Power Distribution Solutions

Since 1929, Union Connector has manufactured electrical products for the entertainment industry. The company was founded by William “Bill” Wolpert, an IATSE Local 1 stagehand. The company is now owned by a third generation of Wolperts, the grandsons of William.

Manufacturing the ‘stage pin’ connector was the mainstay of the company for almost forty years. In that time, Union Connector became the primary manufacturer of the standard theatrical wiring device. It is safe to say that almost every theatre from Broadway to Hollywood has used pin connectors made by Union Connector.

In the 1980’s and 90’s, Union Connector dedicated considerable resources to research and development of new products. Some of these have become the modern standards for power distribution in the industry. Several patents were awarded, including the *polybox*™ power distribution box and the revolutionary SafeCam™ outlet system. The company switch Union designed during this time is now the standard type specified for theatres, convention centers and studios nationwide.

The millennium found Union Connector continuing to evolve into a modern manufacturing company. Major investments were made in CNC fabricating machinery, computerized warehouse facilities and 3-D CAD/CAM design engineering. Power distribution equipment for entertainment lighting/audio is still the mainstay of Union’s product line — much of it custom designed and built for specific applications and projects. But Union now has the ability to fabricate specialty equipment for a variety of other applications as well. Spacelights, data center power distribution, grip equipment and custom machined components are just some of the other products Union Connector now manufactures.

This catalog contains information on the typical power distribution products Union Connector manufactures on a continuing basis. If your needs require a customized version of these products, there are worksheets for you to use for requesting a quote on a custom unit.

This family-owned company, started in a Manhattan loft, still manufactures the simple pin connector. But it also has the resources to build sophisticated, room-sized power distribution equipment. The products are more complex, perhaps, but the service and dedication to build equipment that meets our customer’s needs remains the same.

Union Connector can provide you with Power Distribution Solutions

40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
www.unionconnector.com
www.companyswitch.com

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Who we are	An overview and history of Union Connector, showing the variety of products and services we offer
Emergency Transfer Systems	The UC700 UL1008 Branch Circuit Emergency Lighting Transfer System
	Monograph explaining use and requirements of Emergency Transfer System in Places of Assembly
Company Switches	60A. to 400A. Standard NEMA 1 or 3R and custom versions available up to 2000A.
	SafeCam™
	Custom Load Centers and Power Distribution Solutions we have built
	Quote request form and Worksheet
Fixed Power Distribution	CAM Outlet Boxes: 200A– 400A.
	Emergency Feeder Panel
	Connector Strips and Hangers
	Grid Iron Junction Boxes
	Spec Grade Outlet/Pigtail Boxes
	FL Series Outlet/inlet Boxes
	PS Series Outlet/Inlet Panels
	Rack Mount Power Distribution
	EXPO Series Power Distribution
Portable Power Distribution	DistroBoxes
	CAM Cable Assemblies
	Extension Cables— 2P&G Pin, NEMA, 19-pin
	2-Fers, 3-Fers, Adapters
Connectors	2P&G Pin - 20A., 60A., 100A.
	NEMA - Leviton, Bryant
	19-pin

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Warranty

Union Connector warrants the products it manufactures to be free from defects of material or workmanship for a period of one year from date of shipment. Those products and/or components not manufactured by Union Connector shall be subject only to the warranty extended by the original manufacturer. Union Connector's warranty is restricted to the repair and/or replacement, at Union's option, of any part which proves to be defective and for which a claim is made in writing prior to the expiration date of the warranty. This warranty does not apply to any defect arising from accident, misuse, unauthorized repair, or negligent use. This warranty does not apply to normal wear and tear.

Certificate of Insurance / Product Liability

Proof of product liability insurance or Certificate of Insurance is available upon written request. The insurance company requires complete address information and dates covered for a Certificate of Insurance. Forward this information to Union Connector, attention Insurance liaison.

Returns

Return authorization and shipping instructions must be obtained in writing from Union Connector before returning any products. Used, damaged, out of date or custom items built to customer specs may not be accepted for return. Items returned to Union Connector without prior written authorization will not be accepted. Products must be returned with complete identification, required documentation, and be securely packaged. Failure to comply with these requirements will result in Union Connector returning the material at the owner's expense. When return is due to an Union Connector error, full credit, including transportation charges, will be allowed, provided material is returned in its original packaging.

Restocking

When Union Connector agrees to issue a return authorization at the request of the purchaser, a minimum 20% restocking will be charged.

WE700

Automatic Transfer Systems

UNION CONNECTOR

THE UC700 SYSTEM

DESIGNED FOR MULTI-POLE BRANCH CIRCUIT APPLICATIONS.

UC700 is a complete Emergency Automatic Transfer System (ATS). It is similar in design and function to a main ATS. The system contains all the control and power circuits required for complete independent automatic transfer of groups of branch circuits.

UC700 is unique in providing standard ATS functions in an enclosure containing large quantities of transfer poles with mixed ampacities.

A standard UC700 system enclosure may have from four to fourty-eight transfer poles. Since the Hot and Neutral legs of each circuit must be transferred, a single system can provide transfer switching for two to twenty-four branch circuits. Each transfer pole consists of a double-throw switch for transferring a single line load between two power sources (Normal and Emergency). Individual transfer poles are available in current ratings of 20, 30, 60 or 100 Amperes. Because of the modular construction of switches, a single system may be specified with a mix of transfer pole ampacities. Transfer poles have and AIC rating of 10,000 Amperes and a maximum voltage rating of 600 volts. All poles are 100% rated for mixed loads i.e., motors, tungsten filament lighting, electronic discharge lighting, heaters, etc.

CODE COMPLIANCE

A branch circuit ATS performs the same life safety functions as a Main ATS, so it must comply with the same standards and codes. In addition to construction standards, the NEC and most local codes require that all Emergency enclosures be marked so that they are easily identified as an Emergency system component. Emergency systems must be in separate enclosures, independent of all other Normal wiring and equipment. The UC700 system meets all of these requirements and is in compliance with the following codes and standards:

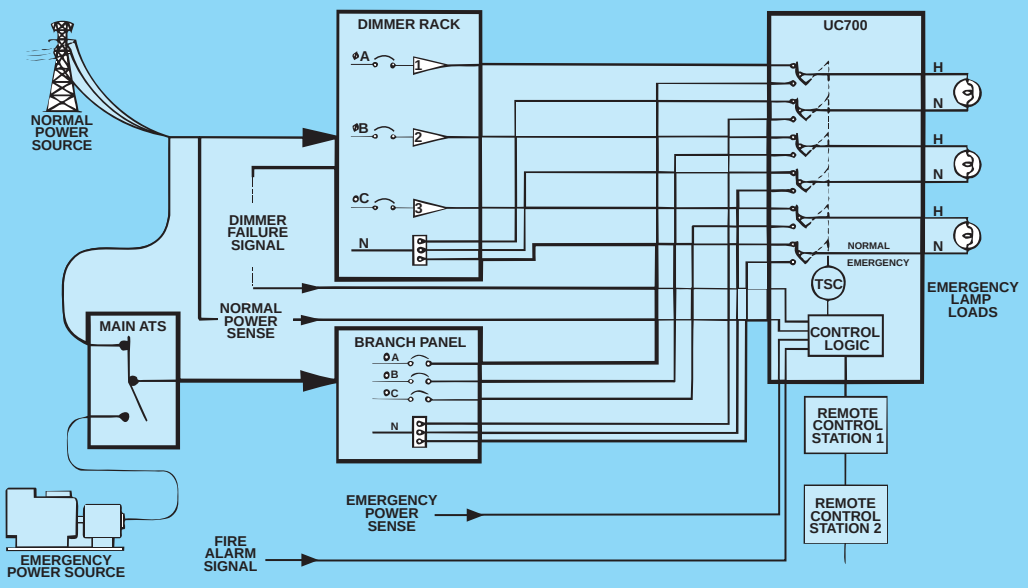
- ANSI/NFPA 70- National Electric Code
- Article 518-3 - Places of Assembly
- Article 520-7 - Theatres and Similar Locations
- Article 540-11 - Motion Picture Houses
- Article 700 - Emergency Systems
- Article 701 - Legally Required Standby Systems
- ANSI/NFPA 110 - Emergency and Standby Power Systems
- ANSI/UL 1008 - Listed, Automatic Transfer Switches
- City of New York, Advisory Board, Electrical Department
- OSHA
- Department of Defense

SYSTEM APPLICATIONS

The national Electric Code (NEC) sets the standards for the installation, operation and maintenance of Emergency systems. Local government or municipalities having jurisdiction may mandate these or similar standards by law. In general, an Emergency system is defined by most codes as – systems consisting of circuits and equipment intended to supply, distribute and control electricity for illumination and power when the Normal electric supply or system is interrupted.

As a part of this Emergency system, a Main ATS is designed to transfer critical loads to an alternate power source when the Normal power source fails. However, if critical loads are controlled down-stream by secondary systems, these secondary systems must be bypassed during Emergency conditions. Typical system devices that require bypassing include: Dimmers, Relays, Motor-controlled Branch Circuit Breaker and Energy Management Systems. In numerous facilities, many of the lighting circuits are used for both Normal and Emergency illumination. There are often large quantities of branch circuits under secondary control. This is typical in Theatres, Places of Assembly and High-rise Building Lobbies.

A code complaint multi-pole Emergency Transfer System is required for these circuits to bypass secondary control devices. UC700 is a system designed for that application.



Typical riser diagram, showing dimmer controlled House/Emergency lights

SYSTEM DESIGN THEATRICAL

DIMMER CONTROLLED EMERGENCY LIGHTING

A SPECIAL CASE

The UC700 Automatic Transfer System has been engineered to comply with all standards and codes relevant to Emergency and Standby Systems. These standards include UL1008, NFPA110, NEC Article 700, Article 701 and various municipal codes. This system also includes special features that are required for situations where dimmer controlled houselights are serving double duty as Emergency lighting.

UC700 provides automatic transfer of power to Emergency houselights when Normal power fails. It also provides this transfer in response to a fire alarm signal, or from a dimmer failure signal. This is a critical design consideration because the Main ATS will only transfer when Normal power fails. Without a branch circuit ATS, a dimmer system failure will leave the audience in a blacked-out facility. Similarly, a fire alarm might not be noticed during a loud or engrossing performance. By automatically bringing critical houselights to full on, the performance may be interrupted, but the audience will be alerted and able to evacuate without a panic.

During a panic or audience emergency condition, transfer may be accomplished manually from any of a number of secure remote control locations. These are key switch operated stations and up to 10 may be safely placed throughout the facility in critical locations, such as the lobby, stage manager's console, lighting booth, etc. In addition to houselights transfer functions, a UC700 system may be used to automatically and simultaneously switch other critical loads such as stage work lights, EXIT lights and lobby lights. Because UC700 transfer poles are rated for mixed loads, it can also handle transformer loads for low voltage lamps and electric discharge lamps with ballasts.

Any UC700 system can control an independent Engine-Generator Set that can be used to provide a dedicated Emergency power source for critical houselights. In situations where no other Engine Generator Set is required, or a set is located remotely, or it is loaded to capacity, the use of a small independent Engine Generator Set is a practical solution. This will provide the maximum degree of safety.

SYSTEM DESIGN ARCHITECTURAL

EMERGENCY ELECTRIC POWER TRANSFER TO BRANCH CIRCUITS

A UC700 system may be interfaced with other Emergency Transfer Systems that are present in a facility. However, the UC700 is a complete, independent ATS and may satisfy all the Emergency transfer functions required in a facility. For certain applications, this can mean a considerable cost savings in system design.

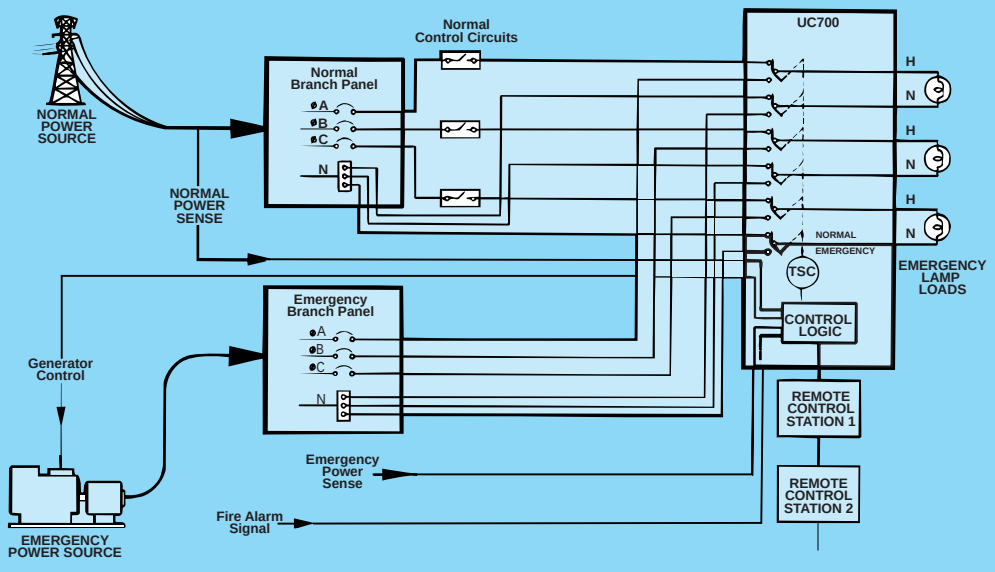
The greatest cost savings occurs when the provision of a UC700 allows lighting fixtures to be used as both Normal and Emergency fixtures. As shown in the Diagram below, it is possible to use fixtures for both general illumination and also for Emergency illumination. This is similar to the theatrical application of a UC700, but instead of transferring power from dimmer circuits, the transfer is from wall switches, relays or other energy management control devices. The need for separate Emergency fixtures may be eliminated! The UC700 has three exclusive features that enable it to accomplish this.

First, a large quantity of transfer poles are available in a single unit. Each UC700 may have up to 48 transfer poles in a single enclosure. A typical ATS is usually limited to 3 or 4.

Second, a variety of individual pole ampacity ratings are available on transfer switches. A UC700 may have a mix of 20, 30, 60 and/or 100 Amp transfer poles, all contained in a single system. This feature may reduce the need for multiple ATS units in a facility.

Third, the system is rated for mixed loads. Any UC700 can be used for transferring motors, electric discharge lamps with ballasts, heaters and other electric loads, in addition to tungsten filament lamps.

This application versatility gives the UC700 a place in the main-stream Emergency transfer market. The multi-rated, multi-pole branch circuit features make the UC700 a practical alternative to the use of duplicate circuits and fixtures for Emergency lighting. And, in certain facilities, it may displace the large ampacity, 3 or 4 pole Main ATS.

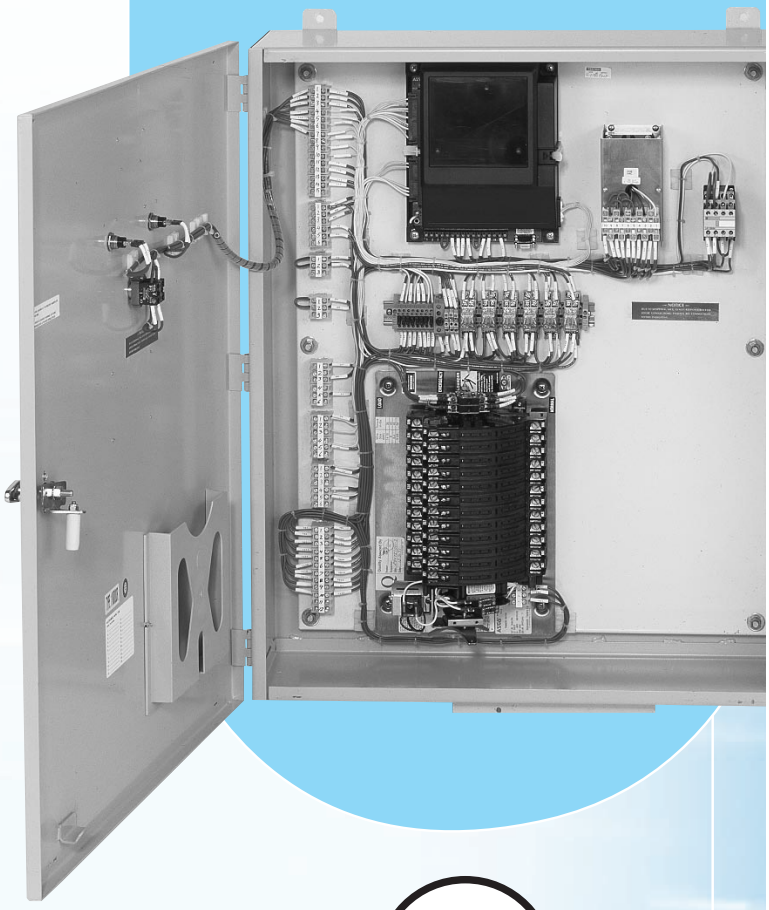


Typical riser diagram, showing switch controlled Normal/Emergency lights

STANDARD FEATURES
DESIGNED FOR USE ON EMERGENCY OR STANDBY SYSTEMS

A COMPLETE SYSTEM

- Automatic transfer of branch circuits from Normal to Emergency power when Normal power fails.
- Automatic retransfer of circuits when Normal power is restored.
- Automatic transfer of critical loads in the event of dimmer or control system failure.
- Automatic transfer of vital loads when fire alarm is activated.
- Panic control of houselights in theatres.
- Models available to transfer from 2 to 24 branch circuits.
- Switches are electronically-operated, mechanically-held.
- Line and Neutral switching on all circuits.
- Overrides momentary outage and prevents oscillations on brown-outs.
- Provides control to start, cool-down and stop an Engine-Generator set.
- Key-operated test switch on cabinet.
- Circuit control from multiple key-switch operated Remote control stations.
- System accepts up to 10 Remote stations.
- All automatic functions will override all remote manual control functions.
- The system will not automatically transfer to a power source that is not acceptable.
- Control power is derived from both power sources.
- If either power source is available, all control functions will be available.
- A backup, manually operated handle, is provided on each transfer switch.
- Approved for Emergency and Standby Power Systems.



ELECTRICAL RATINGS

- Single Phase – 240V. (optional)
- Three Phase – 120/208V. (standard)
  277/480V. – (Optional)
- Rated for mixed loads.
- 4 to 48 transfer pole model available.
- Transfer switches rated for 20, 30, 60 or 100 Amps.

POWER SENSING

- Sensing on all phases of normal power source.
- Monitors voltage and frequency of Emergency source for transfer.
- Monitors voltage and stability of Normal source for retransfer.

1008 Listed

File Number E143369

SPECIAL APPLICATIONS

Places of assembly, such as theatres and auditoriums, seldom have windows, and general illumination is provided by houselights. It is common practice to control the houselights with a group of dimmers so that a smooth transition may be made from full houselights illumination to blackout. Very often, a number of houselights serve double duty as emergency lights. This is a cost-effective way to provide both emergency and general illumination from the same circuits. The use of houselights for emergency lighting is a requirement for large facilities since EXIT lights and unit equipment are not adequate for illuminating large areas.

In the event of an emergency, these houselights must be brought to full intensity to insure safe exiting and to avoid a panic. If houselights are controlled by dimmers, the dimmers must be bypassed, and Emergency power provided directly to the houselights. An independent, branch Automatic Transfer System (ATS) is required for this event. The ATS must be designed and rated for use in Emergency Systems, and be capable of operating independently or in conjunction with other Emergency Transfer Systems in the facility.

UL 1008

The construction and design of a branch ATS, like that of any Emergency equipment, is of paramount concern. The National Electric Code (NEC) specifies that all equipment intended for Emergency use in places of assembly must comply with NEC Article 700 as well as ANSI/NFPA 110. Only equipment that carries a UL 1008 Listing is guaranteed to be in full compliance with these standards. Every UC700 system carries this Listing.

In some instances, pseudo emergency or 'panic' systems have been incorporated into dimmer consoles and racks. Dimming equipment, although UL Listed, does not conform to Emergency System standards specified by Code and UL, and must not be used for this purpose. Another approach had been to use Listed industrial grade relays for transfer functions. These relays, though UL Listed, are not tested to UL 1008 standards, and are not adequate for NEC Article 700 applications.

Not all UL 1008 systems are appropriate for Emergency use. The 1008 Standard covers Emergency systems and "Stand-by" systems. The performance requirements are different for these systems. A true Emergency system is required to provide light and power for life-safety situations. Standby systems, though they carry the UL 1008 mark, are not appropriate for Emergency use. These systems are labeled "for standby systems", or "not for use as Emergency Transfer Equipment". Only UL 1008 systems labeled "for Emergency Use" should be considered.

EMERGENCY SCENARIOS

There are a number of scenarios in which a branch ATS would be required to provide transfer from dimmers to an alternate (Emergency) power source.

In the event of an input power failure to the dimmer rack, critical houselights are automatically disconnected from the dimmers and transferred to a second power source.

In the event of a dimmer system failure, critical houselights are manually or automatically transferred from the dimmer system to a second power source.

In the event the facility fire alarm system is activated, the critical houselights are automatically disconnected from the dimmer circuits and transferred to a second power source.

In the event of an audience panic situation, critical houselights are manually transferred from the dimmer system to a second power source. This manual transfer can be done from remote, secure locations.

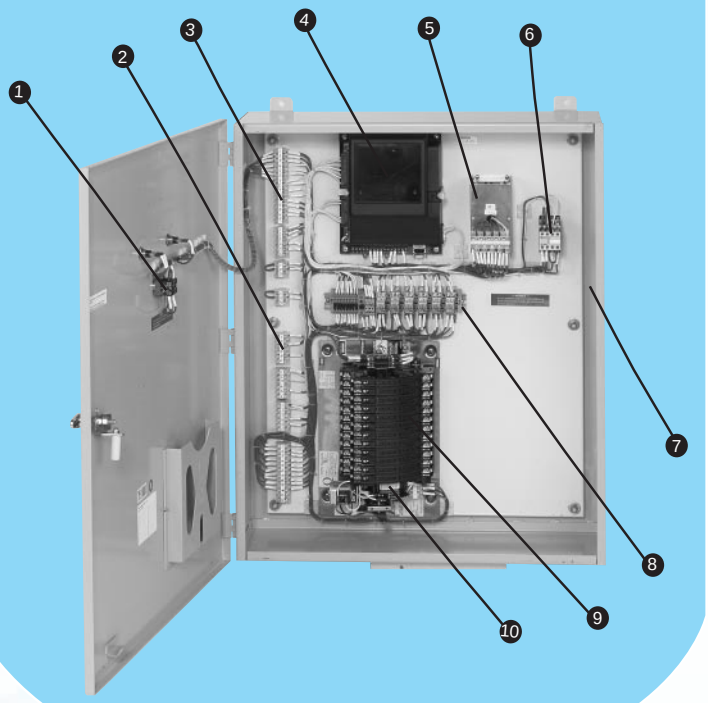
In addition to these emergency events, a branch ATS under manual control has other important uses for an entertainment facility.

It provides:

- Houselights for security purposes.
- A simple way of powering houselights for a facility maintenance.
- An independent source for houselights during dimmer system maintenance.

In facilities with a Main Automatic Transfer System (ATS) for power services to other critical loads, a branch ATS is still required for emergency houselights controlled by dimmers. A Main ATS will not energize these lights if the dimmers are not activated, or if the dimmer system fails.

The use of unit equipment (individual, supplementary battery-powered lighting units) is often acceptable for small facilities. This type of emergency lighting does not provide many of the functions of an ATS, including illumination during panic, fire and/or dimmer system failure. Battery unit equipment requires more maintenance, is often subject to vandalism, may be architecturally obtrusive and is not practical for large theatres or places of assembly.



COMPONENT ASSEMBLY

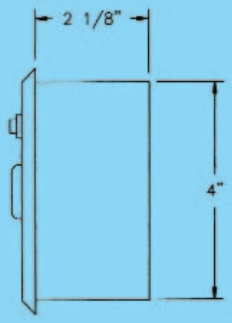
SIMPLE LAYOUT SOPHISTICATED DESIGN

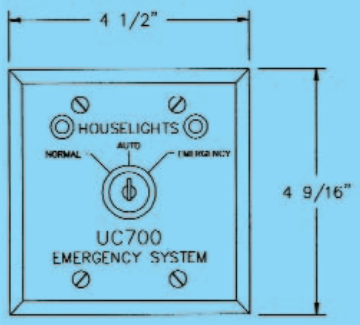
1. Local Control Station
2. Signal Wiring Terminals (Fire Alarm, Dimmer Failure, Generator Control, etc.)
3. Remote Station Terminals
4. Logic Control Panel
5. Dual Source Power Supply
6. Control Power Transfer Relay
7. NEMA 1 Enclosure
8. Remote Signal Isolation Relays
9. Transfer Switch
10. Manual Operation Handle

REMOTE CONTROL STATIONS - PROVIDES SYSTEM CONTROL IN CRITICAL LOCATIONS STANDARD FEATURES

- Key switch operated.
- LED indicator lights to display system status.
- System accepts up to 10 Remote control stations, wired in parallel.
- Mounts in standard 2-gang wall box (4" x 4" x 2 1/8").
- Low voltage, Class 2 signal (24VDC), transmitted via 5-conductor, No. 18 AWG wire.
- Wire leads to remote stations are protected in the system enclosure by a 1.0A fuse.
- Shorted leads to Remote station(s) will not inhibit automatic system functions.
- Remote stations are disabled when automatic transfer occurs due to Normal power source failure, Normal system failure or a fire alarm.

REMOTE STATION
(Cat. No. UC700-RCS-1A)



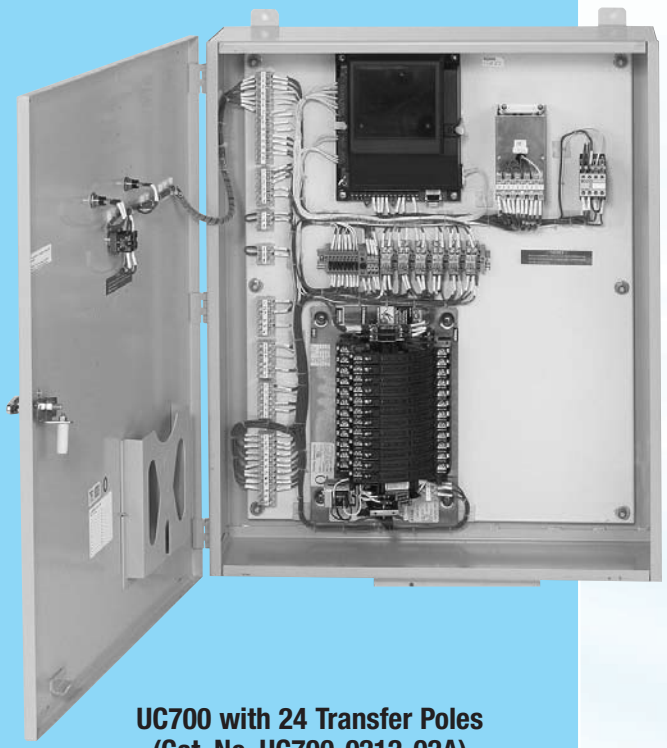


SYSTEM CONSTRUCTION

STURDY AND SIMPLE - UC700 WILL PROBABLY OUTLIVE THE FACILITY IT PROTECTS

ENCLOSURE

- Welded steel, NEMA 1 construction. Minimum thickness, 14 gauge.
- Safety Yellow finish.
- Designed for wall mounting, independent of other equipment.
- All electronics and switchgear on modular, removable steel panels.
- Hinged door has locking handle.
- Local control station accessible without opening enclosure door.



UC700 with 24 Transfer Poles (Cat. No. UC700-0212-02A)

CONTROL PANEL

- Integrated logic for fewer discrete components and higher reliability.
- Field adjustable settings.
- Provisions for remote signal, fire alarm and other input signals.
- Gold-flashed contacts designed for low-voltage signals.
- Completely enclosed by protective cover.
- Meets or exceeds voltage surge capability specified by ANSI/IEEE C37.90A-1978.
- Meets or exceeds withstand voltage test specified by NEMA ICS 1-109.

TRANSFER SWITCHES EO/MH

- Electrically-operated/ mechanically-held.
- Double-throw, inherently interlocked.
- Reliable single-solenoid operating mechanism.
- Contacts easily accessible for inspection and maintenance.

WIRING

- All contractor connections are to easily-readable, terminal strips.

SPECIFICATIONS

1.0 General

1.1 A Branch Circuit Automatic Transfer System with the number of poles, Voltage and Current ratings shall be provided as shown on the accompanying drawings. Each System shall consist of power transfer switches and a control module that are inter-connected so as to provide complete automatic protection.

1.2 The system shall comply with the following safety standards:
A. ANSI / UL 1008
B. ANSI / NFPA 70
C. ANSI / NFPA 110

1.3 The function of the ATS shall be to transfer critical lighting load branch circuits from dimmers or other secondary control outputs to a second power source, in the event of:
A. A loss of power to the dimmer rack or other control devices
B. Activation of the facility fire alarm
C. A Normal system failure
D. A panic condition

1.4 The system shall be provided with a manual containing the following:
A. System Rating
B. Code and Standards Compliance
C. Theory if Operation
D. Installation Instructions
E. Testing and Adjustments
F. Troubleshooting Guide

1.5 Transfer poles shall be provided for the phase and neutral legs of each branch circuit Load.

1.6 Remote control stations for the system shall be provided as shown on the drawings.

2.0 Enclosure

2.1 The ATS shall be mounted in a hinged door, NEMA 1 type enclosure finished brightyellow. Material shall be no less than 14 gauge steel.

2.2 An enclosure containing no more than 24 transfer poles shall be 36" H. x 30" W. x 9" D. (TYPE A). An enclosure containing from 30 to 48 transfer poles shall be 54" H. x 30" W. x 9". (TYPE B).

2.3 The enclosure shall be separate and independent of all other equipment. In no instance shall the ATS be enclosed in a dimmer rack or in an enclosure containing other equipment.

2.4 The system shall be provided with an approve name plate mounted on the Front of the enclosure, stating; 'FOR USE ON EMERGENCY AND STAND BY SYSTEMS".

2.5 The enclosure shall be provided with an approval name plate indicating that the System is UL 1008 Listed.

2.6 The ATS shall contain a recessed Local control station in the enclosure door. This station shall include a key switch and two transfer position indicator LEDs.

3.0 Remote Stations

3.1 Each remote control station shall contain a three-position key switch. The left and right positions of the switch shall be momentary and the switch shall always return to the center position.

3.2 The station faceplate shall be engraved; "NORMAL" for the left switch position; "EMERGENCY" for the right switch position and "AUTO" for the center position.

3.3 The faceplate shall contain two LED's for transfer switch position confirmation.

3.4 Each remote station shall mount in a standard 2-gang wall box (4" x 4" x 2 1/8").

3.5 Remote stations shall not be incorporated into, or mounted onto other equipment.

3.6 All wiring to remote stations shall be by 5-conductor Class 2 wiring (24V DC). A terminal strip shall be provided for contractor wiring.

4.0 Transfer Switch

4.1 The transfer switch unit shall be electrically-operated and mechanically-held. The electrical operator shall be a single-solenoid mechanism, momentarily energized to minimize power consumption, noise and heat generation.

4.2 The switch shall be positively locked and unaffected by voltage variations or momentary outage, so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized.

4.3 The switch shall be mechanically interlocked to ensure only one of two possible positions – Normal or Emergency.

4.4 All of the Switch main contacts shall be silver plated.

4.5 Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages or power conductors.

4.6 A manual operating handle shall be provided for backup operation and maintenance purposes. The handle shall permit the operator to stop the contact at any point throughout the entire travel of the contact.

4.7 Overload and endurance testing of the transfer switch shall comply with UL 1008 Tables 25.1, 25.2, 27.1, and 27.2 for mixed loads.

4.8 The transfer switch shall be rated to withstand the RMS symmetrical short circuit current with the type of overcurrent protection shown, without welding of the contacts.

4.9 Switch contacts shall withstand transfer without welding, with 180º phase displacement between Normal and Emergency power sources, both sources energized and with100% load.

4.10 Transfer switch contacts shall be rated for mixed loads, including: motors, Electric dis-charge lamps, and tungsten filament lamps.

5.0 Logic Control Module

5.1 The control module shall direct the operation of the transfer switch.

5.2 The module's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability and minimum maintenance.

5.3 The control module shall be connected to the transfer switch by an interconnecting wire harness. The harness shall include a keyed disconnect plug to enable the control module to be disconnected from the transfer switch for routine maintenance.

5.4 The control module shall be completely enclosed with a protective cover and be mounted sepa-rately from the transfer switch unit for safety and ease of maintenance

5.5 Sensing and control logic shall be provided on plug-in printed circuit boards, for maximum reliability.

5.6 Interfacing relays shall be industrial control grade plug-in type, with dust covers.

5.7 The control panel shall meet the voltage surge withstand capability in accordance with IEEE Standard 472-1978 (ANSI C37.90A-1978).

5.8 The control panel shall meet the impulse with-stand voltage test in accordance with the proposed NEMA Standard ICS 1-109.

6.0 Operation

6.1 The voltage of each phase of the normal source shall be monitored, with pickup adjustable from 85 to 100% and dropout adjustable from 75 to 98% of pickup setting. These settings shall be adjustable in increments of 1%. Repetitive accuracy of settings shall be 2% or better over a temperature range of -20ºC to 70ºC. It Is factory set to pickup at 90% and dropout at 85%.

6.2 Single-phase voltage sensing of the Emergency source shall be provided with a pickup adjustable from 85 to 100% and dropout fixed at 84 to 86% of pickup. Frequency sensing shall be provided with pickup adjustable from 90 to 100% and dropout fixed at 87 to 89% of pickup. Repetitive accuracy of settings shall be 2% or better over a temperature range of -20º to 70ºC. Factory set to pick up at 90%

6.3 The control module shall include four time delays that are field adjustable in increments of at least 13 steps over the entire range, as follows:

Time delay to override momentary Normal source outage, to delay all transfer switch and engine starting signals, adjustable from 0 to 6 sec. Factory set at 1 sec. Transfer to Emergency time delay, adjustable for 0 to 5 min, is factory set at 0 min.

Retransfer to Normal time delay. Time delay is automatically bypassed if Emergency source fails and Normal source is acceptable. Adjustable from 0 to 30 min. Factory set at 1 min.

Unloaded running time delay for Emergency generator cool-down. Adjustable from 0 to 60 min. Factory set at 5 min.

6.4 Control power for all logic and transfer functions shall always seek the acceptable Power source. This shall prevent the system from locking up in one position if either of the power sources is available, regardless of the sequence of failure events.

6.5 A self-supervising isolated signal input shall be provided for connection to the facility fire alarm. The ATS shall automatically transfer loads to the Emergency power source when the facility fire alarm is activated.

6.6 A key-operated double-throw, momentary test switch shall be provided to manually Control the ATS. All automatic functions shall override this control. Two indicator Lights shall be provided to show the position of the transfer switch.

6.7 All automatic functions shall override remote control functions. Any combination of open or shorted wiring to remote stations shall not affect automatic functions, or disable the local switch.

7.0 Manufacturer

7.1 The equipment described is a UC700 as manufactured by Union Connector, West Babylon, NY, 11704

ORDERING INFORMATION

STANDARD MODELS

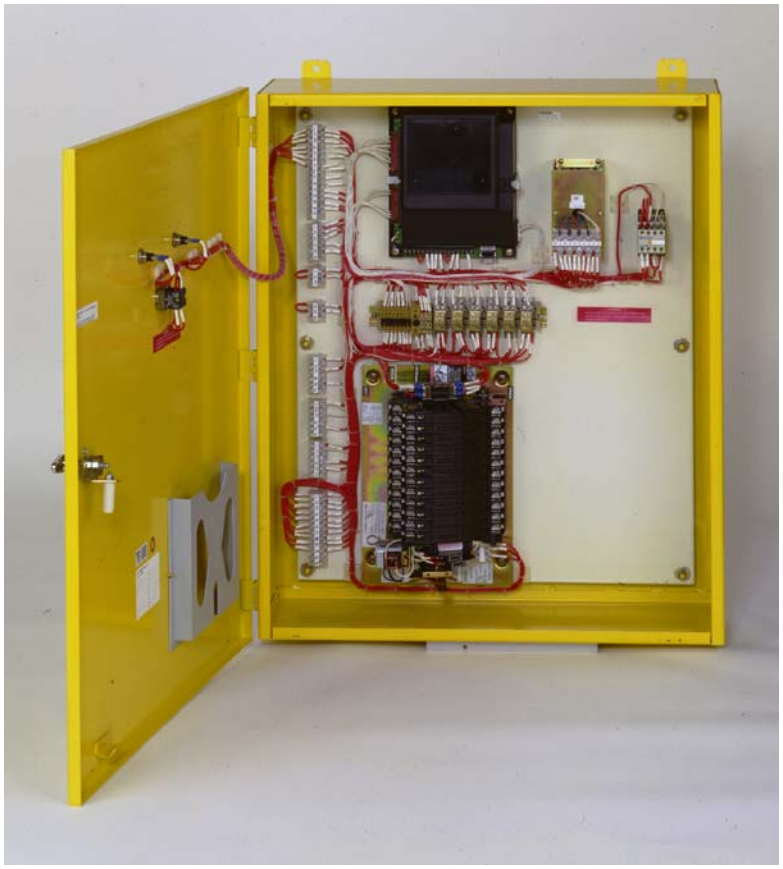
CATALOG	POLES	CIRCUITS	DIMENSIONS
UC700-0204-02A	4	2	36” x 30” x 9”
UC700-0206-02A	6	3	36” x 30” x 9”
UC700-0208-02A	8	4	36” x 30” x 9”
UC700-0212-02A	12	6	36” x 30” x 9”
UC700-0214-02A	14	7	36” x 30” x 9”
UC700-0216-02A	16	8	36” x 30” x 9”
UC700-0218-02A	18	9	36” x 30” x 9”
UC700-0220-02A	20	10	36” x 30” x 9”
UC700-0224-02A	24	12	36” x 30” x 9”
UC700-0226-02A	26	13	54” x 30” x 9”
UC700-0228-02A	28	14	54” x 30” x 9”
UC700-0230-02A	30	15	54” x 30” x 9”
UC700-0232-02A	32	16	54” x 30” x 9”
UC700-0236-02A	36	18	54” x 30” x 9”
UC700-0238-02A	38	19	54” x 30” x 9”
UC700-0240-02A	40	20	54” x 30” x 9”
UC700-0242-02A	42	21	54” x 30” x 9”
UC700-0244-02A	44	22	54” x 30” x 9”
UC700-0248-02A	48	24	54” x 30” x 9”

All listed standard models are designed for 120/208V., 3-Phase, 60Hz. power sources. For 120/240V. or 277/480V. systems, contact the factory or your Union Connector representative.

WARRANTY

All UC700 Emergency Transfer Systems are tested and inspected at the factory and are warranted to be free of material and workmanship defects for a period of one year from the date of shipment. Union Connector’s warranty is restricted to the repair or replacement, at out option, of any part which proves to be defective and for which a claim was made in writing prior to the expiration date of the warranty. This warranty does not apply to any defect arising from accident, misuse, unauthorized repair, or negligent use. This warranty does not apply to normal wear and tear.

EMERGENCY TRANSFER EQUIPMENT IN THEATRES AND PLACES OF ASSEMBLY



Scope and Intent of Document

The intention of this monograph is to provide specifying professionals and facility owners with current regulatory and design requirements for Emergency Transfer Systems that are to be used in Places of Assembly. This document contains public information that can be used to make informed decisions when evaluating transfer equipment for use in this type of space. This information is considered to be the minimum required to make such a decision. This document is not intended to be a design manual or handbook for construction. The information concerning legal issues is not to be used as legal advice, but to raise the issue for discussion when evaluating these systems.

The scope of the document concerns Automatic Emergency Transfer Systems that are considered necessary for life-safety requirements in Places of Assembly. The sources referred to in this document are national in scope, but may be superseded by local jurisdictions and authorities. The standards and regulatory information presented here is the latest available material at the time of publication. The reader is encouraged to check with local and national sources (a partial list is provided) for the latest information when final evaluations are being made prior to purchase.

Union Connector is an original equipment manufacturer of power distribution equipment, not a testing laboratory or regulatory agency. However, with over 75 years of experience in this field, we feel an obligation to present our customers and industry professionals with non-biased information so they can make informed decisions concerning these types of products. The UC700 Automatic Emergency Transfer System was the first of its type to be designed specifically for the entertainment and controlled lighting industry. This equipment is intended for use in situations where power transfer is critical to life safety evacuation of an audience or public assembly. Care should be taken in the evaluation and purchase of such equipment. It could be a matter of life or death.

Emergency Transfer System Definition

The definition of the equipment described here is paraphrased from Article 700 of the National Electric Code.

Emergency transfer systems are those systems legally required by and classed as Emergency by municipal, state federal or other codes having jurisdiction. These systems are intended to automatically transfer supply power for Emergency illumination in the event of failure to the Normal supply, or in the event of accident to elements of a system intended to supply, distribute and control power and illumination essential for safety to human life. This discussion will be limited to the elements of the system that transfers power, and not with the lighting or other ancillary systems involved.

The transfer of power from Normal to Emergency may be required for a number of facility power applications, including lighting, HVAC, elevators, communication, etc. The part of the system that most often concerns theatrical applications is illumination of the audience, aisles, hallways, lobby and other areas necessary for evacuation. In addition to traditional theatre spaces, it is now commonplace to use theatrical lighting control technology in other places of assembly, such as lobbies, boardrooms, ballrooms and convention/arena spaces. The requirements for Emergency transfer equipment are the same for both applications.

One method for providing Emergency lighting in these spaces is to dedicate a number of houselights to this function. These houselights are controlled by dimmers, but there is also some mechanism available to transfer control and power source from the dimmers to an Emergency power supply. This mechanism is an Emergency Transfer System. Figure 1 shows a typical one-line diagram of this method.

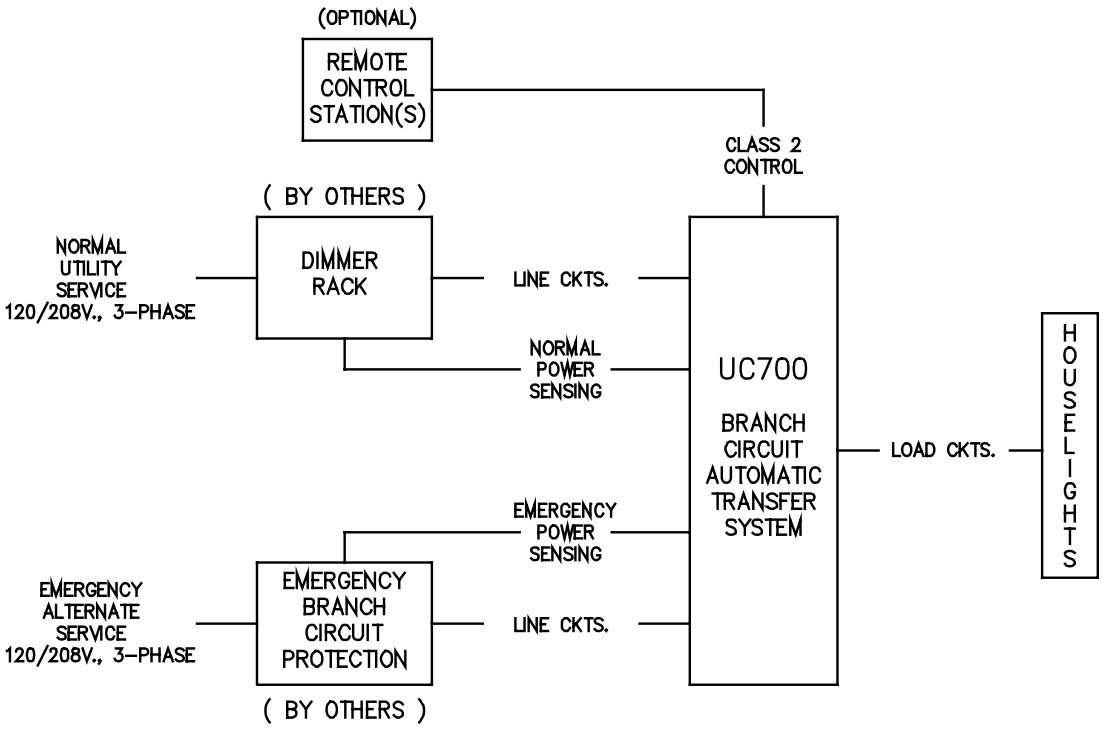


figure 1

A common practice is to place industrial grade relays inside a dimmer rack or cabinet, and use various types of line monitoring sensors to transfer to Emergency power should the Normal power source fail, or if the Emergency system is activated. As will be seen in the following excerpts from various standards and codes, this does not follow national, and in many cases local, standards for Emergency systems. It is also a dangerous practice, as it places a critical part of the Emergency system inside an enclosure that is not easily accessible for manual control of the Emergency system, should that be required. Industrial grade relays are not tested to the same standards as Emergency relays, and are not as reliable. Remember, lives are at stake here.

A problem that is inherent in using dimmer-controlled relays for Emergency use is the possibility of dimmer *system* failure without a Normal *power* failure. If this should occur, activation of relays built into the dimmer rack will prove useless, because the Emergency transfer system will not be activated unless the Normal power source is disrupted. The relays in the dimmer cabinet will transfer to the Emergency power source, but there will be no power available. To avoid these problems, a unit specifically designed for Emergency Systems must be used. These systems are designed to transfer power only when power is available.

Perhaps the most compelling reason for not using industrial control relays in this application is the likelihood of relay failure – sometimes catastrophically. Emergency rated systems have relays that are designed and tested for abuses of power fluctuation, arcing, mechanical wear and contact degradation. Industrial relays, even those used in other optional or standby UL1008 applications, are not mechanically or electrically adequate for the rigors of Emergency applications.

An alternative to using relays or switches is the use of a second lighting control system as the “Emergency” system. The theory is that when the primary power system fails, the secondary control system is powered by the Emergency Power System (EPS) and controls the lighting. There are two problems with this approach. First, the lighting control system is not Listed or evaluated as Emergency equipment. Second, the lighting control system is not guaranteed to bring the lights to full for egress lighting. Bringing the lights to full would require an operator to work the light board. Not exactly an automatic switch.

These Emergency Systems are much more than a mere power distribution system or system component. These are life-safety devices! Special emphasis must be placed on the proper design and installation of these systems. Failure to do so is indefensible.

Legal Considerations

Responsibility

Who is responsible for the design and specification of these systems? Good question! Because the use of dimmer controlled Emergency lighting is unique to Theatrical/Place of Assembly applications, the Theatre Consultant often is tasked with providing the solution. The fact that Emergency system design is involved, places responsibility on the Electrical Engineer of record as well. This responsibility places both parties in a position where they are directly liable for damages in the event of improper system design. The electrical inspector, being the authority having jurisdiction also shares responsibility for proper system implementation.

Small theatres and places of assembly very often do not hire outside consultants for design functions. The design may be done internally by staff members, or it may be provided by outside vendors as a service in anticipation of a sale. If that is the case, then the individuals involved, and their employers may be faced with accepting responsibility for the proper design and functioning of the system.

If the system specified does not meet standard criteria for design and operation in an Emergency system, those responsible would be open to a negligence lawsuit. If the system does not conform to standards and codes set forth by applicable statutory regulation, there is also the possibility of criminal charges, in addition to a civil lawsuit. In many cases, liability insurance policies contain a proviso that absolves the insurance company should the matter become a criminal case.

Liability

While the responsibility of the system design and specification is rather cut and dried, liability for the system can be spread to include a number of parties. With the current state of litigation in this country, it is quite reasonable to assume that the liability for an Emergency system could be placed upon the professionals involved (engineer, consultants, architect), the manufacturer of the equipment, the organization providing the equipment, the Authority Having Jurisdiction (inspector), the installing contractor, the operator of the equipment, the owner of the facility, etc.

Since the market for these devices is rather limited, and requires a certain amount of specialized knowledge not found in an average person, those who deal with the items are considered "experts". As an "expert", therefore, anyone involved with these systems is supposed to be aware of what is required to provide a safe system. This means that selling a system that is not up to applicable codes and standards makes one liable for negligence, even if a professional such as an architect, engineer or consultant specifies such a system.

The point of the preceding section is to provide a warning to those involved with specifying, selling, installing, approving or operating theatrical type lighting equipment that interfaces with Emergency lighting. You may find yourself at risk of litigation.

Standards

This is a list of organizations and their publications that define the standards for the design, installation and use of Emergency Transfer Systems.

Organization:

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269

Publications:

NFPA 70 - National Electric Code
NFPA 110 – Standard for Emergency and Standby Power Systems

Organization:

Underwriter's Laboratories
333 Pfingsten Rd.
Northbrook, IL 60062

Publications:

UL 1008 - Standard for Automatic Transfer Switches

Organization:

American National Standards Institute

(NFPA 70, NFPA 110 and UL 1008 are all ANSI Standards)

1. How do the standards approach the requirements for Emergency Systems?

NFPA 70 - NATIONAL ELECTRIC CODE

ARTICLE 518 - PLACES OF ASSEMBLY

518-3 (C) - Emergency Systems. Control of emergency systems shall comply with Article 700, Emergency Systems.

ARTICLE 520 - THEATERS, AUDIENCE AREAS OF MOTION PICTURE AND TELEVISION STUDIOS AND SIMILAR LOCATIONS

520-8. Emergency Systems. Control of emergency systems shall comply with Article 700, Emergency Systems.

ARTICLE 700 - EMERGENCY SYSTEMS

700.1. Scope. The provisions of this article apply to the electrical safety of the design, installation, operation and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination or power, or both, to required facilities when the normal electrical supply or system is interrupted.
Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any government agency having jurisdiction. These systems are intended to automatically supply illumination or power, or both, to designated areas and equipment in the event of failure of the normal supply, or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life.

(FPN No. 3) Emergency systems are normally installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons, such as hotels, theaters, sports arenas, health care facilities, and similar institutions....

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

Origin and Development of NFPA 110

The Emergency Power Supplies Committee was organized in 1976 by the NFPA in recognition of the demand for viable guidelines for the assembly, installation, and performance of electrical power systems to supply critical and essential needs during outages of the normal power source.It was the intent of the committee to establish the necessary equipment requirements to achieve an on-site auxiliary electrical power source suitable to the needs of the applicable requirements and user criteria.

The requirements of the standard are considered necessary to obtain the minimum level of reliability and performance, particularly where life safety electrical power needs are involved.

The standard does not require the installation of emergency and standby power supply systems. Rather, it is a document that, if followed, will result in a system suitable for various situations as may be required in codes and standards.

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS *(cont.)*

1.1 Scope. This standard covers performance requirements for power systems providing an alternate source of electrical power to loads in buildings and facilities in the event that the normal power source fails.

1.1.1 Power systems covered in this standard include power sources, transfer equipment, controls, supervisory equipment and all related electrical and mechanical auxiliary and accessory equipment needed to supply electrical power to the load terminals of the transfer equipment.

1.2 Purpose

1.2.2 This standard is also intended to provide guidance for inspectors, designers, installers, manufacturers and users of EPSSs and to serve as a vehicle for communication between parties involved. It is not intended as a design manual.

1.2.3 Compliance with this standard is not intended to absolve the parties involved of their respective responsibilities of design, installation, maintenance and performance or compliance with other applicable standards and codes.

UL 1008 - STANDARD FOR AUTOMATIC TRANSFER SWITCHES

1.1 These requirements cover automatic transfer switches intended for use in ordinary locations to provide for lighting and power as follows:

A. In emergency systems in accordance with Articles 517 and 700 in the National Electric Code, ANSI/NFPA 70....

1.3 These requirements cover transfer switches together with their associated control devices including voltage sensing relays, frequency sensing relays, time delay relays, and the like.

1.4 A transfer switch as covered by these requirements is a device that automatically transfers a common load from a normal supply to an alternate supply in the event of failure of the normal supply, and automatically returns the load to the normal supply when the normal supply is restored.

Note: A word of caution is in order when evaluating Emergency Systems that are UL1008 Listed. The 1008 Listing is for Emergency, Standby and Optional Systems. Systems intended for use in Emergency systems are marked as such. Those systems intended for use in Standby or Optional transfer systems are marked as ***NOT*** being intended for Emergency systems.

The 1008 Listing on the UL label is not the only nomenclature that must be read. Look for the statement " Intended for use on Emergency Systems". If that is not present, then the unit is not intended for Emergency transfer systems.

2. What are the guidelines for Emergency System design/installation?

NFPA 70 - NATIONAL ELECTRIC CODE

ARTICLE 700 - EMERGENCY SYSTEMS

700.17 Circuits for Emergency Lighting. Branch circuits that supply emergency lighting shall be installed to provide service from a source complying with Section 700-12 when the normal supply for lighting is interrupted. Such installations shall provide either one of the following:

(1) an emergency lighting supply, independent of the general lighting supply, with provisions for automatically transferring the emergency lights upon the event of failure of the general lighting system supply, or

(2) two or more separate and complete systems with independent power supply, each system providing sufficient current for emergency lighting purposes. Unless both systems are used for regular lighting purposes and are both kept lighted, means shall be provided for automatically energizing either system upon failure of the other. Either or both systems shall be permitted to be part of the general lighting system of the protected occupancy if circuits supplying lights for emergency illumination are installed in accordance with other sections of this article.

700.18 Circuits for Emergency Power. For branch circuits that supply equipment classed as emergency, there shall be an emergency supply source to which the load will be transferred automatically upon the failure of the normal supply.

700.20 Switch Requirements. The switch or switches installed in emergency lighting circuits shall be so arranged that only authorized persons will have control of emergency lighting.

Exception No. 2: Additional switches that act only to put emergency lights into operation but not disconnect them are permissible.

700.21 Switch Location. All manual switches for controlling emergency circuits shall be in locations convenient to authorized persons responsible for their actuation. In places of assembly, such as theaters, a switch for controlling emergency lighting systems shall be located in the lobby or at a place conveniently accessible thereto.

In no case shall a control switch for emergency lighting be in a theater, or motion-picture theater or place of assembly, be placed in a motion-picture projection booth or on a stage or platform.

Exception: Where multiple switches are provided, one such switch shall be permitted in such locations where so arranged that it can energize the circuit only, but it cannot de-energize the circuit.

2. What are the guidelines for Emergency System design/installation? (cont.)

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

6.1.1 Switches shall transfer electric loads from one power source to another.

6.1.2 The electrical rating shall be sized for the total load that is designed to be connected.

6.1.3 Each switch shall be in a separate enclosure or compartment.

6.1.4 The capacity of the transfer switch, including all load current-carrying components, shall be rated to include all classes of loads to be served.

6.1.5 The switch, including all load current-carrying components, shall be designed to withstand the effects of available fault currents. (Note: see ANSI/UL 1008, Standard for Automatic Transfer Switches)

6.1.6 Where available, each switch shall be listed for emergency service as a completely factory-assembled and factory-tested apparatus.

3. What approvals are required by Emergency system standards?

NFPA 70 - NATIONAL ELECTRIC CODE

ARTICLE 700 - EMERGENCY SYSTEMS

700.3 Equipment Approval. All equipment shall be approved for use on emergency systems.

700.6 Transfer Equipment. Transfer equipment, including automatic transfer switches, shall be automatic and identified for emergency use and approved by the authority having jurisdiction. Transfer equipment shall be designed and installed to prevent the inadvertent interconnection of normal and emergency sources of supply in any operation of the transfer equipment.

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

3.2.1 Approved. Acceptable to the "authority having jurisdiction".

3.2.2 Authority Having Jurisdiction. The organization, office or individual responsible for "approving" equipment, materials, an installation or a procedure.

3.2.4 Listed. Equipment or materials included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and by whose listing states either that the equipment, materials or service meets appropriate standards or has been tested and found suitable for use in a specified manner.

6.1.6 Transfer Switch Classification. When available, each transfer switch shall be listed for emergency service as a completely factory-assembled and tested apparatus. (See Section 700-3, NFPA 70, National Electric Code,...)

UL 1008 - STANDARD FOR AUTOMATIC TRANSFER SWITCHES

41.2 Transfer switches shall be plainly marked with the manufacturer's name or trademark, or other descriptive marking by which the organization responsible for the product may be identified, a distinctive catalog number or the equivalent, and the electrical rating. All markings shall be located to be visible after installation.

4. Why must the Transfer System be housed in a separate enclosure?

NFPA 70 - NATIONAL ELECTRIC CODE

ARTICLE 700 - EMERGENCY SYSTEMS

700.9 Wiring, Emergency System.

(A) Identification. All boxes, and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system.

(B) Wiring. Wiring of two or more emergency circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet. Wiring from an emergency source or emergency source distribution overcurrent protection to emergency loads shall be kept entirely independent of all other wiring and equipment, unless otherwise permitted in (1) through (4):

(1) Wiring from the normal power source located in transfer equipment enclosures.
(2) Wiring supplied from two sources in exit or emergency luminaries (lighting fixtures).
(3) Wiring from two sources in a common junction box, attached to exit or emergency luminaries (lighting fixtures).
(4) Wiring within a common junction box attached to unit equipment, containing only the branch circuit supplying the unit equipment and the emergency circuit supplied by the unit equipment.

(C) Wiring Design and Location. Emergency wiring circuit(s) shall be designed and located so as to minimize the hazards that might cause failure due to flooding, fire, icing, vandalism and other adverse conditions.

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

6.1.3 Each switch shall be in a separate enclosure or compartment

5. What are the operational requirements of the transfer equipment?

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

6.2.1 General. Automatic transfer switches shall be electrically capable of all of the following:
(1) Electrical operation and mechanical holding
(2) Transfer and retransfer of the load automatically
(3) Visual annunciation when “not-in-automatic”

6.2.2 Source Monitoring.

6.2.2.1 Undervoltage-sensing devices shall be provided to monitor all ungrounded lines of the primary source of power as follows:
(1). When the voltage on any phase falls below the minimum operating voltage of any load to be served, the transfer switch shall automatically initiate engine start and the process of transfer to the EPS.
(2) When the voltage on all phases of the normal returns to within specified limits for a designated period of time, the process of transfer back to primary power shall be initiated.

6.2.2.2 Both voltage- and frequency-sensing equipment shall be provided to monitor one ungrounded line of the EPS power.

6.2.2.3 Transfer of the EPS shall be inhibited until the voltage and frequency are within a specified range to handle loads to be served.

6.2.3 Interlocking. Mechanical interlocking or an approved alternate method shall prevent the inadvertent interconnection of the normal power supply and the EPS or of any two separate sources of power.

6.2.4.1 Instruction and equipment shall be provided for safe manual nonelectric transfer in the event the transfer switch malfunctions.

6.2.4.2 An automatic transfer switch shall visually annunciate when “not in automatic”.

6.2.5 Time Delay on Starting of EPS. A time delay device shall be provided to delay starting of the EPS. The timer shall prevent nuisance starting of the EPS and possible subsequent load transfer in the event of harmless momentary power dips and interruptions of the normal source.

6.2.7 Time Delay on Transfer to EPS. An adjustable time delay device shall be provided to delay transfer and sequence load transfer to the EPS to avoid excessive voltage drop when the transfer switch is installed for Level 1 use.

6.2.7.1 Time Delay Commencement. The time delay shall commence when proper EPS voltage and frequency are achieved.

6.2.8 Time Delay on Retransfer to Primary Source. An adjustable time delay device with automatic bypass shall be provided to delay retransfer from EPS to the primary source of power. The timer is intended to permit the normal source to stabilize before retransfer of the load. The time delay shall be automatically bypassed if the EPS fails.

6.2.12 Test Switch. A test means shall be provided on each automatic transfer switch (ATS) that simulates failure of the primary power source and then transfers the load to the EPS.

6.2.13 Indication of Switch Position. Two pilot lights with identification nameplates or other approved position indicators shall be provided to indicate transfer switch position.

5. What are the operational requirements of the transfer equipment? (cont.)

NFPA 70 - NATIONAL ELECTRIC CODE

ARTICLE 700 - EMERGENCY SYSTEMS

700.6 Transfer Equipment

(C) Automatic Transfer Switches. Automatic transfer switches shall be electrically operated and mechanically held.

UL 1008 - STANDARD FOR AUTOMATIC TRANSFER SWITCHES

19.3 A transfer switch shall incorporate the necessary control equipment to initiate transfer from the normal supply to the alternate supply upon the interruption of any or all phases of the normal supply.

19.4 The transfer may be additionally controlled by equipment to provide a time delay in either or both directions of transfer. Equipment may also be provided to initiate transfer under low normal voltage conditions and by voltage-frequency measurement in the alternate supply.

19.5 The operating mechanism shall be such that the load cannot remain simultaneously disconnected from both the normal and alternative supplies when either or both supplies are available with voltage and frequency sufficient to permit proper operation...

19.7 Transfer Switches for use in Emergency systems shall be electrically operated.

19.8 Transfer Switches for use in Emergency systems shall have the normal and emergency contacts mechanically held closed.

30.1 A transfer switch shall perform acceptably when subjected to an endurance test controlling a test current as described ... and at a rate and number of cycles described in Table 30.2.

TABLE 30.2
ENDURANCE TEST CYCLES

Switch Rating	Rate of operation	Number of Cycles of Operation With Current [c]
0-300	1 per minute	6000

c ...For transfer switches rated for total system transfer, motor loads, or electric discharge lamp loads, the test shall be conducted for one half of the specified number of operations at 200 percent of rated current and for one half of the specified number of operations at 100 percent of rated current.

31.1 A transfer switch shall be capable of withstanding for 1 minute without breakdown the application of a 60-Hz sinusoidal potential of 1000 V plus twice the maximum rated voltage:

A. Between un-insulated live parts and the enclosure with the contacts alternately closed to each supply source,

B. Between terminals of opposite polarity with the contacts closed,

C. Between un-insulated live parts of different circuits, and

D. Between terminals of normal source and alternate source with switch in both normal and alternate positions.

6. What maintenance is required for Emergency transfer equipment?

NFPA 110 - EMERGENCY AND STANDBY POWER SYSTEMS

Routine Maintenance and Operational Testing

8.1.1 The routine maintenance and operational testing program shall be based on all of the following:
(1) Manufacturer's recommendations
(2) Instruction manuals
(3) Minimum requirements of this chapter
(4) The authority having jurisdiction.

8.2.1 At least two sets of an instruction manual(s) for all major components of the EPSS shall be supplied by the manufacturer(s) of the EPSS and shall contain the following:

(1) A detailed explanation of the operation of the system.
(2) Instructions for routine maintenance.
(3) Detailed instructions for repair of the EPS and other major components of the EPSS.
(4) An illustrated parts list and part numbers.
(5) Illustrated and schematic electrical drawings of wiring systems, including operating and safety devices, control panels, instrumentation, and annunciators.

8.3.4 A written record of the EPSS inspections, tests, exercising, operation and repairs of the EPSS shall be maintained on the premises.

8.3.4.The written record shall include the following:

(1) The date of the maintenance report.
(2) Identification of the servicing personnel.
(3) Notation of any unsatisfactory condition and the corrective action taken, including parts replaced
(4) Testing of any repair for the time as recommended by the manufacturer.

Equipment Conforming to Standards

Acceptable Equipment

Emergency transfer equipment that is acceptable for use in theatres or other places of assembly must pass all of the following criteria:

1. be approved by local jurisdiction
2. be approved by the engineer of record
3. be Listed under UL 1008
4. be installed following proper procedures
5. be tested periodically

Equipment that meet these criteria include unit (battery) equipment, and bona fide UL 1008 Emergency Transfer Systems, such as UC700.

Non-Acceptable Equipment

Transfer equipment that is **NOT** acceptable for Emergency use in theatres or other places of assembly includes, but is not limited to:

1. industrial control relays
2. UL 1008 switches placed within dimmer cabinets
3. UL 1008 equipment intended for use with standby or optional equipment
3. dimmer `panic' switches or controls

Acknowledgments

NFPA 70 **National Electric Code**, copyright 2005, National Fire Protection Assoc.

NFPA 110 **Standard for Emergency and Standby Power Systems**, copyright 2002, National Fire Protection Assoc.

UL 1008 **Standard for Automatic Transfer Switches**, copyright 1989, Underwriter's Laboratories, Inc

Company Switches

CUSTOMIZED TO FIT YOUR EXACT REQUIREMENTS

UNION CONNECTOR

Model PBS / SP

A safe method to make bare-end tie-ins to a Company Switch is now available in a standard product - the Model PBS / SP Company Switch.

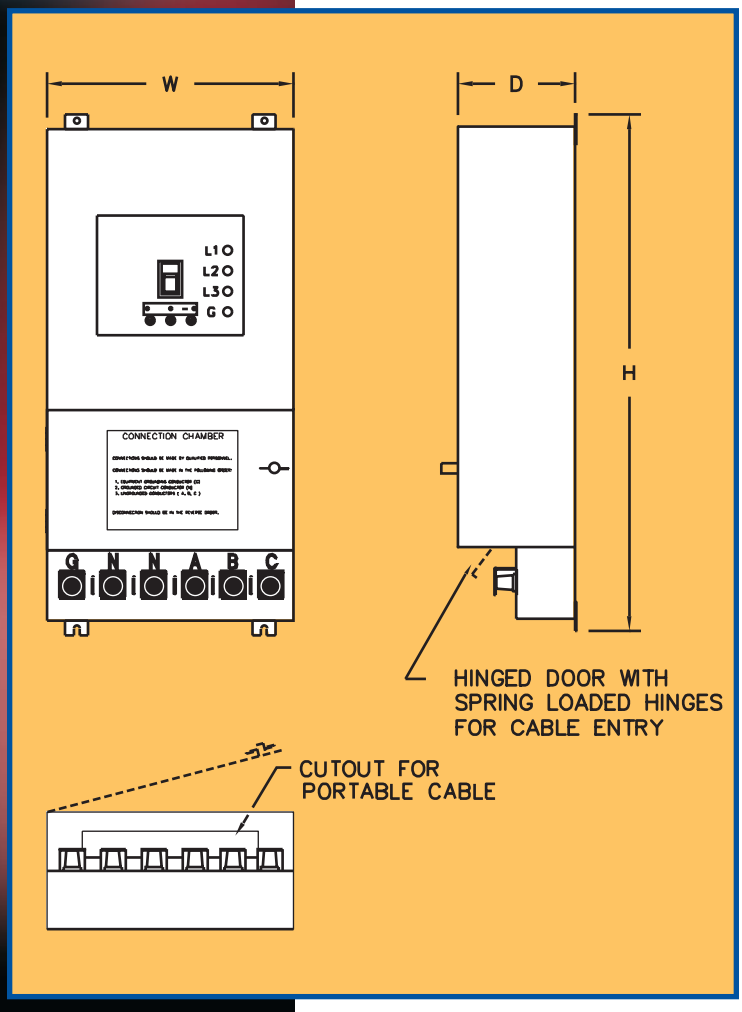
This unit incorporates a UL listed receptacle in an enclosure complete with a main breaker and phase indicator lights. The Model PBS/SP contains a connection chamber for direct tie-in of cable ends to busbars. A strain relief is used to secure cables inside the connection chamber, and busbars are provided with both solderless lugs and threaded studs for cable connection. The access door to the chamber is protected by a micro-switch that activates a shunt trip in the main breaker whenever the door is opened. When the connection chamber door is opened, the main breaker is tripped, and the exposed busbars are "cold", allowing direct tie-in to the bus. Closing the door and resetting the breaker restores power to the bus and the connected cables. This provides a safe and reliable means to tie-in with either bare ends or cable connectors.

The Model PBS/SP is UL listed and conforms to or exceeds all National Electrical Codes and applicable ANSI standards.

Union Connector has a fully equipped CNC metal fabrication facility that can custom manufacture a steel or aluminum Model PBS/SP for your special needs. Contact the factory or your local Union Connector sales rep for more information.

Features

- ✔ *Connection chamber for bare end cable tie-in*
- ✔ *65,000 AC Main breaker*
- ✔ *Cam, SafeCam™, Posi-Lok, or Pin & Sleeve outlets*
- ✔ *Dual Neutral standard on 400A.*
- ✔ *Suitable for service connection use*
- ✔ *Replaceable neon indicator lights*
- ✔ *UL Listed*
- ✔ *Available ratings - 120/240V, 120/208V, 277/480V*
- ✔ *Standard units - 60A, 100A, 200A, 400A, 600A.*



Custom Designed Company Switches

Union Connector can custom design and build a company switch to meet your exact needs. Our UL listing allows us a great deal of latitude in the manufacture of power distribution equipment and the standard model Company Switches can often be modified to meet your requirements.

Some of the modifications that can be incorporated into a Company Switch include the following:

- **Dual Outlet Panels**
  Parallel sets of outlets can be bussed from the load side of the breaker.
- **Reverse Neutral/Ground**
  Available only on cam panels.
- **Recessed Mounting**
  Enclosures can be designed to recess mount into a wall. Trim plates are provided.
- **Outdoor Enclosures**
  Company switches can be mounted inside a UL listed NEMA 3R enclosure for outdoor applications. Cable entry is accomplished through a slot in the bottom of the 3R enclosure.
- **Branch circuits**
  Additional branch breakers and outlets can be incorporated into the design of a Company Switch. These sub-breakers are fed from the main breaker and can be placed on the front or side of the enclosure.
- **Bottom Feed**
  Typical line feed to Company Switches is through the top of the enclosure. In some cases, the enclosure can be modified to accept a bottom feed.
- **Isolated Ground**
  Company Switches are shipped from the factory with provisions for making the ground connection isolated from the enclosure frame. Dual ground models available on most models.
- **Meters**
  Digital multi-meters, analog voltmeters, and analog ammeters can be provided. Digital meters can be coordinated with building energy management systems.

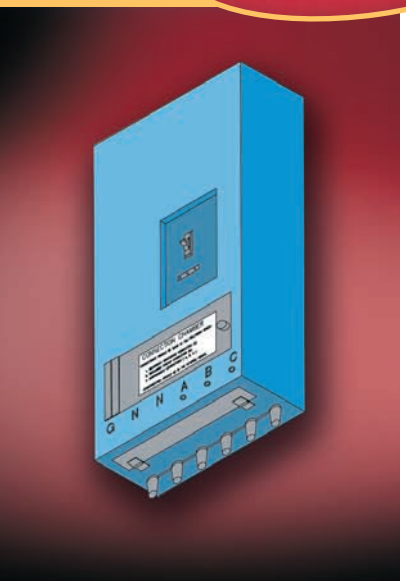
Units can be custom engineered to suit your needs

Model CSC

The Model CSC is an economy grade Company Switch designed for use in professional spaces. The switch consists of a simple steel enclosure, Main breaker, outlets and non-replaceable phase indicator lights.

Features

- ✔ *Steel enclosure*
- ✔ *65,000 AC Main breaker*
- ✔ *Cam, SafeCam™, Posi-Lok, or Pin & Sleeve*
- ✔ *UL Listed*
- ✔ *120/240V, 120/208V, 277/480V*
- ✔ *Standard units - 60A, 100A, 200A, 400A*



Model CSC / SP

The Model CSC / SP is an economy grade Company Switch with a connection chamber for bare end tie-ins and UL Listed outlets. The switch consists of a simple steel enclosure, main breaker with shunt trip, outlets and non-replaceable phase indicator lights.

Features

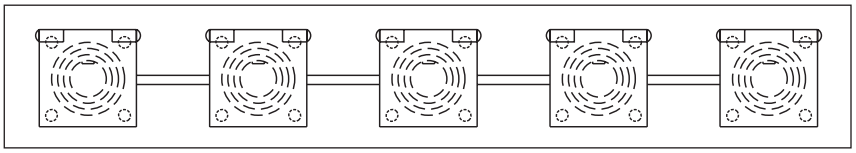
- ✔ *Steel enclosure*
- ✔ *Connection chamber for tie-ins*
- ✔ *65,000 AC Main breaker*
- ✔ *Cam, SafeCam™, Posi-Lok, or Pin & Sleeve*
- ✔ *UL Listed*
- ✔ *120/240V, 120/208V, or 277/480V*
- ✔ *Standard units - 60A, 100A, 200A, 400A*

Output Connections

Company switches can be ordered with various types of output power connections:

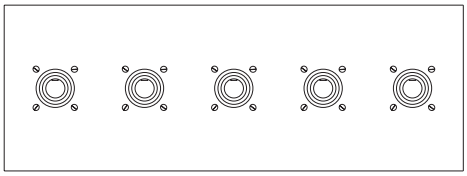
Cam

This single pin device is the industry standard. Union Connector uses Leviton/ECT cams, which are fully compatible with the Cam-Lok E1016 series. Neutral and/or ground devices are normally provided as outlets (female), but can also be provided as inlets (male). Snap-back covers are always included with these cam connectors. On steel enclosures with cam outlets, slots are cut between outlets on the panel. This is done to eliminate historesis, as required by the National Electric Code.



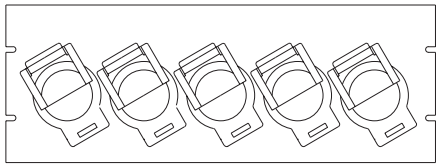
SafeCam™

Using the industry standard cam device, Union Connector's SafeCam™ outlet panel uses proprietary switching technology to trip the main breaker unless all the outlets contain plugs. Ground continuity is also monitored and is required for the breaker to be set in the ON position. SafeCam™ is the safest cam outlet system available.

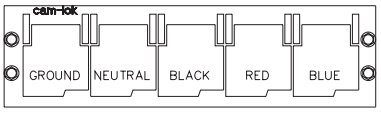


Posi-Lok®

This type of outlet panel requires single pin plug connection and disconnection to be "make ground first / break ground last". A patented system of interlocks prevents access to the outlets unless the proper sequencing is followed. Plugs are keyed to prevent improper connection of ground, neutral and phase conductors. Posi-Loks are available in three ampacity ratings - 200A, 315A and 400A. The 200A. is used for both 100A and 200A applications.



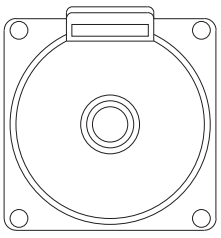
400 A.



200 A.

Pin & Sleeve

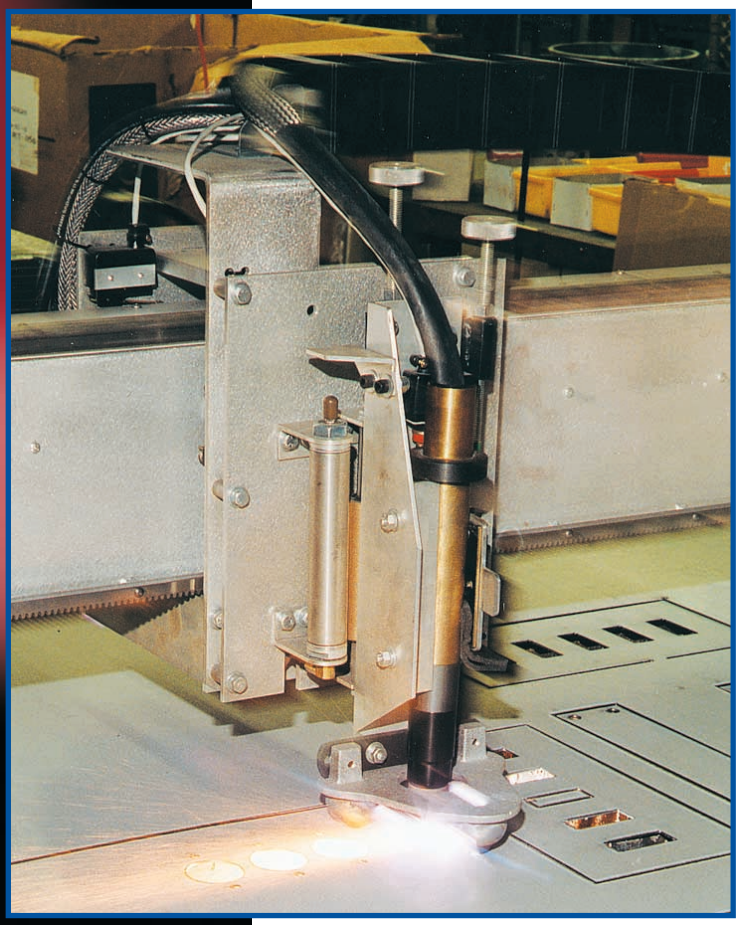
Used in convention centers and on audio equipment, this connector style is based on the IEC 309 standard. The connectors are watertight, high impact plastic, and designed for ease of connection. Ampacity rating is limited to a maximum of 100A.



Bus Bar

The addition of a connection chamber and a shunt-trip mechanism in the main breaker allows a Company Switch to be built with direct tie-in to the load bus from the main breaker. Bus bars are solid copper and sized for the output ampacity of the breaker. Dual rated solderless lugs are provided for attachment of bare end cable that is fed into the connection chamber thru a slot in the bottom of the enclosure. An internal strain relief and a hinged cover for the cable entry slot are provided.

Custom Manufacturing



Union Connector has the experience and manufacturing capability to produce a wide variety of power distribution equipment. Our automated machinery includes CNC mills, plasma cutter, turret presses, router table and brakes. Design and manufacturing processes are fully computerized so repeatability of custom items is guaranteed.

With skilled technicians capable of metalworking, welding, carpentry and wiring, Union Connector can produce the distribution equipment you need.

Contract manufacturing is our specialty, and we can assist you in bringing new products to market. Union Connector is located a short distance from the Melville offices of Underwriter's Laboratories and can expedite the testing of your designs if it is required.

Call our engineering staff for a complete description of our available resources, and for assistance in planning your next project.

UNION CONNECTOR

40 Dale Street • West Babylon, New York 11704 • Tel 631-753-9550 • Fax 631-753-9560
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www.companyswitch.com

Product Bulletin No.: SCF-101B

SafeCam™

Features

- UL Listed
- Accepts industry standard Cam plugs
- Prevents contact with “Hot” cams
- Operates shunt-trip in associated breaker or switch
- Requires all cams to be plugged in before operating
- Available on Union Connector Company Switches
- Sequential connection not required
- Can be retrofitted to some existing Company Switches
- Available with single or dual Neutrals
- Single and three-phase versions available
- Perfect for schools, churches, museums and event centers

Options

- Special labeling
- Parallel sets of outlets
- Isolated Ground
- Re-settable disconnect using a key-operated switch
- Power disconnect when Ground continuity fails
- Audible alarm when disconnect occurs

Specifications

1. The system shall consist of an outlet panel with a quantity of SafeCam™ outlets. These outlets shall accept standard E1016 / Series 16 Cam plugs.
2. SafeCam™ outlets shall contain a means to monitor the insertion and/or removal of a plug into the outlet.
3. A circuit breaker or disconnect switch shall be controlled by the SafeCam™ system monitor. This shall disconnect power to the outlets whenever an outlet is exposed (plug removed).
4. Insertion of a plug into ALL the SafeCam™ outlets shall allow the breaker/disconnect to be reset and energize the outlets.
5. The system shall include “dummy” plugs (non-conducting) for use when a phase leg is not being used.
6. The system shall be ale to monitor Ground continuity.
7. The system shall contain I/O ports for communication with other systems such as fire alarm, stage manager’s controls, etc.
8. The system shall be UL Listed.
9. The system shall be the SafeCam™, as manufactured by Union Connector.

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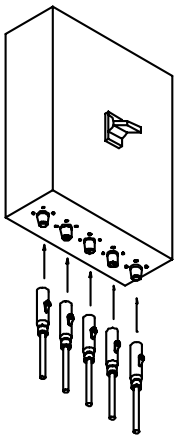
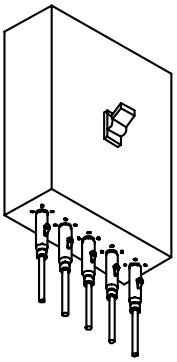
SafeCam™

How It Works - as simple as 1 - 2 - 3



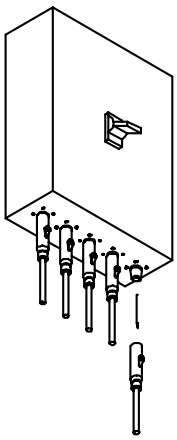
1. Plug the cables into a SafeCam™ panel.

No need to worry about proper sequence of connection. All the outlets are "cold" because the breaker is in the OFF position, SafeCam™ keeps the breaker in the OFF position until ALL the plugs are firmly seated in their outlets. If an outlet is exposed, SafeCam™ trips the breaker and keeps it in the OFF position.



2. Set the breaker to the ON position.

Once all the plugs have been inserted into the proper outlets, energize the system by pushing the breaker handle to the ON position. The outlets are energized, and the cables provide power to the equipment connected to them. As long as the plugs remain in the outlets, the SafeCam™ system will not trip the breaker.



3. Remove any plug when the show is over.

Removing any plug will cause the SafeCam™ system to trip the breaker into the OFF position. The remaining plugs can then be removed also, without fear of making a "hot" disconnect. The breaker is OFF and all outlets are "cold".

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Product Bulletin No.: PBF-101

Company Switch

Features

- UL Listed
- NEMA 1 Steel enclosure
- Powder cost finish
- 65K AIC @ 240V. circuit breakers
- Industry standard Cam type outlets
- Indicator lights
- Wire bending space as required by Code

CSC-2010-CL
200A. Company Switch - SafeCam™ outlets

Options

- Dual Neutral outlets
- Meters - Analog or Digital (Ammeter/Voltmeter)
- Special labeling
- Custom color / finish
- Reverse Ground/Neutral Cams
- Parallel sets of outlets
- SafeCam™ outlets
- Posi-Lok™outlet panels
- Pin & Sleeve (IEC 309) outlets
- Utility and Motor Branch circuits
- Recessed in-wall mounting
- NEMA 3R construction
- Isolated Ground

Standard Models

CATALOG NO.	BREAKER AMPACITY	OUTLET TYPE
CSC-1010-CL	100A.	Cam
CSC-2010-CL	200A.	Cam
CSC-4020-CL	400A.	Cam
CSC-1010-SC	100A.	SafeCam™
CSC-2010-SC	200A.	SafeCam™
CSC-4020-SC	400A.	SafeCam™
CSC-1010-P	100A.	Posi-Lok™
CSC-2010-P	200A.	Posi-Lok™
CSC-4020-P	400A.	Posi-Lok™
CSC-1010-I	60A.	Pin & Sleeve
CSC-2010-I	100A.	Pin & Sleeve

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www.companyswitch.com

Company Switch

Specifications

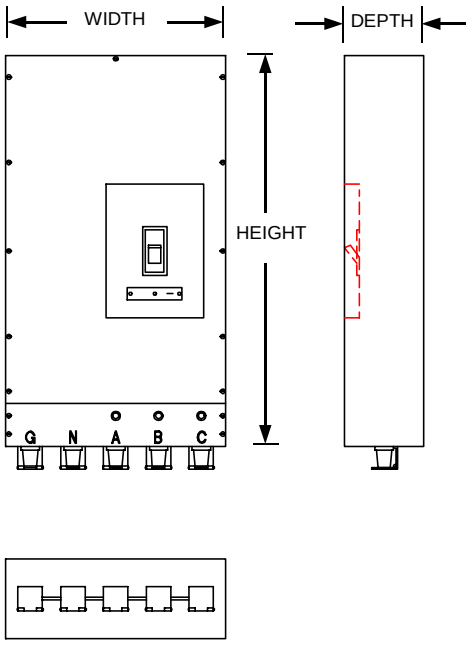
1. Enclosure shall be min. 14 Ga. steel, with dimensions as listed (in inches):

Amps	Height	Width	Depth
60	24	18	6½
100	24	18	6½
200	32	18	6½
400	32	18	6½
400(Posi-Lok™)	32	20	7

2. Finish shall be powder coat blue.
3. The front panel of the enclosure shall contain a recessed panel that exposes the circuit breaker handle. The top of the handle shall be below the plane of the front panel.
4. The rear panel of the enclosure shall contain (4) mounting holes for contractor installation of mounting fasteners.
5. The top panel shall be blank. Conduit entry through this panel shall be the responsibility of the installing contractor.
6. Service connection shall be through conduit to lugs on bus/breaker, sized for copper conductors as listed:

Amps	Phase	Neutral	Ground
60	#14-4/0	#4-600MCM	#14-2/0
100	#14-4/0	#4-600MCM	#14-2/0
200	#6-300MCM	#4-600MCM	#14-2/0
400	(2) 250MCM (1) 500MCM	#4-600MCM	#14-2/0

7. Main breaker shall be a Listed molded case, 3-pole, The breaker shall have a current interrupt rating of 65,000AIC at 240V.
8. Red indicator lights shall be provided to indicate phase voltage available on branch breaker
9. Outlets shall be mounted on the bottom of the enclosure, and shall be UL Listed devices.
10. Company Switches with Posi-Lok™ type outlets shall be provided with the outlet panel only.
11. Company switches with Cam type outlets shall be provided with color-coded outlets and spring-loaded covers.
12. Company switches with Cam or SafeCam®™ type outlets shall contain slots between outlets to eliminate historesis, as required by the NEC.
13. Company switches with Cam or SafeCam™ type outlets shall have a warning label permanently attached to enclosure, as required by NEC Art. 520-53k3. This label shall specify the proper sequence for connection and removal of cable
14. All connections from the Main breaker to single pin outlets shall be by copper bus. Connections to Pin & Sleeve devices shall be copper wire.
15. Company switches shall be rated suitable for use as Service entrance equipment.
16. The Company Switch shall meet or exceed all applicable NEC standards and shall be UL Listed. A label denoting the UL Listing shall be permanently affixed to the unit.
17. The manufacturer shall provide a completely factory assembled, wired and tested Company Switch.
18. The Company Switch shall be a CSC type, as manufactured by Union Connector Co., Inc.



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Product Bulletin No.: PBF-201

Company Switch w/Connection Chamber

Features

- UL Listed
- NEMA 1 Steel enclosure
- Powder cost finish
- 65K AIC @ 240V. circuit breakers
- Industry standard Cam type outlets
- Connection chamber for direct-to-bus connection
- Shunt trip protection of connection chamber
- Integral strain relief in connection chamber
- Indicator lights
- Wire bending space as required by Code

CSC-8000-SP
800A. Company Switch - Connection Chamber only

Options

- Dual Neutral outlets
- Meters - Analog or Digital (Ammeter/Voltmeter)
- Special labeling
- Custom color / finish
- Reverse Ground/Neutral Cams
- Parallel sets of outlets
- SafeCam™ outlets
- Posi-Lok™outlet panels
- Pin & Sleeve (IEC 309) outlets
- Utility and Motor Branch circuits
- Recessed in-wall mounting
- NEMA 3R construction
- Isolated Ground

Standard Models

CATALOG NO.	BREAKER AMPACITY	OUTLET TYPE
CSC-1010-C/SP	100A.	Cam
CSC-2010-C/SP	200A.	Cam
CSC-4020-C/SP	400A.	Cam
CSC-1010-SC/SP	100A.	SafeCam™
CSC-2010-SC/SP	200A.	SafeCam™
CSC-4020-SC/SP	400A.	SafeCam™
CSC-1010-P/SP	100A.	Posi-Lok™
CSC-2010-P/SP	200A.	Posi-Lok™
CSC-4020-P/SP	400A.	Posi-Lok™
CSC-6030-SP	600A.	Connection
CSC-8000-SP	800A.	Chamber Only

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www.companyswitch.com

Product Bulletin No.: PBF-201

Company Switch w/Connection Chamber

Specifications

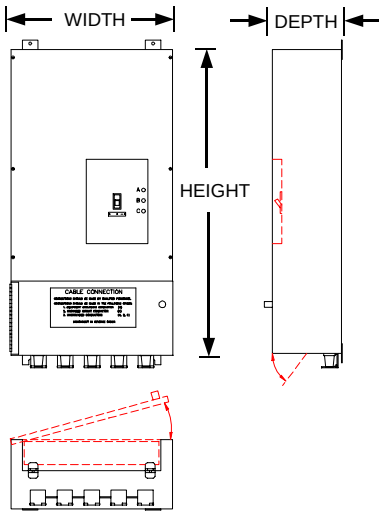
1. Enclosure shall be powder coated blue, .minimum 14 Ga. steel, with dimensions as listed (in inches):

Amps	Height	Width	Depth
60 - 100	32	21	10
200 - 400	42	18	10
600 / 800	48	24	8

2. The enclosure shall contain (4) mounting tabs for surface mounting.
3. The front panel of the enclosure shall contain a re-cessed panel that exposes the circuit breaker handle. The top of the handle shall be below the plane of the front panel.
4. The enclosure shall contain a hinged door to provide access to the output bus-bars. This door shall be secured with an adjustable panel latch. This area is called the connection chamber.
5. A strain relief bar shall be provided inside the connection chamber for securing the load cables.
6. The top panel shall be blank. Conduit entry through this panel shall be the responsibility of the installing contractor.
7. The bottom of the enclosure shall contain a hinged flap for load cable access.
8. Service connection shall be through conduit to lugs on bus/breaker, sized for copper conductors as listed:

Amps	Phase	Neutral	Ground
60-100	#14-4/0	#4-600MCM	#14-2/0
200	#6-300MCM	#4-600MCM	#14-2/0
400	(2) 250MCM (1) 500MCM	#4-600MCM	#14-2/0
600	(2) 400MCM (2) 500MCM	350-800MCM	#6-250MCM
800	(2) 500MCM (2) 750MCM	350-800MCM	#6-250MCM

9. Main breaker shall be a Listed molded case, 3-pole, The breaker shall have a current interrupt rating of 65,000AIC at 240V.
10. The Main breaker shall contain a shunt-trip mecha-nism that will trip the breaker when the micro-switch monitoring the access door to the connection cham-ber is opened.
11. Indicator lights shall be provided to indicate phase voltage available on branch breaker
12. Outlets shall be mounted on the bottom of the enclosure, and shall be UL Listed devices.
13. Load connection bus-bars in the connection chamber shall contain a dual-rated solderless lug for cable connection. Lugs shall accept cable from 4 to 4/0.
14. Company Switches with Posi-Lok™ type outlets shall be provided with the outlet panel only.
15. Company switches with Cam type outlets shall be provided with color-coded outlets and spring-loaded covers.
16. Company switches with Cam or SafeCam®™ type outlets shall contain slots between outlets to eliminate historesis, as required by the NEC.
17. Company switches with Cam or SafeCam™ type outlets shall have a warning label permanently at-tached to enclosure, as required by NEC Art. 520-53k3. This label shall specify the proper sequence for connection and removal of cable
18. All connections from the Main breaker to single pin outlets shall be by copper bus. Connections to Pin & Sleeve devices shall be copper wire.
19. Company switches shall be rated suitable for use as Service entrance equipment.
20. The Company Switch shall meet or exceed all applicable NEC standards and shall be UL Listed. A label denoting the UL Listing shall be permanently affixed to the unit.
21. The manufacturer shall provide a completely factory assembled, wired and tested Company Switch.
22. The Company Switch shall be a CSC/SP type, as manufactured by Union Connector Co., Inc.



40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
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www.companyswitch.com

Product Bulletin No.: PBF-251

PBS Company Switch w/Connection Chamber

Features

- UL Listed
- NEMA 1 Steel enclosure
- Powder cost finish
- 65K AIC @ 240V. circuit breakers
- Industry standard Cam type outlets
- Connection chamber for direct-to-bus connection
- Shunt trip protection of connection chamber
- Integral strain relief in connection chamber
- Indicator lights
- Wire bending space as required by Code

PBS-M4020W-C/SP
400A. Company Switch - Cams and Connection Chamber

Options

- Dual Neutral outlets
- Meters - Analog or Digital (Ammeter/Voltmeter)
- Special labeling
- Custom color / finish
- Reverse Ground/Neutral Cams
- Parallel sets of outlets
- SafeCam™ outlets
- Posi-Lok™outlet panels
- Pin & Sleeve (IEC 309) outlets
- Utility and Motor Branch circuits
- NEMA 3R construction
- Isolated Ground

Standard Models

CATALOG NO.	BREAKER AMPACITY	OUTLET TYPE
PBS-M1010W-C/SP	100A.	Cam
PBS-M2010W-C/SP	200A.	Cam
PBS-M4020W-C/SP	400A.	Cam
PBS-M1010W-SC/SP	100A.	SafeCam™
PBS-M2010W-SC/SP	200A.	SafeCam™
PBS-M4020W-SC/SP	400A.	SafeCam™
PBS-M1010W-P/SP	100A.	Posi-Lok™
PBS-M2010W-P/SP	200A.	Posi-Lok™
PBS-M4020W-P/SP	400A.	Posi-Lok™
PBS-M0610W-I/SP	60A.	Pin & Sleeve
PBS-M1010W-I/SP	100A.	Pin & Sleeve

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Product Bulletin No.: PBF-251

PBS Company Switch w/Connection Chamber

Specifications

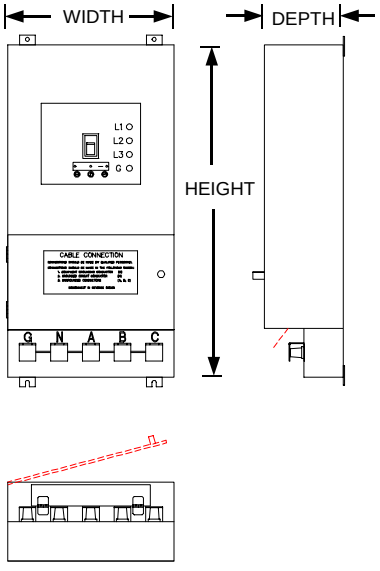
1. Enclosure shall be powder coated blue, .minimum 14 Ga. steel, with dimensions as listed (in inches):

Amps	Height	Width	Depth
60 - 200	40 ½	21	10
400	57	28	12

2. The enclosure shall consist of (2) sections, factory assembled with (4) mounting tabs for surface mounting.
3. The front panel of the enclosure shall contain a recessed panel that exposes the circuit breaker handle. The top of the handle shall be below the plane of the front panel.
4. The enclosure shall contain a hinged door to provide access to the output bus-bars. This door shall be secured with an adjustable panel latch. This area is called the connection chamber.
5. A strain relief bar shall be provided inside the connection chamber for securing the load cables.
6. The top panel shall be blank. Conduit entry through this panel shall be the responsibility of the installing contractor.
7. The bottom of the enclosure shall contain a hinged flap for load cable access.
8. Service connection shall be through conduit to lugs on bus/breaker, sized for copper conductors as listed:

Amps	Phase	Neutral	Ground
60-100	#14-4/0	#4-600MCM	#14-2/0
200	#6-300MCM	#4-600MCM	#14-2/0
400	(2) 250MCM (1) 500MCM	#4-600MCM	#14-2/0

9. Main breaker shall be a Listed molded case, 3-pole, The breaker shall have a current interrupt rating of 65,000AIC at 240V.
10. The Main breaker shall contain a shunt-trip mechanism that will trip the breaker when the micro-switch monitoring the access door to the connection chamber is opened.
11. Replaceable type NE-51H neon lamps shall be provided to indicate voltage present on each phase leg, and to indicate ground integrity.
12. Outlets shall be mounted on the bottom section of the enclosure, and shall be UL Listed devices.
13. Load connection bus-bars in the connection chamber shall contain a dual-rated solderless lug for cable connection. Lugs shall accept cable from 4 to 4/0.
14. Company Switches with Posi-Lok™ type outlets shall be provided with a set of male plugs..
15. Company switches with Cam type outlets shall be provided with color-coded outlets and spring-loaded covers.
16. Company switches with Cam or SafeCam®™ type outlets shall contain slots between outlets to eliminate historesis, as required by the NEC.
17. Company switches with Cam or SafeCam™ type outlets shall have a warning label permanently attached to enclosure, as required by NEC Art. 520-53k3. This label shall specify the proper sequence for connection and removal of cable
18. All connections from the Main breaker to single pin outlets shall be by copper bus. Connections to Pin & Sleeve devices shall be copper wire.
19. Company switches shall be rated suitable for use as Service entrance equipment.
20. The Company Switch shall meet or exceed all applicable NEC standards and shall be UL Listed. A label denoting the UL Listing shall be permanently affixed to the unit.
21. The manufacturer shall provide a completely factory assembled, wired and tested Company Switch.
22. The Company Switch shall be a PBS/SP type, as manufactured by Union Connector Co., Inc.



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Product Bulletin No.: PBF-301

Dual Breaker Company Switch

Features

- UL Listed
- NEMA 1 Steel enclosure
- Powder cost finish
- Line feed to terminals on copper bus or MAIN breaker
- 65K AIC @ 240V. circuit breakers
- Industry standard Cam type outlets
- Indicator lights
- Wire bending space as required by Code
- Built to customer requirements

Options

- Main breaker in addition to Branch breakers
- Other Branch breaker combinations available
- Meters - Analog or Digital (Ammeter/Voltmeter)
- Special labeling
- Reverse Ground/Neutral Cams
- Parallel sets of outlets
- SafeCam® outlets
- Posi-Lok® outlet panels
- Utility and Motor Branch circuits
- NEMA 3R construction
- Isolated Ground

CSDC-60B4121-SC
Custom 600A. Dual Breaker Company Switch
600A. Bus, (1) 400A., (1) 100A. Branch with SafeCam® Outlets

Standard Models

CATALOG NO.	FEED AMPACITY	FEED TYPE	BREAKERS Main	Branch 1	Branch 2
CSDC-20B21-CL	200A.	BUS	——	100A.	100A.
CSDC-2021-CL	200A.	MAIN	200A	100A.	100A.
CSDC-40B22-CL	400A.	BUS	——	200A.	200A.
CSDC-4022-CL	400A.	MAIN	400A	200A.	200A.
CSDC-60B4121-CL	600A.	BUS	——	400A.	200A.
CSDC-604121-CL	600A.	MAIN.	600A.	400A.	200A.
CSDC-80B42-CL	800A.	BUS	——	400A.	400A.
CSDC-8042-CL	800A.	800A.	800A.	400A.	400A.

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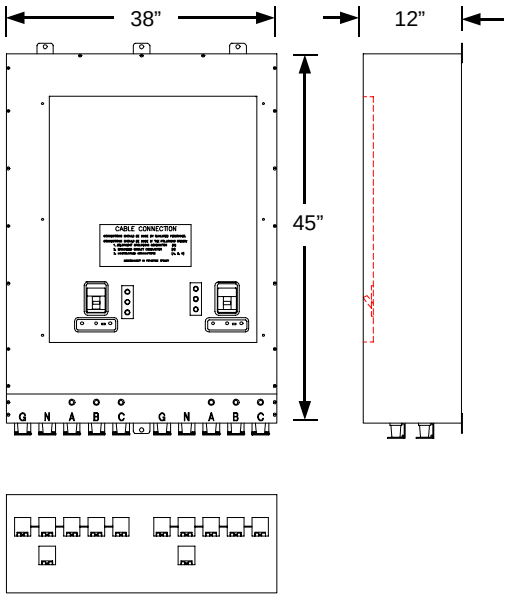
Product Bulletin No.: PBF-301

Dual Breaker Company Switch

Specifications

1. Enclosure shall be min. 14 Ga. Steel. An optional wireway may be mounted to the top of the enclosure when additional wire-bending space is required for feed wiring.
2. Finish shall be powder coat medium blue.
3. Enclosure shall be provided with tabs for surface wall mounting
4. A warning label shall be permanently attached to enclosure, as required by NEC Art. 520-53k3. This label shall specify the proper sequence for connection and removal of cable
5. Feed (Line) entrance shall be via conduit through the top of the enclosure to lugs on Main Breaker or Main Bus.
6. Feed shall terminate to either:
   a. Terminals on Main Bus in units without a Main breaker
   b. Terminals on Main breaker in units provided with a Main breaker.
7. Main Bus shall be copper bar, sized .25 sq. in. in cross-section per 1,000A.
8. Main breaker shall be a molded case Cutler-Hammer, 3-pole, Series C, rated 65K AIC at 240V..
9. Branch breakers shall be molded case Cutler-Hammer, 3-pole, Series C. with a shunt-trip, rated 65K AIC at 240V..
10. Red indicator lights shall be provided to indicate phase voltage available on branch breaker
11. The Neutral bus shall be rated at 200%.
12. Outlets shall be standard Series 16 Cam type devices, mounted on the bottom of the enclosure. Outlets shall be color-coded; Green (Ground), White (Neutral), Black (Phase A), Red (Phase B), Blue (Phase C).
13. Color-coded snap-back covers shall be provided for each outlet.
14. One (1) set of (6) outlets shall be provided for each branch breaker.
15. The steel outlet panel shall contain slots between outlets to eliminate historesis, as required by the NEC.
16. All connections from the Main bus or breaker to the Branch breakers and to the outlets shall be by copper bus.
17. Units with Main breakers shall be Listed for use as Service entrance equipment
18. The company switch shall be UL Listed.



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www.companyswitch.com

Product Bulletin No.: PBF-401

Company Switch Main & Dual Branch Breakers

Features

- UL Listed
- NEMA 1 Steel enclosure
- Powder cost finish
- Line feed to terminals on copper bus or MAIN breaker
- 65K AIC @ 240V. circuit breakers
- Industry standard Cam type outlets
- Shunt-trip protected direct bus connection chamber
- Indicator lights
- Wire bending space as required by Code
- Built to customer requirements

CSDC-8042-CSP
800A. Main, (2) 400A. Branch

Options

- Main breaker in addition to Branch breakers
- Other Branch breaker combinations available
- Meters - Analog or Digital (Ammeter/Voltmeter)
- Special labeling
- Reverse Ground/Neutral Cams
- Parallel sets of outlets
- SafeCam® outlets
- Posi-Lok® outlet panels
- Utility and Motor Branch circuits
- NEMA 3R construction
- Isolated Ground

Standard Models

CATALOG NO.	FEED AMPACITY	FEED TYPE	BREAKERS Main	Branch 1	Branch 2
CSDC-20B21-CSP	200A.	BUS	——	100A.	100A.
CSDC-2021-CSP	200A.	MAIN	400A	100A.	100A.
CSDC-40B22-CSP	400A.	BUS	——	200A.	200A.
CSDC-4022-CSP	400A.	MAIN	400A	200A.	200A.
CSDC-60B4121-CSP	600A.	BUS	——	400A.	200A.
CSDC-604121-CSP	600A.	MAIN.	600A.	400A.	200A.
CSDC-80B42-CSP	800A.	BUS	——	400A.	400A.
CSDC-8042-CSP	800A.	800A.	800A.	400A.	400A.

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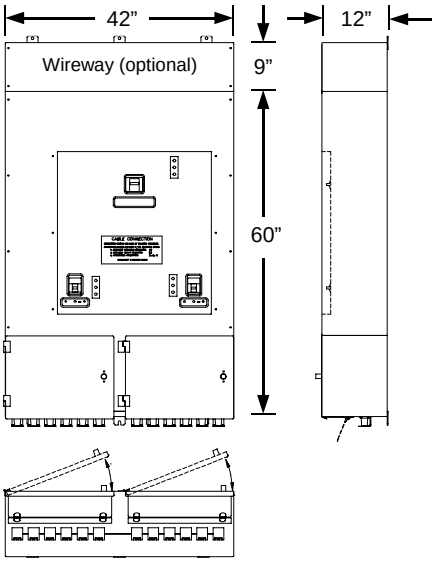
Product Bulletin No.: PBF-401

Company Switch Main & Dual Branch Breakers

Specifications

1. Enclosure shall be min. 14 Ga. Steel. An optional wireway may be mounted to the top of the enclosure when additional wire-bending space is required for feed wiring.
2. Finish shall be powder coat medium blue.
3. Enclosure shall be provided with tabs for surface wall mounting.
4. Spring-loaded hinged doors shall be provided on the bottom of the enclosure for cable entrance to the bus connection chamber.
5. Hinged doors on the front of the enclosure shall be provided for qualified personnel access to the bus connection chamber. These doors shall have a lip on the bottom edge to secure the cable entry door when the connection chamber is not being used.
6. Adjustable strain relief bars shall be provided in the connection chambers.
7. A warning label shall be permanently attached to enclosure, as required by NEC Art. 520-53k3. This label shall specify the proper sequence for connection and removal of cable connectors.
8. Feed (Line) entrance shall be via conduit through the top of the enclosure to lugs on Main Breaker or Main Bus.
9. Feed shall terminate to either:
   a. Terminals on Main Bus in units without a Main breaker
   b. Terminals on Main breaker in units provided with a Main breaker.
10. Main Bus shall be copper bar, sized .25 sq. in. in cross-section per 1,000A.
11. Main breaker shall be a molded case Cutler-Hammer, 3-pole, Series C, rated 65K AIC at 240V.
12. Branch breakers shall be molded case Cutler-Hammer, 3-pole, Series C. with a shunt-trip, rated 65K AIC at 240V.
13. Red indicator lights shall be provided to indicate phase voltage available on branch breaker.
14. Each bus connection chamber shall contain a limit switch. Opening a connection chamber door shall activate the shunt trip in the associated branch breaker and trip the breaker to the OFF position.
15. The Neutral bus shall be rated at 200%.
16. The connection chamber shall contain copper bus with dual-rated solderless lugs for connection of bare-end portable cable. Lugs shall be sized to accept up to (2) 4/0 cables.
17. Outlets shall be standard Series 16 Cam type devices, mounted on the bottom of the enclosure. Outlets shall be color-coded; Green (Ground), White (Neutral), Black (Phase A), Red (Phase B), Blue (Phase C).
18. Color-coded snap-back covers shall be provided for each outlet.
19. One (1) set of (6) outlets shall be provided for each branch breaker.
20. The steel outlet panel shall contain slots between outlets to eliminate historesis, as required by the NEC.
21. All connections from the Main bus or breaker to the Branch breakers and to the outlets shall be by copper bus.
22. Units with Main breakers shall be Listed for use as Service entrance equipment.
23. The company switch shall be UL Listed.



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Product Bulletin No.: PBF-601

Outdoor Enclosures for Company Switches

Features

- UL Listed NEMA 3R outer enclosure
- Galvanized steel construction
- Company switch is completely enclosed inside the NEMA 3R enclosure
- Lockable trapdoor on bottom for cable access
- Protection from weather and vandalism
- Units available to accept ALL company switches manufactured by Union Connector
- Powder coated for long lasting finish
- Company Switch is factory installed inside NEMA 3R

Options

- NEMA 4X outer enclosure
- Stainless steel construction
- Dual doors
- Recessed mount design
- Floor / Pad mounting
- Special labeling
- Custom color / finish

NEMA 3R enclosure containing a 400A. Company Switch outside the Orange County Convention Center in Orlando, FL.
The 400A. Company Switch is completely enclosed and protected from weather and vandalism. The cable entry trapdoor on the bottom of the enclosure is closed and locked

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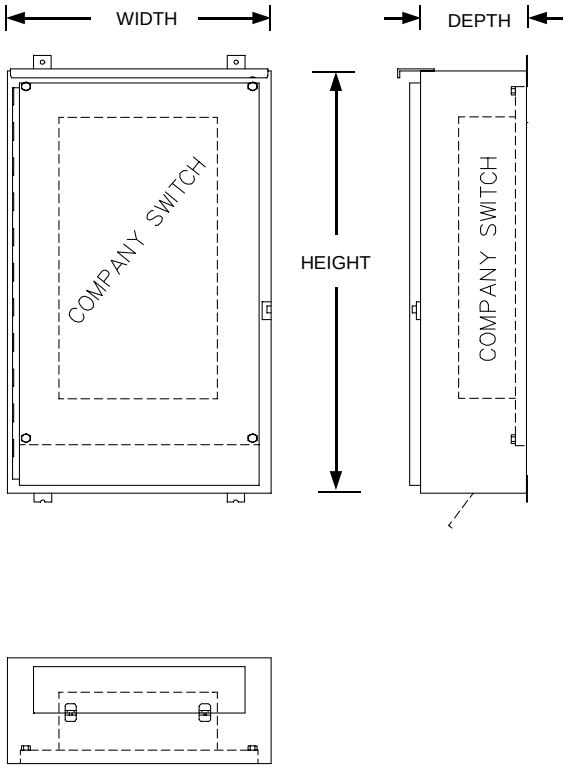
Outdoor Enclosures for Company Switches

Specifications

1. Enclosure shall be a UL Listed NEMA 3R, fabricated of galvanized steel .
2. Finish shall be ASA 61 Gray powder coat.
3. The enclosure shall contain (4) mounting tabs for surface mounting.
4. Dimensions for standard units shall be sized to accept standard Union Connector company switches as indicated:

Company Switch		NEMA 3R		
Type	Ampacity	Height	Width	Depth
CSC	60-100	36	24	10
CSC	200-400	42	24	10
CSC/SP	60-100	48	30	12
CSC/SP	200-400	54	30	14
CSC/SP	600	54	30	12
PBS/SP	60-200	48	30	12
PBS/SP	400	64	34	14

5. A drip shield shall be provided above the door opening.
6. The enclosure shall have a hinged front door and a handle able to accept a padlock.
7. The bottom of the enclosure shall contain a hinged trapdoor for entry of portable cable. The trapdoor shall be secured by a latch accessible only from inside the enclosure.
8. The Company Switch shall be factory installed inside the NEMA 3R enclosure.



Power Distribution Solutions

An Outdoor Power Center built for the Staples Center:

The enclosure is a 48” x 48” x 36” NEMA 3R double door cabinet with a fluorescent worklight.

Feed to the enclosure is 1200A. 3-phase, 277/480V. that enters the cabinet from below. A transformer mounted in the enclosure steps the voltage down to 120/208V and feeds the outlet panel.

Unit contains

- (1) 60A. Branch 3–pole breaker
- (2) 50A. Branch 2-pole breakers
- (10) 20A. Branch 1-pole breakers
- (2) 60A. 3-pole contactors

Output is:

- 60A., 120/208V. Pin & Sleeve
- (3) 50A., 125/250V. non-NEMA Locking:
- (9) 20A., 125V. GFCI duplex:
- (1) 20A., 125V. duplex.

An Outdoor Power Center built for the Staples Center:

The enclosure is a 72” x 72” x 36” NEMA 3R double door cabinet with a fluorescent worklight and cable access doors.

Feed to the enclosure is 1200A. 3-phase, 120/208V. that enters the cabinet from below and is distributed to the disconnects by copper busbars.

Unit contains (4) 200A. fused disconnects that feed the outlet panels.

Output is:

- (4) sets of 200A., 120/208V. cams
- (2) 60A., 120/208V. Pin & Sleeve
- (6) 50A., 125/250V. non-NEMA Locking
- (9) 20A., 125V. GFCI duplex
- (1) 20A., 125V. duplex.

Cam outlets are protected by 200A. fuses in the disconnects. The other outlets are protected by branch-rated circuit breakers

Power Distribution Solutions

A Company Switch built for New Memphis Arena:

The enclosure is a 33” x 60” x 12” NEMA 1 cabinet with shunt-trip protected connection chamber for bare-end cable connection chamber.

Feed to the enclosure is 400A. 3-phase, 120/208V. that enters the cabinet from below.

Unit contains:

- (1) 400A. Main 3–pole breaker
- (2) 200A. Branch 3-pole breakers
- (2) 60A. Branch 3-pole breakers
- (2) 60A. 3-pole contactors
- Analog ammeter with phase selector switch.

Output is:

- (2) sets of 200A., 120/208V. cams
- (2) 60A., 120/208V. Pin & Sleeve.

A Power Center built for the New Memphis Arena:

The enclosure is a 90” x 51” x 24” freestanding NEMA 1 cabinet.

Feed to the enclosure is 1000A. 3-phase, 120/208V.. that enters the cabinet from below and is connected to lugs on the Main Breaker.

Unit contains:

- (1) 1000A. Main 3–pole breaker
- (6) 200A. Branch 3-pole breakers
- (5) 30A. Branch 1-pole breakers
- (6) 20A. Branch 1-pole breakers

Output is:

- (6) sets of 200A., 120/208V. cams
- (5) 30A., 125V. L5-30
- (9) 20A., 125V. GFCI duplex

Power Distribution Solutions

A Power Center built for the Colorado Convention Center Ballroom:

The enclosure is a 60” x 50” x 9” NEMA 1 cabinet

Dual feed to the enclosure is 800A. 3-phase, 120/208V. and 200A., 3-phase, 277/480V. The enclosure has voltage barriers to segregate feeds from different transformers.

Unit contains Boltswitch type fused pullout switches:

- (1) 400A. 3–pole with (3) 400A./ 300V fuses
- (2) 200A. 3–pole with (3) 200A./ 300V fuses
- (1) 200A. 3–pole with (3)600V fuses 200A./

Output is:

- (1) set of 400A., 120/208V. cams
- (2) sets of 200A., 120/208V. cams
- (1) set of 200A., 277/480. cams

A Power Center built for the Broomfield Colorado Convention Center:

The enclosure is a 60” x 50” x 9” NEMA 1 cabinet .

Feed to the enclosure is 1200A. 3-phase, 120/208V. that enters the cabinet from below and is distributed to the disconnects by copper busbars.

Unit contains:

- (2) 400A. Branch 3–pole breakers
- (1) 200A. Branch 3-pole breaker
- (1) 100A. Branch 3-pole breaker

Output is:

- (2) sets of 400A., 120/208V. cams
- (1) set of 200A., 120/208V. cams
- (1) set of 100A., 120/208V. cams

Power Distribution Solutions

A Power Center built for a Community Theatre:

The enclosure is a 60” x 28” x 14” NEMA 1 cabinet

Feed to the enclosure is 800A. 3-phase, 120/208V.

Unit contains a double-break rotary blade type fused safety switch. Operating handle prevents inadvertent opening of the fuse access chamber door during operation.

- (1) 400A. 3–pole switch with (3) 400A./ 300V fuses

Output is:

- (1) set of 400A., 120/208V. cams

A Fused Company Switch built for the Qwest Center:

The enclosure is a 42” x 21” x 12” NEMA 1 cabinet .

Feed to the enclosure is 400A. 3-phase, 120/208V.

Unit contains a double-break rotary blade type fused safety switch. Operating handle prevents inadvertent opening of the fuse access chamber door during operation. Cam outlets are mounted inside a padlockable chamber that provides for tamper-proofed operation. A hinged trapdoor on the bottom of the chamber allow for cable entry.

- (1) 400A. 3–pole switch with (3) 400A./ 300V fuses

Output is:

- (2) sets of 400A., 120/208V. cams

Power Distribution Solutions

An Recessed Outdoor Company Switch built for the Skyline Convention Center:

The enclosure is a 30” x 18” x 6” NEMA 1 recessed cabinet. The dimensions were restrained by the physical location in which the unit was mounted.

Feed to the enclosure is 200A. 3-phase, 120/208V.

Unit contains:

- (1) 200A. Branch 3-pole breaker

Output is:

- (1) set of 200A., 120/208V. cams

A Recessed Company Switch built for the University of Vermont Student Center:

The enclosure is a 21” x 24” x 7” NEMA 1 recessed cabinet . Locking doors are provided over the circuit breaker handles and the cam outlets.

Feed to the enclosure is 200A. 3-phase, 120/208V.

Unit contains:

- (1) 200A. Branch 3-pole breaker

Output is:

- (1) set of 200A., 120/208V. cams

Power Distribution Solutions

An Outdoor Power Center built for the Fulton Ferry State Park:

The enclosure is a 60” x 6” x 16” NEMA 3R single door cabinet with a fluorescent worklight.

Feed to the enclosure is 400A. 3-phase, 120/208V. that enters the cabinet from the side.

Unit contains

- (1) 400A. Branch 3–pole breaker in a Company Switch
- (1) 60A. 3–pole Safety Switch
- (4) 20A. Branch 1-pole breakers

Output is:

- (1) set of 400A., 120/208V. cams
- (4) 20A., 125V. duplex.

An Outdoor Power Center built for the John Paul Jones Arena at the University of Virginia

The enclosure is a 45” x 39” x 25” NEMA 3R double door cabinet with rack rails for signal gear on the reverse side of the power section.

Feed to the enclosure is 400A. 3-phase, 120/208V. that enters the cabinet from below. A hinged access door is provided below the main door for portable cable entrance to the connection area.

Unit contains

- (2) 100A. Branch 3–pole breakers
- (2) 50A. Branch 2-pole breakers
- (2) 30A. Branch 2-pole breakers
- (2) 20A. Branch 1-pole breakers

Output is:

- (2) 100A., 120/208V. Pin & Sleeve
- (2) 50A., 250V. 6-50
- (2) 30A., 250V. L6-30
- (2) 20A., 125V. duplex.

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QRF-CS1: Quote Request Form

Custom Company Switch

Name: _____ **e-mail:** _____

Company: _____ **Phone:** _____ **Fax:** _____

Project: _____ **Request Date:** _____ **Release Date :** _____

Main Breaker

Poles	Ampacity	AIC Rating	Voltage Rating
___ 2	__ 60A.	__ 65K @ 240V.	___ 120/208V.
___ 3	__ 100A.	__ 100K @ 240V.	___ 277/480V.
	__ 200A.	__ 65K @ 480V.	
	__ 400A.	__ 100K @ 480V.	

Branch Breakers

	Qty.	Ampacity	AIC Rating
#1	_____	_____	_____
#2	_____	_____	_____
#3	_____	_____	_____
#4	_____	_____	_____

Connection Chamber

___ **YES** ___ **NO**

Main Outlets

CAM	SafeCam™	Posi-Lok™	Pin & Sleeve
__ (5) devices	__ (5) devices	_ (5) devices	__ 60A.
__ (6) devices (dual Neutral)	__ (6) devices (dual Neutral)	_ (6) devices (dual Neutral)	__ 100A.
__ (7) devices (dual Neut&Gnd)	__ (7) devices (dual Neut&Gnd)		
__ Reverse Neutral & Ground			

Branch Outlets

	Qty.	Type	Rating
#1	_____	_____	_____
#2	_____	_____	_____
#3	_____	_____	_____
#4	_____	_____	_____

Isolated Ground

___ Main Outlets ___ Branch Outlets

Enclosure

___ NEMA 1
___ NEMA 3R
___ NEMA 4X
___ Wall mount
___ Floor Mount
___ Recessed

Meter(s)

___ Digital ____ Ammeter ___ Voltmeter (L-L) __ Multimeter
___ Analog ___ Voltmeter (L-N)
___ Voltmeter (N-G)

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Custom Company Switch

Worksheet

Comments & Notes:

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Product Bulletin No.: DEF-401

Cam Outlet Boxes

Features

- Steel, NEMA Type 1 enclosures
- Available as Surface, or Recessed Mount
- Cams can be mounted on front or bottom of enclosure.
- Locking door on versions with hinged door
- Snap-back covers on versions with exposed Cams
- UL Listed

200COB

Connectors

- Standard Series 16 Cam outlets
- Termination by installing contractor to set screw terminals. No lugging required.

Options

- Reverse Neutral / Ground
- Parallel sets of outlets
- Dual Neutrals
- Custom colors (as shown)
- NEMA 3R enclosures
- Lamicoid engraved circuit numbers

400COB-RC

Specifications

1. Units are UL Listed.
2. Enclosures and panels are 16 Ga. steel, finished black or gray.
3. Ground receptacle is connected to frame with copper conductor and a ground lug is provided for installer.
4. Wiring devices Series 16 Cams, fully compatible with standard E1016 devices.
5. Cams are color-coded; Ground (Green); Neutral (White); Phase A (Black); Phase B (Red) Phase C (Blue).
6. Color-coded snap-back covers shall be used to protect outlets when exposed.
7. Slots shall be provided between Cams as required by N.E.C. to prevent heating by historesis.
8. Wire bending space shal be as required by N.E.C.
9. A warning label denoting correct sequence for connector connection shall be riveted to the enclosure as required by N.E.C. Art. 520-53(K3)

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Cam Outlet Boxes

Catalog Number Ordering Information

Example: 400A. Cam outlet box, Recess Mount, hinged

Catalog No.: 400COB-RC

400 COB - RC

Ampacity
- 200 = up to 200A.
- 400 = up to 400A.

Product (Cam Outlet Box)

Enclosure Style
- (Blank) = Standard surface mount, Cams mounted on bottom
- BH = Surface mount box, Cams recessed on bottom, behind a locking bottom hatch
- FD = Surface mount box, Cams recessed inside box, behind locking front door
- RC = Recessed mount box, Cams recessed inside box, behind locking front door
- 3R = NEMA 3R enclosure, Cams mounted inside, hinged trapdoor for cable access

Custom Versions

Union Connector fabricates enclosures from flat sheet steel and aluminum, using state-of-the-art CNC equipment. We can manufacture custom enclosures to meet specific needs without incurring major design and setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550 ext. 204, or one of your local Union Connector sales reps.

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Product Bulletin No.: DEF-501

Surface Mount Cam Outlet Box

Features

- Steel, NEMA Type 1 enclosures
- Standard Cam type outlets
- Snap-back covers on Cams
- Cams mounted on bottom of enclosure.
- Tabs for easy mounting to wall surface
- UL Listed

Connectors

- Leviton/ECT Series 16 Cam outlets
- Termination by installer to set screw terminals. No lugging required.

Options

- Reverse Neutral / Ground
- Parallel sets of outlets
- Dual Neutrals
- Custom colors
- NEMA 3R enclosures
- Lamicoid engraved circuit numbers

Specifications

1. Unit shall be UL Listed.
2. Enclosure shall be 16 Ga. steel, finished black or gray.
3. Ground receptacle shall be connected to frame with copper conductor and a ground lug shall be provided for installer connection of ground wire.
4. Wiring devices shall be Leviton/ECT Series 16 Cams, fully compatible with standard E1016 devices.
5. Cams shall be color-coded: Ground (Green); Neutral (White); Phase A (Black); Phase B (Red); Phase C (Blue).
6. Cam connectors shall be protected with snap-back covers.
7. Slots shall be provided between Cams as required by N.E.C. to prevent heating by historesis.
8. Wire bending space shall be as required by N.E.C.
9. A warning label denoting correct sequence for connector connection shall be riveted to the enclosure as required by N.E.C. Art. 520-53(K3)

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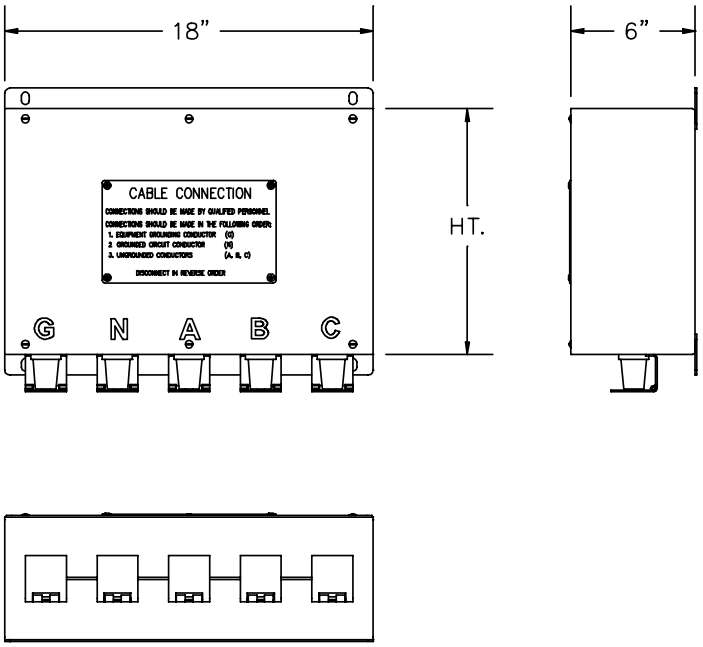
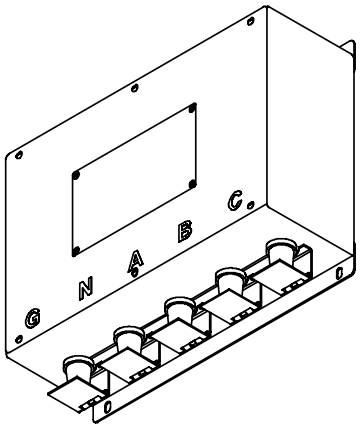
Product Bulletin No.: DEF-501

Surface Mount Cam Outlet Box



Catalog No.	HT.
200COB	14”
400COB	18”



Catalog Number Ordering Information

Example: 400A. Cam outlet box, Surface Mount

Catalog No.: 400COB

400 COB

Ampacity
200 = up to 200A.
400 = up to 400A.

Product (Cam Outlet Box)

Custom Versions

Union Connector fabricates enclosures from flat sheet steel and aluminum, using state-of-the-art CNC equipment. We can manufacture custom enclosures to meet specific needs without incurring major design and setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550 ext. 204, or one of your local Union Connector sales reps.

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Product Bulletin No.: EFP-101

Emergency Feeder Panel

Overview

Emergency Feeder Panels are intended for use as a temporary service connection point between portable power units and the facility service entrance. When normal utility power is interrupted for long periods of time (natural disaster, utility system failure, etc.), it may become necessary to bring in portable generators to augment emergency gen-sets. Connection of these portable power units to building wiring should be through a transfer switch. The safest and easiest way to connect to this switch is through a feeder panel specifically designed for this application.

The Union Connector Emergency Feeder Panel contains Cams for portable cable connection These connectors are standard, inexpensive and familiar to generator operators. The cams are mounted inside a NEMA 3R enclosure with a secure trap-door entry on the bottom of the enclosure. Quick, safe connection of portable cables by qualified personnel is through this trap-door. The front door can be secured with a padlock for further security and the facility can now be safely brought back online.

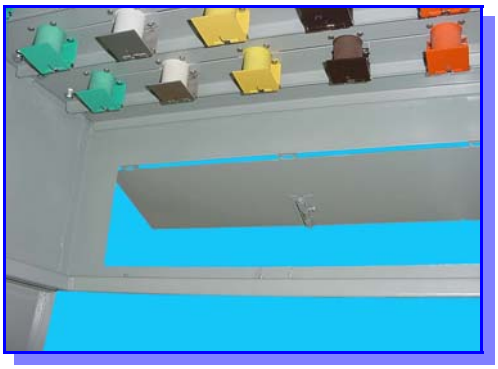
Features

- Steel, powder coated, NEMA Type 3R enclosures
- Latching trap-door for portable cable entry
- 100A. to 2000A.
- Available ratings
  - 1ø 120/240V.
  - 3ø 120/208V.
  - 3ø 277/480V.
- Copper bus with dual-rated lugs for connection to facility wiring
- Standard Series 16 Cam devices
- Cams color-coded per electrical standards
- Cams can be mounted facing forward, facing down or on a 45° angle, as required per application
- Snap-back covers on Cams
- UL Listed

1600A., 277/480V. with forward facing cams

Options

- Reverse Neutral / Ground
- Dual (200%) Neutral
- Recess mount with trim flange
- Floor mount
- Custom colors



Latching trap-door open

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Product Bulletin No.: EFP-101

Emergency Feeder Panel

Catalog Number Ordering Information

Example: 800A. Emergency Feeder Panel - standard Cam connectors

Catalog No.: EFP800

EFP 800 - *

Product (Emergency Feeder Panel)

Ampacity

Options

PL = Posi-Lok cams
RC = Recessed mount box, trim flange around enclosure
N1 = NEMA 1 enclosure, for use indoors

Specifications

1. Enclosures shall be steel, NEMA 3R, finished ASA 61 gray powder-coat.
2. A hinged trap-door shall be provided on the bottom of the enclosure to provide entry for portable feeder cable. The trap-door shall have a latch to secure it in the closed position when not in use.
3. Wiring devices shall be Series 16 Cams, fully compatible with standard E1016 devices.
4. Cams shall be color-coded: Ground (Green); Neutral (White); 120/208V.- Phase A (Black); Phase B (Red) Phase C (Blue); 277/480V.- Phase A (Yellow); Phase B (Brown) Phase C (Orange).
5. (1) complete set of cams shalll be provided for each 400A. of service to be connected.
6. Orientation of cams on panels shall be as required per application.
7. Slots shall be provided between Cams as required by N.E.C. to prevent heating by historesis.
8. Connection to building wiring shall be from dual-rated solderless panelboard lugs that are mounted to copper bus connected to the cam devices.
9. Wire bending space shall be as required by N.E.C.
10. A warning label shall be riveted to the enclosure as required by N.E.C. Art. 520-53(K3)
11. Emergency Feeder Panel shall be UL Listed, and meet N.E.C. and applicable national electrical standards

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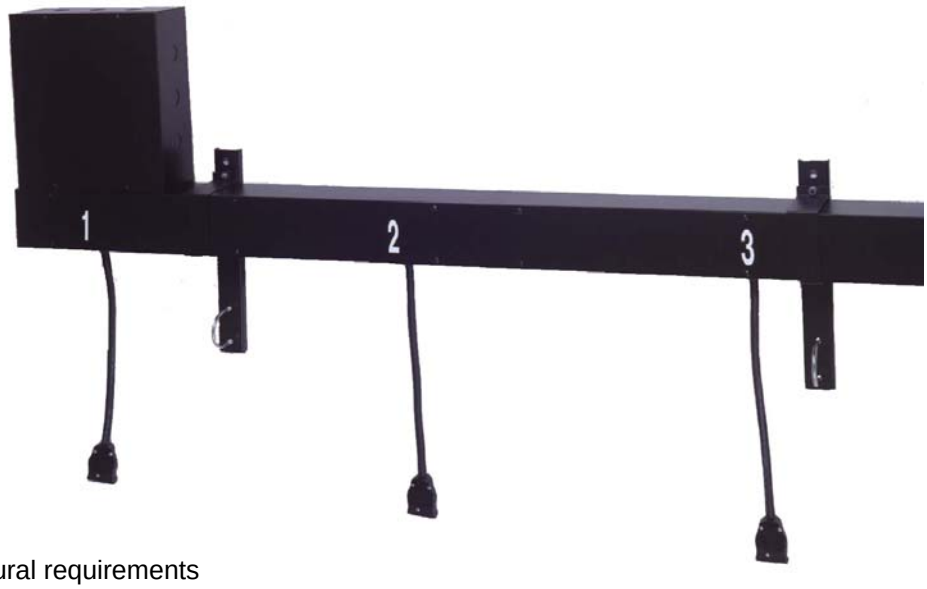
Product Bulletin No.: CSF-101D

Connector Strips

Features

- Steel construction with black powder coat finish
- Completely wired from terminals to outlets with high temperature copper wire
- Complete with hanging hardware
- Die-cut outdoor rated circuit numbers
- Pigtails or panel mount receptacles
- Connector types:
  - Pin
  - Locking
  - U-Ground (Edison)
- UL Listed



Options

- Engraved circuit numbers
- Colors to match architectural requirements
- Unusual shapes (curved, 90° turns, etc.)
- DMX connections and signal wiring

Specifications

1. Connector strip shall be UL Listed.
2. Enclosure shall be 18 Ga. Steel, 5” x 3” in cross-section, finished semi-matte black.
3. Conductor fill shall conform to NEC Article 362-5
4. Conductors shall be minimum 125°C UL Listed copper wire.
5. Flush mount receptacles shall be mounted on the removable front cover.
6. Pigtails shall be 18” SO cable, secured to the enclosure with a nylon strain relief.
7. Strips shall be factory wired from pigtails or receptacles to terminal blocks.
8. Terminal boxes shall be provided on strips with more than six circuits.
9. All wiring devices are identified with 2” high die-cut vinyl characters.
10. Finished strips may be shipped in multiple sections for ease of handling. Installing contractor may have to join and splice sections at the job site.

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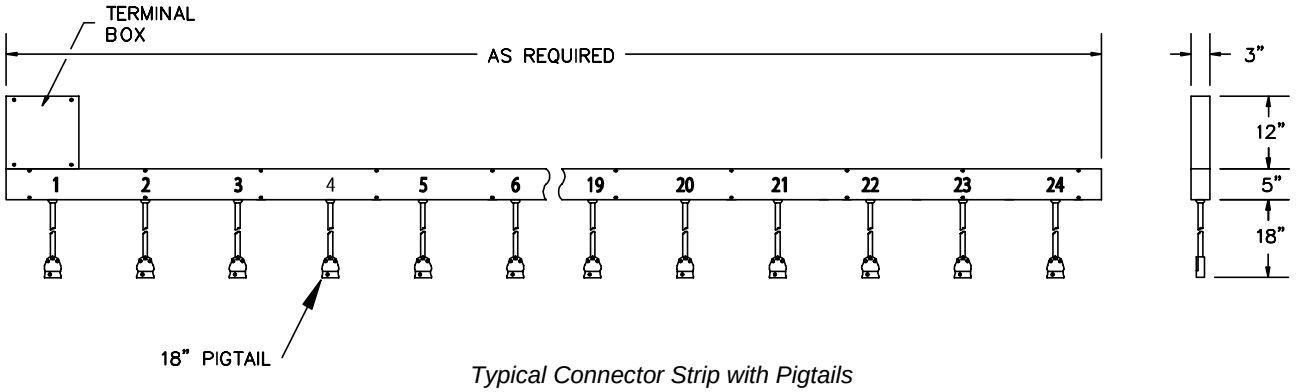
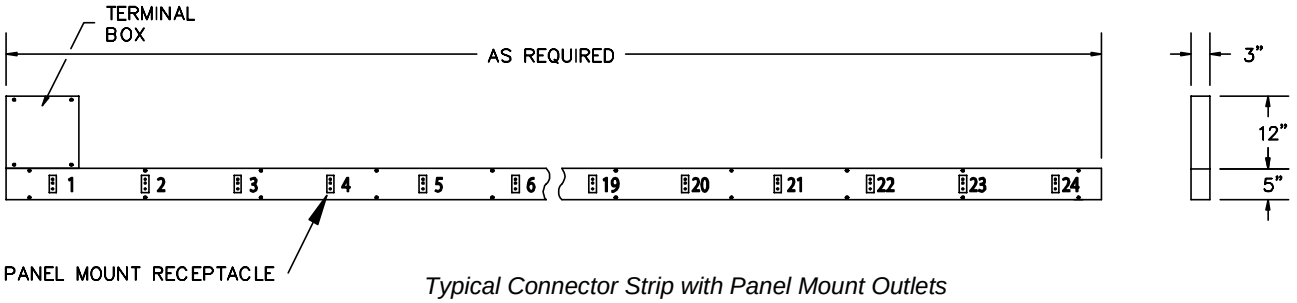
Product Bulletin No.: CSF-101D

Connector Strips



Typical Connector Strip with Pigtails



Typical Connector Strip with Panel Mount Outlets

Catalog Number Ordering Information

Example: 22 ft. connector strip with (14) 20A. Stage Pin pigtails, 18" long and (7) Flush mount 2P&G outlets

Catalog No.: CS22-20PTGP-14

CS 22 - 20 PT GP - 14

CS= Connector Strip

Length in Feet

Ampacity of device

Device mounting type
- PT = Pigtail
- FL = Flush (panel mount outlet)

Wiring device type
- GP = Pin
- GL = Locking (Twist-lock style)
- UG = U-ground (Edison)

Quantity of devices

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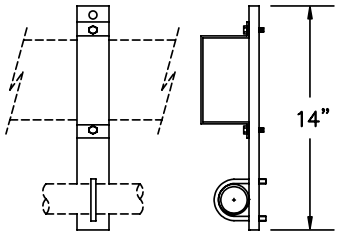
Product Bulletin No.: CSF-103D

Connector Strip Hangers

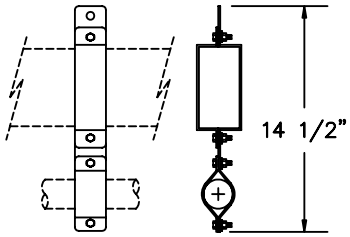
HANGER 14

Standard single pipe theatre type hanger, 14" overall. The connector strip is attached to a 12 Ga. bar with a 2” wide strap of 16 Ga. steel. The hanger is attached to the pipe with a 2” X 5/16” U-bolt.



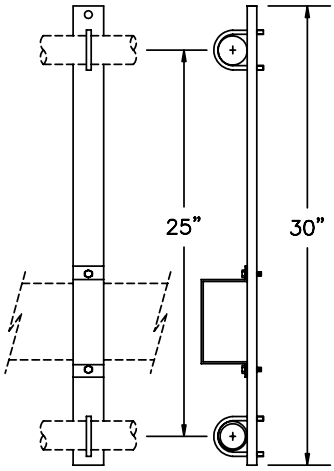
HANGER TV

Standard center hung type hanger. The TV hanger mounts the strip along the centerline of the pipe to which it is attached. The hanger is strapped to pipe with 12 Gauge formed straps.



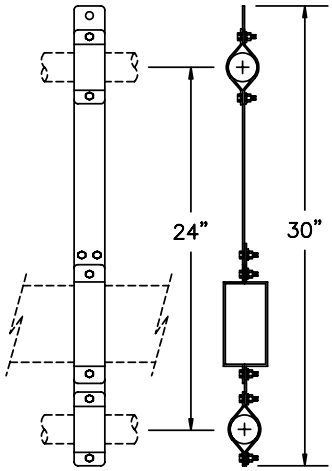
HANGER 30

Standard double pipe theatre type hanger, 30" overall. Similar to an 14” hanger, but the extra length provides room for the connector strip terminal box to fit between two pipes.



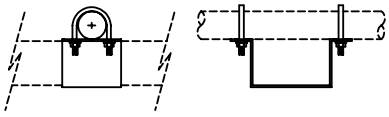
HANGER TV DOUBLE

Center hung type hanger for use between a pair of pipes. The 30” double TV hanger is designed to mount strip in line with pipes to which it is attached. Construction is similar to the TV hanger.



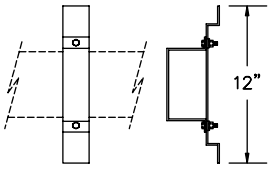
HANGER GRID

Standard hanger for perpendicular mount of strip direct to pipe grid or catwalk . Hanger is secured to pipe with two 2” X 5/16” U-bolts.



HANGER SURFACE

Standard single pipe hanger for mounting strip to wall or ceiling, 12" overall.



Connector Strip Hangers

Hangers are constructed of 12 Gauge cold-rolled steel, and finished the same color as the strips. Typical spacing is one hanger per each 5' of connector strip.

Custom hanger designs are available. Contact Union Connector for details.

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Product Bulletin No.: GJF-101A

Grid Iron Junction Box

Features

- Standard steel NEMA 1 enclosure
- Knockouts for conduit entry
- Molded terminal blocks for #10 - #12 AWG wire
- Ground screw
- UL Listed

Options

- Terminals for larger size wire
- Custom colors
- Permanent die-cut vinyl circuit numbers
- Lamicoid engraved circuit numbers
- Audio/signal terminals with a voltage barrier

Specifications

1. Units are UL Listed.
2. Enclosures and panels are code gauge steel.
3. Finish to be black powder-coat.
4. Terminal blocks are mounted to enclosure with threaded fasteners..
5. Grounding screw provided.

Standard GJB's

CATALOG NUMBER	TERMINALS	CIRCUITS	DIMENSIONS
GJB-36	36	18	12" x 12" x 3"
GJB-72	72	36	12" x 18" x 3"
GJB-96	96	48	12" x 24" x 3"
GJB-120	120	60	24" x 24" x 3"

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QRF-CS2: Quote Request Form

Connector Strips and Accessories

Name: _____ **e-mail:** _____

Company: _____ **Phone:** _____ **Fax:** _____

Project: _____ **Request Date:** _____ **Release Date :** _____

Connector Strip 1 **Description:** _____

Strip(s): **Qty.** ___ **Length** ___ **Feed End** (circle one) Left Center Right

Pigtails: **Qty.** ___ **Length** ___ **Connector** (circle one) Pin Locking U-Ground

Receptacles: **Qty.** ___ **Connector** (circle one) Pin Locking U-Ground

Circuits: **Qty.** ___ **Numbering** _____

Connector Strip 2 **Description:** _____

Strip(s): **Qty.** ___ **Length** ___ **Feed End** (circle one) Left Center Right

Pigtails: **Qty.** ___ **Length** ___ **Connector** (circle one) Pin Locking U-Ground

Receptacles: **Qty.** ___ **Connector** (circle one) Pin Locking U-Ground

Circuits: **Qty.** ___ **Numbering** _____

Connector Strip 3 **Description:** _____

Strip(s): **Qty.** ___ **Length** ___ **Feed End** (circle one) Left Center Right

Pigtails: **Qty.** ___ **Length** ___ **Connector** (circle one) Pin Locking U-Ground

Receptacles: **Qty.** ___ **Connector** (circle one) Pin Locking U-Ground

Circuits: **Qty.** ___ **Numbering** _____

Connector Strip 4 **Description:** _____

Strip(s): **Qty.** ___ **Length** ___ **Feed End** (circle one) Left Center Right

Pigtails: **Qty.** ___ **Length** ___ **Connector** (circle one) Pin Locking U-Ground

Receptacles: **Qty.** ___ **Connector** (circle one) Pin Locking U-Ground

Circuits: **Qty.** ___ **Numbering** _____

Cable and Accessories

Multicable: **Qty.** ___ **Length** ___ **No. of Conductors** ___ **Kellems** Yes No **GJB** Yes No

Multicable: **Qty.** ___ **Length** ___ **No. of Conductors** ___ **Kellems** Yes No **GJB** Yes No

Multicable: **Qty.** ___ **Length** ___ **No. of Conductors** ___ **Kellems** Yes No **GJB** Yes No

Multicable: **Qty.** ___ **Length** ___ **No. of Conductors** ___ **Kellems** Yes No **GJB** Yes No

Cable Clamp: **Qty.** ___ **Cable Cradle: Qty.** ___

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Connector Strips and Accessories

Worksheet

Comments & Notes: _____

_____

_____

_____

_____

_____

_____

UNION CONNECTOR
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Ph: 631-753-9550 Fx: 631-753-9560
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Product Bulletin No.: DEF-101A

Outlet / Pigtal Boxes

Spec Quality Outlet Boxes

- Steel, NEMA Type 1
- Available as Surface, Pipe or Recessed Mount
- Permanent die-cut vinyl circuit numbers
- UL Listed

Connectors

- Pin Connectors - 20 - 100A.
- NEMA Locking - 15 - 50A.
- Edison (U-Ground) - 15 - 30A.
- 19-Pin - 20A.

Options

- Clear or colored covers on 20A. Pin connectors.
- “Kellems” type wire mesh cable grips.
- Bussing of multiple outlets as a single circuit
- Custom colors
- NEMA 3R enclosures
- Lamicoid engraved circuit numbers
- Audio/signal connectors with a voltage barrier built into the enclosure .

Specifications

1. Units are UL Listed.
2. Enclosures and panels are 18 Ga. steel, 5”H. x 3”D., finished with black enamel paint.
3. Receptacles are mounted on a removable front panel.
4. Pigtails are S or SO cable, mounted to the bottom of the enclosure and held with a nylon strain relief.
5. Pin connector receptacles are bussed with a common ground.
6. Wiring devices are grounded to panel and enclosure.
7. Pipe mount versions are provided with a pair of U-Bolts sized for 1 1/2” pipe.
8. Recessed mount versions have front panel with 1” overlap on all edges.
9. Circuit numbers are white vinyl die-cut characters.

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Outlet / Pigtal Boxes

Catalog Number Ordering Information

Example: Pipe mount, pigtail box, 12" x 5" x 3", with (4) 20A. 2P&G connectors

Catalog No.: PM20PTGP1253-4

PM 20 PT GP 1253 - 4

Mounting Style
- PM = Pipe
- SM = Surface
- RC = Recessed

Ampacity of connectors
- 20 = 20A.
- 60 = 60A.
- 100 = 100A.

Connector Mounting
- FL = Flush mount receptacle
- PT = Pigtail

Connector Type
- GP = Grounded Pin (2P&G)
- GL = Grounded Locking
- UG = U-Ground (Edison)
- MP = Multi-pin (19-pin)

Size of enclosure
- 653 = 6" L. x 5" H. x 3" D. (1- 3 devices)
- 1253 = 12" L. x 5" H. x 3" D. (4 - 6 devices)
- 1853 = 18" L. x 5" H. x 3" D. (7- 9 devices)
- 2453 = 24" L. x 5" H. x 3" D. (10 - 12 devices)

Quantity of outlets or pigtails

Custom Versions

Union connector fabricates enclosures from flat sheet steel and aluminum, using state-of-the-art CNC equipment. We can manufacture custom enclosures to meet specific needs without incurring major design and setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550 ext. 204, or one of your local Union Connector sales reps.

UNION CONNECTOR
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Product Bulletin No.: FLF-101A

FL Series
Outlet / Inlet Boxes

Economical Outlet Boxes

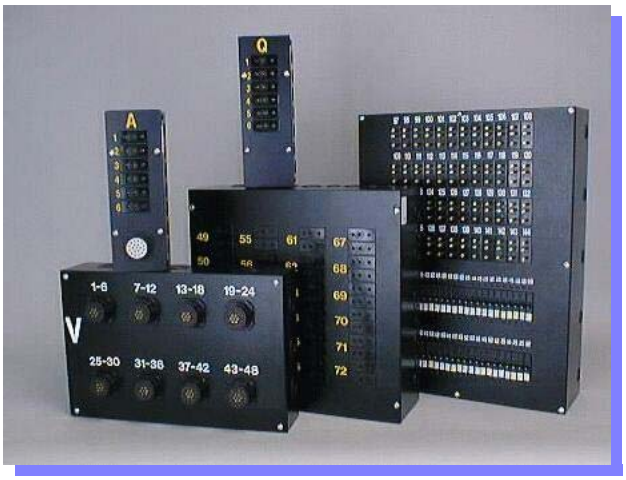
- Use as simple outlet boxes or as part of a “patch” system
- Standard size steel, NEMA Type 1 enclosures
- Standard and custom enclosure sizes
- Common Ground bus
- UL Listed

Connectors

- Pin Connectors - 20 - 100A.
- NEMA Locking - 15 - 50A.
- Edison (U-Ground) - 15 - 30A.
- 19-Pin - 20A.
- Pin & Sleeve - 20—100A.

Options

- Pipe or Recessed Mount
- Bussing of multiple outlets as a single circuit
- Custom colors
- NEMA 3R enclosures
- Permanent die-cut vinyl circuit numbers
- Lamicoid engraved circuit numbers
- Audio/signal connectors with a voltage barrier built into the enclosure .
- Isolated Ground or GFCI outlets



Specifications

1. Units are UL Listed.
2. Enclosures and panels are 18 Ga. steel, finished with black enamel paint.
3. Receptacles are mounted on a removable front panel.
4. Pin connector receptacles are bussed with a common ground.
5. Wiring devices are grounded to panel and enclosure.
6. Recessed mount versions have front panel with 1” overlap on all edges.

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Product Bulletin No.: FLF-101A

FL Series
Outlet / Inlet Boxes

Catalog Number Ordering Information

Example: Surface mount outlet box, 12” x 12” x 3”, with (12) 20A. 2P&G connectors

Catalog No.: 20FLGP12123-12

___ 20 FL GP 12123 - 12 ___

Mounting Style
(Blank) = Surface
PM = Pipe
RC = Recessed

Ampacity of connectors
20 = 20A.
60 = 60A.
100 = 100A.

Series
FL = Flush mount devices

Connector Type
GP = Grounded Pin (2P&G)
GL = Grounded Locking
UG = U-Ground (Edison)
MP = Multi-pin (19-pin)
IEC = Pin & Sleeve (IEC 309)

Size of enclosure
653 = 6” L. x 5” H. x 3” D. (1- 3 devices)

Quantity of outlets or pigtails

Wiring Device
(Blank) = Female
M = Male

Custom Versions

Union connector fabricates enclosures from flat sheet steel and aluminum, using state-of-the-art CNC equipment. We can manufacture custom enclosures to meet specific needs without incurring major design and setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550 ext. 204, or one of your local Union Connector sales reps.

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Product Bulletin No.: PSF-101B

PS Series
Outlet / Inlet Panels

Features

- Standard size steel faceplates for gang or junction boxes
- Custom sized panels in steel or aluminum
- Ground bus
- UL Listed

Connectors

- Pin Connectors - 20 - 100A.
- NEMA Locking - 15 - 50A.
- Edison (U-Ground) - 15 - 30A.
- 19-Pin - 20A.
- Pin & Sleeve - 20—100A.

Options

- Bussing of multiple outlets as a single circuit
- Custom colors
- Permanent die-cut vinyl circuit numbers
- Lamicoid engraved circuit numbers
- Audio/signal connectors with a voltage barrier
- Isolated Ground or GFCI outlets
- Rack mountable (19”)

Specifications

1. Units are UL Listed.
2. Panels shall be painted steel, brushed stainless or anodized aluminum
3. Pin connector receptacles are bussed with a common ground.
4. Wiring devices are grounded to panel.

Custom Versions

Union connector fabricates panels from flat sheet steel and aluminum, using state-of-the-art CNC equipment. We can manufacture custom panels to meet specific needs without incurring major design and setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550 ext. 204, or one of your local Union Connector sales reps.

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Product Bulletin No.: PSF-101B

PS Series
Outlet / Inlet Panels

Catalog Number Ordering Information

Example: Outlet panel, 12" x 4", with (6) 20A. 2P&G connectors

Catalog No.: 20PS124-6

20 PS ___ 124 - 6 ___

Ampacity of connectors
- 20 = 20A.
- 60 = 60A.
- 100 = 100A.

Series
- PS = Panel Series

Connector Type
- (Blank) = Grounded Pin (2P&G)
- GL = Grounded Locking
- UG = U-Ground (Edison)
- MP = Multi-pin (19-pin)
- IEC = Pin & Sleeve (IEC 309)

Size of panel
- 124 = 12" L. x 4"

Quantity of outlets

Suffix
- (Blank) = Female outlet
- M = Male inlet
- SS/SWCH = Stainless Steel Switchplate

Standard Panels

CATALOG NUMBER	DESCRIPTION
#20PS42-1-SWCH/SS	Single gang (4" x 2") stainless steel switchplate with (1) 2P&G outlet
#20PS44-1-SWCH/SS	Two gang (4" x 4") stainless steel switchplate with (1) 2P&G outlet
#20PS44-1-SWCH/SS:	Two gang (4" x 4") stainless steel switchplate with (2) 2P&G outlets
#20PS44-1 : 4" x 4"	Steel panel for junction box with (1) 2P&G outlet
#20PS44-2 : 4" x 4"	Steel panel for junction box with (2) 2P&G outlets
#20PS44-3 : 4" x 4"	Steel panel for junction box with (3) 2P&G outlets

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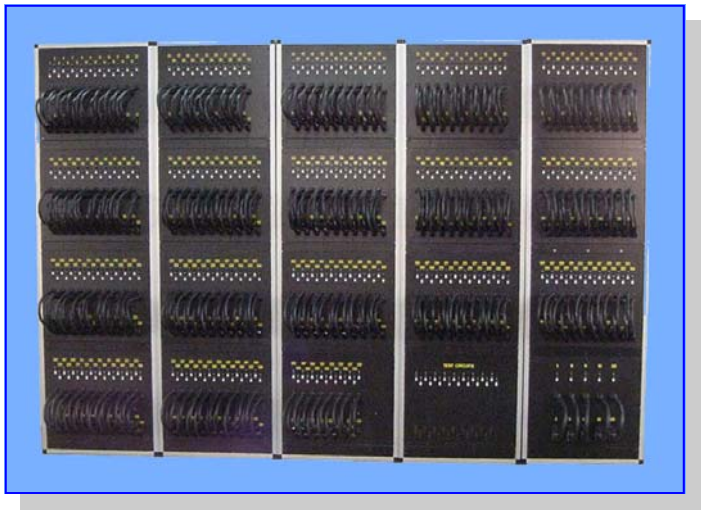
Product Bulletin No.: PPF-101A

Patch Panels

Features - Front of House Type

- Type required when portable dimmers are used
- Steel construction with black powder coat finish
- Completely wired from terminals to outlets with high temperature copper wire
- Load circuit pigtails with circuit breaker protection as required by N.E.C. Art. 520.50(C).
- Pigtails panel mounted or “hanging patch”
- Line circuits with panel mount receptacles
- Connector types:
  - Pin (recommended)
  - Locking
  - U-Ground
- Circuit ampacity - 20, 60 , 100
- All circuits marked with die-cut characters
- UL Listed



Options

- Engraved circuit numbers
- Colors to match architectural requirements
- Multiple enclosures patched with separate jumpers
- Non-dim circuits on separate panels

Specifications - FOH Patch Panel

1. Enclosure shall be min. 16 Ga. steel, powder-coated black.
2. Wiring devices shall be UL Listed Grounding type.
3. Load circuit pigtails shall be UL Listed Extra Hard Usage, secured to the enclosure by nylon strain reliefs.
4. Each load circuit shall be protected by a Listed, 10,000K AIC, branch-rated circuit breaker.
5. Line and Load circuits shall be terminated to terminal blocks.
6. All internal wiring shall be 125ºC UL Listed copper conductors.
7. Circuits numbers shall be provided for Line and Load wiring devices.
8. Patch panel shall be UL Listed.

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Product Bulletin No.: PPF-101A

Patch Panels

Features - Standard Type

- Type required when facility dimmers are hardwired (not portable).
- Steel construction with black powder coat finish
- Completely wired from terminals to outlets with high temperature copper wire
- Load circuits can be:
  - Pigtails - "Hanging Cord Patch"
  - Panel mount inlets on same enclosure as Line circuits (jumpers included).
  - Panel mount inlets on separate enclosure (jumpers included).
- Line circuits with panel mount receptacles
- Connector types:
  - Pin (recommended)
  - Locking
  - U-Ground
- Circuit ampacity - 20, 60 and 100
- All circuits marked with die-cut characters
- UL Listed

Options

- Engraved circuit numbers
- Colors to match architectural requirements
- Non-dim circuits on separate panels

Specifications - Standard Patch Panel

1. Enclosure(s) shall be min. 16 Ga. steel, powder-coated black.
2. Wiring devices shall be UL Listed Grounding type.
3. Hanging cord patch type pigtails shall be secured to the enclosure by nylon strain reliefs.
4. Cables shall be UL Listed Extra Hard Usage,
5. Line and Load circuits shall be terminated to terminal blocks.
6. All internal wiring shall be 125ºC UL Listed copper conductors.
7. Circuits numbers shall be provided for Line and Load wiring devices.
8. Patch panel shall be UL Listed.

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Product Bulletin No.: RMF-201

Rack Mount DistroBoxes

Features

- UL Listed
- Standard 19” EIA dimensions / mounting hole spacing
- Steel construction
- Powder cost finish.
- Variety of connectors to choose from:
  - Pin Connectors - 20 - 100A.
  - NEMA - 15 - 50A.
  - Pin & Sleeve - 20 - 100A.
  - Cam - 150 - 400A.
  - Sequential Interlock - 200 - 400A.
- Connector ratings vary from 1Ø125V., thru 3Ø 277/480V.
- Branch-rated circuit breakers.
- Indicator lights
- Color coding of wiring devices by Phase
- Custom-built to customer requirements

Options

- Meters
  - Analog- Iron Vane Ammeters; Voltmeters; Phase swithes
  - Digital - Multimeter (Ammeter/Voltmeter)
- Special labelling
- Standard 19” EIA dimensions / mounting hole spacing
- Audio / Data connectors - with integral voltage barrier between Power and Data sections

Specifications

1. Units are UL Listed.
2. Enclosures are code gauge steel, finished with polyurethane paint.
3. Boxes have dimensions that conform to EIA Standards. Units shall have mounting brackets punched for standard EIA mounting hole patterns.
4. All wiring devices are UL Listed Grounding type. Where single conductor devices are used, a Grounded device shall be provided.
5. All branch circuits are provided with a UL Listed branch rated over-current protection device. .
6. All pilot lights, meters, and terminal blocks used in these boxes are UL Recognized.

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Product Bulletin No.: RMF-202

Rack Mount Panels

Features

- UL Listed
- Standard 19” EIA dimensions / mounting hole spacing
- Aluminum construction
- Powder cost finish.
- Variety of connectors to choose from:
  - Pin Connectors - 20 - 100A.
  - NEMA - 15 - 50A.
  - Pin & Sleeve - 20 - 100A.
  - Cam - 150 - 400A.
  - Sequential Interlock - 200 - 400A.
- Connector ratings vary from 1Ø125V., thru 3Ø 277/480V.
- Branch-rated circuit breakers.
- Indicator lights
- Color coding of wiring devices by Phase
- Custom-built to customer requirements

Options

- Meters
  - Analog- Iron Vane Ammeters; Voltmeters; Phase swithes
  - Digital - Multimeter (Ammeter/Voltmeter)
- Special labelling
- Standard 19” EIA dimensions / mounting hole spacing
- Audio / Data connectors

Specifications

1. Units are UL Listed.
2. Panels are .125” aluminum, finished with polyurethane paint. Alternate finish is anodizing per customer color.
3. Panels have dimensions that conform to EIA Standards. Units shall have mounting brackets punched for standard EIA mounting hole patterns.
4. All wiring devices are UL Listed Grounding type. Where single conductor devices are used, a Grounded device shall be provided.
5. All branch circuits are provided with a UL Listed branch rated over-current protection device. .
6. All pilot lights, meters, and terminal blocks used in these panels are UL Recognized.

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Product Bulletin No.: EXF-201

Expo Power Distro

Features

- Steel construction with black powder coat finish
- Connector types:
  - NEMA Locking
  - U-Ground (Edison)
  - Stage Pin
  - Pin & Sleeve
  - Cam
- Connector ratings - single phase 125V., thru 3Ø 277/480V
- Color coding of connectors by phase is available in some cases.
- UL Listed

Options

- Audio/signal connectors can also be specified. Voltage barriers will be built into the enclosure when signal and power devices are mixed in the same unit.
- GFCI and switch-rated breakers are available.
- Isolated Ground Connecctors
- Enclosures can be manufactured as NEMA 3R type when required for wet location use.

Specifications

1. Units are UL llsted.
2. Enclosures are galvanized code gauge steel, finished with black polyurethane paint.
3. A hinged door shall be provided to protect access to the circuit breaker handles. An optional key-latch may be provided.
4. A standard 1” per pole snap-in frame shall be provided for circuit breaker connection to line power.
5. All branch circuits are provided with a UL Listed branch rated circuit breakers.
6. A back fed Main breaker may be provided.
7. All wiring devices are UL Listed Grounding type. Where single conductor devices are used, a Grounded device shall be provided.
8. All internal conductors are UL Listed copper

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Product Bulletin No.: DBF-501A

Studio Portable Distro

DBJ-5001545 *(SINGLE PHASE)*

Distribution: 60A.
Input: 60A., 120V., 1Ø, 3-Wire
60A., 2P&G Pin Pigtail
Output: (3) 20A., 120V. Edison Duplex
Feed-Thru: None
Size / Weight: 6"L. x 5"W. x 3" H ; 5 lbs.

DBJ-5001546 *(SINGLE PHASE)*

Distribution: 60A.
Input: 60A., 120V., 1Ø, 3-Wire
60A., 2P&G Pin Pigtail
Output: (3) 20A., 120V. Pin
Feed-Thru: None
Size / Weight: 6"L. x 5"W. x 3" H ; 5 lbs.

DBS-4961 LunchBox *(SINGLE PHASE)*

Distribution: 100A.
Input: 100A., 120V., 1Ø, 3-Wire
100A., 120V., 2P&G Pin
Output: (5) 20A., 120V. Edison Duplex
Feed-Thru: 100A., 120V., 2P&G Pin
Size / Weight: 10"L. x 6½"W. x 6½"H.; 8 lbs.

DBS-3991 *(SINGLE PHASE)*

Distribution: 100A.
Input: 100A., 120V., 1Ø, 3-Wire
100A., 120V., 2P&G Pin
Output: (2) 60A., 120V. Pin
(1) 20A., 120V. Edison Duplex
Feed-Thru: None
Size / Weight: 10"L. x 6½"W. x 6½"H.; 8 lbs.

CONSTRUCTION SPECIFICATIONS

1. Enclosure shall anodized aluminum.
2. All wiring devices shall be UL Listed, grounding type.
3. All branch circuits shall be provided with a UL Listed branch rated circuit breaker.
4. Each branch circuit shall have a UL Recognized pilot light to indicate current present.
5. When pigtails are provided, cable shall be UL Listed Stage Cable, with a strain relief for attachment to the enclosure.
6. Units shall be UL Listed

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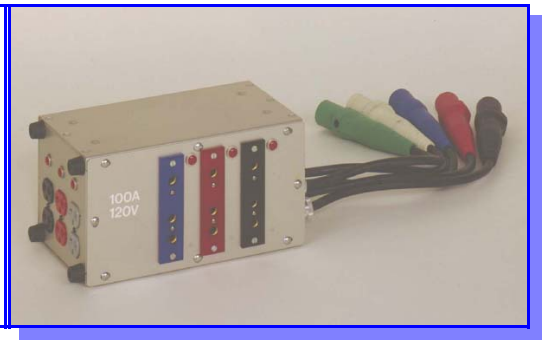
Product Bulletin No.: DBF-501A

Studio Portable Distro

DBS-4633 *(THREE PHASE)*

Distribution: 300A.
Input: 100A., 120/208V., 3Ø, 5-Wire
Input Type: (5) #2 Cam Pigtails
Output: (3) 100A., 120V. 2P&G Pin
(3) 20A. Edison Duplex
Feed-Thru: None
Size / Weight: 10"L.x 6½" W.x 6½"H. ; 15 lbs.



DBT-4681 *(THREE PHASE)*

Distribution: 600A.
Input: 200A., 120/208V., 3Ø, 5-Wire
(5) Cam 2/0 Pigtails
Output: (6) 100A., 120V. 2P&G Pin
(1) 20A., 120V. Edison Duplex
Feed-Thru: None
Size / Weight: 15"L.x 10"W.x 10"H. ; 33 lbs.

DBT-4671 *(THREE PHASE)*

Distribution: 600A.
Input: 400A., 120/208V., 3Ø, 5-Wire
(5) Panel Mount Cam
Output: (6) 100A., 120V. 2P&G Pin
(1) 20A., 120V. Edison Duplex
Feed-Thru: (5) Panel Mount Cam
Size / Weight: 19"L. x 13"W. x 7"H.; 39lbs.

OPTIONS

Enclosure - All standard DistroBoxes are fabricated from aluminum. Steel or Stainless Steel enclosures available on request.

Finish - Standard finish is anodized aluminum. Other colors and finishes are available on request.

Connectors - The boxes detailed here are standard units. Other connectors available include:

TYPE	Ampacity	Voltage
PIN	60 - 100A.	120V. or 240V.
NEMA Edison	15 - 50A.	125V. || 125/250V. || 120/208V.
NEMA Locking	15 - 50A.	125V. || 125/250V. || 120/208V.
Pin & Sleeve	60 - 100A.	120/240V. || 120/208V.

Meters - Analog or digital meters can be added to any distros. These can be as simple as iron-vane ammeters or as modern as a panel mounted true RMS digital multimeter.

Wheels - A way to increase portability is with a dolly tray. The dolly is complete with 4" heavy-duty wheels can be fabricated to hold the larger DistroBoxes. An alternate method is to provide casters bolted directly to the bottom of the DistroBox.

FOR INFORMATION AND PRICING OF CUSTOMIZED DISTROS, CONTACT THE FACTORY AT 631-753-9550

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Product Bulletin No.: WCF-201

CAM Cable Assemblies

Extensions

- SC Type Stage Cable (#2Awg, 2/0 , 4/0)
- Standard Lengths - 25', 50', 100'
- Available banded or single
- Leviton / ECT Cam connectors

Catalog Number	Ampacity	Length	Cable
100EXTCL-25*	100	25'	#2 SC (Stage Cable)
100EXTCL-50*	100	50'	#2 SC (Stage Cable)
100EXTCL-100*	100	100'	#2 SC (Stage Cable)
200EXTCL-25*	200	25'	2/0 SC (Stage Cable)
200EXTCL-50*	200	50'	2/0 SC (Stage Cable)
200EXTCL-100*	200	100'	2/0 SC (Stage Cable)
400EXTCL-25*	400	25'	4/0 SC (Stage Cable)
400EXTCL-50*	400	50'	4/0 SC (Stage Cable)
400EXTCL-100*	400	100'	4/0 SC (Stage Cable)

* = Color : A = Black ; B = White ; C = Red ; D = Blue ; E = Green

Tie-ins *(PIGTAILS)*

- SC Type Stage Cable (#2Awg, 2/0 , 4/0)
- Standard Lengths - 5', 10'
- Available banded or single
- Leviton / ECT Cam connectors

Catalog Number	Ampacity	Length	Cable
100PTCL-5*	100	5'	#2 SC (Stage Cable)
100PTCL-10*	100	10'	#2 SC (Stage Cable)
200EXTCL-5*	200	5'	2/0 SC (Stage Cable)
200EXTCL-10*	200	10'	2/0 SC (Stage Cable)
400EXTCL-5*	400	5'	4/0 SC (Stage Cable)
400EXTCL-10*	400	10'	4/0 SC (Stage Cable)

* = Color : A = Black ; B = White ; C = Red ; D = Blue ; E = Green

Banded Cables and Custom Lengths

Union Connector can band cable sets with flexible heat-shrink tubing, or build cables to special lengths. We can also build special cables with cam devices to meet special needs without incurring major setup fees. For more information or a price quotation, contact Union Connector at 631-753-9550, or one of your local Union Connector sales reps.

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Product Bulletin No.: WCF-301

Stage Pin Extension Cables

20A. Extensions

- 12/3 SO Type Hard-usage Cable
- Standard 20A. 2P&G connectors
- Standard Lengths - 5' - 100'
- Clear covers

Catalog Number	Ampacity	Voltage	Length	Cable
20EXTGP-5	20	125	5'	12/3SO
20EXTGP-10	20	125	10'	12/3SO
20EXTGP-25	20	125	25'	12/3SO
20EXTGP-50	20	125	50'	12/3SO
20EXTGP-75	20	125	75'	12/3SO
20EXTGP-100	20	125	100'	12/3SO

60A. & 100A. Extensions

- SC Type Stage Cable
- 60A. and 100A.
- 120V. And 240V. available
- Standard Lengths - 5' - 100'
- Banded with shrink tubing

Catalog Number	Ampacity	Voltage	Length	Cable
60EXTGP-5	60	125	5'	#6 SC
60EXTGP-25	60	125	25'	#6 SC
60EXTGP-50	60	125	50'	#6 SC
60EXTGP-100	60	125	100'	#6 SC
60EXTHG-5	60	240	5'	#6 SC
60EXTHG-25	60	240	25'	#6 SC
60EXTHG-50	60	240	50'	#6 SC
60EXTHG-100	60	240	100'	#6 SC
100EXTGP-5	100	125	5'	#4 SC
100EXTGP-25	100	125	25'	#4 SC
100EXTGP-50	100	125	50'	#4 SC
100EXTGP-100	100	125	100'	#4 SC
100EXTHG-5	100	240	5'	#4 SC
100EXTHG-25	100	240	25'	#4 SC
100EXTHG-50	100	240	50'	#4 SC
100EXTHG-100	100	240	100'	#4 SC

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Product Bulletin No.: WCF-301

Stage Pin Extension Cables

Ordering Information

Example: 25', 20A., 125V., Extension

Catalog No.: 20EXTGP-25

20 EXT GP - 25

Ampacity of assembly

Type of assembly
EXT = Extension cable

Type of Wiring device
GP = 125V. Stage Pin
GH = 240V. Stage Pin (60 or 100A. only)

Length

Custom Extension Cables

Union Connector can build cable sets with a variety of options:

- Custom lengths
- Velcro cableties
- Colored covers on 20A. cable sets
- Engraved covers
- For more information or a price quotation, contact Union Connector at 631-753-9550

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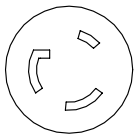
Product Bulletin No.: WCF-501

NEMA Locking Extension Cables

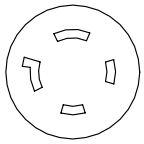
20A. and 30A. Extensions

- 12/3 SO Type Hard-usage Cable
- Edison "U-Ground" conectors
- Standard Lengths - 5' - 100'
- 15A. and 20A.

Catalog Number	Ampacity	Voltage	Length	Cable
20EXTGL-5	20	125	5'	12/3SO
20EXTGL-10	20	125	10'	12/3SO
20EXTGL-25	20	125	25'	12/3SO
20EXTGL-50	20	125	50'	12/3SO
20EXTGL-75	20	125	75'	12/3SO
20EXTGL-100	20	125	100'	12/3SO
20EXTGL14-5	20	125/250	5'	12/3SO
20EXTGL14-10	20	125/250	10'	12/3SO
20EXTGL14-25	20	125/250	25'	12/3SO
20EXTGL14-50	20	125/250	50'	12/3SO
20EXTGL14-75	20	125/250	75'	12/3SO
20EXTGL14-100	20	125/250	100'	12/3SO
20EXTGL21-5	20	120/208	5'	12/5SO
20EXTGL21-10	20	120/208	10'	12/5SO
20EXTGL21-25	20	120/208	25'	12/5SO
20EXTGL21-50	20	120/208	50'	12/5SO
20EXTGL21-75	20	120/208	75'	12/5SO
20EXTGL21-100	20	120/208	100'	12/5SO
30EXTGL14-5	30	125/250	5'	10/3SO
30EXTGL14-10	30	125/250	10'	10/3SO
30EXTGL14-25	30	125/250	25'	10/3SO
30EXTGL14-50	30	125/250	50'	10/3SO
30EXTGL14-75	30	125/250	75'	10/3SO
30EXTGL14-100	30	125/250	100'	10/3SO
30EXTGL21-5	30	120/208	5'	10/5SO
30EXTGL21-10	30	120/208	10'	10/5SO
30EXTGL21-25	30	120/208	25'	10/5SO
30EXTGL21-50	30	120/208	50'	10/5SO
30EXTGL21-75	30	120/208	75'	10/5SO
30EXTGL21-100	30	120/208	100'	10/5SO



L5-20



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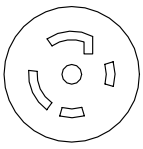
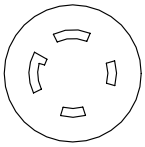
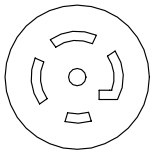


L21-20



L14-30



L21-30

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Product Bulletin No.: WCF-501

NEMA Locking Extension Cables

Ordering Information

Example: 25', 20A., 125V., Extension

Catalog No.: 20EXTGL-25

20 EXT GL - 25

Ampacity of assembly

Type of assembly
EXT = Extension cable

Type of Wiring device
GL = 125V., NEMA L5
GL14 = 125/250V., NEMA L14
GL21 = 120/208V., NEMA L21

Length

Custom Extension Cables

Union Connector can build cable sets with a variety of options:

- Custom lengths
- Velcro cableties
- Special marking on cable
- Colored strain reliefs
- For more information or a price quotation, contact Union Connector at 631-753-9550

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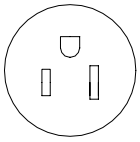
Product Bulletin No.: WCF-401

NEMA U-Ground Extension Cables

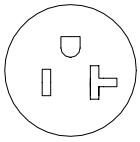
15A. and 20A. Extensions

- 12/3 SO Type Hard-usage Cable
- Edison "U-Ground" conectors
- Standard Lengths - 5' - 100'
- 15A. and 20A.

Catalog Number	Ampacity	Voltage	Length	Cable
15EXTUG-5	15	125	5'	12/3SO
15EXTUG-10	15	125	10'	12/3SO
15EXTUG-25	15	125	25'	12/3SO
15EXTUG-50	15	125	50'	12/3SO
15EXTUG-75	15	125	75'	12/3SO
15EXTUG-100	15	125	100'	12/3SO
20EXTUG-5	20	125	5'	12/3SO
20EXTUG-10	20	125	10'	12/3SO
20EXTUG-25	20	125	25'	12/3SO
20EXTUG-50	20	125	50'	12/3SO
20EXTUG-75	20	125	75'	12/3SO
20EXTUG-100	20	125	100'	12/3SO



15A.



20A.

Ordering Information

Example: 25', 20A., 125V., Extension

Catalog No.: 20EXTUG-25

20 EXT UG - 25

Ampacity of assembly

Type of assembly
EXT = Extension cable

Type of Wiring device
UG = 125V. Edison (U-Ground)

Length

Custom Extension Cables

Union Connector can build cable sets with a variety of options:

- Custom lengths
- Velcro cableties
- Special Marking on cables
- For more information or a price quotation, contact Union Connector at 631-753-9550

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Product Bulletin No.: WCF-701

19-Pin Cable Assemblies

Extensions

- Standard 19-Pin connectors
- Soldered connections
- Flexible 12/14 Pro-flex cable

Catalog Number	Circuits	Length
20EXTMP-25	6	25’
20EXTMP-50	6	50’
20EXTMP-75	6	75’
20EXTMP-100	6	100’

Break-ins / Break-outs

- Standard 19-Pin connectors
- Soldered connections
- (6) 36” 12/3SJ cable tails

Catalog Number	Type	Male	Female
20EXTMP16-GP	Break-out	19-Pin	Stage Pin
20EXTMP16-GL	Break-out	19-Pin	L5-20
20EXTMP16-UG	Break-out	19-Pin	U-Ground
20EXTMP16-GPM	Break-in	Stage Pin	19-Pin
20EXTMP16-GLM	Break-in	L5-20	19-Pin
20EXTMP16-UGM	Break-in	U-Ground	19-Pin

Custom Assemblies

Union Connector can build multi-pin assemblies with a variety of options:

- Custom lengths
- Special marking on cable
- Other multi-pin devices available (7-pin, etc.)
- For more information or a price quotation, contact Union Connector at 631-753-9550

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Product Bulletin No.: WCF-601

Miscellaneous Cable Assemblies

Two-fers

- 12/3 SO Type Hard-usage Cable
- Molded “Y”
- Standard 36” length

Catalog Number	Description
CABLE 12/3 SO 2-FER 36"	12/3 SO Molded 'Y' Cable, no connectors
2FUG-36-12/3-15A	15A. 2-Fer, 5-15 Edison (U-Ground)
2FUG-36-12/3	20A. 2-Fer, 5-20 Edison (U-Ground)
2FGP-36-12/3	20A. 2-Fer, Stage pin
2FGL-36-12/3Y	20A. 2-Fer, L5-20 Twist Locking

Three-fers

- 12/3 SO Type Hard-usage Cable
- Molded “W”
- Standard 36” length

Catalog Number	Description
CABLE 12/3 SO 3-FER 36"	12/3 SO Molded 'W' Cable, no connectors
3FUG-36-12/3-15A	15A. 3-Fer, 5-15 Edison (U-Ground)
3FUG-36-12/3	20A. 3-Fer, 5-20 Edison (U-Ground)
3FGP-36-12/3	20A. 3-Fer, Stage pin
3FGL-36-12/3Y	20A. 3-Fer, L5-20 Twist Locking

Adapters

- 12/3 SO Type Hard-usage Cable
- Standard Pin and NEMA connectors
- Standard 6” length

Catalog Number	Description
15ADUGF/GPM	15A. 5-15R Parallel blade Edison female to 20A. Stage pin male
15ADUGM/GPF	15A. 5-15P Parallel blade Edison male to 20A. Stage pin female
20ADUGF/GPM	20A. 5-20R Edison female to 20A. Stage pin male
20ADUGM/GPF	20A. 5-20R Edison male to 20A. Stage pin female
20ADGLF/GPM	20A. L5-20R Locking female to 20A. Stage pin male
20ADGLM/GPF	20A. L5-20R Locking male to 20A. Stage pin female

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Product Bulletin No.: WCF-601

Miscellaneous Cable Assemblies

Snakebites (CAM TO PIN ADAPTERS)

- #4 SC Type Stage Cable
- Standard Lengths - 36”
- 120V. And 240V. available
- 2P&G Pin connectors
- Leviton / ECT Cam connectors

Catalog Number	Description
100ADGPM/CLF	100A., 120V. Stage Pin male to (3) Cam female pigtals
100ADHGM/CLF	100A., 240V. Stage Pin male to (3) Cam female pigtals

Ordering Information

Example: 20A. Adapter, U-Ground Female to Stage Pin male Catalog No.: 20ADUGF/GPM

20 AD UGF / GPM

Ampacity of assembly

Type of assembly
- 2F = Two-fer
- 3F = Three-fer
- AD = Adapter

Type of Wiring device (s)
- GP = 125V. Stage Pin
- GH = 240V. Stage Pin
- GL = NEMA Locking
- UG = U-ground (Edison)
- CL = Cam
- M = Male
- F= Female

Custom Adapters / Assemblies

Union Connector can build adapters with a variety of options:

- Hi-temp fibreglass sleeving over hi-temp conductors instead in lieu of SO cable
- Custom lengths
- Special marking on cable
- Colored strain reliefs or covers
- For more information or a price quotation, contact Union Connector at 631-753-9550

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Product Bulletin No.: PCL-101

20 Amp Pin Connectors

20-2P&G Cable Connectors

Features

- UL Listed - File E11417
- ULc Listed for use in Canada.
- Rated 20A.,125V. / 15A., 250V. AC
- Pin configuration conforms to ESTA standards.
- Compatible with other entertainment industry pin connectors.
- Non-melting thermo-set molded phenolic construction.
- Ergonomic shape for ease of handling.
- Enough space in body to wire for a two-fer.
- Solid brass contact pins.
- Wire connection with traditional crimp lugs or direct connect pressure- plate terminals.
- "Floating" pins guarantee an easy fit and better electrical connection.
- Pins are removable and replaceable.
- All screws standard Phillips.
- Covers available in a choice of 7 different colors or clear see-thru.
- Covers can be private-labeled with text or logo.
- Cable entry for 12/3 SO.
- Strain relief for use with either small cable or fiberglass sleeved wires.

CATALOG NUMBER		CONNECTION	COVER COLOR
Male Plug	**Female Connector**		
20-2P&GMP	20-2P&GFP	Pressure plate	Black
20-2P&GMP-B	20-2P&GFP-B	Pressure plate	Blue
20-2P&GMP-C	20-2P&GFP-C	Pressure plate	Clear
20-2P&GMP-G	20-2P&GFP-G	Pressure plate	Green
20-2P&GMP-O	20-2P&GFP-O	Pressure plate	Orange
20-2P&GMP-R	20-2P&GFP-R	Pressure plate	Red
20-2P&GMP-W	20-2P&GFP-W	Pressure plate	White
20-2P&GMP-Y	20-2P&GFP-Y	Pressure plate	Yellow
20-2P&GMC	20-2P&GFC	Crimp Lug	Black
20-2P&GMC-B	20-2P&GFC-B	Crimp Lug	Blue
20-2P&GMC-C	20-2P&GFC-C	Crimp Lug	Clear
20-2P&GMC-G	20-2P&GFC-G	Crimp Lug	Green
20-2P&GMC-O	20-2P&GFC-O	Crimp Lug	Orange
20-2P&GMC-R	20-2P&GFC-R	Crimp Lug	Red
20-2P&GMC-W	20-2P&GFC-W	Crimp Lug	White
20-2P&GMC-Y	20-2P&GFC-Y	Crimp Lug	Yellow

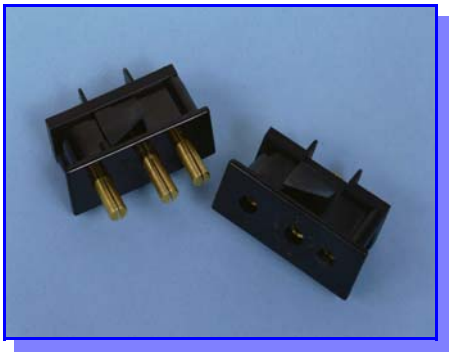
40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
www.unionconnector.com

Product Bulletin No.: PCL-101

20Amp Pin Connectors

2P&G Panel Mount Devices

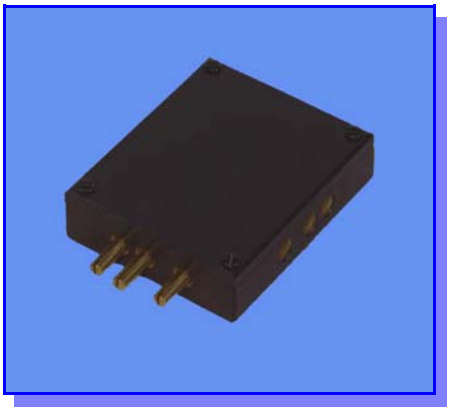
Features



- ULc Listed - File E11417
- Rated 20A.,125V. / 15A., 250V. AC
- Pin configuration conforms to ESTA standards.
- Non-melting thermo-set molded phenolic construction.
- Solid brass contact pins.
- “Floating” pins guarantee an better fit and electrical connection.
- Patented Spring-Lock™ simplifies installation. Push the device into position and the hardened steel spring holds it securely in place.

Branch-Offs (3-Fer Block)

Features



- UL Listed - File E11417
- Pin configuration conforms to ESTA standards.
- Fabricated from Electrical grade phenolic - cannot melt or burn.
- Male tap style has male pins for plug-in connection to outlet.
- Cable style has cable entry hole sized for 12/3 SO.
- Provides a simple way to “ 3-Fer ” an outlet or pigtail.

CATALOG NUMBER	DESCRIPTION
2P&GF-FL	20A., 125V. Panel mount female receptacle
2P&GM-FL	20A., 125V., Panel mount male inlet
G3255	20A., 125V., 3-fer Branch-off, Cable entry hole
G3255MT	20A., 125V., 3-fer Branch-off, Male pin input (Male tap)
COVER-20-BLACK	20-2P&G BLACK Cable Connector cover
COVER-20-BLUE	20-2P&G BLUE Cable Connector cover
COVER-20-CLEAR	20-2P&G CLEAR Cable Connector cover
COVER-20-GREEN	20-2P&G GREEN Cable Connector cover
COVER-20-ORANGE	20-2P&G ORANGE Cable Connector cover
COVER-20-RED	20-2P&G RED Cable Connector cover
COVER-20-WHITE	20-2P&G WHITE Cable Connector cover
COVER-20-YELLOW	20-2P&G YELLOW Cable Connector cover
RINGLUG 100	Bag of (100) Ring lugs for #10-12 wire
FLAGLUG(100)	Bag of (100) Flag lugs for #10-12 wire
8/32(100)	Bag of (100) 8/32 Brass screws for 20A. connectors
#8BF(100)	Bag of (100) #8 Steel screws for 20A. connectors

UNION CONNECTOR
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Product Bulletin No.: PCL-102

60 Amp Pin Connectors

CABLE CONNECTORS

Features

- UL Listed - File E11417
- ULc Listed for use in Canada.
- Available in 125V. and 240V.
- Compatible with other entertainment industry pin connectors.
- Fabricated from Electrical grade phenolic - cannot melt or burn.
- Ergonomic shape with Sure-Grip™ edge for ease of handling.
- Solid brass contact pins.
- Wire connection secured by set screws in pins.
- "Floating" pins guarantee an easy fit and better electrical connection.
- Cable entry sized for range from 4/3 SO to multiple #6 EISL.

PANEL MOUNT DEVICES

Features

- UL Listed - File E11417
- ULc Listed for use in Canada.
- Available in 125V. and 240V.
- Pin configuration conforms to ESTA standards.
- 125V. devices are molded polycarbonate.
- 240V. devices are fabricated from Electrical grade phenolic.
- Available with Spring-Lock™ or bolt-on type mounting.
- Solid brass contact pins.
- Wire connection secured by set screws in pins.
- Floating" pins guarantee an easy fit and better electrical connection.

CATALOG NUMBER	RATING	DESCRIPTION
60-2P&GF1	60A., 125V.	Female cable connector
60-2P&GM1	60A., 125V.	Male cable plug
60-2P&GF-FL	60A., 125V.	Female panel mount receptacle - Spring-Lock™
60-2P&GF-FL-B	60A., 125V.	Female panel mount receptacle - Bolt-on
60-2P&GM-FL	60A., 125V.	Male panel mount inlet - Spring-Lock™
60-2P&GM-FL-B	60A., 125V.	Male panel mount inlet - Bolt-on
60-2H&GF1	60A., 240V.	Female cable connector
60-2H&GM1	60A., 240V.	Male cable plug
60-2H&GF-FL-B	60A., 240V.	Female panel mount receptacle - Bolt-on
60-2H&GM-FL-B	60A., 240V.	Male panel mount inlet - Bolt-on

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Product Bulletin No.: PCL-102

100 Amp Pin Connectors

CABLE CONNECTORS

Features

- UL Listed - File E11417
- ULc Listed for use in Canada.
- Available in 125V. and 240V.
- Compatible with other entertainment industry pin connectors.
- Fabricated from Electrical grade phenolic - cannot melt or burn.
- Ergonomic shape with Sure-Grip™ edge for ease of handling.
- Solid brass contact pins.
- Wire connection secured by set screws in pins.
- “Floating” pins guarantee an easy fit and better electrical connection.
- Cable entry sized for range from 2/3 SO to multiple #4 EISL.

PANEL MOUNT DEVICES

Features

- UL Listed - File E11417
- ULc Listed for use in Canada.
- Available in 125V. and 240V.
- Pin configuration conforms to ESTA standards.
- Fabricated from Electrical grade phenolic.
- Available with Spring-Lock™ or bolt-on type mounting.
- Solid brass contact pins.
- Wire connection secured by set screws in pins.
- Floating” pins guarantee an easy fit and better electrical connection.

CATALOG NUMBER	RATING	DESCRIPTION
100-2P&GF1	100A., 125V.	Female cable connector
100-2P&GM1	100A., 125V.	Male cable plug
100-2P&GF-FL-B	100A., 125V.	Female panel mount receptacle - Bolt-on
100-2P&GM-FL-B	100A., 125V.	Male panel mount inlet - Bolt-on
100-2H&GF1	100A., 240V.	Female cable connector
100-2H&GM1	100A., 240V.	Male cable plug
100-2H&GF-FL-B	100A., 240V.	Female panel mount receptacle - Bolt-on
100-2H&GM-FL-B	100A., 240V.	Male panel mount inlet - Bolt-on

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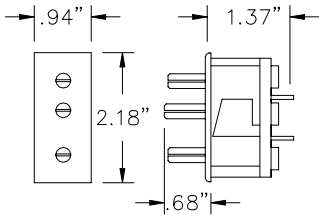
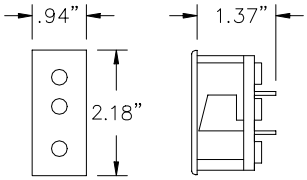
Product Bulletin No.: PCL-103

20 Amp Dimensions & Replacement Parts

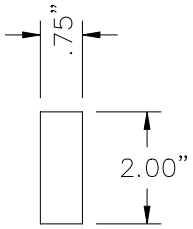
PANEL MOUNT



2P&GM-FL

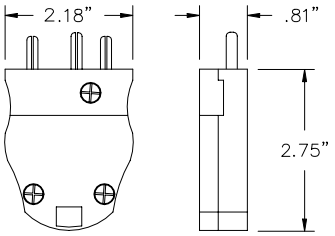


2P&GF-FL

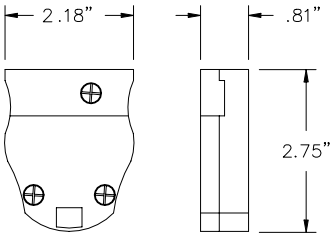


Panel Cutout

CABLE MOUNT

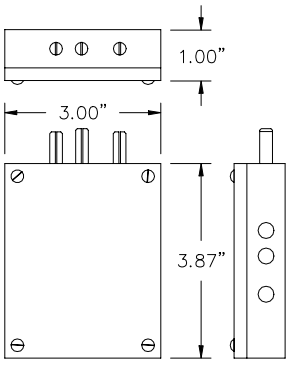


*20-2P&GF**

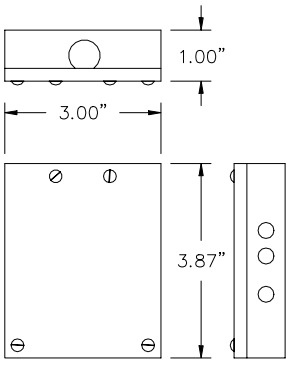


*20-2P&GF**

BRANCH-OFFS (3-FER BLOCK)



G3255MT



G3255

REPLACEMENT PARTS

CATALOG NUMBER	DESCRIPTION
RINGLUG 100	Bag of (100) Ring lugs for #10-12 wire
FLAGLUG(100)	Bag of (100) Flag lugs for #10-12 wire
8/32(100)	Bag of (100) 8/32 Brass screws for 20A. connectors
#8BF(100)	Bag of (100) #8 Steel screws for 20A. Connectors
20-2P&G-SR(100)	Bag of (100) Strain reliefs for 20A. Cable connectors
PIN#UC-505-H	Female Pin, Pressure Plate style w/pressure plate and screw
PIN#UC-506-G	Male Pin, Pressure Plate style w/pressure plate and screw
PIN#UC-555-A	Female Pin, Crimp style w/screw
PIN#UC-556	Male Pin, Crimp style w/screw

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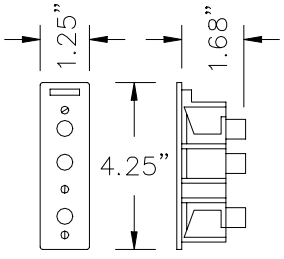
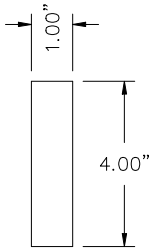
Product Bulletin No.: PCL-103

60 Amp / 100 Amp Dimensions

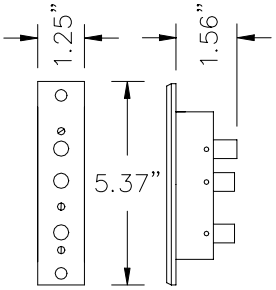
60 Amp Panel Mount



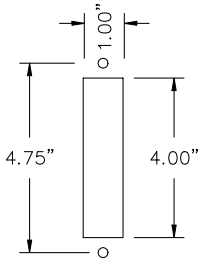
60-2P&GF-FL



60-2P&GF-FL
(Panel Cutout)

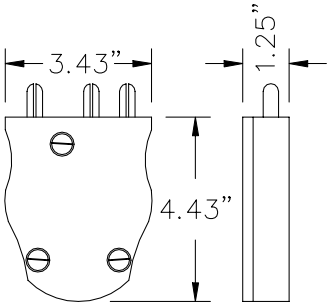


60-2P&GF-FL-B

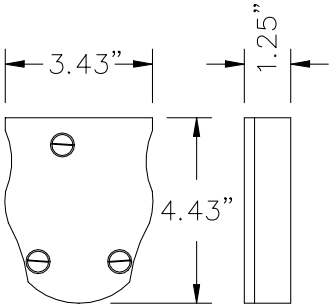


60-2P&GF-FL-B
(Panel Cutout)

60 Amp Cable Mount

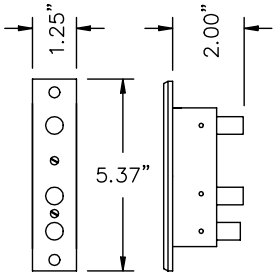


60-2P&GM1

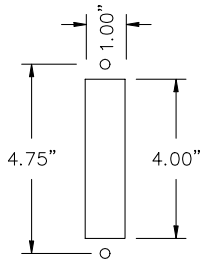


60-2P&GF1

100 Amp Panel Mount

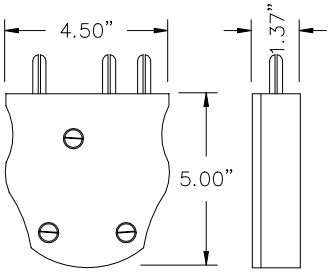


100-2P&GF-FL-B

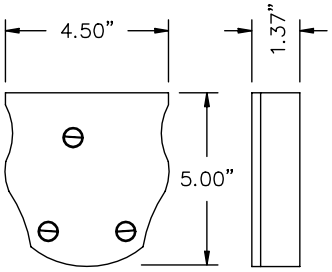


100-2P&GF-FL-B
(Panel Cutout)

100 Amp Cable Mount



100-2P&GM1



100-2P&GF1

UNION CONNECTOR
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Product Bulletin No.: NMA-101

NEMA Connectors

Edison (U-Ground)

LEVITON Cat. No.	BRYANT Cat. No.	Description
———	5965-B	15A., 125V. Edison 5-15 Male Plug (Economy)
———	5969-B	15A., 125V. Edison 5-15vFemale Connector (Economy)
5266-CB	5266-NC	15A., 125V. Edison 5-15 Male Plug
5269-CB	5269-NP	15A., 125V. Edison 5-15 Female Connector
BR15-SE	CRS15-BLK	15A., 125V. Edison 5-15 Duplex Outlet
5366-C	5366-NP	20A., 125V. Edison 5-20 Male Plug
5369-C	5369-NP	20A., 125V. Edison 5-20 Female Connector
BR20-SE	CRS20-BLK	20A., 125V. Edison 5-20 Duplex Outlet

Locking

LEVITON Cat. No.	BRYANT Cat. No.	Description
2311-B	70520-NPB	20A., 125V. L5-20 Male Plug
2313-B	70520-NCB	20A., 125V. L5-20 Female Connector
2310	70520-FR	20A., 125V. L5-20 Female Panel Mount
9965-C	9965	20A., 125/250V. “Nib-Out” Male Plug
7314-C	7314	20A., 125/250V. “Nib-Out” Female Connector
7310-B	7310	20A., 125/250V. “Nib Out” Female Panel Mount
2321-B	70620-NPB	20A., 250V. L6-20 Male Plug
2323-B	70620-NCB	20A., 250V. L6-20 Female Connector
2320	70620-FR	20A., 250V. L6-20 Female Panel Mount
2411	71420-NPB	20A., 125/250V. L14-20 Male Plug
2413	71420-NCB	20A., 125/250V. L14-20 Female Connector
2320	71420-FR	20A., 125/250V. L14-20 Female Panel Mount
2511	72120-NPB	20A., 120/208V. L21-20 Male Plug
2513	72120-NCB	20A., 120/208V. L21-20 Female Connector
2320	72120-FR	20A., 120/208V. L21-20 Female Panel Mount
2611-B	70530-NPB	30A., 125V. L5-30 Male Plug
2613-B	70530-NCB	30A., 125V. L5-30 Female Connector
2620	70530-FR	30A., 125V. L5-30 Female Panel Mount
2621-B	70630-NPB	30A., 250V. L6-30 Male Plug
2623-B	70630-NCB	30A., 250V. L6-30 Female Connector
2620	70630-FR	30A., 250V. L6-30 Female Panel Mount
2711	71430-NPB	30A., 125/250V. L14-30 Male Plug
2713	71430-NCB	30A., 125/250V. L14-30 Female Connector
2710	71430-FR	30A., 125/250V. L14-30 Female Panel Mount
2811	72130-NPB	30A., 120/208V. L21-30 Male Plug
2813	72130-NCB	30A., 120/208V. L21-30 Female Connector
2810	72130-FR	30A., 120/208V. L21-30 Female Panel Mount

Union Connector is a stocking distributor for both Leviton and BRYANT. We have access to their complete line of products, from Edison connectors to Pin & Sleeve devices. The connectors listed above are the most commonly used devices in the industry, but represent only a fraction of what is available. If you have a need for other NEMA devices, contact Union Connector for availability and pricing.

UNION CONNECTOR
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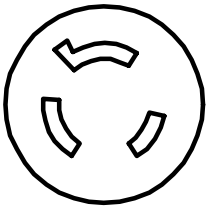
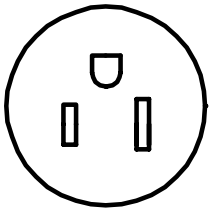
Product Bulletin No.: NMA-101

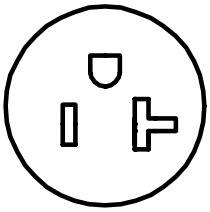
NEMA Connectors



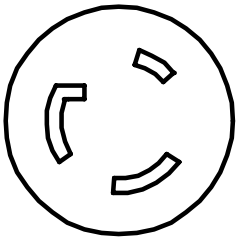
Nib-out
20A, 125/250V.



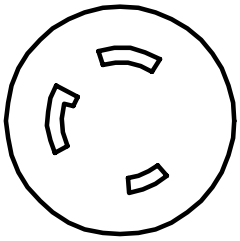
5-15
15A, 125V.



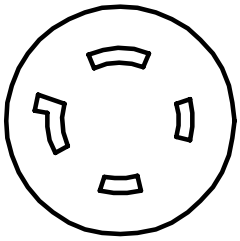
5-20
20A, 125V.



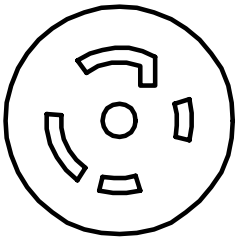
L5-20
20A, 125V.



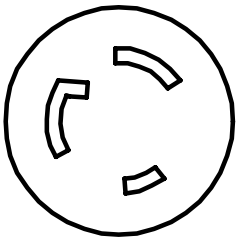
L6-20
20A, 250V.



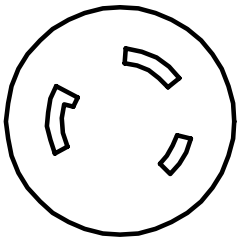
L14-20
20A, 125/250V.



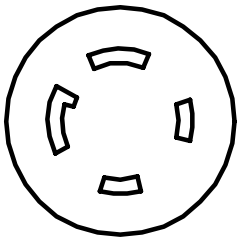
L21-20
20A, 120/208V.



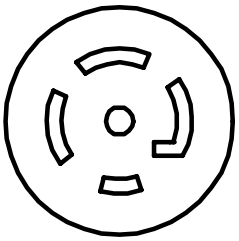
L5-30
30A, 125V.



L6-30
30A, 250V.



L14-30
30A, 125/250V.



L21-30
30A, 120/208V.

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www.unionconnector.com

Product Bulletin No.: WDF-501

CAM Connectors

Features

- Compatible with industry standard CAM type connectors
- Manufactured by LEVITON/ECT
- Machined brass pins
- Shatter and crack proof TPE and neoprene jacket
- Easy assembly, no special tools required
- NEMA 3R rated
- UL Listed

Series 16

Cat. No.	Description
16DSS-220M*	#2 - 2/0 Male Cable Plug
16DSS-220F*	#2 - 2/0 Female Cable Connector
16DSS-204M*	2/0 - 4/0 Male Cable Plug
16DSS-204F*	2/0 - 4/0 Female Cable Connector
16MMM*	Male/Male Turn-around
16WFF*	Female/Female Turn-around
16TMFF*	Tapping 'T' (male/female/female)
16PMMF*	Paralleling 'T' (male/male/female)
16FMMM*	3Fer, Female to (3) Males
16MFFF*	3Fer, Male to (3) Females
16RSS-1040M*	Panel Mount Male Inlet - 4/0 wire
16RSS-1040F*	Panel Mount Feale Outlet - 4/0 wire
16RTS-1040M*	Panel Mount Male Inlet - 1/2" Threaded Stud
16RTS-1040F*	Panel Mount Female Outlet - 1/2" Threaded Stud
16SB-1040*	Snap-back Covers for Panel Mount Devices

* = Color (A=Black, B=White, C=Red, D=Blue, E=Green)

Series 15

Cat. No.	Description
15DS-468M*	#4 - #8 Male Cable Plug
15DS-468F*	#4 - #8 Female Cable Connector
15WFF*	Female/Female Turn-around
15TMFF*	Tapping 'T' (male/female/female)
15PMMF*	Paralleling 'T' (male/male/female)
15RTS-468M*	Panel Mount Male Inlet - 5/16" Threaded Stud
15RTS-468F*	Panel Mount Female Outlet - 5/16" Threaded Stud

* = Color (A=Black, B=White, C=Red, D=Blue, E=Green)

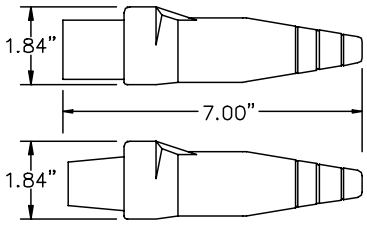
UNION CONNECTOR
40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
www.unionconnector.com

Product Bulletin No.: WDF-501

CAM Connectors

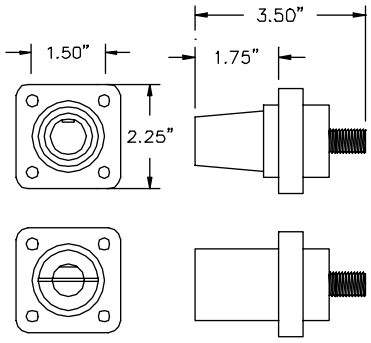
Series 16

Male Cable Plug



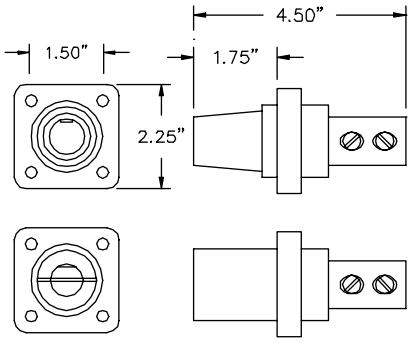
Female Cable Connector

Female Panel Mount
Threaded 1/2" Stud

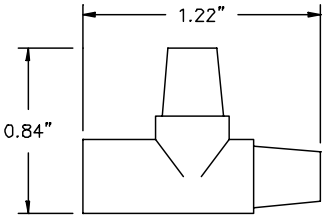


Male Panel Mount
Threaded 1/2" Stud

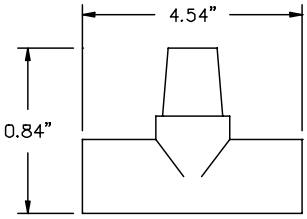
Female Panel Mount
Double Set Screw



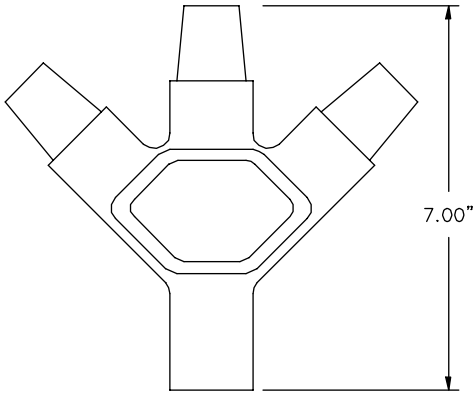
Male Panel Mount
Double Set Screw



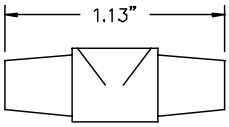
Tapping 'T'



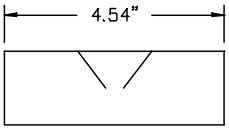
Parallel 'T'



3-Fer

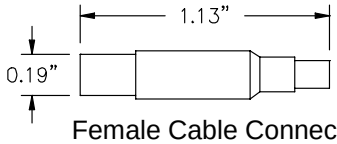


Female Turn-around

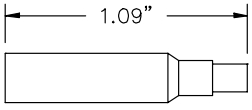


Male Turn-around

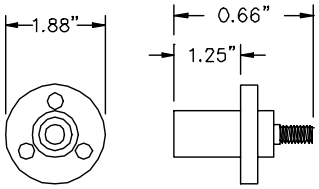
Series 15



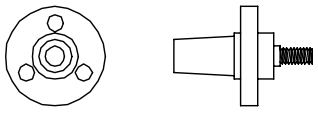
Female Cable Connector



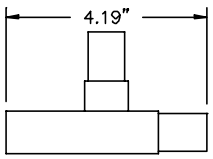
Male Cable Connector



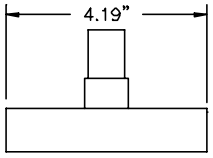
Male Panel Mount



Female Panel Mount



Tapping 'T'



Parallel 'T'

40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
www.unionconnector.com

Product Bulletin No.: WDF-301

Multi-Pin Connectors

Features

- Compatible with industry standard multi-pin connectors
- Manufactured in Spain by (ICP)
- Machined aluminum housing, anodized black
- Cable and panel mount devices
- Strain relief s for various cable sizes
- Gold plated contacts
- Solder contacts for #12 - 16 wire
- UL Recognized

7-PIN

Cat. No.	Description
92-01-37Y-SC	19-Pin Female, cable dia. .51-.79"
92-02-37Y-S	19-Pin Female panel mount
92-06-37Y-PC	19-Pin Male, cable dia. .51"-.79"
92-09-37Y-P	19-Pin Male panel mount

19-PIN

Cat. No.	Description
92-01-419AR-SA	19-Pin Female, cable dia. .51-.79"
92-01-419AR-SD	19-Pin Female, cable dia. .87-1.26"
92-02-419AR-S	19-Pin Female panel mount
92-06-419AR-PA	19-Pin Male, cable dia. .51"-.79"
92-06-419AR-PD	19-Pin Male, cable dia. .87"-1.26"
92-09-419AR-P	19-Pin Male panel mount

19-Pin Cables and Boxes

Union Connector manufactures a complete line of multi-pin cable assemblies using ICP devices. These cable assemblies include fan-outs, extension cables, adapters and multi-cable breakouts. Cable can be either SJ, SO or flexible Dura-Flex.

Union Connector also manufactures multi-pin outlet boxes, inlet boxes, patch panels and portable distros. These are designed and built to meet specific customer needs. Contact Union Connector or your local Union Connector rep agency for more information.

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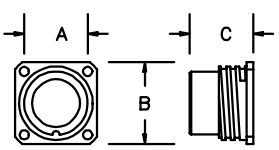
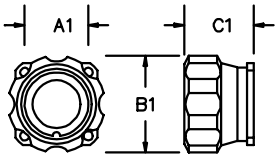
Product Bulletin No.: WDF-301

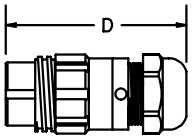
Multi-Pin Connectors



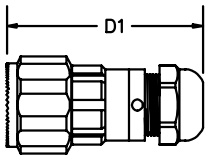
Female
Panel Mount



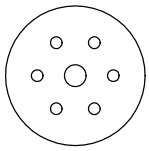
Male
Panel Mount



Female
Cable Mount

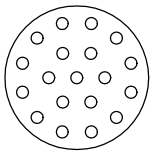


Male
Panel Mount



7-Pin

Female	**A**	**B**	**C**
Panel Mount	1.34	1.81	0.99
Male	**A1**	**B1**	**C1**
Panel Mount	1.34	2.05	1.04
Female	**D**		
Cable Mount	3.66		
Male	**D1**		
Cable Mount	3.40		



19-Pin

Female	**A**	**B**	**C**
Panel Mount	1.61	2.20	0.99
Male	**A1**	**B1**	**C1**
Panel Mount	1.61	2.54	1.04
Female	**D**		
Cable Mount	3.66		
Male	**D1**		
Cable Mount	3.93		

UNION CONNECTOR
40 Dale St. West Babylon, NY 11704
Ph: 631-753-9550 Fx: 631-753-9560
www.unionconnector.com

Product Bulletin No.: WDF-701

Pin & Sleeve Connectors

Features

- IEC 309 construction and contact configuration
- Available in 60A. or 100A. ampacity rating
- Single or three-phase versions
- Color-coded housing delineates voltage
- Machined brass pins
- Manufactured by Leviton
- Easy wiring and assembly
- Watertight
- UL Listed

60 Amp Pin & Sleeve

Cat. No.	Description
460P7W	60A., 480V., 2P3W, Male Cable Plug
460C7W	60A., 480V., 2P3W, Female Cable Connector
460B7W	60A., 480V., 2P3W, Male Panel Mount Inlet
460R7W	60A., 480V., 2P3W, Female Panel Mount Receptacle
460P12W	60A., 125/250V., 3P4W, Male Cable Plug
460C12W	60A., 125/250V., 3P4W, Female Cable Connector
460B12W	60A., 125/250V., 3P4W, Male Panel Mount Inlet
460R12W	60A., 125/250V., 3P4W, Female Panel Mount Receptacle
460P9W	60A., 3Ø 250V., 3P4W, Male Cable Plug
460C9W	60A., 3Ø 250V., 3P4W, Female Cable Connector
460B9W	60A., 3Ø 250V., 3P4W, Male Panel Mount Inlet
460R9W	60A., 3Ø 250V., 3P4W, Female Panel Mount Receptacle
560P9W	60A., 3Ø 120/208V., 4P5W, Male Cable Plug
560C9W	60A., 3Ø 120/208V., 4P5W, Female Cable Connector
560B9W	60A., 3Ø 120/208V., 4P5W, Male Panel Mount Inlet
560R9W	60A., 3Ø 120/208V., 4P5W, Female Panel Mount Receptacle
560P7W	60A., 3Ø 277/480V., 4P5W, Male Cable Plug
560C7W	60A., 3Ø 277/480V., 4P5W, Female Cable Connector
560B7W	60A., 3Ø 277/480V., 4P5W, Male Panel Mount Inlet
560R7W	60A., 3Ø 277/480V., 4P5W, Female Panel Mount Receptacle