

OMRON PHOTOELECTRIC SWITCH

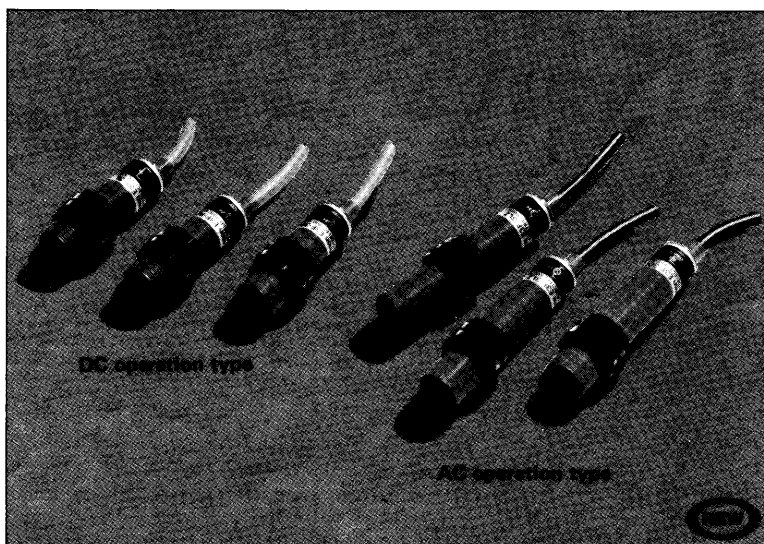
Cat. No. E07-E1-1

Model **E3F**

Cylindrical Photoelectric Switch with Built-in Amplifier

■ FEATURES

- Mounting space saved with M18 cylindrical housing
- Ideal for simple installation where no sensitivity adjustment or optical axial adjustment is required
- Wide operating voltage range (12 to 24 VDC for DC operation type; 24 to 240 VAC for AC operation type)
- Reversible output operations for DC operation type
- Watertight construction conforming to IP66



■ AVAILABLE TYPES

Type of operation	Type		Separate type	Retroreflective type*	Diffuse reflection type
	Operating state of output	Output configuration			
	Detecting distance		3m	2m	0.1m
DC operation type	LIGHT-ON/DARK-ON (Reversible)	PNP open collector	E3F-3B4	E3F-R2B4	E3F-DS10B4
		NPN open collector	E3F-3C4	E3F-R2C4	E3F-DS10C4
AC operation type	LIGHT-ON	SCR	E3F-3Z1	E3F-R2Z1	E3F-DS10Z1
	DARK-ON		E3F-3Z2	E3F-R2Z2	E3F-DS10Z2

* Includes Type OER-04 retroreflective target.

■ SPECIFICATIONS

● RATINGS

Item	Type	DC operation type			AC operation type		
		E3F-3B4 E3F-3C4	E3F-R2B4 E3F-R2C4	E3F-DS10B4 E3F-DS10C4	E3F-3Z1 E3F-3Z2	E3F-R2Z1 E3F-R2Z2	E3F-DS10Z1 E3F-DS10Z2
Supply voltage		12 VDC -10% to 24 VDC +10% Ripple (p-p): 10% max.			24 VAC -10% to 240 VAC +10%		
Current consumption		45mA max.	25mA max.		10mA max.	5mA max.	
Detecting distance		3.0m	0.1 to 2.0m (with OER-04)	0.1m (with 5x5cm white mat paper)	3.0m	0.1 to 2.0m (with OER-04)	0.1m (with 5x5cm white mat paper)
Detectable object		Opaque materials (11mm min.)	Opaque materials (56mm min.)	Transparent and opaque materials	Opaque materials (11mm min.)	Opaque materials (56mm min.)	Transparent and opaque materials
Directional angle		3 to 10°	3 to 20°	—	3 to 10°	3 to 20°	—
Distance differential		—		20% max. at 0.1m	—		20% max. at 0.1m
Output mode		LIGHT-ON/DARK-ON			Z1 type: LIGHT-ON Z2 type: DARK-ON		
Control output		Open collector output: 100mA max. Residual voltage 1V max. (at 20mA) Residual voltage 2V max. (at 100mA)			SCR output Switching capacity: 21.6 to 264 VAC 5 to 200mA max. Residual voltage 5V max. (at 200mA)		
Indicator		LIGHT INDICATOR (RED)					
Response time		2.5msec max.			30msec max.		
Connection cable		2m (cable color: light gray)			2m (cable color: dark gray)		
Material of housing		Plastic					
Degree of protection		IP66 (IEC 144), NEMA types 1, 4, 6, 12, 13					
Color of light source		Infrared					

OMRON

● OUTPUT STAGE CIRCUIT DIAGRAMS

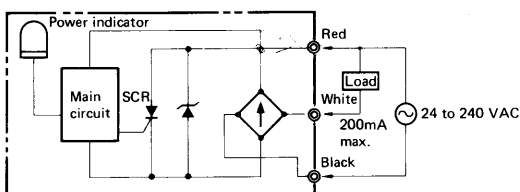
E3F-3C4 (receiver), E3F-R2C4, E3F-DS10C4

Color of cable	Red	Black	Red	Black
Polarity of supply voltage	+	-	-	+
Output mode	LIGHT-ON		DARK-ON	
Output circuit				
Timing chart				

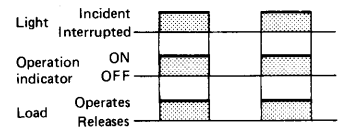
E3F-3B4, E3F-R2B4, E3F-DS10B4

Color of cable	Red	Black	Red	Black
Polarity of supply voltage	+	-	-	+
Output mode	LIGHT-ON		DARK-ON	
Output circuit				
Timing chart				

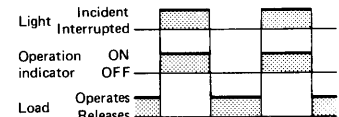
E3F-3Z□, E3F-R2Z□, E3F-DS10Z□



E3F-3Z1
(Separate type)
E3F-R2Z1
(Retroreflective type)
E3F-DS10Z1
(Diffuse reflection type)



E3F-3Z2
(Separate type)
E3F-R2Z2
(Retroreflective type)
E3F-DS10Z2
(Diffuse reflection type)



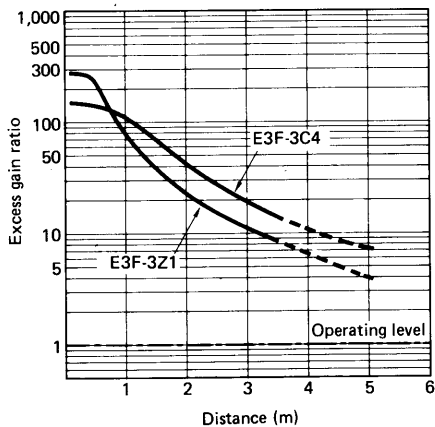
● CHARACTERISTICS

Insulation resistance		20MΩ min. (at 500 VDC)
Dielectric strength		DC operation type: 1,000 VAC 50/60Hz for 1 minute AC operation type: 4,000 VAC 50/60Hz for 1 minute
Vibration		Mechanical durability: 10 to 55Hz; 1.5mm double amplitude (in X, Y, Z directions, respectively for 2 hours)
Shock		Mechanical durability: 500m/sec ² (approx. 50G's)
Ambient operating illumination*	Incand. lamp	3,000 lx max.
	Sunlight	10,000 lx max.
Ambient temperature		Operating: -25 to +55°C Storage: -30 to +70°C
Humidity		Operating: 35 to 85% RH Storage: 35 to 95% RH
Weight		E3F-3□□: Approx. 260 to 280g
		E3F-R2□□, E3F-DS10□□: Approx. 130 to 140g

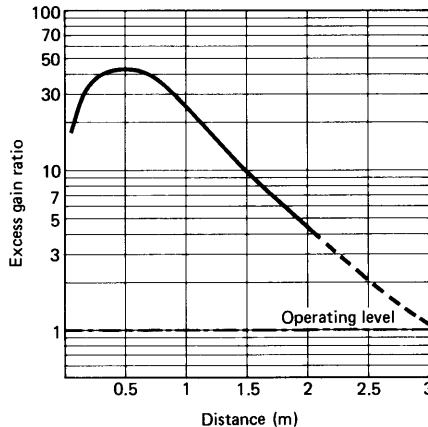
* Ambient operating illumination refers to the illumination at the surface of the receiver which varies the receiver output by ±20% max. with the receiver output at 200 lx. taken as 100%. It should not be construed as the operational limit illumination.

● CHARACTERISTIC DATA (typical example)

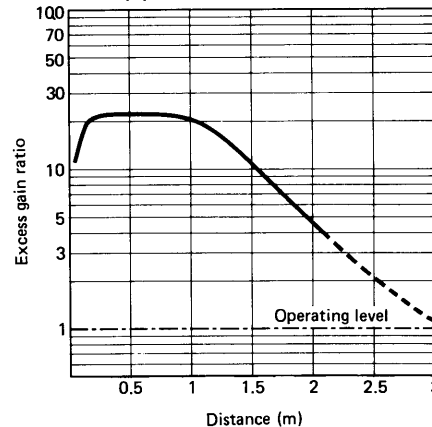
Excess Gain
E3F-3Z1(2), -3C4



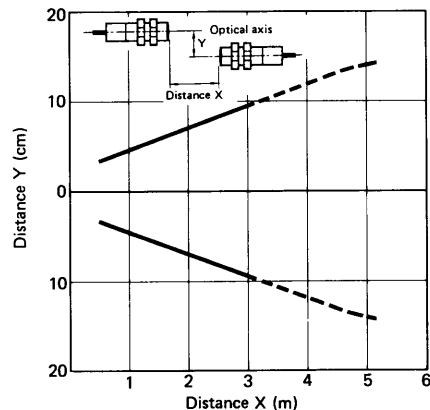
E3F-R2C4



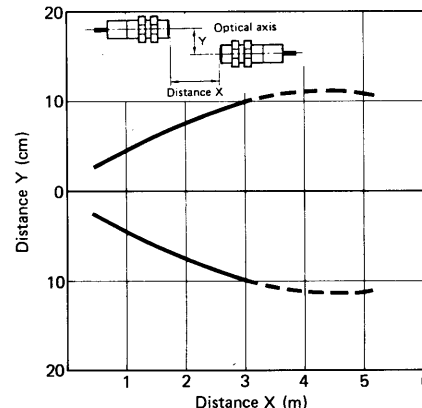
E3F-R2Z1(2)



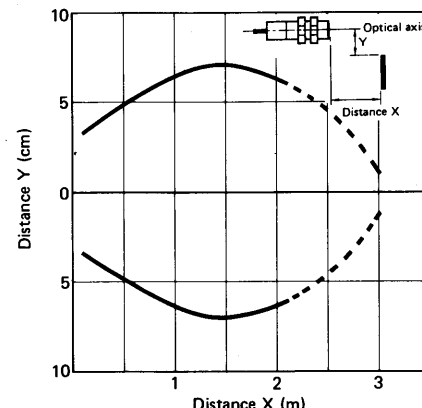
Light Source/Receiver Setting Range
E3F-3C4



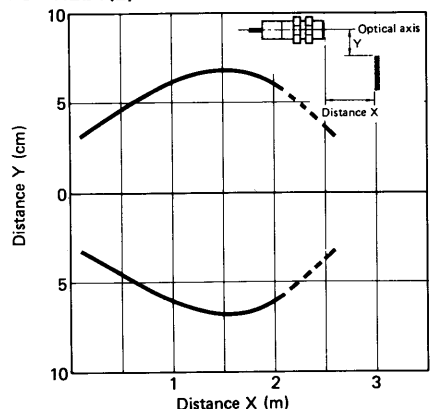
E3F-3Z1(2)



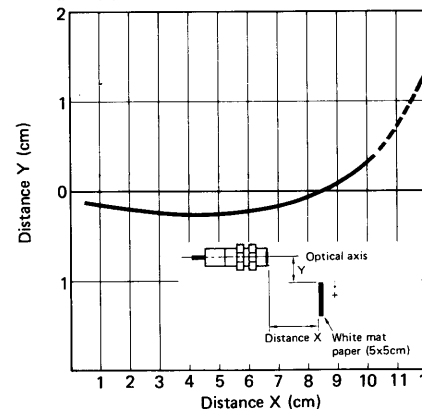
Retroreflective Target Setting Range
E3F-R2C4



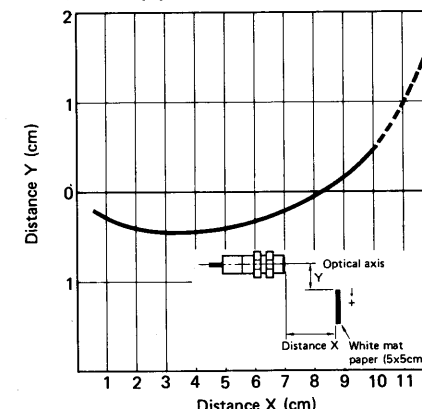
Retroreflective Target Setting Range
E3F-R2Z1(2)



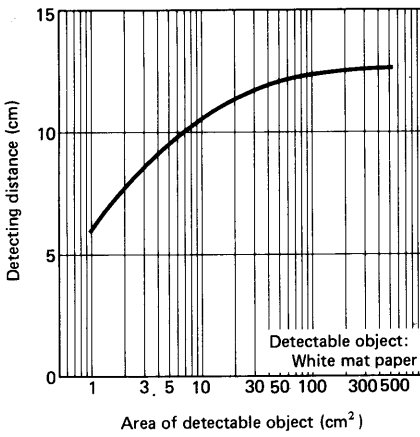
Operating Range Diagram
E3F-DS10C4



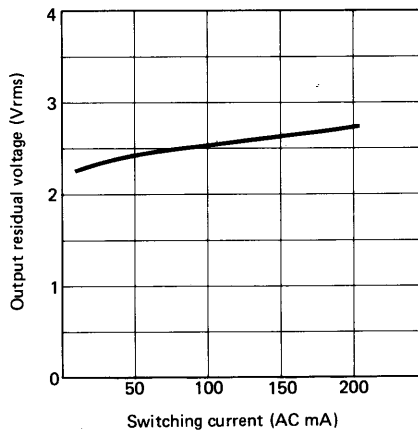
E3F-DS10Z1(2)



Size of Object vs. Detecting Distance
E3F-DS10C4, -DS10Z1(2)

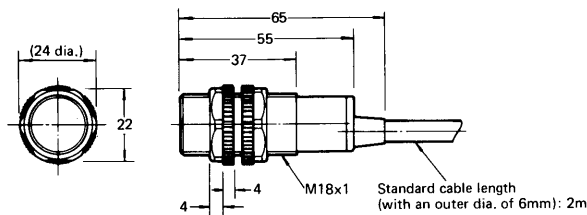


Output Residual Voltage
(AC type)

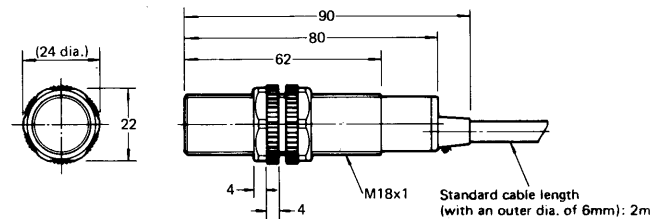


■ DIMENSIONS

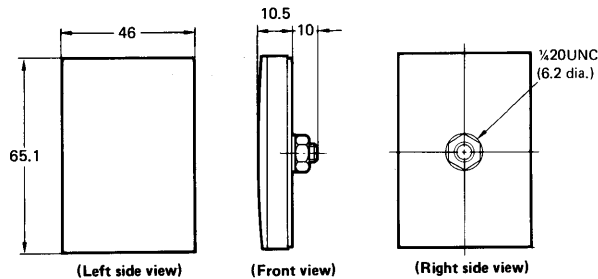
● DC OPERATION TYPE



● AC OPERATION TYPE



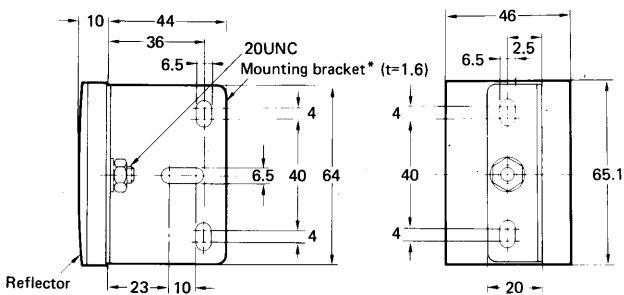
● RETROREFLECTIVE TARGET



This target is supplied as an accessory with Retroreflective Type (E3F-R2□□).

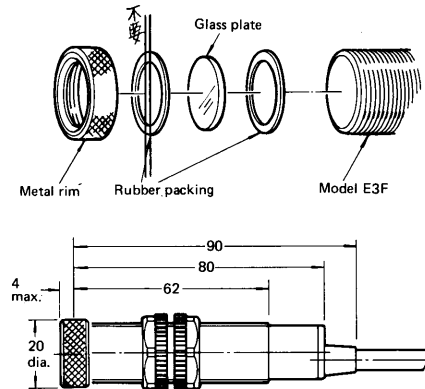
■ ACCESSORIES (available on request)

● OER-04 (RETROREFLECTIVE TARGET)



* Mounting bracket can be removed easily.

● E39-F31 (LENS CAP)



NOTE: ALL DIMENSIONS SHOWN IN THIS CATALOG ARE IN UNITS OF MILLIMETERS.
To convert millimeters into inches multiply by 0.03937. To convert grams into ounces multiply by 0.03527.

NOTE: Specifications subject to change without notice.



OMRON TATEISI ELECTRONICS CO.
Control Components H.Q.
9th Fl., Osaka Center Bldg, 4-68, Kitakyutaro, Higashiku, Osaka 541 Japan
Phone: 06-282-2706 Fax: 06-244-1909 Telex: 522-2484 OMRONELCO OSAKA

OMRON ELECTRONICS INC.
1 East Commerce Drive,
Schaumburg,
IL 60195, U.S.A.
Phone: (312) 843-7900
Fax: 312-943-7787
TWX: 910-291-0426
OMRONELC SHBU

CARLO GAVAZZI OMRON G.m.b.H.
Karl Hohmannstrasse
P.O. Box 3505
4000 Dusseldorf 34 Germany
Phone: (211) 748649
Fax: 49-211-748649
Telex: 8581890

OMRON ELECTRONICS (H.K.) LTD.
No. 34 Hung To Road Gee Lok
Industrial Building 3rd Floor,
Kwun Tong, Kowloon, Hong Kong
Phone: 3-444210, 3-444219
Fax: 852-3-7556711
Telex: 802/41092 (OMRON HK)

OMRON SINGAPORE (PTE.) LTD.
129B Lorong 1,
Toa Payoh #02-01,
Singapore 1231
Phone: 3-444210, 3-444219
Fax: 65-250-8245
Telex: RS23403

OMRON TATEISI ELECTRONICS CO.
Taipei Branch
3rd Fl., Ming Hwei Commercial Bldg.,
No. 164 Fu Hsing North Road
Taipei, Taiwan ROC
Phone: (02) 715-3330/31
Fax: 886-2-712-6712
Telex: 22444 OMRONELC

OMRON ELETRONICA DO BRASIL LTDA.
Av. Paulista, 949-12º Andar, Conj. 122,
Sao Paulo, Brasil
Phone: 251-0933
Fax: 55-11-251-1053
Telex: 1131751 OMRO BR