

Dual Digital Display Digital Fiber Optic Sensor DS-F13

DASS

Fiber Optic Sensor for Diverse Needs



50 μ s high speed response



Fiber Optic Amplifier for Simple Operation DS-F13

Simple

Operation

×

High-speed

response

■ Action mode switch
(L-ON/D-ON)

■ Mode switching
【MODE】

■ Threshold trimming
【UP/DOWN】

■ 【L/D】 indicator
Display the setting status
of Light ON/Dark ON

■ Independent
teaching button

■ Amount of
light received

■ Threshold

■ OUT indicator

■ Fiber optic fixing buckle

Fiber Optic Amplifier DS-F13

Main Features



Two-point mode

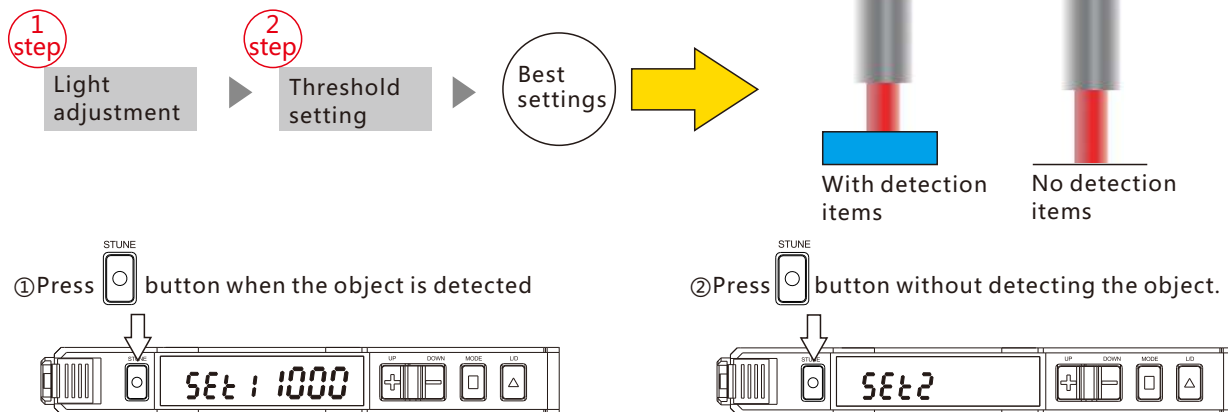
Separate teach-in buttons :

Threshold adjustment is done quickly with only 2 button presses.

After fixing the fiber optic head :

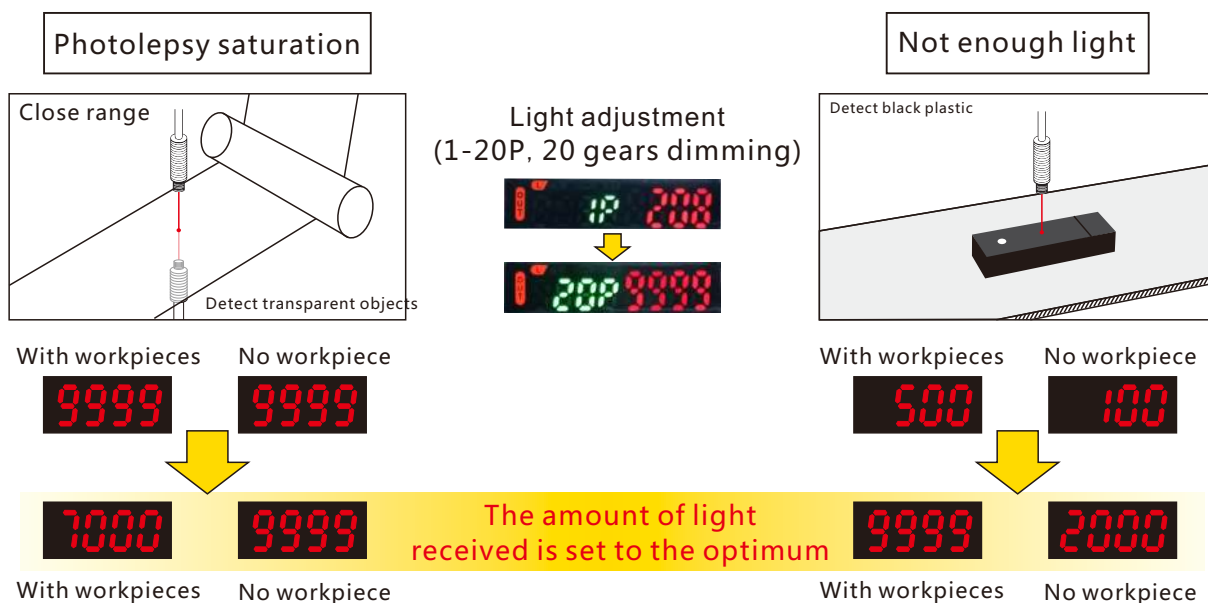
When the detected object is in or out of state, press S TUNE once to complete the threshold setting.

Combined with light adjustment (1-20P, 20 level dimming), the problem of excessive or insufficient light can be solved..



Light Adjustment Mode

The saturation state and insufficient light reception state are also optimized.



Area detection mode

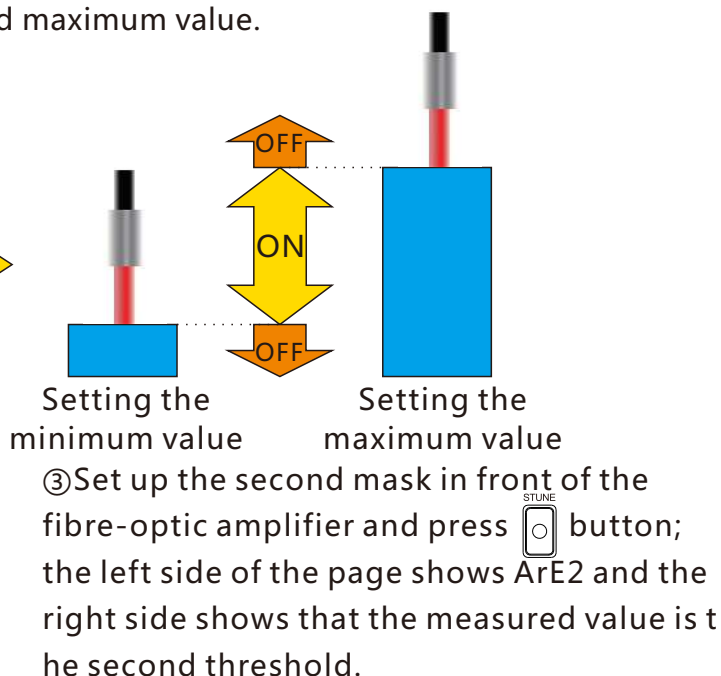
Area detection mode with two thresholds, minimum and maximum values

In the L-ON state, the output is ON when the threshold
 $\text{minimum value} < \text{detection value} < \text{threshold maximum value}$.

① Set up the area detection mode.



② Set up the first mask in front of the fibre-optic amplifier and press  button; the left side of the page shows ArE1 and the right side shows that the measured value is the first threshold value.



④ After setting, the programme automatically returns to the main page of area detection. The program selects the smaller of the two thresholds as the minimum value and the larger one as the maximum value.

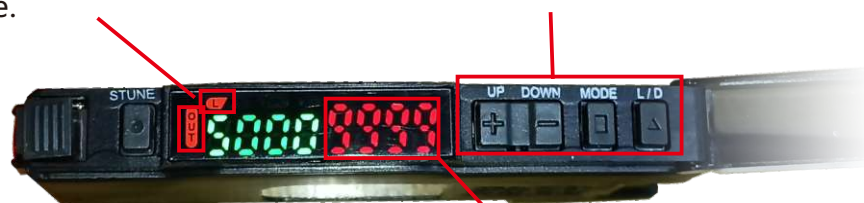


Easy operation

Marked button/status indicator light/dual digital display

■ The action mode indicator light (L-ON/D-ON) and OUT indicator light make the usage status clear at a glance.

■ Marked button, easy to learn.

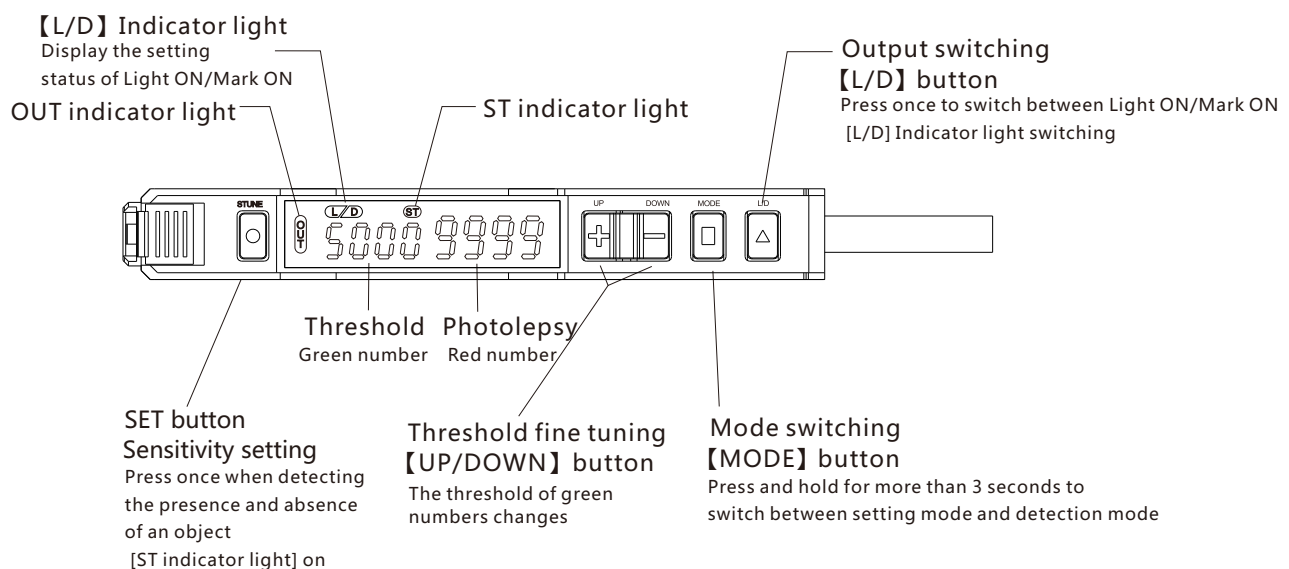


■ Adopting digital display and visual display to improve identification.

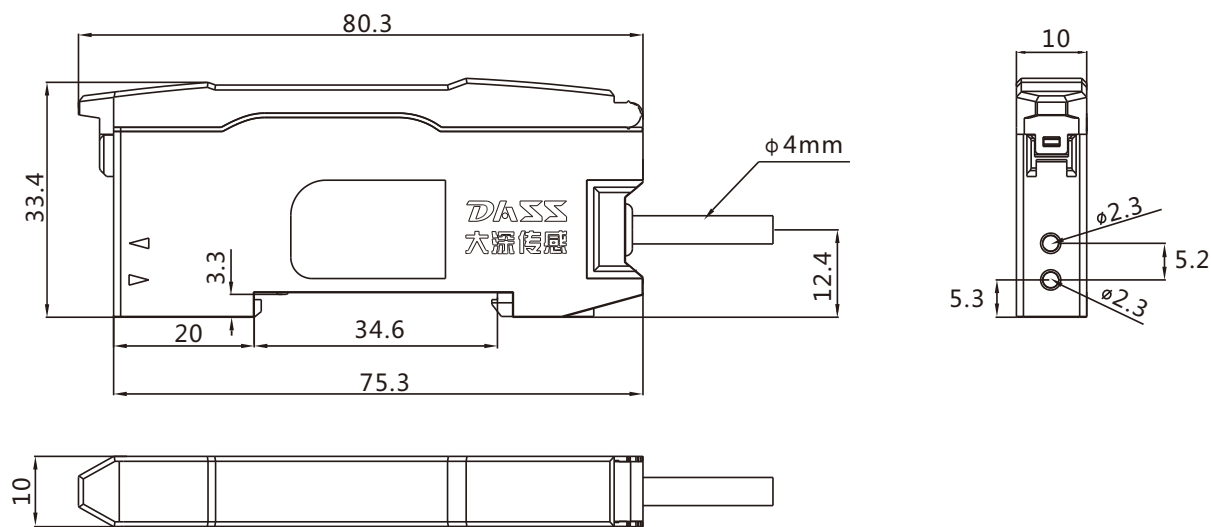
Product specification

Model	DS-F13	DS-F13P
Output	NPN output	PNP output
Type	Pre-wired	
Number of control outputs	1 output port	
Light source	Red LED	
Response time	HS : 200μs、STND : 1ms、SHS:NPN 50μs PNP 55μs、LONG : 1ms	
Output selection	LIGHT-ON/DARK-ON(Switch selection)	
Display indicator	Dual digital monitor: dual display, threshold (4-digit green LED body indicator) and current value (4-digit red LED body indicator) Illuminated together: current value range 0~9999	
Protection circuit	Reverse power connection protection and output short circuit protection	
Detection method	light intensity	
Delay function	Disconnect delay timer/open delay timer/single timer//open delay single timer, selectable timer duration selectable 1ms~9999ms	
Control Output	Load supply voltage DC26.4V or less, load current 100mA or less, open collector output type (NPN/PNP varies by model), residual voltage 2V or less (when load current is 100mA)	
Power supply	DC 12V~24V±10% pulsation (P-P) 10% or less	
Working environment illumination	Incandescent lamp: below 20000lux, daylight: below 30000lux	
Vibration resistance	10 to 55Hz, double amplitude: 1.5mm, 2h each X/Y/Z axis	
Impact resistance	500m/s ² in X/Y/Z direction 3 times each	
Ambient temperature	Range -10 to +55°C without freezing	
Ambient humidity	Range 35 to +85%, non-condensing	
Weight	About 65g	
Material	PC/ABS	

Operation Display Table



Size specifications



Input/output section circuit diagram

NPN output

Model	Sequence Diagram	Action mode	Output Circuit
DS-F13	Light entry time Black out time Operation indicator (orange) Light on Light out Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown ① and black ③ leads)	Light-ON	
	Light entry time Black out time Operation indicator (orange) Light on Light out Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown ① and black ③ leads)	Dark-ON	

PNP output

Model	Sequence Diagram	Action mode	Output Circuit
DS-F13P	Light entry time Black out time Operation indicator (orange) Light on Light out Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown ① and black ③ leads)	Light-ON	
	Light entry time Black out time Operation indicator (orange) Light on Light out Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown ① and black ③ leads)	Dark-ON	

Mating Fibre Heads

Through-beam Fiber Units						
Type	Size/ Appearance	Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance(mm)	Models
					Amplifier DS-F13 HS Detection mode	
M3	Thread		2m(Free Cutting) -55至+70°C	R10	260	DS-FT30
	Right-angle		2m(Free Cutting) -55~+70°C	R25	400	DS-FT30N
M4	Thread		2m(Free Cutting) -55~+70°C	R25	1000	DS-FT40/DS-FT7F
			6m(No Cutting) -40~+350°C	R25	460	DS-FH15HT
	Right-angle		2m(Free Cutting) -55~+70°C	R25	900	DS-FT40N
M6	Thread		6m(No Cutting) -40~+350°C	R25	460	DS-FH16HT
			2m(Free Cutting) -55~+70°C	R60	1500	DS-FT60/DS-FT71
	Right-angle		2m(Free Cutting) -55~+70°C	R25	900	DS-FT60N
φ 2.5			2m(No Cutting) -40~+70°C	R10	60	DS-FT55
φ 3			2m(Free Cutting) (φ 2.2) -40~+70°C	R25	1000	DS-FT5/DS-FT5F
φ 2			2m(Free Cutting) (φ 1.0) -55~+70°C	R10	30	DS-FH25T

对射型镜头

Type	Spot diameter (mm)	Appearance (mm)	Ambient temperature range Weight	Models
Aperture Angle: About 8°	About φ 5mm		-40~+70°C About 1g	DS-FMT04-1
Aperture Angle: About 8°	About φ 5mm		-40~+70°C About 2g	DS-FMT04-2
Side-Looking	1.5~10mm		-40~+70°C About 2g	DS-FMT04-3

Mating Fibre Heads



Through-beam - regional fiber

Type		Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance(mm)	Models
Detection method	Optical axis width (mm)				Amplifier DS-F13 HS Detection mode	
Area detection	11		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT01
	23.5		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT02
	6		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT03
	6.2		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT04
	6.4		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT05
	6.4		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT06
	12		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT07
	13.5		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT08
	14		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT09
	14		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT10
	12		2m(Free Cutting) (φ 2.2) -55~+70°C	5	500	DS-FAT11
	12		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT12
	30		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT13
	35		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT14
	40		2m(No Cutting) (φ 2.8) -55~+70°C	32	1000	DS-FAT15

Mating Fibre Heads



Through-beam - regional fiber

Type		Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance(mm)	Models
Detection method	Optical axis width (mm)				Amplifier DS-F13 HS Detection mode	
Area detection	50		2m(No Cutting) (φ 2.8) -55~+70℃	32	1000	DS-FAT16
	70		2m(No Cutting) (φ 2.8) -55~+70℃	32	500	DS-FAT17
	100		2m(No Cutting) (φ 2.8) -55~+70℃	32	500	DS-FAT18
	4		2m(Free Cutting) (φ 1.3) -55~+70℃	15	300	DS-FAT19
	4		2m(Free Cutting) (φ 1.3) -55~+70℃	15	300	DS-FAT20
	4		2m(Free Cutting) (φ 1.3) -55~+70℃	15	300	DS-FAT21
	4		2m(Free Cutting) (φ 1.3) -55~+70℃	15	300	DS-FAT22

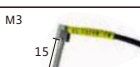
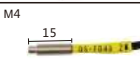
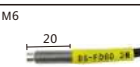
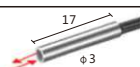
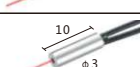
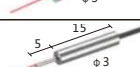
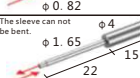
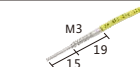
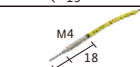


Reflective - regional fiber

Type		Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance (mm) *	Models
Size/ Appearance					Amplifier DS-F13 HS Detection mode	
φ 1	1		1m(No Cutting) (φ 1.0×2) -55至+70℃	5	10	DS-FDF10-1
	2		1m(No Cutting) (φ 1.0×4) -55~+70℃			DS-FDF10-2
	4		1m(No Cutting) (φ 1.0×8) -55~+70℃			DS-FDF10-4
	6		1m(No Cutting) (φ 1.0×12) -55~+70℃			DS-FDF10-6
	8		1m(No Cutting) (φ 1.0×16) -55~+70℃			DS-FDF10-8
	10		1m(No Cutting) (φ 1.0×20) -55~+70℃			DS-FDF10-10
	12		1m(No Cutting) (φ 1.0×24) -55~+70℃			DS-FDF10-12

*标准检测物:200mm×200mm白底纸

Mating Fibre Heads

Reflective Fiber Units						
Type	Size/ Appearance	Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance(mm)*	Models
					Amplifier DS-F13 HS Detection mode	
M3	Thread		2m(Free Cutting) -55至+70℃	R10	60	DS-FD30
	Right-angle		2m(Free Cutting) -55至+70℃	R10	10	DS-FD30N
M4	Thread		2m(Free Cutting) -55至+70℃	R25	180	DS-FD40/DS-FD66
	Right-angle		2m(Free Cutting) -55至+70℃	R25	40	DS-FD40N
M6	Thread		2m(Free Cutting) -55至+70℃	R25	180	DS-FD60
	Right-angle		2m(Free Cutting) -55至+70℃	R25	60	DS-FD60N
φ 3			2m(Free Cutting) (φ 1.3x2) -40至+70℃	R25	180	DS-FD4F
			2m(Free Cutting) (φ 1.0x2) -40至+70℃	R25	60	DS-FD48U
			2m(No Cutting) -40至+70℃	R25	10	DS-FD45X
φ 4			2m(Free Cutting) (φ 1.3x2) -40至+70℃	R25	60	DS-FD43
M3			1m(Free Cutting) (φ 1.0x2) -55至+70℃	R10	50	DS-MRS-310-S15
M4			1m(Free Cutting) (φ 1.0x2) -55至+70℃	R10	50	DS-FRS-410-I

*Standard test substance : 200mm×200mm White paper

Lens Units (Small-spot types)

Type	Spot diameter (mm)	Focus Distance (mm)	Appearance(mm)	Ambient temperature range Weight	Models
Small-spot types	About φ0.6	7±2		-30~+70℃ About 1g	FMD03-2
	About φ0.8	15±2		-30~+70℃ About 2g	FMD03-3
	About φ 1	35±3		-40~+70℃ About 5g	FMD03-4
	About φ0.6	15±2		-40~+70℃ About 5g	FMD04-2
	About φ 3	40±3		-40~+70℃ About 6g	FMD06-2

Lens Units (Parallel-light-spot types)

Type	Spot diameter (mm)	Appearance(mm)	Ambient temperature range Weight	Models
Parallel- light-spot types	About φ 4		-30~+70℃ About 2g	FMD03-1

Mating Fibre Heads

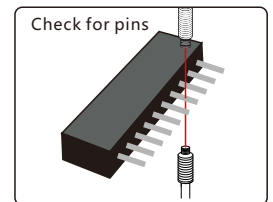
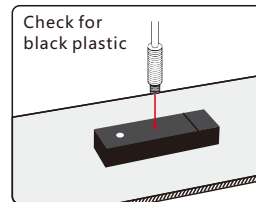
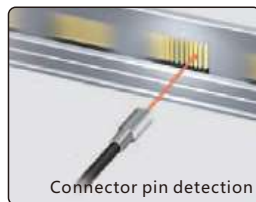


Reflective - regional fiber

Type		Appearance (mm)	Wire length (Diameter) Ambient temperature range	Bending radius of cable (mm)	Sensing distance(mm)	Models
Detection method	Optical axis width (mm)				Amplifier DS-F13 HS Detection mode	
Area detection	5		2m(Free Cutting) ($\phi 1.3 \times 2$) -55~+70°C	15	50	DS-FAD01
	7		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD02
	4		2m(Free Cutting) ($\phi 1.3 \times 2$) -55~+70°C	15	50	DS-FAD03
	4		2m(Free Cutting) ($\phi 1.3 \times 2$) -55~+70°C	15	50	DS-FAD04
	5		2m(Free Cutting) ($\phi 1.3 \times 2$) -55~+70°C	15	50	DS-FAD05
	5		2m(Free Cutting) ($\phi 1.3 \times 2$) -55~+70°C	15	50	DS-FAD06
	12		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD07
	14		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD08
	12		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD09
	25		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD10
	30		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD11
	35		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD12
	40		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD13
	50		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD14
	70		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD15
	100		2m(Free Cutting) ($\phi 2.2 \times 2$) -55~+70°C	5	120	DS-FAD16

*Standard test substance : 200mm×200mm White paper

Manufacturing world-class photoelectric sensor



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