Power Supply for LED Illumination

VLP-2430-4 / 2460-4

Operation Manual

Thank you for purchasing a VAL product.
To use this LED power supply with optimum performance and safety,
please read this manual thoroughly before starting operation.
Keep this manual for the whole product lifetime.

The following warning symbols are used in this manual.
Be sure to fully understand the contents.

⚠ WARNING	A warning denotes a hazard that can cause severe injury or death.
⚠ CAUTION	A caution denotes a hazard that can cause injury or damage of equipment.

1. Safety regulations

⚠ WARNING	
	Do not open the chassis to avoid electric shock. High-voltage parts are inside.
	Use appropriate AC power cord conforming to the standards in the country or region where this product used. 1) AC100-120V : SVT/AWG18/3m max. withstand voltage 125V min.(UL-approved) 2) AC220-240V : H05W-F/AWG18/3m max. withstand voltage 250V min. (EU-approved)
	Plug in AC power cord directly to the outlet. Do not use a table tap with many other cords at the same time to prevent fire or electrical shock.
	Earth ground the product. If you do not, it may cause an electric shock when you touch both a part with earthing potential and the power supply at the same time.
	Do not touch or plug the AC power cord with wet hand. It may cause an electric shock.
	Whenever trouble occurs, such as smoke, smell, noise or abnormal heat, stop the operation immediately and turn off the power and unplug the power cord.
	Use only LED lighting unit made by VS Technology (Thailand) Co., Ltd. If you use with other lighting unit, over current may cause a fire or heat.

⚠ CAUTION
1. USE the extension or remote cables 3m maximum to prevent power drop by voltage reduction or malfunction by noise.
2. Installation of the product 1) Place horizontally in a well ventilated space on the rubber feet at the bottom of the unit. 2) Do not topple or lay on its side. 3) Do not put on unstable or vibrational place. 4) Do not use in environment with humidity, dusty, high temperature or fire. 5) Keep liquids away.
3. Do not look at the LED directly. If you see the LED long time, your eyes may be damaged.
4. Cleaning Use wet cloth twisted well. Never use inflammable liquids such as alcohol, benzene or thinner. Turn off the power and unplug the cord from the outlet while cleaning to avoid any injury or damage of the unit.
5. Dispose the product conforming to the law in the region where the product is used.

2. General Description

VLP-2430-4 and VLP-2460-4 are a power supply for VAL series or LED lighting unit made by VS Technology (Thailand) Co., Ltd.

It can be used with input voltage range with AC100～240V and output wattage maximum totally 30W(2430-4) or 60W(2460-4) with 1CH and 2CH and 3CH and 4CH. There are four independent output channels and each channels can be controlled separately.

Remote control is also available separately in each channels.

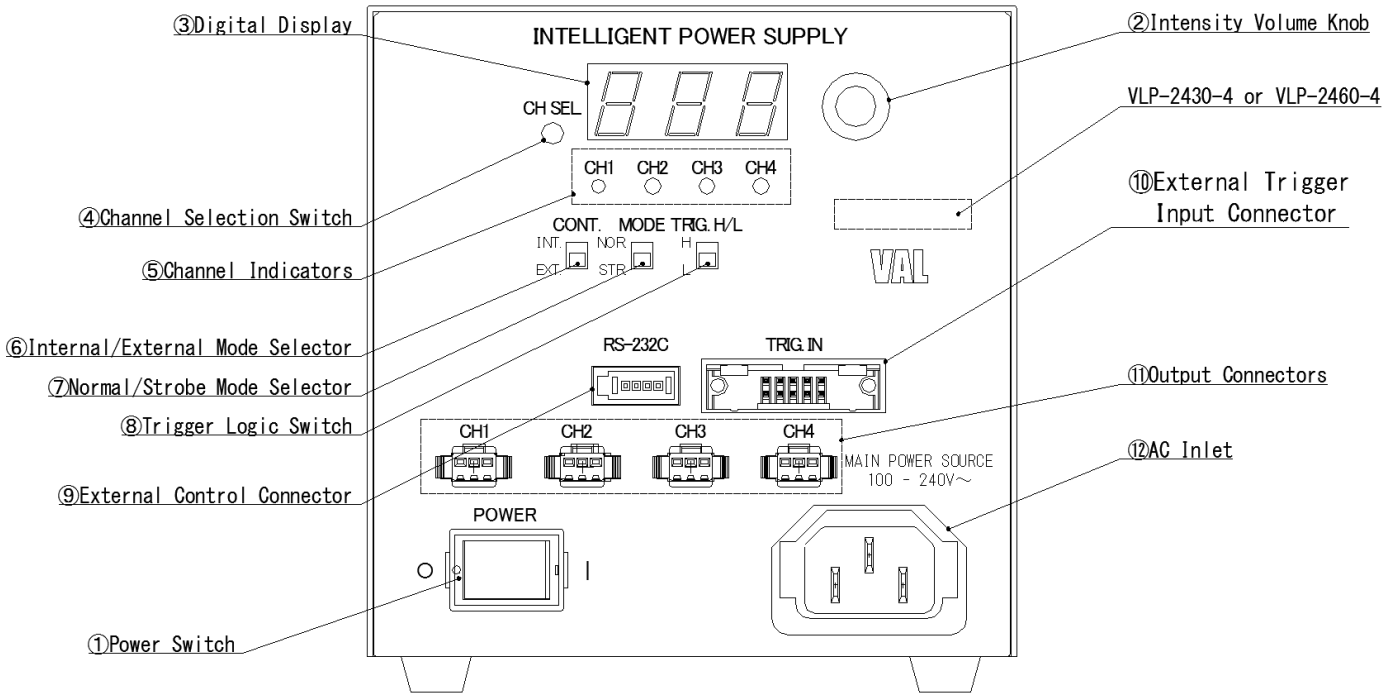
3. Confirming package contents

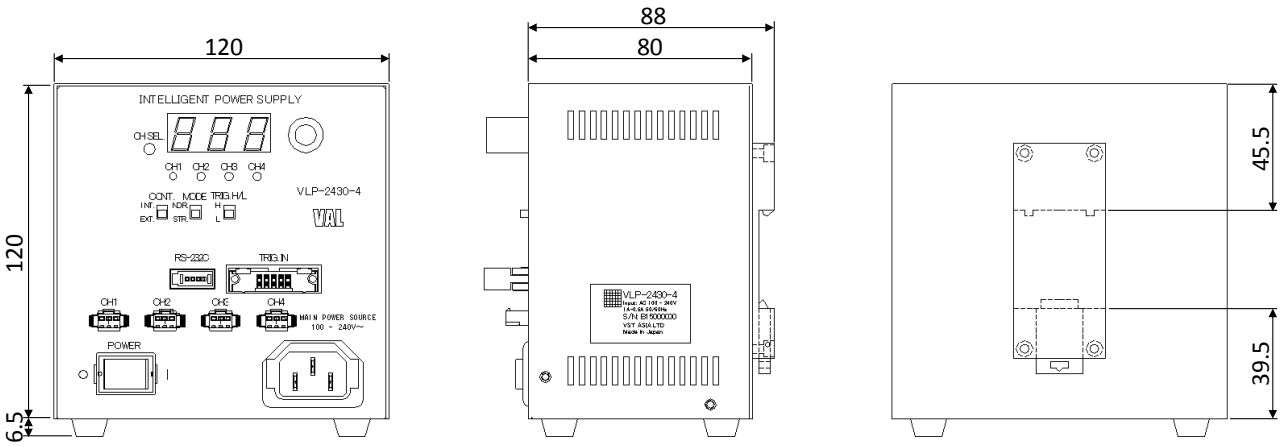
Item	Q'ty
Main unit	1
AC power cord *Use appropriate AC power cord conforming to the standards in the country or region where this product used.	(Optional)
Ferrite core clamp filter for AC power cord *Applicable cable outer diameter 6 to 9mm. *Attach to AC power cord within 100mm from unit.	1
This operation manual	1

4. Specification

Model	VLP-2430-4	VLP-2460-4
Input Voltage	AC 100 - 240V (rated) ±10% 50/60Hz	
Power Consumption	AC100V/1A - AC240V/0.5A	
Inrush Current(A)	30/60 (AC115/230V) at cold start	
AC Power Cord	3m (max.) cord with a protective earth terminal	
Rated output voltage	4 Channels DC24V (between output and GND)	
Rated output current	1.1A (Total for 4 channels)	2.2A (Total for 4 channels)
Input Connectors	AC input 3-pin inlet EN 60320-1 certified C14 type x 1	
Output Connectors	SMP-03V-BC(JST) 1:output＋ 2:NC 3:output－ Insulation resistance：500MΩ(min.) Withstand voltage：AC1500V/minute	
External control connectors	Trigger input MIL connector (MIL-C-83503 compliant), 10-pole For setting the light intensity and lighting mode: e-CON 3-pole	
Intensity Control	INT.: Control manually by volume knobs EXT.: Remote control by external EIA-232-D	
Strobe Control	NOR.: The lights are always ON. STR.: Strobe control.	
Lighting method	PWM (100KHz)	
Overcurrent protection	Operates at 105% or higher of the rated current	
Insulation resistance/ withstand voltage	Between input and FG (frame ground): AC1500V /minute (10mA), DC500V 50MΩ (min.)	
Operating Environment	Temperature： 0 to 40℃ Humidity： 20～85% RH without condensation Altitude： 2000m Max. Pollution level： 2 Protective ground class Ⅰ Installation category Ⅱ (restricted to use in indoor environment)	
Storage Temperature/ Humidity	-15 to 40℃／20 to 85% RH without condensation	
Cooling Method	Natural air cooling	
Dimensions	W120mm x D88mm x H126.5mm	
Weight	Approx. 930g	
Environmental regulations	RoHS compliant	
European Standards (CE Marking) *Under processing	EN61326-1 EN61010-1	

5. Dimensions and Functions





①	Power switch	Power on at "I" side
②	Intensity Volume Knob	For digital control
③	Digital Display	Display the setting of the light intensity or the setting of the lighting mode.
④	Channel Selection Switch	Selects CH1, CH2, CH3, CH4.
⑤	Channel Indicators	CH1 lit: Lit when changing settings for Light Unit connected to output connector CH1. CH2 lit: Lit when changing settings for Light Unit connected to output connector CH2. CH3 lit: Lit when changing settings for Light Unit connected to output connector CH3. CH4 lit: Lit when changing settings for Light Unit connected to output connector CH4.
⑥	Internal/External Mode Selector	Selects internal (INT.) or external (EXT.) control mode.
⑦	Normal/Strobe Mode Selector	Selects normal (NOR.) or strobe (STR.) control mode.
⑧	Trigger Logic Switch	Selects the logic of the trigger signal.
⑨	External Control Connector	For external control with RS-232C communications.
⑩	External Trigger Input Connector	Inputs the ON/OFF signal for ON/OFF Mode. Inputs the trigger signal for Strobe Mode.
⑪	Output Connectors	Supply power to the Light Units.
⑫	AC Inlet	Connects the power source to the Control Unit.

6. Operation

(1) Connections

Confirm the power switch is OFF (on "O" side).
Connect the LED lighting unit to CH1 or CH2 or CH3 or CH4 output connector on front panel of the product.
Connect 3P socket of the AC power cord to power supply inlet on front panel of the product
and connect 3P plug of the AC power cord to outlet.

⚠ CAUTION	Connect an outlet with grounding. If it is not grounded, the power supply will not be ensured electrical safety performance.

(2) Power on

Turn the power switch to ON (on "I" side). Set the intensity to minimum side to suppress the inrush current.

(3) Manual control

Light intensity is adjustable manually when the control switch on the front panel is set at "INT."

(4) Remote control

When the Remote control switch on front panel is set at "EXT.", external control input signal is available through "RS-232C" or "TRIG. IN" connector on front panel.

(5) On/Off Control

It is possible to turn off the light by inputting "off" signal by remote control mode.

(6) Error Signal

Error indicator on front panel will be on if an error of LED lighting unit detected such as breaking of wire.
Error signal from external signal connector will be output at the same time.
It does not identify error of CH1 or CH2 or CH3 or CH4. Please check the lighting units.
This function does not detect the connection of lighting unit. To avoid signal malfunction, set the output minimum level if the lighting unit is not connected.
This function works regardless of "INT./EXT." mode.

(7) Noise reduction

Make sure to attach a Ferrite core clamp filter to AC power cord.

7. Control with External Signals

⚠ CAUTION	Use output signal cable of 3m or shorter. Do not apply too high current and voltage. Do not use external connector except SELV circuit with reinforced insulation or a circuit with double insulation.

Connector

Communications Specifications

No.	Signal
1	Tx
2	Rx
3	NC
4	GND

Communications protocol	EIA-232-D
Baud rate	38,400 bps
Data bit length	8 bits
Parity bit	None
Stop bits	1 bit

Command Formats

Send Data (*1)

Function	Header	Channel specification	Sent command		ID specification	Checksum	Delimiter	Default
			Instruction	Data (*2)				
Light Intensity Setting	@	00 to 03 (Refer toChannel Specification) FF: All channels (ON/OFF setting only)	F	000 to 255 (000:Min. Intensity, 255:Max. Intensity)	00 (Fixed)	00 to FF (Refer to Checksum)	<CR><LF>	000
Lighting Mode Setting			S	01 to 10 (Refer to Lighting Mode Settings)				00
ON/OFF Setting (*3)			L	0 : Not Lit , 1 : Lit (*4)	-----			(*5)

*1: Send a data within 4 seconds from 'Header' to 'Delimiter', otherwise time-out error occurs and command data will be rejected.
*2: Specify all numbers in Decimal format.
*3: ON/OFF settings from EIA-232-D communications without regards to trigger logic switch, turned OFF at '0' and ON at '1'. ON/OFF setting will not be held after turning the power off.
*4: When operating EIA-232-D Communications and trigger signal input at same time in ON/OFF mode.
When Trigger logic switach is at H : if either controls setting, Light unit will be turned OFF.
When Trigger logic switach is at L : if either controls setting, Light unit will be turned ON.
*5: Defalt setting for trigger logic switch is H ='1(ON)' and L='0(OFF)'.

Receive Data

Function	Header	Channel specification	Receive Command				ID specification	Checksum	Delimiter
			OK		NG				
Light Intensity Setting	@	00 to 03 (Refer toChannel Specification) FF: All channels (ON/OFF setting only)	0	-----	N	01: Command Error 02: Checksum Error 03: Setvalue out of Range Error	00 (Fixed)	00 to FF (Refer to Checksum)	<CR><LF>
Lighting Mode Setting									
ON/OFF Setting									

Channel Specification

Channel	CH1	CH2	CH3	CH4
Set Value	00	01	02	03

Lighting Mode Setting

Status	Strobe Mode									
	40μS	80μS	120μS	200μS	600μS	1.2mS	4mS	10mS	20mS	40mS
Channel	F01	F02	F03	F04	F05	F06	F07	F08	F09	F10
Set Value	01	02	03	04	05	06	07	08	09	10

Checksum

The codes of the ASCII characters from the header to the ID are added,
the lowest byte is converted to hexadecimal, and two characters are sent.

Example: Setting the Light Intensity of Channel 2 10 125

	Header	Channel		Sent command				ID		Total
	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	
Character	@	0	1	F	1	2	5	0	0	
ASCII (hexadecimal)	40 hex	30 hex	31 hex	46 hex	31 hex	32 hex	35 hex	30 hex	30 hex	1DF hex

*Set value that are higher than 10 are not valid.

Setting Procedure

-Make sure that the main power source is turned ON.

-Set the Internal/External mode selector to EXT. to set External mode.

-Setting the Light Intensity

Specify the ID and the channel, and the light intensity.

Setting example	Send data	Receive data(When ON)	Receive data(When NG)
Setting the light intensity to 75 for CH2 of the VLP-2430-4 that has the ID set to 01	@01F07500E4CRLF	@0100051CRLF	@01N0300B3CRLF

-Setting the Lighting Mode

Specify the ID and channel, and set the lighting mode.

Setting example	Send data	Receive data(When ON)	Receive data(When NG)
Setting the lighting mode to Strobe Mode at 200μs for CH2 of the VLP-2430-4 that the ID set to 00.	@00S0400B8CRLF	@0000050CRLF	@00N0300B2CRLF

-To set ON/OFF Signal in ON/OFF mode

Specify the ID and the channel, and set ON/OFF signal.

Setting example	Send data	Receive data(When ON)	Receive data(When NG)
To turn all light units OFF of the VLP-2430-4 that has the ID set to FF.	@FFL000A8CRLF	@FF007BCRLF	@FFN0300DDCRLF (When there is a set value out of range error)

8. Inputting an External Trigger

*Input Signal and Photocoupler

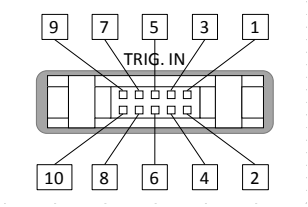
The input signal from the external trigger input connector can be used to control the photocoupler inside the Unit to turn the LED Light Units ON and OFF or to control strobe timing.

Trigger Logic Switch	Input signal	Photocoupler	ON/OFF Mode	Strobe Mode
H	HIGH LOW	OFF ON	Light Units ON Light Units OFF	Lights Units ON for the set time No change
L	HIGH LOW	OFF ON	Light Units OFF Light Units ON	No change Lights Units ON for the set time

*When operating trigger signal input and communication used External trigger input connector at same time in ON/OFF mode.
When Trigger logic switch is at H : if either controls setting, Light unit will be turned OFF.
When Trigger logic switch is at L : if either controls setting, Light unit will be turned ON.

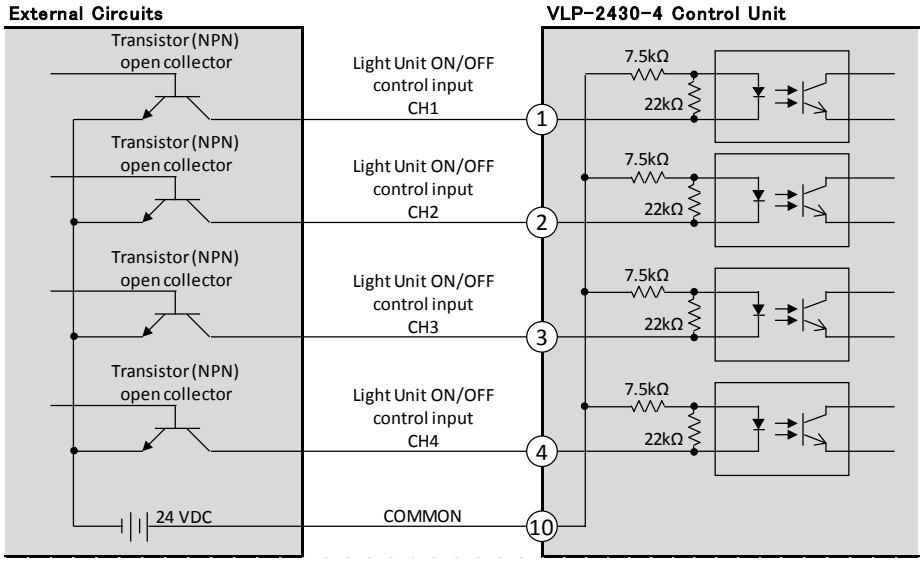
*Connector Layout

External Trigger Input Connector Plug



NO	Signal	Cable Wire color
1	Light Unit ON/OFF control input CH1	Black
2	Light Unit ON/OFF control input CH2	Black/White
3	Light Unit ON/OFF control input CH3	Brown
4	Light Unit ON/OFF control input CH4	BROWN/WHITE
5 to 9	No used	---
10	COMMON+	Yellow/Black

*External Trigger Signal Connection Example



Signal Specifications					
Rated input voltage	Maximum input voltage	ON voltage/ON current	OFF voltage/OFF current	ON/OFF response time	Input impedance
24 VDC	26.4 VDC	14.4 VDC min./3 mA max.	5 VDC max./1 mA max.	10 μs max.	7.5kΩ (per terminal)

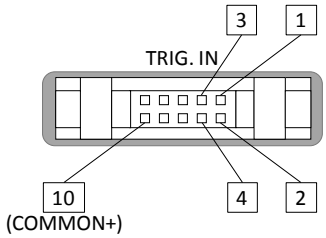
*Setting Procedures

With external trigger input connectors pins 1 to 4, select the channels (CH1 to CH2 to CH3 to CH4) where you want to input an external trigger, and input trigger.

Trigger signals are input from the external trigger input connector in ON/OFF Mode and Strobe Mode in both Internal Mode or External Mode.

ON/OFF Mode
The Light Units are turned ON or OFF according to the external trigger signal input.

Strobe Mode
The Light Units are turned ON for the set time after the external trigger signal input.

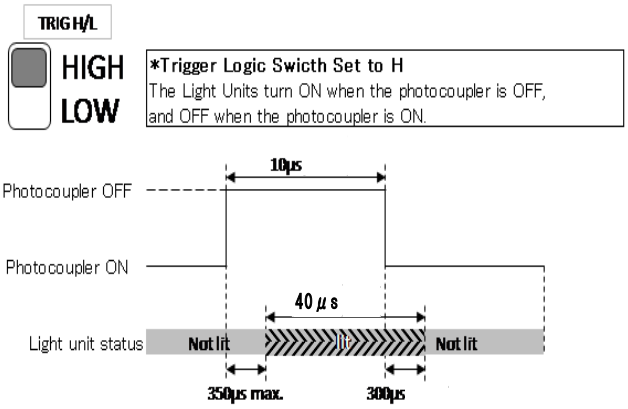


*Trigger Input Sequence Diagram

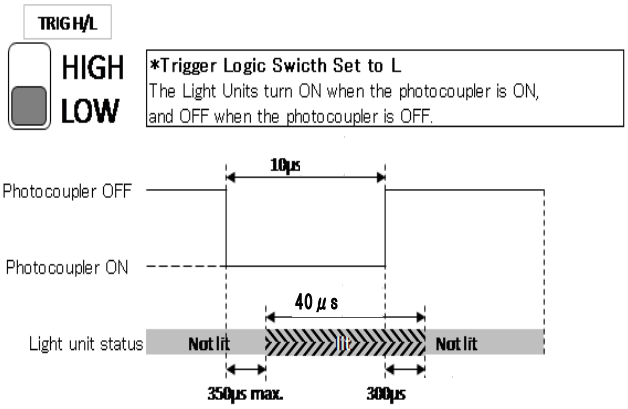
・A pulse width of ON signal shall be 10μs or more. The Light Units will be turned on for at least 40μs, even when the input ON signal is less than 40μs.

・If another trigger is input before the Light Units turns OFF in Strobe Mode, the starting point of the reentered trigger is taken as the start time and the strobe light continues for the set time from that point.

ON/OFF Mode

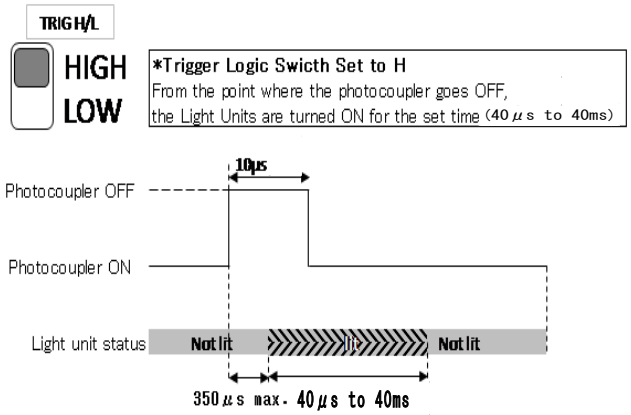


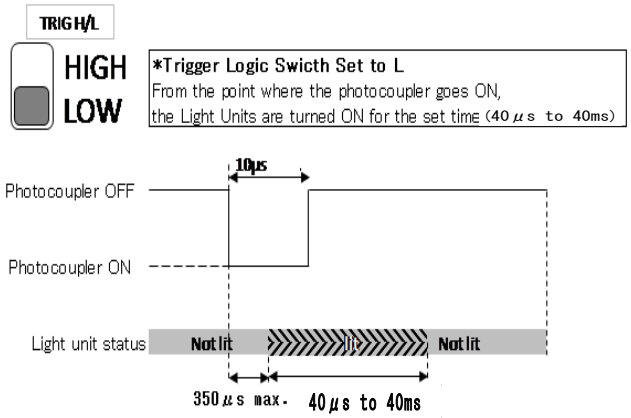
*The LED Light Unit will turn off by OFF signal sent by either trigger signal input or EIA-232-D communications.



*The LED Light Unit will turn on by ON signal sent by either trigger signal input or EIA-232-D communications.

Strobe Mode





9. Optional Accessories

*External Control Cable
Model: VL-EXCB1-3
Connector: XN2A-1470 (Manufactured by OMRON)

*External Trigger Input Cable
Model: VL-EXCB2-3
Connector: XG4M-1030-T (Manufactured by OMRON)

10. Warranty

・Duration of warranty

The duration of the product warranty shall be two years from the day of product delivery.

・Extent of warranty

If a fault or defect attributable under normal use during the warranty period, VS Technology (Thailand) Co., Ltd. will in good faith ship a replacement or repair the defective part of the product free of charge.

- ○ Faults or damage that occur due to conditions, environments, handling, or usage other than those described in the Instruction Manual and specifications.
- ○ Faults or damage that occur due to modification of structure, performance, specifications, etc., by customers after the day of product delivery.
- ○ Faults or damage that occur due to use of the product other than for its designed purpose.
- ○ Faults or damage that occur due to natural or human causes such as saltwater air damage, gas damage, earthquakes, floods, fire, lighting or armed conflicts.

・Disclaimer

VS Technology (Thailand) Co., Ltd. shall not be responsible for any appendant damaged for example business interests cost or abort of business.

≪Note≫

・If there are any unclear points or if you have any questions, please feel free to inquire VS Technology (Thailand) Co., Ltd.
For repair or after sales service, please contact any VS Technology (Thailand) Co., Ltd. office or the sales representative where you have purchased the unit.

・Please provide us with the following information when requesting service.
Model Name
Serial No.:
Date of purchase: . . .
State of trouble: Please provide detailed information
Your name, address, telephone number, email-address