



# Installation Instructions

## FLEX I/O D-Shell Terminal Base Units and Distribution Boards

1794-TB37DS and 1794-TB62DS  
1794-TB37EXD4VM8, 1794-TB37EXD4CM8 and  
1794-TB62EXD4X15

### Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at <http://www.ab.com/manuals/gi>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

<b>WARNING</b> 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
<b>ATTENTION</b> 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: <ul style="list-style-type: none"> <li>• identify a hazard</li> <li>• avoid a hazard</li> <li>• recognize the consequence</li> </ul>
<b>SHOCK HAZARD</b> 	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.
<b>BURN HAZARD</b> 	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.

### ATTENTION



#### Environment and Enclosure

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

### ATTENTION



FLEX I/O is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (e.g. aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

### ATTENTION

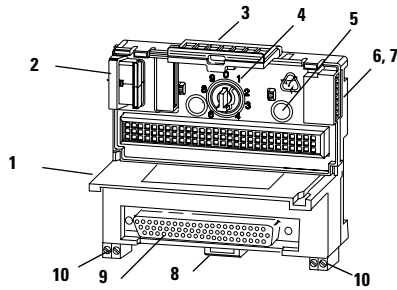


#### Preventing Electrostatic Discharge

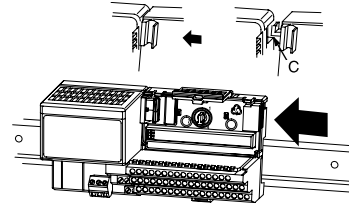
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.

### FLEX I/O D-Shell Terminal Base Units

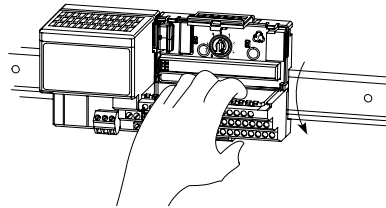


	Description
1	Terminal base unit
2	Female flexbus connector
3	Module locking latch
4	Keyswitch - set to the position required for the installed module
5	Mounting holes for panel mounting
6	Male flexbus connector
7	Cover plug for male flexbus connector
8	Locking tab
9	D-shell connector - 1794-TB37DS - 37 pin D-shell connector; 1794-TB62DS - 62 pin D-shell connector
10	User power connectors

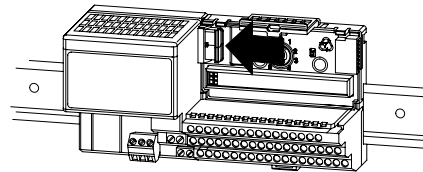


Make sure the hook (C) on the terminal base slides under the edge of the adapter and the flexbus connector is fully retracted. Slide the terminal base over tight against the adapter.

5. Rotate the terminal base onto the DIN rail with the top of the rail hooked under the lip on the rear of the terminal base. Use caution to make sure that the female flexbus connector does not strike any of the pins in the mating connector.



Press down on the terminal base to lock it on the DIN rail. If the terminal base does not lock into place, use a screwdriver or similar device to open the locking tab, press down on the base, and release the locking lever to lock the base in place.



Gently push the flexbus connector into the side of the adapter to complete the backplane connection.

6. For specific wiring information, refer to the installation instructions for the module you are installing in this terminal base.
7. Repeat the above steps to install the next terminal base.

### Mounting the Terminal Base Unit on a DIN Rail

**ATTENTION**

During mounting of all devices, be sure that all debris (metal chips, wire strands, etc.) is kept from falling into the module. Debris that falls into the module could cause damage on power up.



**ATTENTION**

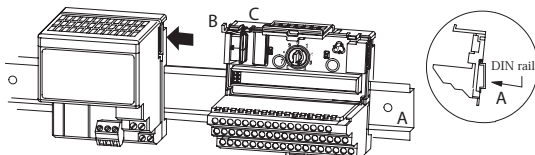
Do not remove or replace a terminal base unit when power is applied. Interruption of the flexbus can result in unintended operation or machine motion.



1. Remove the cover plug (if used) in the male connector of the unit to which you are connecting this terminal base unit.
2. Check to make sure the 16 pins in the male connector on the adjacent device are straight and in line so that the mating female connector on this terminal base unit will mate correctly.
3. Make certain the female connector (C) is fully retracted.
4. Position the terminal base unit on the 35 x 7.5 DIN rail (A) (A-B pt no. 199-DR1).

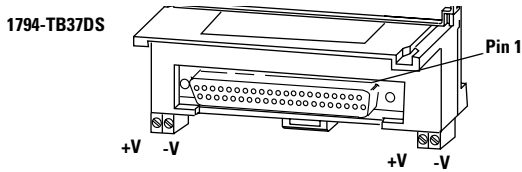
**ATTENTION**

Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.



Position the terminal base at a slight angle and hooked over the top of the DIN rail.

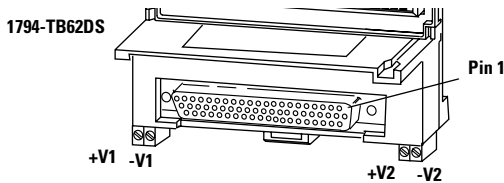
### Wiring Connections for the Terminal Base Units



**Table 1 Wiring Connections for the 1794-TB37DS D-Shell Terminal Base Unit**

Pin No. <sup>1</sup>	Digital Modules	1794-IF4I, OF4I, IF2XOF2I, OE4	1794-IE8 (see note 2)	1794-IE4XOE2 (see note 2)
1	V +24V			
2	V +24V			
3	V Common			
4	Not used			
5	Chassis ground			
6	Chassis ground			
7	Chassis ground			
8	Not used			
9	Input/Output Ch 14	Ch 3 Voltage	Ch 7 Current	Ch 1 Output Voltage
10	Input/Output Ch 12	Ch 3 Current	Ch 6 Current	Ch 1 Output Current
11	Not used			
12	Input/Output Ch 10	Ch 2 Voltage	Ch 5 Current	Ch 0 Output Voltage
13	Input/Output Ch 8	Ch 2 Current	Ch 4 Current	Ch 0 Output Current
14	Not used			
15	Input/Output Ch 6	Ch 1 Voltage	Ch 3 Current	Ch 3 Input Current
16	Input/Output Ch 4	Ch 1 Current	Ch 2 Current	Ch 2 Input Current
17	Not used			
18	Input/Output Ch 2	Ch 0 Voltage	Ch 1 Current	Ch 1 Input Current
19	Input/Output Ch 0	Ch 0 Current	Ch 0 Current	Ch 0 Input Current
20	V +24V			
21	V Common			
22	V Common			
23	Not used			
24	Chassis Ground			
25	Chassis Ground			
26	Not used			
27	Input/Output Ch 15	Ch 3 Voltage Ret	Ch 7 Voltage	Ch 1 Out Voltage Ret
28	Input/Output Ch 13	Ch 3 Current Ret	Ch 6 Voltage	Ch 1 Out Current Ret
29	Not used			
30	Input/Output Ch 11	Ch 2 Voltage Ret	Ch 5 Voltage	Ch 0 Out Voltage Ret
31	Input/Output Ch 9	Ch 2 Current Ret	Ch 4 Voltage	Ch 0 Out Current Ret
32	Not used			
33	Input/Output Ch 7	Ch 1 Voltage Ret	Ch 3 Voltage	Ch 3 Input Voltage
34	Input/Output Ch 5	Ch 1 Current Ret	Ch 2 Voltage	Ch 2 Input Voltage
35	Not used			
36	Input/Output Ch 3	Ch 0 Voltage Ret	Ch 1 Voltage	Ch 1 Input Voltage
37	Input/Output Ch 1	Ch 0 Current Ret	Ch 0 Voltage	Ch 0 Input Voltage

1 5 A current limit per pin. The mountings are tied to chassis ground.  
 2 V common is the return for all of the analog inputs of 1794-IE8 and IE4XOE2 modules.



**Table 2 Wiring Connections for the 1794-TB62DS D-Shell Terminal Base Unit**

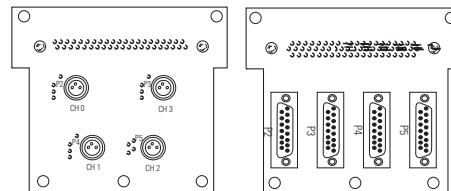
Pin No. <sup>1</sup>		Pin No. <sup>1</sup>	
1	V2 Common	32	Chassis Ground
2	V2 Common	33	Chassis Ground
3	V2 +24V	34	Chassis Ground
4	Input/Output Ch 16	35	Not used
5	Input/Output Ch 17	36	Input/Output Ch 5
6	Input/Output Ch 18	37	Input/Output Ch 6
7	Input/Output Ch 19	38	Input/Output Ch 7
8	Input/Output Ch 20	39	Input/Output Ch 8
9	Not used	40	Input/Output Ch 9
10	Chassis ground	41	Input/Output Ch 10
11	Chassis ground	42	Input/Output Ch 11
12	Chassis ground	43	V2 Common
13	Chassis ground	44	V2 +24V
14	Not used	45	Input/Output Ch 26
15	V1 +24V	46	Input/Output Ch 27
16	V1 +24V	47	Input/Output Ch 28
17	Input/Output Ch 0	48	Input/Output Ch 29
18	Input/Output Ch 1	49	Input/Output Ch 30
19	Input/Output Ch 2	50	Input/Output Ch 31
20	Input/Output Ch 3	51	Not used
21	Input/Output Ch 4	52	Chassis Ground
22	V2 Common	53	Chassis Ground
23	V2 +24V	54	Chassis Ground
24	V2 +24V	55	Chassis Ground
25	Input/Output Ch 21	56	Not used
26	Input/Output Ch 22	57	V1 Common
27	Input/Output Ch 23	58	V1 Common
28	Input/Output Ch 24	59	Input/Output Ch 12
29	Input/Output Ch 25	60	Input/Output Ch 13
30	Not used	61	Input/Output Ch 14
31	Chassis ground	62	Input/Output Ch 15

1 5 A current limit per pin.

Terminal Base 1794-	24V dc	120V ac	230V ac	Isolation Voltage
TB37DS, TB62DS				Dependent upon Installed Module - refer to individual installation instructions for your specific module.

### Distribution Boards for the 1794-TB37DS and 1794-TB62DS D-Shell Terminal Bases

**1794-TB37EXD4VM8 and 1794-TB37EXD4CM8**      **1794-TB62EXD4X15**



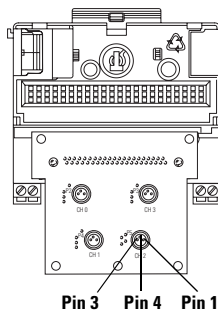
The distribution boards mount on the terminal base and provide multiple input/output ports. By using the distribution boards, you can use individual wiring for each of the channels. Refer to Table 3 for application information on the distribution boards.

**Table 3 FLEX I/O D-Shell Terminal Base Application Guide**

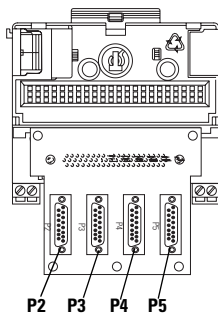
FLEX I/O Module	Compatible D-Shell Terminal Base	Compatible Distribution Board 1794-	Notes
1794-IB10XOB6	1794-TB37DS	N/A	24V @ 1 A or less per channel
1794-IB16	1794-TB37DS	N/A	
1794-IB16D	1794-TB62DS	N/A	
1794-IB16XOB16P	1794-TB62DS	TB62EXD4X15	
1794-IB32	1794-TB62DS	TB62EXD4X15	
1794-IB8	1794-TB37DS	N/A	
1794-IB8S	1794-TB37DS	N/A	
1794-ID2	1794-TB37DS	N/A	
1794-IE4XOE2	1794-TB37DS	N/A	
1794-IE8	1794-TB37DS	N/A	
1794-IF2XOF2	1794-TB37DS	TB37EXD4VM8	Voltage Mode only
	1794-TB37DS	TB37EXD4CM8	Current Mode only
1794-IF4I	1794-TB37DS	TB37EXD4VM8	Voltage Mode only
	1794-TB37DS	TB37EXD4CM8	Current Mode only
1794-IP4	1794-TB37DS	N/A	
1794-IV16	1794-TB37DS	N/A	
1794-OB16	1794-TB37DS	N/A	
1794-OB16D	1794-TB37DS	N/A	
1794-OB16P	1794-TB37DS	N/A	
1794-OB32P	1794-TB62DS	TB62EXD4X15	
1794-OB8	1794-TB37DS	N/A	
1794-OB8EP	1794-TB37DS	N/A	24V @ 1 A or less per channel
1794-OE4	1794-TB37DS	TB37EXD4VM8	Voltage Mode only
	1794-TB37DS	TB37EXD4CM8	Current Mode only
1794-OF4I	1794-TB37DS	TB37EXD4VM8	Voltage Mode only
	1794-TB37DS	TB37EXD4CM8	Current Mode only
1794-OV16	1794-TB37DS	N/A	
1794-OV16P	1794-TB37DS	N/A	
1794-OW8	1794-TB37DS	N/A	24V @ 1 A or less per channel

With the distribution board mounted, you have individual connections for each channel.

**1794-TB37EXD4VM8 and 1794-TB37EXD4CM8**



**1794-TB62EXD4X15**



**ATTENTION**



Torque distribution board screws to 5 pound-inches (0.6Nm).

**Table 4 Pin Assignments for the 1794-TB37EXD4VM8 Distribution Board**

P2	Channel 0	P4	Channel 1
1	Chassis ground	1	Chassis ground
2	No pin 2	2	No pin 2
3	Signal Return	3	Signal Return
4	Signal	4	Signal
P3	Channel 3	P5	Channel 2
1	Chassis ground	1	Chassis ground
2	No pin 2	2	No pin 2
3	Signal Return	3	Signal Return
4	Signal	4	Signal

**Table 5 Pin Assignments for the 1794-TB62EXD4X15 Distribution Board**

Pin	D-Shell P2	Pin	D-Shell P4
1	Input/Output Channel 0	1	Input/Output Channel 16
2	Input/Output Channel 1	2	Input/Output Channel 17
3	Input/Output Channel 2	3	Input/Output Channel 18
4	Input/Output Channel 3	4	Input/Output Channel 19
5	Input/Output Channel 4	5	Input/Output Channel 20
6	Input/Output Channel 5	6	Input/Output Channel 21
7	Input/Output Channel 6	7	Input/Output Channel 22
8	V1 +24V	8	V2 +24V
9	V1 Common	9	V2 Common
10	Not used	10	Not used
11	Input/Output Channel 7	11	Input/Output Channel 23
12	V1 +24V	12	V2 +24V
13	V1 Common	13	V2 Common
14	Not used	14	Not used
15	Chassis ground	15	Chassis ground
Pin	D-Shell P3	Pin	D-Shell P5
1	Input/Output Channel 8	1	Input/Output Channel 24
2	Input/Output Channel 9	2	Input/Output Channel 25
3	Input/Output Channel 10	3	Input/Output Channel 26
4	Input/Output Channel 11	4	Input/Output Channel 27
5	Input/Output Channel 12	5	Input/Output Channel 28
6	Input/Output Channel 13	6	Input/Output Channel 29
7	Input/Output Channel 14	7	Input/Output Channel 30
8	V1 +24V	8	V2 +24V
9	V1 Common	9	V2 Common
10	Not used	10	Not used
11	Input/Output Channel 15	11	Input/Output Channel 31
12	V1 +24V	12	V2 +24V
13	V1 Common	13	V2 Common
14	Not used	14	Not used
15	Chassis ground	15	Chassis ground

**All Terminal base units are rated at 10A.**

Tighten screws to 5 pound-inches (0.6Nm).

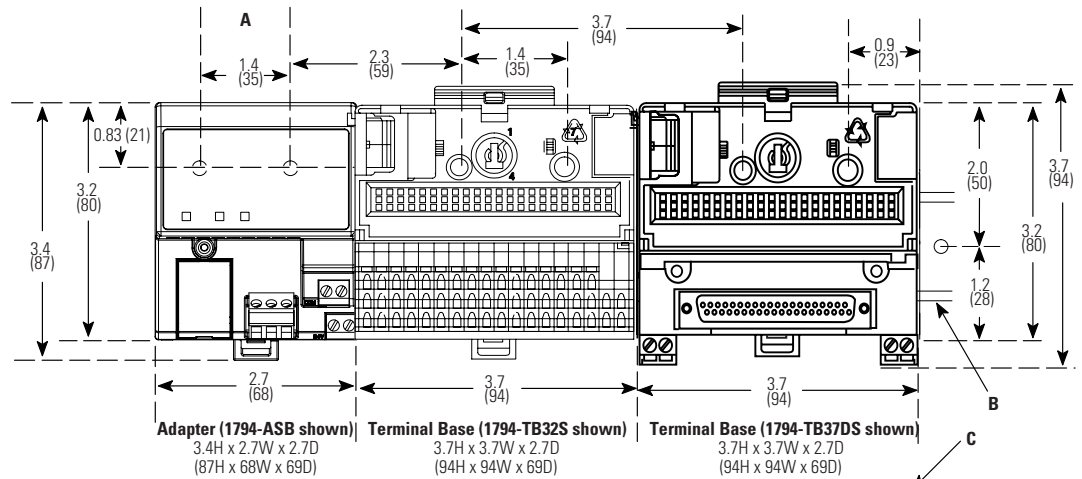
<b>Specifications</b>	
Terminal Screw Torque	5 pound-inches (0.6Nm)
Dimensions (with expansion module installed)	5.0H x 3.7W x 2.7D inches 127.0H x 94W x 69D mm
Current Capacity	<b>1794-TB62DS and 1794-TB62EXD4X15</b> V2 - 8A maximum V1 - 6A maximum; 5A per pin 10A maximum per module <b>1794-TB37DS</b> 10A maximum per module 5A per pin
Voltage Rating (continuous-voltage withstand rating)	See chart
Isolation Voltage	Established by installed module
Environmental Conditions	
Operating Temperature	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock); 0 to 55°C (32 to 131°F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock); -40 to 85°C (-40 to 185°F)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat); 5 to 95% noncondensing
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz
Shock	IEC60068-2-27 (Test Ea, Unpackaged shock): Operating 30g Non-operating 50g
Emissions	CISPR 11: Group 1, Class A (with appropriate enclosure)
ESD Immunity	IEC 61000-4-2: 8kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 2000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900MHz 10V/m with 200Hz 50% Pulse 100%AM at 1890MHz
EFT/B Immunity	IEC 61000-4-4: ±2kV at 5kHz on power ports ±2kV at 5kHz on signal ports
Surge Transient Immunity	IEC 61000-4-5: ±1kV line-line(DM) and ±2kV line-earth(CM) on power ports ±1kV line-line(DM) and ±2kV line-earth(CM) on signal ports
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80MHz
Enclosure Type Rating	None (open-style)
Conductors Wire Size Category <sup>1</sup>	12AWG (4mm <sup>2</sup> ) stranded copper wire rated at 75°C or higher 3/64 inch (1.2mm) insulation maximum Established by installed module
Certifications (when product is marked) <sup>2</sup>	<b>c-UR-USUL</b> Recognized Component Industrial Control Equipment, certified for US and Canada (1794-TB37EXD4VM8, 1794-TB37EXD4CM8 and 1794-TB62EXD4X15) <b>CSA CE</b> CSA Accepted Component for Process Control Equipment European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity <b>C-Tick</b> - Australian Radiocommunications Act compliant with AS/NZS CISPR 11, Industrial Emissions

<sup>1</sup> You use this category information for planning conductor routing as described in Allen-Bradley publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.

<sup>2</sup> For the latest up-to-date information, see the Product Certification link at [www.ab.com](http://www.ab.com) for Declarations of Conformity, Certificates and other certification details. For notification of any additional release notes, refer to [www.ab.com/manuals/](http://www.ab.com/manuals/).

## Mounting Dimensions

Inches  
(Millimeters)

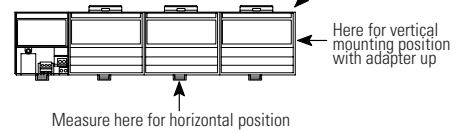


Secure DIN rail approximately every 200mm.

A = Mounting hole dimensions for optional mounting kit

B = DIN rail

C = Operating temperature 1.0 (25.4) below each module when mounted in any position must not exceed 55 degrees C (131 degrees F)



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