KEYENCE

96M17056

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Touch Panel Display VT3 Series

VT3-X15/X15D/S12/S12D/S10/V10/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Instruction Manual

Read this manual before using the product in order to achieve maximum performance. Keep this manual in a safe place after reading it so that it can be used at any time.

Introduction

Before you start to use the Touch Panel Display VT3 Series, be sure to thoroughly read this document in order to fully understand the functions of the Touch Panel Display VT3 Series and VT STUDIO.
Store this document in a safe place so that you can retrieve it whenever necessary.

■ Symbols

This manual uses the following symbols to alert you to important information.

DANGER	**Indicates a hazardous situation which, if not avoided, will result in death or serious injury.**
WARNING	**Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**
CAUTION	**Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**
NOTICE	**Indicates a situation which, if not avoided, could result in product damage as well as property damage.**
Important	**Indicates cautions and limitations that must be followed during operation.**
Point	**Indicates additional information on proper operation.**

Indicates useful information or information that aids understanding of text descriptions.

■ Request

(1) No part of this instruction may be reprinted or reproduced without the prior written permission of KEYENCE CORPORATION.
(2) The contents of this manual are subject to change without notice.
(3) Every effort has been made in preparing this document. If, however, you fi nd any unclear points, errors, omissions or other inconsistencies, please feel free to contact us.
(4) Note that KEYENCE CORPORATION shall not be liable for any infl uence resulting from operation of the VT series regardless of item (3) above.
(5) We shall replace any missing or incorrectly collated pages.

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- Windows is a registered trademark of Microsoft Corporation of the United States.
- Pentium is a registered trademark of Intel Corporation.
- Other company names, product names, and model names used in this manual are trademarks or registered trademarks of their respective companies.
- UNLHA32 and DLL are public domain software made by Micco.

Licenses for software used by this product.

- This document describes the license information of the software used by this product.
  [libjpeg]
  "This software is based in part on the work of the Independent JPEG Group".

Safety Precautions

■ General precautions

- Do not use this product for the purpose to protect a human body or part of a human body.
- This product is not intended for use as an explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere.
- At startup and during operation, be sure to monitor the functions and performance of the VT3 series. We recommend that you take substantial safety measures to avoid any damage in the event that a problem occurs.
- When the VT3 series is used in combination with other instruments, functions and performance may be degraded, depending on operating conditions and the surrounding environment.
- Do not subject instruments including peripheral devices to sudden changes in temperature. Doing so might cause condensation which may cause the instrument or device to malfunction.
- Mount the VT3 as far away as possible from power lines or high-voltage lines. Noise from power lines and high-voltage lines may cause the VT3 to malfunction.
- Fine dots (black dots or bright dots), color changes from outside view, uneven brightness, blinking or cross talk (appearance of unintended lines or stripes) can occur on the LCD panel. However, these are not defective or trouble products.
- Do not continuously display the same screen for a long time. Doing so might cause a residual image to appear due to the characteristics of the LCD panel.

CAUTION	**• Do not use the touch panel (touch switches), cross-key pads or push-button switches on the switch unit to make switches that may affect human life or lead to product damage. Also, design a system that is adaptable to touch panel (touch switches), cross-key pad or push-button switches on the switch unit malfunction. • Do not touch the touch panel or touch switches with a sharp-pointed object such as a pen or screwdriver. Doing so might scratch the touch panel or touch switches or cause them to malfunction. • Do not subject the touch panel (touch switches), cross-key pad or push-button switches on the switch unit to shock or impact, or touch them with more than necessary force. Doing so might damage them. • Never wipe the display with paint thinner or organic solvents. Doing so might damage the display. When wiping the display, use a soft cloth moistened with watered down neutral detergent. • Do not copy copyrighted fonts and image data onto this unit for use as this infringes on the copyright. • If the equipment is used in a manner not specifi ed by the manufacturer, the protection provided by the equipment may be impaired.**

■ About CE Marking and UL Cerifi cate

For details on precautions for CE marking and for UL Cerificate, see "Precautions for CE Marking", "Precautions for UL Cerificate".

Operating Environment

■ Surrounding air temperature/humidity

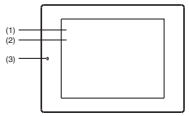
Pay attention to the following points when installing the VT3 inside a control panel.

- Do not install the VT3 in a location where the surrounding air temperature exceeds the 0 to 50°C range or the ambient humidity exceeds the 35 to 85%RH range.
- If the surrounding air temperature exceeds the above range, install a forced air cooling fan or air conditioner to keep the ambient temperature within this range.
- Keep much space between the VT3 and surrounding structures and other components to improve maintainability, operability and ventilation.
- Do not mount the VT3 directly above equipment (e.g. heaters, transformers, inverters and equipment with large resistance) that generate lots of heat.
- Do not use PORT1 (USB) in locations that are subject to vibration or impact. The USB connector is not provided with a locking function, so the USB cable may become loose or disconnected, and disrupt communications.

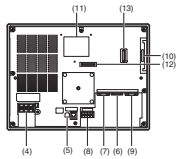
Names of Parts on the VT3

■ VT3-X15(D)

● Front view

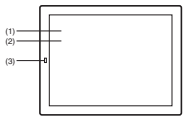


● Rear view

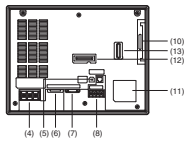


■ VT3-S12(D)/S10/V10(D)

● Front view

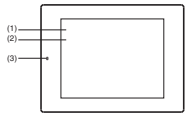


● Rear view

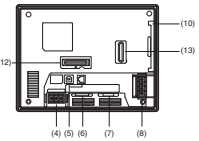


■ VT3-V8/V7

● Front view

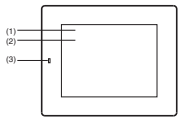


● Rear view

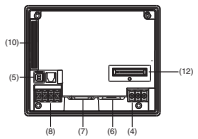


■ VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

● Front view



● Rear view



	Name	Description
(1)	Display area	Displays setup screens, messages, and data from the PLC or other external devices. VT3-X15(D): Number of display dots 1024×768 dots VT3-S12(D)/S10: Number of display dots 800×600 dots VT3-V10(D): Number of display dots 640×480 dots VT3-V8/V7: Number of display dots 640×480 dots VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A: Number of display dots 320×240 dots
(2)	Touch panel	Screens are switched and data is written to PLCs or other external devices by touching the touch switch.
(3)	Power indicator	Lights when the power is ON.
(4)	Terminal block for power supply	Power supply connection terminal. VT3-X15/S12/S10/V10: 100 to 240 VAC ±10% 50/60Hz VT3-X15D/S12D/V10D/V8/V7: 24 VDC ±10% VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A: 24 VDC ±10%
(5)	Serial I/F (PORT1: SERIAL/USB) for personal computer connection	This port is for connecting to a personal computer when writing or reading data to and from VT STUDIO.
(6)	Serial I/F (PORT2) for PLC or external device connection	This port supports the RS-232C or RS-422A interface. This is used for connecting a PLC, temperature controller or other external devices.
(7)	Serial I/F (PORT3) for Barcode Reader/PLC or external device connection	This port is for connecting the KEYENCE Corporation Barcode Reader BL-80RK/210RK/HR-40RK/50RK/TL-30K/ RF500/RF550, PLC, temperature controller, or other external devices.
(8)	Serial I/F (PORT4) for Mega-link/Multi-link/KL-link/external device connection	This interface is for connecting Multi-link Unit VT-L16Z/ L16CA, Multi-communications Unit KV-L20, High-speed Multilink unit KV-LM2*(V), a KL-link unit, temperature controller, or other devices.
(9)	RGB output I/F	This port supports the analog RGB output interface. It is XGA (1024 x 768) compatible.
(10)	Memory Card slot	Memory Card OP-42254 (128 Mbytes) is inserted in this slot.
(11)	Addon memory	Addon memory OP-42253 (16 Mbytes) is inserted onto a PCB inside the VT3.
(12)	Expansion connector 1	This connector (which does not exist on the VT3-Q5M(W)/Q5T(W)A) connects Ethernet Unit VT2-E1/ E2, VT3-E3 or Printer Unit VT2-P1/P2.
(13)	Expansion connector 2	This connector (which does not exist on the VT3-V7) connects 4-channel Video Unit VT3-VD4, 1-channel Video Unit VT3-VD1, or RGB Output Unit VT3-R1.

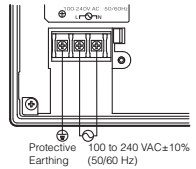
General Specifications

Item	VT3-X15/S12/S10/V10	VT3-X15D/S12D/V10D/V8/V7/Q5□□
Rated voltage	100 to 240 VAC ±10%(50/60 Hz)	24 VDC ±10%
Power consumption	VT3-X15: 110 VA max. VT3-S12: 70 VA max. VT3-S10: 65 VA max. VT3-V10: 65 VA max.	-
Current consumption	-	VT3-X15D: 1800 mA max. VT3-S12D: 1100 mA max. VT3-V10D: 1000 mA max. VT3-V8: 950 mA max. VT3-V7: 800 mA max. VT3-Q5T(W): 650 mA max. VT3-Q5S(W): 650 mA max. VT3-Q5M(W): 400 mA max. VT3-Q5T(W)A: 650 mA max. VT3-Q5M(W)A: 400 mA max.
Withstand voltage	1500 VAC for 1 minute (across power supply terminal and case)	
Insulating resistance	50 MΩ or more (500 VDC mega between power supply terminal and case)	
Operating atmosphere	Must be free from severe dust and corrosive gas	
Operating surrounding air temperature	0 to +50°C*1	
Operating surrounding air humidity	35 to 85%RH (condensation not allowed)*2	
Overvoltage category	II	I
Pollution degree	2	
Weight	VT3-X15: Approx. 4400 g*3 VT3-S12: Approx. 2450 g*3 VT3-S10: Approx. 2250 g*3 VT3-V10: Approx. 2300 g*3	VT3-X15D: Approx. 4150 g*3 VT3-S12D: Approx. 2350 g*3 VT3-V10D: Approx. 2200 g*3 VT3-V8: Approx. 1150 g*3 VT3-V7: Approx. 1150 g VT3-Q5T(W): Approx. 900 g VT3-Q5S(W): Approx. 850 g VT3-Q5M(W): Approx. 850 g VT3-Q5T(W)A: Approx. 850 g VT3-Q5M(W)A: Approx. 850 g

*1 The values indicated above are for when the VT3 series is mounted vertically. For details on other mounting methods, see "Mounting".
*2 When the ambient temperature is higher than 40°C, please use it at a maximum absolute humidity of 85% RH at 40°C.
*3 Weight when the backlight is a white LED (the serial number has an underscore). When the backlight is a cold cathode tube (the serial number does not have an underscore), weights are as follows.
VT3-X15: Approx. 4750 g
VT3-X15D: Approx. 4500 g
VT3-S12: Approx. 2600 g
VT3-S10: Approx. 2300 g
VT3-S12D: Approx. 2500 g
VT3-V8: Approx. 1250 g

Power Supply Terminal Block Layouts

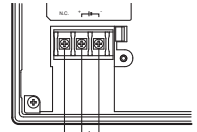
■ VT3-X15/S12/S10/V10



● Terminal block specification

Item	Specifications
Wire gage	AWG8-20
Tightening torque	1.4 N•m {12 lbf•in}
Wire material	Copper
Wire type	Stranded wire
Rated temperature of wire	60°C

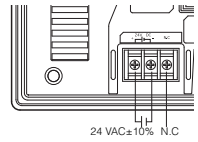
■ VT3-X15D/S12D/V10D



● Terminal block specification

Item	Specifications
Wire gage	AWG8-20
Tightening torque	1.4 N•m {12 lbf•in}
Wire material	Copper
Wire type	Stranded wire
Rated temperature of wire	60°C

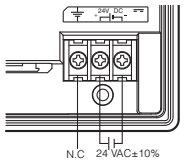
■ VT3-V8/V7



● Terminal block specification

Item	Specifications
Wire gage	AWG14-20
Tightening torque	0.5 N•m {4.3 lbf•in}
Wire material	Copper
Wire type	Stranded wire
Rated temperature of wire	60°C

■ VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

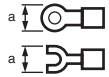


● Terminal block specification

Item	Specifications
Wire gage	AWG14-20
Tightening torque	0.5 N•m {4.3 lbf•in}
Wire material	Copper
Wire type	Stranded wire
Rated temperature of wire	60°C

■ Power supply terminal block

As the power terminal block of this unit, use M4 screws on the VT3-X15(D)/S12(D)/S10/V10(D), and M3 screws for the VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A.
When wiring the power supply using crimped terminals, use crimped terminals that match the following dimensions.

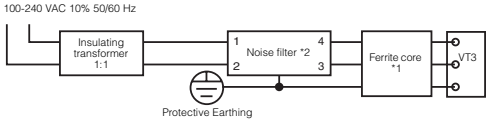


VT3-X15(D)/S12(D)/S10/V10(D)	VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A
a: 8.0 mm max.	a: 6.0 mm max.

■ Wiring

● Wiring VT3-X15

Connect the 100 to 240 VAC±10% (50/60 Hz) power supply to the power supply terminal block as follows:

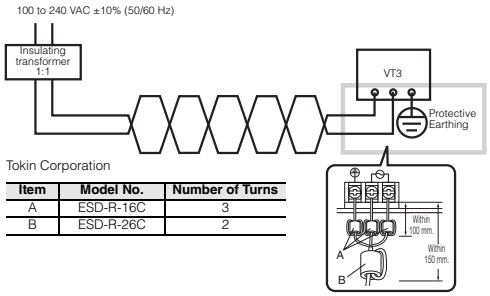


*1 ZCAT3035-1330 (two turns) made by TDK Corporation.
*2 ZRAC2206-11 made by TDK Corporation.

Point **Ground the metallic portions on the case for the noise fi lter. If it cannot be grounded, ground the FG (ground) terminal for the noise fi lter with a wire no more than 50 cm in length.**

● Wiring the VT3-S12/S10/V10

Connect the 100 to 240 VAC±10% (50/60 Hz) power supply to the power supply terminal block as follows:



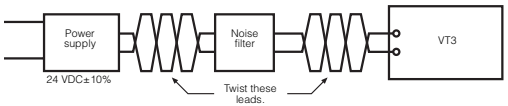
Tokin Corporation

Item	Model No.	Number of Turns
A	ESD-R-16C	3
B	ESD-R-26C	2

Point **Use a cable of nominal cross-section area 2 mm^2 square or thicker to prevent voltage drops. Wire using twisted lead.**

● VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Connect the 24 VDC?10% power supply to the power supply input terminal as follows:



Pass the power supply line through a ferrite core (ZCAT3035-1330 from TDK Corp). Turn the wire 3 times within 100 mm from the terminal block.

Precautions for CE Marking

Keyence Corporation has confi rmed that VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A complies with the essential requirements of the applicable EC Directive(s), based on the following specifi cations. Be sure to consider the following specifi cations when using VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A in the Member States of European Union.
When installing the VT3 series, be sure to install it through an opening in a conductive enclosure (such as control panel).

■ EMC Directive

CAUTION **The VT3-X15 (D)/S12 (D)/S10/V10 (D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A is a Class A device (for general industrial use). If the VT3-X15/S12/S10/V10/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A is used in domestic environments, it may cause electromagnetic interference.**

Point **These specifi cations do not give any guarantee that the end-product with VT3 Series incorporated complies with the essential requirements of EMC Directive. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive.**

■ Applicable ferrite core

Excluding the power lead, all ferrite cores should be inserted at a position within 100 mm from ports and connectors.

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Port/Connector	Ferrite Core	Number of Turns	Cable/ Equipment
Power supply terminal block	"Power Supply Terminal Block Layouts"		
PORT1: SERIAL[*1]	None		OP-26487
PORT1: USB	Made by TDK Corporation,ZCAT3035-1330	2	OP-35331
PORT2		3	Shielded cable
PORT3		2	BL-80RK/210RK TL-30K/RF-500 RF-550
PORT4	Made by TDK Corporation, ZCAT2035-0930	1	OP-30591/30592

*1 A ferrite core (made by TDK Corporation, ZCAT2235-1030) is needed when using VT2-D2.

VT3-VD4/VD1, VT3-R1, VT2-E1/E2/P1/P2, VT3-E3

Port/Connector	Ferrite Core	Number of Turns	Cable/ Equipment
CH1 to CH4 video input	Made by TDK Corporation, ZCAT3035-1330	2	Shielded video cable
Console output			OP-42290
RGB input	Made by TDK Corporation, ZCAT2235-1030	1	Co-axial cable 75 Ω RGB cable with ferrite cor
RGB output	-	-	OP-66842
Ethernet I/F	Made by TDK Corporation, ZCAT3035-1330	2	Shielded cable
Printer I/F			62 Ω compatible printer cabl
Printer I/F (USB)	-	-	OP-35331

■ Low-voltage Directive

Point
- **The following shows the details evaluated for VT3-X15/S12/S10/V10 only internally by Keyence Corporation, and do not guarantee compliance with Low-voltage Directive for machinery devices. VT3-X15/S12/S10/V10 The user must judge compliance with Low-voltage Directive for machinery devices.**
- **For details on mounting, wiring and installation methods, see "Operating Environment", "Mounting", and "Grounding Precautions".**

● Precautions

VT3-X15/S12/S10/V10

- Overvoltage category II
- Pollution degree 2

The VT3-X15/S12/S10/V10 is designed as a Class I equipment. Be sure to connect the protective earthing terminal on the VT3-X15/S12/S10/V10 to the protective earthing conductor in the building installation.
When installing the VT3-X15/S12/S10/V10, be sure to provide a switch or circuit breaker complying with EN60947-1 and EN60947-3 as the disconnecting device. A switch or circuit breaker shall be in the building installation close to this equipment, and within easy reach of the operator.

VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Devices subject to Low-voltage Directive are devices having an input or output of 50 to 1000 VAC or 75 to 1500 VDC.
As the VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A has only inputs or outputs of less than 75 VDC, these devices are not subject to Low-voltage Directive.

Precautions for UL Certificate

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A are UL/C-UL Listed products.

- UL File No. E207185, UL Category NRAQ/NRAQ7

c UL us LISTED 15JN IND. CONT. EQ.

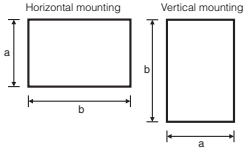
■ Be sure to follow the specifi cation below

- For wiring to the power supply terminal of the VT3-X15(D)/S12(D)/S10/V10(D), use a stranded copper wire having gage of AWG#8-#20 with the temperature rating of 60°C or higher. Tightening torque must be 1.4 N•m (12lbf•in).
- For wiring to the power supply terminal of the VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A, use a stranded copper wire having gage of AWG#14-#20 with the temperature rating of 60°C or higher. Tightening torque must be 0.5 N•m (4.3lbf•in).
- For wiring to the PORT4 of the VT3 series, use a stranded copper wire having gage of AWG#14-#20 with the temperature rating of 60°C or higher. Tightening torque must be 0.5 N•m (4.3lbf•in).
- The VT3 series is for use on a fl at surface of a Type 1 enclosure.
- The VT3 series is for use in pollution degree 2 environment.
- Indoor use only.
- Install at an altitude of 2000 m or less.
- Ensure the circuits to be connected to the input/output terminals are SELV circuits.
- Use the DC power type models (VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A) with one of the following power supplies.
  - UL/CSA certifi ed power supply that provides Class 2 output as defi ned in the NFPA70 (NEC: National Electrical Code) and CEC (Canadian Electrical Code).
  - UL/CSA certifi ed power supply that has been evaluated as a Limited-energy circuit as defi ned in UL61010-1 and CAN/CSA-C22.2 No. 61010-1.

Mounting

This section describes how to mount the VT3 series onto a industrial control panel from its front.
Mounting fi xtures are required for mounting.

1 Cut open a mounting space at the size shown below for fi tting the VT3 into.

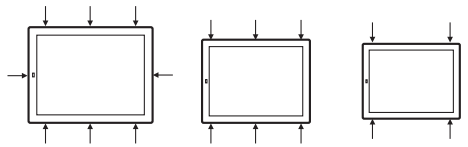


Model No.	a	b
VT3-X15 (D)	282.5 $^{+1}_{0}$	383.5 $^{+1}_{0}$
VT3-S12(D)	227.5 $^{+1}_{0}$	301.5 $^{+1}_{0}$
VT3-S10/V10(D)	217.5 $^{+1}_{0}$	295.5 $^{+1}_{0}$
VT3-V8	167.5 $^{+1}_{0}$	226.5 $^{+1}_{0}$
VT3-V7	165.0 $^{+1}_{0}$	207.0 $^{+1}_{0}$
VT3-Q5T(W)/ Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A	126.0 $^{+1}_{0}$	157.0 $^{+1}_{0}$

Unit: mm

2 Insert the VT3 into the opening of the industrial control panel for mounting.

3 Fix the VT3 onto the panel using the mounting fi xtures.
Attach the mounting fi xtures on the long side of the VT3 at the locations indicated by the arrows in the following fi gure.

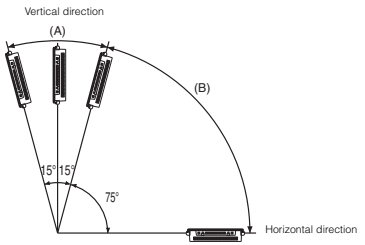


4 Tighten the mounting bracket screws with a torque of 0.3 to 0.5 N•m (2.6 to 4.3 lbf•in).
Ensure the panel thickness where the unit is mounted is 1.6 to 4.0 mm. (2.0 to 4.0 mm when installing the VT3-X15(D).)

CAUTION
- **When mounting vertically, install the unit so that the POWER indicator is facing down.**
- **The number of fi xtures used for mounting varies depending on the unit type. Be sure to use all the fi xtures supplied with the unit.**
- **If the screws are tightened with the excessive torque higher than the specifi ed torque, it can result in "wrinkle" or "defl ection" of the display sheet.**

■ Mounting angle

The mounting angle is restricted by ambient operating temperature and backlight adjustment.
Adjust the mounting angle to suit the mounting circumstances.

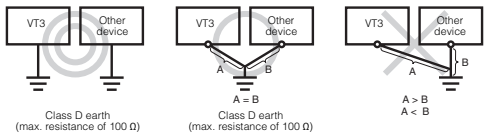


Type	Operating Surrounding Air Temperature	
	Range A	Range B
VT3-X15(D)	0 to 50°C (★★★)*1	0 to 40°C (★★★)
VT3-S12(D)	0 to 50°C (★★★)	
VT3-S10		
VT3-V10(D)		
VT3-V8	0 to 50°C (★★★)*2	0 to 50°C (★★★)*3
VT3-V7	0 to 40°C (★★★) 0 to 50°C (★★)*4	0 to 50°C (★★)*5
VT3-Q5T(W)	0 to 50°C (★★★)	0 to 40°C (★★★) 0 to 50°C (★★)
VT3-Q5T(W)A		
VT3-Q5S(W)		0 to 50°C (★★★)
VT3-Q5M(W)		
VT3-Q5M(W)A		

★ indicates the "Back Light Power" setting in the System mode.
*1 0 to 45°C (★★★) when the unit is mounted in the vertical display orientation.
*2 0 to 40°C (★★★) when expansion ports 1 and 2 are used simultaneously.
0 to 50°C (★) when an expansion port either 1 or 2 is used.
*3 Only one port either port 1 or 2 can be used. 0 to 40°C (★).
*4 0 to 50°C (★) when expansion port 1 is used.
*5 0 to 40°C (★) when expansion port 1 is used.

Grounding Precautions

- When grounding the protective earth terminal, be sure to use exclusive grounding. Provide an exclusive ground of class D earth (maximum resistance of 100 Ω) when grounding the shielded lead on the protective earth terminal.
- If an exclusive ground cannot be obtained, share the ground with another device.



- Use a cable of nominal cross-section area 2 mm2 square or thicker as the grounding cable.
- Keep the grounding point as close as possible to the VT3, and keep the ground lead as short as possible.
- If the ground lead must be extended, use thick insulating cable and pass the ground lead through a duct before grounding.

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