



# ***Combination Manual Transfer Switch with Camlocks***

## **Instruction Manual**

**100 – 1200 Amp  
2, 3 & 4 Pole**



## WARNING

**Before Installation READ THIS MANUAL carefully to learn how to properly install, operate and maintain this unit. Personal injury and /or equipment damage will result by failing to pay attention to the vital safety information and instructions in this manual.**

**RETAIN THIS MANUAL WITH THE UNIT. This technical manual contains IMPORTANT SAFETY DATA and should be kept with the Transfer Switch at all times.**



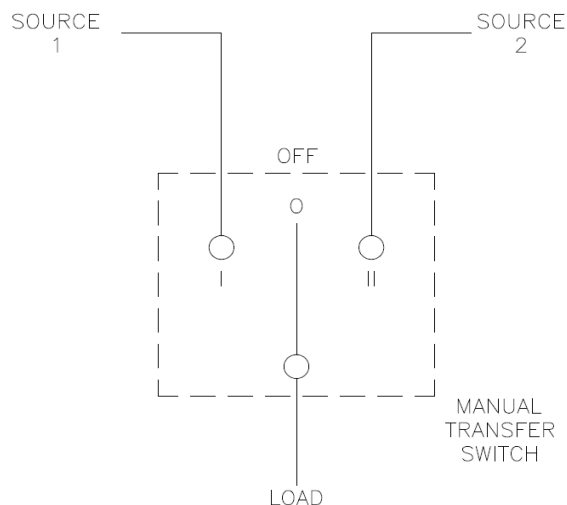
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## 1.0 INTRODUCTION

Manual Transfer Switches are used to manually transfer power from one source to another. The most common application is transferring power from the utility to a generator during a utility failure. PSI Control Solutions' Manual Transfer Switch is an enclosed, three-position switch with an external handle for switching. Figure 1 depicts a basic application of the Manual Transfer Switch with two sources and a center "OFF" position. When failure of one source occurs, transfer to the other source by using the external handle. The switch contains a center off position to prevent simultaneous connection of both sources.



**Figure 1**  
**Typical Transfer Scheme**

Manual Transfer Switches are available with the following offerings.

- 100-1200A
- 100-240VAC Single Phase
- 208-600VAC Three Phase
- 3 and 4 Pole
- NEMA 3R, Enclosure
- Short Circuit Protection-Fusible with Optional Fuses, Circuit Breakers
- Service Entrance Rated
- Cam-Lok Receptacles
- Phase Rotation Protection
- Metering



## 2.0 RECEIVING, HANDLING, and STORAGE

### 2.1 RECEIVING

After receiving the Manual Transfer Switch, unpack the unit and check for any damage that may have occurred during shipment.

### 2.2 HANDLING

The following guidelines are provided to help avoid personal injury and equipment damage during handling.

- A. Follow the manufacturer's handling instructions for the specific equipment.
- B. Handle the Manual Transfer Switch with care, to avoid damage to components and to the enclosure or its finish.
- C. Ensure the moving means is capable of handling the entire weight of the Manual Transfer Switch. **NOTE:** Weights are not distributed evenly.

### 2.3 STORAGE

If the Manual Transfer Switch is to be stored for any length of time prior to installation, restore the packaging for protection during that period. Where conditions permit, leave the packing intact until the Manual Transfer Switch is at its final installation position. When packing is removed, cover the top and openings of the equipment during the construction period to protect them against dust and debris

## 3.0 INSTALLATION



### WARNING!

**It is the customer's responsibility to insure that all local, regional and national codes and standards are correctly followed.**

### 3.1 MOUNTING LOCATION

It is the responsibility of the customer to determine the final mounting location of the Manual Transfer Switch before installation. Refer to the included dimensional drawing for mounting dimensions. All indoor Manual Transfer Switches should be installed near



the switchgear or service entrance. All outdoor Manual Transfer Switches should be located as close as possible to the engine generator or to the alternate source.

### **3.2 CABLE ENTRY**

Manual Transfer Switches are shipped from the factory with no holes for cable entry. Any enclosure penetrations for cable entry must be provided in the field. Conduits should be installed to prevent moisture or water from entering and accumulating within the enclosure. All conduits (including stubs) should be bonded to the Manual Transfer Switch. All conduits should be chosen to maintain the appropriate NEMA rating and located in areas recommended by the manufacturer to avoid cable interference with structural members and live components.

### **3.3 CONDUCTOR ROUTING**

Provisions should be made to locate conductors in the Manual Transfer Switch to avoid physical damage and to avoid overheating. The conductors should be secured in order to withstand available short-circuit currents. Follow the manufacturer's instructions for lacing or bracing cables. The largest practical bending radius should be maintained to avoid insulation damage and loose terminals. Please consult and follow appropriate NEMA Bending Radius standards.

### **3.4 POWER CONNECTIONS**

Refer to the drawings in the drawing packet provided for customer connections prior to installing. It is the responsibility of the customer to ensure the field conductors are sized appropriately. Ensure the Manual Transfer Switch is in the "Off" position before making the connections. Connect the LOAD, NORMAL SOURCE and EMERGENCY SOURCE power cables in the same phase sequence. Refer to the torque label on the door interior for torque requirements. **NOTE:** Manual Transfer Switches with Cam-Lok receptacles installed for a portable generator will not have an interior switch connection for the emergency source. The field connection for the portable generator should be made with an appropriate gender Cam-Lok plug

Care should be exercised in stripping the insulation from the conductors to prevent the conductor from "nick" or "ring". For aluminum, clean all oxide from the stripped portion and immediately apply inhibiting compound. Installation of cables should be done at temperatures above freezing to prevent cable insulation from cracking or splitting due to cold, unless the cable is suitable for installation at temperatures below freezing.



## 4.0 OPERATION



### **WARNING!**

**DO NOT ATTEMPT TO INSTALL OR USE THIS DEVICE WITHOUT REFERING TO THE DRAWINGS AND MANUAL.**

Refer to the schematic and wiring diagrams provided with the Manual Transfer Switch. These drawings are provided in a packet, along with this manual.

After installation is complete and either source for the Manual Transfer Switch is energized, a source availability pilot light on the door exterior will energize, indicating the source is live. Transfer to either source is done by turning the exterior handle in the source direction indicated on the exterior door. Direct transfer from one source to the other is not possible due to the center "OFF" position. The operator must turn the handle from the first source to the center "OFF" position and then from the center "OFF" position to the second source.

The enclosure door is interlocked with the Manual Transfer Switch, preventing opening of the enclosure door when the switch is in either source position. A white tab on the switch handle is present for adding a padlock to lock the switch in a position. Lifting up the tab exposes the holes for inserting the padlock shackle and prevents the handle from turning to a different position.

Two Form-C auxiliary contacts are included for both source positions. Refer to the schematic supplied with the Manual Transfer Switch. The contacts are rated for pilot duty: 5 Amps @ 125 or 250 VAC.

## 5.0 MAINTENANCE



### **WARNING!**

**DO NOT TOUCH THE MANUAL TRANSFER SWITCH UNIT UNTIL ALL POWER IS DISCONNECTED. SHOCKS, BURNS OR DEATH MAY RESULT FROM HIGH VOLTAGE**



### **Preventative Maintenance**

The following checks should be performed as a part of routine maintenance.

- A transfer test of the Manual Transfer Switch should be performed every week.
- The Manual Transfer Switch should be kept clean of dust and moisture. DO NOT USE A BLOWER TO CLEAN the switch or inside the enclosure. Always use a clean dry cloth or vacuum to prevent debris from lodging in the switching mechanism.
- Check all wiring connections.
- Visually inspect the contacts for surface deposits and pitting. This inspection should be performed annually.

### **Transfer Test**

After installation along with each week thereafter, check the operation of the Manual Transfer Switch by performing a manual transfer.

1. Verify the Manual Transfer Switch transfers to the emergency power source.
2. Verify the Manual Transfer Switch retransfers to the NORMAL position

## **6.0 TROUBLESHOOTING**



### **WARNING**

**DISCONNECT ALL POWER SUPPLY SOURCES TO THE MANUAL TRANSFER SWITCH BEFORE SERVICING TO PREVENT SHOCK OR ACCIDENT HAZARD**

Before troubleshooting, perform the following checks:

- A. Visual Inspection for physical damage.
- B. Ensure the source intended for use is operational and available.
- C. Ensure the switch handle is in the intended position.
- D. Ensure all wiring connections are secure.
- E. If the unit is fusible, ensure the fuses are not blown.
- F. If the unit contains a circuit breaker, ensure the breaker has not tripped.

As-built schematics and panel outlines are provided as a part of the drawing packet supplied with each Manual Transfer Switch.





## **7.0 OPTIONAL FEATURES**

### **7.1 SHORT CIRCUIT PROTECTION**

Manual Transfer Switches can be provided with short circuit protection, including fuses or a circuit breaker. Fusible Manual Transfer Switches will include fuseblocks, but will only include fuses if purchased.

### **7.2 SERVICE ENTRANCE RATING**

Manual Transfer Switches can be rated "Suitable for use as Service Equipment." Service Entrance rated switches will have short circuit protection, main bonding jumper, and a Service Disconnect Label. When the Manual Transfer Switch is to be used as Service Equipment, the label, "SERVICE DISCONNECT" should be placed near the disconnect handle.

### **7.3 CAM LOCK RECEPTACLES**

Manual Transfer Switches can be provided with Cam-Lok receptacles and flip covers installed for a portable generator. The receptacles can be male or female and will be color coded for the nominal voltage. It is the responsibility of the customer to ensure that the generator cables are fitted with the appropriate cord-ends. Before connecting, ensure the portable generator is not energized and the Manual Transfer Switch is not in the Emergency position.

### **7.4 PHASE ROTATION PROTECTION**

Phase rotation protection is an optional feature intended to protect against incorrect phase sequence in three phase systems. If selected, an indication light on the door and relay will be provided. The indication light and relay will energize if the phase sequence is correct (ABC). If the sequence is anything other than ABC, the indication light and relay will not be energized. Refer to the electrical schematic for contact connections (1 N/O and 1 N/C contacts are provided).

### **7.5 METERING**

Manual Transfer Switches can be provided with panel-mounted meters for voltage, current, and frequency.



## 8.0 WARRANTY

### WARRANTY

Seller warrants that the Products manufactured by it and delivered hereunder will be free from defects in material and workmanship for a period of twelve (12) months from date of shipment. Buyer shall be obligated to promptly report any failure to conform to this warranty, in writing to Seller within said period, whereupon Seller shall, at its option, correct such nonconformity, by suitable repair to such Goods or, furnish a replacement part F.O.B. point of shipment, provided Buyer has stored, installed, maintained and operated such Goods in accordance with good industry practices and has complied with specific recommendations of Seller. **This warranty does not cover reimbursement for labor, gaining access, removal, installation, temporary power or any other expenses, which may be incurred in connection with repair or replacement.**

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