

Allen-Bradley 1204 Terminator For Use With AC Variable Frequency Drives (Catalog Number 1204-TFA1, 1204-TFB2)

What This Option Contains

The Terminator Option contains the terminator device with an attached 1.4m (54in) standard 4 wire 3mm² (12 gauge) connection cable.

Where This Option Is Used

The Allen-Bradley 1204 Terminator Option can be installed in most AC variable frequency drive applications to increase the protection of the AC motor. The Terminator Option is designed to be used with Allen-Bradley AC variable frequency drives. When installed at the motor terminals, the terminator can reduce potentially destructive reflected wave spikes that can occur with long motor leads.

What These Instructions Contain

These instructions contain the information you need to properly install the Terminator Option. Recommended mounting, connecting, and grounding procedures are included.

Catalog Number Description

The following table provides information about the catalog number for the Terminator Option:

1204 - T F B2

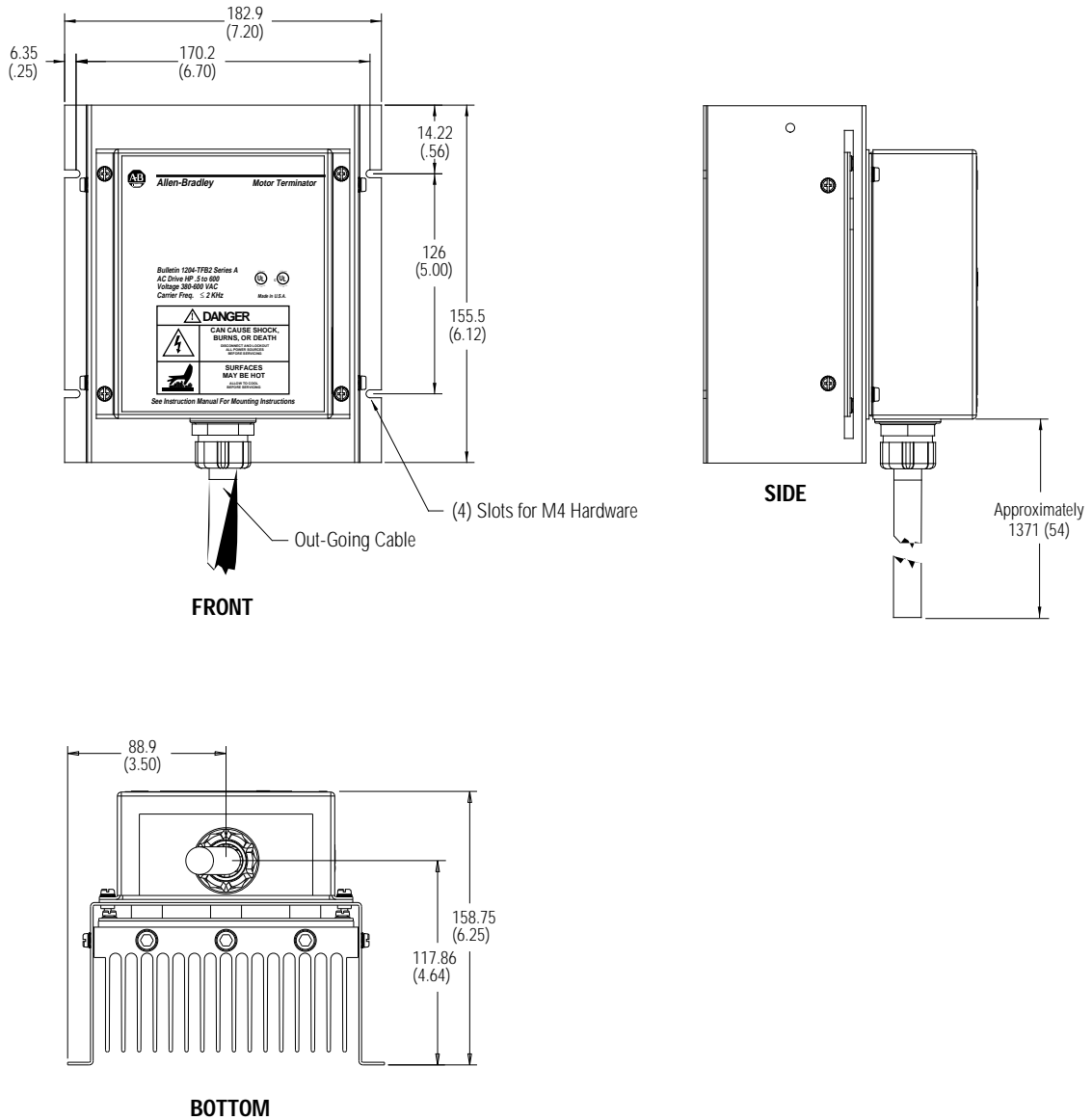
First Position	Second Position		Third Position		Fourth and Fifth Positions				
Bulletin Number	Type		NEMA Rating		Voltage Rating and Size		Motor Lead Length m (ft)	Maximum Allowable Drive Carrier Frequency	
	Letter	Description	Letter	Description	Designator	Voltage Rating			Drive KW (HP)
	T	Terminator	F	NEMA Type 4	A1	380-480V	0.37 - 3.7 (0.5 - 5)	①	6 kHz
					B2	380-600V	1.5 - 597 (2 - 800)	①	2 kHz

① Refer to the maximum cable length charts on pages 1-4 through 1-6.

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Dimensions, Weights, and Cable Locations

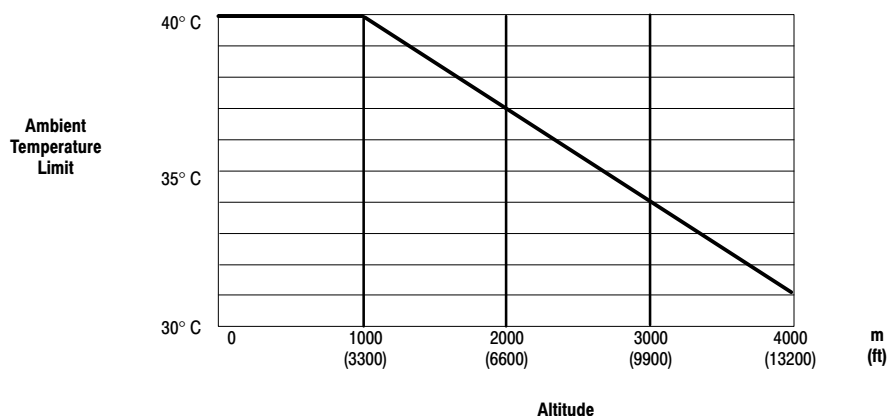
The following are the dimensions and cable locations for the terminator. The dimensions are given in millimeters (inches). The terminator weighs 3.86 kilograms (8.5 pounds).



Specifications

The following specifications are provided for the Terminator Option:

Category	Specifications
Input power	TFA1 -- 380-480 V/3 ϕ TFB2 -- 380-600 V/3 ϕ
Maximum drive carrier frequency ^①	TFA1 -- 6 kHz TFB2 -- 2 kHz Refer to the Drive Programming section on page 1-9 for additional information.
Ambient temperature	0-40°C (32-104°F)
Humidity	5-95% non-condensing
Atmosphere	Atmosphere should not contain hazardous (volatile) dust, vapor, gas, or liquid.
Heat dissipation ^①	Refer to the heat dissipation table.
Enclosure type	NEMA Type 4x (IP65)
Agency certification	U.L., C-UL
Altitude derating	Full rating (0-1000m)



① The drive PWM carrier frequency that you choose affects the heat dissipation and the surface temperature of the terminator.

Heat Dissipation

This chart is based on an ambient temperature of 45°C.

Drive		1204-TFA1 Terminator		1204-TFB2 Terminator			
		460 Volts + 10%		460 Volts + 10%		600 Volts + 10%	
Frequency	meters (feet)	91 (300)	183 (600)	91 (300)	183 (600)	91 (300)	183 (600)
6 kHz	Watts	210	250	Must Use 2 kHz			
	Heatsink Temp	142°C	160°C				
4 kHz	Watts	170	180				
	Heatsink Temp	125°C	130°C				
2 kHz	Watts	80	90	200	250	290	360
	Heatsink Temp	81°C	88°C	139°C	160°C	182°C	215°C

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Determining the Maximum Cable Length for Your System

Use the following tables to determine the maximum cable length for your system.

The values shown in the following tables are for nominal input voltage and a drive carrier frequency of 2kHz. If you plan to operate your system at carrier frequencies above 2kHz, refer to the heat dissipation table on page 1-2. If you plan to operate your system above the levels listed in the heat dissipation table, consult the factory.

If you are running at high-line conditions (nominal line + 10%), multiply the values by 0.85.

The values shown in the following tables are in meters and (feet).

1305 MICRODRIVE Maximum Motor Cable Length Restrictions

Drive HP	Motor HP	1204-TFA1 Terminator				1204-TFB2 Terminator	
		Using a motor with insulation $V_{I-(PK)}$					
		1000 Volt		1200 or 1600 Volt		1000 or 1200 Volt	
		Cable Type		Cable Type		Cable Type	
		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
5	5	91 (300)	61 (200)	91 (300)	122 (400)	Not recommended	Not recommended
	3	99 (325)	61 (200)	152 (500)	122 (400)	91 (300)	122 (400)
	2	99 (325)	61 (200)	183 (600)	122 (400)	122 (400)	183 (600)
	1	99 (325)	61 (200)	183 (600)	122 (400)	122 (400)	183 (600)
	1/2	99 (325)	61 (200)	183 (600)	122 (400)	183 (600)	183 (600)
3	3	91 (300)	61 (200)	91 (300)	122 (400)	Not recommended	Not recommended
	2	99 (325)	61 (200)	152 (500)	122 (400)	91 (300)	122 (400)
	1	99 (325)	61 (200)	183 (600)	122 (400)	91 (300)	183 (600)
	1/2	99 (325)	61 (200)	183 (600)	122 (400)	122 (400)	183 (600)
2	2	91 (300)	61 (200)	91 (300)	122 (400)	Not recommended	Not recommended
	1	99 (325)	61 (200)	122 (400)	122 (400)	61 (200)	61 (200)
	1/2	99 (325)	61 (200)	152 (500)	122 (400)	91 (300)	122 (400)
1	1	46 (150)	61 (200)	46 (150)	76 (250)	Not recommended	Not recommended
	1/2	76 (250)	61 (200)	76 (250)	122 (400)	Not recommended	Not recommended
1/2	1/2	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended

1336 PLUS/FORCE™ Maximum Motor Cable Length Restrictions (380-480 Volt Drives)

Drive Frame Designation	Drive HP	Motor HP	1204-TFA1 Terminator				1204-TFB2 Terminator			
			Using a motor with insulation $V_{L-I(PK)}$						Using a motor with insulation $V_{L-I(PK)}$	
			1000 Volt		1200 or 1600 Volt		1000 1200, or 1600 Volt			
			Cable Type		Cable Type		Cable Type			
		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded			
A1	1/2	1/2	30 (100)	61 (200)	30 (100)	61 (200)	Use 1204-TFA1			
	1	1	30 (100)	30 (100)	30 (100)	30 (100)				
		1/2	30 (100)	61 (200)	30 (100)	61 (200)				
A2	1 1/2	1 1/2	30 (100)	30 (100)	61 (200)	61 (200)				
		1	30 (100)	30 (100)	61 (200)	61 (200)				
		1/2	30 (100)	30 (100)	61 (200)	61 (200)				
	2	2	30 (100)	30 (100)	91 (300)	61 (200)			91 (300)	183 (600)
		1 1/2	30 (100)	30 (100)	91 (300)	61 (200)			91 (300)	183 (600)
		1	30 (100)	30 (100)	91 (300)	61 (200)			183 (600)	183 (600)
		1/2	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
A3	3	3	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		2	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		1	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		1/2	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
	5	5	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		3	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		2	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
		1	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
	1/2	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)			
A4	7.5 - 10	7.5 - 10	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
B	7.5 - 30	7.5 - 30	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
C	X40 - X60	40 - 60	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
D	60 - X150	60 - 150	30 (100)	30 (100)	91 (300)	61 (200)	183 (600)	183 (600)		
E	150 - 250	150 - 300	30 (100)	30 (100)	91 (300)	91 (300)	183 (600)	183 (600)		
G	X250 - 600	250 - 600	30 (100)	30 (100)	91 (300)	91 (300)	183 (600)	183 (600)		

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1336 PLUS/FORCE™ Maximum Motor Cable Length Restrictions (500-600 Volt Drives)

Drive Frame Designation	Drive HP	Motor HP	1204-TFB2 Terminator					
			Using a motor with insulation $V_{I-(PK)}$					
			1000 Volt		1200 Volt		1600 Volt 1329R	
			Cable Type		Cable Type		Cable Type	
			Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
A4	1	1	①	①	①	①	①	①
		1/2	①	①	①	①	①	①
	2	2	①	①	①	①	①	①
		1 1/2	①	①	①	①	①	①
		1	①	①	①	①	①	①
		1/2	①	①	①	①	①	①
	3	3	①	①	①	①	①	①
		2	①	①	①	①	①	①
		1	①	①	①	①	①	①
		1/2	①	①	①	①	①	①
	5	5	①	①	①	①	①	①
		3	①	①	①	①	①	①
		2	①	①	①	①	①	①
		1	①	①	①	①	①	①
		1/2	①	①	①	①	①	①
B	7.5 - 20	7.5 - 20	91 (300)	91 (300)	183 (600)	183 (600)	183 (600)	183 (600)
C	25 - 60	25 - 60	91 (300)	91 (300)	183 (600)	183 (600)	183 (600)	183 (600)
D	75 - 125	75 - 125	91 (300)	91 (300)	183 (600)	183 (600)	183 (600)	183 (600)
E	150 - X30	150 - X30	91 (300)	91 (300)	183 (600)	183 (600)	183 (600)	183 (600)
G	300 - 600	300 - 600	91 (300)	91 (300)	183 (600)	183 (600)	183 (600)	183 (600)

① Information not available at time of printing.

Installation

To install the terminator, follow these steps:

1. Remove all power connected to the system.

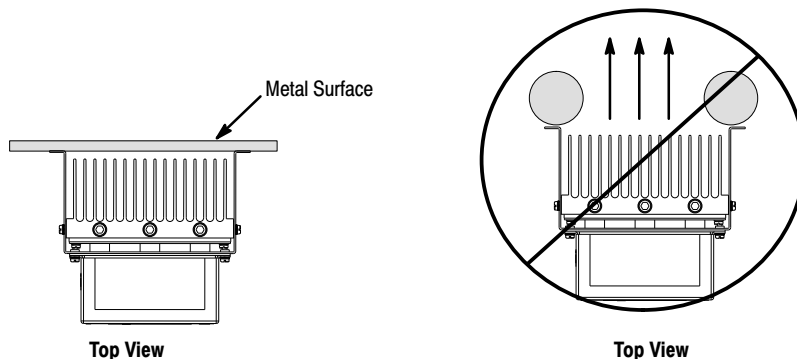


ATTENTION: Electric shock can cause injury or death. Remove all power before working with this product. Verify that the voltage on the bus capacitors has discharged. Measure the DC bus voltage at the + and - terminals of TB1. The voltage must be zero.

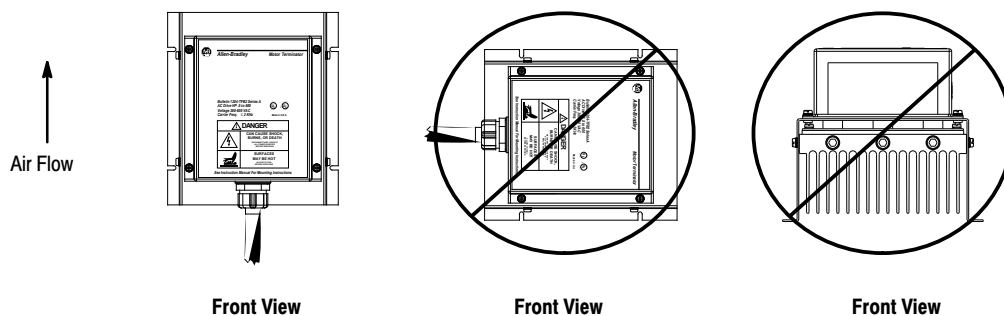


ATTENTION: The terminator surfaces may be hot enough to cause serious burns. You should take this into consideration when deciding where you mount your terminator.

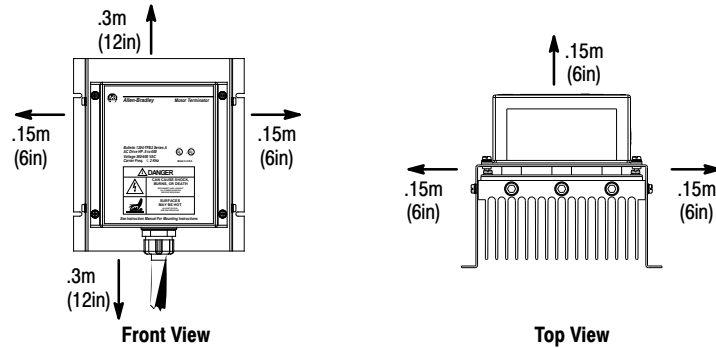
2. Mount the terminator on a metal surface within 1.4m (4.59 ft) of the motor.



The heatsink fins must be vertical.

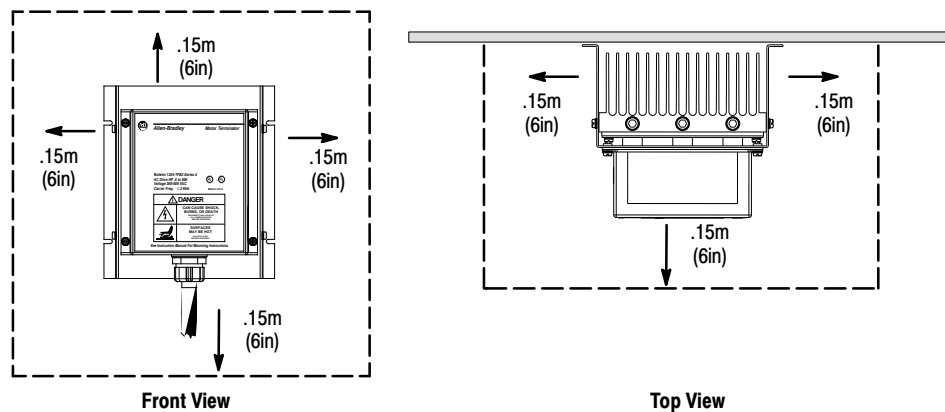


You must allow at least 0.15m (6 in) on each side of the unit and 0.3m (12 in) on the top and bottom of the unit for air circulation.



ATTENTION: The terminator surfaces may be hot enough to cause serious burns. If your system consistently runs at line voltages above nominal, you should place a shroud around the terminator to prevent accidental exposure.

3. If your system consistently runs at line voltages above nominal and you are mounting the terminator in a high-traffic area where the potential for contact is high, you should place a shroud of expanded metal or mesh screen around the terminator. The shroud should not restrict air flow to the terminator, nor should it be closer than six inches to the terminator at any point.



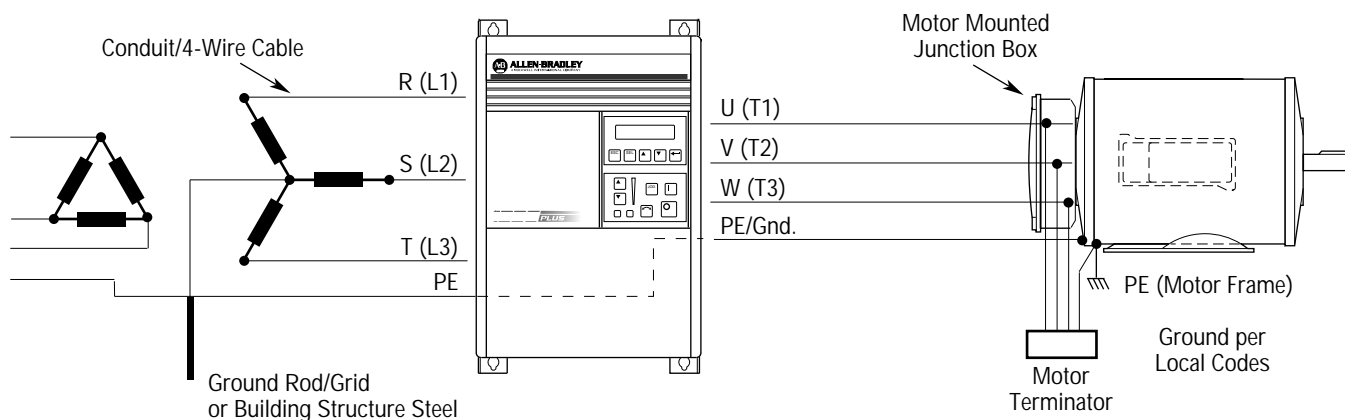
4. Connect each of the red, white, and black cable conductors to one each of the 3-phase motor leads/terminals.
5. Attach the green cable conductor to the motor ground that is connected directly to the drive PE terminal.

Drive Programming

If the default PWM frequency is greater than the maximum drive carrier frequency listed on page 1-3, you must re-program the drive to a value that is less than or equal to the maximum drive carrier frequency.

Grounding

Follow the recommended grounding practices as provided in your Allen-Bradley AC drive user manual. The following illustration shows an example of the system grounding practices.



Note: If you cannot connect the terminator directly to the motor mounted junction box, you can use an auxiliary junction box. You should keep the terminator-to-motor connection to a maximum length of 3m (10 ft).



ATTENTION: The National Codes and standards (NEC, VDE, BSI, etc.) and local codes outline provisions for safely installing electrical equipment. Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. Failure to do so may result in personal injury and/or equipment damage.

You can power up the system once proper installation, drive programming, and grounding is completed.

Maintenance

The terminator does not require routine maintenance. However, you should periodically remove dust to allow for maximum cooling efficiency.



ATTENTION: Electric shock can cause injury or death. Remove all power before touching the terminator.



ATTENTION: The terminator surfaces may be hot enough to cause serious burns. Allow the terminator time to cool down before touching any surface.

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