UniGear type ZS1

Medium voltage, arc-proof, air-insulated switchgear

ABB – a global leader

ABB is a global leader in Power and Automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries.

In India, ABB has a vast installed base, extensive manufacturing facilities and a countrywide marketing and service presence.

The Power Technologies business offers electric, gas and water utilities as well as industrial and commercial customers a wide range of products, systems and services for power generation, transmission and distribution. ABB's turnkey solution capabilities in the sector range from bulk power transmission, turnkey substations and complete electrification to utility automation and distribution systems.

The product offering covers a wide spectrum of technologies across the entire voltage range including indoor and outdoor circuit breakers, air and gas insulated switchgear, instrument transformers, disconnectors, capacitor banks, reactive power compensators, power and distribution transformers and a range of power distribution products like Compact Secondary Substations (CSS) and Ring Main Units (RMU).

Advantage ABB

- ✓ 120 years of technology and innovation
- ✓ Unparalleled domain competence
- ✓ Vast global experience
- ✓ Total solution provider
- ✓ Large installed base
- ✓ Environment-friendly technologies

Commitment to quality and sustainability

ABB manufacturing facilities conform to the highest quality standards and environment norms. The facilities are ISO 9001 and ISO 14001 compliant and certified by leading international authorities.

ISO 9001 - 2000 Quality Systems

ISO 14001 - Environment Management

UniGear: an innovative solution for all installation requirements

UniGear-ABB's medium voltage air-insulated switchgear, is the result of ABB's global know-how integrated into a single technological solution and is also ABB's answer to the range of solutions demanded by global markets.

The switchgear complies with IEC 62271-200 standards. 'Made in ABB', UniGear comes with the same design and quality standards across 5 continents, and offers the best solutions for all installations including power plants, power distribution substations, compact Motor Control Centers, double-level, duplex and special-unit switchgear.

Salient Features

- Metal-clad, four-sided internal arc-proof construction (IAC AFLR)
- Designed in conformance with the highest in class for minimum Loss of Service Continuity - 'LSC-2B with metallic partitions'
- Constructed with pre-galvanized sheets without welding points, making it the most reliable switchgear in its range
- REF542 and other high-end communicable relays offer intelligent solutions for all installation requirements
- It is virtually maintenance-free and all circuit-breaker operations can be carried out with the door closed
- Earthing-switch is provided as an option. It is rated for full making capacity and is provided with safe and reliable position indicators
- All compartments can be accessed from the front, hence the switchgear can be placed against the wall
- The switchgear is provided with conventional or integrated protection and measurement systems
- It is fitted with conventional instrument transformers or new generation sensors

Apparatus which can be installed in UniGear Switchgear

Vacuum Circuit-breaker - Cassette version

- Circuit-breaker for all fields of application
- Vacuum Interrupters, using radial magnetic field contact system, rotate arc column over the complete contact periphery to give the best current-interruption performance at all current values
- Epoxy resin poles for greater protection of the interrupters

Vacuum Circuit-breaker - Floor-rolling version

- Circuit-breaker for all fields of application
- Vacuum Interrupters, using radial magnetic field contact system, rotate arc column over the complete contact periphery to give the best current-interruption performance at all current values
- Epoxy resin poles for greater protection of the interrupters

Vacuum Circuit-breaker with magnetic drive

- The magnetic actuator is a bi-stable system with electromagnetic coils for driving the armature and permanent magnet for latching on to the end positions
- All functions like charging, switching, controlling and self-diagnostics are carried out from an integrated electronic controller
- Equipped with multivoltage feeder in direct and alternating current

Vacuum Contactors

- Optimal solution for motor and transformer switching and switching of capacitor bank for power-factor control
- Fitted with medium voltage fuses according to DIN and BS Standards
- Availability of operating mechanisms with electric or mechanical latching functions
- Equipped with multivoltage feeder in direct and alternating current

UniGear with single busbar system

Each switchboard consists of a single switchgear, which can be equipped with a circuit-breaker or contactor along with all accessories required for the switchgear.

Each switchgear is provided with a metering compartment, placed in the upper part, for auxiliary instrumentation.

The units can be coupled together with either ZVC or double-level units, with the possibility of extension on both ends of the switchgear.

The switchgear can be accessed from both, front and rear sides for installation and maintenance purposes.

All the service operations are carried out from the front.

The switchgear offers:

- Flexible applications
- Complete range of units and apparatus
- Service continuity
- Personnel safety
- Simple maintenance
- Effective use of space
- Built-up modular solutions
- Full access from the front and rear

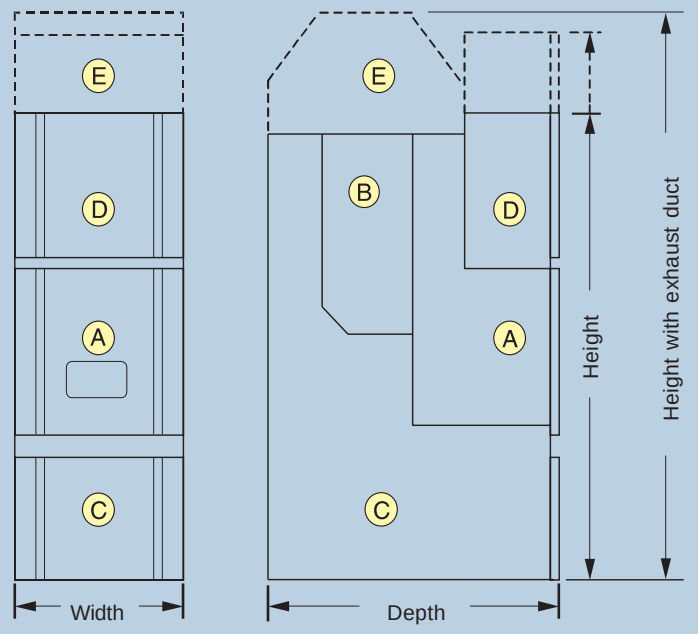
Classification of UniGear according to IEC 62271-200

Resistance to internal arc faults	
Classification	IAC
Accessibility	
– Front	Type A
– Lateral	Type A
– Rear	Type A
Test current	25kA / 40kA
Test duration	0.1 / 1.0 sec *

Construction and design	
Class of partition	PM
Service continuity category	LSC2B
Compartment accessibilty	
– Busbar compartment	Tool-based
– Switching-device compartment	Interlock-based
– Low voltage compartment	Tool-based
– Cable compartment	Tool-based

* 1 second on request

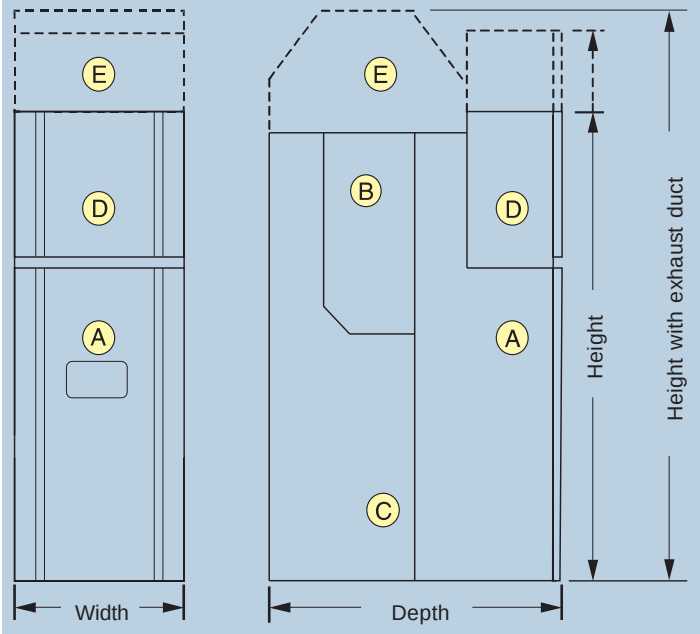
Typical unit cross-section - Cassette version



A Apparatus
B Main busbar
C Feeder
D Instruments
E Gas exhaust duct

Width - 650/800/1000 mm
Height - 2200 mm Depth - 1340 mm

Typical unit cross-section - Floor-rolling version



A Apparatus
B Main busbar
C Feeder
D Instruments
E Gas exhaust duct

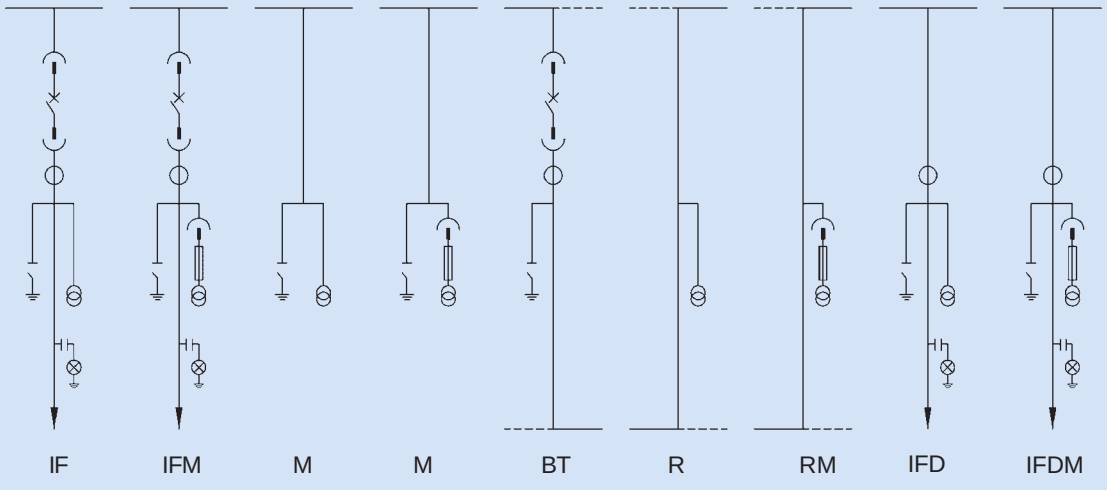
Width - 650/800/1000 mm
Height - 2200 mm Depth - 1340 mm

UniGear with single busbar system

Electrical characteristics

Rated voltage	kV	7.2	12	17.5	24
Rated insulation voltage	kV	7.2	12	17.5	24
Rated power frequency withstand voltage	kV 1min	20	28	38	50
Rated lightning impulse withstand voltage	kV	60	75	95	125
Rated frequency	Hz	50-60	50-60	50-60	50-60
Rated short time withstand current	kA 3s	...50	...50	...40	...25
Peak current	kA	...125	...125	...100	...63
Internal arc withstand current	kA 1s	...40	...40	...40	...25
	kA 0.1s	...50	...50	...40	...25
Main busbar rated current	A	...4000	...4000	...4000	...2500
Branch connection rated current	A	630	630	630	630
		1250	1250	1250	1250
		1600	1600	1600	1600
		2000	2000	2000	2000
		2500	2500	2500	2500
		3150	3150	3150	–
Branch connection rated current with forced ventilation	A	3600 4000	3600 4000	3600 4000	2500 –

Switchgear typical units



UniGear with double busbar system

The double busbar system switchgear is based on two different schemes:

– two busbar systems, two line-side isolators and a circuit-breaker (actual system)
– two busbar systems, two circuit-breaker units with one or two circuit-breakers (duplex system).

The schemes offer redundancy of the busbar system with physical isolation between the systems. The use of this switchgear may be necessary in the case of:

– switch incoming units with unsynchronised circuit-breakers
– disconnection of loads with different levels of importance under emergency conditions
– isolation of particular outgoing units from the normal network
– balance of the outgoing units under normal service conditions
– flexibility during the inspection and maintenance procedures without interruption of the load
– possibility of extension without turning the switchgear off.

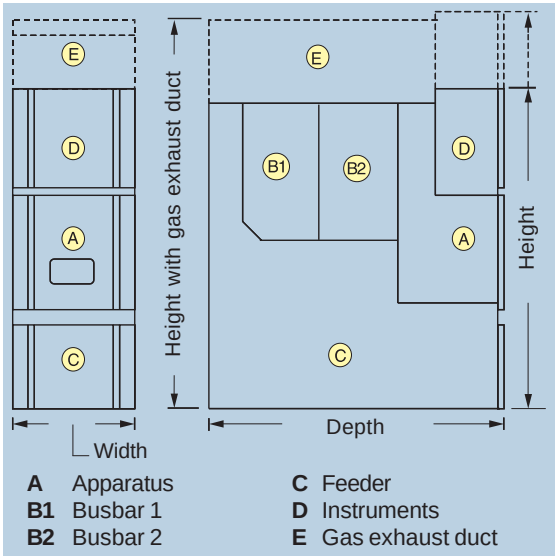
The switchgear offers:

- Line with double isolation up to 2500 A
- 3150 A and 4000 A duplex line
- Segregated busbar and isolation compartments
- Earthing switch with making capacity
- Operations can be carried out from the front
- Reliable and uninterrupted service conditions

Electrical characteristics

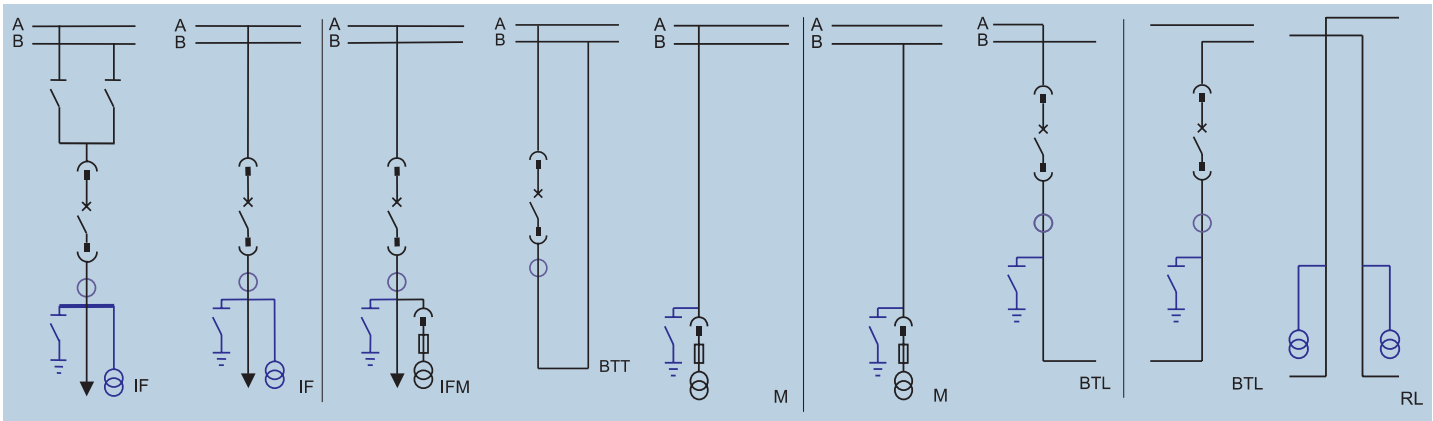
Rated voltage	kV	12	17.5	24
Rated insulation voltage	kV	12	17.5	24
Rated power frequency withstand voltage	kV 1min	28	38	50
Rated lightning impulse withstand voltage	kV	75	95	125
Rated frequency	Hz	50-60	50-60	50-60
Rated short time withstand current	kA 3s	...31.5	...31.5	...25
Peak current	kA	...80	...80	...63
Internal arc withstand current	kA 1s	...31.5	...31.5	...25
Main busbar rated current	A	1250...4000	1250...4000	1250...2500
Branch connection rated current	A	630...3150	630...3150	630...2000
Branch connection rated current with forced ventilation	A	3600...4000	3600...4000	–

Typical unit cross-section



Width: 650/800/1000 Depth: 2021mm Height: 2075 mm

Single-line diagram of the main typical units



IF Incoming/Outgoing

IF - IFM Busbar duplex (ex. A)

BTT Transverse bus-tie

M Measurements

BTL Longitudinal Bus-tie

RL Longitudinal bus riser

Standard components Accessories Alternative solutions

UniGear type ZVC switchgear for motor switching and control

Each unit is equipped with a withdrawable vacuum contactor with fuses.

The use of medium voltage protection fuses strongly limits the let-through fault energy, making it possible to reduce the cross-section of the connection cables to the motor. This characteristic contributes to safeguarding the insulation levels and increasing the electrical life of the cables and the machine connected.

For users with high consumption levels, it is possible to fit the contactor with two fuses in parallel for each of the phases.

The units can be coupled directly with the main switchgear, with the possibility of extension on both ends.

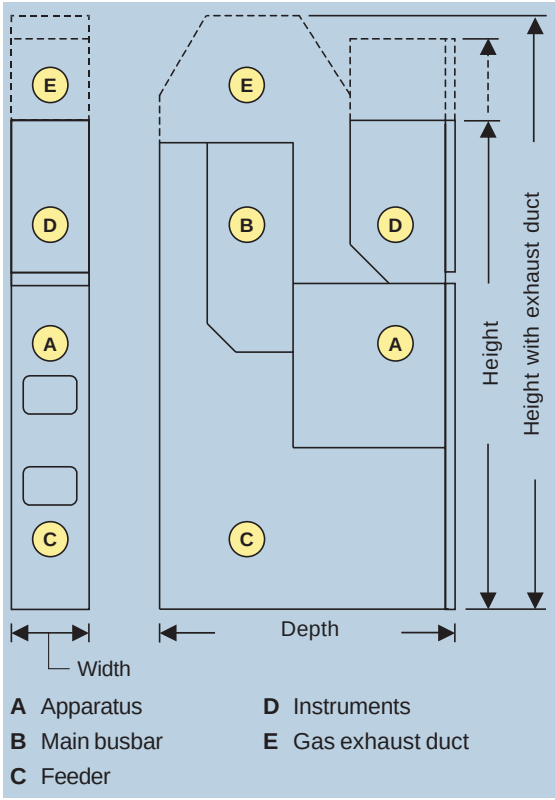
The switchgear offers:

- Configuration for all types of motor starting
- Reduction in the width of the switchgear and of the surface area occupied (the typical unit is 325 mm wide), also using more than one contactor for complex motor start-ups
- The same service and maintenance procedures as the UniGear type ZS1 switchgear
- Full access from the front
- Typical motor start-ups: direct, reversal of direction, reactor, autotransformer, star delta

Electrical characteristics

Rated voltage	kV	3.6	7.2
Rated insulation voltage	kV	3.6	7.2
Rated power frequency withstand voltage	kV 1min	16	20
Rated lightning impulse withstand voltage	kV	40	60
Rated frequency	Hz	50-60	50-60
Rated short time	kA (3s)	...50	...50
withstand current			
Peak current	kA	...125	...125
Internal arc withstand current	kA 1s	...40	...40
	kA 0.5s	...50	...50
Main busbar rated current	A	...4000	...4000
Branch connection rated current	A	400	400

Typical unit cross-section



Width - 325 mm Height - 2200 mm Depth - 1125 mm

Single-line diagram of the main typical units

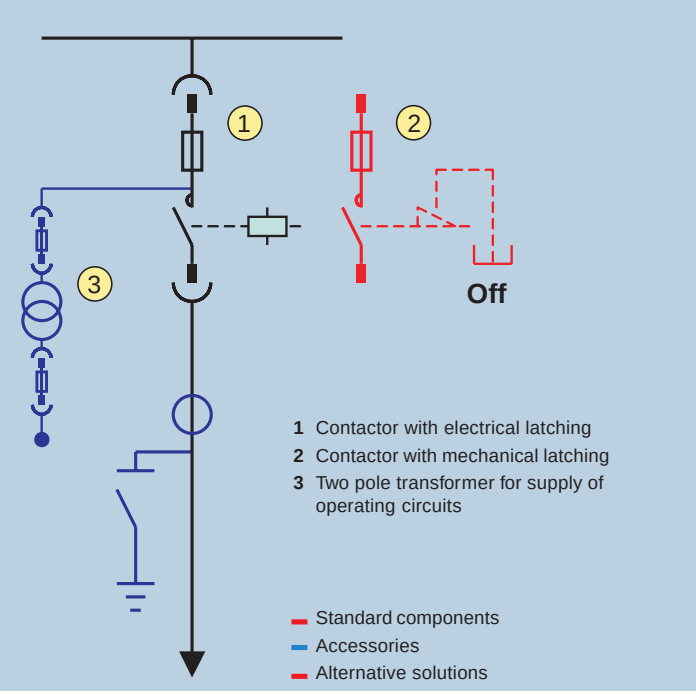


ABB Limited operates a process of continuous product development. We therefore reserve the right to change designs, dimensions and data without prior notice.

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