



UniPack Compact Substation

Optimized solution for Data Centers



Data Centers

UniPack Compact Secondary Substation (CSS)

Data Centers

Compact Secondary Substation

ABB UniPack



Values

High level of safety for equipment and personnel

- Type tested per the latest international standard IEC 62271-202
- Internal arc tested for public and service personnel safety

Compact solution with a small footprint

- Design optimized for optimal footprint utilization
- Faster delivery

Reliability

- Plug and play solution including medium voltage switchgear, transformer and low voltage switchboard
- Easy and fast installation, commissioning and relocation
- Natural cooling of transformer to reduce risk of failure

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Values



1. High safety

- Internal arc fault tested
- Type tested per IEC62271-202



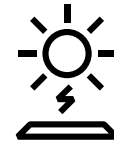
2. Reliability

- Plug and play solution including MV/LV SWG and transformer
- Easy and fast installation, commissioning and relocation
- Natural cooling of transformer to reduce risk of failure



3. Compact solution with a small footprint

- Design optimized for optimal footprint utilization
- Fast delivery



4. Eco-friendly

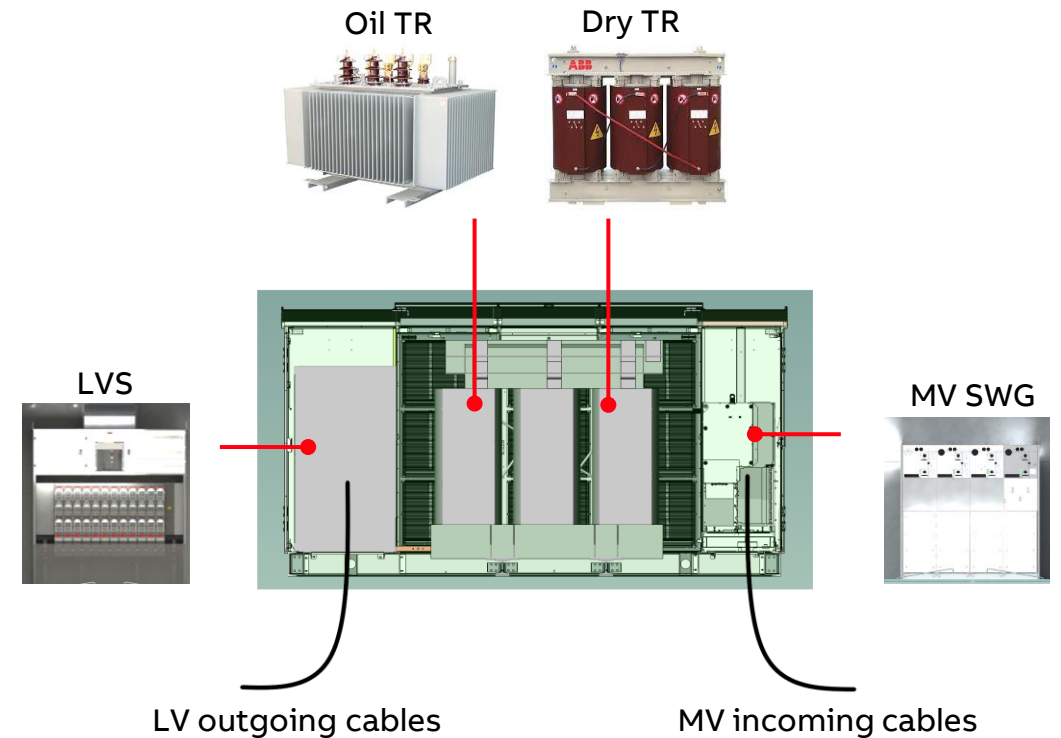
- Low environmental impact
- Transformer oil containment bund or dry type
- Low global warming potential MV switchgear as an option
- Energy efficient with low losses transformer

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UniPack Mercury

Main equipment

- Designed and manufactured to install dry or oil transformers up to 3.5 MVA
 - In case of oil transformer there is integrated oil pit in TR compartment
- Designed to accommodate medium voltage secondary switchgear up to 40.5 kV
 - ABB gas insulated secondary switchgear (SafeRing/SafePlus)
 - ABB ecoGIS secondary switchgear (SafeRing Air, AirPlus)
- Low voltage switchboard dimensioned according to transformer ratings
 - Breaker (ACB) capable of disconnecting the transformer and LV busbar
- Designed for continuous operation
- Provision for power management system
- Compartment design to ensure safety and segregated access areas



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UniPack-S

Technical parameters for a typical data center application

Parameter	Value
Max transformer power	Up to 3500KVA (oil or dry type)
Max rated voltage	40.5kV
Short circuit withstand current of internal earthing network	20kA/1s
Max overall dimensions (LxWxH)	5212 X 2250 X 3038 mm
Transformer compartment IP protection degree	IP23D (Optional IP35 or 45)
MV/LV compartment IP protection degree	IP43 (Optional 54)
CSS enclosure thermal class	K10 / K15 depending on IP class
MV compartment	ABB SafePlus
LV compartment	ABB low voltage switchboard or direct connection to Transformer Main breaker: Air circuit breaker
Max rated current of LV panel	Up to 5000A
Rated short circuit withstand capacity of LV switchboard	Up to 66kA/1s

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Internal Arc Classification (IAC)

Safety

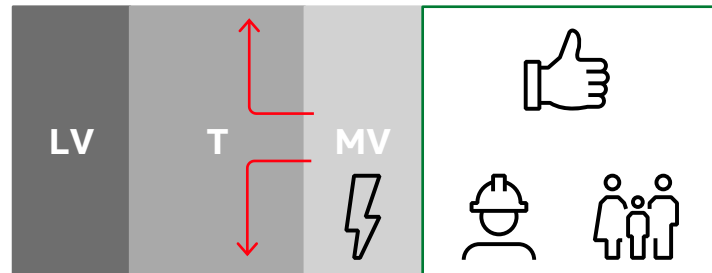
Internal arc classified substation

- According to IEC62271-202
- IAC-AB 20kA/1 sec
- Protection to both operators and general public

Internal arc proof

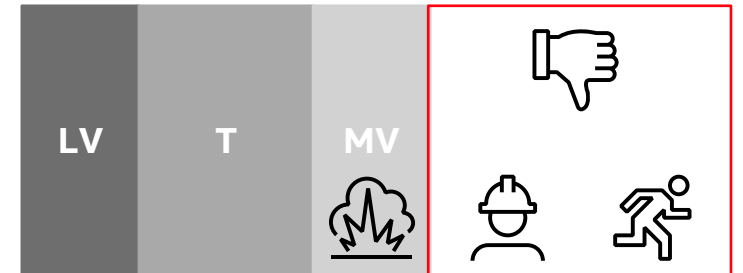


Gases directed



Gases directed

Non-arc proof



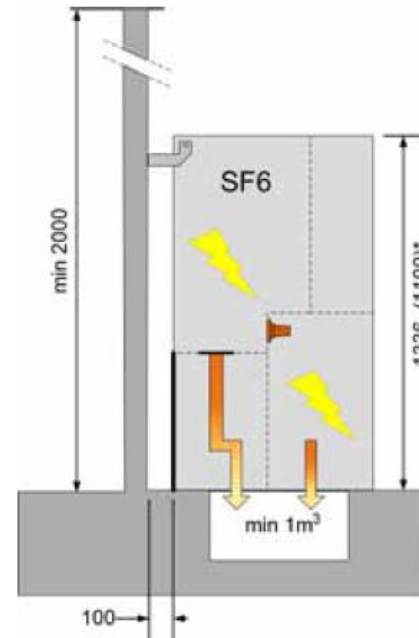
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Internal Arc Classification (IAC)

Safety

- Arc proof MV switchgear inside CSS does not mean that CSS is arc tested
- Compact substation needs to be tested with medium voltage switchgear due to following cases:
 - Overpressure inside CSS
 - Overpressure on RMU covers
 - Hot gases routing inside substation
- Important to manage hot gases for safety

Arc proof SWG



Non-arc proof CSS





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Case studies

Case study

Powering a cryptocurrency data center

Location: Australia

Installed base: UniPack-S CSS



Challenge:

- Robust and reliable electrical power supply of cryptocurrency data center
- Fast delivery
- Ability to expand in line with future developments



Outcome:

- CSS integrated in customer SCADA providing monitoring for both low- and medium-voltage side
- Layout is standardized for next phases of the projects
- Small footprint compared to a traditional solution with very short installation time on site



Solution:

- UniPack-S Mercury35 compact secondary substation with additional monitoring and control compartment
- Remote control, status and fault monitoring with SCADA integration
- Dry type transformer
- Fully type tested solution allowing safe operation for service personnel



Case study

Powering a cryptocurrency data center

Location: Estonia

Installed base: UniPack-S CSS



Challenge:

- Fast delivery time
- Customer required a scalable, modular solution



Outcome:

- Project finalized within a short delivery period



Solution:

- Standard unit with quick delivery
- 12 units of Mercury 16 with 1250kVA transformer
- UniPack low-voltage switchboard for power distribution with fuse switch protection for outgoing cables



Case study

Powering crypto mining

Location: Sweden

Installed base: UniPack-S CSS



Challenge:

- Tight requirements to comply with customer site layout and footprint
- Monitoring, remote control and integration solution into customer system
- Modular solution also for next phases



Solution:

- Reliable, pre-fabricated, customized solutions for grid integration
- Fully type tested product to guarantee safety and reliability
- Expansion capabilities with modular solution
- A total of 11 containerized substations including:
 - Dry transformers
 - Secondary MV switchgear SafeRing AirPlus™
 - LVS3 with low-voltage breakers



Outcome:

- Fast delivery
- Ability to meet client demands
- Maintain profitable business operations

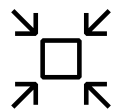


CSS Solutions for Data Centers

Value proposition

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Value proposition CSS vs. Standalone products (MV switchgear, transformers, LV cabinet)



Compact solution with a small footprint

- CSS footprint is approximately 30% smaller than standalone components



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Value proposition CSS vs. Standalone products (MV switchgear, transformers, LV cabinet)



Compact solution for fast delivery

- CSS is delivered as one piece; pre-tested unit with premade internal interconnections

Item	CSS	Standalone components
MV Switchgear	● Included	● Included
Transformer	● Included	● Included
Low voltage switchboard	● Included	● Included
Interconnections	● Included	● Not included
Automation and monitoring	● Inside CSS enclosure	● Standalone box
Tested as a package	● Included	● Not included

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Value proposition CSS vs. Standalone products (MV switchgear, transformers, LV cabinet)



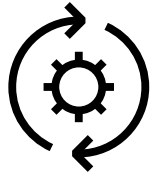
Low cost of ownership

- CSS reduce project management, installation and commissioning cost

Scope of works with CSS		Scope of works with standalone components	
CSS foundation	●	MV Foundation	●
		TR foundation	●
		LV foundation	●
Incoming MV and LV cables	●	MV cable MV SWG-TR	●
		LV cable TR-LVS	●
		Incoming MV and LV cables	●
PRJ Mngmt CSS	●	PRJ Mngmt MV SWG	●
		PRJ Mngmt TR	●
		PRJ Mngmt LVS	●
		PRJ Mngmt Cable supplier	●
Test at factory	●	Test at site	●
Transportation of one unit	●	Transportation of components	●

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Value Proposition



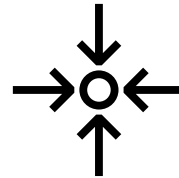
Continuous operation

Embedded solution designed for 'the' most demanding **reliability and availability** levels



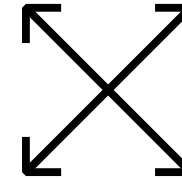
Energy efficient

Load management systems and integrated metering to **efficiently measure PUE levels**



Space saving

Small footprint of compact solutions for medium- and low-voltage power distribution **delivers higher power**



Flexible and modular

Increased speed to deployment and **cost savings** via a scalable and modular solution

Key drivers for data centers

ABB