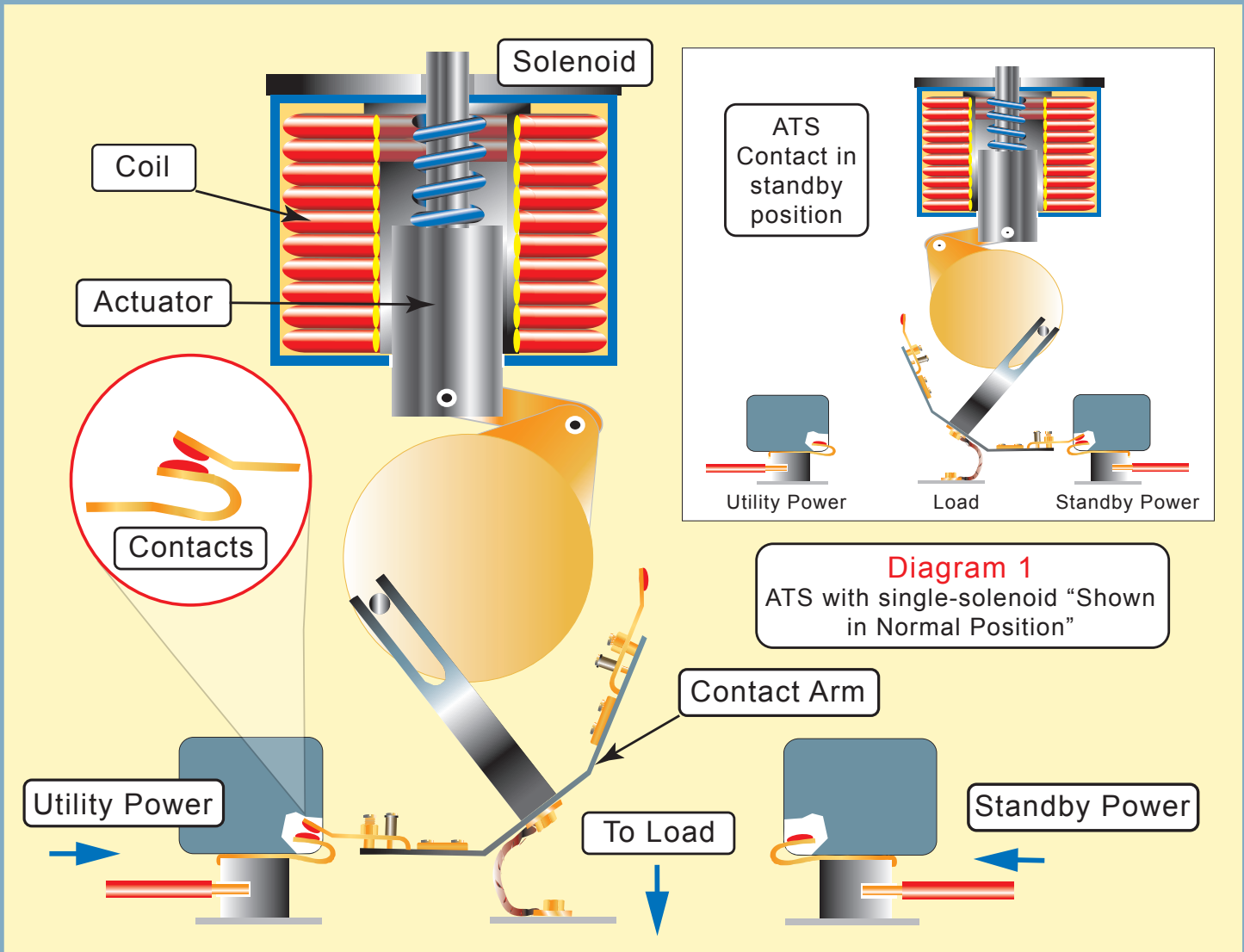




A designer of an emergency standby system (EPS) has a selection of Automatic Transfer Switches (ATS) to choose from. The load is switched from the primary power supply (normally the utility) via an ATS that is designed to ensure the load can be only supplied from one source. (Note! This information Sheet replaces IS# 6). This information sheet discusses the various ATS covered under UL1008 and its application in Emergency Standby generator sets installations.

1.0 ANSI/UL ELECTRICAL CODE:

American National Standards Institute (ANSI)/Underwriters Laboratories (UL) 1008 covers the industry standards for the use of automatic transfer switches utilized in the United States. This requires that manufacturers test their designs for endurance and overload to ensure that they are able to handle the in-rush capabilities, switching at worse case power factor, and have a minimum life of 3000 to 6000 operations. They also must ensure that the short-time current Withstand and Closing Ratings (WCR) hold for 3 cycles and contacts remain closed, with the ATS remaining functional. The 3-cycle rating was introduced into UL 1008 in 1989. It allows ATS manufacturers to provide their switches with another rating capacity for short-current WCR. The ATS that passes this test is able to withstand a fault of a given magnitude for three cycles (e.g. 1.5 cycles for switches 400 amps or less and tested for 10,000 WCR) and not to exceed certain damage criteria.



The installation information provided in this information sheet is informational in nature only, and should not be considered the advice of a properly licensed and qualified electrician or used in place of a detailed review of the applicable National Electric Codes and local codes. Specific questions about how this information may affect any particular situation should be addressed to a licensed and qualified electrician.

2.0 DEFINITIONS:

Given below are the definitions for ratings:

- **Interrupting ratings** - the highest current at rated voltage that a device is intended to interrupt under standard test conditions
- **Withstand ratings** - the highest current at rated voltage that a device is intended to carry under standard test conditions

Applied to automatic transfer switches, these ratings become the highest rated current that the transfer switch can either withstand or interrupt under standard test conditions. UL 1008 requires that transfer switches be able to withstand (or interrupt) up to 20 times their normal current.

3.0 TEST CRITERIA:

Test agencies utilize the following test criteria when reviewing products for approval under UL 1008:

- The door of the enclosure shall not have blown off
- The conductors shall not have come loose from their connecting terminals
- The mounting of the live parts shall not have fallen apart

4.0 PURPOSE:

The purpose of this test is to allow a transfer switch to be marked or labeled for use with any manufacturer's circuit breaker that incorporates an "instantaneous trip" when the ATS and circuit breaker are applied within their ratings. This umbrella rating allows the engineer more flexibility when designing the installation when specifying circuit breaker protection for a transfer switch.

5.0 OPTIONS FOR ATS PROTECTION:

An ATS must be properly protected for short-circuit currents from either source of power, or, in the case of closed transition ATS's, the combination of the fault current from each source. Should a transfer switch be subject to a fault current above its maximum short-circuit withstand and closing rating, severe ATS damage, including a potential fire and/or arc flash hazard, which could result in severe injury or death to personnel.

Transfer switches are tested, listed, and labeled for use with either fuses or circuit breakers - each offering different levels of protection. In the first test the ATS must withstand a short-circuit when the switch is in a closed position. In the second withstand test, the ATS must transfer, close, withstand the short-circuit current magnitude and survive within the specified damage limits. This is commonly known as Withstand and Closing (Close On) Rating (WCR).

All ATS's protected by circuit breakers can be classified by one of three different WCR's:

- Specific circuit breaker (CB) rating
- Any breaker rating 30-cycle short-circuit rating applicable to any CBs having an instantaneous trip
- Short time rating, which may be rated for 18 - 30 cycles

6.0 SYSTEM DESIGNER GUIDELINES FOR ATS SELECTION:

While every system has to be considered individually, the following are examples of ATS selection a system designer would be considering:

- **Selection of 30-cycle ATS** - If a project is a healthcare application and the circuit breakers ahead of the ATS will NOT have instantaneous trips, the ATS has to be able to withstand the short circuit until a downstream breaker trips. This gives breaker coordination. In this instance the designer will probably select a 30-cycle ATS able to withstand a short circuit while the breaker is tripping downstream.
- **3-cycle or 1.5-cycle ATS** - A designer would select this ATS rating when the trip device ahead of the ATS is either a breaker with instantaneous trip or fuse. The designer of the system should check with the manufacturer/supplier of the ATS to ensure selection of the proper style of fuse.
- **Selection of 3-cycle or 1.5-cycle over 30-cycle ATS** - Usually the first choice is the 3-cycle or 1.5-cycle unless a more expensive 30-cycle ATS for coordination is required, as stated above.
- **Specific Breaker Rating** - Frequently this is the most economic selection. When choosing this option the system designer has to check that the ATS manufacturer has tested and passed the ATS with the specific breaker they are selecting for the circuit. The system designer should also check whether the circuit breaker has updated their breaker design and the ATS manufacturer has made the appropriate updated test.

To fulfill our commitment to be the leading supplier in the power generation industry, the Buckeye Power Sales team ensures they are always up-to-date with the current power industry standards as well as industry trends. As a service, our Information Sheets are circulated on a regular basis to existing and potential power customers to maintain their awareness of changes and developments in standards, codes and technology within the power industry.



CANAL WINCHESTER, OH
8155 Howe Industrial Parkway
Canal Winchester, OH 43110
(614) 751-4515
(866) 889-2628

CINCINNATI, OH
4992 Rialto Road
West Chester, OH 45069
(513) 755-2323
(800) 368-7422

CLEVELAND, OH
8465 Tower Drive
Twinsburg, OH 44087-0394
(330) 425-9165
(800) 966-2825

TOLEDO, OH
12400 Williams Road
Perrysburg, OH 43551
(855) 638-2728



CHICAGO, IL
1308 Marquette Drive
Romeoville, IL 60446
(630) 914-3000

INDIANAPOLIS, IN
1707 S. Franklin Road
Indianapolis, IN 46239
(317) 271-9661
(800) 632-0339

FORT WAYNE, IN
7525 Maplecrest Road #221
Fort Wayne, IN 46835
(855) 638-2721