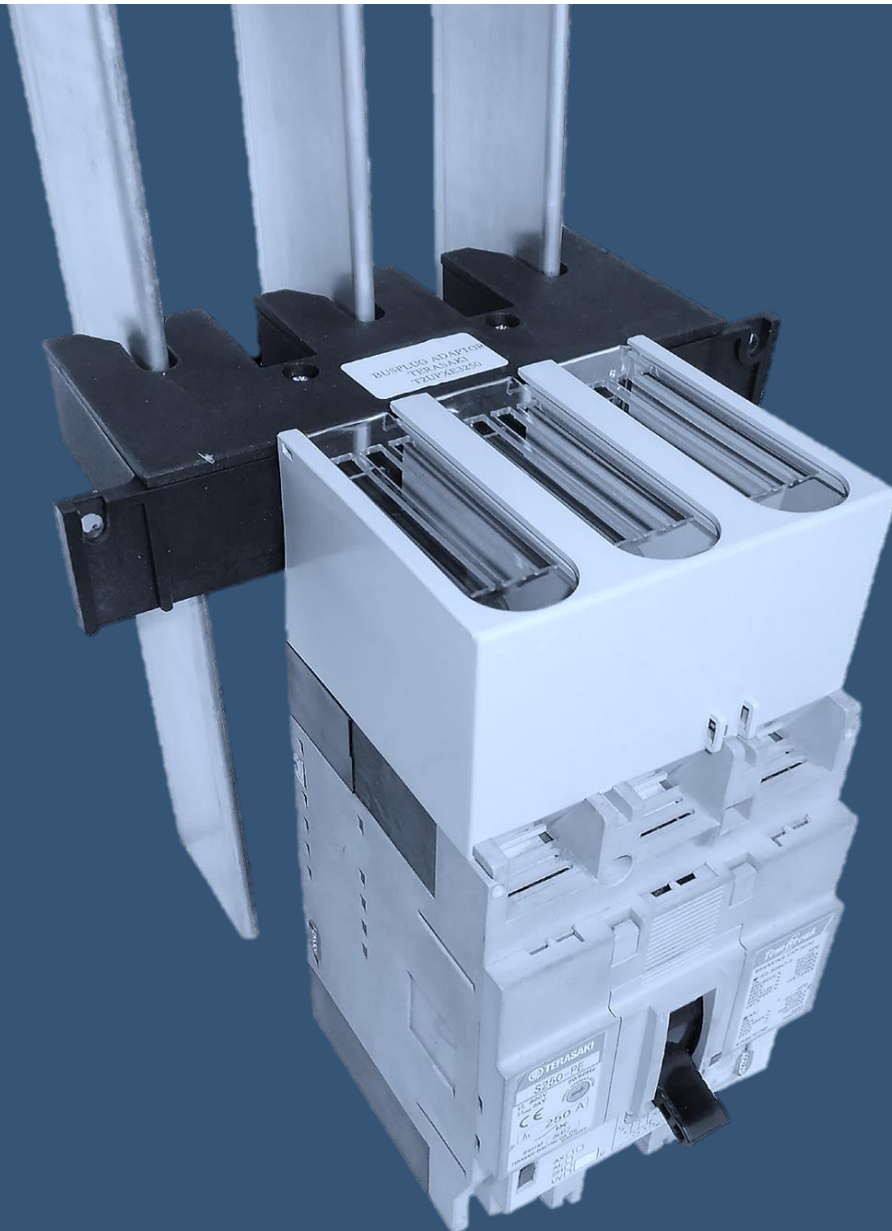




SWITCHBOARD EQUIPMENT AND AUTOMATION

# Busplug Adaptors

Low Voltage Switchboard Equipment



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Since product improvement is a continuing policy, we reserve the right to change specifications without notice.

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# Descriptive

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## Introduction

Busplug adaptors are made for specific brands of MCCB's and switch-fuse units, and will therefore not fit into devices for which they are not designed.

To produce them economically, they are manufactured in minimum order quantities.

For these reasons, busplug adaptors are normally only available from the same company supplying the MCCB or switch-fuse.

This brochure is intended to give an overview of the busplug adaptors without promoting any particular brand of short-circuit protective device.

## Advantages of Plug-Type Power Connections in Switchboards and Motor Control Centres

### For the Switchboard Manufacturer

- Assists in standardising method of switchboard construction
- Simplifies changes made to drives and feeders while the switchboard or MCC is under construction
- Allows the demountable or withdrawable units to be made and tested away from the switchboard, then fitted at the final stage of manufacture.
- In the case of distribution boards, the MCCB's or switch-fuses can be purchased later in the construction programme due to the minimal amount of time needed to install.
- Reduces the amount of labour needed, compared to making solid connections onto the busbars.
- Provides a type tested method of connection.

### For the Customer/User

- Simplifies changes on site. The plug-in method of connection means that drives and feeders can be added, deleted, modified or maintained without having to isolate the switchboard and disrupt power to the facilities.
- Allows quick removal and substitution of spare units in the event of a failure.

### Safety

- Busplugs provide a positive means of isolation. Maintenance and repairs can be carried out on withdrawn units, even with the power on.
- Fully withdrawable units provide a visible confirmation of isolation of the circuit.

# Descriptive

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## General Description

These adapt switch-fuse units and vertically mounted moulded case circuit breakers (MCCB'S) for plug-in connections to vertical busbars.

Each adaptor kit provides all of the parts needed. This includes the busplug, connectors, terminal cover (when the MCCB standard cover is not used) and hardware.

Busplug adaptors are made for many brands of MCCB's up to 1200A, and switch-fuses up to 800A.

Busplugs connect to 5-6.36mm bars as standard.

Busplugs for 8 or 10mm bars are available if specifically ordered.

## Use of Busplug Adaptors

Busplug Adaptors provide an "off load" disconnectable link between the busbar system and the short circuit protective device (SCPD.)

They are normally mounted on a tray or mounting panel containing all the protective, switching and control equipment for a motor drive or feeder circuit. The composite arrangement is then easily and safely "demountable" when the switchboard is alive. Withdrawable units (where both the line and power connections are unpluggable) would also use a busplug or similar device on the load side connections.

Busplugs should not be used to connect non-protective devices (e.g. Isolators and non-auto circuit breakers) unless that section of the supply is protected by a SCPD.

## Operating Temperature

The load-side terminals of the MCCB or CFS unit should not exceed a temperature rise of 70°C. The connections between the busplug and short circuit protection device (SCPD) may operate at a higher temperature provided that there is no long term damage to the conductors or insulation.

# Descriptive

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## Construction of Busplugs

### Housing

These are injection moulded from 25% glass filled nylon. The material is self-extinguishing and listed as UL 94V-O.

Each phase is fully segregated. The deep cavities in the casing between each pole permits a separate opening into the busbar chamber and complete segregation between the dropper busbars.

### Contacts

Contacts are press formed from electrolytic copper coil strip. The one piece design means that the current path is constricted only at the contact end. (Centre pivoted contact arrangements have constricted current paths at both ends of the contact.)

The contact area is curved in both directions to ensure a consistent point of contact to the busbars.

Contact pressure is maintained by a steel spring.

Contacts are silver plated. (Nickel plating can be provided when the plugs are installed in sulphurous or polluted atmospheres.)

### Connectors

The connection between the busplug fingers and SCPD terminals is tin plated sheet copper or copper bar depending on the current rating.

### Terminal Covers

Covers supplied with the kit are laser cut from clear polycarbonate sheet and hot folded.

# Technical

## Standards and Type-Tests

AS/NZS 60947.3: 2015

Low Voltage Switchgear and Controlgear. Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units. This standard applies when the busplug is installed as an integral part of the short circuit protective device.

Tests carried out under clause 8.3.6.2 of this standard are to prove the short-circuit strength of the plug and connections to the SCPD. (Fuse combination units and moulded case circuit breakers.) Fault currents 50-65kA depending on the rating of the SCPD.

Numerous tests have been carried out as prescribed in the relevant standards.

These tests include:

- Temperature rise
- Dielectric properties
- Clearance and creepage distances
- Short circuit strength to 80kA in conjunction with HRC fuses and suitable rated moulded case circuit breakers for both motor circuits and feeders
- Mechanical endurance of the contacts

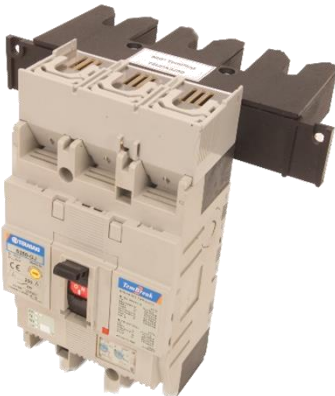
## Ratings

Rated Thermal Current	(A)	63-1250A
Rated Operational Voltage U <sub>e</sub>		1000V (63-400A)
		800V (800-1250A)
Rated Insulation Voltage U <sub>i</sub>		1000V (63-400A)
		800V (800-1250A)
Short-Circuit. Current (With Back-Up HRC Fuses)	(kA)	63
Short-Circuit. Current (With Back-Up MCCB)	(kA)	50-80
Frequency	(Hz)	40-60
Permissible Ambient Temperature	(°C)	-20 to +70
Contacts Per Pole	1	(63-250A)
	2	(400A)
	3	(630/800A)
	5	(1000A)
	6	(1250A)
	Contact Resistance Per Pole	(μΩ)
		34 (400A)
		19 (630/800A)

Refer to Publication UP2020 Busplugs type UP for further technical information.

# Typical Busplug Adaptors

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**Terasaki Tembreak 2**  
(250A)



**Schneider NS160**  
(160A)



**Siemens 3VAI 630A**



**LS TS800**  
(800A)



**Schneider NS800**  
(800A)



**ABB OS 8000D03P (Switch Fuse)**  
(800A)

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