Series S340
1000-4000 Amp
Single-Coil Contactor
Nema 3R & 12 Enclosures
Automatic Transfer Switch
Non-Automatic Transfer Switch

Operation and Installation Manual

KOHLER
Transfer Switches

CONTENTS

	Page
Safety Precautions	i
Introduction	2
Function	2
Ratings	2
Installation	
Unpacking	2
Mounting	3
Line Connections	3
Auxiliary Connections	3
Functional Test	3
Manual Operation	4
Electrical Operation	4
General Maintenance	5
Troubleshooting	5
Sequence of Operation	6
Accessories	6
Manual Controls	6
Generator Set Exercising Timer	8
Motor Load Transfer	9
Disconnecting the Control Panel	9
Sensor Adjustments	10
Time Delay Adjustments	11
Wiring Diagrams	13
Outline and Mounting Diagrams	17

Switch No. _____

Serial No. _____

SAFETY PRECAUTIONS

Read these safety instructions carefully. Failure to follow instructions and safety rules could result in serious bodily injury and/or damage to the transfer switch or test equipment.

⚠WARNING

HIGH VOLTAGE! Remember that wherever electrical energy is present, there is the potential danger of electrocution. Keep everyone away from the set and take precautions to prevent unqualified personnel from tampering. Have the set and electrical circuits serviced only by qualified technicians. Wiring should be inspected frequently—replace leads that are frayed or in poor condition. Do not operate electrical equipment when standing in water, on wet ground, or when your hands are wet.

⚠WARNING

BODILY INJURY! A detachable operator handle is provided on the Transfer Switch for maintenance purposes only. Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided when service is completed.

⚠WARNING

SHOCK HAZARD! The Transfer Switch will now be energized. Proceed with care!

⚠WARNING

SHOCK HAZARD! De-energize the normal source branch to be connected to the Transfer Switch before making any line or auxiliary connections.

⚠WARNING

SHOCK HAZARD! De-energize both normal and emergency sources before proceeding. Move Generator Master Switch on controller to OFF position and disconnect battery negative (-) before working on transfer switch! Turn the transfer switch selector switch to the OFF position.

⚠WARNING

ELECTRICAL SHOCK! The Automatic Transfer Switch is energized; proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove rings, watches, and jewelry that can cause short circuits. This test should be done only by a qualified electrician. Follow manufacturer's instructions when operating tester.

⚠WARNING

SHOCK HAZARD! Disconnect inner panel harness at in-line connector. This will de-energize circuit board and logic circuitry, but allow transfer switch to continue to supply utility power to necessary lighting and equipment. Potential electrocution will exist if any accessories mounted to inner panel are NOT wired through and de-energized by harness separation. Such accessories may be at line voltage.

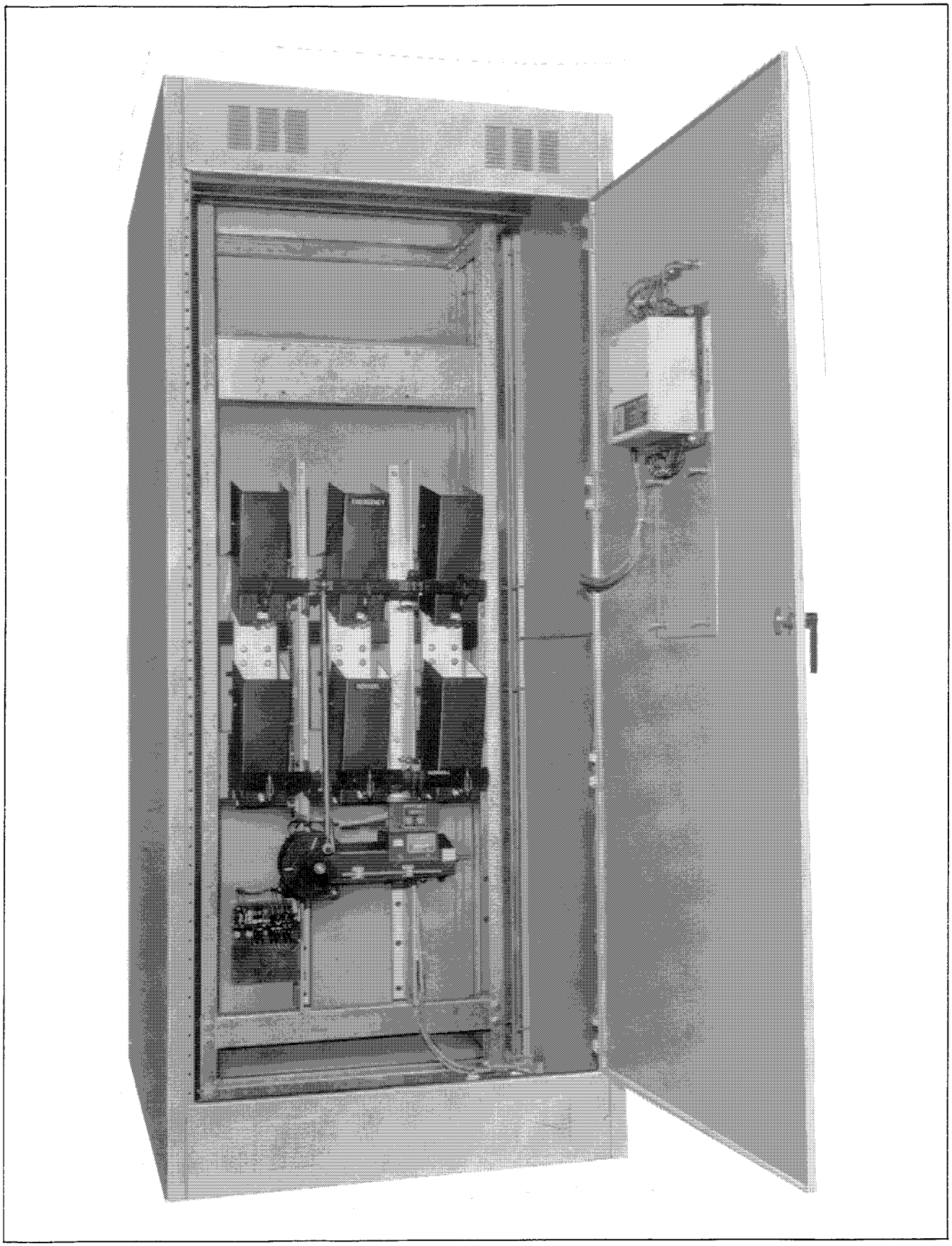


Figure 1. Typical Automatic Transfer Switch

INTRODUCTION

Automatic Transfer Switch Function

An *Automatic Transfer Switch* is an emergency device used for transferring critical loads from a normal (preferred) source to an emergency (standby) source of power. This transfer automatically occurs when the normal source voltage fails or is substantially reduced and the emergency source voltage has reached an acceptable level.

Upon normal source failure, the Automatic Transfer Switch signals the start of the generator set. The Automatic Transfer Switch continuously senses for the presence of an acceptable normal source and will retransfer the load to the normal source after it has been restored to an acceptable level. After retransfer of the load, the start signal from the Automatic Transfer Switch is cancelled and the generator set is allowed to shut down.

Non-automatic Transfer Switch Function (Accessory KA-29)

A toggle or key selector switch selects automatic or non-automatic operation. Depending upon the version of Accessory KA-29 used to create the non-automatic switch, toggle switches may initiate transfers in both directions, or emergency to normal only. If the normal source fails, the emergency source-generator set will start automatically. Transfer to emergency is either automatic, or initiated by a toggle switch. Transfer to emergency will occur after the generator set's voltage-frequency reaches acceptable levels, and any time delays have timed out.

Transfer to normal is initiated by a toggle switch. Transfer to normal will occur if the normal source voltage-frequency has reached an acceptable level, and any time delays have timed out.

Accessories KA-29-0 to KA-29-V also include a selector switch override circuit, to automatically transfer, if the connected source fails and the other source is available.

Ratings

The rating label is prominently affixed to the Transfer Switch. Data relating to each specific switch is included on the nameplate. Long and trouble-free equipment life is assured by using the switch within the limits shown on the rating label and nameplate.

Figure 2 shows the location of the Automatic Transfer Switch in the system. The switch should be as close as possible to the critical electrical loads connected to it.

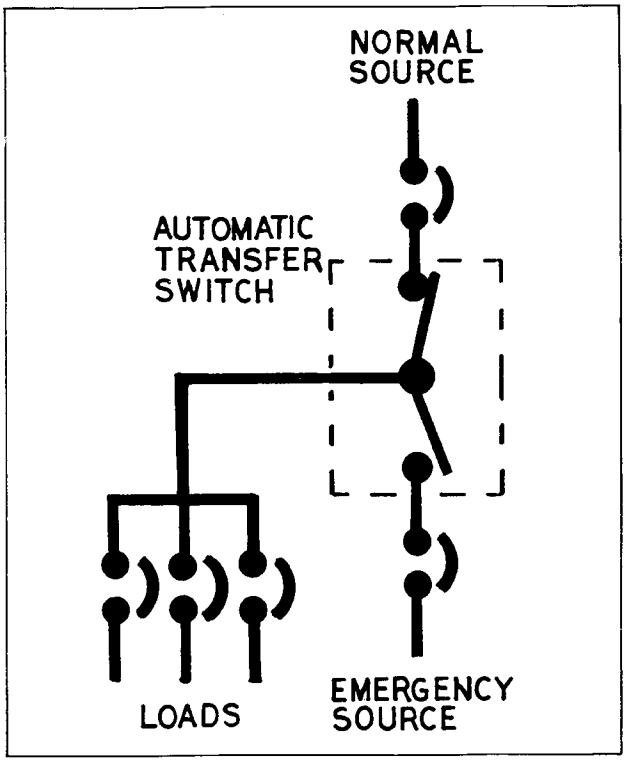


Figure 2. Switch Connection

INSTALLATION

Kohler Automatic Transfer Switches are factory wired and tested. Installation simply requires mounting, and connection of service cables and auxiliary control circuits. Do not remove protective packing until ready for complete installation. Protect switch at all times from excessive moisture, construction grit, and metal chips.

Unpacking

Carefully unpack or uncrate switch and check for damage. Report any damage immediately to the Kohler Distributor.

Any lifting devices must be attached to the switch mounting holes or mounting channels only. Do not lift Transfer Switch at any other points. Protect arc barriers at all times from impact.

Mounting
Three **Composite Outline and Mounting Diagrams** are furnished at the back of this manual. One diagram is for enclosed switches. The other diagrams are for open type switches; with and without optional Acc. 36-A switched neutral. Select the appropriate diagram and mount the Automatic Transfer Switch. All mounting details and instructions are shown on the diagram.

The Automatic Transfer Switch must be mounted vertically to a rigid supporting structure. Level all mounting points by using flat washers behind holes to avoid forced distortion of switch. Enclosed switches have the Control Panel mounted on the cabinet door. For open type switches, mount the Control Panel to the right of the Transfer Switch, preferably on the inside surface of the enclosure door.

⚠WARNING

SHOCK HAZARD! De-energize the normal source branch to be connected to the Transfer Switch before making any line or auxiliary circuit connections.

Line Connections
Two **Composite Elementary Wiring Diagrams** are furnished at the back of this manual. One diagram is for 3 pole Transfer Switches and the other is for 2 pole Transfer Switches. Select appropriate diagram.

All conductors should enter enclosure adjacent to the Transfer Switch terminals. Pilot knockouts are provided on enclosed Automatic Transfer Switches. Protect the Transfer Switch from metal chips and construction grit at all times. Standard terminal lugs are solderless screw type and will accept the conductor sizes listed on the **Composite Outline and Mounting Diagram** furnished after the wiring diagrams in the manual.

Connect source and load conductors to clearly marked Transfer Switch terminal lugs. Remove surface oxides from conductors by cleaning with wire brush. When aluminum conductor is used, apply joint compound to conductor. Tighten conductor and carefully wipe away excess compound.

Do not run cables behind the Transfer Switch. Cables can be bundled to the side of the switch. Maintain proper electrical clearance between the live metal parts and grounded metal.

All internal connections are made at the factory. The Transfer Switch and the Control Panel each have their own wire harness. The two harnesses are joined together by the In-Line Disconnect Plug. Extension harnesses are available in standard lengths. The plug is already engaged on enclosed Automatic Transfer Switches. For open type switches, the plug must be engaged after installation is completed.

Auxiliary Connections
Connect auxiliary circuit wires to appropriate Control Panel terminals as shown on the **Composite Elementary Wiring Diagram**. External circuits can include engine-generator set start signal, auxiliary contacts, signal lights, and Test Switch. The Test Switch and the signal lights are already installed on enclosed Automatic Transfer Switches. For open type switches the Test Switch and signal lights are supplied loose.

Note any Optional Accessories that may have been furnished on this switch, and make auxiliary connections if necessary. Refer to "ACCESSORIES."

One extra Accessory 12-A, C and one extra Accessory 12-C, D (signal lights) can be added later in Kit form.

Replacement bulb for standard application is
LEDTRONICS #5SB206CR6 red LED
LEDTRONICS #5SB206CG6 green LED
Replacement bulb for oil-tight, watertight and weatherproof applications is
ANSI #1819.

Do **not** substitute!

FUNCTIONAL TEST

Read and understand all instructions on the **Composite Elementary Wiring Diagram** and on labels affixed to the Automatic Transfer Switch. **Note any Optional Accessories that may have been furnished on this switch, and review their operation. Refer to "ACCESSORIES."** The following Manual Operation must be checked before proceeding to Electrical Operation.

⚠WARNING

BODILY INJURY! A detachable operator handle is provided on the Transfer Switch for maintenance purposes only. Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided when service is completed.

⚠WARNING

SHOCK HAZARD! De-energize both normal and emergency sources before proceeding. Move Generator Master Switch on controller to OFF position and disconnect battery negative (-) before working on transfer switch! Turn the transfer switch selector switch to the OFF position.

Manual Operation

A detachable manual operator handle is provided on the Transfer Switch for maintenance purposes only (Figure 3). Insert manual handle into hole provided in rotating weight.

Move the installed handle up and down to manually operate the Transfer Switch. The switch should operate smoothly without binding. *Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided.*

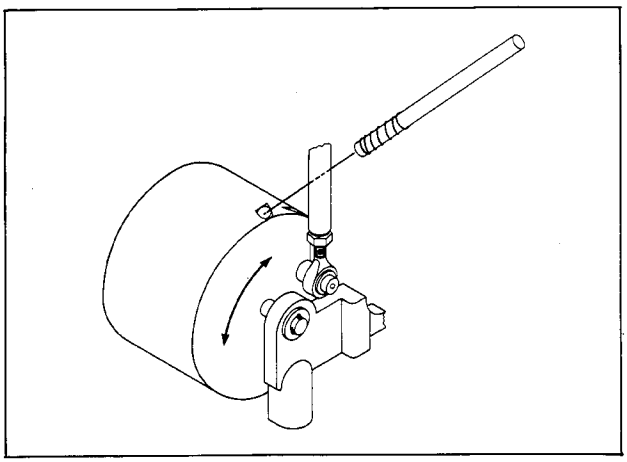


Figure 3. Manual Operation

Electrical Operation

First check Transfer Switch nameplate for rated voltage. It should be the same as the normal and emergency line voltages.

The Transfer Switch should be in the *Normal* position. The following procedure will check the electrical operation of the Transfer Switch.

⚠WARNING

ELECTRICAL SHOCK! The Automatic Transfer Switch is energized; proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove rings, watches, and jewelry that can cause short circuits. This test should be done only by a qualified electrician. Follow manufacturer's instructions when operating tester.

1. Close normal source circuit breaker.
2. Use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the Transfer Switch normal source terminals.
3. Close emergency source circuit breaker.
4. Manually start the engine-generator at the set.
5. Use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the Transfer Switch emergency source terminals.
6. If necessary, adjust the voltage regulator on the generator set according to the manufacturer's recommendations. The Automatic Transfer Switch will respond only to rated voltage and frequency specified on the nameplate.
7. Shut down the generator set, then put starting control in *"automatic"* position.
8. Operate and **hold** door-mounted Test Switch until engine starts and runs. This should happen within 15 seconds.
9. The Transfer Switch will operate to the *emergency* position. If Acc. 01-A is used, the transfer will occur after a time delay (up to 1 minute).
10. The Transfer Switch will operate back to *normal* after Acc. 03-C time delay (up to 30 minutes).
11. Acc. 04-C allows the engine to continue to run for an additional unloaded running time.

This completes the functional test of the Automatic Transfer Switch. The generator set's starting control should be left in the *"automatic"* position.

GENERAL MAINTENANCE

Reasonable care in preventive maintenance will insure high reliability and long life for the Automatic Transfer Switch.

⚠WARNING

HIGH VOLTAGE! Remember that wherever electrical energy is present, there is the potential danger of electrocution. Keep everyone away from the set and take precautions to prevent unqualified personnel from tampering. Have the set and electrical circuits serviced only by qualified technicians. Wiring should be inspected frequently-replace leads that are frayed or in poor condition. Do not operate electrical equipment when standing in water, on wet ground, or when your hands are wet.

Operate Transfer Switch at least once a week. Use the Test Switch to check the electrical operation of the Transfer Switch. Because the Test Switch only simulates failure of the normal source, service is interrupted only during the actual transfer of the load.

Keep Automatic Transfer Switch Clean. During installation protect the switch from construction grit and metal chips. Once a year brush and vacuum away any excessive dust accumulation. Leave the cover on the Control Panel.

Maintain Transfer Switch lubrication. The Transfer Switch has been properly lubricated, and under normal operating conditions no further lubricate is required. Renew factory lubrication if the switch is subjected to severe dust or abnormal operating conditions. Relubricate the operator if the TS coil is replaced. Order lubrication kit 296233.

Inspect main current carrying contacts. Once a year de-energize all sources, then remove barriers to check condition of contact material. Replace contacts when pitted or worn excessively.

TROUBLESHOOTING

⚠WARNING

SHOCK HAZARD! The Transfer Switch will now be energized. Proceed with care!

Note any Optional Accessories that may have been furnished on this switch, and review their operation. Refer to "ACCESSORIES."

Generator set does not start when Test Switch is operated and held.

1. **Check Operation**. Make sure switch is held in *"Test"* position for 15 seconds.
2. **Check Engine Controls**. Make sure control is in *"automatic"* position. Make sure batteries are charged and connected.
3. **Check Wiring**. Make sure start signal wires from engine controls are connected to the correct terminals on the Control Panel. See Wiring Diagram.
4. **Check Signal Circuit**. Disconnect and tape start signal wires. Connect ohmmeter between terminals CP16 and CP17. Reading should indicate a closed circuit. Depress and hold Test Switch for 15 seconds. After Acc. 02-A time delay, ohmmeter should indicate an open circuit.

Transfer Switch does not retransfer the load after normal returns or after Test Switch is released.

1. **Check Operation**. Make sure at least 30 minutes have passed to allow for Acc. 03-C time delay.
2. **Check Normal Source Voltage Levels**. On a three phase system, voltmeter should read phase to phase voltage between terminals CP28 and CP29, CP29 and CP30, CP30 and CP28. On a single phase system, voltmeter should read system voltage between terminals CP30 and CP29.
3. **Check Signal Circuit**. Confirm that Test Switch has reclosed by measuring 0 volts between terminals CP26 and CP27. Voltmeter should read phase to phase voltage between terminals CP3 and CP4. If there is no voltage reading, the problem is on the Transfer Switch. If voltage is present between CP3 and CP4, it should also be present between terminals CP2 and CP5. If voltage is not present between CP2 and CP5, the problem is in the Control Panel.

With generator set running, Transfer Switch does not transfer the load to emergency.

1. **Check Operation.** Make sure at least 2 minutes have passed to allow for Acc. 01-A time delay.
2. **Check Engine Controls**. Check generator output frequency and voltage. Output should be at least 90% of nominal voltage and 95% of nominal frequency. Make sure generator output circuit breaker is closed.
3. **Check Wiring**. Voltmeter should read phase-to-phase voltage between Transfer Switch terminals EA and EC, and also between Control Panel terminals CP14 and CP15.
4. **Check Signal Circuit**. Voltmeter should read phase-to-phase voltage between terminals CP1 and CP6. If there is no voltage reading, the problem is on the Transfer Switch. If voltage is present between CP1 and CP6, it should also be present between terminals CP2 and CP5. If the voltage is not present between terminals CP2 and CP5, the problem is in the Control Panel.

Transfer Switch retransfers the load, but generator set continues to run.

1. **Check Operation.** Make sure at least 7 minutes have passed to allow for Acc. 04-C time delay.
2. **Check Engine Controls.** Make sure engine starting control is in *"automatic"* position.
3. **Check Signal Circuit.** Disconnect and tape wires to terminals CP19 and CP20. Connect ohmmeter between these terminals; reading should indicate a closed circuit.

If the problem is isolated to signal circuits on the Control Panel or the Transfer Switch, call your local Kohler Distributor for further assistance.

SEQUENCE OF OPERATION

Note any Optional Accessories that may have been furnished on this switch, and review their operation. Refer to "ACCESSORIES."

Normal Source Failure
Load transfer to the emergency source automatically begins when the voltage sensor detects reduced voltage or total loss of the normal source. Relay SE will de-energize whenever the voltage level falls below the preset dropout point of the voltage sensor. An under voltage condition on any phase of a three phase system, or a phase-to-phase reduction of a single phase system, is detected by the sensor.

SE relay de-energizes, signalling a failure, and relay NR begins its timing cycle (Acc. 02-A). NR relay is provided with a time delay on dropout to override momentary outages. This delay prevents nuisance starting of the generator set. If the normal source voltage returns above the sensor dropout setting before the time delay expires, the SE relay energizes and the timing cycle is reset to zero.

NR relay de-energizes after the time delay and signals the generator set to start. At the same time, a voltage and frequency sensor begins monitoring the emergency source. The sensor will accept the emergency source only when **both** voltage and frequency reach preset pickup points. Usually about ten seconds elapse from dropout of the NR relay to acceptance by the sensor. This time span occurs because the generator set must crank, start, and run up to nominal pickup points. If the emergency source is available immediately, the sensor may accept as soon as NR relay drops out.

When the emergency source is accepted by the sensor, relay ER begins its timing cycle (Acc. 01-A). ER relay is provided with a time delay on pickup to prevent immediate load transfer to the emergency source.

ER relay energizes, the TS coil is energized, the Transfer Switch operates, and all switch contacts (mains, controls, auxiliaries) reverse position. The Transfer Switch is now supplying the load from the emergency source.

The switch will remain in this position until the normal source is restored.

Normal Source Restoration
Load retransfer to the normal source automatically begins when the voltage sensor detects restoration of the normal source. The voltage level must rise above the preset pickup point on all phases before the sensor will accept the normal source again.

When the normal source is accepted by the sensor, relay SE begins its timing cycle (Acc. 03-C). SE relay is provided with a time delay on pickup to prevent immediate load retransfer to the normal source. The delay insures that the normal source has stabilized before reconnection of vital loads. If the normal source voltage falls below the preset dropout point before the time delay expires, the timing cycle is reset to zero. If the emergency source fails during the timing cycle, ER relay drops out, and the load is immediately retransferred to the normal source, if acceptable.

SE relay energizes and ER relay is dropped out. The TS coil is energized, the Transfer Switch operates, and all switch contacts (mains, controls, auxiliaries) reverse position. The Transfer Switch is now supplying the load from the normal source.

Upon retransfer to the normal source, NR relay begins its timing cycle (Acc. 04-C). NR relay is provided with a time delay on pickup to keep the engine running for a cool-down period.

NR relay energizes after the time delay and signals the engine-driven generator to shut down. All circuits are reset for any future normal source failure.

ACCESSORIES

Optional Manual Controls

These manual controls, if furnished, are connected and mounted on the enclosure door, or are shipped loose for open type Automatic Transfer Switches. Optional Accessories can be added later in kit form. Include Serial Number and Catalog Number of Automatic Transfer Switch when ordering kit.

Acc. 29-C, E Reset switch to manually retransfer the Automatic Transfer Switch to the normal source. (Figure 4).

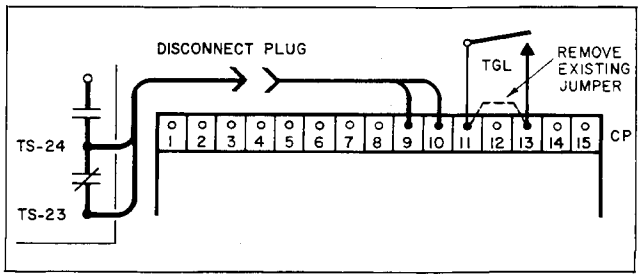


Figure 4. Acc. 29-C, E Connection

Sequence of Operation

Normal Source Restoration: When the normal source is accepted by the sensor, SE relay remains de-energized until the reset switch is momentarily closed. The standard Sequence of Operation is resumed after SE relay is energized.

Acc. 08-A, C Reset switch to manually bypass time delay on retransfer to the normal source. (Figure 5).

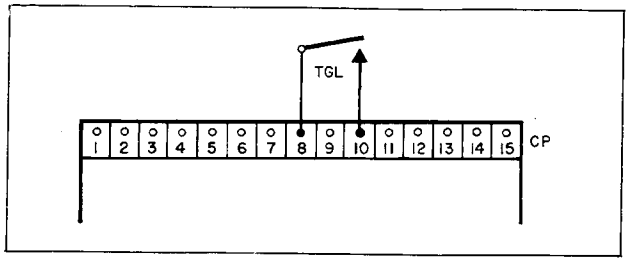


Figure 5. Acc. 08-A, C Connection

Sequence of Operation

Normal Source Restoration: When the sensor accepts the normal source, SE relay remains de-energized until the reset switch is momentarily closed. If the emergency source fails before the reset switch is depressed, the load is immediately retransferred to the normal source. The standard Sequence of Operation resumes after SE relay energizes.

☐ **Acc. 29-V** Reset switch to manually retransfer the automatic transfer switch to the normal source with automatic retransfer in event of emergency source failure. If **Feature 3-C** is used, wait until the time delay has expired before operating the reset switch. See Figure 6.

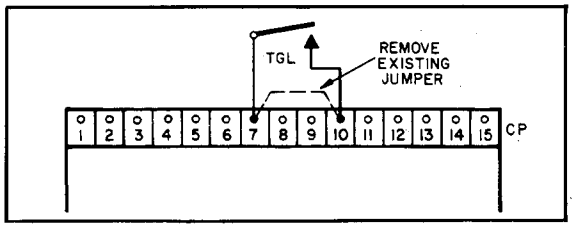


Figure 6. ACC. 29-V Connection

Sequence of Operation

Normal Source Restoration: When the sensor accepts the normal source, SE relay remains de-energized until the reset switch is momentarily closed. If the emergency source fails before the reset switch is depressed, the load is immediately retransferred to the normal source. The standard Sequence of Operation resumes after SE relay energizes.

Acc. 26-D Terminal provisions for Area Protection remote contact which opens to signal Automatic Transfer Switch to transfer to the emergency source (Figure 7).

Acc. 15-A Auxiliary contact closed when Automatic Transfer Switch is connected to the normal source.

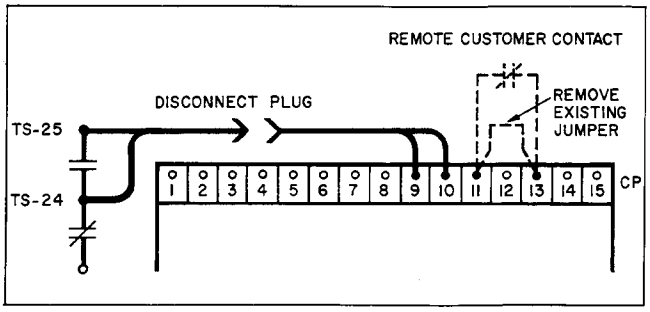


Figure 7. Acc. 26-D Connection

Acc. 15-A Auxiliary contact closed when Automatic Transfer Switch is connected to the emergency source.

One Acc. 15-A is supplied standard on all Automatic Transfer Switches. The following table provides the terminal numbers for standard and optional indicators, if furnished:
(Consult factory for location of 3rd optional Acc. 15).

Accessory 15-A	Indicator Terminal Numbers		
	(standard)	(1st optional)	(2nd optional)
Normal Side	12-13	31-32	35-36
Emergency Side	10-11	29-30	33-34

The location of the auxiliary contacts varies according to the ampere size of the Transfer Switch as shown in Figure 8.

Optional Accessory 15 can be added later in kit form. Include Serial Number and Catalog Number of Automatic Transfer Switch when ordering kit.

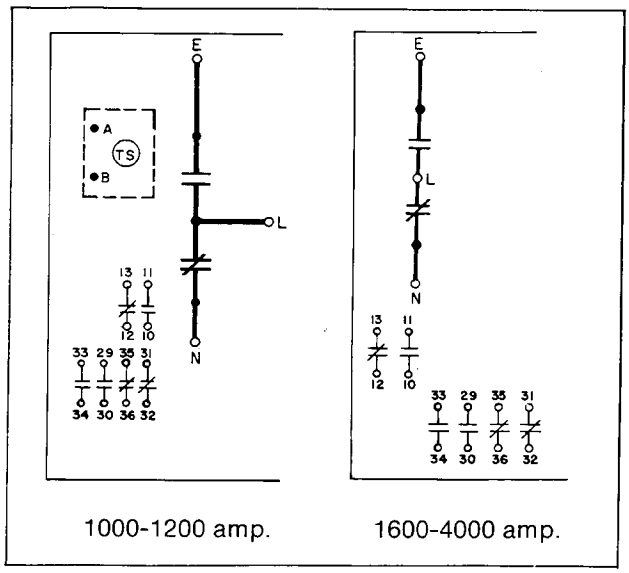


Figure 8. Acc. 15 Connections.

OPTIONAL ACCESSORY 23 GENERATOR SET EXERCISING TIMER (Figure 9)

This timer, if furnished, is used for periodic exercising of the emergency generator set. This timer is factory set for a 20 minute minimum exercise period once a week. The time period can be lengthened and can be set to occur more often than once a week. The generator set should be exercised under load once a week for a minimum time period of 30 minutes. Optional Accessory 23 can be added later in kit form. Include Serial Number and Catalog Number of Automatic Transfer Switch when ordering kit.

Acc. 23-C timer does not simulate a normal source failure. The Automatic Transfer Switch is not affected. The engine-generator plant is signalled to run unloaded for the set time period.

Set Exercise Day

1. Decide what day (or days) of the week to exercise the plant.
2. Remove the screw from the star wheel lobe marked with the decided day.

Set Exercise Period

1. Decide what time of the day to start the exercise period. Position light color tripper on dial edge at decided start time. Tighten knurled screw.
2. Decide what time of the day to stop the exercise period. Position dark color tripper on dial edge to decided stop time. Tighten knurled screw.

Set Present Time and Day

1. Find the present time of day on the dial. Turn the dial counterclockwise (direction of arrow) until the present time is adjacent the *"time"* arrow.

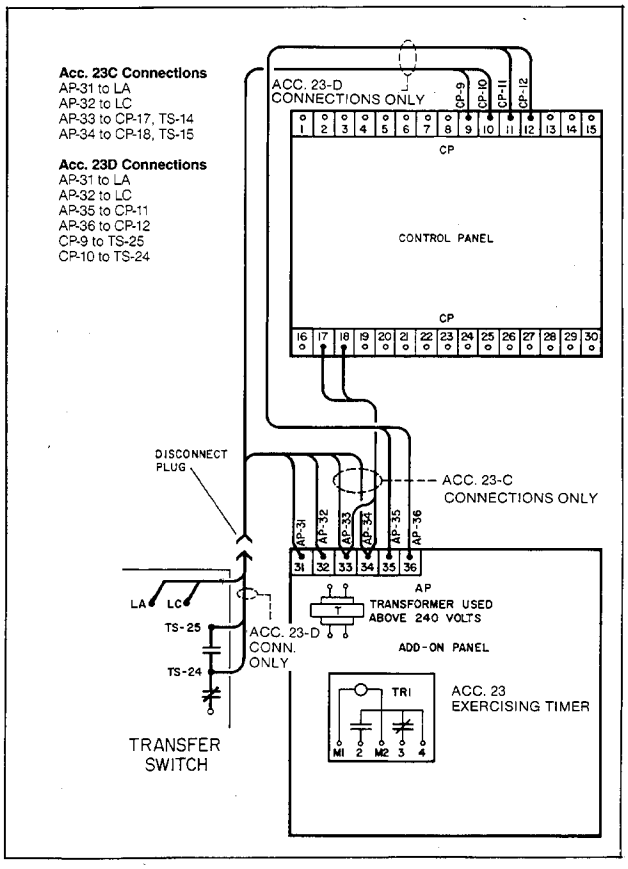


Figure 9. Acc. 23 Connections

2. Find the star wheel lobe marked with the present day. Turn the star wheel clockwise until day lobe is adjacent to the red lever.

Acc. 23-D timer simulates a normal source failure. The Automatic Transfer Switch transfers the electrical load to the emergency generator during the exercise period.

In Case of Trouble

If Acc. 23-C timer contact 4-2 does not close during the set exercise period, the engine-generator plant will not be signalled to run. If the contact remains closed beyond the set exercise period, the plant will continue running. In either case, Acc. 23-C timer is malfunctioning.

If Acc. 23-D timer contact 4-3 does not open during the set exercise period, the engine-generator plant will not be signalled to run and the load will not be transferred to the emergency source. If the contact remains open beyond the set exercise period, the plant will continue running and the load will remain connected to the emergency source. Immediate retransfer may be accomplished by manually shutting down the engine. Make sure that full rated normal voltage is available before doing this. In either case, Acc. 23-D timer is malfunctioning.

OPTIONAL ACCESSORY 34-A MOTOR LOAD TRANSFER-INPHASE MONITOR (Figure 10)

Acc. 34-A, if furnished, is an inphase monitor control for transfer and retransfer of motor loads, so that inrush currents do not exceed normal starting currents, to avoid nuisance tripping of circuit breakers and possible mechanical damage to motor couplings.

Sequence of Operation

Normal Source Restoration: SE relay energizes and ER relay is dropped out. After approximately 2 seconds the inphase monitor senses both sources of power, and its output relay energizes to initiate inphase transfer. The TS coil is energized and the standard Sequence of Operation is resumed.

When test switch Acc. 06-A, B is used, the inphase monitor senses both sources of power approximately 2 seconds after the ER relay energizes. The TS coil is energized and the standard Sequence of Operation is resumed.

If either source of power is **not** available when the inphase monitor starts its sensing mode, the output relay picks up after 2 seconds and allows the TS coil to be energized.

Optional Accessory 34-A can be added later in kit form. Include Serial Number and Catalog Number of Automatic Transfer Switch when ordering.

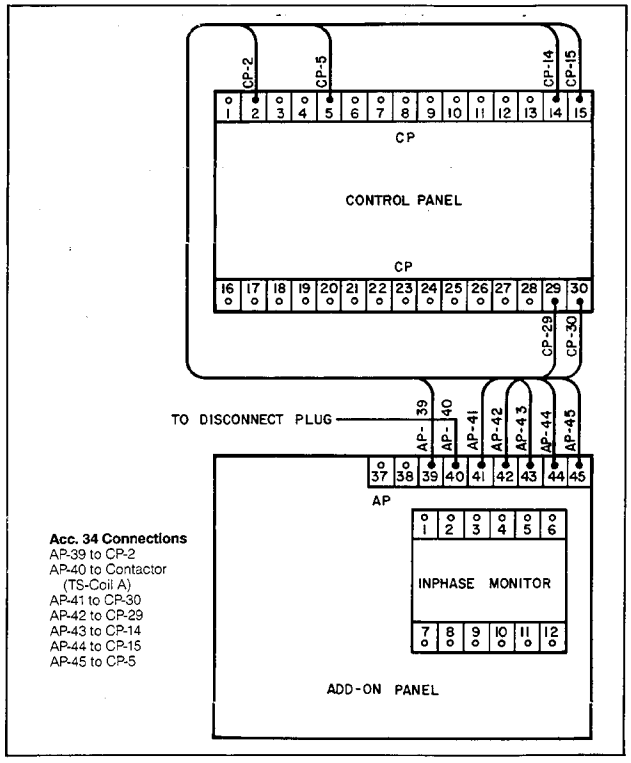


Figure 10. Acc. 34 Connection

In Case of Trouble

1. Connect a voltmeter between terminals NA and EA on the Transfer Switch. Set the meter scale to at least twice the system phase-to-phase voltage.
2. Manually start the generator set. After it has reached maximum output voltage, the meter needle should sweep back and forth at a regular rate between 0 volts and about twice the system voltage.
3. Depress and **hold** the Test Switch. The load should transfer to the emergency source when the meter needle is near 0 volts. If transfer does not occur, Acc. 34-A is malfunctioning.
4. Release the Test Switch. The load should retransfer back to the normal source after Acc. 03-C time delay, if used. The retransfer should occur when the needle is near 0 volts. If retransfer does not occur after the time delay, Acc. 34-A is malfunctioning.
5. Immediate retransfer may be accomplished by manually shutting down the generator set. Make sure that full rated normal voltage is available before doing this.
6. Disconnect and remove voltmeter.

DISCONNECTING THE CONTROL PANEL

The In-Line Disconnect Plug is furnished for repair purposes **only** and should not have to be separated. If it must be separated, follow these steps carefully.

⚠WARNING

SHOCK HAZARD! Disconnect inner panel harness at in-line connector. This will de-energize circuit board and logic circuitry, but allow transfer switch to continue to supply utility power to necessary lighting and equipment. Potential electrocution will exist if any accessories mounted to inner panel are NOT wired through and de-energized by harness separation. Such accessories may be at line voltage.

CAUTION

Follow steps 1a and 1b before disconnecting or reconnecting the plug, and observe the position of the Transfer Switch.

Disconnecting the Plug

1a. If the Transfer Switch is in the *Normal* position, place the generator set starting controls in the *"off"* position. Then open the emergency source circuit breaker.

1b. If the Transfer Switch is in the *Emergency* position, open the normal source circuit breaker. Place the generator set starting control in the *"test"* or *"run"* position.

2. Separate the In-Line Disconnect Plug by grasping and squeezing the plug. Do not pull on the wires.

3. Remove, label, and tape the signal wires connected to the engine start terminals on the Control Panel. (Terminals CP16 and CP17, or CP17 and CP18)

4. Remove, label, and tape the wire connected to Control Panel terminal CP2.

Reconnecting the Plug

1a. If the Transfer Switch is in the *Normal* position, place the generator set starting controls in the *"off"* position. Then open the emergency source circuit breaker.

1b. If the Transfer Switch is in the *Emergency* position, open the normal source circuit breaker.

2. Reconnect the signal wires to the appropriate engine start terminals. Reconnect the wire previously removed from terminal CP2.

3. Engage the In-Line Disconnect Plug by grasping and pressing together.

4a. If the Transfer Switch is in the *Normal* positon, place the generator set starting controls in the *"automatic"* position. Then close the emergency source circuit breaker.

4b. If the Transfer Switch is in the *Emergency* position, close the normal source circuit breaker. The load will be automatically retransferred to the normal source after Acc. 03-C time delay. For immediate retransfer, open and then reclose the emergency source circuit breaker. Place the generator set starting control in the *"automatic"* position.

Manual Load Transfer

1 Open the normal and emergency source circuit breakers.

2. Install the manual operator handle (see "FUNCTIONAL TEST, Manual Operation") and manually operate the Transfer Switch to the *Emergency* position. Remove handle.

3. Manually start the generator set and then close the emergency source circuit breaker.

SENSOR ADJUSTMENTS

The voltage and frequency sensor pickup and dropout points have been factory set in accordance with the job specifications. If these settings must be changed, contact your local Kohler Distributor.

CAUTION

Any indiscriminate change in these settings may effect the normal operation of the Automatic Transfer Switch thereby allowing the load circuits to remain connected to a low voltage source.

Normal Source Voltage Sensor

Pickup Setting	
Adjustment Range	85-100% of nominal
Factory Setting (unless otherwise specified)	90% of nominal

Dropout Setting	
Adjusting Range	75-98% of pickup
Factory Setting (unless otherwise specified)	85% of nominal

Emergency Source Voltage and Frequency Sensor

Voltage Pickup Setting	
Adjustment Range	85-100% of nominal
Factory Setting (unless otherwise specified)	90% of nominal

Voltage Dropout Setting

A fixed differential of approximately 15% below the pickup setting.

Frequency Pickup Setting	
Adjustment Range	90-100% of nominal
Factory Setting (unless otherwise specified)	95% of nominal

Frequency Dropout Setting

A fixed differential of approximately 12% below the pickup setting.

TIME DELAY ADJUSTMENTS

Acc. 02-A, 01-A, 03-C, and 04-C time delays have been factory set in accordance with the job specifications. If these time delays must be changed, follow these steps.

CAUTION

Do not remove or install A1 board while the Control Panel is energized. Observe the position of the Transfer Switch.

1a. If the Transfer Switch is in the *Normal* position, place the generator set starting controls in the *"off"* positon. Then open the emergency source circuit breaker.

1b. If the Transfer Switch is in the *Emergency* position, open the normal source circuit breaker. Place the generator set starting control in the *"test"* or *"run"* position.

2. Separate the In-Line Disconnect Plug by following instructions under "DISCONNECTING THE CONTROL PANEL."

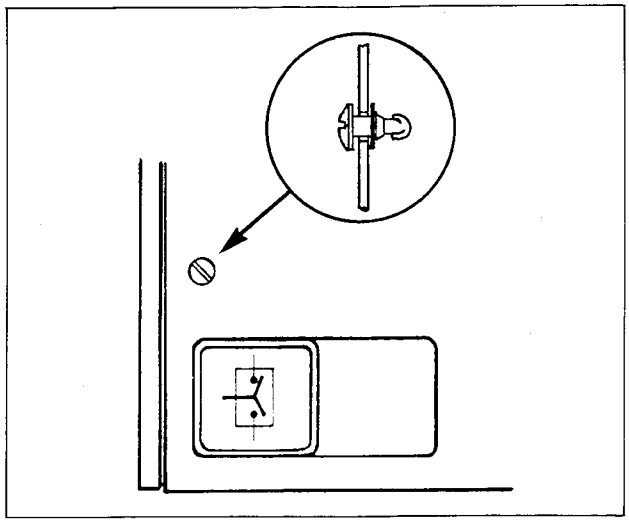


Figure 11. Cover Removal

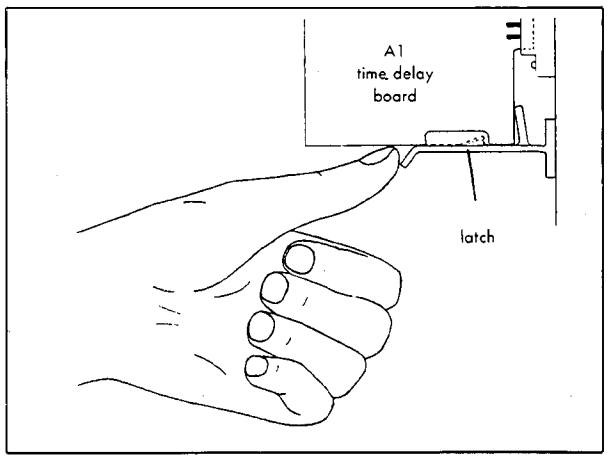


Figure 12. Time delay board latch

3. Remove the cover from the Control Panel as follows: Locate the two fasteners on the face of the cover. Use a screwdriver to turn the fasteners 1/4 turn until cover is released (Figure 11).

4. Remove Time Delay Board *"A1"* from its socket (release clips, grasp board by edges and gently rock it loose as shown in Figure 12).

5. Scrape "pot. seal" from potentiometer to be adjusted. (Support potentiometer with fingers as shown in Figure 13.)

6. Each time delay is adjusted by turning a potentiometer; clockwise to increase, counterclockwise to decrease. See Figure 14. Use the table below as a guide to approximate time delays and their corresponding pot. settings. The pots are shown with *A1* board vertical.

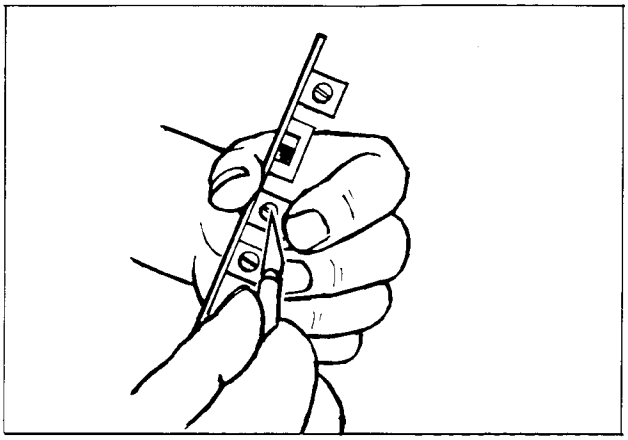


Figure 13. Pot Seal Removal

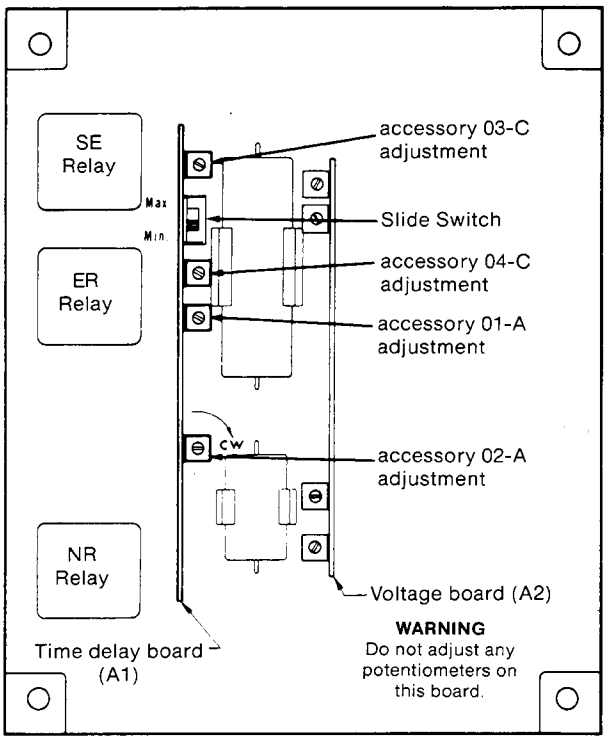


Figure 14. Adjustments

Adjustable Time Delays	potentiometer setting				
	Standard factory setting	Adjustment Range	max. ccw	½ cw	max. cw
Acc. 02-A override momentary outages	1	½ to 6 seconds	½	3	6 seconds
Acc. 01-A transfer to emergency	0	0 to 1 minute	0	½	1 minute
Acc. 03-C retransfer to normal (see Note)	30	½ to 30 minutes	½	15	30 minutes
Acc. 04-C generator set cool down	5	0 to 5 minutes	0	2½	5 minutes

CCW = Counterclockwise
CW = Clockwise

NOTE

If the slide switch is in the Min. position, Acc. 03-C is not used.

7. Reinstall Time Delay Board *"A1"* into its socket. (Figure 15.)
8. Install the cover on the Control Panel as follows: Align the cover over the two standing brackets and push it toward the panel. Then turn the two fasteners until they secure the cover (1/4 turn).
9. Reconnect the In-Line Disconnect Plug by following instructions under "DISCONNECTING THE CONTROL PANEL."

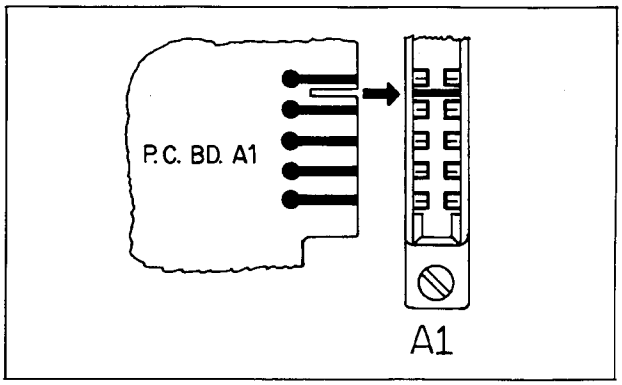
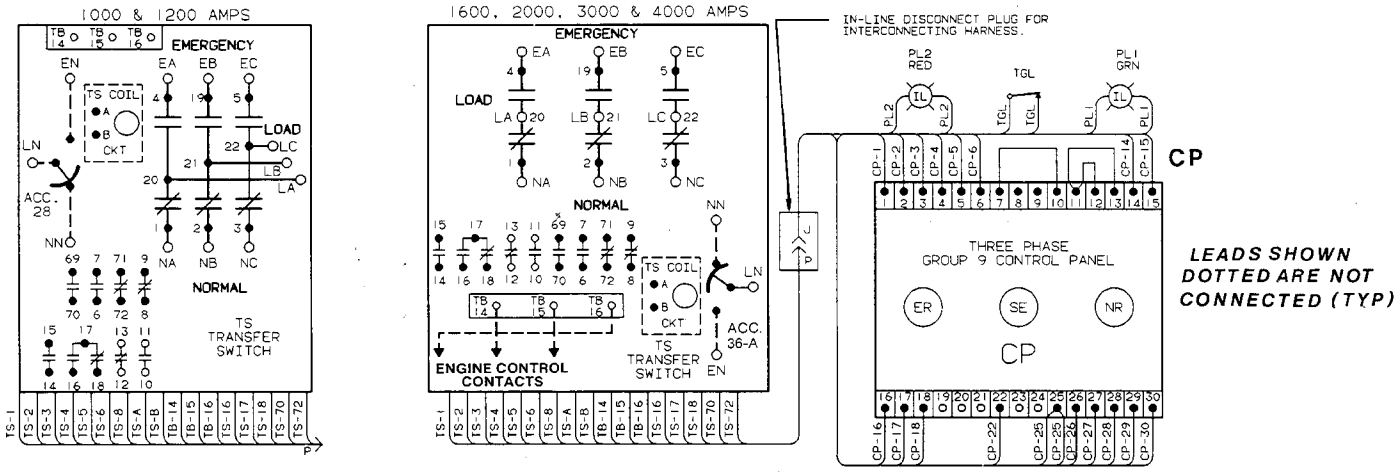


Figure 15. Slot Alignment

Three-Pole Switches



STANDARD ACCESSORIES

VOLTAGE AND FREQUENCY SENSING

A. Close differential voltage sensing on all phases of normal source. Pickup voltage is adjustable from 85% to 100% of nominal and the dropout is adjustable from 75% to 98% of the pickup value. Factory set to pickup at 90% and dropout at 85% of nominal unless otherwise specified.

B. Single phase voltage sensing of emergency source. Pickup adjustable from 85% to 100% of nominal. Factory set to pickup at 90% unless otherwise specified.

C. Frequency sensing of emergency source. Pickup adjustable from 90% to 100% of nominal. Factory set to pickup at 95% unless otherwise specified.

TIME DELAYS

D. Time delay to override momentary normal source outages to delay all transfer switch and engine starting signals. Adjustable from 0.5 to 6 seconds. Factory set at 1 second unless otherwise specified. Standard accessory 02-A.

E. Retransfer to normal time delay. Time delay is automatically bypassed if emergency source fails and normal source is available. Adjustable from 0 to 30 minutes. Factory set at 30 minutes unless otherwise specified. Standard accessory 03-C.

F. Unloaded running time delay for emergency engine generator cool down. Adjustable from 0 to 5 minutes. Factory set at 5 minutes unless otherwise specified. Standard accessory 04-C.

G. Transfer to emergency time delay. Adjustable from 0 to 5 minutes. Factory set at 0 minutes unless otherwise specified. Standard accessory 01-A.

ENGINE CONTROL CONTACTS

H. A contact that closes when normal source fails. Gold plated contacts for low voltage engine start signals or other customer use. Rated 10 amps, 32 volts DC.

J. A contact that opens when normal source fails. Gold plated contacts for low voltage engine start signal or other customer use. Rated 10 amps, 32 volts DC.

MANUAL CONTROLS

K. Test switch TGL with gold plated low voltage contacts to momentarily simulate normal source failure. Installed and connected on enclosure door. Shipped loose on open types. Standard accessory 06-A, B.

INDICATORS

L. One auxiliary contact closed when automatic transfer switch is connected to normal. Note: Additional auxiliary contacts are available as options. Standard accessory 15-A.

M. One auxiliary contact closed when automatic transfer switch is connected to emergency. Note: Additional auxiliary contacts are available as options. Standard accessory 15-A.

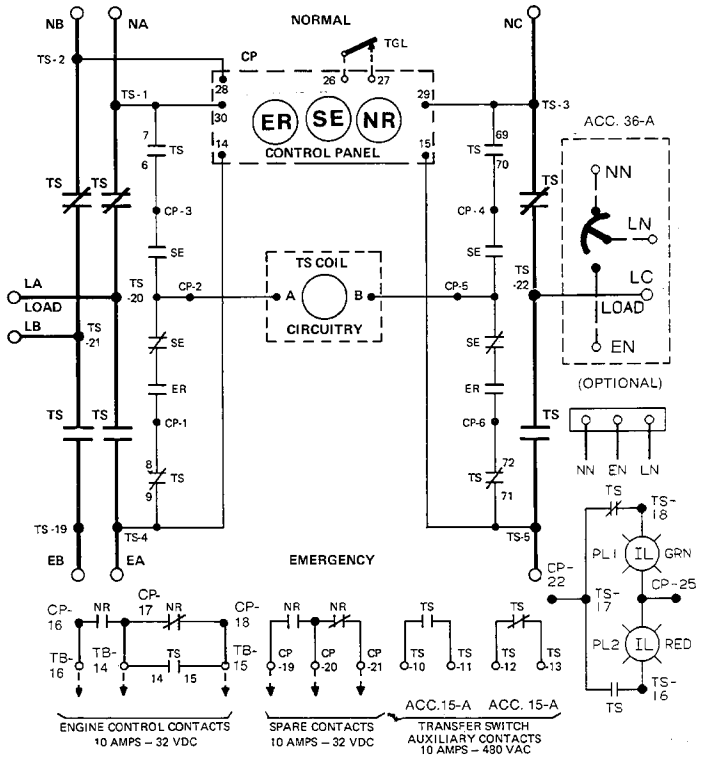
N. Signal light PL1 indicates when automatic transfer switch is connected to normal source. Installed and connected on enclosed types. Shipped loose for open types. Standard Accessory 12-A, C. Refer to Operator's Manual for replacement bulb number.

P. Signal light PL2 indicates when automatic transfer switch is connected to emergency source. Installed and connected on enclosed types. Shipped loose for open types. Standard Accessory 12-C, D. Refer to Operator's Manual for replacement bulb number.

GENERAL NOTES

1. Switch shown de-energized connected to normal source.
2. Device symbols and designations are in accordance with NEMA PUB.ICS 1-1983. Part 1-101A.
3. All wires are #16 AWG stranded copper and follow NEMA Standard ICS-1-112-64 color code unless otherwise specified.
4. ° Indicates customer connection points.
5. • Indicates factory connection points.
6. Connection points that have both customer connections and factory connections are shown as customer connection points.
7. *On enclosed type switches the transfer unit is mounted on the back inside surface and the Control Panel on the inside door surface.* When an additional accessory mounting panel is required to mount the optional accessories, it is located directly below the Control Panel.
8. Publication TP-5089 Operator's Manual is furnished with each Automatic Transfer Switch. Refer to this publication prior to installation and operation of the switch.

ELEMENTARY WIRING DIAGRAM



OPTIONAL ACCESSORIES

MANUAL CONTROLS FOR AUTOMATIC TRANSFER SWITCHES

☐ **Acc. 29-C, E** - Reset switch to manually retransfer the automatic transfer switch to the normal source. Gold plated low voltage contacts. Installed and connected on enclosure door. Shipped loose for open types.

☐ **Acc. 08-A, C** - Reset switch to manually bypass time delay on retransfer to normal. Gold plated low voltage contacts. Installed and connected on enclosure door. Shipped loose for open types.

INDICATORS

☐ **Acc. 15-A** - One auxiliary contact is supplied as standard. (See Standard Accessories.) Auxiliary contact closed when automatic transfer switch is connected to normal. Specify TOTAL quantity of Accessory 15-A if more than one is required.

☐ **Acc. 15-A** - One auxiliary contact is supplied as standard. (See Standard Accessories.) Auxiliary contact closed when automatic transfer switch is connected to emergency. Specify TOTAL quantity Accessory 15-A if more than one is required.

ENGINE-GENERATOR CONTROLS

Battery Charger adjustable from 0.05 AMP (Trickle Charger) to 2.0 AMPS maximum charge rate. Shipped loose for open types. Mounted separately on enclosed types.

☐ **Acc. 24 - 12 Volts DC** Battery Charger

☐ **Acc. 24 - 24 Volts DC** Battery Charger

☐ **Acc. 23-C** - Engine-Generator exercising timer without load. Adjustable in 15 minute increments. Factory set for 20 minutes minimum each week unless otherwise specified.

☐ **Acc. 23-D** - Engine-Generator exercising timer with load. Adjustable in 15 minute increments. Factory set for 20 minutes minimum each week unless otherwise specified.

MOTOR LOAD TRANSFER

☐ **Acc. 34-A** - Inphase monitor controls for transfer and retransfer of motor loads, so that inrush currents do not exceed normal starting currents, to avoid nuisance tripping of circuit breakers and possible mechanical damage to motor couplings. See Catalog.

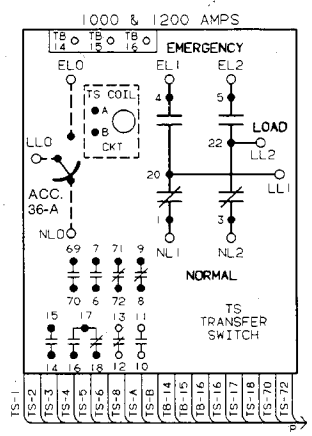
TRANSFER SWITCH OPTIONS

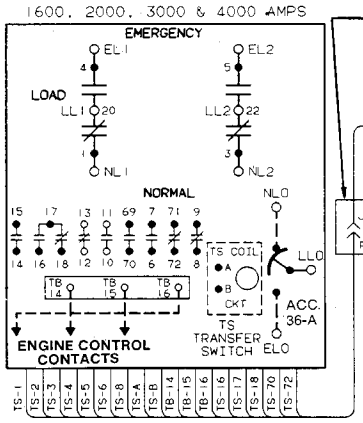
☐ **Acc. 36-A** - Overlapping neutral transfer contacts. Assures proper ground fault sensing and avoids possible phase overvoltages during transfer of neutral between normal and emergency. See Catalog.

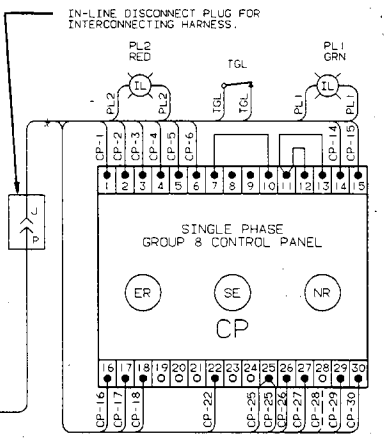
REMOTE AUTOMATIC TRANSFER SWITCH CIRCUITS

☐ **Acc. 26-D** Terminal provisions for Area Protection remote contact which opens to signal automatic transfer switch to transfer to emergency. See Catalog. Gold plated low voltage contact required.

Two-Pole Switches







CP

LEADS SHOWN DOTTED ARE NOT CONNECTED (TYP)

STANDARD ACCESSORIES

VOLTAGE AND FREQUENCY SENSING

A. Close differential voltage sensing on all phases of normal source. Pickup voltage is adjustable from 85% to 100% of nominal and the dropout is adjustable from 75% to 98% of the pickup. Factory set to pickup at 90% and dropout at 85% of nominal unless otherwise specified.

B. Single phase voltage sensing of emergency source. Pickup adjustable from 85% to 100% of nominal. Factory set to pickup at 90% unless otherwise specified.

C. Frequency sensing of emergency source. Pickup adjustable from 90% to 100% of nominal. Factory set to pickup at 95% unless otherwise specified.

TIME DELAYS

D. Time delay to override momentary normal source outages to delay all transfer switch and engine starting signals. Adjustable from 0.5 to 6 seconds. Factory set at 1 second unless otherwise specified. Standard accessory 02-A.

E. Retransfer to normal time delay. Time delay is automatically bypassed if emergency source fails and normal source is available. Adjustable from 0 to 30 minutes. Factory set at 30 minutes unless otherwise specified. Standard accessory 03-C.

F. Unloaded running time delay for emergency engine-generator cool down. Adjustable from 0 to 5 minutes. Factory set at 5 minutes unless otherwise specified. Standard accessory 04-C.

G. Transfer to emergency time delay. Adjustable from 0 to 5 minutes. Factory set at 0 minutes unless otherwise specified. Standard accessory 01-A.

ENGINE CONTROL CONTACTS

H. A contact that closes when normal source fails. Gold plated contacts for low voltage engine start signals or other customer use. Rated 10 amps, 32 volts DC.

J. A contact that opens when normal source fails. Gold plated contacts for low voltage engine start signal or other customer use. Rated 10 amps, 32 volts DC.

MANUAL CONTROLS

K. Test switch TGL with gold plated low voltage contacts to momentarily simulate normal source failure. Installed and connected on enclosure door. Shipped loose on open types. Standard accessories 06-A, B.

INDICATORS

L. One auxiliary contact closed when automatic transfer switch is connected to normal. Note: Additional auxiliary contacts are available as options. Standard accessory 15-A.

M. One auxiliary contact closed when automatic transfer switch is connected to emergency. Note: Additional auxiliary contacts are available as options. Standard accessory 15-A.

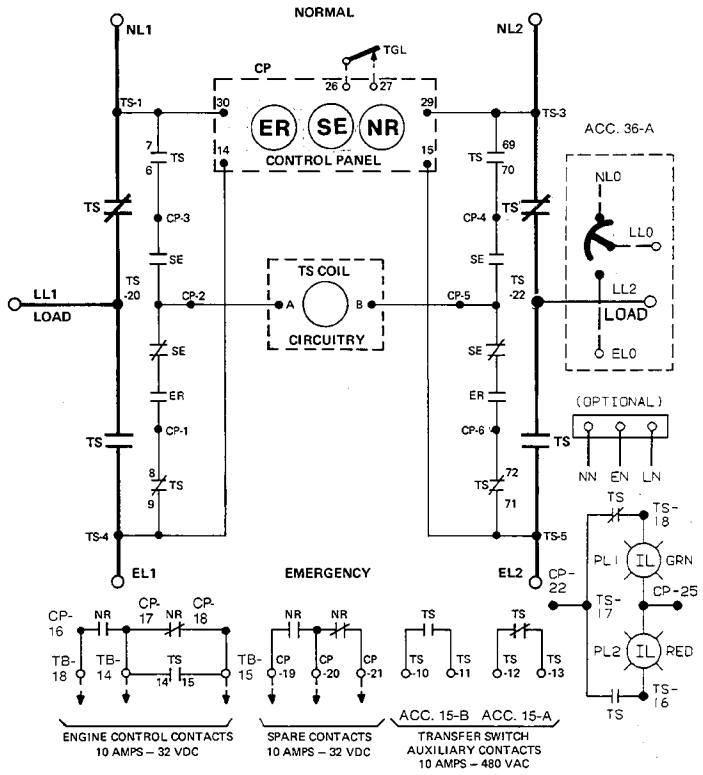
N. Signal light PL1 indicates when automatic transfer switch is connected to normal source. Installed and connected on enclosed types. Shipped loose for open types. Standard Accessory 12-A, C. Refer to Operator's Manual for replacement bulb number.

P. Signal light PL2 indicates when automatic transfer switch is conneced to emergency source. Installed and connected on enclosed types. Shipped loose for open types. Standard Accessory 12-C, D. Refer to Operator's Manual for replacement bulb number.

GENERAL NOTES

1. Switch shown de-energized connected to normal source.
2. Device symbols and designations are in accordance with NEMA PUB.ICS—1983. Part 1 - 101A.
3. All wires are #16 AWG stranded copper and follow NEMA Standard ICS-1-112-64 color code unless otherwise specified.
4. ° Indicates customer connection points.
5. • Indicates factory connection points.
6. Connection points that have both customer connections and factory connections are shown as customer connection points.
7. *On enclosed type switches the transfer unit is mounted on the back inside surface and the Control Panel on the inside door surface.* When an additional accessory mounting panel is required to mount the optional accessories, it is located directly below the Control Panel.
8. Publication TP-5089 Operator's Manual is furnished with each Automatic Transfer Switch. Refer to this publication prior to installation and operation of the switch.

ELEMENTARY WIRING DIAGRAM



OPTIONAL ACCESSORIES

MANUAL CONTROLS FOR AUTOMATIC TRANSFER SWITCHES

☐ **Acc. 29-C, E** - Reset switch to manually retransfer the automatic transfer switch to the normal source. Gold plated low voltage contacts. Installed and connected on enclosure door. Shipped loose for open types.

☐ **Acc. 08-A, C** - Reset switch to manually bypass time delay on retransfer to normal. Gold plated low voltage contacts. Installed and connected on enclosure door. Shipped loose for open types.

☐ **Acc. 29-U, V** - Reset switch to manually retransfer the automatic transfer switch to the normal source after time delay expires with automatic retransfer in the event of emergency source failure. Gold plated low voltage contacts. Installed and connected on enclosure door. Shipped loose for open types.

INDICATORS

☐ **Acc. 15-A** - One auxiliary contact is supplied as standard. (See Standard Accessories.) Auxiliary contact closed when automatic transfer switch is connected to normal. Specify TOTAL quantity of Accessory 15-A if more than one is required.

☐ **Acc. 15-A** - One auxiliary contact is supplied as standard. See Standard Accessories.) Auxiliary contact closed when automatic transfer switch is connected to emergency. Specify TOTAL quantity Accessory 15-A if more than one is required.

ENGINE GENERATOR CONTROLS

☐ Battery Charger adjustable from 0.05 AMP (Trickle Charger) to 2.0 AMPS maximum charge rate. Shipped loose for open types. Mounted separately on enclosed types.

☐ **Acc. 24 - 12 Volts DC** Battery Charger

☐ **Acc. 24 - 24 Volts DC** Battery Charger

☐ **Acc. 23-C** - Engine-Generator exercising timer without load. Adjustable in 15 minute increments. Factory set for 20 minutes minimum each week unless otherwise specified.

☐ **Acc. 23-D** - Engine-Generator exercising timer with load. Adjustable in 15 minute increments. Factory set for 20 minutes minimum each week unless otherwise specified.

REMOTE AUTOMATIC TRANSFER SWITCH CIRCUITS

☐ **Acc. 26-D** Terminal provisions for Area Protection remote contact which opens to signal automatic transfer switch to transfer to emergency. See Catalog. Gold plated low voltage contact required.

MOTOR LOAD TRANSFER

☐ **Acc. 34-A** - Inphase monitor controls for transfer and retransfer of motor loads, so that inrush currents do not exceed normal starting currents, to avoid nuisance tripping of circuit breakers and possible mechanical damage to motor couplings. See Catalog.

TRANSFER SWITCH OPTIONS

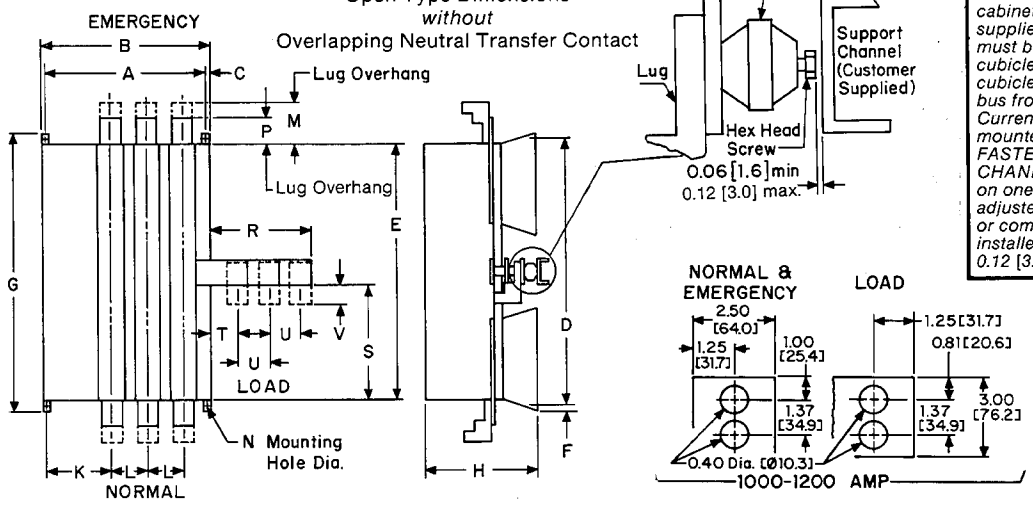
☐ **Acc. 36-A** - Overlapping neutral transfer contacts. Assures proper ground fault sensing and avoids possible phase overvoltages during transfer of neutral between normal and emergency. See Catalog.

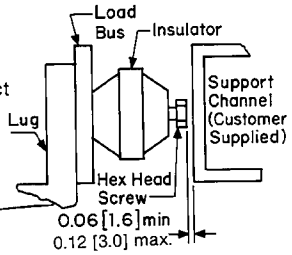
AMP SIZE	Open type Dimensions—Inches [mm]								
	A	B	C	D	E	F	G	H	J
1000	18.87 [479.4]	19.62 [498.3]	0.37 [9.4]	31.25 [793.8]	30.00 [762.0]	0.62 [15.7]	32.50 [825.5]	13.00 [330.2]	—
1200	18.87 [479.4]	19.62 [498.3]	0.37 [9.4]	31.25 [793.8]	30.00 [762.0]	0.62 [15.7]	32.50 [825.5]	13.00 [330.2]	—

AMP SIZE	Open type Dimensions—Inches [mm]									
	K	L	M	N	P	R	S	T	U	V
1000	7.50 [190.5]	4.28 [108.7]	5.06 [128.6]	0.43 [10.9]	3.00 [76.2]	11.87 [301.6]	12.62 [320.5]	3.18 [80.7]	3.68 [93.4]	1.37 [34.8]
1200	7.50 [190.5]	4.28 [108.7]	5.06 [128.6]	0.43 [10.9]	3.00 [76.2]	11.87 [301.6]	12.62 [320.5]	3.18 [80.7]	3.68 [93.4]	1.37 [34.8]

1000 THRU 1200 AMP.

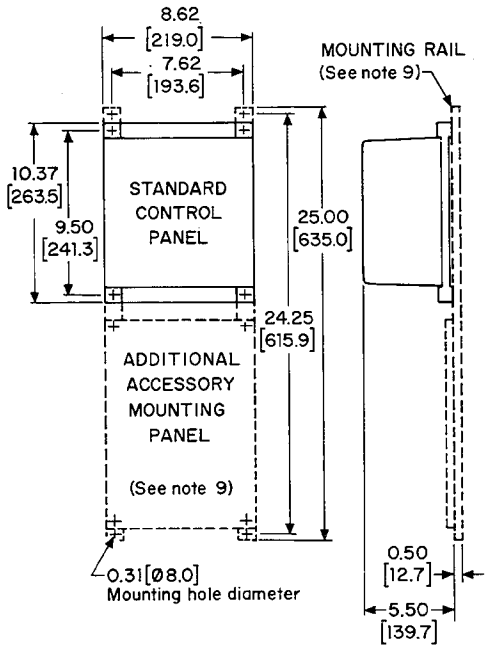
Open Type Dimensions
without
Overlapping Neutral Transfer Contact





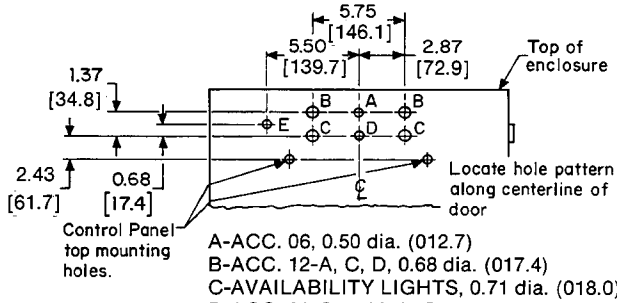
IMPORTANT NOTE:
When mounted in other than conventional cabinet, such as a cubicle, a customer supplied support channel is required and must be mounted and located in the cubicle between the load bus and the cubicle back. This will prevent the load bus from bending under High Fault Current conditions. An insulator is mounted on the load bus. DO NOT FASTEN THE INSULATOR TO THE CHANNEL! A hex head screw is supplied on one end of the insulator. It may be adjusted to build up the insulator length or completely removed to attain an installed clearance of 0.06 [1.6] min. to 0.12 [3.0] max.

Open Type Dimensions-Inches [mm]



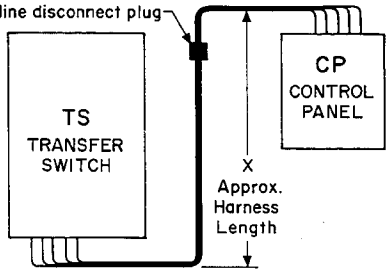
STANDARD CONTROL PANEL
with additional accessory mounting panel
and channels used with any size
Transfer Switch Unit

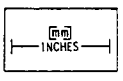
RECOMMENDED ENCLOSURE DOOR MOUNTING HOLE LAYOUT
FOR TOGGLE SWITCHES; PILOT LIGHTS ETC.

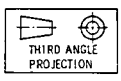


A-ACC. 06, 0.50 dia. (012.7)
B-ACC. 12-A, C, D, 0.68 dia. (017.4)
C-AVAILABILITY LIGHTS, 0.71 dia. (018.0)
D-ACC. 29-C or 08-A, C, 0.50 dia. (012.7)
E-ACC. 07-C, D, 0.50 dia. (012.7)

AMPS	DIM. X
1000-1200	60.0 [1524.0]
1600-4000	96.0 [2438.4]

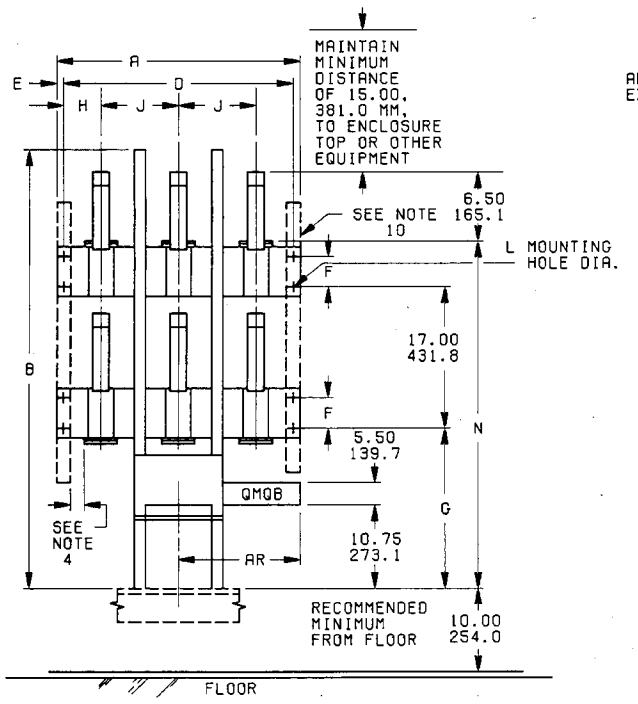


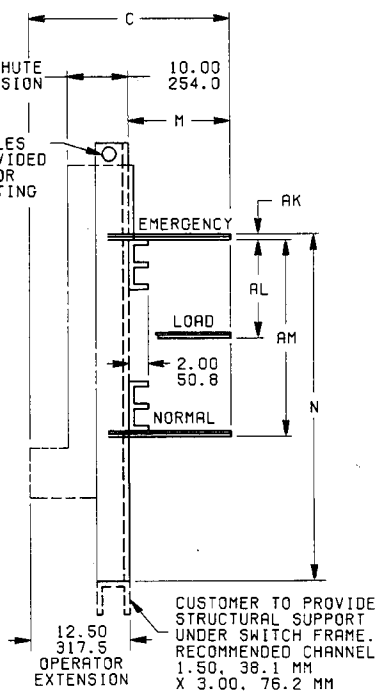


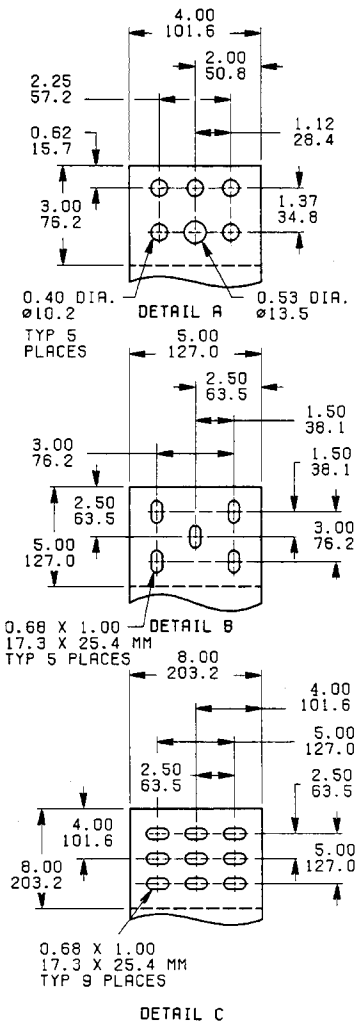


1600 THRU 4000 AMP.

Open Type Dimensions
without
Overlapping Neutral Transfer Contact







AMP SIZE	DIMENSIONS								
	A	B	C	D	E	F	G	H	J
1600 & 2000	28.50 723.9	52.00 1320.8	18.50 469.9	27.00 685.8	0.75 19.1	4.37 111.0	20.65 524.5	4.50 114.3	9.00 228.6
3000	31.50 800.1	52.00 1320.8	22.50 571.5	30.00 762.0	0.75 19.1	4.37 111.0	20.65 524.5	5.00 127.0	10.00 254.0
4000	41.00 1041.4	52.00 1320.8	25.50 647.7	39.00 990.6	1.00 25.4	4.37 111.0	20.65 524.5	6.50 165.1	13.00 330.2

AMP SIZE	DIMENSIONS								
	L	M	N	AK	AL	AM	AR		
1600 & 2000	0.40 ø10.2	6.00 152.4	43.46 1103.9	0.50 12.7	11.62 295.1	23.75 603.3	—		
3000	0.40 ø10.2	10.00 254.0	43.71 1110.4	0.75 19.1	11.75 298.5	24.00 609.6	20.50 520.7		
4000	0.40 ø10.2	13.00 330.2	43.71 1110.4	0.75 19.1	11.75 298.5	24.00 609.6	19.50 495.3		

GENERAL NOTES

1. For Two pole switches, omit center pole.
2. When installing, connect Normal, Emergency, and Load conductor to clearly marked terminals.
3. All internal connections are made at the factory.
4. Maintain electrical clearance of 1 in. (25.4) minimum between live metal parts and grounded metal when mounted.
5. Load Lugs can be factory assembled for optional bottom connection, 1000, and 1200 amp switches.
6. When open type ATS's are intended for enclosure type mounting by others, mount the transfer switch unit on the inside back surface and the control panel(s) on the *inside door surface*. Refer to layout for recommended toggle switch, pilot light, etc. door mounting hole pattern.
7. The control panel is connected to the transfer switch panel by two wire harnesses in a common in-line quick disconnect plug. *Consult factory for availabile extension harnesses.*
8. Required front top and bottom enclosure ventilation openings for 1600 thru 4000 amp switches is 140 sq. inches (980) sq. cm. total.
9. Mounting rails are supplied with open type switches, *ONLY* with additional accessory mounting panel as required for mounting optional time delays, relays, and monitors.
10. *Publication TP-5089 Operator's Manual is furnished with each Automatic Transfer Switch. Refer to this publication prior to installation and operation of the switch.*

SIZES OF AL-CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS

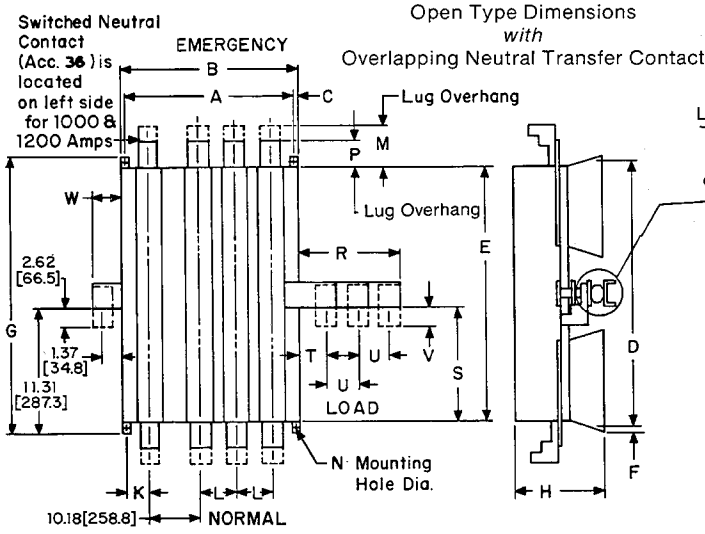
Switch Rating (Amps)	Range of Wire Sizes	Special Lug Sizes
1000-1200	Four # 2 AWG to 600 MCM	
1600-4000	Suitable for Bus Bar	

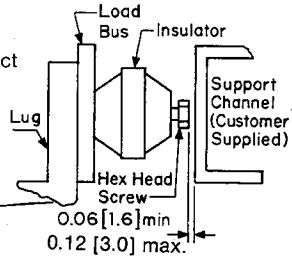
AMP SIZE	Open Type Dimensions—inches [mm]									
	A	B	C	D	E	F	G	H	J	K
1000	24.25 [616.0]	25.00 [635.0]	0.37 [9.4]	31.25 [793.8]	30.00 [762.0]	0.62 [15.7]	32.50 [825.5]	13.00 [330.2]	—	3.06 [77.8]
1200	24.25 [616.0]	25.00 [635.0]	0.37 [9.4]	31.25 [793.8]	30.00 [762.0]	0.62 [15.7]	32.50 [825.5]	13.00 [330.2]	—	3.06 [77.8]

AMP SIZE	Open Type Dimensions—inches [mm]									
	L	M	N	P	R	S	T	U	V	W
1000	4.28 [108.7]	5.06 [128.6]	0.43 [10.9]	3.00 [76.2]	11.87 [301.6]	12.62 [320.5]	3.18 [80.7]	3.68 [93.4]	1.37 [34.8]	2.62 [66.5]
1200	4.28 [108.7]	5.06 [128.6]	0.43 [10.9]	3.00 [76.2]	11.87 [301.6]	12.62 [320.5]	3.18 [80.7]	3.68 [93.4]	1.37 [34.8]	2.62 [66.5]

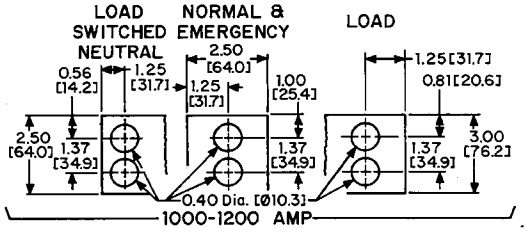
1000 THRU 1200 AMP.

Open Type Dimensions
with
Overlapping Neutral Transfer Contact

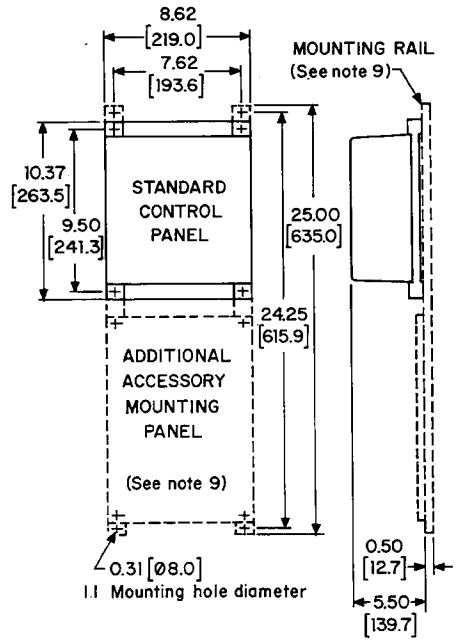




IMPORTANT NOTE:
When mounted in other than conventional cabinet, such as a cubicle, a customer supplied support channel is required and must be mounted and located in the cubicle between the load bus and the cubicle back. This will prevent the load bus from bending under High Fault Current conditions. An insulator is mounted on the load bus. DO NOT FASTEN THE INSULATOR TO THE CHANNEL! A hex head screw is supplied on one end of the insulator. It may be adjusted to build up the insulator length or completely removed to attain an installed clearance of 0.6[1.6] min. to 0.12[3.0] max.

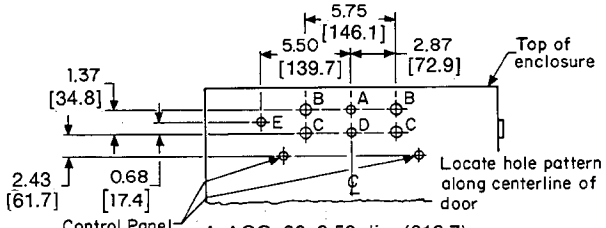


Open Type Dimensions-Inches [mm]



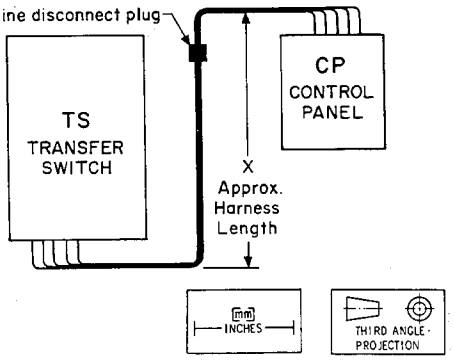
STANDARD CONTROL PANEL
with additional accessory mounting panel
and channels used with any size
Transfer Switch Unit

RECOMMENDED ENCLOSURE DOOR MOUNTING HOLE LAYOUT
FOR TOGGLE SWITCHES; PILOT LIGHTS ETC.



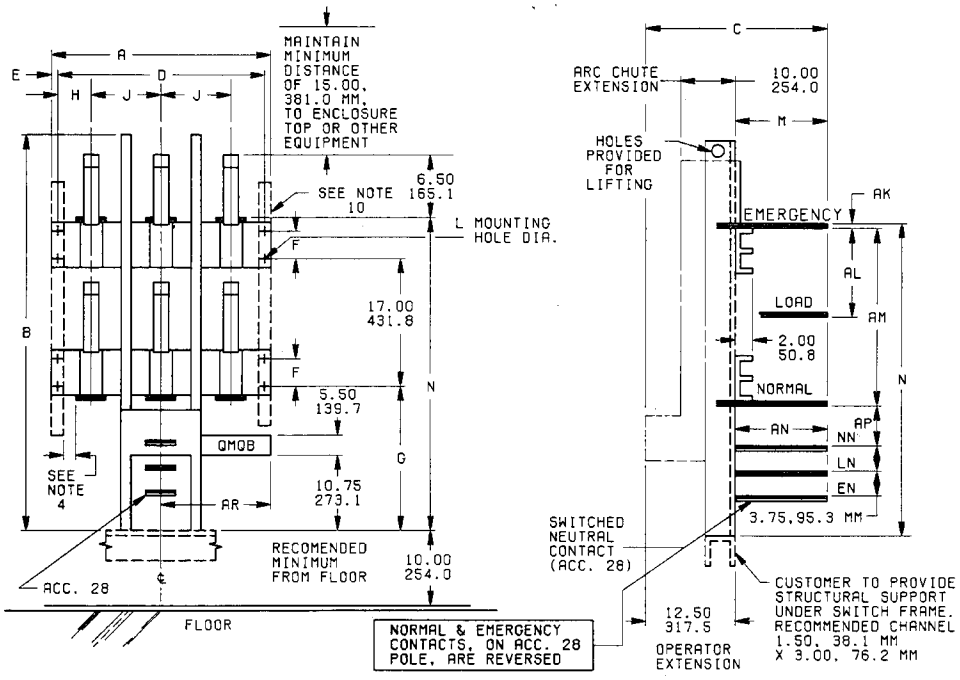
A-ACC. 06, 0.50 dia. (012.7)
B-ACC. 12-A, C, D, 0.68 dia. (017.4)
C-AVAILABILITY LIGHTS, 0.71 dia. (018.0)
D-ACC. 29-C or 08-A, C, 0.50 dia. (012.7)
E-ACC. 07-C, D, 0.50 dia. (012.7)

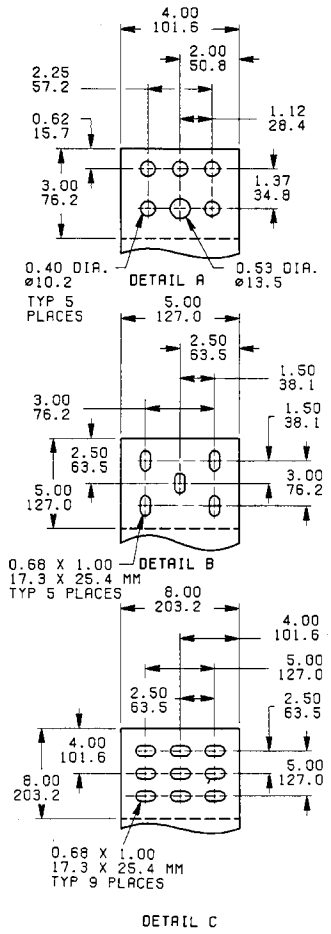
AMPS	DIM. X
150-260	36.0[914.4]
400-800	50.0[1270.0]
1000-1200	60.0[1524.0]
1600-4000	96.0[2438.4]



1600 THRU 4000 AMP.

Open Type Dimensions
with
Overlapping Neutral Transfer Contact





AMP SIZE	DIMENSIONS								
	A	B	C	D	E	F	G	H	J
1600 & 2000	28.50 723.9	52.00 1320.8	18.50 469.9	27.00 685.8	0.75 19.1	4.37 111.0	20.65 524.5	4.50 114.3	9.00 228.6
3000	31.50 800.1	52.00 1320.8	22.50 571.5	30.00 762.0	0.75 19.1	4.37 111.0	20.65 524.5	5.00 127.0	10.00 254.0
4000	41.00 1041.4	52.00 1320.8	25.50 647.7	39.00 990.6	1.00 25.4	4.37 111.0	20.65 524.5	6.50 165.1	13.00 330.2

AMP SIZE	DIMENSIONS								
	L	M	N	AK	AL	AM	AN	AP	AR
1600 & 2000	0.40 ø10.2	6.00 152.4	43.46 1103.9	0.50 12.7	11.62 295.1	23.75 603.3	6.00 152.4	8.03 204.0	—
3000	0.40 ø10.2	10.00 254.0	43.71 1110.4	0.75 19.1	11.75 298.5	24.00 609.6	10.00 254.0	8.41 223.7	20.50 520.7
4000	0.40 ø10.2	13.00 330.2	43.71 1110.4	0.75 19.1	11.75 298.5	24.00 609.6	13.00 330.2	8.41 223.7	19.50 495.3

GENERAL NOTES

1. For Two pole switches, omit center pole.
2. When installing, connect Normal, Emergency, and Load conductors to clearly marked terminals.
3. All internal connections are made at the factory.
4. Maintain electrical clearance of 1 in. (25.4) minimum between live metal parts and grounded metal when mounted.
5. Load Lugs can be factory assembled for optional bottom connection 1000, and 1200 amp switches.
6. When open type ATS's are intended for enclosure type mounting by others, mount the transfer switch unit on the inside back surface and the control panel(s) on the *inside door surface*. Refer to layout for recommended toggle switch, pilot light, etc. door mounting hole pattern.
7. The control panel is connected to the transfer switch panel by two wire harnesses in a common in-line quick disconnect plug. *Consult factory for available extension harnesses.*
8. Required front top and bottom enclosure ventilation openings for 1600 thru 4000 amp switches is 140 sq. inches (980) sq. cm. total.
9. Mounting rails are supplied with open type switches, *ONLY* with additional accessory mounting panel as required for mounting optional time delays, relays, and monitors.
10. *Publication TP-5089 Operator's Manual is furnished with each Automatic Transfer Switch. Refer to this publication prior to installation and operation of the switch.*

SIZES OF AL-CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS

Switch Rating (Amps)	Range of Wire Sizes	Special Lug Sizes
1000-1200	Four #2 AWG to 600 MCM	
1600-4000	Suitable for Bus Bar	

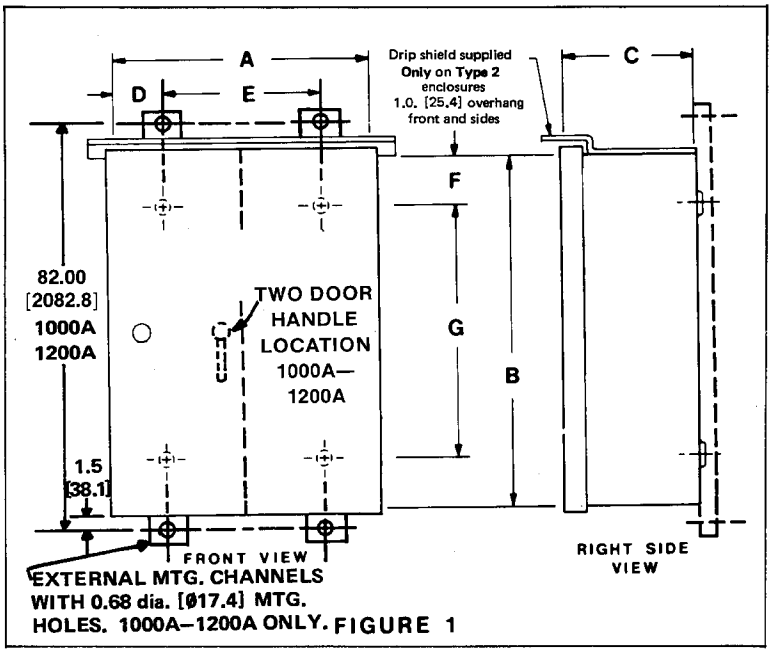


FIGURE 1

1. Removable single door hinged on right side with key locking handle. Two door on 1000 & 1200A.
2. Full wiring gutters and 0.75 dia. (019.0)—0.50 dia. (012.7) combination pilot knockouts provided top and bottom only.
3. Nema Type 1 can be supplied with gasketing to provide a dust seal.
4. Flush Mounted type have removable Flush door and trim. Trim overlaps 1" (25.4) on all sides.
5. Nema Type 2 enclosures are provided with a top mounted drip shield that extended beyond the front and sides of the enclosure. Pilot knockouts provided in bottom only.
6. Add 3" for Flush Mounted enclosure.
7. 3 Point Latch on 1000 - 1200A.

NOTES
(Figure 1 ONLY)

① ② ④ ⑤ ⑦ TYPE 1

① ② ⑤ ⑦ TYPE 2

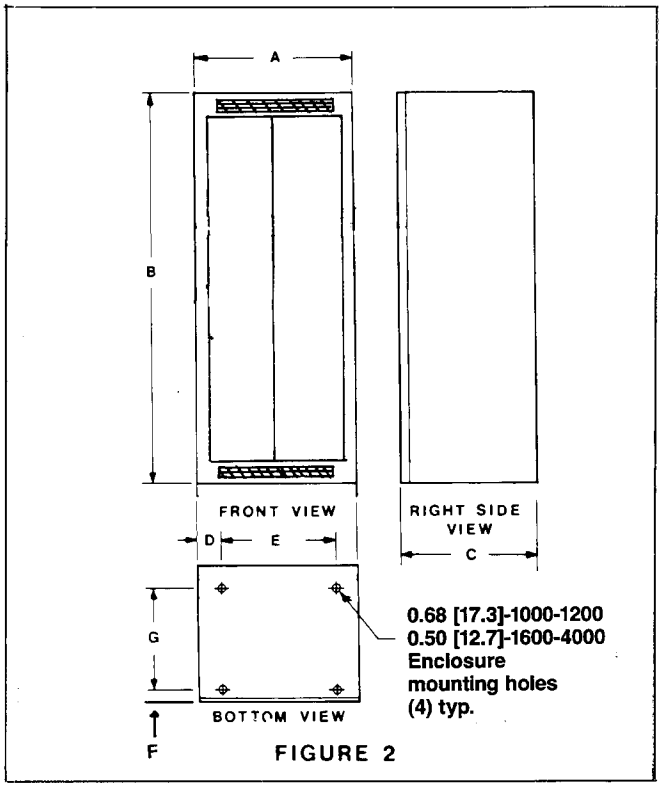


FIGURE 2

NOTES
(Figure 2 ONLY)

TYPE 1 – General Purpose, Indoor, Floor Supported

1. Free standing, frame construction.
2. Removable doors. Key Locking Handle.
3. Sides, top and back removable, open bottom.
4. Ventilated front, on top and bottom.
5. Provisions for lifting.
6. Single door hinged on right with single center latch and captive screws on top and bottom for 1600—2000A. Two door with 3 point latch on 3000—4000A.

TYPE 1 AND 2 ENCLOSURES FOR
Transfer Switches WITHOUT
Overlapping Neutral Transfer Contact

AMP SIZE	FIG. NO.	Dimensional Data Inches [mm]						
		A	B	C	D	E	F	G
1000	1	36.0 [914.4]	79.0 [2006.6]	16.0 [406.4]	1.87 [47.6]	32.25 [818.2]	—	—
1200		36.0 [914.4]	79.0 [2006.6]	16.0 [406.4]	1.87 [47.6]	32.25 [818.2]	—	—
1600	2	38.0 [965.2]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	33.5 [850.9]	3.12 [79.0]	41.75 [1060.4]
2000		38.0 [965.2]	90.0 [2286.0]	48.0 [1219.2]	57.2 [57.2]	33.5 [850.9]	3.12 [79.0]	41.75 [1060.4]
3000		46.0 [1168.4]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	41.5 [1054.1]	3.12 [79.0]	41.75 [1060.4]
4000		46.0 [1168.4]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	41.5 [1054.1]	3.12 [79.0]	41.75 [1060.4]

TYPE 1 AND 2 ENCLOSURES FOR
Transfer Switches WITH
Overlapping Neutral Transfer Contact

AMP SIZE	FIG. NO.	Dimensional Data Inches [mm]						
		A	B	C	D	E	F	G
1000	1	44.0 [1117.6]	79.0 [2006.6]	16.0 [406.4]	5.12 [130.0]	33.75 [857.2]	—	—
1200		44.0 [1117.6]	79.0 [2006.6]	16.0 [406.4]	5.12 [130.0]	33.75 [857.2]	—	—
1600	2	38.0 [965.2]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	33.5 [850.9]	3.12 [79.0]	41.75 [1060.4]
2000		38.0 [965.2]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	33.5 [850.9]	3.12 [79.0]	41.75 [1060.4]
3000		46.0 [1168.4]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	41.5 [1054.1]	3.12 [79.0]	41.75 [1060.4]
4000		.46.0 [1168.4]	90.0 [2286.0]	48.0 [1219.2]	2.25 [57.2]	41.5 [1054.1]	3.12 [79.0]	41.75 [1060.4]

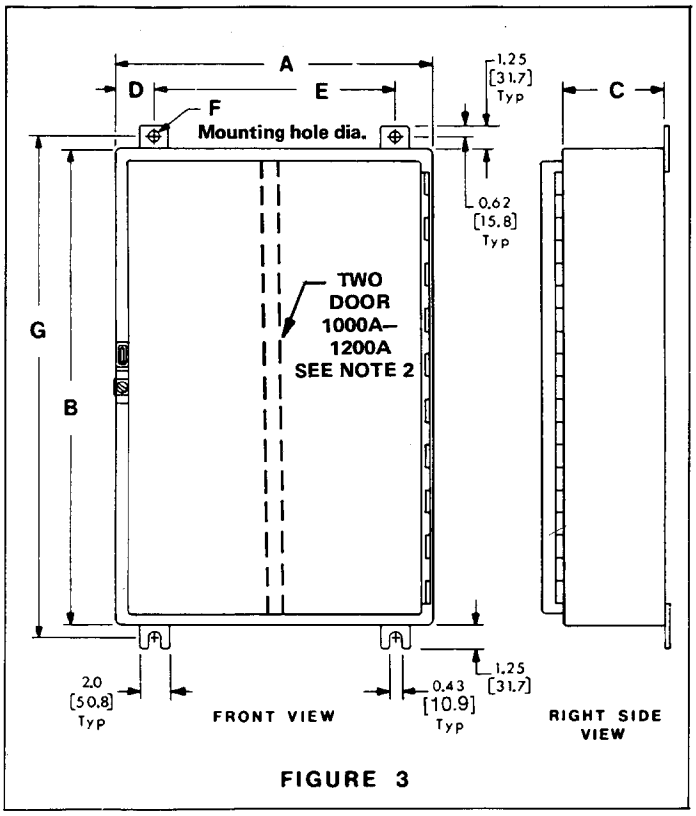


FIGURE 3

TYPE 3R, 4 AND 12 ENCLOSURES for Transfer Switches WITH Overlapping Neutral Transfer Contact.

AMP. SIZE	FIG. NO.	Dimensional Data Inches [mm]						
		A	B	C	D	E	F	G
1000	3	44.0 [1117.6]	79.0 [2006.6]	16.0 [406.4]	3.0 [76.2]	38.0 [965.2]	0.43 [10.9]	80.25 [2038.4]
1200		44.0 [1117.6]	79.0 [2006.6]	16.0 [406.4]	3.0 [76.2]	38.0 [965.2]	0.43 [10.9]	80.25 [2038.4]
1600	CONSULT FACTORY							
2000								
3000								
4000								

TYPE 3R, 4 AND 12 ENCLOSURES for Transfer Switches WITHOUT Overlapping Neutral Transfer Contact.

AMP. SIZE	FIG. NO.	Dimensional Data Inches [mm]						
		A	B	C	D	E	F	G
1000	3	36.0 [914.4]	79.0 [2006.6]	16.0 [406.4]	3.0 [76.2]	30.0 [762.0]	0.43 [10.9]	80.25 [2038.4]
1200		36.0 [914.4]	79.0 [2006.6]	16.0 [406.4]	3.0 [76.2]	30.0 [762.0]	0.43 [10.9]	80.25 [2038.4]
1600	CONSULT FACTORY							
2000								
3000								
4000								

NOTES
(Figure 3 ONLY)

TYPE 3R TYPE 4 TYPE 12

1. Two door Type 3R and 4 enclosures have removable center post installed between doors with door clamps on both sides of center post. Two door Type 12 enclosure have 3 - point latching with keylocking handle. (1000A — 1200A).
2. Full wiring gutters provided on top and bottom.
3. NO knockouts provided.

GENERAL NOTES

(Figures 1, 2, and 3)

1. Enclosures constructed in accordance with UL standard 508 (ANSI C33.76 — 1971) as referenced in UL standard 1008;
2. All dimensions are inside dimensions and include space for the transfer switch unit and accessory control panel.
3. Transfer switch unit is mounted on the inside back surface and the accessory control panel mounted on the inside door surface. Both units are terminated by an In-line quick disconnect plug located on the inside of the door.
4. Publication TP-5089 Operator's Manual is furnished with each automatic transfer switch. Refer to this publication prior to installation and operation of the switch.

SIZES OF AL–CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS

Switch Rating (Amps)	Range of Wire Sizes	Special Lug Sizes
1000, 1200	Four # 2 to 600 MCM	
1600, 2000, 3000, 4000	Suitable for Bus Bar	

THIRD ANGLE PROJECTION

TP-5089 **2/88**

PRINTED IN U.S.A.

KOHLER
GENERATORS

KOHLER CO. KOHLER, WISCONSIN 53044