E3NX-FA Fiber Amplifier Units and Related Products

Fiber Amplifier Units E3NX-FA Series

Type	Appearance	Connecting method	Inputs/ outputs	Models		Ratings and Specifications	Dimensions
				NPN output	PNP output		
Standard models		Pre-wired (2 m)	1 output	E3NX-FA11 2M	E3NX-FA41 2M	Page 66	Page 68 68-A
		Wire-saving Connector	1 output	E3NX-FA6	E3NX-FA8		Page 68 68-B
Advanced models		Pre-wired (2 m)	2 outputs + 1 input	E3NX-FA21 2M	E3NX-FA51 2M		Page 68 68-A
		Wire-saving Connector	1 output + 1 input	E3NX-FA7	E3NX-FA9		Page 68 68-B
			2 outputs	E3NX-FA7TW	E3NX-FA9TW		
		M8 Connector	1 output + 1 input	E3NX-FA24	E3NX-FA54		Page 69 69-A
			2 outputs	E3NX-FA7TW	E3NX-FA54TW		
Model for Sensor Communications Unit		Connector for Sensor Communications Unit	2 outputs	E3NX-FA0			Page 69 69-B

Sensor Communications Unit

Sensor Communications Unit

Communication method	Appearance	Applicable Fiber Amplifier Model	Model	Ratings and Specifications	Dimensions
EtherCAT		E3NX-FA0	E3NW-ECT	Page 76	Page 77 77-A

* For details, refer to your OMRON website.

Distributed Sensor Unit

Appearance	Applicable Fiber Amplifier Model	Model	Ratings and Specifications	Dimensions
	E3NX-FA0	E3NW-DS	Page 76	Page 77 77-B

Accessories (sold separately)

Wire-saving connectors (Required for Wire-saving Connector type Amplifiers)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Type	Appearance	Cable length	Number of conductors	Applicable Fiber Amplifier Units	Models	Ratings, Specifications and Dimensions
Master Connector		2m	4	E3NX-FA7 E3NX-FA7TW E3NX-FA9 E3NX-FA9TW	E3X-CN21	Page 88 88-A
Slave Connector			2		E3X-CN22	Page 88 88-B
Master Connector			3	E3NX-FA6 E3NX-FA8	E3X-CN11	Page 88 88-A
Slave Connector			1		E3X-CN12	Page 88 88-B

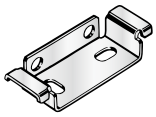
Sensor I/O Connectors (Required for models with M8 Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Appearance	Cable length	Number of conductors	Models	Ratings and Specifications	Dimensions
Straight 	2m	4	XS3F-M421-402-A	Page 88	Page 88 88-C
	5m		XS3F-M421-405-A		
L-shaped 	2m		XS3F-M422-402-A		Page 88 88-D
	5m		XS3F-M422-405-A		

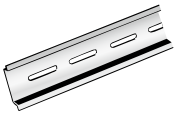
Mounting Bracket

A Mounting Bracket is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity	Dimensions
	E39-L143	1	Page 89 89-A

DIN Track

A Din Track is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Type	Models	Quantity	Dimensions
	Shallow type, total length: 1 m	PFP-100N	1	Page 89 89-B
	Shallow type, total length: 0.5 m	PFP-50N		
	Deep type, total length: 1 m	PFP-100N2		Page 89 89-C

End Plate

Two End Plates are provided with the Sensor Communications Unit.
End Plates are not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity	Dimensions
	PFP-M	1	Page 89 89-D

Ratings and Specifications

Item		Type	Standard		Advanced					Model for Sensor Communications Unit
		NPN output	E3NX-FA11	E3NX-FA6	E3NX-FA21	E3NX-FA7	E3NX-FA7TW	E3NX-FA24	—	E3NX-FA0
		PNP output	E3NX-FA41	E3NX-FA8	E3NX-FA51	E3NX-FA9	E3NX-FA9TW	E3NX-FA54	E3NX-FA54TW	
		Connecting method	Pre-wired	Wire-saving Connector	Pre-wired	Wire-saving Connector		M8 Connector		Connector for Sensor Communications Unit
Inputs / Outputs	Output		1 output		2 outputs	1 output	2 outputs	1 output	2 outputs	— *1
	External input		—		1 input	1 input	—	1 input	—	
Light source (wavelength)			Red, 4-element LED (625 nm)							
Power supply voltage			10 to 30 VDC , including 10% ripple (p-p)							
Power consumption *2			At Power Supply Voltege of 24 VDC. Standard Models or Model for Senser Communications Unit: Normal mode: 960 mW max. (Current consumption: 40 mA max.) Power saving Eco mode: 840 mW max.(Current consumption: 35 mA max.) Advanced Models: Normal mode: 1,080 mW max. (Current consumption: 45 mA max.) Power saving Eco mode: 930 mW max.(Current consumption: 40 mA max.)							
Control output			Load power supply voltage: 30 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifier Units: 100 mA max., Groups of 4 to 30 Amplifier Units: 20 mA max. (Residual voltage: At load current of less than 10 mA: 1 V max., At load current of 10 to 100 mA: 2 V max.) OFF current: 0.1 mA max.							—
External input			—		Refer to *3.		—	Refer to *3.	—	
Indicators			7-segment displays (Sub digital display: green, Main digital display: white) Display direction: Switchable between normal and reversed. OUT indicator (orange), L/D indicator (orange), ST indicator (blue), DPC indicator (green) OUT Selection Indicator (orange)(only on models with 2 outputs)							
Protection circuits			Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection							Power supply reverse polarity protection and output short-circuit protection
Response time	Super-high-speed mode (SHS) *4		Operate or reset for model with 1 output: 30 μs, with 2 outputs: 32 μs							
	High-speed mode (HS)		Operate or reset: 250 μs							
	Standard mode (Stnd)		Operate or reset: 1 ms							
	Giga-power mode (GIGA)		Operate or reset: 16 ms							
Sensitivity adjustment			Smart tuning (2-point tuning, full auto tuning, position tuning, maximum sensitivity tuning, power tuning, or percentage tuning (–99% to 99%)) or manual adjustment							
Mutual interference prevention	Super-high-speed mode (SHS) *4		Possible for up to 0 units							
	High-speed mode (HS)		Possible for up to 10 units							
	Standard mode (Stnd)		Possible for up to 10 units							
	Giga-power mode (GIGA)		Possible for up to 10 units							
Functions	Auto power control (APC)		Always ON							
	Dynamic power control (DPC)		Provided							
	Timer		Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer. 1ms to 9999ms							
	Zero reset		Negative values can be displayed. (Threshold value is shifted.)							
	Resetting settings *5		Select from initial reset (factory defaults) or user reset (saved settings).							

*1. Two sensor outputs are allocated in the programmable logic controller PLC I/O table.
PLC operation via Communications Unit enables reading detected values and changing settings.
*2. At Power Supply Voltage of 10 to 30 VDC.
Standard Models or Model for Sensor Communications Unit:
Normal mode: 1,080 mW max. (Current consumption: 36 mA max. at 30 VDC, 108 mA max. at 10 DVC)
Power saving Eco mode: 930 mW max. (Current consumption: 31 mA max. at 30 VDC, 93 mA max. at 10 VDC)
Advanced Models:
Normal mode: 1,230 mW max. (Current consumption: 41 mA max. at 30 VDC, 123 mA max. at 10 DVC)
Power saving Eco mode: 1,050 mW max. (Current consumption: 35 mA max. at 30 VDC, 105 mA max. at 10 VDC)
*3. The following details apply to the input.

	Contact input (relay or switch)	Non-contact input (transistor)	Input time
NPN type	ON: Shorted to 0V (Sourcing current: 1 mA max.). OFF: Open or shorted to Vcc.	ON: 1.5V max. (Sourcing current: 1 mA max.). OFF: Vcc – 1.5 V to Vcc (Leakage current: 0.1 mA max.)	ON : 9ms min. OFF : 9ms min.
PNP type	ON: Shorted to Vcc (Sinking current: 3 mA max.). OFF: Open or shorted to 0V.	ON: Vcc – 1.5 V to Vcc (Sinking current: 3 mA max.). OFF: 1.5V max.(Leakage current: 0.1 mA max.)	

*4. The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.
*5. The bank is not reset by the user reset function or saved by the user save function.

Item		Type	Standard		Advanced					Model for Sensor Communications Unit
		NPN output	E3NX-FA11	E3NX-FA6	E3NX-FA21	E3NX-FA7	E3NX-FA7TW	E3NX-FA24	—	E3NX-FA0
		PNP output	E3NX-FA41	E3NX-FA8	E3NX-FA51	E3NX-FA9	E3NX-FA9TW	E3NX-FA54	E3NX-FA54TW	
		Connecting method	Pre-wired	Wire-saving Connector	Pre-wired	Wire-saving Connector		M8 Connector		Connector for Sensor Communications Unit
Functions	Eco mode		Select from OFF (digital displays lit) or ECO (digital displays not lit).							
	Bank switching		Select from banks 1 to 4.							
	Power tuning		Select from ON or OFF.							
	Output 1		Select from normal detection mode, or area detection mode.							
	Output 2		—		Select from normal detection mode, alarm output mode, or error output mode.	—	Select from normal detection mode, alarm output mode, or error output mode.	—	Select from normal detection mode, alarm output mode, or error output mode.	
	External input		—		Select from input OFF, tuning, power tuning, emission OFF, zero reset, or bank switching.		—	Select from input OFF, tuning, power tuning, emission OFF, zero reset, or bank switching.	—	
	Hysteresis width		Select from standard setting or user setting. For a user setting, the hysteresis width can be set to from 0 to 9,999.							
Ambient Illumination (Receiver side)			Incandescent lamp: 20,000 lx max., Sunlight: 30,000 lx max.							
Maximum connectable Units			30 units							
Ambient temperature range			Operating: Groups of 1 to 2 Amplifer Units: –25 to 55°C, Groups of 3 to 10 Amplifer Units: –25 to 50°C, Groups of 11 to 16 Amplifer Units: –25 to 45°C, Groups of 17 to 30 Amplifer Units: –25 to 40°C Storage: –30 to 70°C (with no icing or condensation)							Operating: Groups of 1 to 2 Amplifer Units: 0 to 55°C, Groups of 3 to 10 Amplifer Units: 0 to 50°C, Groups of 11 to 16 Amplifer Units: 0 to 45°C, Groups of 17 to 30 Amplifer Units: 0 to 40°C Storage: –30 to 70°C (with no icing or condensation)
Ambient humidity range			Operating and storage: 35% to 85% (with no condensation)							
Insulation resistance			20 MΩ min. (at 500 VDC)							
Dielectric strength			1,000 VAC at 50/60 Hz for 1 min							
Vibration resistance (destruction)			10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock resistance (destruction)			500 m/s² for 3 times each in X, Y, and Z directions							150 m/s² for 3 times each in X, Y, and Z directions
Weight (packed state/unit only)			Approx. 115 g/ Approx. 75 g	Approx. 60 g/ Approx. 20 g	Approx. 115 g/ Approx. 75 g	Approx. 60 g/Approx. 20 g		Approx. 65 g/Approx. 25 g		
Materials	Case		Polycarbonate (PC)							
	Cover		Polycarbonate (PC)							
	Cable		PVC							
Accessories			Instruction Manual							

Dimensions

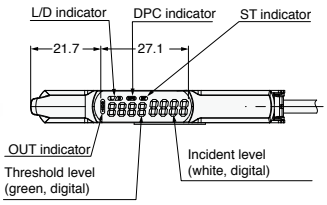
(Unit: mm)
Tolerance class IT16 applies to demmensions in this date sheet unless otherwise specified.

Pre-wired Amplifier Units

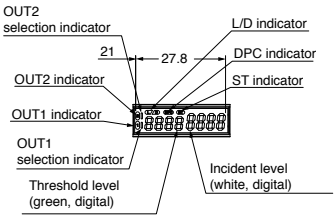
68-A

E3NX-FA11
E3NX-FA21
E3NX-FA41
E3NX-FA51

E3NX-FA11/FA41

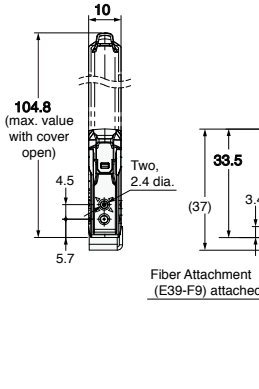


E3NX-FA21/FA51

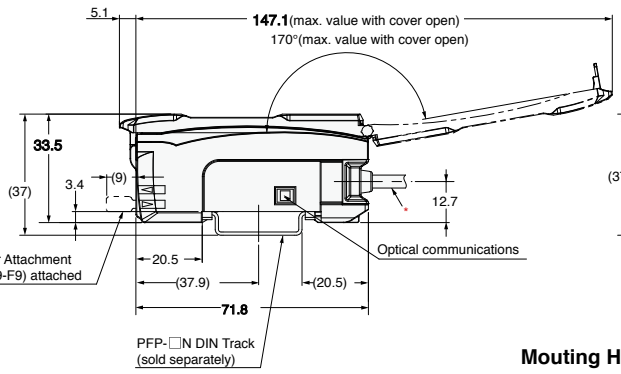


*Cable Specifications

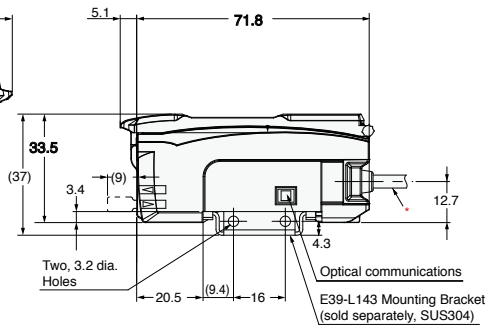
Models	Outer diameter	Number of conductors	Others
E3NX-FA11	4.0 dia.	3	Conductor cross-section: 0.2 mm²
E3NX-FA41			Insulator dia.: 0.9 mm
E3NX-FA21	4.0 dia.	5	Standard length: 2 m
E3NX-FA51			Minimum bending radius: 12 mm



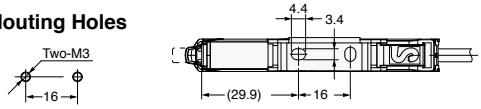
Mounted to DIN Track



With Mounting Braket Attached



Mouting Holes

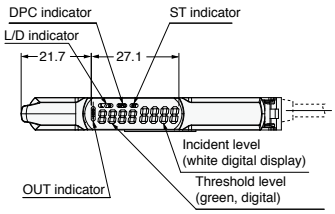


Amplifier Units with Wire-saving Connectors

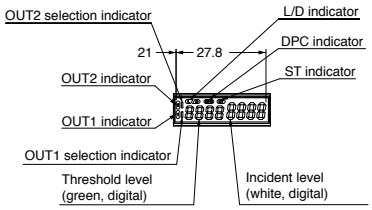
68-B

E3NX-FA6
E3NX-FA7
E3NX-FA7TW
E3NX-FA8
E3NX-FA9
E3NX-FA9TW

E3NX-FA6/FA7/FA8/FA9

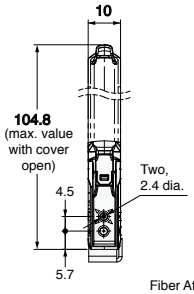


E3NX-FA7TW/FA9TW

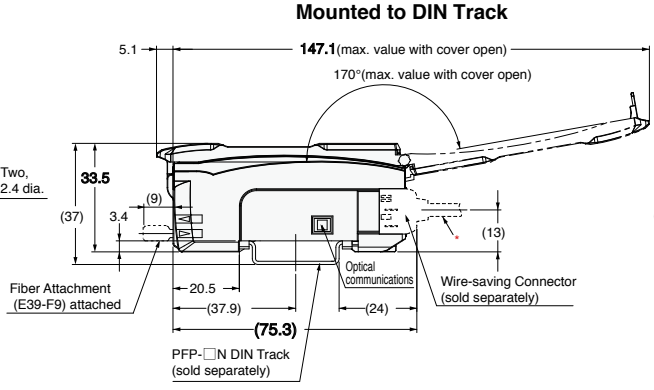


*Cable Specifications

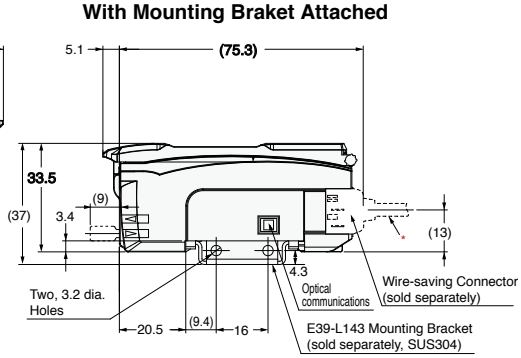
Models	Outer diameter	Number of conductors
E3X-CN12	2.6 dia.	1
E3X-CN22	4.0 dia.	2
E3X-CN11		3
E3X-CN21		4



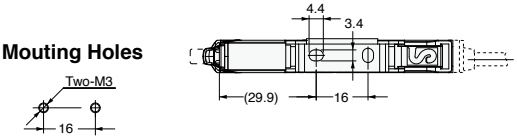
Mounted to DIN Track



With Mounting Braket Attached

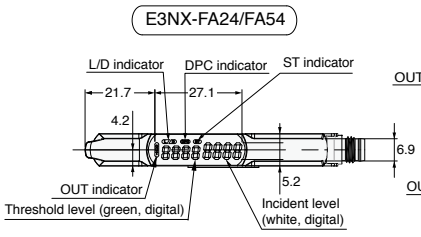


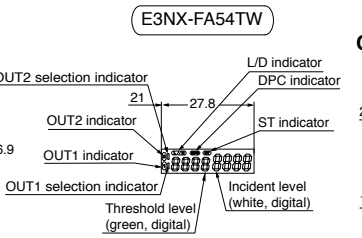
Mouting Holes



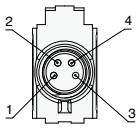
Amplifier Units with M8 Connector

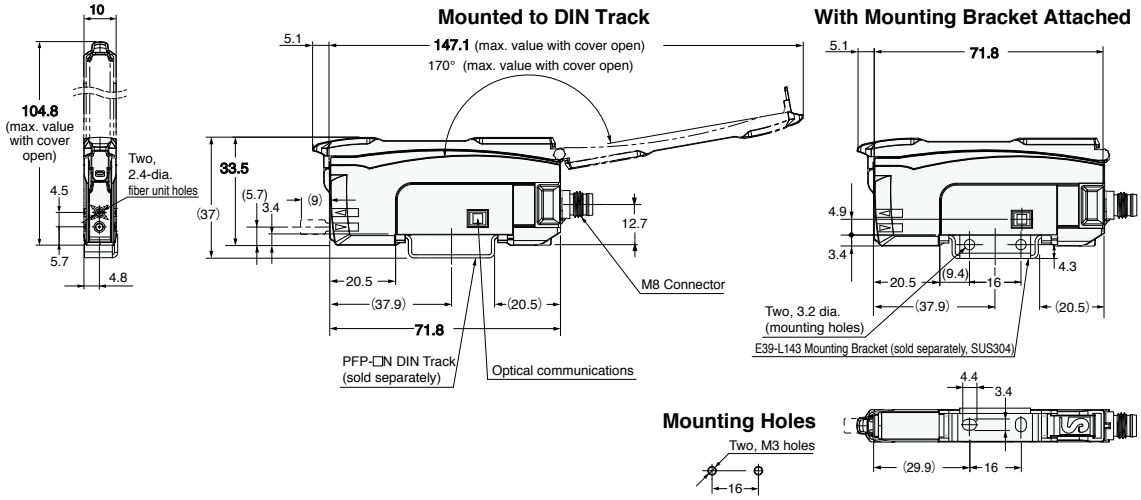
69-A **E3NX-FA24**
E3NX-FA54
E3NX-FA54TW





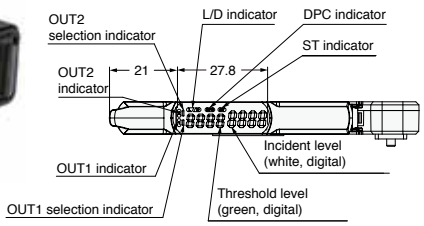
Connector pin arrangement

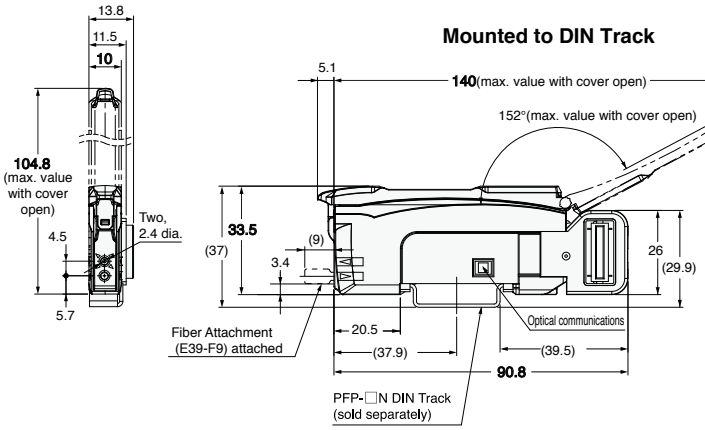




Amplifier Unit with Connector for Sensor Communications Unit

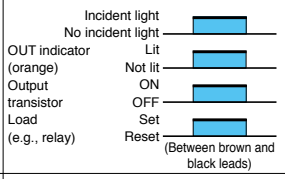
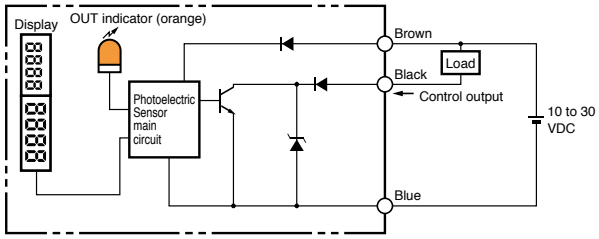
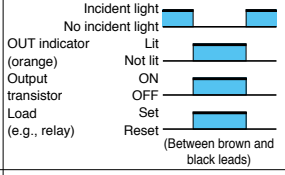
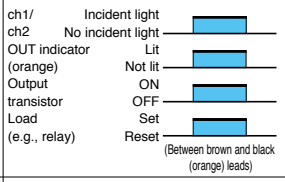
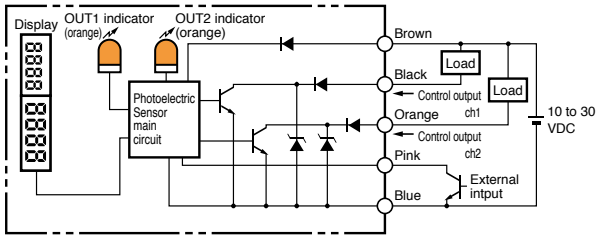
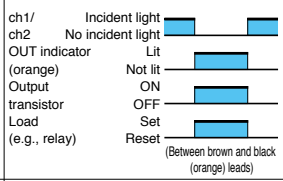
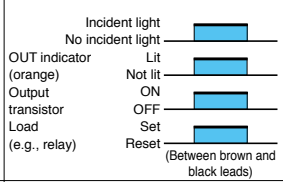
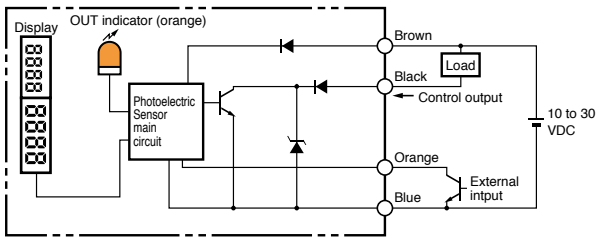
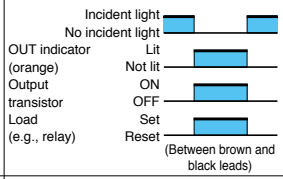
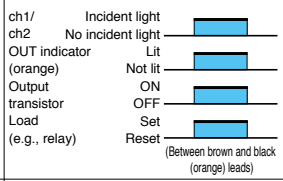
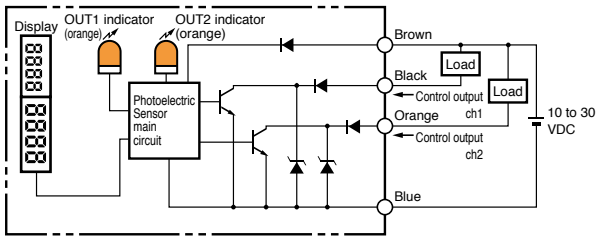
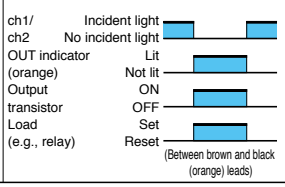
69-B **E3NX-FA0**





I/O Circuit Diagrams

NPN Output

Models	Operation mode	Timing chart	L/D indicators	Output circuit
E3NX-FA11 E3NX-FA6	Light-ON		L lit.	
	Dark-ON		D lit.	
E3NX-FA21	Light-ON		L lit.	
	Dark-ON		D lit.	
E3NX-FA7 E3NX-FA24	Light-ON		L lit.	
	Dark-ON		D lit.	
E3NX-FA7TW	Light-ON		L lit.	
	Dark-ON		D lit.	