Empowering designers to Build a Greener & more Sustainable Data Center





Simplifying maintenance

The development of a **proactive** and safe **preventive maintenance** programme is vital to ensure the availability of today's critical infrastructure

Reduce the need for reactive and **urgent interventions** with an optimized, **connected and remote approach** to maintenance

- **Eliminate** human error
- **Avoid** costly downtime
- **Reduce** risk to critical loads



Simplifying maintenance

Maintain switching equipment with no-break to critical loads



Alastair UREN
Specification Engineer - UK



Kevin SCHALL
Product Manager - ATSE



Maintain switching equipment with no-break to critical loads thanks to Bypass TSE (BTSE)

Safety

ISOLATE POWER DURING MAINTENANCE

No-Break

KEEP ESSENTIAL LOADS "ALWAYS ON"

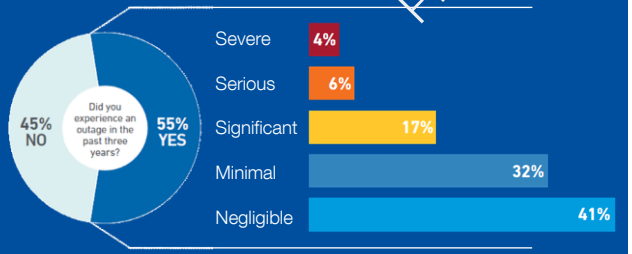
Maintenance of critical equipment in a **Data Centre needs to be carefully managed** to ensure minimal or **no disruption**

- Periodic Tests
- Annual Maintenance
- Software Update
- Hardware Replacement

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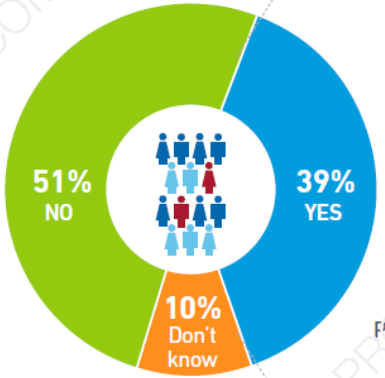
Things will go wrong in any given situation, if you give them a chance

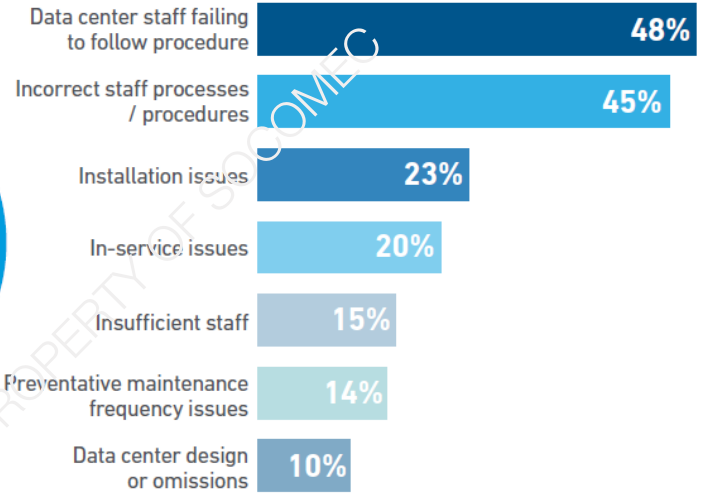
Murphy's law



Most common causes of major human error-related outages

Has your organization experienced a significant, serious, or severe IT service outage(s) that was caused by human error over the past three years? If so, what are their most common causes? Choose no more than three. (n=418)





UPTIME INSTITUTE GLOBAL SURVEY OF IT AND DATA CENTER MANAGERS 2023

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What is an Automatic Transfer Switch?

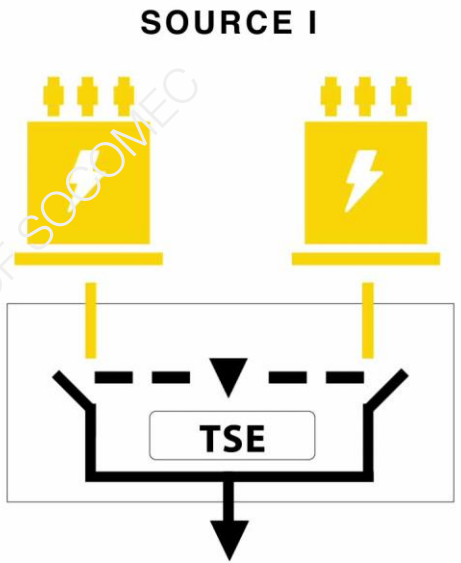
Transfer Switching Equipment (TSE) - Definition

"Equipment containing one or more switching devices and associated operating mechanisms for disconnecting load circuits from one supply and connecting to another".

IEC 60947-6-1 Edition 3 : Section 3.3.1

Similar definitions for UL 1008 and GB/T 14048.1

IEC	UL	GB
ATSE	ATSE	ATSE
RTSE	RTSE	RTSE
MTSE	MTSE	MTSE
-	BTSE	BTSE



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Major changes in progress - IEC 60947-6-1

121A/594/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:
IEC 60947-6-1 ED4

DATE OF CIRCULATION: 2024-01-05

CLOSING DATE FOR COMMENTS: 2024-03-29

SUPERSEDES DOCUMENTS:
121A/591/RR

IEC SC 121A : LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR

SECRETARIAT: France

SECRETARY: Mr Michaël LAHEURTE

OF INTEREST TO THE FOLLOWING COMMITTEES: SC 23K,SC 121B

PROPOSED HORIZONTAL STANDARD: ☐

Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:
☒ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:
Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Transfer switching equipment

NOTE FROM TC/SC OFFICERS:
Officers of SC121A supports circulation of CD1 for project IEC 60947-6-1 ED4.

Secretary note: NCs are kindly requested to refer their comments to line numbers.

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Addition of Annex C … *New requirements !*

Bypass Transfer Switching Equipment – BTSE

BTSE – Definition

Transfer switching equipment used to select an available power source and feed load circuits while temporarily

“***isolating and bypassing the main TSE for inspection, no-load test sequence and maintenance purposes***”

IEC 60947-6-1: Transfer Switch Equipment Standard (TSE)

Example of the operating sequence of a single line BTSE

- Extract from Annex C (CD document in progress) with requirements for Bypass Isolation Transfer Switching Equipment – BTSE

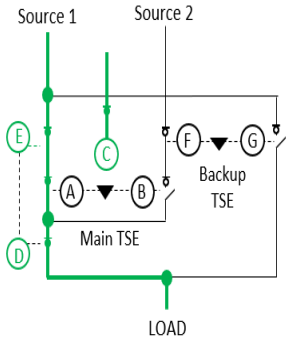


Figure 1.1 :
Normal Mode

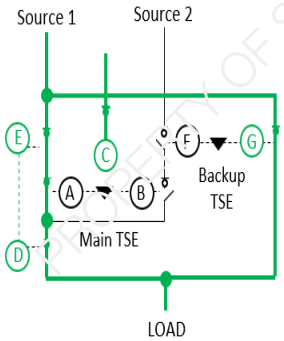


Figure 1.2 :
Bypass Mode

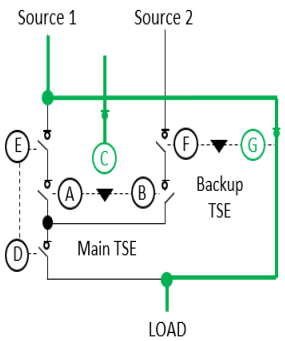


Figure 1.3 :
Bypass and Test Mode

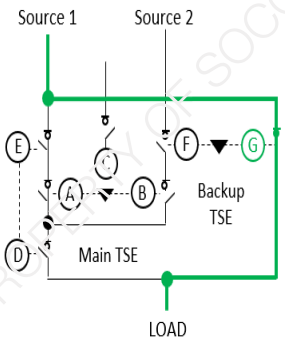


Figure 1.4 :
Bypass and Isolation Mode

Key

A Main TSE Contacts (Position I)

B Main TSE Contacts (Position II)

C Isolation Contacts (ATS Control Power)

D Isolation Contacts (Main TSE to LOAD)

E Isolation Contacts (Source I to Main TSE)

F Isolation Contacts (Source II to Main TSE)

G Bypass Contacts (Source I to LOAD)

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IEC 60947-6-1: Transfer switch equipment standard (TSE)

Additional requirements specific to BTSE

RELIABILITY

IEC 61439-2: Low-voltage switchgear assembly

Construction requirements pertaining to the system for enclosure, corrosion protection, insulating material, bases, mounting of parts, current-carrying parts, wiring, terminals, grounding, spacings shall be in accordance with construction requirements in IEC 61439-2

For BTSE that are delivered in type tested, unassembled or partially assembled form to be assembled in an enclosure by others, the BTSE manufacturer shall provide guidelines to follow in order to ensure that the final assembly is compliant to this standard along with IEC 61439-2

Full assembly type tests shall be done in accordance with IEC 61439-2.

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Typical ATS Bypass installation environment in Data Centers for HVAC applications

Outdoor Installation - Demanding
(humidity, heat, UV etc…)

Risk of:

- Corrosion
- Short-circuit
- Overheating
- Mechanical damage …



Request BTSE
IEC 61439-2 compliance!

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IEC 60947-6-1: Transfer switch equipment standard (TSE)

Additional requirements specific to BTSE - (introduction of IEC 61439-2)

PERFORMANCE



- Design
- EMC
- Short-circuit
- Mechanical
- Temperature rise
- Dielectric
- Overloads

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IEC 60947-6-1: Transfer switch equipment standard (TSE)

Additional requirements specific to BTSE

SAFETY

INTERLOCKING

The operating mechanism of the BTSE shall be interlocked to prevent unintentional simultaneous connection to both source I and source II supplies under all conditions.

Removal of doors or access panels shall not result in defeating the interlocking mechanism.

When manually operated bypass and/or isolation switches are used, they shall include mechanical interlocks.

OPERATING PROCEDURE

The operating sequence procedure instructions shall be located on the outside of the enclosure, adjacent to the operating means and visible during operation by the operator.

COMPARTMENTS (optional)

All equipment comprising a BTSE shall be contained within one enclosure or separate compartments of the same enclosure and can be delivered as type tested, unassembled or partially assembled BTSE.

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Simplified Maintenance for Precision Cooling Equipment

Reduce the risk of failure with bypass isolation transfer switching equipment



DTC cooling requires high power availability to operate effectively

Context:

-Servers require stable conditions to operate continuously

-Efficiency of cooling improving, however resilience & safety remain key

Operational Challenge:

-Guaranteed power availability to cooling & essential power systems…

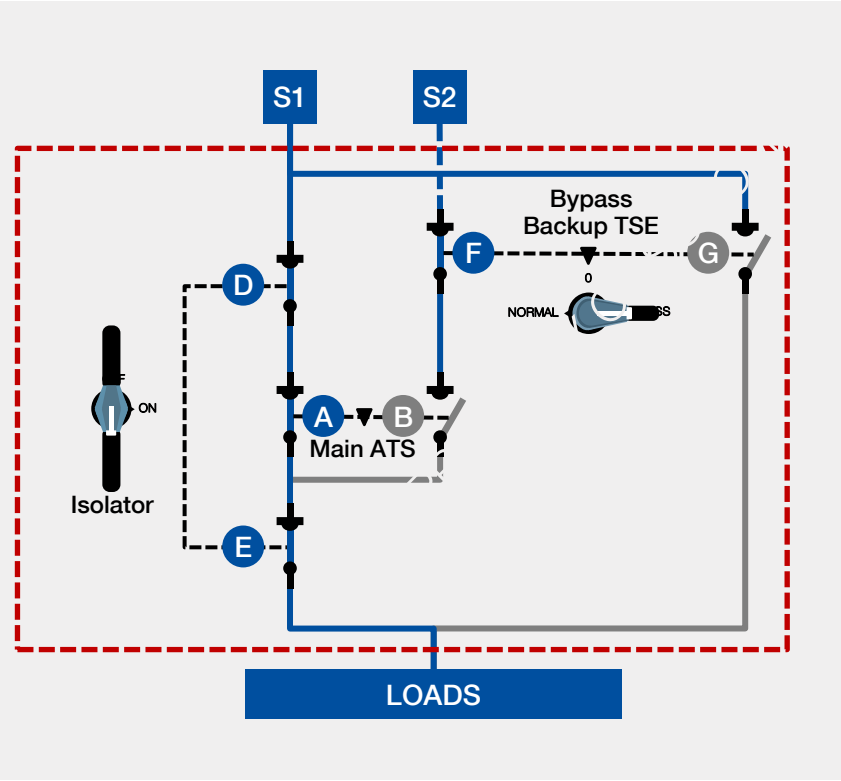
CHALLENGE

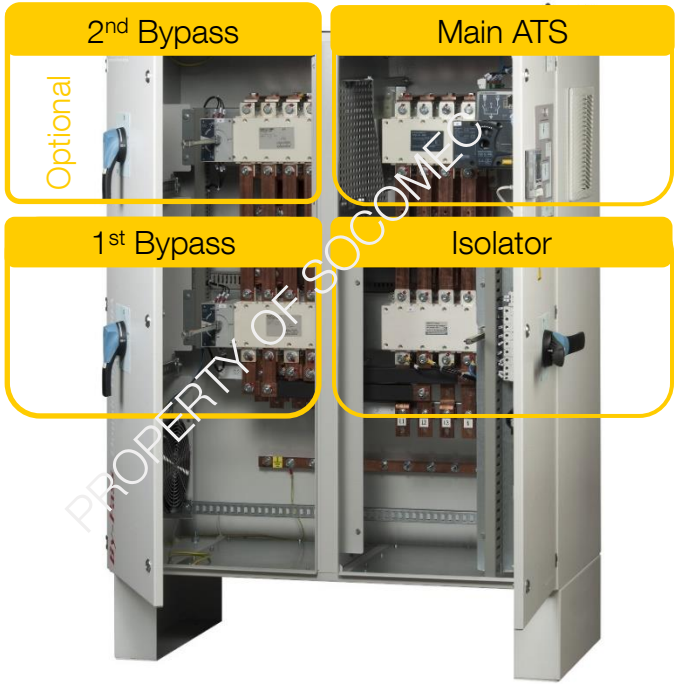
NON-STOP

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How it works – Simplifying Maintenance with No-Break

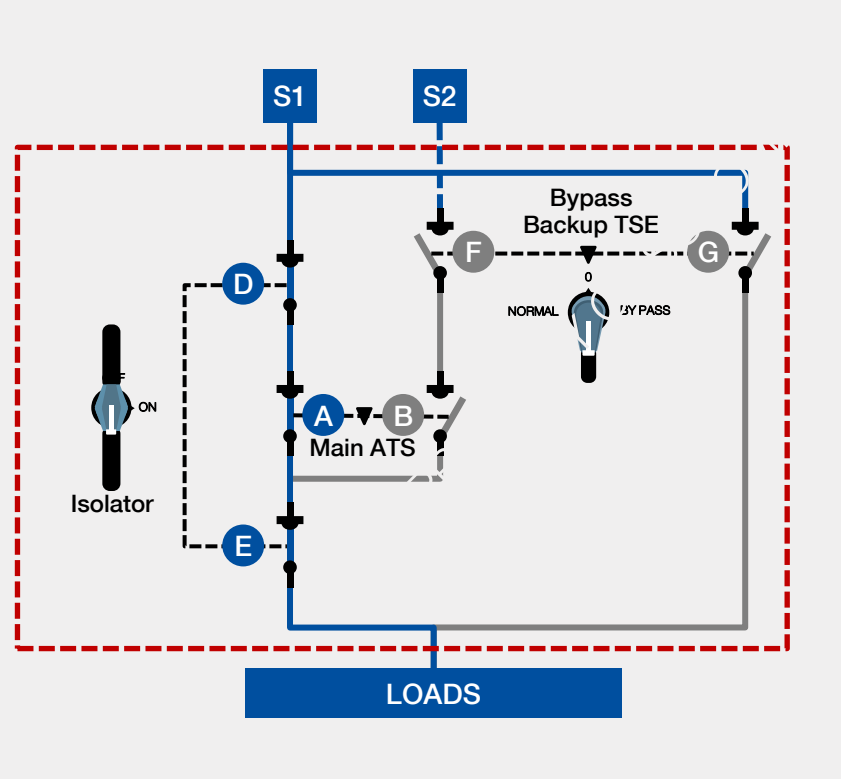
Example of the operating sequence of a single line BTSE





How it works – Simplifying Maintenance with No-Break

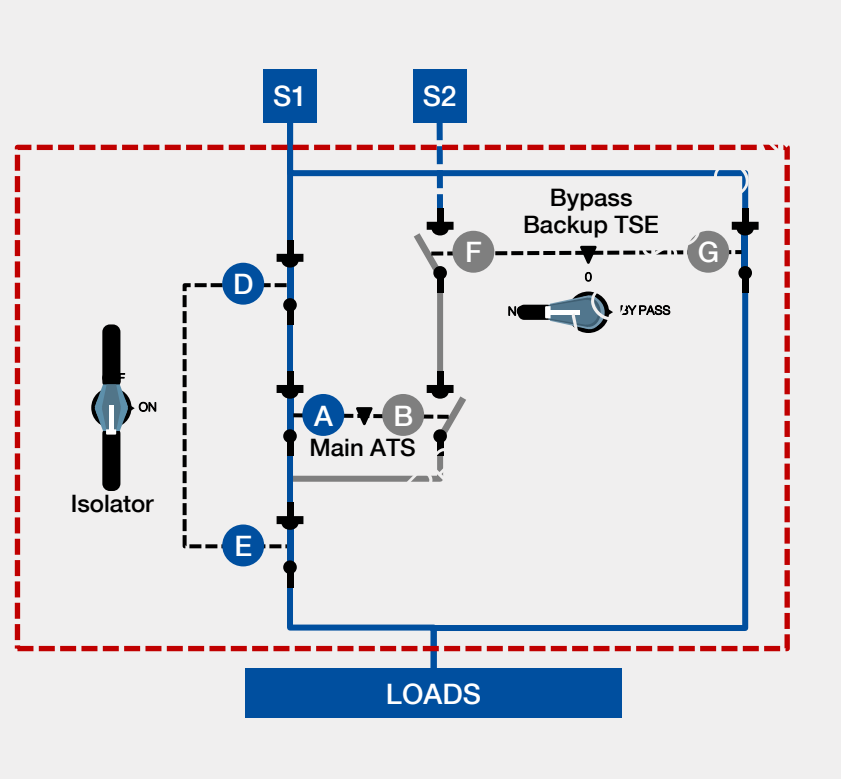
Example of the operating sequence of a single line BTSE





How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE

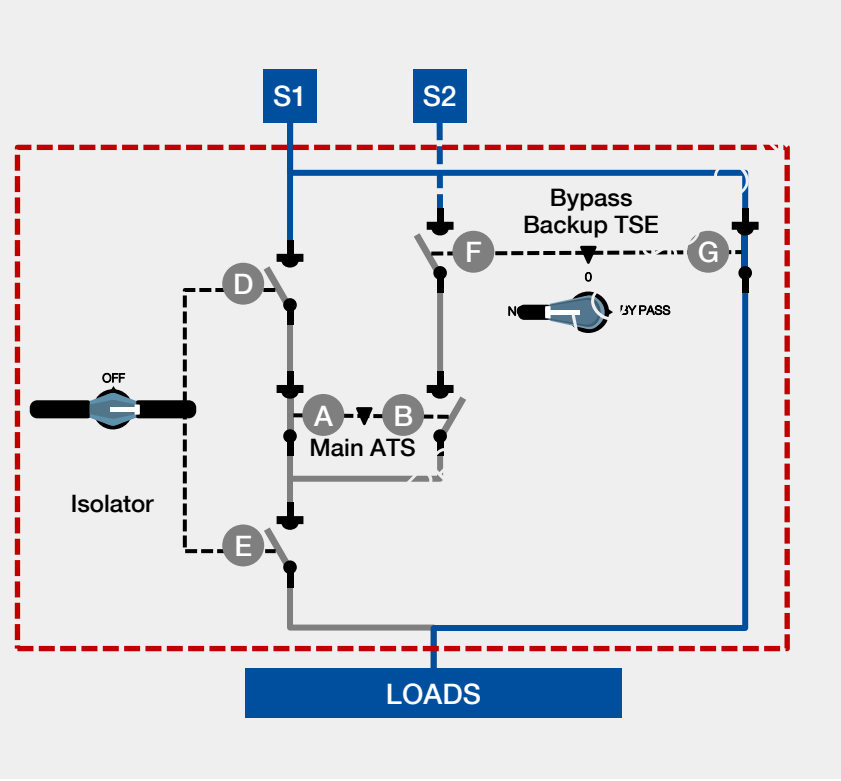




PROPERTY OF SOCOMEC

How it works – Simplifying Maintenance with No-Break

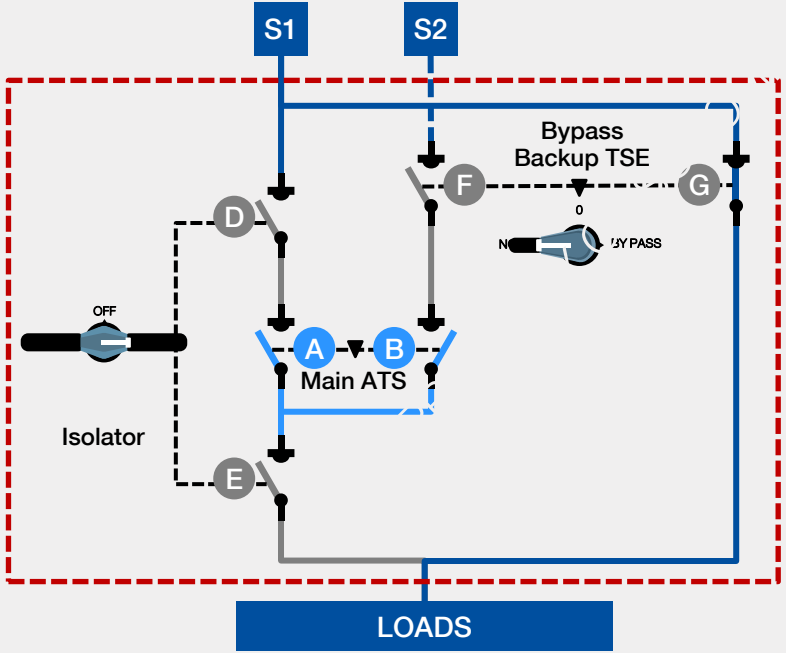
Example of the operating sequence of a single line BTSE





How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE



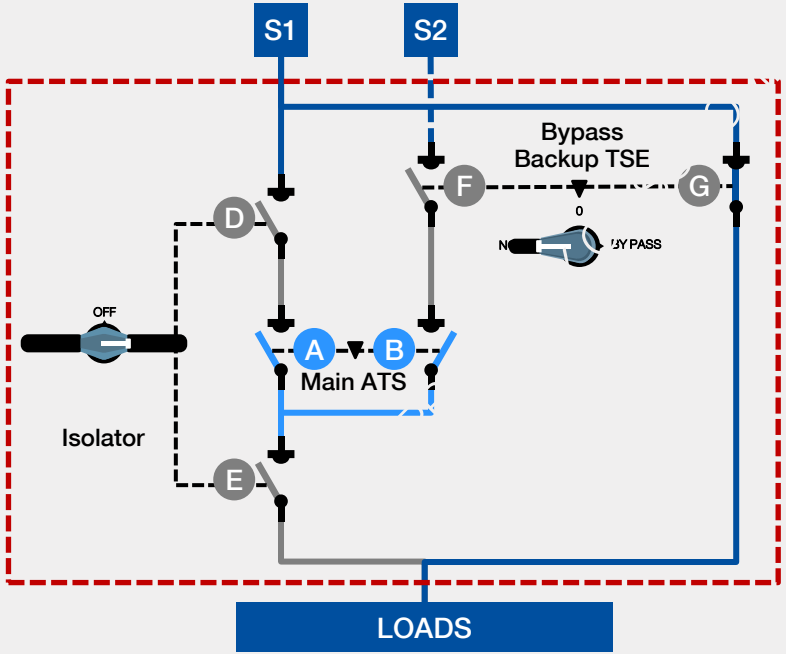
Test without disconnecting the load

PROPERTY OF SOCOMEC

TEST

How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE



Test without disconnecting the load

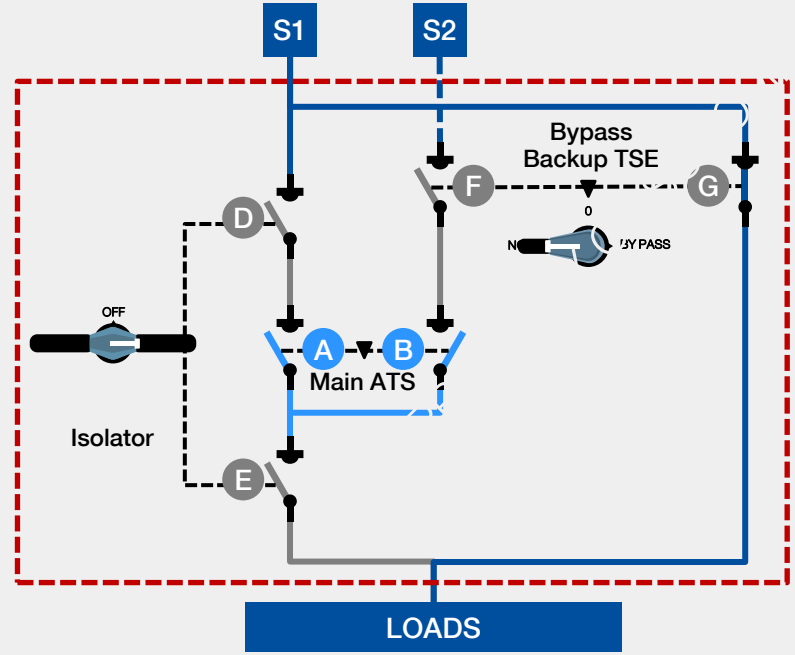
Test the whole chain, not only the ATS

PROPERTY OF SOCOMEC

TEST

How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE



Test without disconnecting the load

Test the whole chain, not only the ATS

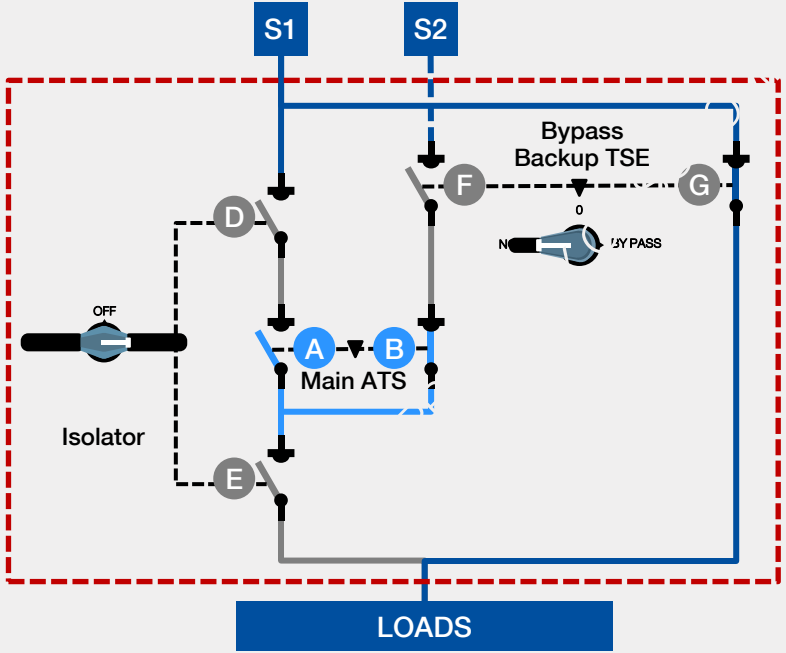
Test new ATS settings

PROPERTY OF SOCOMEC

TEST

How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE



Test without disconnecting the load

Test the whole chain, not only the ATS

Test new ATS settings

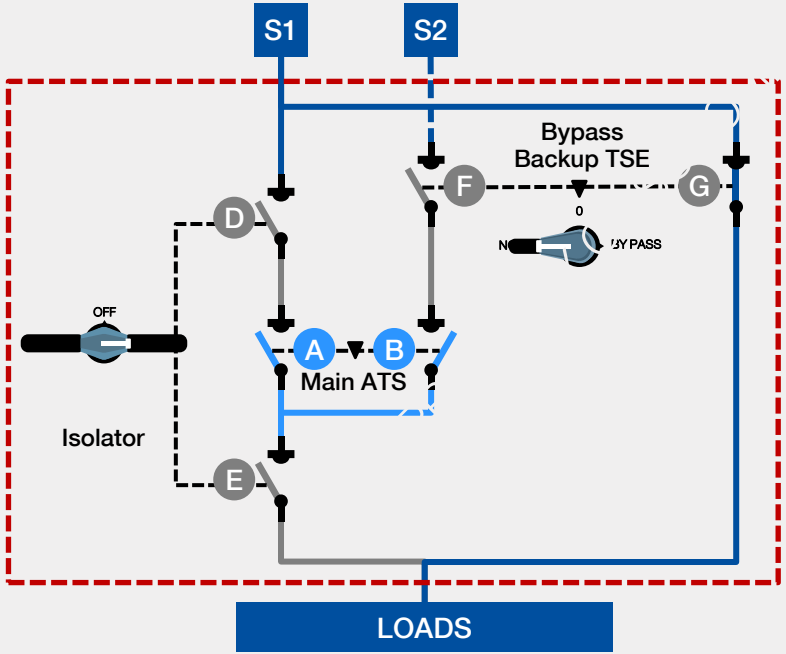
Human error is impossible!

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MAINTENANCE

How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a single line BTSE



Test without disconnecting the load

Test the whole chain, not only t

Test new ATS settings

Human error i

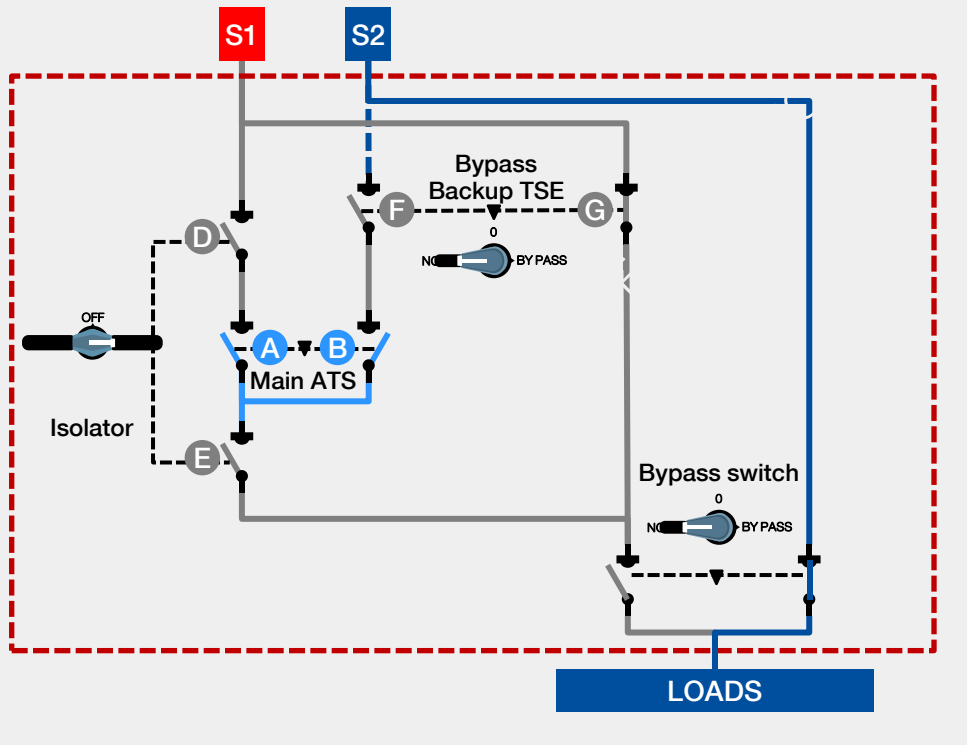
WHAT IF NORMAL SOURCE (S1) IS LOST DURING BYPASS?

PROPERTY OF SOCOMEC

MAINTENANCE

How it works – Simplifying Maintenance with No-Break

Example of the operating sequence of a DOUBLE line BTSE



In case of S1 power loss during ATS maintenance, transfer to the alternative S2 power source

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MAINTENANCE

The Socomec BTSE Range





Wall and floor mounting versions

> Wall mounted enclosure from 40 to 125A
> Floor standing panel from 160 to 3200A

2 ATS Bypass solutions

> Single Line Bypass
> Double Line Bypass

Flexible solution

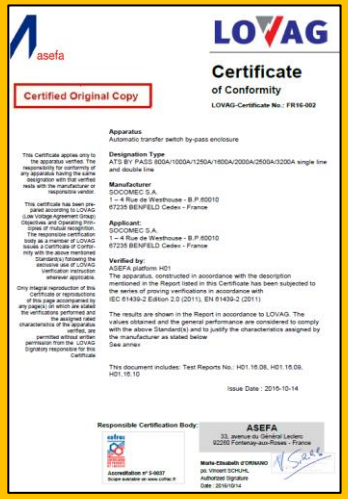
> Accessories and optional features
> Specific solution, on request

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IEC 61439: Low voltage switchgear assemblies

SAFETY & PERFORMANCE

- Type tested by 3rd party laboratory LOVAG
- Socomec routine test after production


asefa

LOVAG

Certificate of Conformity

Certified Original Copy

LOVAG-Certificate No.: FR16-002

Apparatus
Automatic transfer switch by-pass enclosure

Designation Type
ATS BY PASS 600A/1000A/1250A/1600A/2000A/2500A/3200A single line and double line

Manufacturer
SOCOMEC S.A.
1 – 4 Rue de Westhouse - B.P.60010
67235 BENFELD Cedex - France

Applicant:
SOCOMEC S.A.
1 – 4 Rue de Westhouse - B.P.60010
67235 BENFELD Cedex - France

Verified by:
ASEFA platform HD1
The apparatus, constructed in accordance with the description mentioned in the Report listed in this Certificate has been subjected to the series of proving verifications in accordance with IEC 61439-2 Edition 2.0 (2011), EN 61439-2 (2011)

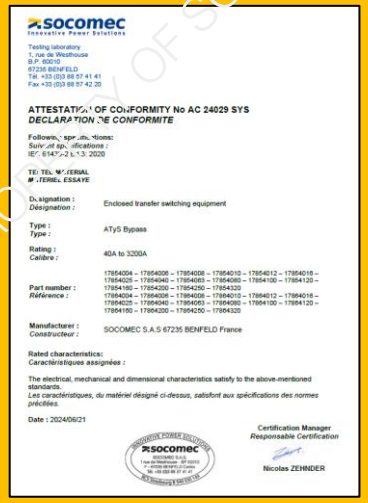
The results are shown in the Report in accordance to LOVAG. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the characteristics assigned by the manufacturer as stated below.
See annex

This document includes: Test Reports No.: HD1.16.08, HD1.16.09, HD1.16.10

Issue Date : 2016-10-14

Responsible Certification Body:
ASEFA
33, avenue du Général Leclerc
92260 Fontenay-aux-Roses - France

Marie-Elisabeth D'ORNANO
pp. Vincent SCHUHL
Authorized Signature
Date : 2016/10/14


socomec
Innovative Power Solutions

Testing laboratory
1, rue de Westhouse
B.P. 60010
67235 BENFELD
Tél. +33 (0)3 88 57 41 41
Fax +33 (0)3 88 57 42 26

ATTESTATION OF CONFORMITY No AC 24029 SYS
DECLARATION DE CONFORMITE

Following specifications:
Suivant spécifications :
IEC 61439-2 & 1-3: 2020

TEST MATERIAL
MATERIEL ESSAYE

Designation :
Désignation : Enclosed transfer switching equipment

Type :
Type : ATyS Bypass

Rating :
Calibre : 40A to 3200A

Part number :
Référence : 17854004 – 17854006 – 17854008 – 17854010 – 17854012 – 17854015 – 17854025 – 17854040 – 17854063 – 17854080 – 17854100 – 17854120 – 17854160 – 17854200 – 17854250 – 17854320
17864004 – 17864006 – 17864008 – 17864010 – 17864012 – 17864015 – 17864025 – 17864040 – 17864063 – 17864080 – 17864100 – 17864120 – 17864160 – 17864200 – 17864250 – 17864320

Manufacturer :
Constructeur : SOCOMEC S.A.S 67235 BENFELD France

Rated characteristics:
Caractéristiques assignées :

The electrical, mechanical and dimensional characteristics satisfy to the above-mentioned standards.
Les caractéristiques, du matériel désigné ci-dessus, satisfont aux spécifications des normes précitées.

Date : 2024/06/21

Certification Manager
Responsable Certification
Nicolas ZEHNDER

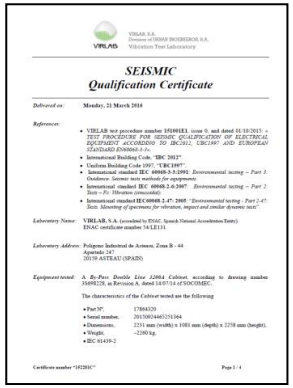
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SEISMIC qualifications

ROBUSTNESS

- UBC_1997 - Zone-2A & IBC2012 Class D (Ss=0.62; S1=0.28) (e.g. Saudi Arabia)
- UBC_1997 - Zone-3 & IBC2012 Class D (Ss=1.65; S1=0.75) (e.g. Europe)
- UBC_1997 - Zone-4 & IBC2012 Class D (Ss=2.25; S1=0.83) (e.g. Los Angeles)


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VIRLAB

SEISMIC
Qualification Certificate

Delivered on: Monday, 21 March 2016

References:
- VIRLAB test procedure number 15190413, issue 0, and dated 01/10/2015: « TEST PROCEDURE FOR SEISMIC QUALIFICATION OF ELECTRICAL EQUIPMENT ACCORDING TO IBC2012, UBC1997 AND EUROPEAN STANDARD EN60068-3-3»;
- International Building Code, "IBC 2012";
- Uniform Building Code 1997, "UBC1997";
- International standard IEC 60068-3-3:1991, Environmental testing – Part 3: Guidance: Seismic test methods for equipments;
- International standard IEC 60068-2-6:2007, Environmental testing – Part 2: Tests – Fc: Vibration (sinusoidal);
- International standard IEC60068-2-47: 2005, "Environmental testing - Part 2-47: Tests: Mounting of specimens for vibration, impact and similar dynamic tests".

Laboratory Name: VIRLAB, S.A. (accredited by ENAC, Spanish National Accreditation Entity). ENAC certificate number 34/LE131.

Laboratory Address: Polígono Industrial de Asteasu, Zona B - 44 Apartado 247 20159 ASTEASU (SPAIN)

Equipment tested: A By-Pass Double Line 32004 Cabinet, according to drawing number 35698228, in Revision A, dated 14/07/14 of SOCOMEC.

The characteristics of the Cabinet tested are the following

- Part N°: 17864320
- Serial number: 20150024465251564
- Dimensions: 2231 mm (width) x 1081 mm (depth) x 2258 mm (height).
- Weight: ~2280 kg.
- IEC 61439-2

Certificate number "15P2016"

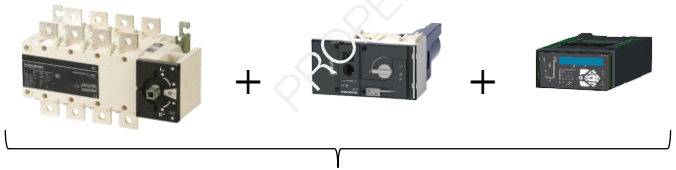
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Innovative Power Solutions

Sustainability

Modular Construction

✓ Replace switch, motor or controller as required



Motor replaced <30min

CO² & € impact limited

Environmental Declarations



Intent to limit CO² impact:

- Sourcing
- Production
- Transportation
- Use
- End of Life

MADE IN EUROPE

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socomec
Innovative Power Solutions

Connected ATyS Bypass

Socomec equipment in your pocket, anytime, anwhere…

SoLive

24/7 quick access

1 **Alarm notifications**
- Ranking regarding criticality
- Shortcut to details

2 **Equipment overview**
- UPS, Storage systems, Bypass…
- Customizable classification

3 **Key product information**
- Product identification
- Running alarms
- Status



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thank you **so** much!