



HWX-C

Air Insulated Switchgear



SCHNEIDER ELECTRIC HWX-C metal clad switchgear range combines safety with simplicity to provide the most versatile medium voltage switchgear solution on the market today. HWX is ideally suited to power authority and industrial applications and can be supplied in high current and fault rating designs. Its versatility however, allows solutions for current and fault ratings encountered in modern medium voltage distribution systems from the smallest distribution or industrial project to a major power station or oil and gas project.

Safety

Operator safety and continuity of supply are key factors incorporated into the design of HWX-C. Robust mechanical interlocks ensure that operators cannot perform incorrect operations removing the threat to both equipment and personnel. HWX-C is fully type tested to IEC 62271-200, for internal arc withstand ensuring maximum operator safety. Any fault is safely vented away from the front of the panel without damage to the adjacent compartments which also ensures continuity of supply for critical installations.

Vacuum Technology

HWX-C utilises vacuum technology for breaking and fault interruption which has proven itself to be the most reliable and safe interrupting medium through many years of service. Vacuum technology requires smaller contact movement and less mechanical energy than other methods, therefore minimising stress on the equipment resulting in unsurpassed electrical and mechanical endurance.

Fully Tested

The HWX-C operating mechanism provides a long maintenance free life and corrosion resistance through the use of special aluminium bronze castings. The high accuracy of component manufacture together with the elimination of complicated lever systems has resulted in a very simple, accurate mechanism with few adjustment settings.

Customer Benefits

- Metal clad, withdrawable design
- Suitable for up to 12kV 28kVrms, 75kVp
- Designed for up to 25kA / 3 second withstand
- Up to 1250A continuous current rating
- Type tested to latest IEC62271-200





Robust Construction

The HWX-C operating mechanism provides a long maintenance free life and corrosion resistance through the use of special aluminium bronze castings.

Fully tested

The short stroke required for the operation of the vacuum interrupter together with the relatively low loading bearings results in very little wear on the mechanism. This together with the long life of the interrupter results in the most cost effective maintenance free switching device available.

The mechanism is provided with a spring charge motor as standard but can also be hand charged if required. Up to 2 shunt trips can be fitted in all standard AC and DC voltages. Indication of the main contact status is provided by a 12 way auxiliary switch.

Design Characteristics

The HWX-C is designed to provide simple yet reliable operation under all conditions. The metalclad design provides safety to the operator from potential faults occurring in adjacent compartments during operation of the vacuum circuit breaker/ contactor and earth switch.

The cubicles are constructed from 2.5mm aluzinc steel which provides long term protection against corrosion. The front doors are powder coated to suit the customers requirements.

The circuit breaker compartment is filled with independently operated metal shutters. These shutters are padlockable in the closed position to prevent

access to live cables or busbars. A prop is provided to hold the shutter open for access to the plug spout whilst testing. The shutters are automatically reset once the truck is re-inserted. The shutters are gravity operated and do not rely on springs for closing.

The HWX-C utilises tinned busbars for reliable operation and ease of installation. These bars are fitted with heat shrink insulation for added protection.

Interlocking

Operator and equipment safety are key factors of the HWX-C design. A series of mechanical interlocks prevent incorrect or unsafe operation.

Racking Interlock: A racking interlock prevents the breaker being removed from/ into the service position when the circuit breaker is closed. This interlock also ensures the truck is secure in the cubicle in the service, test and isolated positions.

Earth Switch Interlock: The Circuit breaker cannot be racked into the service position if the cable side earth switch is closed. It also ensures the circuit breaker is in the isolated position prior to closing the cable side earth switch.

Key Interlocking: Castell and Fortress key interlocks can be fitted to the circuit breaker and cable/ bus earth switches for key interlocking schemes required for applications such as non paralleling of incomers.





Cabling

Cable connection is provided at the rear of the cubicle. A rear cable connection allows for increased termination height which is often required for Australian conditions where large multiple 3 core cables per phase are common.

A metal gland plate is provided for each set of cables and is located 200mm above the floor level. The cable connection point is located an additional 544mm above the gland plate providing adequate space for trifurcation of 3 core cables and large single core cables up to 630mm² within the switchgear.

HWX-C is supplied with facility for 2 cables per phase as standard but can be fitted with up to 7 or more cables per phase. The rear connected design also allows for top cable connection to be provided if required.

Special Applications

HWX-C can be provided to suit special applications such as capacitor switching. The unique, flexible cubicle design also allows incorporation of proprietary equipment such as station transformers and neutral earthing resistors.

Voltage Transformers

Cable side or busbar voltage transformers can be provided. The standard arrangement utilises 3 x single phase cast resin fixed and fused VT's. An option is available with hinged (withdrawable) VT's if required.



- Images :
- Left : Offshore oil plant
 - Right : Focus of a Feeder Panel view
 - Above right : Schneider MV Switchgear and transformer factories at Rocklea, Brisbane



Low Voltage Chamber

A low voltage compartment is provided on top of the HWX-C panel for fitting of protection and control equipment. Two heights are available (600mm and 900mm) to suit customer requirements.

The instrument compartment door is provided with a stay which limits the door opening and includes a hold open fixing for door security when working within the chamber. The door is restrained by the stay to open 90°, but with the stay detached it can open to 120°.

A chamber depth of 560mm allows considerable accommodation for terminals, fuses, relays and wiring.

HWX-C can provide protection solutions from the traditional MIDOS range through to the latest technology microprocessor based protection relays. These can be integrated into the plant control system to provide full communication and control of the MV Switchgear.

Low voltage multicore cables can enter the switchgear from above or below. Metal ducts are provided within the switchgear for cable access from below. A metal duct is provided on the top of the HWX-C instrument compartment for interpanel wiring and top multicore cable access.



Earthing Switch

HWX-C is provided with a fault make cable side earth switch as standard on each incomer/ feeder panel. Operation of the earth switch is conducted with the breaker removed from the cubicle to ensure the circuit is isolated. The cable side earth switch is visible from the front of the cubicle and allows confirmation of the position of the earth switch after operation. The earth switch is located in the rear metal clad cable compartment and segregation ensures operator safety during switching.

The operating system incorporates an anti reflex design which requires a deliberate pause in the sequence of operation. This pause delays attempts to remove the earth switch if closed onto a live cable (incomer).

Busbar earth switches can also be provided and are located on the top rear of the switchboard avoiding the necessity for an additional panel.

Key interlocks can also be fitted on both cable side and busbar earth switches.



Images :

Far Left : A transportable building showing a single entry door

Left : The same building showing the double entry doors

Above : A HWX-C switchboard installed inside the transportable building

Above right: HWX-C busbar earth switch mechanism

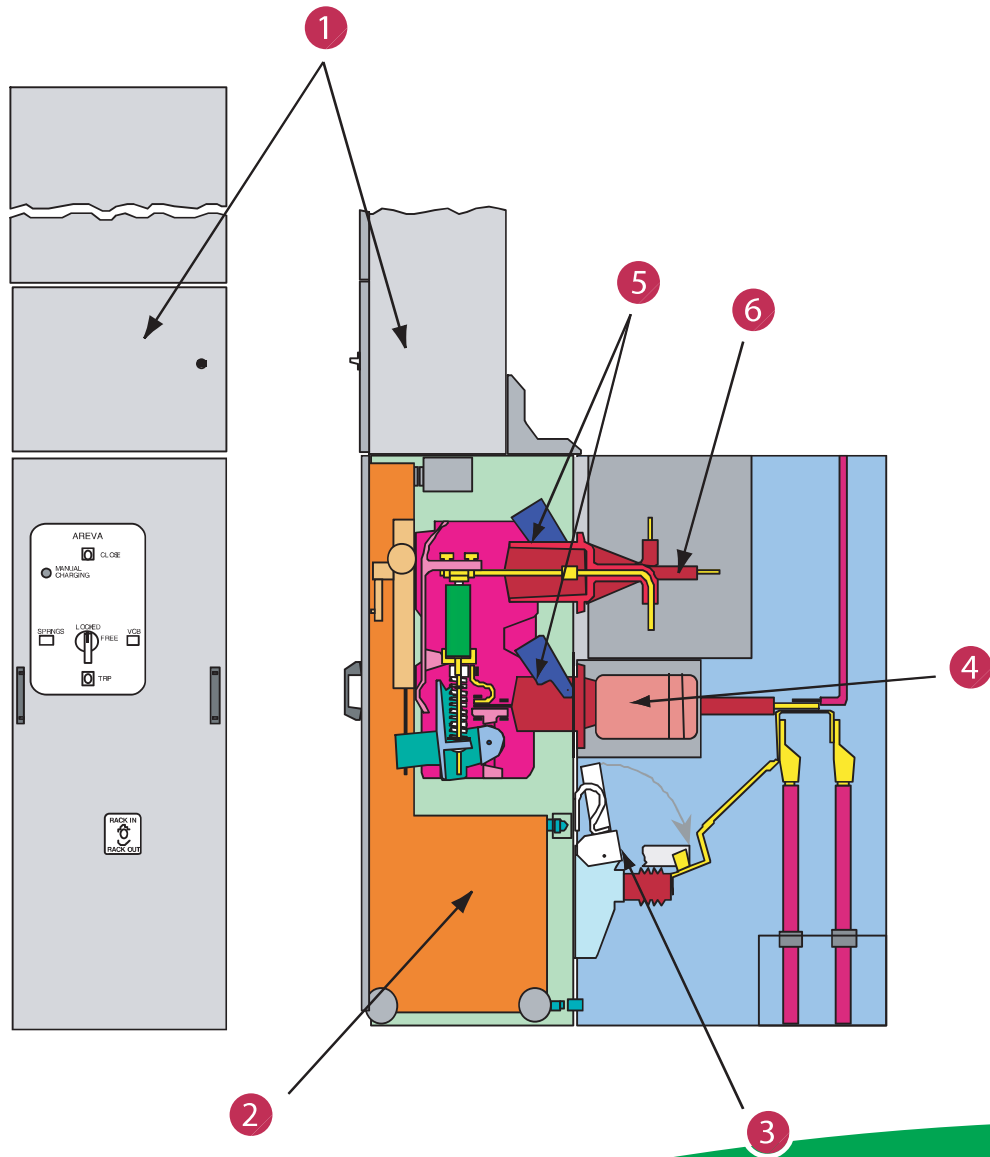
Far Top Left: A HWX-C switchboard being commissioned at site by one of our highly specialised, experienced personnel.

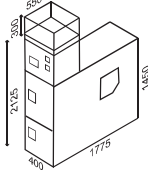
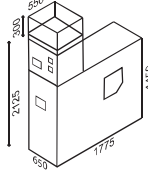
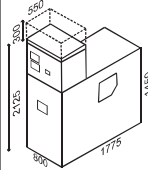
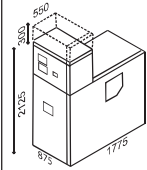
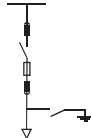
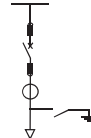
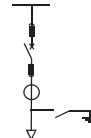
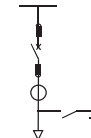
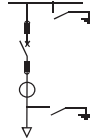
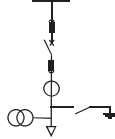
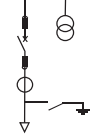


Ratings

Picture 1. An internal view of the HWX-C switchgear circuit breaker panel. The key below describes the major aspects of the panel.

- | | |
|----------------------------|---------------------------------|
| 1. Low voltage compartment | 2. Vacuum circuit breaker truck |
| 3. Earth switch | 4. Current transformer |
| 5. Shutters | 6. Busbars |



RATING		400A	630A 800A 1250A	2000A	2500A	
Dimensions (1) (2)						
Panel Type		Contactor	Incomer/ Feeder	Incomer/ Feeder	Incomer/ Feeder	
Single Line Diagram						
Typical Weights						
truck		100kg	180kg	210kg	215 kg	
cubicle without truck		300kg	410kg	470kg	500kg	
Options						
Busbar Earth Switch (3)			✓	✓	✓	
Cableside Voltage Transformer		✓	✓	✓	✓	
Busbar Voltage Transformer (3)			✓	✓	✓	

- (1) Additional width of 350mm is required for bus section panels
(2) For top cable entry add 420mm to the depth (2 cables per phase)
(3) Busbar earth switch and busbar voltage transformer cannot be mounted on the same panel.

HWX-C - TECHNICAL SPECIFICATIONS

Characteristic	Ratings			
Rated Voltage (kV)	3.6	7.2	12	15
Rated Insulation Level (kV) power frequency withstand voltage lightning impulse withstand voltage	16 40	20 60	28 75/95 (1)	36 75/95 (1)
Vacuum Circuit Breakers (kA) (2) I _{th} max (kA / 3 sec)	20 25 31.5 40	20 25 31.5 40	20 25 31.5 40	20 25 31.5 40
Vacuum Contactors (kA) I _{th} max (kA / 3 sec)	20 25 31.5 40	20 25 31.5 40		
Rated short circuit breaking capacity Vacuum Circuit Breakers (kA)	20 25 31.5 40	20 25 31.5 40	20 25 31.5 40	20 25 31.5 40
Vacuum Contactors (kA) (3)	20 25 31.5 40	20 25 31.5 40		
Earth Switch Making Capacity (kA peak)	62.5 100	62.5 100	62.5 100	62.5 100
Rated continuous current at 40°C (4) Vacuum Circuit Breaker (A)	800 1250 2000 2500	800 1250 2000 2500	800 1250 2000 2500	800 1250 2000 2500
Maximum motor size - DOL starting (5) Vacuum contactor (kW)	900	1800		
Degree of protection	IP3X (IP41 option) (6)			
Seismic Rating	0.7g	0.7g	0.7g	0.7g
Circuit Breaker Internal Arc Withstand kA / 1 sec kA / 0.1 sec	25 40	25 40	25 40	25 40

- (1) 95kV up to 2000A, 2500A rated at 75kV
- (2) Peak making capacity is 2.5 times the short time withstand
- (3) In combination with HRC motor start fuse
- (4) Busbar rating options are identical to CB ratings
- (5) Utilising 280A fuses with a starting time less than 6 seconds and less than / equal to 4 starts per hour
- (6) IP51 can be provided on 800A and 1250A panels