Allen-Bradley

CompactLogix Packaged Controllers

Catalog Numbers 1769-L23E-QB1B, 1769-L23E-QBFC1B, 1769-L23-QBFC1B

Use this document as a guide to install the CompactLogix™ packaged controllers.

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.rockwellautomation.com/literature/) 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.

	**WARNING:** 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.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard and recognize the consequences.
	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, drive or motor, to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Environment and Enclosure

WARNING: 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 (6562 ft) 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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. 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.
In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley® publication 1770-4.1, for additional installation requirements
- NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure

Prevent Electrostatic Discharge

WARNING: 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 wrist-strap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations.	Informations sur l'utilisation de cet équipement en environnements dangereux.
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING: **Explosion Hazard -** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**AVERTISSEMENT:** **Risque d'Explosion –** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

European Hazardous Location Approval

European Zone 2 Certification (The following applies when the product bears the Ex or EEx Marking.)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.

WARNING:

- This equipment must be installed in an enclosure providing at least IP54 protection when applied in Zone 2 environments.
- This equipment shall be used within its specified ratings defined by Allen-Bradley.
- Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Zone 2 environments.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

ATTENTION: This equipment is not resistant to sunlight or other sources of UV radiation.

Verify Compatibility

IMPORTANT The series B controllers are compatible only with the controller firmware and the RSLogix 5000 software versions as indicated in the table below.

Attempting to use controllers with incompatible software and firmware revisions can result in the following:

- An inability to connect to the series B controller in RSLogix 5000 software
- Unsuccessful firmware upgrades in ControlFLASH™ or AutoFlash utilities

This table shows the compatible pairs of RSLogix 5000 software versions and controller firmware revisions.

Controller	RSLogix 5000 Software Version or Later	Controller Firmware Revision or Later
1769-L23E-QB1B, 1769-L23E-QBFC1B, 1769-L23-QBFC1B	16.00.00	16.023
	17.01.02	17.012
	19.01.00	19.015
	20.01.00	20.013

Before You Begin

This section contains information you should understand before installing the CompactLogix packaged controller.

Restrictions

The maximum amount of expansion modules that can be used with the packaged controllers is two. Within that limit, the number of expansion I/O modules that can be attached to the packaged controller depends on the bus current draw of the modules being attached.

Each packaged controller has a specified amount of available bus current as shown in this table.

Packaged Controller Bus Current and Expansion Module Limits

Cat. No.	Total Available 5V DC Bus Current
1769-L23E-QB1B	1 A (1000 mA)
1769-L23E-QBFC1B	450 mA
1769-L23-QBFC1B	800 mA

To determine the number of expansion I/O modules you can add, total the bus current draw (maximum) of your planned expansion I/O modules and the end cap. If your result is less than

the packaged controller's maximum available bus current, you are within the expansion I/O limit of your packaged controller.

Example of Expansion I/O Calculation

In this example, these expansion I/O modules and bus current draws are planned for use with the 1769-L23E-QBFC1B packaged controller.

Planned Expansion I/O Module	Bus Current Draw, max(1)
1769-OV16 Sink Output Module	200 mA
1769-IF4 Analog Input Module	105 mA
1769-ECR End Cap	5 mA
Total Bus Current Draw	**310 mA**

(1) The maximum bus current draw specification for each Compact I/O™ module is available in the Compact I/O Selection Guide, publication 1769-SG002. This publication also provides further explanation of and a table for the calculation of Compact I/O power supply requirements.

The total bus current draw of the Compact I/O modules (310 mA) is less than the total available bus current of the packaged controller (450 mA). These planned expansion I/O modules are within the limits of the 1769-L23E-QBFC1B packaged controller.

Parts (included with the controller)

These components are included with your CompactLogix packaged controller.

Cat. No.	Part
1747-KY	Key
1769-BA	Battery
1769-ECR	End cap

Parts (optional, not included with the controller)

In addition to the parts included with the packaged controller, you may choose to use these components specific to your application.

If using	Then use this component
RS-232 port to connect to the packaged controller.	1756-CP3 or 1747-CP3 serial cable.
EtherNet/IP port to connect to the packaged controller.	Standard Ethernet cable with an RJ45 connector, or, for industrial grade requirements, 1585J Ethernet connectivity media.
Panel mount method to install the packaged controller.	4…8 M4 or #8 panhead screws (depending on the number of expansion modules used).

Replacement Parts

These CompactLogix packaged controller replacement parts are available for order.

Catalog No.	Description	Compatible Packaged Controllers
1769-BA	CompactLogix controller battery	1769-L23E-QB1B, 1769-L23E-QBFC1B, and 1769-L23-QBFC1B
1769-ECR	Compact right end cap	1769-L23E-QB1B, 1769-L23E-QBFC1B, and 1769-L23-QBFC1B
1769-RDQB	CompactLogix packaged controller door	1769-L23E-QB1B
1769-RDQBFC	CompactLogix packaged controller door	1769-L23E-QBFC1B and 1769-L23-QBFC1B

Required Tools

The only tool required for the installation of the CompactLogix packaged controller is a medium-sized Phillips-head screwdriver.

Installation Checklist

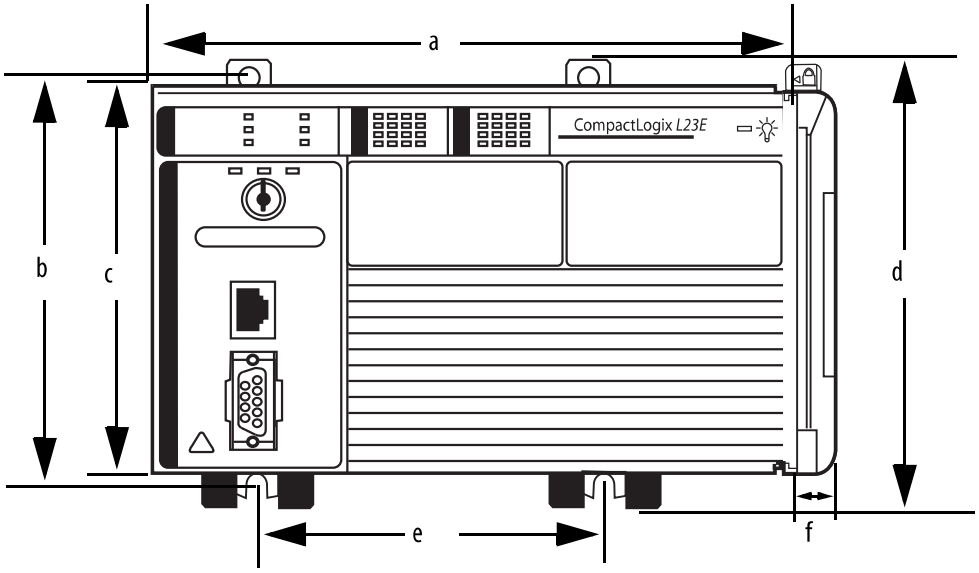
This table lists tasks that must be completed to fully install and begin using your packaged controller.

✓	Installation Tasks
	Install the Battery
	Connect Expansion Modules (optional)
	Panel Mount the System or DIN-rail Mount the System
	Grounding Considerations
	Wiring Power to the System
	Wire the I/O Removable Terminal Blocks
	Connect Using the RS-232 Connection
	Connect Using the Ethernet Connection
	Download and Install EDS Files
	Download Packaged Controller Firmware
	Use the AutoFlash Feature of RSLogix 5000 Software to Load Firmware or Use the ControlFLASH Utility to Load Firmware

Packaged Controller Dimensions

1769-L23E-QB1B Packaged Controller

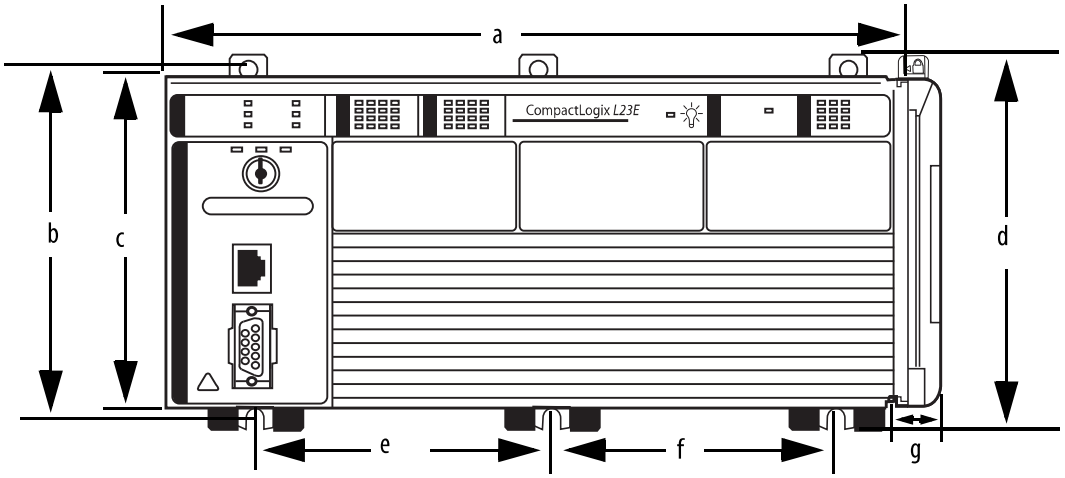
The 1769-L23E-QB1B controller has these approximate dimensions.

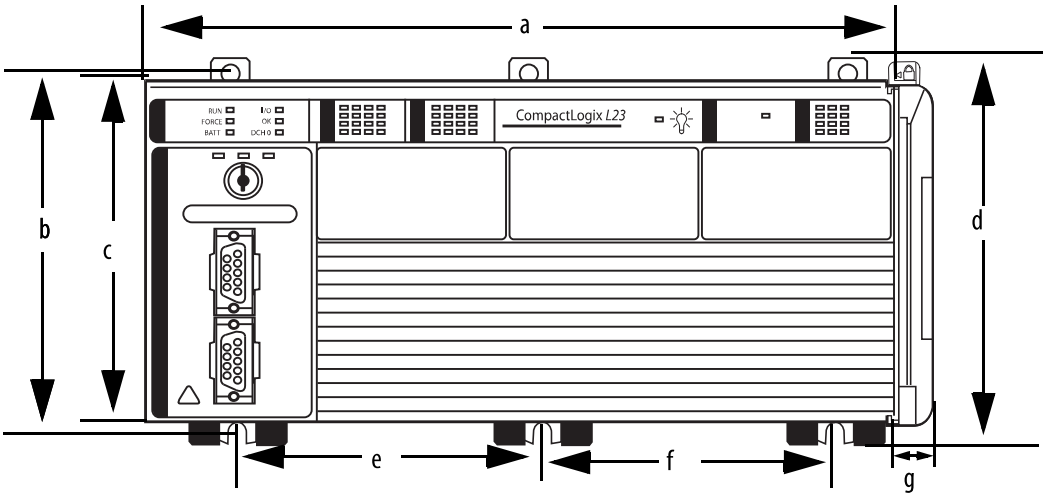


Measurement	Dimension, approximate
a	185.2 mm (7.29 in.)
b	123.86 mm (4.88 in.)
c	118 mm (4.65 in.)
d	132 mm (5.20 in.)
e	132.9 mm (5.23 in.)
f	18 mm (0.71 in.)

1769-L23E-QBFC1B and 1769-L23-QBFC1B Packaged Controllers

The 1769-L23E-QBFC1B and 1769-L23-QBFC1B packaged controllers have these approximate dimensions.





Measurement[1]	Dimension, approximate
a	249.25 mm (9.81 in.)
b	123.86 mm (4.88 in.)
c	118 mm (4.65 in.)
d	132 mm (5.20 in.)
e	98.475 mm (3.88 in.)
f	98.475 mm (3.88 in.)
g	18 mm (0.71 in.)

(1) Applies to both the 1769-L23E-QBFC1B and 1769-L23-QBFC1B packaged controllers.

Connect Using the RS-232 Connection

1769-L23E-QB1B, 1769-L23-QBFC1B, and 1769-L23E-QBFC1B Controllers

WARNING: If you connect or disconnect the serial cable with power applied to this module or the serial device on the other end of the cable, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

To connect to your controller using the RS-232 (serial) connection, simply connect the 9-pin female end of the serial cable to the serial port of the controller.

Connect Using the Ethernet Connection

1769-L23E-QB1B and 1769-L23E-QBFC1B Controllers

Complete these steps to connect to the controller using the Ethernet connection.

WARNING: If you connect or disconnect the Ethernet cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: Do not plug a DH-485 network cable or a NAP port cable into the Ethernet port. Undesirable behavior and/or damage to the port may result.

1. Insert the RJ45 connector of the Ethernet cable into the Ethernet port located on the front of the controller.