Slot-type Photomicrosensor (Non-modulated) +

EE-SX47/67

Global Standard Slot-type photomicrosensors with 50- to 100-mA direct switching capacity.

- · Series includes models that enable switching between dark-ON and light-ON operation.
- Response frequency as high as 1 kHz.
- Easy operation monitoring with bright light indicator.
- Wide operating voltage range: 5 to 24 VDC
- Models in which the light indicator turns ON for dark-ON operation are also available.
- A wide range of variations in eight different shapes.
- Flexible robot cable is provided as a standard feature. *2

Be sure to read Safety Precautions on page 5.

Pre-wired Models are available only in the EE-SX67 Series.

*2. Only for Pre-wired Models.

Ordering Information

	Sensing	Connect-			Output		Мо	Infrared ligh
Appearance	method	ing method	Sensing	distance	configuration	Indicator mode	NPN output	PNP output
Standard				Dark-ON/Light-ON	Incident light	EE-SX670	EE-SX670P	
Trees .					(selectable) *3 *4	No incident light	EE-SX670A	EE-SX670R
0000					Light-ON	Incident light	EE-SX470	
L-shaped					Dark-ON/Light-ON	Incident light	EE-SX671	EE-SX671P
					(selectable) *3 *4	No incident light	EE-SX671A	EE-SX671R
1111					Light-ON	Incident light	EE-SX471	
T-shaped,					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX672	EE-SX672P
slot center 7 mm						No incident light	EE-SX672A	EE-SX672R
6.40			5 mm			Light-ON	Incident light	EE-SX472
Close-	Through- beam type	Connector (4 poles)			Dark-ON/Light-ON	Incident light	EE-SX673	EE-SX673P
mounting				5 mm (slot width)	(selectable) *3 *4	No incident light	EE-SX673A	EE-SX673R
0000					Light-ON	Incident light	EE-SX473	
Close-	(with slot)	()			Dark-ON/Light-ON	Incident light	EE-SX674	EE-SX674P
mounting					(selectable) *3 *4	No incident light	EE-SX674A	EE-SX674R
2148					Light-ON	Incident light	EE-SX474	
T-shaped, slot center 10 mm					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX675	EE-SX675P
F-shaped					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX676	EE-SX676P
R-shaped						Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX677

*3. Dark-ON when the L terminal of the connector is opened, and light-ON when the L terminal and positive (+) terminal are connected. Do not connect the L terminal to 0 V when using dark-ON operation. When using light-ON, it is useful to select the connector EE-1001-1. The L terminal and positive (+) terminal of this connector are connected in advance.

*4. If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

_	Sensing			Output	Indicator	Connecting	Mo	del
Appearance	method	Sensing dis	stance	configura- tion	mode	method	NPN output	PNP output
itandard							EE-SX670-WR 1M	EE-SX670P-WR 1M
-shaped)						EE-SX671-WR 1M	EE-SX671P-WF 1M
-shaped, lot center mm	P						EE-SX672-WR 1M	EE-SX672P-WF 1M
close- nounting	Through- beam		Dark-ON/ Light-ON	Incident	Pre-wired	EE-SX673-WR 1M	EE-SX673P-WF 1M	
close- nounting	type (with slot)			(selectable) *1 *2) light	Models (1m)	EE-SX674-WR 1M	EE-SX674P-WF 1M
-shaped, lot center 0 mm						EE-SX675-WR 1M	EE-SX675P-WF 1M	
-shaped						EE-SX676-WR 1M	EE-SX676P-WF 1M	
R-shaped							EE-SX677-WR 1M	EE-SX677P-WF 1M

*1. Dark-ON operation can be used when the L terminal is left unconnected or Light-ON operation can be used when the L terminal and positive (+) terminal are connected to each other. Do not connect the L terminal to 0 V when using dark-ON operation.

*2. If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

Accessories (Order Separately) Connector Models

	Туре	Cable length	Model	Remarks
Connector			EE-1001	
			EE-1001-1	L terminal and positive (+) terminal are already short-circuited.
			EE-1009 *	
		1 m	EE-1006 1M	
	Connector with Cable	1 111	EE-1010 1M *	
		2 m	EE-1006 2M	
			EE-1010 2M *	
	Connector with Robot Cable	1 m	EE-1010-R 1M *	
		2 m	EE-1010-R 2M *	
Connector Hold-down Clip			EE-1006A	Applicable Photomicrosensors For EE-SX670 and 470 only. (Can be used only with EE-1006 Connectors for the Photomicrosensors listed above.)

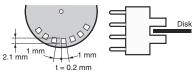
Note: For details, refer to the Photomicro Sensors Accessories on EE-... which can be accessed from your OMRON website.

* EE-1009- or EE-1010-series Connectors have a builtin locking mechanism to prevent cable disconnection when only the cable is pulled. To remove the Connector from the Sensor, grip the top and bottom of the Connector firmly and push into the Sensor once before pulling out. The locking mechanism prevents the Connector from being removed by pulling on the cable only and enables removal only when the Connector (housing) is pulled.

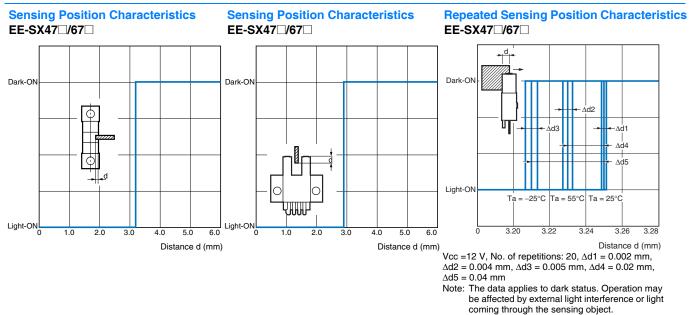
Ratings and Specifications

		Туре	Standard	L-shaped	T-shaped, slot center 7 mm	Close-m	nounting	T-shaped, slot center 10 mm	F-shaped	R-shaped		
	NPN models	Connector models	EE-SX670 EE-SX670A EE-SX470	EE-SX671 EE-SX671A EE-SX471	EE-SX672 EE-SX672A EE-SX472	EE-SX673 EE-SX673A EE-SX473	EE-SX674 EE-SX674A EE-SX474	EE-SX675	EE-SX676	EE-SX677		
	models	Pre-wired models	EE-SX670- WR	EE-SX671- WR	EE-SX672- WR	EE-SX673- WR	EE-SX674- WR	EE-SX675- WR	EE-SX676- WR	EE-SX677- WR		
	PNP	Connector models	EE-SX670P EE-SX670R	EE-SX671P EE-SX671R	EE-SX672P EE-SX672R	EE-SX673P EE-SX673R	EE-SX674P EE-SX674R	EE-SX675P	EE-SX676P	EE-SX677P		
ltem	models	Pre-wired models	EE-SX670P- WR	EE-SX671P- WR	EE-SX672P- WR	EE-SX673P- WR	EE-SX674P- WR	EE-SX675P- WR	EE-SX676P- WR	EE-SX677P- WR		
Sensi	ng distand	ce	5 mm (slot widt	h)								
Sensi	ng object		Opaque: 2×0.8	3 mm min.								
Differ	ential dist	ance	0.025 mm									
Light	source				ength of 940 nm							
Indica	itor *1		Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)									
Suppl	y voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.									
Curre	nt consum	nption	12 mA max. (Connector models, L terminal open), 35 mA max. (NPN pre-wired models), 30 mA max. (PNP pre-wired models) NPN open collector: 5 to 24 VDC, 100 mA max.									
Contr	ol output		100 mA load current with a residual voltage of 0.8 V max. 40 mA load current with a residual voltage of 0.4 V max. OFF current (leakage current): 0.5 mA max. PNP open collector: 5 to 24 VDC, 50 mA max. 50 mA load current with a residual voltage of 1.3 V max. OFF current (leakage current): 0.5 mA max.									
Prote	ction circu	uits	Load short circuit protection (Connector models), No circuit protection (Pre-wired models)									
	onse frequ	•	1 kHz min. (3 kHz average)									
	ent illumin		1,000 lx max. with fluorescent light on the surface of the receiver.									
		rature range	Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing or condensation)									
Ambie	ent humid	ity range	Operating: 5% to 85%, Storage: 5% to 95% (with no icing or condensation)									
Vibration resistance Destruction: 20 to 2,000 Hz (peak acceleration: 100 m/s²) 1.5-mm double amplitude for 2 h (4-min periods) each in X, Y, and						d Z directions						
	<pre>c resistand</pre>		Destruction: 500 m/s ² for 3 times each in X, Y, and Z directions									
Degre	e of prote	ction	IEC60529 IP50									
Conne	ecting met	thod		Connector Models (direct soldering possible), Pre-wired Models (Standard cable length: 1 m), Nodels with Connectors (Standard cable length: 0.1 m)								
Wei-	Connecte	or models	Approx. 3.1 g	Approx. 3 g	Approx. 2.4 g	Approx. 2.3 g	Approx. 3 g	Approx. 2.7 g	Approx. 2.2 g	Approx. 2.2 g		
ght	Pre-wired	d models		•	Approx. 17.8 g	Approx. 16.8 g	Approx. 17.1 g	Approx. 18.3 g	Approx. 16.9 g	Approx. 16.9 g		
Ma-	Case		Polybutylene ph	nthalate (PBT)								
teri- al	Cover Emitter/r	eceiver	Polycarbonate									

*1. The indicator is a GaP red LED (peak wavelength: 690 nm).
*2. The response frequency was measured by detecting the rotating disk shown at the right.



Engineering Data (Reference Value)



I/O Circuit Diagrams

Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ① terminal and positive ⊕ terminal	EE-SX67D EE-SX67DA
EE-SX67□-WR	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between ① terminal and positive ⊕ terminal *1 *2	*The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX670A EE-SX671A	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ① terminal and positive ⊕ terminal	EE-SX67D-WR
EE-SX672A EE-SX673A EE-SX674A	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between ① terminal and positive ⊕ terminal *1 *2	The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX470 EE-SX471 EE-SX472 EE-SX473 EE-SX474	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases		Light indicator (red) Main circuit Cir

*1. Do not connect the L terminal to 0 V when using dark-ON operation. *2. If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

PNP Output Model	Output configuration	Timing charts	Terminal connections	Output circuit		
EE-SX67□P	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases	Short-circuited between © terminal and positive ⊕ terminal			
EE-SX67⊡P-WR	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases	Open between ℂ terminal and positive ⊕ terminal *1 *2	Light indicator (red) Main Main UT T 24 VDC		
EE-SX670R EE-SX671R EE-SX672R	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between © terminal and positive ⊕ terminal	*The terminal arrangement depends on the model. Check the dimensional diagrams.		
EE-SX672R EE-SX673R EE-SX674R	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates	Open between © terminal and positive ⊕ terminal *1 *2			

*1. Do not connect the L terminal to 0 V when using dark-ON operation.

*2. If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

Safety Precautions

Refer to Warranty and Limitations of Liability.

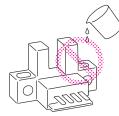
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



Precautions for Safe Use

Operating Environment

These Photomicrosensors have an IP50 (conforms to IEC) enclosure and do not have a water-proof or dust-proof structure. Therefore, do not use them in applications in which the sensor will be subjected to splashes from water, oil, or any other liquid. Liquid entering the Sensor may result in malfunction.



Precautions for Correct Use

Make sure that this product is used within the rated ambient environment conditions.

Installation

When direct soldering to the terminals, use the following guidelines.
 Soldering Conditions

Item	Temper- ature	Permissible time	Remarks					
Caldaring	25000		The portion between the base of					

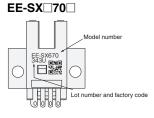
nom	ature	time	Tioniai Ko
Soldering iron	350°C max.	3 s max.	The portion between the base of the terminals and the position 1.5 mm from the terminal base must not be soldered.

 The terminal base uses a polycarbonate resin, which could be deformed by excessive soldering heat, resulting in damage to the product's functionality.

Lot Number and Model Number Legend

In the following diagrams, 343U indicates the lot number and factory where the product was manufactured. Do not include this code with the model number when ordering.

The QR code on connector models is used by OMRON only.

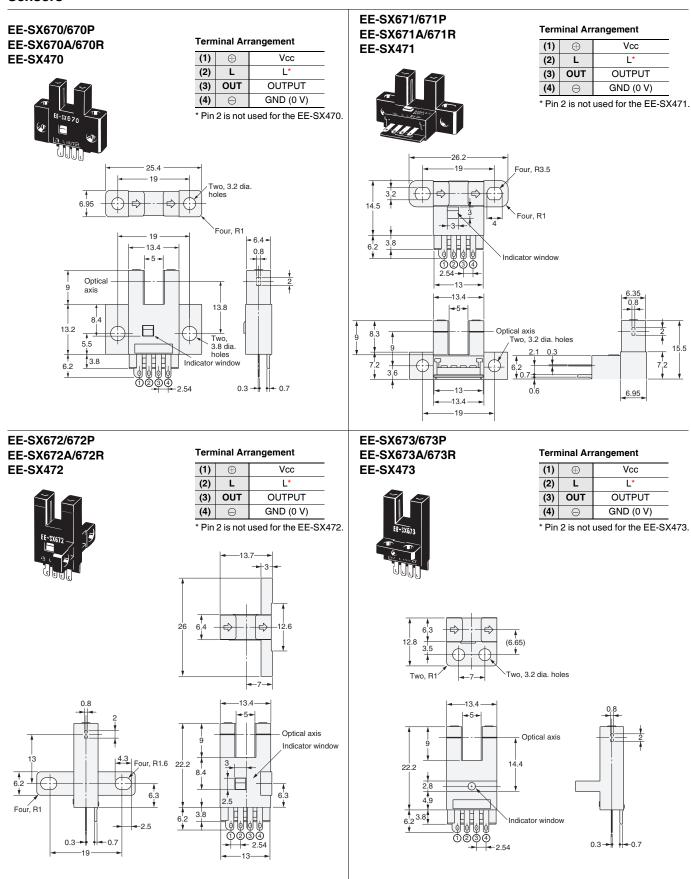


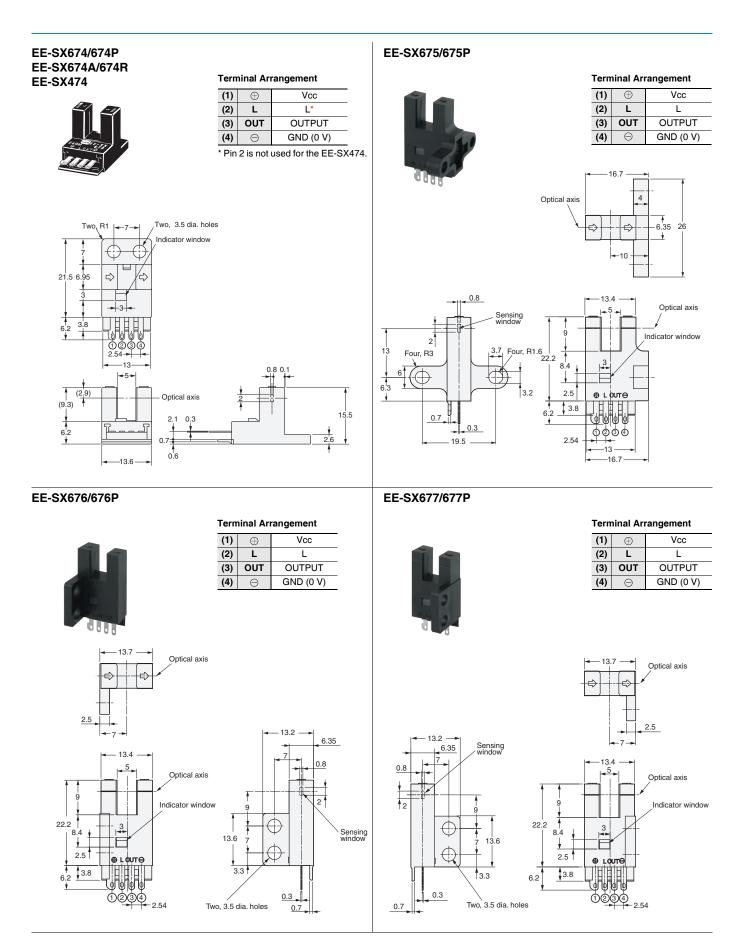
(Unit: mm)

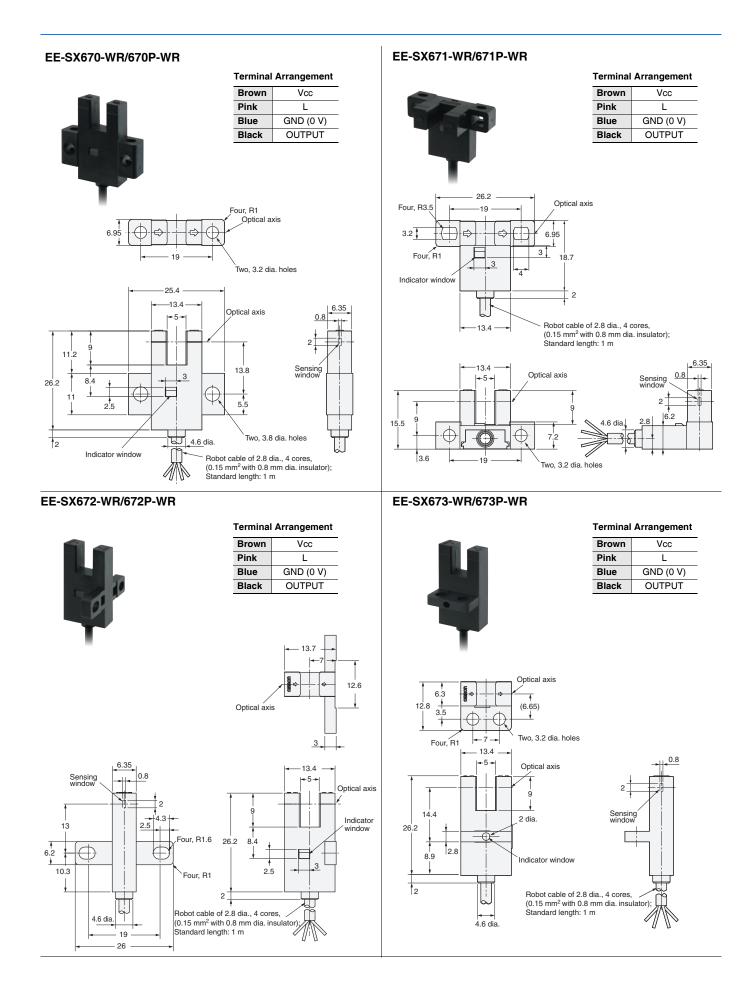
Dimensions

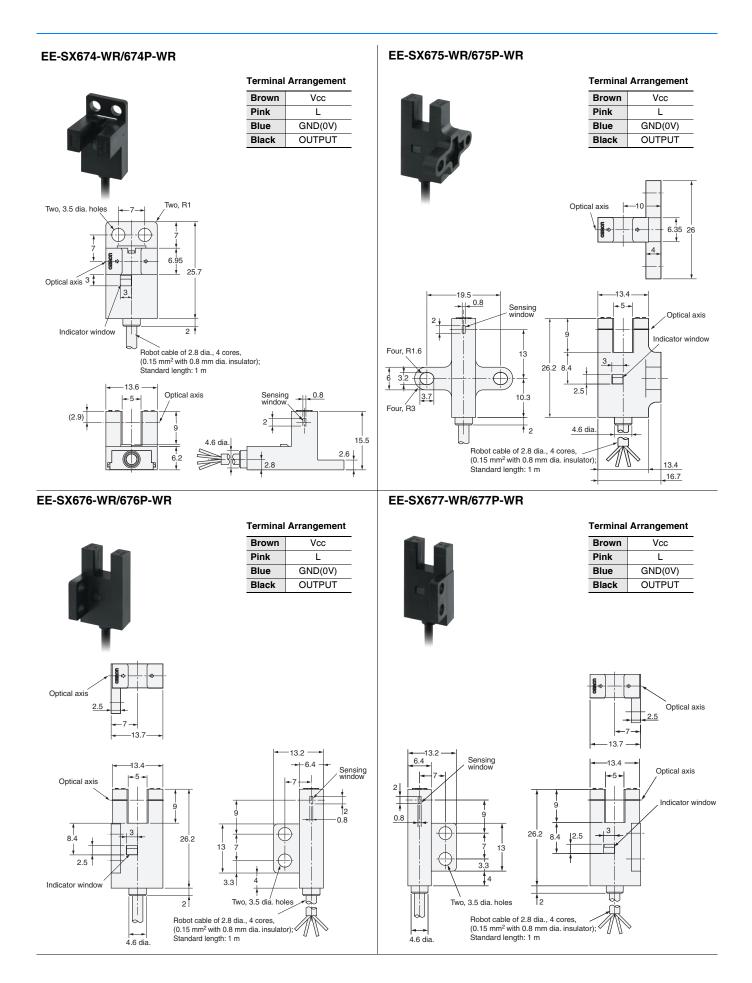
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Sensors









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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж: moschip.ru moschip.ru_4

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