recommended: 1.57" 40)	New CZ-H35S
	0.43" to 0.79" (11 to 20) (Recommended: 0.59" 15)	New CZ-H37S
	0.98" to 2.17" (25 to 55) (Recommended: 1.38" 35)	New CZ-H52

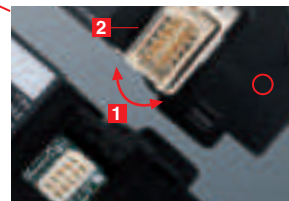
1-Line Wire Connection System for Saving Wiring Time and Cost

All of KEYENCE's digital display amplifiers feature common expansion functions, which allows amplifiers to be directly connected each other. Since electrical power is supplied through the connectors, you can save wires quite easily.

Power is supplied through the connector, and expansion units can be connected through a single line.



Dedicated Expansion Connector for 1-Line System



- 1 Shock absorber function incorporated**
The connector is provided with a spring mechanism for shock absorption.
- 2 Dust cover provided**
The dust cover prevents the exposure of the connector pins regardless of whether the expanded sensors are misaligned.

Hi-Speed Sensors

The lineup of KEYENCE's high-speed amplifiers including the ultra-high-speed type for fiberoptic sensors which achieves response of 20 μs applicable for high-speed production lines.

20 μs type

Ultra-high-speed response amplifier for fiberoptic sensors



FS-M1H

50 μs type

Digital, high-speed amplifier for fiberoptic sensors



FS-V21R

80 μs type

Digital, high-speed amplifier for laser optic sensors



LV-21A

Dual Display Digital Fiberoptic Sensors

Easier Mounting and Adjustment

FEATURE

- World's first fiberoptic sensor with dual digital display
- Industry's most powerful beam
- Industry's highest response speed of 50 μ s
- Industry's highest resolution of 1/65520
- Stable detection over a longer lifetime

Type	Main unit		1-line expansion unit	0-line expansion unit
Model	NPN	FS-V21R	FS-V22R	FS-V20R
	PNP	FS-V21RP	FS-V22RP	-
Light source	Red LED		Red LED	Red LED
Response time	250 μ s (FINE)/500 μ s (TURBO)/1 ms (SUPER TURBO)/4 ms (ULTRA TURBO)/500 μ s (HIGH RESOLUTION)/50 μ s (HIGH SPEED)			
Output selection	LIGHT-ON/DARK-ON (switch-selectable)			
Detection mode	Light intensity/rising edge/falling edge			
Display shift function	Max. \pm 1999 (variable)			
Control output	NPN	100 mA max. (40 VDC max.) Residual voltage : 1 V max.	20 mA max. (40 VDC max.) Residual voltage : 1 V max.	
	PNP	100 mA max. (30 VDC max.) Residual voltage : 1 V max.	20 mA max. (30 VDC max.) Residual voltage : 1 V max.	
Power supply	12 to 24 VDC \pm 10%, ripple: 10% max.			
Current consumption ¹	Normal	S-APC OFF: 650 mW max. (27 mA max. at 24 VDC), S-APC ON: 720 mW max. (30 mA max. at 24 VDC)		
	ECO half	S-APC OFF: 530 mW max. (22 mA max. at 24 VDC), S-APC ON: 600 mW max. (25 mA max. at 24 VDC)		
	ECO all	S-APC OFF: 480 mW max. (20 mA max. at 24 VDC), S-APC ON: 550 mW max. (23 mA max. at 24 VDC)		
Weight (including 6.6' (2-m) cable)	Approx. 80 g		Approx. 45 g	Approx. 30 g

1. S-APC will be always turned ON when the high-resolution or high-speed mode is selected. S-APC is by default set to OFF in any other mode.

Laser Optic Sensors

Higher Performance in Smaller Size

FEATURE

- Long-distance, high-accuracy sensor
- Amplifier with two digital displays
- Simple wiring
- Long-distance detection of up to 164' (50 m) [Retro-reflective type]
- Ultra small beam spot of 2.0 Mil (50 μ m) [Definite-reflective type]

Model	NPN	LV-21A	LV-22A	LV-11A	LV-51M	LV-52
	PNP	LV-21AP	LV-22AP	-	LV-51MP	LV-52P
Supported sensor head	LV-H32/H35/H37/H42/H47/H62/H67		LV-H41	LV-H100/H110/H300		
FDA ¹	Class II		Class I	Class II		
Main unit/expansion unit	Main unit	Expansion unit (1 line)		Main unit	Main unit	Expansion unit (1 line)
Response time	FINE	80 μ s	500 μ s	500 μ s	80 μ s	
	TURBO	500 μ s	2 ms	2 ms	500 μ s	
	SUPER	4 ms	8 ms	8 ms	4 ms	
Operation mode	LIGHT-ON/DARK-ON (switch selectable)					
Output	Red LED x 2ch					
Timer function	OFF DELAY/ON DELAY/ONE SHOT, separate settings for ch A/B, timer 1 to 9999 ms variable					
Laser emission stop input	Non-voltage input, stop during laser radiation, input time: 20 ms min.					
Control output	NPN open-collector x 2 ch, max. 100 mA (40 V max.), residual voltage 1 max. LV-21AP/22AP: PNP open-collector x 2 ch, max. 100 mA (30 V max.), residual voltage 1 max.					
Protection circuit	Reverse-polarity protection, overcurrent protection, surge absorber					
Power voltage	12 to 24 VDC \pm 10% max., Ripple (P-P) 10% max. ²					
Power consumption	1.5 W max. (current consumption: 12 V: 125 mA, 24 V: 62.5 mA)					
Weight (including 6.6' (2-m) cable)	Approx. 120 g	Approx. 75 g	Approx. 75 g	Approx. 120 g	Approx. 120 g	Approx. 75 g

1. Use LV-H41 for FDA Class I and IEC Class 1. 2. The power for LV-22A/22AP is supplied from the main unit.

Note: To connect several units they must be mounted on a DIN rail (metal DIN rail). Make sure that output current is 20 mA max.
Note also that the expansion unit (LV-22A/22AP) cannot be used as it is.

RGB Color Sensors

Stable Detection of Glossy Targets

FEATURE

- Extremely high power
- RGB light source for triple 16-bit calculation
- New sensor head cancels luster
- Automatic selection of 7 different light combinations (patent pending).

Model	NPN	CZ-V21	
	PNP	CZ-V21P	
Response time	200 μ s (HIGH SPEED)/1 ms (FINE)/4 ms (TURBO)/8 ms (SUPER)		
Control output	NPN (PNP) open-collector x 4 channels, 40 VDC (30 VDC) max., Up to 100 mA for one output, Up to 200 mA in total of 4 outputs, Residual voltage: 1.0 V max.		
Protection circuit	Reverse-polarity protection, overcurrent protection, surge absorber		
External calibration input	Non-voltage input, Input time: 20 ms min.		
External bank switch input (C/C-I mode), External shift input (Super I mode)	Non-voltage input, Input time: 20 ms min.		
Timer function	Timer OFF/OFF-delay/ON-delay/One-shot, Timer time: 1 to 1,000 ms adjustable (for each bank respectively)		
Power supply	24 VDC, Ripple (P-P): 10% max.		
Current consumption	Normal mode: 1.5 W (62.5 mA max.), Eco-mode: 1 W (42.0 mA max.)		
Weight (with 2-m cable)	Approx. 110 g		

FS-V20 Series



LV Series



CZ Series



Variety of Quick Disconnect Models



FS-V21RS0(2435)

- NPN, M8 Quick Disconnect Model

FS-V21RPS0(2436)

- PNP, M8 Quick Disconnect Model

FS-V21RS0(2437)

- NPN, M12 Quick Disconnect Model

FS-V21RPS0(2438)

- PNP, M12 Quick Disconnect Model

	Cable Length	Model
M8 connector cable	6.6' 2 m	OP-42187
	32.8' 10 m	OP-42188
M12 connector cable	6.6' 2 m	OP-94734
	16.4' 5 m	OP-97491

KEYENCE's latest technology for stable detection

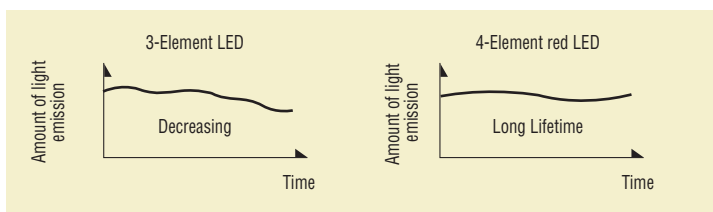
Functions

Stable detection over a long lifetime provided with two new devices for stable, high-precision detection

It is essential for fiberoptic sensors to be able to maintain stable light emissions for long periods of time. Fluctuations or decreased light emissions over a long period may compromise high-precision detection. The FS-V20's 4-element red LED and S-APC function solve these problems where conventional sensors fail.

4-element Red LED

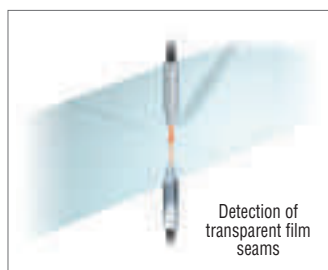
Conventional 3-element LED's characteristically lose brightness gradually with extended usage. This means the sensitivity is also decreasing little by little. However, KEYENCE's 4-element red LED features a longer service life without light emission deterioration.



S-APC features

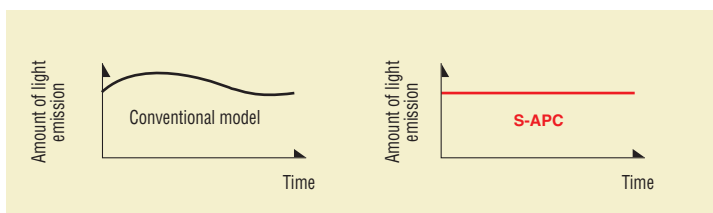
Ensures high-precision detection in clean environments.

Changes in temperature or environmental conditions may adversely affect high-precision detection. The S-APC (Selectable Auto-Power Control) feature maintains constant light emission by regulating current input to the light emission element.



Maintaining constant light emission

Conventional models do not regulate light emission, leading to fluctuations in the amount of received light over a long period of time. The S-APC feature continuously monitors and corrects light emission.



INDEX

Model	Dimensions	Detecting distance	Features
CZ-10	P.29	P.33	P.19
CZ-11	P.29	P.33	P.19
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NEW CZ-60	P.29	P.33	P.19/22
NEW CZ-H32	P.29	P.33	P.19
NEW CZ-H35S	P.29	P.33	P.19
NEW CZ-H37S	P.29	P.33	P.19
NEW CZ-H52	P.29	P.33	P.19
FU-10	P.25	P.32	P.18/21
FU-11	P.25	P.32	P.17
FU-12	P.24	P.30	P.10/11/17/18
NEW FU-13	P.25	P.31	P.22
NEW FU-15	P.25	P.31	P.22
FU-16	P.24	P.30	P.20
FU-16Z	P.24	P.30	P.11/12/13/18
FU-18	P.24	P.30	-
NEW FU-18M	P.24	P.30	P.12/13/21
FU-20	P.25	P.32	P.21
FU-21X	P.25	P.32	-
FU-22X	P.25	P.32	-
FU-2303	P.26	P.32	P.8/9
FU-23X	P.25	P.31	-
NEW FU-24X	P.26	P.32	P.12/21
FU-25	P.26	P.31	-
NEW FU-2540	P.26	P.32	P.8/9
FU-31	P.26	P.32	P.13
FU-32	P.24	P.31	P.12/13
FU-33	P.26	P.32	P.12/13
FU-34	P.24	P.30	P.13
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NEW FU-35TG	P.26	P.32	P.8/9/14
NEW FU-35TZ	P.26	P.32	P.10/11/14/18
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NEW FU-38S	P.26	P.32	P.22
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FU-41TZ	P.26	P.32	P.12/13/14/18
NEW FU-42TZ	P.26	P.32	P.13/14/18
FU-43	P.26	P.32	-
FU-45X	P.26	P.32	-
NEW FU-46	P.26	P.32	P.13
FU-48	P.26	P.32	P.11
FU-49X	P.26	P.32	P.11/13
FU-4F	P.26	P.31	-
FU-4FZ	P.26	P.31	-
NEW FU-50	P.24	P.30	P.10/11/20
FU-51TZ	P.24	P.31	P.10/12/13/14/18
FU-52TZ	P.24	P.30	P.12/13/14/18
FU-53TZ	P.24	P.31	P.12/13/14/18
FU-54TZ	P.24	P.30	P.12/13/14/18
FU-56	P.24	P.31	-
NEW FU-58	P.24	P.31	P.10/11/12/13
FU-59	P.24	P.30	P.11/12/13
FU-5F	P.24	P.30	-
FU-5FZ	P.24	P.30	-
FU-61	P.27	P.31	P.20
FU-61Z	P.27	P.31	P.11/18/20
FU-63	P.27	P.32	-
FU-63T	P.27	P.32	P.12/13
FU-63Z	P.27	P.32	P.11/13
FU-65X	P.27	P.32	-
FU-66	P.27	P.31	-
NEW FU-66TZ	P.27	P.32	P.10/11/13/14/18
FU-66Z	P.27	P.31	P.11
FU-67	P.27	P.31	-
FU-67G	P.27	P.31	P.8/9
NEW FU-67TG	P.27	P.31	P.8/9/14
NEW FU-67TZ	P.27	P.31	P.10/11/12/14/18
FU-67V	P.27	P.31	P.10/11/18
FU-68	P.27	P.32	P.11
FU-69X	P.27	P.32	P.11
FU-6F	P.27	P.31	-
FU-71	P.24	P.30	P.20
FU-71Z	P.24	P.30	P.11/18/20
FU-73	P.24	P.30	-
NEW FU-75F	P.24	P.30	-
NEW FU-76F	P.25	P.31	P.21
FU-77	P.25	P.30	-
FU-77G	P.25	P.30	P.8/9
NEW FU-77TG	P.25	P.30	P.8/9/14
NEW FU-77TZ	P.25	P.30	P.10/11/14/18
FU-77V	P.25	P.30	P.10/11/18
FU-78	P.25	P.30	-
FU-79	P.25	P.30	-
FU-7F	P.25	P.30	-
FU-81C	P.27	P.31	P.16
FU-82C	P.27	P.31	P.16
FU-83C	P.27	P.31	P.16
FU-84C	P.25	P.30	P.16
FU-85	P.27	P.31	P.16
FU-85Z	P.27	P.31	P.16
FU-86	P.25	P.30	P.16
FU-86Z	P.25	P.30	P.16
FU-87	P.27	P.31	P.16
FU-88	P.25	P.30	P.16
FU-91	P.27	P.32	P.16
FU-92	P.25	P.30	P.16
FU-93	P.27	P.33	P.23
FU-93Z	P.27	P.33	P.23
FU-95	P.27	P.33	P.23
NEW FU-95H	P.27	P.33	P.23
NEW FU-95S	P.27	P.33	P.23
FU-95Z	P.27	P.33	P.23
FU-96	P.25	P.30	P.16
NEW LV-H100	P.29	P.33	P.15/17/20
NEW LV-H110	P.29	P.33	P.15/17
NEW LV-H300	P.29	P.33	P.15/17
LV-H32	P.28	P.33	P.15/20/21
LV-H35	P.28	P.33	P.15
NEW LV-H35F	P.28	P.33	P.16
LV-H37	P.28	P.33	P.15/21
LV-H41	P.28	P.33	P.15/17
LV-H42	P.28	P.33	P.15/17/20
LV-H47	P.28	P.33	P.15/17
LV-H62	P.28	P.33	P.15/20/22
NEW LV-H62F	P.28	P.33	P.16
LV-H67	P.28	P.33	P.15/20

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