

Automatic transfer switches Service entrance rated

30–4000 A



UL 1008 listed transfer switch with ARMS at the point of service entrance

Why use service entrance rated transfer switches?

When the entire load of an installation requires standby emergency power for protection against an electric utility interruption, it becomes necessary to have the automatic transfer switch (ATS) as close to the point of service entrance as possible. And nobody does this better than Eaton.

Introduction

With Eaton's service entrance rated automatic transfer switches, installation can be made directly at the point of service entrance—while simultaneously eliminating the need for separate upstream device(s), including additional power connections.

Overcurrent protection and a disconnect means are both integral to the Eaton design, providing a single UL® 1008 listed transfer switch assembly.

When required by National Electrical Code® (NEC) 240.87, overcurrent protection can be configured with Eaton's Arcflash Reduction Maintenance System™ (ARMS) to reduce clearing time. The result is lower incident energy at all downstream work locations.

Significant benefits

- Cost and space savings
- Reduced installation time
- Compliance to NEC 240.87
- Enhanced worker safety
- Listed to UL 1008 (entire assembly) for use at 100% of rated current

End-use segments

- Water treatment plants
- Pumping stations
- Industrial plants
- Hospitals
- Commercial buildings
- Transportation
- Public safety facilities

Application

Service entrance, as the name implies, is the point where power supplied by an electric utility enters a facility.

Facilities with a single utility connection and a single emergency power source will often have an ATS located at the service entrance to ensure that critical loads can quickly and safely shift to emergency power (generator) if utility power is interrupted.

Non-critical loads are often inhibited or shed from connection to the emergency power source to avoid capacity overload.

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Eaton vs. conventional approach

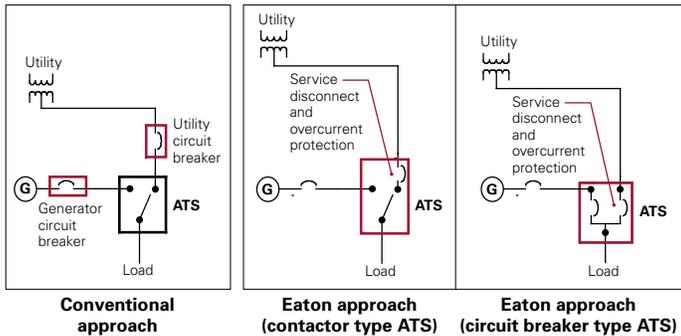
Eaton's approach is simple—integrate overcurrent protection and a means of disconnect within the ATS assembly.

The result:

- A service entrance rated ATS that can be installed directly at the point of service entrance
- Reduced power connections
- Space and labor savings
- Ease of installation
- Fully UL 1008 listed solution

At a minimum, overcurrent protection is provided on the utility side as required by the NEC, however, overcurrent protection can optionally be added to the emergency side.

For three-phase solidly grounded wye electric services, rated 1000 A or more, ground fault protection is also available to comply with NEC 230.95.



Specification and application flexibility

Eaton service entrance rated transfer switches are available in the following construction types and amperage ratings to meet varying specification and application requirements:

- Contactor (40–1600 A)
- Molded case circuit breaker (30–1000 A)
- Power circuit breaker (200–4000 A)

In addition to multiple construction types, there are many options and features available to engineers when specifying a transfer switch.

The UL 1008 standard establishes minimum construction and performance criteria, but it is important to understand the specific application needs of the facility before deciding on a particular transfer switch configuration.

For a more detailed discussion on the advantages and disadvantages associated with different construction types and features, please reference the Eaton white paper, [“Transfer Switch 101—An introductory guide to picking the right transfer switch for your equipment”](#) or contact your local Eaton sales representative.

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Arcflash Reduction Maintenance System (ARMS)

A circuit breaker equipped with ARMS can improve worker safety by providing a simple and reliable method to reduce fault clearing time. For applications where the highest continuous current trip setting of the overcurrent device in a circuit breaker is rated (or can be adjusted to) 1200 A or higher, a method to reduce clearing time is required per NEC 240.87.

When the ARMS maintenance mode is enabled, an integral analog trip circuit provides an accelerated instantaneous trip. This results in work locations downstream of the circuit breaker having a significantly lower incident energy level. To facilitate maximum arc-flash reduction while avoiding nuisance tripping, the ARMS pickup level is adjustable.



Prior to performing maintenance, service personnel can enable ARMS via a lockable selector switch (blue) that can be incorporated into a lockout/tagout (LOTO) procedure. A corresponding blue light provides visual indication that the ARMS maintenance mode is enabled.

Incident energy level decreases dramatically when the ARMS maintenance mode is enabled:

Service entrance transfer switch rating (A)	Available fault current (kA)	Arcing fault current (kA)	Without ARMS		With ARMS	
			Max. clearing time (sec)	Incident energy (cal/cm ²)	Max. clearing time (sec)	Incident energy (cal/cm ²)
4000	64	32	0.5	58.4	0.04	4.7
3000	51	26.4	0.5	47.3	0.04	3.8
2000	39	21	0.5	37	0.04	3.0
1600	28	15.8	0.5	27.2	0.04	2.2
1200	19	11.3	0.5	19	0.04	1.5

Notes: Overcurrent protection device modeled is Eaton Magnum DS circuit breaker (520MC or 1150+ trip).

When Eaton MCCB (310+ trip) is used as the protection device, maximum clearing time (ARMS) is 0.03 sec.

Arcing fault current and incident energy values derived using SKM System Analysis software.

Incident energy is calculated immediately downstream of transfer switch load.

Fully UL 1008 listed and 100% rated

Regardless of the amperage rating or construction type, Eaton service entrance rated transfer switches are “fully UL 1008 listed” and marked for use at 100% of rated current.

The phrase “fully UL 1008 listed” is used to describe the entire transfer switch enclosure assembly—including the integral circuit breaker and power bus—which has passed rigorous temperature rise performance testing required by the UL 1008 standard for transfer switch equipment.

The Eaton benefits to end users and specifying engineers are:

- A service entrance rated transfer switch can be applied at 100% of its rated current; there are no circuit breaker de-rating adjustments to be considered
- A “fully UL 1008 listed” service entrance transfer switch is provided; the construction is not a mix of a UL 1008 listed transfer switch and a UL 891 listed structure housing a circuit breaker

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